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Volume 1

Programmatic Environmental Impact Statement For Northern Border Activities

Department of Homeland Security
U.S. Customs and Border Protection



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Programmatic Environmental Impact Statement For Northern Border Activities

Executive Summary



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EXECUTIVE SUMMARY

INTRODUCTION

U.S. Customs and Border Protection (CBP), a component of the Department of Homeland Security (DHS), proposes the use of a multilayered law enforcement approach to deploy border security program elements in the most effective combination to respond to any evolution of cross-border terrorist, criminal, and public safety threats along the northern border over the next five to seven years. Border security program elements consist of facilities; technologies for communication, detection, inspection, and surveillance; and land-based security infrastructure. These assets are used by agents, officers, specialists, and other personnel to pursue effective control of air, land, and sea borders between the United States and Canada. Under this proposal, CBP is evaluating alternative programmatic approaches that focus on augmenting particular elements for future responses to evolving threats and changes in security or trade and travel facilitation priorities.

CBP is charged with the dual mission of securing the Nation's borders while facilitating legitimate trade and travel through the legal ports of entries (POE). CBP enforces customs, immigration, agriculture, and numerous other laws and regulations at the Nation's borders. Its priority is to prevent terrorists and terrorist weapons from entering the United States (U.S.), but it is responsible for deterring all cross-border violations, including illegal immigration and the trafficking of human beings, narcotics, and other contraband. As the guardian of U.S. borders, CBP protects the border between the United States and Canada, 1,900 miles of international border with Mexico, and the 95,000 miles of shoreline in the contiguous United States. (Note: Although CBP operates POEs along the border between Alaska and Canada, this PEIS addresses only the 4,000-mile contiguous border from Maine to Washington, referred to in this document as the "northern border." The 1,500 mile border between Alaska and Canada represents a distinct and separate operational environment.)

This PEIS was prepared in accordance with the National Environmental Policy Act (NEPA). It focuses on broad actions. It provides a reference document for future site-specific and project-specific NEPA documentation (tiering) that will analyze effects of CBP proposals along the northern border. CBP will continue to comply with NEPA while carrying out its mission and this document is part of that process.

PURPOSE AND NEED

The purpose of the proposed action is to provide CBP with the flexibility to expand or alter its activities as needed to maintain effective control of the northern border in response to changes in priorities along that border. The proposed action is needed to better enable CBP agents and officers to operate in support of the CBP mission to safeguard the Nation. Improved border security will exist when CBP is able to stay abreast of current border activities; that is, to maintain situational awareness, determine the level of threat involved in given situations, and work in collaborative partnerships with local, state, and tribal law enforcement partners. To provide the needed flexibility, CBP is evaluating alternative approaches, including making changes to the mixture and amount of operations, facilities, tactical infrastructure, and technology implemented along the northern border through the Office of Field Operations (OFO), the United States Border Patrol (USBP), and the Office of Air and Marine (OAM). CBP

prepared this PEIS to address the potential impacts of these changes with respect to the evolution of environmental conditions since CBP's inception in March 2003.

PUBLIC INVOLVEMENT

CBP is committed to continued public involvement under NEPA. On July 6, 2010, CBP published in the Federal Register a Notice of Intent (NOI) (75 FR 38822) to prepare individual PEISs for four regions along the northern border. After conducting a public scoping process, CBP determined that it would be preferable to produce one document covering the entire northern border to ensure that CBP effectively analyzes and conveys impacts that occur across the region of the northern border. Therefore, CBP published a second Notice on November 9, 2010, (75 FR 68810) stating that a single PEIS would be prepared for the entire northern border. The PEIS analyzes impacts for four regions and also summarizes impacts for the northern border as a whole.

A series of 11 public scoping meetings were held along the northern border, 6 during the week of July 12, 2010, and 5 during the week of July 19, 2010. Scoping letters were sent to approximately 1,200 agencies, organizations, and individuals. The letters described the proposed project and invited comments in response. Display advertisements were published in local newspapers and public service announcements were sent to radio stations making the public aware of the meetings and the public scoping program. The results of the scoping process, including public input, are provided in Appendix A.

Scoping comments were received at the public meetings, as well as through e-mails, faxes, phone calls, and posted letters. A total of 223 communications were received during the public scoping process.

On September 16, 2011 CBP issued a Notice of Availability for the Draft PEIS and asked for public comment. CBP held 12 public meetings in various locations within the area of study and one additional meeting in the Washington, DC, metropolitan area. CBP received 123 individually identifiable pieces of correspondence providing comments and over 700 identifiable comments on the Draft PEIS. The Final PEIS reflects the consideration and incorporation of public comments received. Commenters expressed concerns with the range of alternatives proposed, impacts to transboundary areas and movement of species, and impacts to specific cultural resources. There were also concerns that CBP would build a "border fence" after completing this PEIS. The Final PEIS addresses these concerns programmatically and clarifies that CBP is not contemplating a "border fence" for the northern border.

CBP also invited the U.S. Department of the Interior and the U.S. Department of Agriculture - Forest Service to be cooperating agencies and requesting their participation in the preparation of the PEIS.

DESCRIPTION OF PROPOSED ACTION

To ensure its continued effectiveness protecting the United States from existing and evolving threats to the Nation's physical and economic security, and to facilitate legitimate trade and travel, CBP is proposing changes to the mixture of facilities, operations, tactical infrastructure, and technology implemented along the northern border through its uniformed law enforcement components: OFO, USBP, and OAM.

ALTERNATIVES

This document considers several alternative ways for CBP to address the purpose and need; that is, to maintain effective control of the northern border. These alternatives emphasize emerging technologies and increased use of security measures; at the same time, they continue to deploy existing CBP personnel in the most effective manner and to maintain the safety of CBP law enforcement personnel and the public. Indeed, one of the principal aims of each alternative is to leverage CBP personnel; that is, to provide CBP personnel with the tools or assets necessary to maximize their effectiveness in securing the Nation's borders. Following are several alternatives considered in the PEIS. Implicit in each alternative is the concept that strong partnerships remain a central component of CBP's northern border strategy. The use of partnerships is and will continue to be common to all alternatives outlined below. It will always be a program direction because it is efficient and effective.

The No Action Alternative, or status quo, would be to continue with the same facilities, technology, infrastructure, and approximate level of personnel currently in use, deployed, or currently planned by CBP. Normal maintenance of existing facilities is included in this alternative. This alternative would not fully meet the need for the proposed program because it would not allow CBP to improve its capability to interdict cross-border violators or to identify and resolve threats at the POEs in a manner that avoids adverse effects on legal trade and travel. However, it is evaluated in this PEIS because it provides a baseline against which the impacts of the other reasonable alternatives can be compared.

The Facilities Development and Improvement Alternative would focus on replacing or providing new permanent facilities, such as Border Patrol stations, housing, and other facilities, or making major modifications to permanent facilities, such as POEs, to allow agents, officers, and agricultural specialists within CBP to operate more efficiently and respond to situations more quickly. This alternative also includes the construction of temporary or long-term facilities such as forward operating bases (FOBs) and checkpoints, and other facilities necessary to support CBP law enforcement agents and officers as they carry out operational duties. This alternative would help meet the need for the proposed program because the new and improved facilities would make it more difficult for cross-border violators to cross the border. It would also divert traffic from or increase the capacity of the more heavily used POEs; and thus decrease wait times. The applicability of this alternative would be limited, as most roads crossing the northern border already have a POE. As demonstrated in Table ES-1 "Comparison of Action Alternatives," this alternative partially meets the purpose and need for the proposed action.

The Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative would focus on deploying more effective surveillance and communications technologies in support of CBP activities. It would include improvements to the identification and inspection technologies used by OFO and USBP. It would include continuing intelligence network developments and other Office of Technology, Innovation, and Acquisition (OTIA) and Office of Information Technology (OIT) technological developments and plans. These plans involve fielding upgraded surveillance and telecommunications systems (e.g., remote sensors, short-range radar, remote and mobile video surveillance and communications systems, new camera systems, and upgrades to stationary communications systems) that would enable USBP and OAM to focus their efforts on identified threat areas, improve agent and officer communication systems, and deploy personnel to resolve incidents with maximum efficiency.

This alternative would help meet the need for the proposed program by improving CBP's situational awareness and allowing it to more efficiently and effectively direct its resources for interdicting cross-border violators. This alternative would have the least potential for major adverse environmental impacts among the action alternatives and so is selected as the environmentally preferable alternative. As demonstrated in Table ES-1, this alternative fully meets the purpose and need for the proposed action and is selected as the preferred alternative.

The Tactical Security Infrastructure Deployment Alternative would focus on constructing additional barriers, access roads, and related facilities. The barriers would include selective fencing and vehicle barriers at selected points along the border and would deter and delay cross-border violators. The access roads and related facilities would increase the mobility of USBP agents, enhancing their capabilities for surveillance and response to international border violations. This alternative would help meet the need for the proposed program to discourage cross-border violators and improve CBP's capability to respond to threats, but would not assist CBP in identifying and classifying threats. As demonstrated in Table ES-1, this alternative partially meets the purpose and need for the proposed action.

The Flexible Direction Alternative would allow CBP to follow any of the above directions either across the entire border or in a particular region based on what would be most effective in responding to a changing threat environment along the northern border. It is impossible to predict what measures will be needed at any point in time, and the needed mix is likely to change constantly because the threat environment changes constantly. Accordingly, the Flexible Direction Alternative would allow CBP to pursue the optimal mix of facilities, technology, and tactical infrastructure in order to respond to the changing environment and allow CBP personnel to be deployed in the most effective manner possible. As demonstrated in Table ES-1, this alternative fully meets the purpose and need for the proposed action.

Table ES-1 Comparison of Action Alternatives

CRITERIA CONTRIBUTING TO EFFECTIVE CONTROL OF THE BORDER ENVIRONMENT				
ALTERNATIVES	Maintain Situational Awareness	Identify and Classify Threats	Respond Efficiently and Effectively	Resolve Law Enforcement Situations to Satisfaction
No Action Alternative	Status Quo	Status Quo	Status Quo	Status Quo
Facilities Development and Improvement Alternative	Indirect: Provides agents and officers with more modernly equipped facilities distributed closer to CBV threat environment	Indirect: Provides agents and officers and with more modern facilities for inspecting cargo, vehicles, and people	Direct: Reduces agent and officer distance from patrol areas or trade and travel processing areas	Indirect: Provides agents and officers with more modernly equipped facilities to process CBVs
Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative (Preferred Alternative)	Direct: Improves the common operating picture and effective communication regarding CBV threats	Direct: Improves ability to screen potential CBVs and relay intelligence about potential threats	Direct: Increases accuracy of information about the location of threats and increases the operational tempo of agents and officers ready for response	Direct: Potentially increases interdiction rate by accelerating operational tempo and improving situational awareness
Tactical Security Infrastructure Deployment Alternative	Indirect: Provides selective barriers to impede CBV access and movement and provides road upgrades to increase agent and officer access to more points along the border	Status Quo	Direct: Reduces potential average response time and distance by upgrading existing or adding new roads thereby increasing access to more points along the border	Indirect: Provides road upgrades and additions to increase border area accessibility and likely make CBP interdictions more effective
Flexible Direction Alternative	Direct: Improves the common operating picture and effective communication regarding CBV threats	Direct: Improves ability to screen potential CBVs and relay intelligence about potential threats	Direct: Increases information accuracy, border accessibility, and operational tempo	Direct: Potentially increases interdiction rate by accelerating operational tempo and improving situational awareness

SUMMARY OF ENVIRONMENTAL IMPACTS

In compliance with NEPA, Council on Environmental Quality (CEQ) regulations, and the DHS Directive 023-01 *Environmental Planning Program*, this PEIS describes the existing environmental conditions potentially affected by the proposed action, as well as the potential environmental impacts of implementing the alternatives. Sections 3.2 and 3.3 of the PEIS explain the analytical methodology. Analyzing program directions as proposed action alternatives allows for comparison of the impacts of each measure in different geographic settings. Analyses will show that some measures are better suited than others to each geographic area. This will assist CBP in developing planning guidelines for its operations and facilities. Table ES-1 summarizes the potential impacts anticipated under each alternative considered, broken down by resource area or impact topic for the entire northern border. Chapters 4 through 7 of this PEIS evaluate these impacts for each of the four regions.

Table ES-2. Summary of Potential Environmental Impacts by Alternative

Resource Area	Alternatives				
	No Action	Facilities Development and Improvement	Detection, Inspection, Surveillance, and Communications Technology Expansion	Tactical Security Infrastructure Deployment	Flexible Direction
Air quality	Minor	Minor	Minor	Minor	Minor
Biological resources	Moderate	Moderate	Moderate	Moderate	Moderate
Geology and soils	Moderate	Moderate	Moderate	Moderate	Moderate
Water resources	Minor	Minor	Minor	Minor	Minor
Noise	Minor	Moderate	Minor	Minor	Moderate
Climate change	Minor (with beneficial)	Minor (with beneficial)	Minor (with beneficial)	Minor (with beneficial)	Minor (with beneficial)
Land use	Moderate	Moderate	Moderate	Moderate	Moderate
Aesthetic and visual resources	Minor	Moderate	Moderate	Moderate	Moderate
Socioeconomic resources	Moderate	Moderate	Moderate	Moderate	Moderate
Cultural and paleontological resources	Major (with beneficial)	Major (with beneficial)	Major (with beneficial)	Major (with beneficial)	Major (with beneficial)
Environmental justice and protection of children	Minor	Minor	Minor	Minor	Minor
Human health and safety	Moderate (with beneficial)	Moderate (with beneficial)	Moderate (with beneficial)	Moderate (with beneficial)	Moderate (with beneficial)

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Resource Area	Alternatives				
	No Action	Facilities Development and Improvement	Detection, Inspection, Surveillance, and Communications Technology Expansion	Tactical Security Infrastructure Deployment	Flexible Direction
Hazardous materials	Minor (with beneficial)	Minor	Minor	Minor	Minor
Utilities and infrastructure	Negligible	Negligible	Negligible	Negligible	Negligible
Roadways and traffic	Major	Major	Major	Major	Major
Recreation	Minor	Moderate	Moderate	Moderate	Moderate

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MASTER TABLE OF CONTENTS

Executive Summary	ES-1
Master Table of Contents	I
Abbreviations	ABBR-1
Table of Contents	1-i
1 Introduction	1-1
1.1 Purpose of the PEIS	1-2
1.2 CBP Northern Border Activities	1-3
1.2.1 CBP Organization	1-3
1.2.2 Operational Perspective	1-4
1.2.3 CBP Northern Border Operations, Facilities, Tactical Infrastructure, and Technologies	1-7
1.3 Purpose and Need	1-17
1.3.1 Purpose of the Proposed Action	1-17
1.3.2 Need	1-18
1.4 Proposed Action and Alternatives	1-18
1.5 Other Considerations for Northern border planning	1-19
1.5.1 Policy and Budgetary Considerations	1-19
1.5.2 ongoing Interagency Cooperation	1-20
1.5.3 Compliance Framework	1-20
1.5.4 Permits, Approvals, and Interagency Coordination	1-21
1.5.5 Actions/Activities with Little or No Potential for Impact on the Environment.	1-22
1.5.6 Public Involvement	1-22
1.6 PEIS Cooperating and Coordinating Agencies	1-23
Table of Contents	2-i
2 Proposed Action and Alternatives	2-1
2.1 Proposed Action Alternatives	2-2
2.1.1 Descriptions of Alternatives	2-3
2.2 Activities to be Evaluated	2-5
2.3 No Action Alternative	2-8
2.4 Facilities Development and Improvement Alternative	2-10
2.5 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative (Preferred Alternative/Environmental Preferable Alternative)	2-11
2.6 Tactical Security Infrastructure Deployment Alternative	2-14
2.7 The Flexible Direction Alternative	2-14
2.8 Alternative Considered But Removed From Further Consideration	2-15
2.9 Summary Comparison of Action Alternatives	2-15
2.9.1 Other Mission Considerations	2-18
2.9.2 Environmental Stewardship and Social Responsibility	2-19
Table of Contents	3-i
3 Framework for Analysis	
3.1 Environmental Resource Areas Analyzed for Impacts	3-1

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

3.1.1 Methodology for Resource Analysis	3-2
3.1.2 Impact Determinations	3-3
3.2 Air Quality	3-4
3.2.1 Context for Affected Environment	3-4
3.2.2 Framework for Characterizing Resource Impacts	3-8
3.2.3 Activities with Environmental Consequences to Air Quality	3-9
3.3 Biological Resources	3-10
3.3.1 Context for Affected Environment	3-10
3.3.2 Framework for Characterizing Resource Impacts	3-13
3.3.3 Activities with Environmental Consequences to Biological Resources	3-14
3.4 Geology and Soils	3-15
3.4.1 Context for Affected Environment	3-15
3.4.2 Framework for Characterizing Resource Impacts	3-18
3.4.3 CBP Activities with Environmental Consequences to Geologic and Soil Resources	3-19
3.5 Water Resources	3-20
3.5.1 Context for Affected Environment	3-20
3.5.2 Framework for Characterizing Resource Impacts	3-21
3.5.3 Activities with Environmental Consequences to Water Resources	3-22
3.6 Noise	3-23
3.6.1 Context for Affected Environment	3-23
3.6.2 Framework for Characterizing Resource Impacts	3-24
3.6.3 Activities with Environmental Consequences to the environment	3-25
3.7 Climate Change and Sustainability	3-26
3.7.1 Context for Affected Environment	3-26
3.7.2 Framework for Characterizing Resource Impacts	3-28
3.7.3 Activities with Environmental Consequences to Climate Change and Sustainability	3-29
3.8 Land Use	3-29
3.8.1 Context for Affected Environment	3-29
3.8.2 Framework for Characterizing Resource Impacts	3-34
3.8.3 Activities with Environmental Consequences to Land Use	3-35
3.9 Aesthetic and Visual Resources	3-36
3.9.1 Context for Affected Environment	3-36
3.9.2 Framework for Characterizing Resource Impacts	3-40
3.9.3 Activities with Environmental Consequences to Aesthetic and Visual Resources	3-43
3.10 Socioeconomic Resources	3-43
3.10.1 Context for Affected Environment	3-43
3.10.2 Framework for Characterizing Resources Impacts	3-44
3.10.3 Activities with Environmental Consequences to Socioeconomic Resources	3-45
3.11 Cultural and Paleontological Resources	3-45
3.11.1 Context for Affected Environment	3-45
3.11.2 Framework for Characterizing Resource Impacts	3-45
3.11.3 Activities with Environmental Consequences to Cultural and Paleontological Resources	3-46

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

3.12 Environmental Justice and Protection of Children	3-46
3.12.1 Context for Affected Environment	3-46
3.12.2 Framework for Characterizing Resource Impacts	3-48
3.12.3 Activities with Environmental Consequences to Environmental Justice and Protection of Children	3-49
3.13 Human Health and Safety	3-49
3.13.1 Context for Affected Environment	3-49
3.13.2 Framework for Characterizing Resource Impacts	3-50
3.13.3 Activities with Environmental Consequences to Human Health and Safety	3-50
3.14 Hazardous and Other Regulated materials	3-51
3.14.1 Context for Affected Environment	3-51
3.14.2 Framework for Characterizing Resource Impacts	3-57
3.14.3 Activities with Hazardous and Other Regulated Materials Environmental Consequences	3-57
3.15 Utilities and Infrastructure	3-58
3.15.1 Context for Affected Environment	3-58
3.15.2 Framework for Characterizing Resource Impacts	3-59
3.15.3 Activities with Environmental Consequences to Utilities and Infrastructure	3-59
3.16 Roadways and Traffic	3-60
3.16.1 Context for Affected Environment	3-60
3.16.2 Framework for Characterizing Resource Impacts	3-60
3.16.3 Activities with Environmental Consequences to Transportation Resources	3-61
3.17 Recreation	3-61
3.17.1 Context for Affected Environment	3-61
3.17.2 Framework for Characterizing Resource Impacts	3-64
3.17.3 Activities with Environmental Consequences to Recreation Resources	3-65
Table of Contents	4-i
4 West of the Rockies Region	4-1
4.1 Introduction	4-1
4.2 Air Quality	4-4
4.2.1 Introduction	4-4
4.2.2 Affected Environment	4-4
4.3 Biological Resources	4-8
4.3.1 Introduction	4-8
4.3.2 Affected Environment	4-10
4.4 Geology and Soils	4-23
4.4.1 Introduction	4-23
4.4.2 Affected Environment	4-23
4.5 Water Resources	4-39
4.5.1 Introduction	4-39
4.5.2 Affected Environment	4-39
4.6 Noise	4-45
4.6.1 Introduction	4-45
4.6.2 Affected Environment	4-45
4.7 Climate Change and Sustainability	4-51

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

4.7.1 Introduction	4-51
4.7.2 Affected Environment	4-51
4.8 Land Use	4-54
4.8.1 Introduction	4-54
4.8.2 Affected Environment	4-54
4.9 Aesthetic and Visual Resources	4-68
4.9.1 Introduction	4-68
4.9.2 Affected Environment	4-68
4.10 Socioeconomic Resources	4-71
4.10.1 Introduction	4-71
4.10.2 Affected Environment	4-71
4.11 Cultural and Paleontological Resources	4-91
4.11.1 Introduction	4-91
4.11.2 Affected Environment	4-91
4.12 Environmental Justice and Protection of Children	4-108
4.12.1 Introduction	4-108
4.12.2 Affected Environment	4-108
4.13 Human Health and Safety	4-114
4.13.1 Introduction	4-114
4.13.2 Affected Environment	4-114
4.14 Hazardous and Otherwise Regulated materials	4-122
4.14.1 Introduction	4-122
4.14.2 Affected Environment	4-123
4.15 Utilities and Infrastructure	4-124
4.15.1 Introduction	4-124
4.15.2 Affected Environment	4-124
4.16 Roadways and Traffic	4-127
4.16.1 Introduction	4-127
4.16.2 Affected Environment	4-127
4.17 Recreation	4-133
4.17.1 Introduction	4-133
4.17.2 Affected Environment	4-135
Table of Contents	5-i
5 East of the Rockies Region	5-1
5.1 Introduction	5-1
5.2 Air Quality	5-4
5.2.1 Introduction	5-4
5.2.2 Affected Environment	5-4
5.3 Biological Resources	5-8
5.3.1 Introduction	5-8
5.3.2 Affected Environment	5-10
5.4 Geology and Soils	5-22
5.4.1 Introduction	5-22
5.4.2 Affected Environment	5-22
5.5 Water Resources	5-36

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

5.5.1 Introduction	5-36
5.5.2 Affected Environment	5-36
5.6 Noise	5-42
5.6.1 Introduction	5-42
5.6.2 Affected Environment	5-42
5.7 Climate Change and Sustainability	5-47
5.7.1 Introduction	5-47
5.7.2 Affected Environment	5-47
5.8 Land Use	5-49
5.8.1 Introduction	5-49
5.8.2 Affected Environment	5-49
5.9 Aesthetic and Visual Resources	5-65
5.9.1 Introduction	5-65
5.9.2 Affected Environment	5-65
5.10 Socioeconomic Resources	5-70
5.10.1 Introduction	5-70
5.10.2 Affected Environment	5-70
5.11 Cultural and Paleontological Resources	5-92
5.11.1 Introduction	5-92
5.11.2 Affected Environment	5-92
5.12 Environmental Justice and Protection of Children	5-110
5.12.1 Introduction	5-110
5.12.2 Affected Environment	5-110
5.13 Human Health and Safety	5-117
5.13.1 Introduction	5-117
5.13.2 Affected Environment	5-117
5.14 Hazardous Materials	5-127
5.14.1 Introduction	5-127
5.14.2 Affected Environment	5-128
5.15 Utilities and Infrastructure	5-129
5.15.1 Introduction	5-129
5.15.2 Affected Environment	5-129
5.16 Roadways and Traffic	5-132
5.16.1 Introduction	5-132
5.16.2 Affected Environment	5-132
5.17 Recreation	5-138
5.17.1 Introduction	5-138
5.17.2 Affected Environment	5-140
Table of Contents	6-i
6 Great Lakes Region	6-1
6.1 Introduction	6-1
6.2 Air Quality	6-4
6.2.1 Introduction	6-4
6.2.2 Affected Environment	6-4
6.3 Biological Resources	6-8

6.3.1 Introduction	6-8
6.3.2 Affected Environment	6-10
6.4 Geology and Soils	6-21
6.4.1 Introduction	6-21
6.4.2 Affected Environment	6-21
6.5 Water Resources	6-36
6.5.1 Introduction	6-36
6.5.2 Affected Environment	6-36
6.6 Noise	6-41
6.6.1 Introduction	6-41
6.6.2 Affected Environment	6-41
6.7 Climate Change and Sustainability	6-46
6.7.1 Introduction	6-46
6.7.2 Affected Environment	6-46
6.8 Land Use	6-48
6.8.1 Introduction	6-48
6.8.2 Affected Environment	6-48
6.9 Aesthetic and Visual Resources	6-66
6.9.1 Introduction	6-66
6.9.2 Affected Environment	6-66
6.10 Socioeconomic Resources	6-71
6.10.1 Introduction	6-71
6.10.2 Affected Environment	6-71
6.11 Cultural and Paleontological Resources	6-98
6.11.1 Introduction	6-98
6.11.2 Affected Environment	6-98
6.12 Environmental Justice and Protection of Children	6-123
6.12.1 Introduction	6-123
6.12.2 Affected Environment	6-123
6.13 Human Health and Safety	6-131
6.13.1 Introduction	6-131
6.13.2 Affected Environment	6-131
6.14 Hazardous and Otherwise Regulated Materials	6-140
6.14.1 Introduction	6-140
6.14.2 Affected Environment	6-141
6.15 Utilities and Infrastructure	6-142
6.15.1 Introduction	6-142
6.15.2 Affected Environment	6-142
6.16 Roadways and Traffic	6-145
6.16.1 Introduction	6-145
6.16.2 Affected Environment	6-145
6.17 Recreation	6-151
6.17.1 Introduction	6-151
6.17.2 Affected Environment	6-153

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

7 New England Region	7-1
7.1 Introduction	7-1
7.2 Air Quality	7-4
7.2.1 Introduction	7-4
7.2.2 Affected Environment	7-4
7.3 Biological Resources	7-8
7.3.1 Introduction	7-8
7.3.2 Affected Environment	7-10
7.4 Geology and Soils	7-18
7.4.1 Introduction	7-18
7.4.2 Affected Environment	7-18
7.5 Water Resources	7-30
7.5.1 Introduction	7-30
7.5.2 Affected Environment	7-30
7.6 Noise	7-36
7.6.1 Introduction	7-36
7.6.2 Affected Environment	7-36
7.7 Climate Change and Sustainability	7-41
7.7.1 Introduction	7-41
7.7.2 Affected Environment	7-41
7.8 Land Use	7-43
7.8.1 Introduction	7-43
7.8.2 Affected Environment	7-43
7.9 Aesthetic and Visual Resources	7-60
7.9.1 Introduction	7-60
7.9.2 Affected Environment	7-60
7.10 Socioeconomic Resources	7-65
7.10.1 Introduction	7-65
7.10.2 Affected Environment	7-65
7.11 Cultural and Paleontological Resources	7-85
7.11.1 Introduction	7-85
7.11.2 Affected Environment	7-85
7.12 Environmental Justice and Protection of Children	7-107
7.12.1 Introduction	7-107
7.12.2 Affected Environment	7-107
7.13 Human Health and Safety	7-114
7.13.1 Introduction	7-114
7.13.2 Affected Environment	7-114
7.14 Hazardous Materials	7-122
7.14.1 Introduction	7-122
7.14.2 Affected Environment	7-123
7.15 Utilities and Infrastructure	7-124
7.15.1 Introduction	7-124
7.15.2 Affected Environment	7-124
7.16 Roadways and Traffic	7-127
7.16.1 Introduction	7-127

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

7.16.2 Affected Environment	7-127
7.17 Recreation	7-133
7.17.1 Introduction	7-133
7.17.2 Affected Environment	7-135
Table of Contents	8-i
8 Environmental Consequences	8-1
8.1 Introduction	8-1
8.2 Environmental Consequences to Air Quality	8-4
8.2.1 No Action Alternative	8-5
8.2.2 Facilities Development and Improvement Alternative	8-7
8.2.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	8-11
8.2.4 Tactical Security Infrastructure Deployment Alternative	8-15
8.2.5 Flexible Direction Alternative	8-16
8.2.6 Best Management, Minimization, and Mitigation	8-19
8.2.7 Summary of Potential Impacts	8-20
8.3 Environmental Consequences to Biological Resources	8-22
8.3.1 No Action Alternative	8-24
8.3.2 Facilities Development and Improvement Alternative	8-33
8.3.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	8-37
8.3.4 Tactical Security Infrastructure Deployment Alternative	8-38
8.3.5 Flexible Direction Alternative	8-42
8.3.6 Best Management, Minimization, and Mitigation	8-42
8.3.7 Summary of Potential Biological Resources Impacts	8-48
8.4 Environmental Consequences to Geology and Soils	8-51
8.4.1 No Action Alternative	8-51
8.4.2 Facilities Development and Improvement Alternative	8-55
8.4.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	8-56
8.4.4 Tactical Security Infrastructure Deployment Alternative	8-57
8.4.5 Flexible Direction Alternative	8-58
8.4.6 Best Management, Minimization, and Mitigation	8-58
8.4.7 Summary of Potential Geology, Topography, and Soils Impacts	8-59
8.5 Environmental Consequences to Water Resources	8-62
8.5.1 No Action Alternative	8-63
8.5.2 Facilities Development and Improvement Alternative	8-68
8.5.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	8-70
8.5.4 Tactical Security Infrastructure Deployment Alternative	8-71
8.5.5 Flexible Direction Alternative	8-72
8.5.6 Best Management, Minimization, and Mitigation	8-74
8.5.7 Summary of Potential Water Resources Impacts	8-76
8.6 Environmental Consequences of Noise	8-79
8.6.1 No Action Alternative	8-79

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

8.6.2 Facilities Development and Improvement Alternative	8-79
8.6.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	8-83
8.6.4 Tactical Security Infrastructure Deployment Alternative	8-91
8.6.5 Flexible Direction Alternative	8-91
8.6.6 Best Management, Minimization, and Mitigation	8-93
8.6.7 Summary of Potential Noise Impacts	8-93
8.7 Environmental Consequences for Climate and Resource Sustainability	8-96
8.7.1 No Action Alternative	8-96
8.7.2 Facilities Development and Improvement Alternative	8-99
8.7.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	8-101
8.7.4 Tactical Security Infrastructure Deployment Alternative	8-102
8.7.5 Flexible Direction Alternative	8-102
8.7.6 Best Management, Minimization, and Mitigation	8-103
8.7.7 Summary of Impacts	8-106
8.8 Environmental Consequences to Land Use	8-108
8.8.1 No Action Alternative	8-109
8.8.2 Facilities Development and Improvement Alternative	8-114
8.8.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	8-114
8.8.4 Tactical Security Infrastructure Expansion Alternative	8-115
8.8.5 Flexible Direction Alternative	8-116
8.8.6 Best Management, Minimization, and Mitigation	8-116
8.8.7 Summary of Potential Impacts	8-117
8.9 Environmental Consequences to Aesthetic and Visual Resources	8-120
8.9.1 No Action Alternative	8-123
8.9.2 Facilities Development and Improvement Alternative	8-133
8.9.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	8-134
8.9.4 Tactical Security Infrastructure Deployment Alternative	8-135
8.9.5 Flexible Direction Alternative	8-135
8.9.6 Best Management, Minimization, and Mitigation	8-136
8.9.7 Summary of Impacts	8-138
8.10 Environmental Consequences to Socioeconomic Resources	8-140
8.10.1 No Action Alternative	8-153
8.10.2 Facilities Development and Improvement Alternative	8-158
8.10.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	8-159
8.10.4 Tactical Security Infrastructure Deployment Alternative	8-159
8.10.5 Flexible Direction Alternative	8-160
8.10.6 Best Management, minimization, and Mitigation	8-161
8.10.7 Summary of Potential Socioeconomic Impacts	8-162
8.11 Environmental Consequences To Cultural and Paleontological Resources	8-165
8.11.1 No Action Alternative	8-166
8.11.2 Facilities Development and Improvement Alternative	8-166

8.11.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	8-167
8.11.4 Tactical Security Infrastructure Deployment Alternative	8-167
8.11.5 Flexible Direction Alternative	8-168
8.11.6 Best Management, Minimization, and Mitigation	8-168
8.11.7 Summary of Potential Impacts on Cultural and Paleontological Resources	8-168
8.12 Environmental Consequences to Environmental Justice and the Protection of Children	8-173
8.12.1 No Action Alternative	8-176
8.12.2 Facilities Development and Improvement Alternative	8-178
8.12.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	8-180
8.12.4 Tactical Security Infrastructure Deployment Alternative	8-181
8.12.5 Flexible Direction Alternative	8-182
8.12.6 Best Management, Minimization, and Mitigation	8-184
8.12.7 Summary of Potential Impacts	8-185
8.13 Environmental Consequences to Human Health and Safety	8-188
8.13.1 No Action Alternative	8-189
8.13.2 Facilities Development and Improvement Alternative	8-205
8.13.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	8-206
8.13.4 Tactical Security Infrastructure Deployment Alternative	8-207
8.13.5 Flexible Direction Alternative	8-208
8.13.6 Best Management, Minimization, and Mitigation	8-210
8.13.7 Summary of Potential Impacts	8-211
8.14 Environmental Consequences of Hazardous Materials	8-214
8.14.1 No Action Alternative	8-214
8.14.2 Facilities Development and Improvement Alternative	8-220
8.14.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	8-222
8.14.4 Tactical Security Infrastructure Deployment Alternative	8-223
8.14.5 Flexible Direction Alternative	8-224
8.14.6 Best Management, Minimization, and Mitigation	8-224
8.14.7 Summary of Impacts	8-225
8.15 Environmental Consequences to Utilities and Infrastructure	8-229
8.15.1 No Action Alternative	8-230
8.15.2 Facilities Development and Improvement Alternative	8-234
8.15.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	8-236
8.15.4 Tactical Security Infrastructure Deployment Alternative	8-237
8.15.5 Flexible Direction Alternative	8-237
8.15.6 Best Management, Minimization, and Mitigation	8-238
8.15.7 Summary of Potential Impacts	8-239
8.16 Environmental Consequences to Roadways and Traffic Resources	8-241
8.16.1 No Action Alternative	8-242

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

8.16.2 Facilities Development and Improvement Alternative	8-242
8.16.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	8-243
8.16.4 Tactical Security Infrastructure Deployment Alternative	8-246
8.16.5 Flexible Direction Alternative	8-246
8.16.6 Best Management, Minimization, and Mitigation	8-247
8.16.7 Summary of Potential Impacts	8-248
8.17 Environmental Consequences to Recreation Resources	8-250
8.17.1 No Action Alternative	8-251
8.17.2 Facilities Development and Improvement Alternative	8-261
8.17.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	8-262
8.17.4 Tactical Security Infrastructure Deployment Alternative	8-263
8.17.5 Flexible Direction Alternative	8-264
8.17.6 Best Management, Minimization, and Mitigation	8-265
8.17.7 Summary of Potential Impacts	8-265
8.18 Cumulative Impacts	8-269
8.18.1 Introduction	8-269
8.18.2 Air Quality	8-269
8.18.3 Biological Resources	8-270
8.18.4 Geology and Soils	8-271
8.18.5 Water Resources	8-272
8.18.6 Noise	8-273
8.18.7 Climate and Resource Sustainability	8-274
8.18.8 Land Use	8-275
8.18.9 Aesthetics	8-276
8.18.10 Socioeconomics	8-277
8.18.11 Cultural and Paleontological Resources	8-278
8.18.12 Environmental Justice and the Protection of Children	8-279
8.18.13 Human Health and Safety	8-280
8.18.14 Hazardous Materials	8-283
8.18.15 Utilities and Infrastructure	8-283
8.18.16 Roadways and Traffic	8-287
8.18.17 Recreation	8-288
Table of Contents	9-i
9 Environmental Design and Planning Considerations	9-1
9.1 Introduction	9-1
9.2 Air Quality	9-2
9.3 Biological Resources	9-2
9.3.1 Mitigation for Impacts to General Wildlife and Habitat	9-2
9.3.2 Mitigation for Impacts to Wetlands and Aquatic Resources	9-2
9.3.3 Mitigation for Impacts to Protected Species	9-3
9.4 Geology and Soils	9-4
9.5 Water Resources	9-5
9.6 Noise	9-6

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

9.7 Climate Change and sustainability	9-7
9.8 Land Use	9-9
9.9 Aesthetic and Visual Resources	9-9
9.10 Socioeconomic Resources	9-11
9.11 Cultural and Paleontological Resources	9-11
9.12 Environmental Justice/Protection of Children	9-12
9.13 Human Health and Safety	9-12
9.14 Hazardous Materials	9-13
9.15 Utilities and Infrastructure	9-14
9.16 Roadways and Traffic	9-15
9.17 Recreation	9-15
Table of Contents	10-i
10 Future Planning and NEPA Compliance	10-1
10.1 NEPA Compliance	10-1
10.2 Future Planning	10-2
11 List of Preparers	11-1
12 References	12-1
13 Glossary	13-1
14 Index	14-1

ABBREVIATIONS

212	Laurentian Mixed Forest Province (ecoregion)
221	Eastern Broadleaf Forest (Oceanic) Province (ecoregion)
222	Eastern Broadleaf Forest (Temperate) Province (ecoregion)
242	Pacific Lowland Mixed Forest Province (ecoregion)
251	Prairie Parkland (Temperate) Province (ecoregion)
331	Great Plains Palouse Dry Steppe Province (ecoregion)
332	Great Plains Steppe Province (ecoregion)
342	Intermountain Semi-Desert Province (ecoregion)
ACM	asbestos-containing material
A.D.	Anno Domini
AEW	airborne early warning
AGL	above ground level
AIRFA	American Indian Religious Freedom Act
ALARA	as low as reasonably achievable
ANSI	American National Standards Institute
APE	area of potential effect
APHIS	Animal and Plant Health Inspection Service
APIS	Advance Passenger Information System
AQCR	Air Quality Control Region
ARPA	Archaeological Resources Protection Act
ARRA	American Recovery and Reinvestment Act of 2009
AT/FP	antiterrorism/force protection
ATV	all-terrain vehicle
A/V	audio visual (equipment or communication)
BACT	best available control technology
BHP	Bureau for Historic Preservation
BIA	Bureau of Indian Affairs (DOI)
BLM	Bureau of Land Management (DOI)
BLS	Bureau of Labor Statistics (DOL)
BMP	best management practice
BOR	Bureau of Reclamation (DOI)
BORTAC	Border Patrol Tactical Unit
BORSTAR	Border Patrol Search, Trauma and Rescue program
USBP	Border Patrol
B.P.	before present
BPF Guide	U.S. Border Patrol Facilities Design Guide

BPS	Border Patrol station
BTS	Bureau of Transportation Statistics (DOT)
C-E-Q	Causes-Effects-Questions
C-TPAT	Customs Trade Partnership against Terrorism
C&D	construction and demolition
ca.	circa
CAA	Clean Air Act
CASC	Customs Area Surveillance Center
CATEX	Categorical Exclusion
CBP	U.S. Customs and Border Protection
CBPO	U.S. Customs and Border Protection officer
CCEA	Canadian Council on Ecological Areas
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIPM	Center for Invasive Plant Management
CMA	census metropolitan area
CO	carbon monoxide
CO ₂	carbon dioxide
COA	Certificate of Waiver or Authorization process
COTS	commercial off-the-shelf
CPR	cardiopulmonary resuscitation
CRM	cultural resource management
CRT	communication relay tower
¹³⁷ Cs	cesium-137
CWA	Clean Water Act
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Program
dB	decibel
dBA	A-weighted decibel
dBC	C-weighted decibel
DHS	Department of Homeland Security
DMM	discarded military munitions
DNL	day-night sound level
DNR	Department of Natural Resources
DOC	U.S. Department of Commerce
DOD	U.S. Department of Defense

DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DOL	U.S. Department of Labor
DOT	U.S. Department of Transportation
EA	Environmental Assessment
EED	Environmental and Energy Division (CBP)
EIS	Environmental Impact Statement
EM	electromagnetic
EMS	environmental management system
EO	Executive Order
EOE	Encyclopedia of Earth
EOR	East of the Rockies
USEPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESP	Electronics Stewardship Plan
FAA	Federal Aviation Administration (DOT)
FAR	Federal Acquisition Regulation
FAST	Free and Secure Trade program
fc	foot candles
FCA	full compliance audit
FCC	Federal Communications Commission
FDA	U.S. Food and Drug Administration (U.S. Department of Health and Human Services)
FEC	Federal Electronics Challenge
FEMA	Federal Emergency Management Agency
FEMP	Federal Energy Management Program
FL	flight level
FLETC	Federal Law Enforcement Training Center
FLIR	forward-looking infrared radar
FM&E	Facilities Management and Engineering (CBP)
FOB	forward operating base
FONSI	Finding of No Significant Impact
FP&F	finances, penalties, and forfeitures
FPEIS	Final Programmatic Environmental Impact Statement
FPPA	Farmland Protection Policy Act
ft	foot
FY	Federal fiscal year
GAO	U.S. Government Accountability Office

GCR	General Conformity Rule
GDP	gross domestic product
GHG	greenhouse gas
GHz	Gigahertz
GIS	geographic information system
GFAFB	Grand Forks Air Force Base
GSA	U.S. General Services Administration
HAP	hazardous air pollutant
HEXRIS	High-Energy X-Ray Inspection System
HH&S	human health and safety
HPSB	high-performance sustainable building
HVAC	heating, ventilation, and air conditioning
Hz	Hertz
IAFIS	Integrated Automated Fingerprint Identification System
IBET	Integrated Border Enforcement Team
ICE	U.S. Immigration and Customs Enforcement
ID	Idaho
IDA	intentional destructive act
IDFG	Idaho Fish and Game
IEEE	Institute of Electrical and Electronics Engineers
IL	Illinois
IN	Indiana
IPCC	Intergovernmental Panel on Climate Change
kW	kilowatt
LBP	lead-based paint
LEED	Leadership in Energy and Environmental Design
Leq	equivalent sound level
linac	linear accelerator
LOS	level of service
LPOE	land port of entry
LPOE Guide	U.S. Land Port of Entry Design Guide
LRT	long-range tracker
LSU	Louisiana State University
MBTA	Migratory Bird Treaty Act
MC	munitions constituents
MDA	Maritime Domain Awareness
ME	Maine
MEC	munitions and explosives of concern

mgd	million gallons per day
MHPC	Maine Historic Preservation Commission
MI	Michigan
MMBtu/hr	million British thermal units per hour
MMPA	Marine Mammal Protection Act
MN	Minnesota
MNDOT	Minnesota Department of Transportation
MOU	memorandum of understanding
MPE	maximum permissible exposure
mph	miles per hour
MRLC	Multi-Resolution Land Characteristics Consortium
MRZ	machine-readable zone
MSA	metropolitan statistical area
MSS	mobile surveillance system
MT	Montana
MT FWP	Montana Fish, Wildlife and Parks
NAAQS	National Ambient Air Quality Standards
NAFTA	North American Free Trade Agreement
NAGPRA	Native American Graves Protection & Repatriation Act
NAS	National Airspace, National Airspace System
National Register	National Register of Historic Places
ND	North Dakota
NDGFD	North Dakota Game and Fish Department
NDSHPO	North Dakota State Historic Preservation Office
NE	New England
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NEPA	National Environmental Policy Act
NEXUS	[Not an acronym. A NEXUS card is a kind of travel document.]
NF	National Forest
NH	New Hampshire
NHFGD	New Hampshire Fish and Game Department
NHPA	National Historic Preservation Act
NII	nonintrusive inspection
NLCD	National Land Cover Database
NMFS	National Marine Fisheries Service (NOAA)
NNSR	nonattainment new source review (under the Clean Air Program)
NO ₂	nitrogen dioxide
NOAA	National Oceanic Atmospheric Administration

NOB	Northern Border
NOHVCC	National Off-Highway Vehicle Conservation Council
NOI	Notice of Intent
NP	National Park
NPDES	National Pollutant Discharge Elimination System
NRA	National Recreation Area
NPS	National Park Service (DOI)
NRC	Natural Resources Canada, Nuclear Regulatory Commission
NRCS	Natural Resources Conservation Service (USDA)
NRHP	National Register of Historic Places
NRL	National Register listed
NSPS	New Source Performance Standards
NSR	new source review
NTIA	National Telecommunications and Information Administration (DOC)
NWR	National Wildlife Refuge
NY	New York
O ₃	ozone
OA	Office of Administration (CBP)
OAM	Office of Air and Marine (CBP)
OES	Occupational Employment Statistics Survey
OFO	Office of Field Operations
OH	Ohio
OHDNR	Ohio Department of Natural Resources
OHV	off-highway vehicle
OIC	Operational Integration Centers
OIT	Office of Information Technology
ORV	off-road vehicle
OSHA	Occupational Safety and Health Act, Occupational Safety and Health Administration
OSPP	Operational Sustainability Performance Plan
OTIA	Office of Technology, Innovation, and Acquisition
PA	Pennsylvania
Pb	lead
PCBs	polychlorinated biphenyls
PEIS	Programmatic Environmental Impact Statement
PM	particulate matter
PM _{2.5}	Particulate matter with an aerodynamic diameter of 2.5 microns or less
PM ₁₀	Particulate matter with an aerodynamic diameter of 10 microns or less

POL	petroleum, oil, and lubricants
POV	privately owned vehicle
PRD	personal radiation detector
PRPA	Paleontological Resources Preservation Act
PSD	prevention of significant deterioration
POE	port of entry
PTE	potential to emit
R&A	repairs and alterations
RCRA	Resource Conservation and Recovery Act
REC	Record of Environmental Consideration
RF	radio frequency
RFID	radio-frequency identification devices
RIID	radiation isotope identification device
ROD	Record of Decision
RV	recreational vehicle
ROW	right of way
RVSS	remote video surveillance system
SARA	Species at Risk Act (Canada)
SAV	submerged aquatic vegetation
SBI	Secure Border Initiative
SDWA	Safe Drinking Water Act
SEL	sound exposure level
SEQRA	State Environmental Quality Review Act
sf	square feet
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO ₂	sulfur dioxide
SOW	scope of work
SUV	sport-utility vehicle
SVP	Society of Vertebrate Paleontology
SWMA	State Wildlife Management Area
SWPPP	storm water pollution prevention plan
T&E	threatened and endangered (species)
TCP	traditional cultural property
THPO	Tribal Historic Preservation Officer
TNC	The Nature Conservancy
tpy	tons per year
TR	thematic resource

TSCA	Toxic Substances Control Act
U.S.	United States
UAS	unmanned aircraft system
UAV	unmanned aerial vehicle
UESC	utility energy service contract
UGS	unattended ground sensor
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USBP	U.S. Border Patrol
USC	U.S. Code
USCB	U.S. Census Bureau
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service (USDA)
USFWS	U.S. Fish and Wildlife Service
USGBC	U.S. Green Building Council
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
UXO	unexploded ordnance
VDHP	Vermont Division for Historic Preservation
VOC	volatile organic compound
VRM	visual resource management
VT	Vermont
WA	Washington (State)
WDFW	Washington Department of Fish and Wildlife
WAC	Washington Administrative Code
WHTI	Western Hemisphere Travel Initiative
WI	Wisconsin
WIDNR	Wisconsin Department of Natural Resources
WMA	Wildlife Management Area
WOR	West of the Rockies
WWF	World Wildlife Fund
⁶⁰ Co	cobalt-60

ABBREVIATIONS (IN APPENDICES ONLY)

AC	
ACE	Automated Commercial Environment
ACEC	Areas of Critical Environmental Concern
ACHP	Advisory Council on Historic Preservation
AHPD	Archeology and Historic Preservation Division
ANR	Agency of Natural Resources
B.C.	Before Christ
CARMA	Cultural Architectural Resources Management Archive
CCC	Civilian Conservation Corps
CCD	Coastal Consistency Determination
CLG	Certified Local Government
CRIS	Cultural Resource Information System
C-TPAT	Customs Trade Partnership against Terrorism
CRABS	Cultural Resources Annotated Bibliography System
CRGIS	Cultural Resources Geographic Information System
CSI	Container Security Initiative
CZM	Coastal Zone Management
DAHP	Department of Archeology and Historic Preservation
DEP	Department of Environmental Protection
DEQ	Department of Environmental Quality
EPCRA	Emergency Planning and Community Right-to-Know Act
FMP	Forest Management Plan
GM	General Motors
GOIA	Governor's Office of Indian Affairs
GRANIT	New Hampshire online mapping tool
HBC	Hudson Bay Company
IDEM	Indiana Department of Environmental Management
IDNR	Indiana Department of Natural Resources
IEPA	Illinois Environmental Protection Agency
ISHS	Idaho State Historical Society
M212	Adirondack New England Mixed Forest Coniferous Forest Alpine Meadow Province (ecoregion)
M242	Cascade Mixed Forest Coniferous Forest Alpine Meadow Province (ecoregion)
M332	Middle Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province
M333	Northern Rocky Mountain Steppe Coniferous Forest Alpine Meadow Province

MHS	Minnesota Historical Society, Montana Historical Society
MOA	Memorandum of Agreement
MPS	multiple property submissions
MSHDA	Michigan State Housing Development Authority
NAGPRA	Native American Graves Protection & Repatriation Act
NDCRS	North Dakota cultural resource database
NDDH	North Dakota Department of Health
NHDHR	New Hampshire Division of Historical Resources
NHL	National Historic Landmark
NHP	National Heritage Partnership
NRPA	National Resources Protection Act
NTC	National Targeting Center
NYAC	New York Archeological Council
NYCRR	New York Code of Rules and Regulations
NYDEC	New York Department of Environmental Conservation
NYOPRHP	New York Office of Parks, Recreation & Historic Preservation
OEPA	Ohio Environmental Protection Agency
OHPO	Ohio Historic Preservation Office
OHS	Ohio Historical Society
OHSPAB	Ohio Historic Site Preservation Advisory Board
OPLMA-PRP	Omnibus Public Land Management Act, Subtitle D, “Paleontological Resources Preservation”
OSA	Office of the State Archeologist
PS	Paleontological Society
PSA	paleontological study area
PHMC	Pennsylvania Historical & Museum Commission
RCW	Revised Code of Washington
RHA	Rivers and Harbors Act
RMP	resource management planning
RPR	request for project review
SENTRI	Secure Electronic Network for Travelers Rapid Inspection
SHSND	State Historic Society of North Dakota
SLRU	Sensitivity Level Rating Units (BLM)
SMP	Shoreline Master Program
SPGP	State Program General Permit
SVP	Society of Vertebrate Paleontology
SQRU	Scenic Quality Rating Units (BLM)
T&E	threatened and endangered (species)

THPO	Tribal Historic Preservation Officer
TR	Thematic Resource
UCMP	University of California Museum of Paleontology
US-VISIT	United States Visitor and Immigrant Status Indication Technology
VSA	Vermont Statutes Annotated
VRM	Visual Resource Management (BLM)
WA DFW	Washington Department of Fish and Wildlife
WHPD	Wisconsin Historical Preservation Database
WHS	Wisconsin Historical Society
WISAARD	Washington Information System for Architectural and Archaeological Research Data
WPA	Works Progress Administration
WSR	Wild and Scenic River

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Final

Programmatic Environmental Impact Statement For Northern Border Activities

Section 1: Introduction



July 2012

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CONTENTS

1 Introduction..... 1-1

1.1 Purpose of the PEIS 1-2

1.2 CBP Northern Border Activities 1-3

1.2.1 CBP Organization 1-3

1.2.2 Operational Perspective 1-4

1.2.2.1 Common Operating Picture 1-5

1.2.2.2 Situational Awareness..... 1-5

1.2.2.3 Environmental Awareness 1-6

1.2.2.4 Meeting Border Security and Trade and Travel Facilitation Mission Objectives
1-7

1.2.3 CBP Northern Border Operations, Facilities, Tactical Infrastructure, and
Technologies 1-7

1.2.3.1 Meeting OFO Mission and Operations 1-7

1.2.3.2 USBP Mission and Operations 1-8

1.2.3.3 OAM Mission and Operations 1-10

1.2.3.4 CBP Facilities 1-11

1.2.3.5 CBP Communication, Detection, Inspection, and Surveillance Technologies
..... 1-12

1.2.3.6 Tactical Security Infrastructure..... 1-17

1.3 Purpose and Need 1-17

1.3.1 Purpose of the Proposed Action..... 1-17

1.3.2 Need 1-18

1.4 Proposed Action..... 1-18

1.5 Other Considerations for Northern Border Planning..... 1-19

1.5.1 Policy and Budgetary Considerations..... 1-19

1.5.2 Ongoing Interagency Cooperation 1-20

1.5.3 Compliance Framework..... 1-20

1.5.4 Permits, Approvals, and Interagency Coordination..... 1-21

1.5.5 Actions/Activities with Little or No Potential for Impact on the Environment..... 1-22

1.5.6 Public Involvement 1-22

1.6 PEIS Cooperating and Coordinating Agencies..... 1-23

FIGURES

Figure 1.2-1 Common Operating Picture of Northern Border CBP Facilities 1-5
Figure 1.2-2(A) CBP Northern Border Facilities: West of the Rockies Region 1-15
Figure 1.2-2(B) CBP Northern Border Facilities: East of the Rockies Region 1-15
Figure 1.2-2(C) CBP Northern Border Facilities: Great Lakes Region..... 1-16
Figure 1.2-2(D) CBP Northern Border Facilities: New England Region..... 1-16

1 INTRODUCTION

The Department of Homeland Security (DHS), U.S. Customs and Border Protection (CBP), proposes a programmatic approach to enhance security resources employed to protect the border between the United States and Canada (northern border) in order to respond to existing and evolving cross-border threats over the next five to seven years. The area of analysis extends from the Atlantic Ocean to the Pacific Ocean (approximately 4000-miles), encompassing the contiguous northern tier states from Maine to Washington and around the Great Lakes, up to 100 miles south into the United States.

The proposed action includes several elements that contribute to a multilayered response approach to security that reduces reliance on any single point or program that could be compromised. CBP's inventory of facilities, deployment of surveillance and communications technologies and operations, and deployments of additional land-based security structures (roads, culverts, barriers, towers) are all contributing elements to the proposed action. If changes in the nature, intensity, or locations of cross-border threats or changes in security or trade and travel priorities required CBP to implement a response, elements of the proposed action would be implemented only after further appropriate detailed review and evaluation under the National Environmental Policy Act (NEPA). The location, timing, and individual characteristics of specific proposed projects and activities would dictate the level of NEPA review and scope of stakeholder involvement required.

Along with the proposed action, this Final Programmatic Environmental Impact Statement (PEIS) evaluates a range of alternatives that involve additions to or expansions of current law enforcement tools and techniques for border security and trade and travel facilitation. CBP would continue to plan for and develop specific responses to actual evolving security threats and trade and travel priorities occurring within the area of analysis.

This PEIS has 14 chapters and 20 appendices. Chapter 1 provides background information on CBP mission, northern border security activities, public involvement, and the purpose and need for the proposed action and the PEIS. Chapter 2 provides a description of the proposed action, alternatives considered, and the No Action Alternative. Chapter 3 explains the overall approach used to identify affected resources and analyze impacts from CBP's proposal. Chapters 4 through 7 of the PEIS describe four regional environmental settings:

- Chapter 4: West of the Rockies (Washington, Idaho, and the western part of Montana);
- Chapter 5: East of the Rockies (eastern part of Montana, North Dakota, and Minnesota);
- Chapter 6: Great Lakes (Wisconsin, Michigan, Ohio, Pennsylvania, and New York); and,
- Chapter 7: New England (Vermont, New Hampshire, and Maine).

Chapter 8 identifies the potential overall direct, indirect, and cumulative environmental impacts that could occur within each resource area given implementation of any alternative approach. Chapter 9 discusses mitigations and best management practices that CBP would consider for the proposed action. Chapter 10 discusses NEPA compliance for CBP along the northern border beyond this PEIS. Chapters 11 through 14 list people and references involved in the preparation

of this PEIS. These chapters also identify important terminology and the locations of key concepts found in the PEIS. The appendices contain supporting analysis and information.

Within this chapter, Section 1.1 provides background and purpose of the PEIS effort. Section 1.2 provides an overview of CBP activities with respect to the northern border. Section 1.3 discusses the purpose and need for the programmatic proposal. Section 1.4 summarizes the programmatic proposal and Section 1.5 explains the overall framework for the PEIS as a planning tool. Section 1.6 discusses coordination with other agencies to develop this PEIS.

1.1 PURPOSE OF THE PEIS

CBP prepared this document as a planning tool in accordance with the National Environmental Policy Act (NEPA) and DHS Directive 023-01, Environmental Planning. This PEIS is intended to provide decision-makers within CBP with information on the potential for direct, indirect, and cumulative environmental impacts that could result from any future proposals to secure and otherwise facilitate legal trade and travel through the northern border. Environmental conditions and CBP's activity level and presence in the northern United States have changed since CBP was created in 2003. The alternatives presented within this document represent CBP looking forward at the maximum levels of activity and types of changes CBP could anticipate for its northern border security program as an overall response to evolving threats and changing trade and travel priorities. This PEIS therefore represents prudent planning, both area-wide and operation-wide, in advance of requirements that could emerge in the near future.

This document also provides the public, Native American Tribes, and other government agencies at the Federal, state, and local levels with relevant information about the environmental impacts of current CBP activities along the northern border and the potential for environmental impacts from enhancements that CBP could make. The PEIS identifies practices and mechanisms available to CBP to lessen potential adverse environmental impacts while still achieving its homeland security mission. This includes identifying procedures and processes for working with other Federal agencies and land managers to improve the effectiveness of law enforcement measures and the protection of environmental values and resources. This document will help CBP conduct security planning efficiently and effectively with an institutional perspective of its potential for environmental impacts along the northern border.

Actual material changes to CBP's northern border security program that might occur in the next five to seven years would be dictated in part by: (1) top-level national strategic guidance on security and trade and travel priorities confirmed by Congress, the Office of the President, or the Secretary of the Department of Homeland Security (DHS); (2) emerging technical advances; and (3) evolving security and trade and travel facilitation needs. Analysis and decisions originating from this PEIS and NEPA process are not intended to permit CBP to undertake individual projects or activities within the region of analysis without additional review for impacts to the specific resources that would be affected. CBP would not implement any alternative or any element of any alternative in this PEIS based solely on the analysis presented in this document. Material proposed changes to CBP activities meeting the definition of "major Federal action" (40 CFR 1508.18) would be subjected to further NEPA review at the appropriate level of analysis and documentation. This PEIS would provide background information for incorporation into those more project-specific plans. However, site-specific NEPA will continue to be completed for all projects that would have required it prior to the PEIS. Subsequent environmental analysis

documents for specific projects within the area studied in this PEIS will “tier off” or draw upon the general information in this area-wide programmatic analysis document.

CBP has documented what approach it envisions would be most responsive to changes in security or trade and travel priorities or evolving threats within five to seven years in the Record of Decision (ROD) accompanying this PEIS. The ROD also clarifies CBP’s recognition that the actual level of activities that might be required or funded could likely be substantially lower than what is addressed in this document.

1.2 CBP NORTHERN BORDER ACTIVITIES

CBP is the largest law enforcement component of the DHS. It has a priority mission of keeping terrorists and their weapons out of the United States. It is charged with enforcing customs, immigration, agriculture, and numerous other laws and regulations at the Nation’s borders while facilitating legitimate trade and travel through the legal ports of entry (POEs). This includes deterring all cross-border violators, including those who seek to participate in global terrorism; illegal immigration; and the illegal trafficking of human beings, narcotics, weapons, and other contraband. As the guardian of U.S. borders, CBP protects approximately 4,000 miles of the international border between the contiguous United States and Canada, as well as 1,000 miles between Alaska and Canada, 1,900 miles of international border with Mexico, and 95,000 miles of shoreline in the contiguous United States. CBP’s mission and the core values under which it operates are explained in Appendix B.

CBP modifies its deployment and use of manpower and intelligence on an ongoing basis to respond to evolving threats. It also periodically enhances its deployment and use of technologies and physical infrastructure to support the mission of its agents and officers to protect the borders and ensure the secure, safe, and legal movement of goods and people between the United States and its neighbors.

1.2.1 CBP ORGANIZATION

CBP has three law enforcement components that provide security and customs enforcement at the borders of the United States.

- The **Office of Field Operations (OFO)** operates the POEs, including airports, land ports, and sea (or lake) ports. OFO is responsible for screening all travelers, vehicles, and goods entering the United States through POEs. Officers determine the identity, citizenship, and admissibility of all travelers seeking to enter the United States.
- The **U.S. Border Patrol (USBP)** monitors the border areas between and beyond the POEs to prevent illegal entry and trafficking of people as well as contraband. USBP

CBP Mission

The five elements of the CBP mission statement are as follows:

- We are the Guardians of our Nation’s borders. We are America’s frontline.
- We safeguard the American homeland at and beyond our borders.
- We protect the American public against terrorists and the instruments of terror.
- We steadfastly enforce the laws of the United States while fostering our Nation’s economic security through lawful international trade and travel.
- We serve the American public with vigilance, integrity, and professionalism. (See Appendix B for more details about CBP.)

agents work in all types of terrain and weather, often in isolated communities, throughout the United States.

- The **Office of Air and Marine (OAM)** deploys helicopters and fixed-wing aircraft and coastal enforcement and riverine vessels to search, detect, identify, and track suspect targets of interest and also to aid routine and specific criminal investigations that take place on the ground away from the border.

Various other CBP offices at the headquarters level [e.g., the Office of Technology Innovation Assessment (OTIA), formerly the Secure Border Initiative (SBI), and the Office of Information Technology (OIT)] provide support to the law enforcement components by developing the technologies or by managing facilities and infrastructure that they use.

1.2.2 OPERATIONAL PERSPECTIVE

The northern border is the longest non-militarized open border in the world. It includes land and water boundaries and is the most environmentally diverse contiguous border protected by CBP. The terrain south of the border ranges from densely forested lands on the west and east coasts, to open plains in the central portion of the country, to the maritime environment of the Great Lakes. There are several Federal, state, and tribal lands and sparsely distributed towns and smaller cities along the immediate border area. Around the Great Lakes and in the Pacific Northwest there are more densely populated urban areas. Securing and maintaining effective control of the northern border requires a different mixture of facilities, operations, infrastructure, and technology resources from those appropriate to the Southwest and Coastal borders because the operating environment and the nature of threats faced on this border are different.

CBP processes more than 70 million international travelers and 35 million vehicles each year coming through northern border crossings. Each year, CBP makes around 6,000 arrests and interdicts approximately 40,000 pounds of illegal drugs at and between the POEs along the northern border. In general, the northern border is subjected to a significantly lower number of illegal incursions than the southwest border. However, attempts at illegal immigration and smuggling regularly occur in this region. There are also known terrorist affiliates and extremist groups present along the northern border, in both the United States and Canada.

Alaska has miles of land and coastal border, but activities along those borders are not addressed in this PEIS because it represents a different operational area for CBP from the rest of the border with Canada.

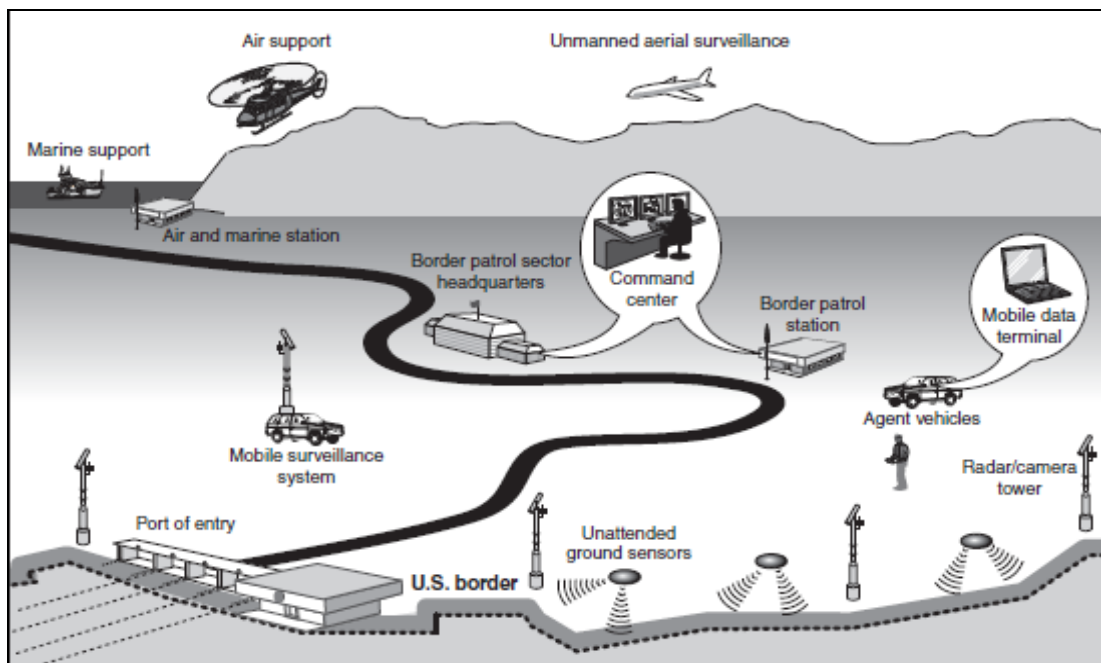
Section 387(a)(3) of the Immigration and Nationality Act provides for CBP agents and officers "to board and search for aliens any vessel within the territorial waters of the United States and any railway car, aircraft, conveyance, or vehicle" within a "reasonable distance from an external boundary of the United States." Part 287 of Chapter 8 of the Code of Federal Regulations clarifies that 100-miles is a reasonable distance from an external boundary. Within the first 25 miles from that external boundary, CBP personnel have the right to access to private lands (but not dwellings) to patrol the border to prevent the illegal entry of undocumented cross-border violators (CBVs) into the United States. Therefore, this PEIS uses the 100-mile range from the northern border as the area of analysis for CBP activities.

1.2.2.1 Common Operating Picture

The concept of the Common Operating Picture refers to all components of CBP having access to the same information about the conditions on the ground, in the sea, and in the air within a specified area of operations. This shared information includes the location and status of all of its diverse assets, the condition of infrastructure elements such as roads, and relevant information about other agencies' activities and assets.

It is a CBP objective to provide and maintain the Common Operating Picture of the border's environment among its component uniformed elements (Figure 1.2-1) and to employ a risk-based approach to enhance the security of the border while facilitating lawful trade and travel (Fisher, 2012).

Figure 1.2-1 Common Operating Picture of Northern Border CBP Facilities



The border security perspective shown in the Common Operating Picture can change frequently. Threats to border security are not uniform along the border, nor are they confined to particular areas. Illegal border crossing attempts for the purposes of smuggling may intensify for a period in one particular area, while terrorist threats emerge in some other locations at another time. Given the dynamic nature of risks to border security, CBP must be prepared to vary the combination of assets and operations as appropriate to the area, the intelligence processed, and threats observed. This operational variability is partly in response to information that CBP obtains about the changing threat.

1.2.2.2 Situational Awareness

In the context of CBP border operations, agents and officers have situational awareness when they can “identify, process, and comprehend the critical elements of information” about what is happening to them and to their environment with respect to their mission (USCG, 1998). While the Common Operating Picture provides CBP agents and officers with a baseline of shared

information on possible threats and challenges in the operational area, in the field they must also understand their relationship to the terrain and environmental conditions while being able to discriminate between present and future threats and benign activities in the area. Because CBP agents, officers, agricultural specialist, and non-uniformed personnel may encounter environmentally sensitive or traditionally important areas and items during the course of executing their duties, situational awareness encompasses understanding of natural and cultural resources at and beyond the POEs.

To improve intelligence-gathering and detection, interdiction, and apprehension of CBVs, CBP works closely with other Federal, state, and local law enforcement partners as well as other Government agencies, individuals, Tribal Nations, and international partner agencies in Canada and elsewhere.

1.2.2.3 Environmental Awareness

From CBP officers providing custom inspections that identify historic or culturally significant items that smugglers attempt to transport across-borders, to USBP agents patrolling in vehicle on roads in national forests, to air and marine interdiction agents flying over or navigating through parks, CBP incorporates awareness of stewardship responsibilities into conduct of its mission.

Environmental and Cultural Stewardship Training, prepared jointly by CBP, the Department of Interior, and the U.S. Department of Agriculture-Forest Service, is mandatory for USBP agents and is available to all CBP personnel.¹ This training provides practical guidelines to practice awareness of:

- Natural and cultural resources in the operational environment;
- Lands and places set aside for preservation, conservation, or appreciation of unique natural or cultural values; and,
- People and departments that use or manage that land, including sensitivity to Government-to-Government relations with Tribes.

CBP has Public Lands Liaison Agents (PLLAs) - senior USBP agents - charged with working with public lands managers to facilitate enforcement of border security in accord with the missions of parks, forests, and other lands adjacent to the borders. CBP cooperates with Federal, state, and local agencies, individual land-owners, and Tribal Nations to obtain necessary access to points along the border while being mindful of land management designations and inherent or prescribed values of the lands.

PLLAs also facilitate CBP agent and officer understanding of environmental sensitivities and values of areas managed for the enjoyment of the public or protection of unique and valued resources. They regularly inform USBP agents and other CBP personnel about practices to limit

¹ This training was prepared in accordance with the 2006 Memorandum of Understanding among DHS (CBP-BP), DOI, and USDA-FS.

unnecessary and unintended adverse environmental impacts to species, recreational resources, and cultural resources without compromising border security and agent and officer safety.

All CBP components otherwise provide environmental and cultural resources training appropriate to their personnel's daily responsibilities.

1.2.2.4 Meeting Border Security and Trade and Travel Facilitation Mission Objectives

CBP carries out its missions through the diligence of its personnel, as well as the use of intelligence, targeting, technology, infrastructure, and a broad range of other assets and capabilities. Technology and infrastructure help CBP personnel detect and interdict CBVs. Intelligence and targeting help to extend the zone of security outward, making the physical border one of multiple lines of defense. The aforementioned factors and tools discussed in this section influence how CBP personnel accomplish their tactical objectives in relation to their mission and goals. Periodically, changing the distribution of CBP personnel, infrastructure, and equipment helps to deny potential CBVs understanding of law enforcement routines. It also allows CBP to concentrate assets and resources where most appropriate to counter threats while aiding the legal movement of people, goods, and services cross the border. This multilayered, risk-based approach to securing the border while facilitating lawful travel and trade reduces reliance on any single element that could be compromised and multiplies the effectiveness of the uniformed protectors of the U.S. border.

1.2.3 CBP NORTHERN BORDER OPERATIONS, FACILITIES, TACTICAL INFRASTRUCTURE, AND TECHNOLOGIES

1.2.3.1 Meeting OFO Mission and Operations

The mission of the OFO is to prevent entry of people and goods that are prohibited or are a threat to U.S. citizens, infrastructure, resources, and food supply, while efficiently facilitating legitimate trade and travel at ports of entry.

As of January 2012, there were over 3,700 CBP officers at POEs, serving as the front line defenders protecting the American public against the movement of terrorists and instruments of terror across the border while facilitating the lawful movement of goods and people into the United States (Fisher, 2012). To accomplish its responsibilities within the POEs, CBP employs a strategy built on a series of enforcement layers. These layers are composed of sophisticated targeting and communication systems, state-of-the-art detection technology, and a cadre of professional law enforcement personnel. Working in concert, these systems screen for, identify, and inspect high-risk persons or cargo in the stream of cross-border vehicles and pedestrians. However, the success of this strategy depends heavily on the physical state and operational utility of the inspection facilities. It is this combination of highly trained personnel, technology, and modernized facilities that form the essential foundation for CBP's operational strategy.

Specialized X-ray equipment is used to look through a van for contraband that may be hidden inside.



Source: (USDHS, No Date[a]).

CBP officers use a variety of technologies (see below) to improve their ability to examine vehicles and cargo effectively and expeditiously while also improving their situational awareness of potential threats from dangerous cargo, concealed CBVs, and potential weapons of mass destruction. Officers check electronic manifests for commercial goods and flag shipments for examination according to criteria established by various agencies with jurisdiction over or interest in imports. Vehicular, cargo, and pedestrian inspections are usually performed at POEs, but officers sometimes escort shipments to a receiver site and inspect them there. If a shipment contains inadmissible items or an anomaly, it is detained until a representative from the documented shipper (or recipient) arrives. CBP officers also use canine teams for detecting a variety of substances (such as narcotics and explosives).

1.2.3.2 USBP Mission and Operations

As the mobile, uniformed Federal law enforcement arm securing the border between POEs, USBP's priority mission is the prevention of "terrorists and terrorist weapons, including weapons of mass destruction, from entering the United States." (USDHS, 2012) This antiterrorism focus since the September 11, 2001 terrorist attacks on the United States is an extension of its nearly 90 year-old mission of preventing illegal entry of persons across our borders. As of January 2012, there were over 2,200 Border Patrol agents assigned to the northern border which amounts to over a six-fold increase since CBP was created in 2003.

USBP protects the American homeland, enforcing several laws, through the detection, interdiction, and apprehension of those who attempt to illegally enter or smuggle any person or contraband into the United States. USBP accomplishes its mission using a risk-based approach combining surveillance, intelligence, response to electronic sensing and aircraft sightings, and interpreting and following tracks. As needed, USBP agents also support and participate in disaster relief and search and rescue operations in coordination with Federal, state and local emergency managers and law enforcement agencies.

Surveillance operations include line watch (agents stationed at specific observation points or driving predetermined routes) and road and waterborne patrols. USBP agents use a variety of transportation modes to patrol thousands of miles of U.S. roads and border areas each day. These include four-wheel-drive vehicles, sedans, scope trucks, all-terrain vehicles (ATVs), motorcycles, snowmobiles, as well as bicycle and foot patrols in urban areas and rough terrain. For those sectors with water boundaries (e.g., the Great Lakes, Lake Champlain, and rivers and canals), USBP runs maritime patrols using boats and other marine-based watercraft. OAM provides the USBP sectors with a range of watercraft to assist in river or lake patrols.

Methods used for detection of CBVs include sign cutting (discovery of any disturbances in natural terrain that could indicate the passage of people, animals, or vehicles), use of alerts from electronic sensors and remote (video) surveillance systems, and establishment and operation of traffic checkpoints and transportation checks.

Traffic checkpoints, conducted on major roads leading away from the border, are aimed at detecting persons and narcotics entering the country illegally. Roadway checkpoints are traffic lanes temporarily controlled by USBP. In some cases, checkpoints include temporary support buildings to provide office and holding space, as well as lights, signage, and other support equipment. There is one permanent checkpoint in New York state, which has a processing office, temporary detention facilities, administration office, a potable water supply, and a sewage system. These checkpoints provide an opportunity to detect and interdict cross-border violators (CBVs) that have otherwise avoided apprehension. USBP agents use transportation checks to conduct inspections of interior-bound conveyances including passenger vehicles (cars, trucks, vans, and buses) and container and similar cargo trucks. Similar checks are conducted at airports for commercial aircraft and at locations along railroad lines for passenger and freight trains.

USBP agents routinely conduct searches
of trains entering the United States from Canada.



Source: (USDHS, No Date[a]).

If illegal activity is detected, USBP agents attempt to interdict, apprehend, and detain the CBVs. Ground vehicles and aircraft (assistance from OAM) are used, individually or collectively, to make apprehensions. When possible, USBP agents remain on existing roads to apprehend CBVs but they occasionally go off-road when required. In some places, access to lookout sites requires coordination with relevant Federal land managers [e.g., U.S. Forest Service (USFS) or National

Park Service (NPS)] in order to ensure consistency with applicable laws, the land manager's mission and specific land management requirements.

On the northern border, USBP operates from eight geographically based sector headquarters, each overseeing operations from more than 50 Border Patrol stations (BPS) with designated areas of responsibility. In remote areas, USBP agents also deploy from forward operating bases (FOBs) and camps to conduct patrol or checkpoint operations.

1.2.3.3 OAM Mission and Operations

The mission of the OAM is to protect the American people and the Nation's critical infrastructure using an integrated system of air and marine forces to detect, interdict, and prevent acts of terrorism and the unlawful movement of people, illegal drugs, and other contraband toward or across the borders of the United States. OAM performs border security missions independently and in coordination with its CBP and DHS partners and other Federal, state, local, and tribal agencies.

Two CBP marine unit Midnight Express boats patrol the waters off of the U.S. shore



Source: (USDHS, No Date[a]).

OAM is responsible for acquiring, outfitting, and maintaining all CBP maritime vessels for both OAM "marine unit" operations (on the coasts and the Great Lakes), and USBP "riverine unit" operations on small lakes and rivers. Both OAM and USBP agents are trained in maritime vessel operations. CBP operates Coastal Enforcement and Interceptor Class vessels along the coasts and Great Lakes; on small lakes and rivers, CBP operates Riverine Class vessels.

OAM pilots and boat operators also deploy aviation and maritime resources in support of routine and specific criminal investigations that take place on the ground away from the border. OAM agents operate from approximately 20 locations along the northern border, supporting CBP's overall mission at the border. OAM deploys helicopters and fixed-wing aircraft from eight locations along the northern border to search, detect, identify, and track suspect airborne and ground targets of interest. They use a variety of aircraft to intercept people and contraband illegally crossing land and water borders. They provide aerial surveillance of the border in cooperation with the USBP agents and they conduct air operations in support of other Federal, state, and local needs, such as search and rescue operations and disaster relief. In the marine environment, OAM performs the same functions by deploying coastal enforcement vessels in the

nearshore waters of the Pacific Ocean and the Great Lakes and by deploying riverine vessels along the Great Lakes, northern border rivers, and the Gulf of Maine.

In 2011, CBP expanded its operational airspace by 950 miles with the cooperation of the Federal Aviation Administration (FAA). This enables unmanned aircraft surveillance operations to extend from the Lake of the Woods area in Minnesota to the vicinity of Spokane in Washington state.

1.2.3.4 CBP Facilities

Although CBP typically defines the northern border region as the area between the United States and Canada, running from Washington through Maine and including the Great Lakes region, CBP also facilitates and ensures the security of trade across the Alaska-Canadian border. On the northern border, CBP has 122 land border crossings and 13 ferry land crossings, 8 Border Patrol Sectors, 8 Air and Marine Branches, 9 Coastal Marine Units and 23 Riverine Marine Units to protect against the illegal flow of people and contraband at and between the official POEs. There are currently more than 100 POEs along the northern border. Between 2010 and 2012, more than 35 land POEs underwent modernization to meet security and operational needs (Fisher, 2012). CBP and the U.S. General Services Administration (GSA) modernize POEs through the rehabilitation of existing property or acquisition of property to construct new facilities. CBP uses several size-based standard building/station concepts to replace or build new facilities. The new standard designs include green building features, such as those recommended by the Green Building Council through its Leadership in Energy and Environmental Design *LEED® Certification Policy Manual*. Replacement of many of the older POEs is already under way, and this process is addressed by separate NEPA documents.

POEs are set up to allow several lanes of vehicular traffic to move “down the line” concurrently, with secondary inspection areas available to the CBP officer if needed. Separate areas are used for processing people and cargo. CBP officers also inspect rail cars at more than 20 POEs across the northern border that also service railroads crossing the border.

In addition to CBP personnel, agents from other interested U.S. agencies such as the U.S. Fish and Wildlife Service (USFWS), the U.S. Department of Agriculture (USDA), the U.S. Drug Enforcement Administration, and the U.S. Immigration and Customs Enforcement (ICE) work at many POEs. Larger land POEs (LPOEs) may have laboratories for identifying narcotics, plant pests on incoming agricultural products, or other harmful items and substances transported in cargo or luggage. Onsite kennel facilities are provided for canine teams used to detect narcotics and explosives.

POEs are connected to local county or municipal sanitary, potable water supply, and electrical utility providers' systems. Where these are unavailable, the land POEs are equipped with their own septic systems, water-supply wells, and generators. Some POEs are equipped with telecommunications facilities, antennas, and other electronic equipment to support radio communications. CBP telecommunications frequencies are certified by the National Telecommunications and Information Administration (NTIA), the Federal Communications Commission (FCC) counterpart that regulates Government communications systems. Radio and lighting support infrastructure is usually located within the bounds of each POE property.

Border Patrol stations (BPSs) vary in size and typically include administrative and support buildings, vehicle maintenance garages, equine and canine facilities, vehicle wash facilities, fuel tanks, small arms practice ranges, illegal alien processing and temporary holding facilities, confiscated vehicle storage facilities, and agent and visitor parking. BPS are either connected to local county or municipal utility systems or have their own septic systems, water-supply wells, lighting, and generators. Older BPSs are often co-located with other Government agencies or located in buildings owned or leased by GSA. A number of these BPSs are being upgraded to provide space for additional agents. Upgrades have been or are being addressed in NEPA documents (USDHS, No Date[b]).

BPSs, particularly new stations being constructed to current standards, are often equipped with helipads for OAM aircraft and pilots supporting reconnaissance or enforcement activities. Helipads are typically concrete but can also consist of matting or sandbags filled with cement with riprap or sandbags for stabilization and to reduce erosion caused by the helicopter's propeller "wash."

As mentioned in Section 1.2.3.2, FOBs are temporary or permanent buildings that provide living and office accommodations, detention space, and equipment storage as a base for USBP agents when operating remotely, but not in a camping setting. USBP uses lighting not only at its BPSs but also at temporary checkpoints and for surveillance operations (usually in response to intelligence). Lighting at temporary checkpoints is usually mounted on a vehicle.

OAM aircraft are home-based at existing airports or are tenants on military air installations, where CBP leases existing hangar space, runways, helipads, and fueling facilities. OAM does not have any requirements to construct new facilities, but may occasionally do minor modifications to existing facilities. Refueling of aircraft and helicopters usually occurs at established airports or sometimes at BPSs or other CBP facilities equipped to support aircraft activities. Due to the remote nature of many CBP activities, remote landing areas may be needed to support reconnaissance, observation, and enforcement activities. These landing areas usually consist of relatively level land cleared of vegetation.

Maritime assets on the coast of Washington, Maine, or Great Lakes states may be located at U.S. Coast Guard (USCG) stations or more often in space rented from commercial marinas. In some USBP sectors where patrol operations are primarily land-based but may have smaller lakes and rivers that straddle the border (e.g., Houlton Sector in Maine patrols the St. John and St. Croix Rivers and several small lakes), OAM provides equipment to USBP, which conducts the patrols.

1.2.3.5 CBP Communication, Detection, Inspection, and Surveillance Technologies

To process cargo, CBP officers use nonintrusive/nondestructive inspection and detection technologies (NII), including large-scale X-ray and gamma-ray imaging systems and radiation detection technology, such as vehicle and cargo inspection systems and personal radiation detectors (PRDs), to quickly determine whether there are anomalies in the cargo of rail cars, trucks, or rail containers, or other types of truck and ship cargoes. Almost all CBP officers at ports use NII daily. They also use radioactive isotope identifiers (RIIDs). To process people, all POEs are linked to the Integrated Automated Fingerprint Identification System (IAFIS) and Advance Passenger Information System (APIS). For example, the Western Hemisphere Travel Initiative passport card system, which began in 2007, reduced the number of documents that

CBP officers need to identify and determine citizenship status by introducing a radio frequency identification (RFID) chip and a machine-readable zone (MRZ) in or on the card (USDHS, 2007). Other technologies include infrared license plate readers, decal transponder readers, biometric scanners, document readers, cameras, radio systems, and repeater communication systems.

USBP agents use many of the same technologies as CBP officers, including NII, PRD, and RIID. Most USBP sectors use tower-based remote video surveillance systems (RVSS) and vehicle-based mobile video surveillance systems (MSS) to supplement patrols by agents. A current project by the OTIA seeks to tailor RVSS/MSS systems to the northern border terrain and climate. Pilot projects to test the effectiveness of this system are being conducted in Detroit, Michigan; Buffalo, New York; and the Swanton Sectors (New Hampshire, Vermont, and eastern New York) (USDHS, 2010b) (see Section 1.2.4 for more information.)

USBP employs a network of radio communications transmitters, repeaters, and receivers to provide base-to-field communications and to allow USBP personnel to operate with partners in law enforcement such as the Canadian Border Guard, the Royal Canadian Mounted Police, and local and state police and sheriffs' offices. Operational frequencies are certified by the NTIA.

USBP uses unattended ground sensors, small seismic and magnetic transmitters placed on or near roads and trails within illegal travel corridors, capable of detecting ground vibrations and vehicle movements. When sensors are activated, a signal is broadcast to the nearest USBP station/sector. The locations of the sensors are not fixed, and the USBP regularly moves them.

OAM operates different types of aircraft and high-speed vessels (e.g., Interceptor and Coastal Enforcement Class vessels) nationwide. A large percentage of these assets are assigned to the northern border.

Aircraft include rotary and fixed-wing, ranging from occasional use of the Orion P-3 aircraft to smaller jet and turboprop airplanes, to several models of helicopters, including the UH-60 Blackhawk (USDHS, 2010a).

Aircraft travel to mission destinations at altitudes of 3,000 feet or greater above ground level once beyond the airfield/airport, although they may drop lower to investigate or respond to a situation. All missions are coordinated preflight with the FAA. In some sectors, CBP operates a Predator-B unmanned aircraft system (UAS) to fly surveillance. The UAS is guided by remote control, operated by qualified pilots, and equipped with a camera (day or night vision) or forward-looking infrared radar (FLIR). These aircraft can be operated at higher altitudes when conducting surveillance, because of the sensitivity of their imaging systems.

OAM pilots also use night vision goggles, FLIR, digital aerial video, airborne radar platform, video downlinks, flares, and lasers.

OAM participates in the National Plan to Achieve "Maritime Domain Awareness (MDA)," a plan to achieve effective understanding of anything associated with the global maritime domain that could impact the security, safety, economy, or environment of the United States. Enterprise Hubs are being developed from within existing organizations with capabilities that already make

substantial contributions to MDA. CBP has been designated to lead the Cargo and People Enterprise Hubs (USDHS, 2010c).

The maps in Figure 1.2-2 show the locations of POEs, BPSs, and OAM branches and units servicing the northern border. (Detailed location information for POEs is available on the CBP website at <http://cbp.gov/xp/cgov/toolbox/ports/>). In some instances, particularly where operations and POEs are in remote locations, CBP also provides housing for its agents and officers through its Engineering Support section.

CBP is investigating integrated surveillance and communications systems to provide data for the Common Operating Picture. Deployment of such technologies may require upgrades to existing facilities (such as BPSs), erection of new towers or co-location of new capabilities on existing Government or commercially owned towers, mounting on and movement of mobile (vehicular) platforms, setting-up or upgrading of radar systems for use in maritime and near ground environments, and integration and upgrade of existing electronic equipment and maintenance and operation of infrastructure and equipment.

CBP is also evaluating commercial off-the-shelf (COTS) technologies for applications like detecting low-flying aircraft and other intrusions near or across the border.

Figure 1.2-2(A) CBP Northern Border Facilities: West of the Rockies Region

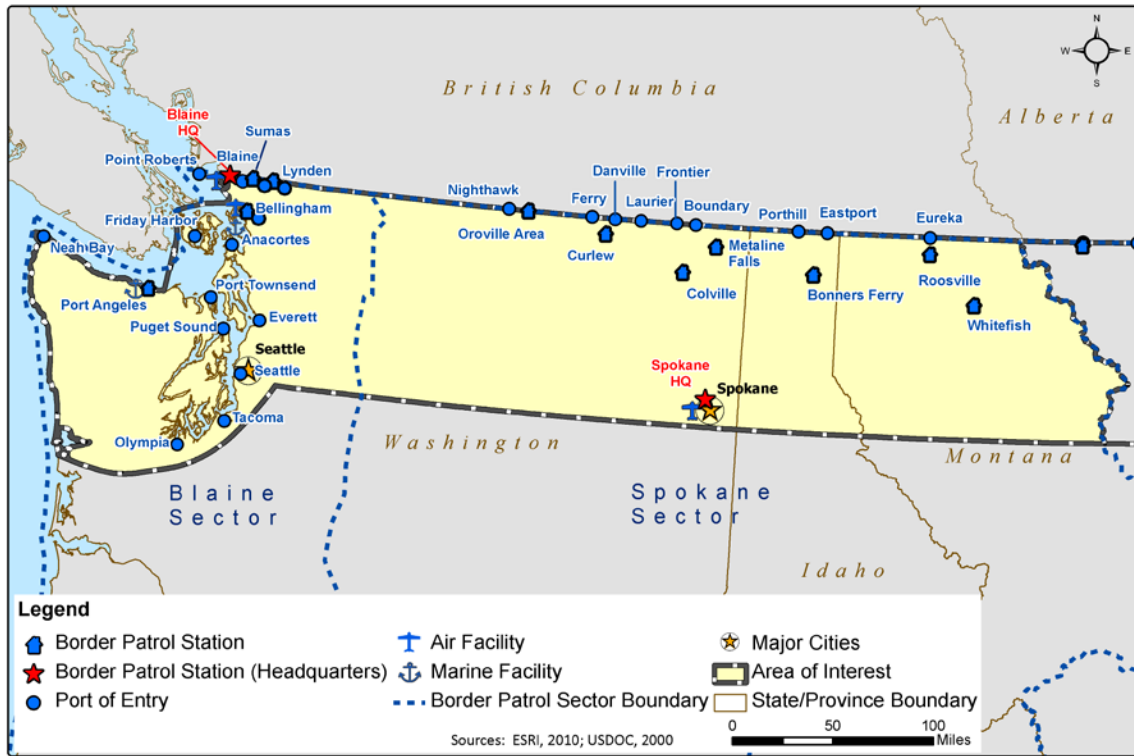


Figure 1.2-2(B) CBP Northern Border Facilities: East of the Rockies Region

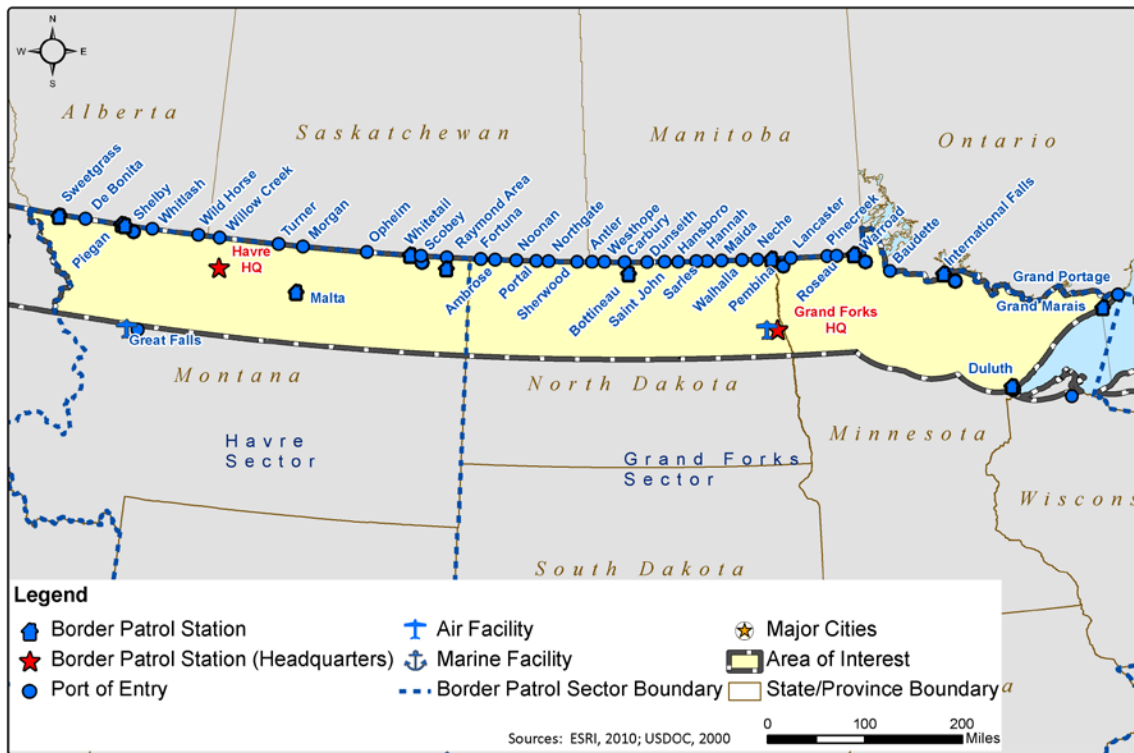
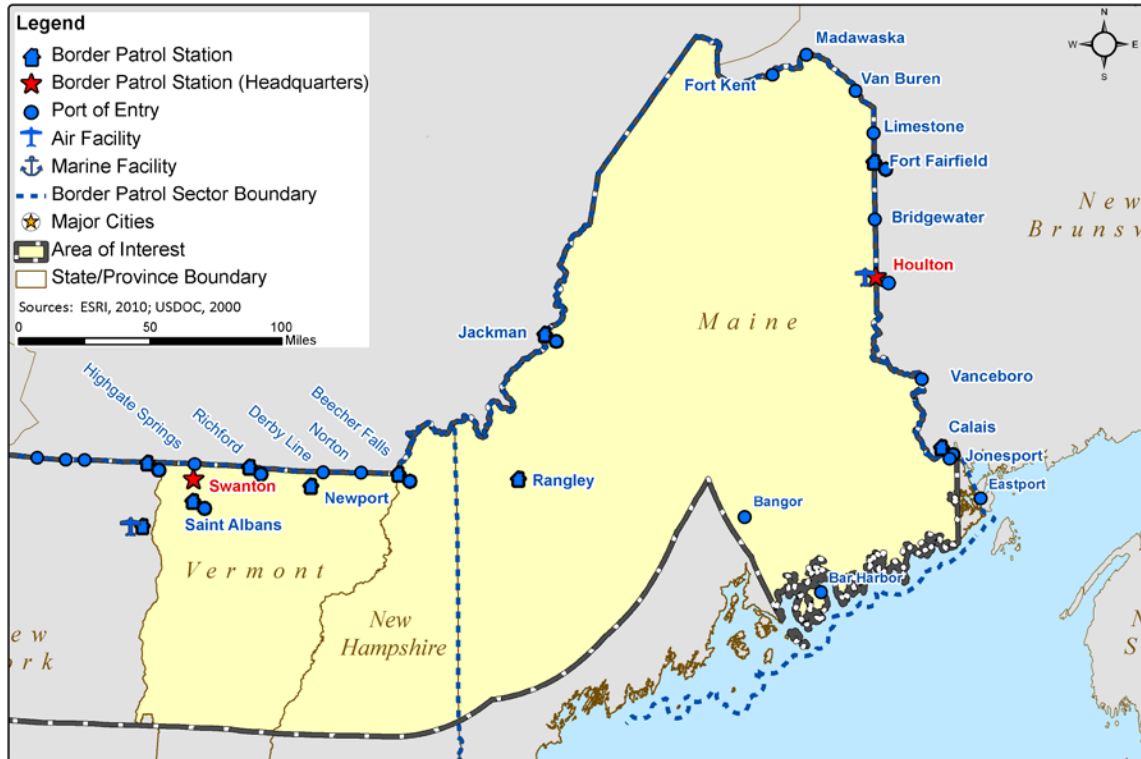


Figure 1.2-2(C) CBP Northern Border Facilities: Great Lakes Region



Figure 1.2-2(D) CBP Northern Border Facilities: New England Region



1.2.3.6 Tactical Security Infrastructure

USBP often needs certain types of infrastructure to help prevent unauthorized border crossings and CBVs from gaining access to parts of the border that might otherwise be difficult to monitor consistently. Construction and routine maintenance of these land-based security infrastructure assets are key tools for maintaining a secure border environment.

Roads, bridges, culverts, and low-water crossings, as well as gabions, water bars, and other drainage or erosion control structures facilitate CBP mobility for ground patrols. While the majority of the dirt roads within the border region were about 24 feet wide originally, over the years, vegetation has encroached to the point that these roads are now typically less than 10 feet wide. In addition, some roads have experienced severe wind and water erosion, resulting in long, impassable stretches. Frequently, gabions, water bars, and other drainage or erosion control structures are needed to support new structures or maintain existing ones.

In remote areas that have experienced a high volume of illegal vehicle traffic, CBP directs construction of barriers to prohibit illegal vehicle entry. These are frequently metal or concrete posts and railings at heights that do not allow vehicles to pass under or over them. They are constructed in discrete locations (usually blocking back roads or trails) in remote areas that have experienced high illegal vehicle traffic. Construction of barriers requires construction of an access road for maintenance. Barriers can also include trenches cut across existing roads to prevent passage. Along the northern border, CBP uses fences to increase the time needed for cross-border violators to get away from the border and blend into traffic. In contrast to fences built along the southwest border, fencing along the northern border tends toward simpler construction of either chain link or barbed-wire. CBP has no plans to construct a “border fence” or fence segments along the northern border of the same magnitude as that along the southwestern border. Border Patrol’s operational requirements in the southwest dictate a need for persistent impedance of undocumented immigrating CBVs, smugglers, and organized drug cartels. The length of the northern border, the diverse terrain, and the differing security considerations make such an effort operationally untenable as well as nearly technically unfeasible.

Communications and surveillance towers for the installation of radio antennae, radio transmitters and receivers, and RVSS and motion detection devices are currently in place primarily in the eastern part of the country along the northern border. Many towers have a small building to house electronic equipment associated with the operations. These are similar to nongovernment-owned cellular towers in most respects, and sometimes CBP technologies are collocated with existing privately or publicly owned towers.

1.3 PURPOSE AND NEED

1.3.1 PURPOSE OF THE PROPOSED ACTION

The purpose of the proposed action is to provide CBP with a well-integrated, reasonable framework for sustaining and enhancing security along the United States border with Canada. CBP’s intent is to determine the appropriate mix of infrastructure, technology, and facilities to support personnel responding to evolving cross-border threats and border protection priorities. The timeframe considered for the proposed action is the next five to seven years.

The proposed action must provide CBP law enforcement components with the means to stay abreast of current border activities and discriminate among a variety of types and levels of threats to the United States and its citizens. The ultimate goal is to create conditions so that CBP (working in collaborative partnerships with local, state, and tribal law enforcement partners) would be able to resolve all cross-border violations through deterrence, interdiction, and confinement as appropriate to achieve the satisfactory law enforcement result efficiently and effectively. The proposed action must facilitate CBP's safeguarding of land, sea, and aerial border areas.

1.3.2 NEED

CBP needs the capability to pursue effective control of air, land, and maritime borders to the north of the contiguous United States. More effective control will exist when CBP is consistently able to (1) stay abreast of current cross-border violations and activities and maintain "situational awareness," (2) identify and classify each situation to determine the level of threat involved, (3) efficiently and effectively respond to these situations, and (4) bring each event to a satisfactory law enforcement resolution.

1.4 PROPOSED ACTION

CBP proposes to arrange the program elements described in Section 1.2.3 in the most effective combination to provide the flexibility to respond to existing and any evolution of cross-border terrorist, criminal, and public safety threats over the next five to seven years. To protect the northern border against evolving threats, CBP would assume an approach for modifying its deployment of facility, technology, and tactical security infrastructure in a manner that would enable its agents, officers, specialists, and supporting personnel to pursue effective control of air, land and sea borders between the United States and Canada. The proposed action and alternatives are intended to respond to changes which are reasonably foreseeable inasmuch as external threats could drive the need for CBP to augment its northern border security program. There are several alternative program directions that would be reasonable ways to respond to future threats. These alternatives and their impacts are analyzed in this PEIS.

The main activity elements of the proposed action would support the operations of the three CBP law enforcement components: OFO, USBP, and OAM. Under all alternatives, CBP would continue to conduct current activities such as enhancing partnerships with other Government agencies and maintaining current assets. Also, personnel increases as a function of normal agency growth would likely occur over the next five to seven years under the proposed action and all alternatives. Additional personnel would also likely be deployed in cases where operational paces were increased for extended periods of time. These increases might be accomplished by redeployment of the existing workforce or by acquisition of new personnel.

Given that northern border security is an ongoing, multifaceted and ever-changing effort, there is no discrete point at which a comprehensive "new" program will be decided upon or implemented. Instead, CBP anticipates a process of continuous improvement, where it is constantly seeking the combination of law enforcement measures that best meets the mission objectives at a particular time and place. In this more continuous planning and decision making context the use of information about environmental impacts is not limited to one point in time or one place.

1.5 OTHER CONSIDERATIONS FOR NORTHERN BORDER PLANNING

1.5.1 POLICY AND BUDGETARY CONSIDERATIONS

Agents, officers, and other personnel working within CBP's three law enforcement components and supporting offices, must use combinations of facilities, infrastructure, and technologies in a complementary fashion as they guard against the diverse and often-evolving profile of cross-border threats. Managers at multiple levels of CBP, from headquarters offices to field stations, must plan and decide on the allocations and assignments of these assets in their areas of operation. Planning for border security and legal cross-border activities also occurs on an agency-wide, nationwide, and international level. Between the topmost national/international strategies and site-specific implementation procedures, there are several intermediate levels of ongoing planning. For CBP, the top level strategies and goals are set by higher authorities such as the President, Congress, and the Secretary of DHS.

CBP decided to prepare this PEIS to inform its decision-makers about potential environmental impacts resulting from CBP northern border activities. Although this PEIS is not connected to any other strategic efforts underway regarding border security and legal cross-border movement, CBP will use this PEIS as a tool for understanding environmental impacts that likely could occur were policy initiatives external to this PEIS planning process to provide additional direction for CBP's northern border activities.

The "Beyond the Border: A Shared Vision for Perimeter Security and Economic Competitiveness," declaration by President Obama And Prime Minister Stephen Harper of Canada (February 2011) and the subsequent Action Plan (December 2011) set a strategic vision for a new long-term partnership built upon a perimeter approach to security and economic competitiveness at and "beyond the border." Its goals include enhancing security and accelerating the legitimate flow of people, goods, and services with a risk management approach using greater information sharing among all levels of government and communities to address threats before they reach the border.

There is also a DHS "Northern Border Strategic Plan" released in May 2012 which established general policy goals to guide CBP and other DHS components. The framework established by these high level planning efforts will require CBP to develop more specific plans for enhancing security along the northern border. This planning process will guide more particulars about the overall mix of types of tools and techniques to be used over the next five to seven years. Within this framework, CBP will make subsequent site decisions regarding deployments of resources.

Other factors that affect the deployment and allocation of security measures include the availability of budgetary resources and the availability and suitability of technologies to identify, discriminate, and transmit information on cross-border threats. The number of personnel, vehicles, aircraft, vessels, and other equipment available as well as the amount of facility and infrastructure construction or maintenance that CBP can perform varies annually based on Congressional appropriations and authorizations and other factors. Also new tools, such as cargo inspection technologies and remotely piloted aircraft, are developed and proven for use at and between the POEs. CBP includes consideration of these budgetary and technological factors

when planning and projecting its approaches for maintaining the security of the long and environmentally diverse northern border

1.5.2 ONGOING INTERAGENCY COOPERATION

There are several key cooperating relationships that CBP law enforcement personnel participate in for the purposes of enhancing border security and facilitating legal trade and travel. Integrated Border Enforcement Teams (IBET) are a collaboration of U.S. and Canadian Federal, state/provincial, and local law enforcement personnel ranging across the northern border. The five core participating agency-components are CBP, the USCG, ICE, Royal Canadian Mounted Police, and the Canadian Border Services Agency (CBSA). IBETs are designed to work as teams to accelerate the sharing of information and intelligence capabilities between U.S. and Canadian authorities to enhance border security enforcement. IBETs also integrate the mobile response capabilities of the law enforcement partners in air, land, and marine environments. This maximizes the effectiveness of the existing law enforcement authorities without increasing the need for physical or personnel assets.

CBP also augments ICE's Border Enforcement Security Task Force (BEST) units along the northern border to help dismantle cross-border criminal organizations. The BEST uses every element of the enforcement process to interdict, prosecute, and remove transborder criminals and the supporting infrastructure to maintain criminal enterprises.

CBP continually engages with the Department of the Interior (DOI) and U.S. Department of Agriculture (USDA) so that it can fulfill its border security enforcement responsibilities on Federal lands while respecting the mission and integrity of areas designated for recreational use as well as natural, aesthetic, and historical resource conservation, and preservation. CBP operates in cooperation with DOI and USDA under a March 2006 Memorandum of Understanding (MOU), describing the cooperative national security and counterterrorism responsibilities on Federal lands along U.S. borders. This MOU specifies protocols for cooperation related to border security and CBP's responsibilities with regard to compliance with environmental laws, regulations, and policies on public lands and with respect to protected resources.

1.5.3 COMPLIANCE FRAMEWORK

NEPA has both procedural and substantive legal requirements, which are described in Appendix C, Potentially Relevant Federal Statutes and Executive Orders (EOs). The procedural requirements that CBP has followed developing this PEIS are set forth in NEPA itself, 42 U.S.C. 1331 et seq.; its implementing regulations promulgated by the Council on Environmental Quality (CEQ), 40 CFR 1500–1508; and the DHS NEPA regulation, Directive 023-01. The substantive requirements are primarily found in the implementing regulations from CEQ. These include guidelines on what sections must be included in the PEIS:

- A description of the purpose of and need for the proposed action;
- Alternatives considered, including the proposed action and “no action” alternatives;
- The affected environment of the proposed action and alternatives;
- The environmental consequences of the proposed action alternatives;

- Mitigation measures available to reduce impacts on the various environmental resources; and,
- A listing of agencies, organizations, and persons contacted during the PEIS preparation and the public involvement processes.

As noted above, CBP is responsible for substantive compliance with a wide array of Federal laws and regulations. Within the framework of environmental impact analysis under NEPA, legal authorities for which substantive compliance might be applicable (i.e., what CBP would actually do) include statutes such as the American Indian Religious Freedom Act (AIRFA), Archaeological Resources Protection Act, Clean Air Act (CAA), Clean Water Act (CWA), Coastal Zone Management Act (CZMA), Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), National Historic Preservation Act (NHPA), Resource Conservation and Recovery Act (RCRA), and a number of Federal EOs. A summary of laws and EOs that might be applicable to the proposed action and alternatives is presented in Appendix C.

1.5.4 PERMITS, APPROVALS, AND INTERAGENCY COORDINATION

Specific Federal and state permits, approvals, and interagency coordination can only be generally identified at this programmatic document stage. The permits, approvals, and coordination that could be required for site-specific CBP actions include the following:

- Federally recognized American Indian Tribe consultations regarding potential effects on cultural resources and religious issues;
- Relevant state CWA Section 401 Water Quality Certifications;
- Relevant state CZMA consistency determinations;
- Relevant state NHPA Section 106 consultations;
- U.S. Army Corps of Engineers (USACE) CWA Section 404 and possibly Section 10 Rivers and Harbors Act permits;
- U.S. Department of the Interior (DOI) ESA Section 7 consultations;
- U.S. DOI Migratory Bird Treaty Act (MBTA) coordination;
- U.S. DOI, Land and Wilderness Management Plans and Special Use Permits;
- U.S. Department of Agriculture, Forest Management and Transportation Plans and Special Use Permits;
- U.S. Environmental Protection Agency (USEPA) or relevant state CAA conformity analyses;
- USEPA or relevant state National Pollutant Discharge Elimination System (NPDES) stormwater permits;
- USEPA Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or relevant state contaminated property requirements; and,
- USEPA or relevant state Resource Conservation and Recovery Act (RCRA) hazardous waste small quantity generator requirements and underground storage tank requirements.

1.5.5 ACTIONS/ACTIVITIES WITH LITTLE OR NO POTENTIAL FOR IMPACT ON THE ENVIRONMENT

The extent to which a particular action or activity can affect a specific resource varies. In many cases, a particular action may have no effect or a negligible effect. For example, the use of scanning technologies by OFO or USBP at POEs or checkpoints would have no impact on water quality, wetlands, or other natural resources, and would have little impact on human health and safety. Along with the list of activities with the potential to impact a resource, activities with little or no potential to impact a resource are identified in Chapter 3, which provides an overview of how impact determinations are made for each affected environmental or socioeconomic resource.

The CEQ's NEPA implementation regulations encourage Federal agencies to develop lists of actions that can be "categorically excluded" from the requirements for an environmental assessment (EA) or environmental impact statement (EIS). 40 CFR 1508.4 of the CEQ's NEPA implementation regulations defines the categorical exclusion (CATEX) as "...a category of actions which do not individually or cumulatively have a significant effect on the human environment ... and ... for which, therefore, neither an environmental assessment nor an environmental impact statement is required."

Appendix D provides a list of DHS CATEXs from Directive 023-01 that may be applicable to the actions covered by this PEIS. The directive also provides guidance for those instances where conditions or extraordinary circumstances associated with an action or actions that would ordinarily be covered by a CATEX can be further evaluated by a Record of Environmental Consideration (REC) process to determine whether or not the action or actions should be categorically excluded.

1.5.6 PUBLIC INVOLVEMENT

Agency and public involvement in the NEPA process promotes open communication between the public and the Government and enhances the decision-making process. All persons or organizations having a potential interest in the proposed action are encouraged to participate in the decision-making process.

NEPA and implementing regulations from the CEQ and DHS, direct agencies to make EISs available to the public during the document development process and prior to any decision making on what actions are to be taken. The premise of NEPA is that the quality of Federal decisions will be enhanced if proponents provide information to the public and involve the public in the planning process.

Public scoping activities for the PEIS were initiated on July 6, 2010, when a Notice of Intent (NOI) to prepare four region-specific PEISs was published in the *Federal Register* (FR Doc. 2010-16392). In addition to providing a brief description of the proposed action and announcing CBP's intent to prepare these PEISs, the NOI also established a 30-day public scoping period. In coordination with the publication of the NOI, display advertisements were published in various newspapers serving local communities; public service announcements were broadcasted on local radio; scoping letters were mailed to potentially interested stakeholders consisting of agencies, organizations, and individuals; and a public website was developed for the project. Following

the publication of the NOI, public scoping meetings were held in July 2010 (see Appendix A for a summary of the scoping report).

The purpose of the scoping process was to solicit public comments regarding the range of issues, including potential impacts and alternatives that should be addressed in the PEISs. Public comments received during the public scoping period were taken into consideration as part of the preparation of the Draft PEIS. In part due to comments received during the scoping process, a subsequent notice was published on November 9, 2010 in the *Federal Register*, notifying the public that CBP intended to prepare a single PEIS as opposed to the four region-specific PEISs contemplated in the initial NOI. It also informed the public that CBP would continue to accept scoping comments through development of the DRAFT PEIS.

The USEPA published a Notice of Availability (NOA) for this Draft PEIS in the *Federal Register* on September 16, 2011. The USEPA NOA announced to the public the availability of this Draft PEIS, and began a 45-day public comment period. In addition to the USEPA NOA, CBP published a separate NOA in the *Federal Register* announcing the dates, times, and places for public meetings and to request comments on the Draft PEIS. All comments received were considered in the development of this Final PEIS and are included in Appendix A-2.

CBP invites agencies, organizations, and individuals to provide comments, suggestions, or relevant information related to this Final PEIS. Information submitted by (30 days from date of NOA publication) will be considered in the Record of Decision (ROD.) This information may be submitted by any of the following methods:

- Sending to Jennifer DeHart Hass, Environmental and Energy Division, U.S. Customs and Border Protection, 1331 Pennsylvania Ave NW, Suite 1220N, Washington, DC 20229;
- Emailing to: cbpenvironmentalprogram@cbp.dhs.gov; or,
- Calling to 202-325-4191.

Throughout the NEPA process, the public may obtain information concerning the status and progress of the PEIS on the project website at www.NorthernBorderPEIS.com. Information about how to obtain a copy of the Draft PEIS can also be found on the site.

1.6 PEIS COOPERATING AND COORDINATING AGENCIES

USDA and DOI acted as limited cooperating agencies for the PEIS. In this capacity, they will assist identifying USFS and DOI agency lands and resources affected by the PEIS and assure that consultation requirements under the ESA or other Federal laws are satisfied. They will also participate in public meetings as needed and review draft PEIS documentation for CBP activities impacting resources under their jurisdiction or otherwise contributing their special expertise. The cooperating-agency relationship among CBP and DOI and USDA will follow the applicable sections of 40 CFR 1501.6 and 1508.5.

Typically, a bureau within DOI, such as USFWS, acts as a cooperating agency; however, because of the geographic scope of this PEIS and the need to coordinate review and consultation

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

among several bureaus within DOI [including USFWS, NPS, Bureau of Indian Affairs (BIA), and the Bureau of Land Management (BLM)]; DOI has agreed to act as the cooperating agency.

Final

Programmatic Environmental Impact Statement For Northern Border Activities

Section 2: Proposed Action and Alternatives



July 2012

Contents

2	Proposed Action and Alternatives	2-1
2.1	Proposed Action Alternatives	2-2
2.1.1	Descriptions of Alternatives	2-3
2.2	Activities to be Evaluated	2-5
2.3	No Action Alternative.....	2-8
2.4	Facilities Development and Improvement Alternative	2-10
2.5	Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative (Preferred Alternative / Environmental Preferable Alternative).....	2-11
2.6	Tactical Security Infrastructure Deployment Alternative.....	2-14
2.7	The Flexible Direction Alternative	2-14
2.8	Alternative Considered But Removed From Further Consideration	2-15
2.9	Summary Comparison of Action Alternatives.....	2-15
2.9.1	Other Mission Considerations.....	2-18
2.9.2	Environmental Stewardship and Social Responsibility	2-19

TABLES

Table 2.2-1	CBP Activities	2-6
Table 2.2-2	Categories of Activities for Impact Assessment	2-7
Table 2.3-1	Current Activity Levels by Region—No Action Alternative.....	2-9
Table 2.4-1	Anticipated Activity Levels by Region ¹ —Facilities Development and Improvement Alternative.....	2-11
Table 2.5-1	Anticipated Activity Levels by Region— Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	2-13
Table 2.6-1	Anticipated Activity Levels by Region—Tactical Security Infrastructure Deployment Alternative.....	2-14
Table 2.7-1	Anticipated Activity Levels by Region—Flexible Direction Alternative	2-15
Table 2.9-1	Comparison of Action Alternatives.....	2-17
Table 2.9-2	Summary of Overall Potential Environmental Impacts by Alternative.....	2-19

2 PROPOSED ACTION AND ALTERNATIVES

U.S. Customs and Border Protection (CBP) proposes the use of a multilayered law enforcement approach to deploy border security program elements in the most effective combination to respond to any evolution of cross-border terrorist, criminal, and public safety threats along the northern border over the next five to seven years. Border security program elements consist of facilities; technologies for communication, detection, inspection, and surveillance; and land-based security infrastructure. These assets are used by agents, officers, specialists, and other personnel to pursue effective control of air, land, and sea borders between the United States and Canada. Under this proposal, CBP is evaluating alternative programmatic approaches that focus on augmenting particular elements for future responses to evolving threats and changes in security or trade and travel facilitation priorities. These alternative approaches may effectively change the pace of CBP operations and increase CBP's inventory of physical assets.

Within the national border security context, it is reasonably foreseeable that CBP might need to augment its northern border security program to respond to external threats that are not yet apparent. However, in the absence definitive national security priority drivers for change, CBP anticipates that the majority of its northern border activities in the next five to seven years would be covered under the No Action Alternative.

The main program elements of the proposed action would support the operations of CBP's law enforcement components: Office of Field Operations (OFO), U.S. Border Patrol (USBP), and the Office of Air and Marine (OAM).

This Final Programmatic Environmental Impact Statement (PEIS) was not prepared to analyze any specific strategic framework for northern border security proposed or prepared under the direction of the Office of the President of the United States or the Department of Homeland Security (DHS). The analysis in this PEIS however will broadly inform CBP's implementation of relevant portions of any strategic initiatives. The exact combination of elements for northern border security that CBP will use in the next several years will be developed over time and in response to the security environment. Therefore, the extent to which CBP might add new facilities, add more technologies, or intensify various operations, will be the subject of ongoing planning. When individual projects or program elements with the potential to significantly impact the environment are ripe for proposal and assessment, CBP will continue to conduct appropriate project-specific National Environmental Policy Act (NEPA) analysis. CBP will make determination of the appropriate level of review in accordance with 40 CFR 1501.2 thru 1501.4, as well as DHS Directive 032-01 sections V (Responsibilities), VI (Procedures), and Appendix A (Timely and Effective Environmental Planning in the Department of Homeland Security). This PEIS does not have the specificity of analysis to preclude the need for further analysis to identify site-specific impacts for actions with the potential to adversely impact the environment. However, this PEIS does address the combined impacts of CBP northern border activities. It also provides a baseline of information that may be referenced in NEPA analysis for future specific projects. This PEIS will also present recommended best management practices and mitigations for consideration in future planning for CBP projects along the northern border.

2.1 PROPOSED ACTION ALTERNATIVES

NEPA requires that Federal agencies rigorously explore and objectively evaluate reasonable alternatives for a proposed action with the potential to significantly impact the human environment.

The proposed action alternatives considered within this PEIS address reasonably foreseeable changes to CBP’s northern border security program that could be implemented based on evolutions in threats and security priorities. The length and diversity of the border and the wide range security considerations that could emerge over the next few years presents a challenge for using a scenario-based approach to determine the range of alternatives for the proposed action. Using location-based or threat specific scenarios to develop different alternatives would lead to the creation of a large range of potential programmatic responses. It would not be feasible to identify and analyze all possible proposals for combinations of facilities, enhanced technologies, infrastructure, and other factors within this document appropriate to respond to each scenario. And attempting to narrow the range of alternatives in either case would reduce the likelihood of analyzing for and then selecting a proposal that was representative of the appropriate response approach to an actual emergent threat.

CBP therefore determined that it should analyze alternatives flexible enough to address the full range of foreseeable changes that might be needed for CBP’s program activities over the next five to seven years, regardless of particular threat or location along the northern border. Each alternative in this PEIS emphasizes an aspect of the CBP “toolkit” of assets that enables CBP personnel to effectively secure the border. The alternatives examined within this PEIS provide a reasonable basis for comparing allocations of resources and resulting impacts from those allocations. CBP has identified the following alternatives for comparison under the proposed action:

- Increased focus on improving availability of facilities to support CBP law enforcement personnel executing their duties;
- Increased emphasis on deploying communication, detection, inspection, and surveillance technologies and operations;
- Increased deployment of tactical security infrastructure; or,
- A combination of these approaches, with elements from any of the three.

Alternatives Analysis

The NEPA regulations (40 CFR 1502.14 [a]) require agencies to “... rigorously explore and objectively evaluate all reasonable alternatives” for meeting the agency’s purpose and need for taking action. For alternatives which were eliminated from detailed study, the agencies must briefly discuss the reasons for their having been eliminated.” DHS Directive 023.01 states that the Department will “ensure that appropriate environmental planning, including the analyses and documentation required by NEPA, is completed before the Proponent makes a decision that has adverse environmental effects or limits the choices of alternatives to satisfy an objective, fix a problem, or address a weakness.”

The directive further states that “No action or portion of an action that is the subject of an [Environmental Assessment] or EIS process will be taken that limits reasonable alternatives, involves a conflict of resource use, or has an adverse environmental effect until the Record of Decision (ROD) or Finding of No Significant Impact (FONSI) has been made public.”

These alternative program directions represent CBP's estimation of upper limits of activity or inventory encompassed within existing, planned, and foreseeable northern border program elements. They would each allow CBP to continue to deploy the existing CBP personnel in an effective manner while maintaining officer safety. The impacts of whatever specific combination of actions CBP could decide to implement over time will be contained within the "range" of impacts discussed in this study.

It is also likely that increases or fluctuations in the number of personnel securing the northern border would occur over the next five to seven years as a function of normal CBP-wide growth. Also, if the pace of operations were to increase due to changes in legal or illegitimate movement across the border for extended periods, additional personnel might be required in specific areas or facilities along the border. CBP might accomplish these increases through redeployment of the existing workforce or by acquisition of new personnel.

Under all of the alternatives, CBP would continue to conduct current activities such as enhancing partnerships with other Government agencies and maintaining current assets. CBP is continuing to pursue and expand its cooperation with Federal and state land management agencies through several mechanisms including the regional Borderland Management Task Forces (BMTFs) and the Public Lands Liaison Agent (PLLA) program. CBP would expand its cooperation to cover more planning for specific construction, repair, and maintenance projects and generally for law enforcement activity operations.

This PEIS provides useful input to CBP's planning process, helping to identify environmental considerations that are of most concern given any combination of actions that CBP could choose to implement. It also provides information on what best practices CBP should consider employing for recurring activities and when it needs to consider mitigating measures.

2.1.1 DESCRIPTIONS OF ALTERNATIVES

The following descriptions of alternatives and subsequent analysis of potential impacts provide bases for understanding the scope of CBP activities within the northern border environment and comparing the approaches.

- **No Action Alternative:** NEPA regulations require analysis of a No Action Alternative (40 CFR 1502.14(d)). In a situation such as this where an agency has an ongoing program of actions, the meaning of "No Action" is that the agency would make no changes in its current program. That is, it would maintain the status quo. Thus, CBP would continue the current level of operations with approximately the same manpower. The No Action Alternative would include routine maintenance and repairs of facilities, equipment, and technology (including commercial upgrades of equipment presently in use as these become available). An important part of CBP's overall strategy is to partner with other law enforcement agencies of the United States, as well as Canada and other international partners in order to build a shared commitment to border security and facilitation and to respond to situations more quickly and efficiently. These partnerships can help reduce the need for increases in staffing, technology, and infrastructure for any participating agency. The use of partnerships is a direction that is practiced, and will continue to be practiced, no matter what potential alternative direction CBP chooses to follow.

- **Facilities Development and Improvement Alternative:** The Facilities Development and Improvement Alternative would focus on replacing or providing new permanent facilities, such as Border Patrol stations (BPSs), housing, and other facilities and making major modifications to permanent facilities, such as ports of entry (POEs), to allow CBP agents, officers, and agricultural specialists to operate more efficiently and respond to situations more quickly. In some cases, USBP agents are currently operating out of space not optimized for their operational responsibilities. This includes space leased in buildings primarily occupied by other Federal, state, or local governments/law enforcement agencies that may not meet space, location, or accommodation requirements for BPSs and the area of operations. Many of the POE inspection facilities along the northern border have high traffic volume and operate 24 hours per day, 365 days per year in extreme climates. As a result, they undergo considerable wear and tear. These facilities, built for a different era of operations, are poorly configured to support CBP's evolving trade facilitation and antiterrorism mission. A number of POEs need to be replaced or extensively upgraded, which would involve major construction. Included also in this alternative is the construction of semi-permanent and temporary facilities, such as forward operating bases (FOBs), temporary housing (where local housing stock may not be readily available), checkpoints, and other facilities necessary to support CBP law enforcement agents and officers as they carry out operational duties. This alternative is considered reasonable and its impacts are assessed throughout this document. It would help meet the need for the proposed action in that it would make it more difficult for cross-border violators to cross the border between POEs. It would also divert traffic from or increase the capacity of the more heavily used POEs, which would decrease waiting times for vehicles engaged in legal trade and travel.
- **Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative:** The Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative would focus on increased patrol activity and deploying more and better technologies to support CBP's detection, inspection, and surveillance capabilities and operational communications. It would include either hiring additional USBP and OAM agents or shifting these agents from the other borders to conduct surveillance and respond to situations. It would include improvements to the identification and inspection technologies used by OFO. It would also include continuing deployment of integrated remote video surveillance systems (RVSS) and plans such as fielding upgraded surveillance and telecommunications systems (e.g., remote sensors, short-range radar, remote and mobile video surveillance and communications systems, new camera systems, and upgrades to stationary communications systems) that would improve CBP's situational awareness and allow it to more efficiently and effectively direct its resources for cross-border violator interdiction. CBP considers this alternative to be the **Preferred Alternative** because it supports operational flexibility required to meet the purpose and need.
- **Tactical Security Infrastructure Deployment Alternative:** The Tactical Security Infrastructure Deployment Alternative would focus on expanding access roads and related facilities to increase the mobility of Border Patrol agents for surveillance and response and constructing additional barriers, such as selective fencing or vehicle barriers, at selected points along the border to deter and delay cross-border violators. This alternative would hinder cross-border violators and improve CBP's ability to

respond quickly and effectively. This alternative is considered reasonable and its impacts are assessed throughout the document.

- **Flexible Direction Alternative:** The Flexible Direction Alternative would allow CBP to implement any of the above program changes based on what CBP deems to be the most effective way to respond to the changing threat environment along the northern border. It is impossible to predict what combination of the above alternatives is likely to be needed at any time, and the needed mix is likely to change constantly because the threat environment changes constantly. Therefore, CBP is assessing the maximum scope of impact that might result from selecting this alternative as the sum of the impacts that would result from full implementation of all three alternatives. (See Table 2.9-1 for comparison of alternatives with respect to the need for the proposed action.) This alternative also is consistent with current national policy directions and is feasible on economic, environmental, technical grounds over the time period covered by this PEIS.

2.2 ACTIVITIES TO BE EVALUATED

Because this is a PEIS, a detailed description, and therefore a complete assessment, of the specific impacts of individual actions at specific locations is beyond the scope of this effort. As discussed above, CBP cannot know at this time exactly what or how many specific activities it will need to undertake in the next five to seven years; threats to the northern border are much more dynamic than that and can change almost daily. CBP can only foresee the general types of activities it will need to employ.

Table 2.2-1 summarizes the basic construction and operation categories of CBP actions, both current and proposed.

Table 2.2-1 CBP Activities

Basic Activity	Separate Activity
Construction	Modification to ports of entry (POE) ¹ Repairs and maintenance of existing POEs ¹ Construct or modification to BPSs ¹ Repairs and maintenance of existing BPSs ¹ Construct communications towers Small additions to OAM facilities Construct new FOBs Construct pedestrian or vehicle fences or other physical barriers Construct access roads, drag roads, bridges, culverts, and low-water crossings
Operations	Trade and travel processing at POEs (includes the various inspection and processing operations) Ground surveillance and situational response activities (motorized and non-motorized, use of unattended ground sensors (UGS) and other technology) Traffic checkpoint activities Aircraft surveillance and situational response activities Maritime surveillance and situational response activities Use of Non-Intrusive Inspection (NII) systems Use of other detection systems Repair and maintenance of NII, surveillance, and support equipment ²

¹Repairs and maintenance do not include modernization, which often involves demolition of the existing structure and construction of a new and often larger structure. Repairs and maintenance include structural and interior repairs to buildings, access roads, and parking lots. Modification can include large alterations to structures, but not one-for-one replacement.

²Includes repairs to vehicles, aircraft, vessels, and support infrastructure.

For clarity of the impact assessment, this PEIS has also organized activities into smaller subsets of impact categories, such as large versus small construction projects, ground versus air operations, motorized versus non-motorized ground operations, etc., as shown in Table 2.2-2.

For example, construction of or modification to a BPS is likely to be similar to that of other facilities in many respects. They all involve clearing, grading, and (if the facility is constructed at a previously undisturbed location) long-term changes in vegetation. What would vary in terms of impact would be the size of the facility and the existing environment at the location where it is constructed. All construction projects would involve operation of construction machinery that would generate air emissions and noise, as well as potentially disrupting traffic if in a busy location.

Table 2.2-2 Categories of Activities for Impact Assessment

Category	Includes
Small construction projects (Footprint < 1 acre; length < 1/4 mile)	Repairs and maintenance or minor modification to existing POEs, BPS Small building or parking expansions, upgrades in septic or storm water systems, sheds, etc. Access road extensions, upgrades, repairs Technology support infrastructure such as RVSS and radio communications towers Security infrastructure such as fencing
Large construction projects (Footprint > 1 acre; length > 1/4 mile)	New facilities and major modifications (including major modifications to existing BPSs or POEs, modernization to existing standards, and may also include demolition of existing structures and construction of new structures). Helipads are rolled into considerations for new BPSs Access road extensions, upgrades, repairs Security infrastructure such as fencing
Small POE trade and travel processing operations	All operations at POEs or fixed checkpoints < 10,000 – crossings/day
Large POE trade and travel processing operations	All operations at POEs or fixed checkpoints > 10,000 crossings/day
Off-site trade and travel processing operations	Temporary checkpoints Off-site inspections
Ground operations	Motorized: all-terrain vehicles, snowmobiles, sport-utility vehicles, and other vehicles
	Non-motorized: foot patrols and horses
Aircraft operations	All aircraft, including unmanned aerial systems (UAS).
Vessel operations	All vessels
Operation of NII systems	All non-intrusive scanning and detection systems
Operation of sensor and other technologies	UAS, RVSS/mobile surveillance systems, short-range radar, passive acoustic detection systems

Operations of the facilities, due to their different natures, would vary. Operation of a POE (trade and travel processing) involves the public in a very different way than does a BPS. Visitors and cargo must be processed through a POE, while operation of a BPS essentially does not directly involve the public—the station is merely a base of operations for the agents. USBP operations are conducted along the border, generally away from the station. On the other hand, operation of either type of facility is likely to generate secondary beneficial impacts, such as employment and spinoff benefits to local economies, as well as adverse impacts on the local public, as in increasing vehicle traffic on local roads.

Impacts from surveillance operations are dependent on the type of operation (motorized versus non-motorized, air versus ground, among others).

Inherent in the two basic categories of construction and operations are basic repair and maintenance activities associated with any kind of infrastructure or equipment. These include minor repairs and maintenance of buildings, parking lots, and roadways; landscaping; oil changes for ground vehicles, aircraft, and vessels; and others. Relevant activities are evaluated by alternative.

This PEIS does not evaluate the closure of any existing POEs or BPSs because closing facilities is not considered to be a reasonably foreseeable means of meeting the purpose and need of the proposed action. Unlike the choices about allocations of resources discussed in this study, closures do not inherently improve border security or facilitate trade and travel. If closure of POE or a BPS becomes ripe for consideration because of a need outside the scope of this PEIS, it would be analyzed individually through a site-specific NEPA document and an independent NEPA process.

2.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, CBP would anticipate annual allocations of resources over the next five to seven years sufficient to (1) continue the current level of operations and (2) continue maintaining and repairing existing facilities, technology, and infrastructure in support of the three law enforcement components. CBP would continue to implement the measures described in Section 1.2 at approximately their current levels.

Table 2.3-1 shows the approximate current infrastructure and levels of activities by region.

Roughly Measured

Throughout this PEIS, many numbers and measurements are expressed in rough terms, often with a “plus or minus” notation to emphasize that the number shown is meant as an estimate, not as an exact minimum or maximum. Many numbers are rounded to further emphasize that they are not exact specifications. A quantity expressed as “221” implies an exact number, while “200” implies only that the quantity is closer to 200 than it is to 100 or to 300. Although having exact numbers in some cases is desirable, the reality for CBP, as in everyday life, is that most quantities are known only roughly).

Using approximations and estimates like this is in keeping with the programmatic nature of this planning and analysis effort.

Table 2.3-1 Current Activity Levels by Region—No Action Alternative

Category	West of the Rockies	East of the Rockies	Great Lakes	New England
Number of small construction projects currently underway or in planning (e.g., parking lot repairs, access road repairs)	20 ±	20 ±	20 ±	20 ±
Number of large construction projects currently underway or in planning (e.g., access road repairs)	15 ±	15 ±	15 ±	15 ±
Number of small onsite trade and travel processing operations (no. POEs with < 10,000 crossings/day) ¹	20 ±	30 ±	10 ±	20 ±
Number of large onsite trade and travel processing operations (no. POEs > 10,000 crossings/day)	1	0	3	0
Checkpoints operations (per day)	100 ±	100 ±	100 ±	100 ±
Ground operations/day (motorized) ²	800 ±	800 ±	800 ±	800 ±
Ground operations/day (non-motorized)	150 ±	150 ±	150 ±	150 ±
Aircraft operations (number/day)	15 ±	20 ±	20 ±	15 ±
Vessel operations (number/day)	14 ±	5 ±	42 ±	16 ±
Operation of NII systems (hours/day)	1,000 ±	1,000 ±	1,000 ±	1,000 ±
Operation of sensor and other technologies	1,500 ±	1,500 ±	1,500 ±	1,500 ±

¹Includes only those POEs within 100 miles of the northern border.

²Motorized operations range from about 2 to about 200 miles and average 50 miles; of these, approximately 65 percent occur on established roads and about 35 percent occur off-road.

In Table 2.3-1, the construction projects represent those projects that CBP has already programmed and that have been addressed, or are in the process of being addressed, by separate NEPA documents. CBP currently has approximately 40 POE projects programmed, ranging from renovations and alterations to complete facility replacements.¹ It currently has more than 65 USBP projects programmed, ranging from landscaping and expansion of parking, housing for radio repeater sites, and other minor construction, to complete new stations in a new location. NEPA documents for these projects are or will be available through libraries local to the project locations. Many of these projects were funded under the American Recovery and Reinvestment Act of 2009 (ARRA). These projects are considered part of the No Action Alternative because they are already under way or are advanced in the planning process. Determinations regarding

¹For the purposes of this analysis, POEs referenced in the No Action Alternative of this PEIS include those already being undertaken by CBP and those undertaken by the U.S. General Services Administration (GSA) in response to requirements defined by CBP.

the need for these projects have already been made and site-specific NEPA analysis will inform site-specific planning decisions.

The trade and travel processing operations in Table 2.3-1 represent the full range of typical activities at a POE on a daily basis. These include processing of visitors and inspection of cargo for anomalies (smuggled drugs or other contraband or human trafficking). These inspections employ nonintrusive/nondestructive inspection and detection technologies and other means (e.g., canine teams).

Ground operations are defined as one agent on one patrol, that is, a trip out and back via motorized or non-motorized means. Aircraft and vessel operations are defined differently: a take-off and a landing represent two operations, while a landing for rescue operations or an interdiction would constitute a third operation.

As discussed previously, the levels of operations within CBP are not constant. They can vary considerably over periods of days, weeks, and months. This and subsequent tables and discussions therefore focus on the foreseeable peak levels for some period of time. This means that for much of the time, the activity levels are lower, perhaps much lower, than the numbers shown in the tables. The impacts to be discussed in subsequent chapters are based on these conservatively high estimates of activities. Therefore, the analyses represent the greatest reasonably foreseeable level of effects, and intentionally somewhat overstate the typical levels of effects that would be experienced at any particular time or place.

2.4 FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE

Under the Facilities Development and Improvement Alternative, CBP would leverage its funding and resources to securely and efficiently process trade and cargo at POEs. Additionally, CBP would leverage funding and resources to ensure adequate space for current and projected force and checkpoint capacity for USBP agents.

CBP does not foresee the development of new land POEs, referred to henceforth as “border piercings,” at locations without existing crossings. CBP would make or initiate major modifications equivalent to large construction to existing POEs if needed to meet operational needs. The overall staffing levels of officers would change as needed to meet the purpose of the expansion or new facility within existing financial resources.

CBP would anticipate construction of new BPSs or modernization or replacement of existing stations under this alternative. Many USBP sector personnel are currently operating from leased space that is shared with other law enforcement agencies, or in space that the agency has outgrown. The construction of new stations or improvements to existing stations would enhance USBP’s ability to respond to cross-border violators and other law enforcement situations. CBP would also construct new permanent and temporary FOBs and other temporary facilities under this alternative.

Because OAM leases its space from both military and commercial airfields or airports, or marina berths and commercial space from Government (e.g., U.S. Coast Guard) or commercial marinas, it does not foresee a construction program in the near future. While it maintains a base of operations in the various cities, towns, or regions shown, it will shift its specific location in response to better rental prices.

Many of the future CBP construction projects considered under this alternative would be considered small, and many would likely be covered under CBP categorical exclusions (CATEXs). Potentially applicable CBP CATEXs include those listed in the D and E categories of Appendix D.

Table 2.4-1 shows by geographic region the approximate activity levels that the Facilities Development and Improvement Alternative would address. These represent totally new projects that are not yet being programmed or are very early in the programming process.

Table 2.4-1 Anticipated Activity Levels by Region¹—Facilities Development and Improvement Alternative

Category	West of the Rockies	East of the Rockies	Great Lakes	New England
Number small construction projects (various) ^{1,2}	30 ±	30 ±	30 ±	30 ±
Number large construction projects (BPSs, other facility construction or major modification) ^{1,2}	20 ±	20 ±	20 ±	20 ±

¹ Next five to seven years.

² These numbers represent new projects, beyond those already planned (shown in Table 2.3-1).

2.5 DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE (PREFERRED ALTERNATIVE / ENVIRONMENTAL PREFERABLE ALTERNATIVE)

Under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative (Detection/Inspection Alternative), CBP would leverage its funding and resources on more USBP and OAM surveillance operations and greater use of technological security tools, such as RVSS, short-range radars, ground sensors, UASs, and the various types of scanning technologies for vehicle and cargo inspections (see box). CBP would continue to evaluate commercial off-the-shelf (COTS) applications for their utility for the following purposes:

- Processing visitors and cargo more rapidly while maintaining strict security by using more and improved personal radiation detectors (PRD), RIDs, and NII tools, such as high-energy container scanners and full-body scanners (see box). (CBP completed a programmatic Environmental Assessment (EA) on the deployment of various types of NII technology in 2009 and recently published EAs for the use of high-energy scanners for both cargo and people.)

Detection, Inspection, Surveillance, and Communications Technology Systems and Tools

Vehicle and Cargo Inspection System

This is a gamma-ray backscatter imaging system used for inspecting cargoes. It can be delivered as a portal for POEs or mounted on a truck to be used at multiple, temporary, and/or remote locations. The truck-mounted system can be especially useful for those situations where the container itself is fixed, such as a railroad car.

High-Energy X-Ray Imaging Scanners

High-energy imaging scanners scan a passenger by rastering or moving a single high-energy X-ray beam rapidly over the body. The signal strength of detected backscattered X-rays from a known position then allows a highly realistic image to be reconstructed (EPIC, 2010).

Communications Systems

Communications systems consist of equipment (e.g. land mobile radio (LMR) antennae, microwave dishes, repeaters, and receivers) mounted on communications towers or other structures. Additional associated equipment may be used, including: shelters, generators (used for back-up power), fuel storage tanks, and tower-related equipment. Solar power may be used as a power source and would be supplied by photovoltaic panels installed in the vicinity of the communications equipment.

Innovative Wireless Technologies

This unattended sensor system includes integrated acoustic sensors for detection of low flying aircraft and other targets. It reliably scales from a small, focused target to a nationwide network. The components fit into small plastic containers (approximately three feet on side) and a small antenna (several feet), which can be set on the ground surface.

Acoustic Air Surveillance System

The Acoustic Air Surveillance System consists of a set of sensor nodes and a central processing server. The components consist of COTS hardware such as microphones, antennas, solar panels, battery, and a pelican (weatherproof) or similar case. The microphones and antennas are generally mounted on camera tripods.

OmniSense Sensor System

This is an integrated sensor package that includes unattended ground sensors, surveillance cameras, rugged hand-held programmer/ monitor, repeaters, and a display unit. OmniSense CORE activity detection units can signal imaging sensor units to take pictures when activity is detected.

Low-Flying Aircraft Passive Acoustic Detection System (LPADS)

The LPADS is a network of appropriately-located microphone array units. When two or more units detect the same source, a three-dimension, real-time track of the source is produced. The microphone units are small and lightweight, and can be powered by batteries and solar cells.

- Providing the Common Operating Picture for increased situational awareness to all CBP components. The CBP Office of Technology Innovation and Assessment (OTIA) is evaluating several passive acoustic air surveillance systems, using innovative wireless technologies to integrate UGS with surveillance cameras and repeaters, for detection of low-flying aircraft (including ultra-lights), and using short range radars. Most of these applications involve combining commercial-off-the-shelf technology in new ways to address specific needs.

The possible consequences of this alternative would be (1) a reduction in wait times at POEs; (2) an increase in the rate and amount of materials confiscated that would have to be transported, analyzed, and properly disposed of; (3) an increase in the interdiction of cross-border violators

and therefore the need for detention; (4) the need for additional support infrastructure in the form of poles, towers, and access roads (for maintenance) in many locations; and (5) more focused, more effective CBP operations.

To the extent practicable, CBP would use existing structures—buildings and towers with appropriate heights, or share towers with other law enforcement agencies—for mounting antennas and RVSS, to reduce the overall impacts of tower, pole, and access road construction. (An example of this is the plan by Houlton Sector to colocate upgrades to its radio communications system with the Maine State Police and to use existing towers where practicable.) The Detection/Inspection Alternative could also lead to an increase in the deployment of military engineering units or private contractors to construct towers, poles, and access roads for maintaining surveillance systems and whatever other infrastructure would be required for new equipment (e.g., fixed mounts for the vehicle high-energy scanning systems). The deployments would also be needed to install and maintain more underground sensors.

As new technological tools are introduced through the CBP agencies for national use, these tools would be addressed by specific NEPA documents. In addition, the use of tools currently available would increase under this alternative. Potentially applicable CBP CATEXs include B1, B3, B8, B9, D1, D4, E1, E2, and F series as listed in Appendix D.

Table 2.5-1 shows approximate activity levels by the geographic regions that the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative would address.

Table 2.5-1 Anticipated Activity Levels by Region— Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative

Category	West of the Rockies	East of the Rockies	Great Lakes	New England
Small construction projects (towers and other infrastructure to mount antennas, etc.) ¹	100 ±	100 ±	100 ±	100 ±
Number of ground operations/day (motorized) ²	1,300±	1,300±	1,300±	1,300±
Number of ground operations/day (non-motorized)	200 ±	200 ±	200 ±	200 ±
Aircraft operations (number/day) ²	23 ±	30 ±	30 ±	23 ±
Vessel operations (per day) ²	21 ±	10 ±	63 ±	24 ±
Operation of NII systems (hours/day)	1,500 ±	1,500 ±	1,500 ±	1,500 ±
Operation of Sensor and Other Technologies (hours/day)	2,500 ±	2,500 ±	2,500 ±	2,500 ±

¹These are new projects, beyond those already planned (Table 2.2-1).

²These numbers represent the total level of operations.

2.6 TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE

Under the Tactical Security Infrastructure Deployment Alternative, CBP would leverage its funding and resources to construct more fences and other barriers to prevent illegal border crossings. While fencing has played a prominent role in CBP’s enforcement strategy on the southern border to deter illegal border crossings, it is unlikely that fencing will play as prominent a role on the northern border, given the length of the border and the variability of the terrain. However, CBP would use fencing and other barriers to manage movement (e.g., trenching across roads) in trouble spots where passage of cross-border violators (CBV) is difficult to control; the resulting delay for CBVs would increase the rate of interdiction.

This alternative would also include upgrades to roadways and trails proximate to the border or construction of new roadways to access CBP facilities and infrastructure. The lack of roads or presence of unmaintained roads impedes efficient surveillance operations. Improving or expanding the roadway and trail networks could improve mobility, allowing agents to patrol more miles each day and shortening response times. For those areas that have become impassible, infrastructure improvements would include construction of new or repair of existing, bridges, culverts, low-water crossings, gabions, and water bars. This alternative would also include remediation of tunnels as they are discovered.

Table 2.6-1 shows approximate activity levels by the geographic regions that the Tactical Security Infrastructure Deployment Alternative would address. Once again, these represent new projects that have not already been programmed or addressed by specific NEPA documents.

This alternative would lead to an increase in deployments of military engineering units, as well as private contractors, to construct roadways, trails, fencing, barriers, and trench cuts. Potentially applicable CBP CATEXs include B9, D1, D3, E, E6, K1, and K2 as listed in Appendix D.

Table 2.6-1 Anticipated Activity Levels by Region—Tactical Security Infrastructure Deployment Alternative

Category	West of the Rockies	East of the Rockies	Great Lakes	New England
Small construction projects (trench cuts, towers, minor access roads and fences < 1/4 mile) ¹	30 ±	30 ±	30 ±	30 ±
Large construction projects (access roads and fences > 1/4 mile) ¹	5 ±	5 ±	5 ±	5 ±

¹These are new projects, beyond those already planned (Table 2.2-1).

2.7 THE FLEXIBLE DIRECTION ALTERNATIVE

The Flexible Direction Alternative would include elements of any or all the above action alternatives. Because it is impossible to predict the mix of each of the other potential program directions, CBP is assessing the maximum envelope of impact that might result as shown in Table 2.7-1, which represents full implementation of all three action alternatives.

Table 2.7-1 Anticipated Activity Levels by Region—Flexible Direction Alternative

Category	West of the Rockies	East of the Rockies	Great Lakes	New England
Small construction projects ¹	160 ±	160 ±	160 ±	160 ±
Large construction projects ¹	25 ±	25 ±	25 ±	25 ±
Checkpoints operations ²	100 ±	100 ±	100 ±	100 ±
Number of ground operations (motorized) ^{3,4}	1,300 ±	1,300 ±	1,300 ±	1,300 ±
Number of ground operations (non-motorized) ^{3,4}	200 ±	200 ±	200 ±	200 ±
Aircraft operations ²	23 ±	30 ±	30 ±	23 ±
Vessel operations ²	21 ±	10 ±	63 ±	24 ±
Operation of NII systems	1,500 ±	1,500 ±	1,500 ±	1,500 ±
Operation of Sensor and Other Technologies	2,500 ±	2,500 ±	2,500 ±	2,500 ±

¹These are new projects, beyond those already planned (Table 2.2-1).

²These numbers represent the total level of operations.

³Motorized operations range from about 2 to about 200 miles, and average 50 miles.

⁴Of these, approximately 65 percent occur on established roads and 35 percent occur off-road.

2.8 ALTERNATIVE CONSIDERED BUT REMOVED FROM FURTHER CONSIDERATION

CBP also considered another alternative, the Agent and Officer Augmentation Alternative, which would focus on hiring and training significantly more USBP agents to conduct more border surveillance operations, as well as more CBP officers to increase the rate of inspection of visitors and cargo as they pass through the POEs. This alternative has been eliminated from further consideration as an independent alternative. CBP recently significantly increased staffing along both the northern and southern borders and has a number of projects under way to provide the additional workspace needed.

CBP personnel are and will remain the key tool in CBP’s approach to border security. That is a constant that is unlikely to change. However, in order to maximize the effectiveness of CBP personnel, they must be given the tools necessary to do their jobs even better. It is more appropriate, therefore, to focus on alternatives that will allow CBP to maximize the effectiveness of its personnel, i.e., better facilities, better technology, and better infrastructure.

2.9 SUMMARY COMPARISON OF ACTION ALTERNATIVES

Table 2.9-1 provides a comparison of the contribution of each alternative to the four elements of the purpose and need for the proposed action. There are three categories of contribution to the four elements contributing to the ultimate goal of effective control of the border. The first, “Status Quo,” means that the alternative does not contribute to the corresponding element above the current CBP program. The second, “Indirect,” means that the alternative does not by itself increase capability under the element, but it can make a contributing activity somewhat more

effective. The third, "Direct," means that the alternative does contribute to effective control element.

Table 2.9-1 Comparison of Action Alternatives

CRITERIA CONTRIBUTING TO EFFECTIVE CONTROL OF THE BORDER ENVIRONMENT				
ALTERNATIVES	Maintain Situational Awareness	Identify and Classify Threats	Respond Efficiently and Effectively	Resolve Law Enforcement Situations to Satisfaction
No Action Alternative	Status Quo	Status Quo	Status Quo	Status Quo
Facilities Development and Improvement Alternative	Indirect: Provides agents and officers with more modernly equipped facilities distributed closer to CBV threat environment	Indirect: Provides agents and officers and with more modern facilities for inspecting cargo, vehicles, and people	Direct: Reduces agent and officer distance from patrol areas or trade and travel processing areas	Indirect: Provides agents and officers with more modernly equipped facilities to process CBVs
Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative (Preferred Alternative)	Direct: Improves the common operating picture and effective communication regarding CBV threats	Direct: Improves ability to screen potential CBVs and relay intelligence about potential threats	Direct: Increases accuracy of information about the location of threats and increases the operational tempo of agents and officers ready for response	Direct: Potentially increases interdiction rate by accelerating operational tempo and improving situational awareness
Tactical Security Infrastructure Deployment Alternative	Indirect: Provides selective barriers to impede CBV access and movement and provides road upgrades to increase agent and officer access to more points along the border	Status Quo	Direct: Reduces potential average response time and distance by upgrading existing or adding new roads thereby increasing access to more points along the border	Indirect: Provides road upgrades and additions to increase border area accessibility and likely make CBP interdictions more effective
Flexible Direction Alternative	Direct: Improves the common operating picture and effective communication regarding CBV threats	Direct: Improves ability to screen potential CBVs and relay intelligence about potential threats	Direct: Increases information accuracy, border accessibility, and operational tempo	Direct: Potentially increases interdiction rate by accelerating operational tempo and improving situational awareness

As Table 2.9-1 indicates, the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative and the Flexible Direction Alternative both contribute to all four elements needed to pursue effective control of the border. Both the Facilities Development and Improvement Alternative and the Tactical Security Infrastructure Deployment Alternative would directly support the objective of improving the efficiency and effectiveness of response to cross-border law enforcement situations by decreasing the distance travelled to respond to situations. However, the Tactical Security Infrastructure Deployment Alternative would not have any effect on the identification and classification of threats while the Facilities Development and Improvement Alternative would.

2.9.1 OTHER MISSION CONSIDERATIONS

Strategic Priorities: Although not a subject of this PEIS, “The Beyond the Border Initiative” does set joint priorities between Canada and the United States that have implications for CBP on the northern border. The four key goal areas are detailed for the security partnership are: (1) addressing threats early; (2) promoting trade facilitation, economic growth, and jobs; (3) strengthening cross-border law enforcement; and (4) protecting shared critical infrastructure, including enhancing continental and global cybersecurity. Overall, the “Beyond the Border Initiative” places a greater premium on employing cooperative risk management strategies to facilitate trade and travel between the United States and Canada while securing critical assets and citizens of both nations.

In May 2012, DHS released its first unified “Northern Border Strategy” reflecting the expertise of all of its components and guiding departmental policies and operations along the U.S.-Canada border. It reinforces the close relationship between security and lawful trade and travel, stressing risk-management approaches such as, separating higher-risk traffic from lower-risk traffic, utilizing advance information, and inspecting people and goods bound for our shared borders at the earliest opportunity. The three strategic goals for DHS at the northern border are to: 1) Deter and prevent terrorism and other illegal activity; 2) Safeguard and facilitate the secure flow of lawful trade and travel; and, 3) Ensure community resilience to natural and man-made disasters. Mechanisms for executing the strategy and achieving its goals include leveraging information sharing and analysis resources inside DHS and with key partners and enhancing coordination of U.S.-Canada joint interdictions and investigations. Technology deployment for joint security efforts as well as updating infrastructure to facilitate travel and trade are also key components of a more comprehensive strategy. The DHS strategic approach includes continued fostering of partnerships with Federal, state, local, tribal, private sector, and Canadian agencies to resolve border management issues more efficiently.

Budget Considerations: Between 2009 and 2011, CBP executed considerable investments in northern border security improvement. This includes the modernization of over 35 older LPOEs largely funded under the ARRA program to meet security and operational needs. However, in the last two years CBP’s total enacted budget has been below the fiscal year 2010 level and also below the 2009 level, which included the ARRA investment. Particularly, the facilities management and infrastructure budgets have been enacted at 10s of million dollars lower than requested and also lower than prior budget years.

2.9.2 ENVIRONMENTAL STEWARDSHIP AND SOCIAL RESPONSIBILITY

CBP’s social responsibility statement states: “CBP is committed to acting responsibly while performing our core missions of border security and the facilitation of legitimate trade and travel. We fully embrace the concept of incorporating practices into our mission that will create a more sustainable future.” This includes the commitment “to responsible environmental stewardship to include the comprehensive evaluation of potential environmental impacts, thorough consultation with stakeholders, and the identification of opportunities to avoid, minimize, and, where appropriate, mitigate for impacts to sensitive resources.”

Table 2.9-2 provides a snapshot comparison of overall impact determinations for each alternative for each environmental resource category analyzed within this PEIS. These determinations present the highest level of impacts anticipated in particular cases from programmatic perspective. However, a specific individual project could have greater impacts upon an environmental resource than anticipated within this PEIS based on its site-specific conditions.

Table 2.9-2 Summary of Overall Potential Environmental Impacts by Alternative

Resource Area	Alternatives				
	No Action	Facilities Development and Improvement	Detection, Inspection, Surveillance, and Communications Technology Expansion	Tactical Security Infrastructure Deployment	Flexible Direction
Air quality	Minor	Minor	Minor	Minor	Minor
Biological resources	Moderate	Moderate	Moderate	Moderate	Moderate
Geology and soils	Moderate	Moderate	Moderate	Moderate	Moderate
Water resources	Minor	Minor	Minor	Minor	Minor
Noise	Minor	Moderate	Minor	Minor	Moderate
Climate change	Minor (with beneficial)	Minor (with beneficial)	Minor (with beneficial)	Minor (with beneficial)	Minor (with beneficial)
Land use	Moderate	Moderate	Moderate	Moderate	Moderate
Aesthetic and visual resources	Minor	Moderate	Moderate	Moderate	Moderate
Socioeconomic resources	Moderate	Moderate	Moderate	Moderate	Moderate
Cultural and paleontological resources	Major (with beneficial)	Major (with beneficial)	Major (with beneficial)	Major (with beneficial)	Major (with beneficial)

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Resource Area	Alternatives				
	No Action	Facilities Development and Improvement	Detection, Inspection, Surveillance, and Communications Technology Expansion	Tactical Security Infrastructure Deployment	Flexible Direction
Environmental justice and protection of children	Minor	Minor	Minor	Minor	Minor
Human health and safety	Moderate (with beneficial)	Moderate (with beneficial)	Moderate (with beneficial)	Moderate (with beneficial)	Moderate (with beneficial)
Hazardous materials	Minor (with beneficial)	Minor	Minor	Minor	Minor
Utilities and infrastructure	Negligible	Negligible	Negligible	Negligible	Negligible
Roadways and traffic	Major	Major	Major	Major	Major
Recreation	Minor	Moderate	Moderate	Moderate	Moderate

The actual potential for impacts from any alternative course of action would be highly dependent on determinations of any future selected site-locations for projects within any of the alternatives, but the Flexible Direction Alternative clearly has the greatest potential and range of adverse impacts to the environment. The No Action Alternative represents the least environmental harm approach purely on the basis of no net increase in impact causing activities beyond the status quo. Among the action alternatives, it is CBP’s determination that the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative would have the least potential for major adverse environmental impacts among the action alternatives. This alternative has the least potential for fragmenting habitats, recreational resources, or community resources. It also has low potential for work in waterways and has greater flexibility for mitigation via site selection for individual projects. Therefore, the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative is the environmentally preferable action alternative.

To the extent CBP can accomplish its border security and trade and travel facilitation missions without compromising the safety of law enforcement personnel and employing methods and programs that have lesser impacts than alternatives, CBP will continue to work with stakeholder agencies and communities to avoid or reduce adverse impacts to the environment.

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Final

Programmatic Environmental Impact Statement For Northern Border Activities

Section 3: Framework



July 2012

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CONTENTS

3 Framework for Analysis 3-1

3.1 Environmental Resource Areas Analyzed for Impacts 3-1

3.1.1 Methodology for Resource Analysis 3-2

3.1.2 Impact Determinations 3-3

3.2 Air Quality 3-4

3.2.1 Context for Affected Environment 3-4

3.2.1.1 National Ambient Air Quality Standards and Attainment Status 3-4

3.2.1.2 General Conformity 3-5

3.2.1.3 Permitting Requirements 3-7

3.2.1.4 Other Requirements 3-8

3.2.2 Framework for Characterizing Resource Impacts 3-8

3.2.3 Activities with Environmental Consequences to Air Quality 3-9

3.3 Biological Resources 3-10

3.3.1 Context for Affected Environment 3-10

3.3.1.1 Blocks of Regionally Significant Habitat 3-10

3.3.1.2 Sensitive Habitats 3-11

3.3.1.3 Threatened and Endangered Species 3-11

3.3.1.4 Critical Habitat 3-11

3.3.1.5 Wildlife 3-11

3.3.1.6 Vegetative Habitat 3-12

3.3.1.7 Wetlands and Waterways 3-12

3.3.1.8 Aquatic Resources 3-12

3.3.2 Framework for Characterizing Resource Impacts 3-13

3.3.3 Activities with Environmental Consequences to Biological Resources 3-14

3.4 Geology and Soils 3-15

3.4.1 Context for Affected Environment 3-15

3.4.1.1 Geologic Conditions 3-15

3.4.2 Framework for Characterizing Resource Impacts 3-18

3.4.3 CBP Activities with Environmental Consequences to Geologic and Soil Resources
3-19

3.5 Water Resources 3-20

3.5.1 Context for Affected Environment 3-20

3.5.1.1 Hydrology and Groundwater 3-20

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

3.5.1.2 Surface Waters and Waters of the United States..... 3-20

3.5.1.3 Floodplains 3-21

3.5.2 Framework for Characterizing Resource Impacts 3-21

3.5.3 Activities with Environmental Consequences to Water Resources 3-22

3.6 Noise 3-23

3.6.1 Context for Affected Environment 3-23

3.6.1.1 Regulations and Requirements for Noise Control..... 3-24

3.6.2 Framework for Characterizing Resource Impacts 3-24

3.6.3 Activities with Environmental Consequences to NOISE 3-25

3.7 Climate Change and Sustainability 3-26

3.7.1 Context for Affected Environment 3-26

3.7.1.1 Global Climate Change 3-26

3.7.1.2 Sustainability 3-27

3.7.2 Framework for Characterizing Resource Impacts 3-28

3.7.3 Activities with Environmental Consequences to Climate Change and Sustainability
3-29

3.8 Land Use 3-29

3.8.1 Context for Affected Environment 3-29

3.8.1.1 Land Use Management..... 3-29

3.8.1.2 Recreation and Conservation Resource Areas..... 3-30

3.8.1.3 CBP Responsibilities on Federal Lands 3-33

3.8.1.4 Consistency with Enforceable Policies of the Coastal Zone Management Act
3-34

3.8.2 Framework for Characterizing Resource Impacts 3-34

3.8.3 Activities with Environmental Consequences to Land Use..... 3-35

3.9 Aesthetic and Visual Resources..... 3-36

3.9.1 Context for Affected Environment 3-36

3.9.1.1 Affected Landscapes and Visual Resources..... 3-37

3.9.1.2 Areas with High Visual Sensitivity 3-38

3.9.1.3 Affected User Groups..... 3-39

3.9.2 Framework for Characterizing Resource Impacts 3-40

3.9.2.1 Analysis Methodology..... 3-40

3.9.2.2 Impact Definition..... 3-42

3.9.2.3 Visual Feature Considerations..... 3-42

3.9.3	Activities with Environmental Consequences to Aesthetic and Visual Resources	3-43
3.10	Socioeconomic Resources	3-43
3.10.1	Context for Affected Environment	3-43
3.10.2	Framework for Characterizing Resources Impacts	3-44
3.10.3	Activities with Environmental Consequences to Socioeconomic Resources	3-45
3.11	Cultural and Paleontological Resources	3-45
3.11.1	Context for Affected Environment	3-45
3.11.2	Framework for Characterizing Resource Impacts	3-45
3.11.3	Activities with Environmental Consequences to Cultural and Paleontological Resources	3-46
3.12	Environmental Justice and Protection of Children	3-46
3.12.1	Context for Affected Environment	3-46
3.12.1.1	Definitions of Affected Populations	3-46
3.12.1.2	Study Area and Analysis Methods	3-47
3.12.2	Framework for Characterizing Resource Impacts	3-48
3.12.3	Activities with Environmental Consequences to Environmental Justice and Protection of Children	3-49
3.13	Human Health and Safety	3-49
3.13.1	Context for Affected Environment	3-49
3.13.2	Framework for Characterizing Resource Impacts	3-50
3.13.3	Activities with Environmental Consequences to Human Health and Safety	3-50
3.14	Hazardous and Other Regulated materials	3-51
3.14.1	Context for Affected Environment	3-51
3.14.1.1	Hazardous Substances	3-51
3.14.1.2	Hazardous Waste	3-52
3.14.1.3	Special Hazards	3-54
3.14.1.4	Hazardous Materials Regulatory Requirements	3-57
3.14.2	Framework for Characterizing Resource Impacts	3-57
3.14.3	Activities with Hazardous and Other Regulated Materials Environmental Consequences	3-57
3.15	Utilities and Infrastructure	3-58
3.15.1	Context for Affected Environment	3-58
3.15.2	Framework for Characterizing Resource Impacts	3-59
3.15.3	Activities with Environmental Consequences to Utilities and Infrastructure	3-59

3.16	Roadways and Traffic	3-60
3.16.1	Context for Affected Environment.....	3-60
3.16.2	Framework for Characterizing Resource Impacts.....	3-60
3.16.3	Activities with Environmental Consequences to Transportation Resources ...	3-61
3.17	Recreation	3-61
3.17.1	Context for Affected Environment.....	3-61
3.17.1.1	Definitions	3-61
3.17.1.2	Analysis Methods	3-62
3.17.2	Framework for Characterizing Resource Impacts.....	3-64
3.17.3	Activities with Environmental Consequences to Recreation Resources.....	3-65

FIGURES

Figure 3.4-1.	Landslide Types	3-16
Figure 3.4-2.	Sink Hole in Karst Topography	3-17
Figure 3.4-3.	Soil Classification Based on the Fraction of Clay Sand and Silt in a Soil.....	3-17

TABLES

Table 3.2-1.	State Environmental Agencies and the Environmental Protection Agency Region	3-4
Table 3.2-2.	Applicability Thresholds for Nonattainment Areas	3-6
Table 3.2-3.	Major Modification Thresholds of Criteria Pollutants	3-7
Table 3.4-1.	Soil Texture and Particle Size	3-18
Table 3.6-1.	Common Sound Levels	3-23
Table 3.14-1.	Building Components in Which Hazardous Materials Are Found.....	3-55
Table 3.17-1.	Federal Recreation Areas along the Northern Border by Intensity of Use	3-64

3 FRAMEWORK FOR ANALYSIS

This Programmatic Environmental Impact Statement (PEIS) provides an analysis of U.S. Customs and Border Protection (CBP) activities for which less-than-significant impacts are expected. It also provides an analytical tool to assess activities that may cause significant adverse impacts or specifies if the appropriate information is not currently available to determine the level of impact. The analysis is limited (or “bounded”) based on CBP’s uppermost projection of activity levels conceivable under each action alternative. The activity levels depicted within the PEIS would represent a considerable response to significant changes in the cross-border threat environment. The PEIS characterizes potential impacts as negligible, minor, moderate, or major using resource-specific criteria, and outlines regulatory requirements, best management practices, and possible ways to mitigate significant impacts. The PEIS also includes planning guidelines for avoiding, managing, mitigating, or minimizing impacts.

This chapter provides the framework for describing environmental resources that would be affected if CBP implemented the proposed action or any of the program alternatives. It also outlines the approach CBP used to determine the type and intensity of environmental impacts likely to occur from each alternative course of action. The goal of this PEIS is to present conclusions about the general level and nature of potential impacts to each resource category from program alternatives, and also to provide descriptive indicators for conducting impact analyses and making impact determinations at the site and project levels. This PEIS also broadly addresses cumulative impacts to resources from CBP planned and existing activities and activities beyond CBP’s control.

Chapters 4 through 7 present the northern border area of study in four geographical regions: West of the Rockies (WOR), East of the Rockies (WOR), Great Lakes, and New England. These chapters focus on the unique aspects of the regional affected environments and particular considerations for environmental consequences that predominate in each region.

Chapter 8 presents direct and indirect impacts to affected resources for CBP activities, as well as cumulative impacts from CBP action alternatives combined with other activities beyond CBP’s control. Chapter 9 presents mitigation measures being considered by CBP beyond those incorporated into CBP’s normal practices. The appendices provide supplemental information and resource descriptions, relevant guidelines and legal requirements, scenarios used to shape analysis, relevant statistics and data used in calculations, and additional information on CBP’s mission and public participation in the National Environmental Policy Act (NEPA) process for this PEIS.

3.1 ENVIRONMENTAL RESOURCE AREAS ANALYZED FOR IMPACTS

This PEIS analyzes potential impacts from CBP activities to 16 categories of environmental or socioeconomic resource areas. The resource areas and general impacts considered are as follows:

- Air Quality: Contribution of air pollutants with respect to regional air quality goals;
- Biological Resources: Influence on the viability of regional animal and plant species;

- Geologic Resources: Alterations to regional geologic structures and soil characteristics;
- Water Resources: Influence on quality and quantity of surface and subsurface supplies;
- Noise: Creation of nuisance sound-levels relative to the expected soundscape;
- Climate Change and Sustainability: Contribution to greenhouse gas (GHG) emissions and long-term enjoyment of natural resources and quality of life;
- Land Use: Alteration of existing, expected, or planned regional uses of land and land covers;
- Aesthetic and Visual Resources: Alteration of existing or desired visual resources;
- Socioeconomic Resources: Changes to the local or regional economic profiles or social conditions;
- Cultural and Paleontological Resources and Native American Issues: Potential to effect above- and below-ground historic and cultural resources and potential to obscure evidence of prehistoric life;
- Environmental Justice and Protection of Children: Potential to have disproportionate adverse effects on minority or low-income populations or to harm children;
- Human Health and Safety: Actual alteration of or risk of impacting well-being of workers and the general population;
- Hazardous and Otherwise Regulated Materials: Generation, use, and disposal of harmful chemicals and other materials;
- Utilities and Infrastructure: Alterations in delivery or capacity of utility services to a region or locality;
- Roadways and Traffic: Alterations in flow of traffic or capacity of road infrastructure within a region or locality; and,
- Recreation: Changes in recreational value of areas used for leisure, exercise, and enjoyment of natural resource areas.

3.1.1 METHODOLOGY FOR RESOURCE ANALYSIS

The analysis of environmental consequences for each resource topic is based on application of scenarios employing CBP activities included in the alternatives within the applicable resource setting. Types of potential impacts from CBP activities are determined on the basis of professional judgment. The analysis explores the chain of causes that could trigger those impacts, given the activity scenarios, and that chain is then used to define the affected environment on the basis of where the activities may occur. The specific approach to each resource differs because of the wide range of CBP activities within the umbrella of the program alternatives. Thus, the potential “area of impact,” for example, could range from a narrow noise envelope for aerial patrols to possible regional or national economic impacts for changes in inspection technologies at several ports of entry (POEs). This approach provides a programmatic analysis of potential environmental impacts on manmade and naturally occurring environmental resources.

The two principle categories of activity included in CBP's security program are construction and operational activities. CBP also undertakes maintenance and repair of constructed facilities and technologies used under each of these categories. The scenarios for construction and operational activities are based on a representative or "typical" activity for each type of construction project and each type of operational activity that could occur. Standard dimensions, frequencies of occurrence, and other factors characterize the size and extent of the representative activities.

Causes-Effects-Questions (C-E-Q) networks prepared for this PEIS (Appendix E) were used to construct the chain of activities, impacts, and affected environmental resources. The C-E-Q diagrams show the actions, operations, and components analyzed; the chains of potential direct, indirect, and cumulative impacts studied; and the interrelationships of these elements on environmental resources. The C-E-Q diagrams include references that direct the reader to the section or sections that address each identified impact. This PEIS presents assessment of cumulative impacts using descriptions of CBP and non-CBP projects and actions that could jointly impact resources identified in the affected environment sections. The scenarios used as the basis for cumulative impacts analysis in this PEIS is described in Appendix F.

3.1.2 IMPACT DETERMINATIONS

In Chapter 8, discussion on environmental consequences of the proposed action and alternatives, each resource category contains a prediction of impact determinations in the conclusion. This document details four impact levels – negligible, minor, moderate, and major – to characterize the intensity and persistence of adverse effects. In general, the significance levels are based on the likelihood of an action alternative damaging a resource beyond its ability to recover back to the previous level of productive use. When beneficial impacts are also predicted to occur within a resource area, they are also identified in the conclusion. The level of any beneficial impact is always considered to be minor since it would at best periodically improve the condition of immediately impacted resources, but not increase their viability.

The criteria for the impact levels for the natural environment (biological and physical resources) are similar to those for the societal environment (land use, recreation, socioeconomic and cultural resources, environmental justice, aesthetic and visual resources, and cultural resources), but some variations exist. In all cases, "negligible" impacts are those that have no measurable, persistent impact upon the resources in a given resource category. Description of the criteria pertaining to minor, moderate, and major impact determinations follow.

Minor impacts: CBP could mitigate actions to avoid causing these impacts. Otherwise, these are impacts that an affected environmental resource would completely recover from once the impacting agent (activity) was eliminated. Impacts to the societal environment would not disrupt the normal or routine functions of the affected activity or community.

Moderate impacts: These impacts to an affected resource would be unavoidable, but once the impact causing activity was removed, the resource would recover to a level of negligible impact if proper remediation measures were taken. Affected resources within the natural environment would not have their viability threatened, but some impacts might prove irreversible. Affected resources within the societal environment would face disruptions forcing users to adjust to project impacts in some manner.

Major impacts: These impacts to the affected resource would be unavoidable and lasting. The viability of an affected natural resource may be threatened. After the activity impacts ceased, an affected natural resource would not fully recover, or measurable degradation of an affected societal resource would persist. Affected societal resources would experience disruptions to a degree beyond what is normally acceptable.

The remaining sections of Chapter 3 detail the basis for describing each resource area’s affected environment and for determining what types of activities analyzed under each alternative may impact a resource.

The remainder of this chapter describes the underlying context for regional descriptions of the affected environment for each of the 16 resource areas. It also explains the resource-specific basis for determining impacts and impact levels and categorizes and lists CBP activities that could cause impacts to each resource.

3.2 AIR QUALITY

3.2.1 CONTEXT FOR AFFECTED ENVIRONMENT

The air quality for a given region or area is measured with respect to the presence of various pollutants and their concentrations in the air. The entire northern border study area contains many air quality control regions (AQCR) and Class I areas that could experience impacts if the proposed alternatives are implemented. An AQCR is an area (interstate or intrastate) designated by the U.S. Environmental Protection Agency (USEPA) for the attainment and maintenance of National Ambient Air Quality Standards (NAAQS). Class I areas are Federal lands with more stringent air quality restrictions under Section 162(a) of the Federal Clean Air Act. These restrictions are largely meant to maintain unimpaired visibility in areas such as national parks, national wilderness areas, and national monuments. For descriptions of the regional affected environments for the air quality resource area see Sections 4.2.2 (WOR), 5.2.2 (EOR), 6.2.2 (Great Lakes), and 7.2.2 (New England).

3.2.1.1 National Ambient Air Quality Standards and Attainment Status

The USEPA as well as individual state environmental regulatory agencies, regulate air quality along the northern border (Table 3.2-1). The Clean Air Act (CAA) (42 U.S.C.7401–7671q), as amended, gives USEPA the responsibility to establish the primary and secondary NAAQS (40 CFR 50) that set acceptable concentration levels for six criteria pollutants: particulate matter (PM₁₀ and PM_{2.5}), sulfur dioxide (SO₂), carbon monoxide (CO), nitrogen oxide (NO_x), ozone (O₃), and lead (Pb). Short-term standards (1-, 8-, and 24-hour periods) have been established for pollutants contributing to acute health effects, while long-term standards (annual averages) have been established for pollutants contributing to chronic health effects. Each state has the authority to adopt standards stricter than those established under the Federal program; however, all states along the northern border accept the Federal standards.

Table 3.2-1. State Environmental Agencies and the Environmental Protection Agency Region

State	State Agency	USEPA
Northern Border Activities	3-4	July 2012

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

		Region
WEST OF THE ROCKIES REGION		
Idaho	Idaho Department of Administration	10
Western Montana	Montana Department of Environmental Quality	8
Washington	Washington Department of Natural Resources	10
EAST OF THE ROCKIES REGION		
Minnesota	Minnesota Pollution Control Agency	5
Eastern Montana	Montana Department of Environmental Quality	8
North Dakota	North Dakota Department of Environmental Health	8
GREAT LAKES REGION		
Michigan	Michigan Department of Environmental Quality	3
New York	New York State Department of Environmental Conservation	2
Ohio	Ohio Environmental Protection Agency	5
Pennsylvania	Pennsylvania Department Environmental Protection	3
Wisconsin	Wisconsin Department of Natural Resources	5
NEW ENGLAND REGION		
Maine	Maine Department of Environmental Protection	1
New Hampshire	New Hampshire Department of Environmental Services	1
Vermont	Vermont Department of Environmental Conservation	1

Source: (USEPA, 2010).

Federal regulations designate AQCRs that have concentrations of one or more of the criteria pollutants that exceed the NAAQS as “nonattainment areas.” Major cities usually have high traffic volumes and large industrialized areas that can contribute to elevated O₃ and PM_{2.5} (USEPA, 2010). Federal regulations designate AQCRs that were once classified as nonattainment and that have lowered the levels of pollutants through the use of regional controls as “maintenance areas.”

3.2.1.2 General Conformity

Two independent legal requirements address air quality management in the preplanning stages: (1) NEPA and (2) the general conformity provision of CAA §176(c). Under the CAA section, Federal agencies are prohibited from engaging in, supporting, providing assistance for, or approving activities (e.g., issuing a license or permit) that are inconsistent with State Implementation Plan (SIP) requirements. This section is known as the General Conformity Rule (GCR). Depending on the action and the attainment status of the county, a CBP activity might have to complete a separate conformity analysis in addition to the NEPA analysis. Exemption from one requirement does not automatically exempt the action from the other requirement, nor does fulfillment of one requirement constitute fulfillment of the other. The GCR, however, was

written with NEPA in mind, and CBP integrates the two requirements to save time and resources.

According to CAA §176(c), CBP activities must conform to an implementation plan’s purpose of “eliminating or reducing the severity and number of violations” of NAAQS and achieving “expeditious attainment” of such standards. Such activities must not cause or contribute to a new violation; increase the frequency or severity of an existing violation; or delay timely attainment of any standard, required interim emission reduction, or other milestone. Pursuant to that rule, conformity determinations are required to ensure that state air quality standards will not be exceeded, and that an action will comply fully with the SIP.

The GCR divides the air conformity process into two distinct areas: applicability analysis and conformity determination. The GCR requires Federal agencies to determine whether their actions would increase emissions of criteria pollutants above preset threshold levels (40 CFR 93.153(b)). Total direct and indirect emissions of a criteria pollutant caused by a Federal action in a nonattainment area (NAA) or a maintenance area are de minimis if they are at rates less than the specified applicability thresholds. These de minimis rates vary depending on the type of pollutant and the geographic location for the level of nonattainment (Table 3.2-2).

Table 3.2-2. Applicability Thresholds for Nonattainment Areas

Criteria Pollutants	Threshold (tons per year)
O₃ (VOCs or NO_x)	
Serious NAAs	50
Severe NAAs	25
Extreme NAAs	10
Other O ₃ NAAs outside an O ₃ transport region	100
Marginal and moderate NAAs inside an O ₃ transport region	
VOC	50
NO _x	100
CO	
All NAAs	100
SO₂ or NO_x	
PM₁₀	
Moderate NAAs	100
Serious NAAs	70
Pb	

Source: (40 CFR 93.153).

3.2.1.3 Permitting Requirements

Air permitting is required for many industries and facilities that emit regulated pollutants. Based on the size of the emissions units and the type of pollutants emitted (criteria pollutants or hazardous air pollutants [HAPs]), each state environmental agency sets permit rules and standards for emissions sources. Permitting scenarios may vary based on the equipment, the timing of the projects, and the types of controls ultimately selected. Actual scenarios may differ in specific features from the ones described in this PEIS. However, during the final design stage and the permitting process, either (1) the actual equipment, controls, or operating limitations would be selected to reduce the “potential to emit” (PTE) below the major source threshold, or (2) the permitting process would require emission offsets be obtained from other previously decommissioned sources within nonattainment areas where applicable. This cap-and-trade type system is inherent to Federal and state air regulations, and leads to a forced reduction in regional emissions. Therefore, regardless of the ultimate permitting scenario, these impacts would be considered minor under NEPA. Notably, sources subject to major source permitting are not subject to general conformity.

Construction Permits

The air quality permitting process begins with the application for a construction permit. Typically there are three types of construction permits available for the construction and temporary operation of new emissions sources: Major New or Modified Source Construction in Nonattainment Areas (Nonattainment New Source Review [NNSR]) permits; Prevention of Significant Deterioration (PSD) permits in attainment areas; and Minor New Source Construction (Minor New Source Review [NSR]). permits

Attainment areas are managed under the PSD program of the CAA. The goal of this program is to prevent the degradation of air quality, while at the same time allowing for moderate economic growth. Thresholds requiring a PSD permit are outlined in Table 3.2-3. PSD review and permitting is required for sources emitting 100 tons per year (tpy) of any regulated pollutant for any of 26 named PSD source categories. One of the named source categories is fossil-fuel boilers that singly, or in combination at a single facility, total more than 250 MMBtu/hr heat input. For all other sources not in the 26 named source categories, PSD review is required if the source emits 250 tpy or more of any regulated pollutant. Sources subject to PSD are typically required to complete Best Available Control Technology (BACT) review for criteria pollutants, predictive modeling of emissions from proposed and existing sources, and public involvement.

Table 3.2-3. Major Modification Thresholds of Criteria Pollutants

Pollutant	New Major Source (tpy)	Major Modification to an Existing Source (tpy)
CO	250 (100)	100
NO _x	N/A	N/A
SO ₂	250 (100)	40

PM	250 (100)	25
PM ₁₀	250 (100)	15
PM _{2.5}	250 (100)	10
VOCs	N/A	N/A

Notes: PSD review and permitting is required for sources emitting or with the potential to emit 100 tpy of any regulated pollutant for (combinations of) fossil fuel boilers totaling more than 250 MMBtu/hr heat input.

N/A = Not applicable.

Source: (40 CFR Part 52).

A Minor NSR permit would be required to construct minor new sources and to make minor modifications of existing sources. The NSR permitting process typically takes four to five months to complete. Sources subject to Minor NSR could be required to complete a BACT review for each criteria pollutant, a Maximum Available Control Technology (MACT) review for regulated HAPs and designated categories, and predictive air dispersion modeling, as well as establish procedures for measuring and recording emissions and process rates.

Operating Permits

Under state and Federal Title V regulations, a Title V permit is required for facilities whose increases in emissions exceed the thresholds outlined in Table 3.2-3. In addition, a significant permit modification would be required if it became necessary to establish federally enforceable limitations to reduce potential emissions below the thresholds. A minor permit modification would be required if emissions were below the thresholds and a federally enforceable limit was not necessary. Submission of an application for these permit modifications would be required within one year of the first operation of a new emissions source.

3.2.1.4 Other Requirements

In addition to the permitting requirements to construct and operate new or modified emissions sources, New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP) set emissions control standards for categories of new stationary emissions sources of both criteria pollutants and HAPs. The NSPS process requires EPA to list categories of stationary sources that cause or contribute to air pollution that might reasonably be anticipated to endanger public health or welfare. The NSPS program sets uniform emissions limitations for many industrial sources such as boilers and stand-by generators. Under NESHAP, new stationary sources whose potential to emit HAPs exceeds either 10 tpy of a single HAP or 25 tpy of all regulated HAPs would be subject to MACT requirements.

3.2.2 FRAMEWORK FOR CHARACTERIZING RESOURCE IMPACTS

To analyze the potential for CBP activities to produce air quality impacts, this PEIS:

- Characterizes the areas within which CBP’s proposed action and alternatives would be implemented as:
 - Attainment/unclassified;

- Nonattainment;
- Maintenance; and,
- Class I.
- Characterizes various direct and indirect sources of air emissions associated with the action such as:
 - Stationary (e.g., permanent, stationary sources of air emissions);
 - Mobile (e.g., on-road automobile and truck traffic);
 - Non-road (e.g., heavy equipment and off-road vehicles); and,
 - Area (e.g., fugitive dust and lawn maintenance equipment).
- Compares the direct and indirect emissions from the activities to the regulatory thresholds, such as the de minimis thresholds under the general conformity regulation or the major source threshold for the permitting of stationary sources.

This approach assumes that a project or activity has the potential to create a major adverse impact to air quality if:

- The total direct and indirect emissions would exceed the de minimis thresholds as outlined under the general conformity regulations for a nonattainment or maintenance area (e.g., more than 100 tons per year of nitrogen oxides [NO_x] and a moderate nonattainment area for the 8-hour ozone NAAQS);
 - New stationary sources of air emissions would exceed the nonattainment new source review major source threshold in a nonattainment area;
 - New stationary sources of air emissions would exceed the prevention of significant deterioration major source threshold in an attainment area; or,
 - New stationary sources of air emissions would be large enough and/or close enough to potentially affect a Class I area.

The study area contains many AQCRs and Class I areas that could experience impacts due to the proposed action and alternatives in this PEIS. However, the mere presence of a sensitive area, such as a nonattainment, maintenance, or Class I area, does not guarantee that it would be impacted by CBP's activities. Impacts would be considered minor unless they exceeded the applicability threshold for a CAA nonattainment area or contributed to a violation of any Federal, state, or local air regulation. While there are scattered areas of air quality nonattainment in Montana and Idaho, and in urban areas of the Great Lakes and New England Regions, air quality over the majority of the northern border is in attainment with the relevant air quality standards. All CBP actions would normally conform to each SIP.

3.2.3 ACTIVITIES WITH ENVIRONMENTAL CONSEQUENCES TO AIR QUALITY

Several activities do not generate any direct or indirect emissions that would require CBP to maintain an ongoing program to control them. These activities include nonmotorized ground operations, operation of nonintrusive inspection systems, and operation of sensor and other

technologies. This PEIS does not carry these activities forward into the analysis of potential impacts to air quality. Additionally, some of CBP's activities analyzed for adverse impacts could have minor beneficial impacts, in addition to those outlined in the appropriate section, based on the site-specific context. For example, constructing new CBP facilities closer to areas with housing occupied by CBP employees or available to CBP employees would reduce their commute time and distance, and the associated air emissions.

CBP-related activities that could affect air quality include:

- Large construction projects;
- Small construction projects;
- Motorized ground operations;
- Aircraft operations; and,
- Vessel operations.

3.3 BIOLOGICAL RESOURCES

3.3.1 CONTEXT FOR AFFECTED ENVIRONMENT

The area of consideration for the northern border PEIS is vast and includes a variety of ecosystems and habitats that may extend in parts beyond the 100-mile range south of Canada and also into parts of Canada. Appendix L provides detailed narratives about the ecosystems included in the northern border area, including additional information about habitat and species varieties found within the ecosystems. To provide a useful context for identifying impacts of CBP program alternatives and activities, the description of the affected environment focuses on the following areas.

3.3.1.1 Blocks of Regionally Significant Habitat

Activities in relatively undisturbed habitats can have more far-reaching environmental impacts than similar activities in already disturbed areas. The importance and sensitivity of such habitats may vary based on the presence and variety of native species, the size and shape (and connectivity) of the habitat, and its contribution to ground and surface water supply and quality. Habitat fragmentation (the breakup of intact habitat into increasingly smaller and more segregated areas) can isolate wildlife populations; in turn, this isolation can lead to declines in wildlife population. Fragmentation is a growing and significant threat to species persistence (Reed, 2004). Some of the areas addressed in this PEIS reach across the northern border into Canada.

The Wilderness Act of 1964 established a system for identifying important wilderness areas and protecting the wilderness character of these areas. Over 103 million acres of land in the U.S. are protected as Wilderness Areas. Wilderness designation carries the most stringent protections from development and use of any special designations (see the National Park Service (NPS) and the U.S. Fish and Wildlife Service (USFWS) Wilderness websites). To receive Wilderness designation, the proposed area must be recommended by the President and approved by Congress. An example of the Wilderness designation process can be viewed on the U.S. Forest Service website at <http://www.wilderness.net/index.cfm?fuse=NWPS&sec=designateFS>.

Therefore, projects that could impact wilderness areas will be given special attention in reviews of specific impacts.

3.3.1.2 Sensitive Habitats

Delineation of sensitive habitats is important because disturbance of such areas can cause rapid ecological change (Turner, 2010). These sensitive ecological communities are less able to withstand the effects of human activities and disturbance than agricultural areas, deciduous forests, or other more-resistant habitats. For the purposes of this PEIS, sensitive habitats are identified based on those enumerated and described by the World Wildlife Fund (2001), ecological system descriptions within the NatureServe.org database, and information from state natural resources agencies.

3.3.1.3 Threatened and Endangered Species

Endangered species are those species of plants and animals determined to be in danger of extinction throughout a significant portion of their natural range. Threatened species are those that will imminently become endangered without intervention. The U.S. Endangered Species Act (ESA) of 1973 provides for making Federal listings of threatened and endangered species and for protecting and recovering these imperiled species along with the habitat and ecosystems upon which they depend. (Threatened and endangered species found within the area covered by this PEIS are listed in Appendix M.) The ESA prohibits “take” of listed, threatened, and endangered fish and wildlife. Section 3(18) of the ESA defines the term ‘take’ as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” Listed plants are not protected from take, although it is illegal to collect or maliciously harm them on Federal land. The ESA also prohibits interstate or international trade in listed plants and animals, except under Federal permit usually implemented for conservation and scientific purposes.

Multiple agencies enforce provisions of the ESA. The USFWS has primary responsibility for terrestrial and freshwater organisms, while the Department of Commerce’s National Marine Fisheries Service (NMFS) mainly protects marine wildlife and anadromous fish. The Canadian equivalent of the ESA is the Species at Risk Act (SARA) of 2002. Actions within the United States are not bound by the Canadian SARA.

3.3.1.4 Critical Habitat

Critical habitat is a term defined and used in the ESA (16 U.S.C § 1532). It is a specific geographic area(s) that is essential for the conservation of a threatened or endangered species, and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery. An area is designated as “critical habitat” after the USFWS publishes a proposed Federal regulation in the *Federal Register*, and after public comments are considered on the proposal (USFWS, 2011d).

3.3.1.5 Wildlife

Healthy ecosystems depend on diverse and balanced wildlife populations. Land use changes may disrupt movement of wildlife during migration or dispersal, and affect breeding, nesting, and other normal behaviors. Therefore, removal of a wildlife population or its habitat, or

alteration of its ability to use the habitat to complete its life cycle successfully, could significantly alter ecosystem function.

Although most of the species referenced in this section of the document are not threatened or endangered, they may be protected by other legislation. The Migratory Bird Treaty Act (MBTA) protects migratory birds, their eggs, feathers, and nests from “take” resulting from human activities. The MBTA defines “take” to include “by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing or transporting any migratory bird, nest, egg, or part thereof.” The Bald and Golden Eagle Protection Act (BGEPA) affords additional protection to all bald and golden eagles.”¹ The BGEPA prohibits anyone, without a permit issued by the Secretary of the Interior, from “taking” bald eagles, including their parts, nests, or eggs. The BGEPA defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.” The Marine Mammal Protection Act (MMPA) prohibits, with certain exceptions, “take”² or “to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal” in U.S. waters and by U.S. citizens on the high seas; and the importation of marine mammals and marine mammal products into the U.S.”³ In some cases, wildlife species protected by the aforementioned statutes may also be protected under the ESA.

3.3.1.6 Vegetative Habitat

Healthy ecosystems depend on robust vegetation and local plant communities. Removal of a native vegetative population or its habitat could significantly alter ecosystem function. A growing threat to healthy native plant communities is the introduction of nonnative invasive species. The negative effects of these introduced species contribute to habitat destruction. In fact, introduced species pose a greater threat to native biodiversity within all ecoregions than the threats from pollution, harvest, and disease combined (Simberloff, 2000).

3.3.1.7 Wetlands and Waterways

Wetlands are often ecologically important, very sensitive to disturbance, and have a greater likelihood of slow recovery compared to adjacent uplands. Large-scale wetland disappearance and disturbance represent the current status of wetlands across the Nation, with loss estimates of one-half of the country’s original 221 million acres of these highly productive lands (Feierabend, 1992).

3.3.1.8 Aquatic Resources

The major types of aquatic habitats that CBP activities may affect along the northern border are estuaries, streams, lakes, rivers, and wetlands. The WOR and New England Regions also have ocean coastal areas. Aquatic organisms found in these habitats include fish (marine and freshwater), amphibians, reptiles, marine mammals, and plants. Waterborne human operations as well as runoff from human activities on the land have the potential to affect aquatic resources.

¹<http://www.fws.gov/pacific/migratorybirds/mbta.htm>

² The MMPA uses the same definition of “take” as the ESA.

³<http://www.nmfs.noaa.gov/pr/laws/mmpa/>

3.3.2 FRAMEWORK FOR CHARACTERIZING RESOURCE IMPACTS

This PEIS evaluates the potential for CBP activities to have impacts within each biological resource consideration area discussed in Section 3.3.1. In general, the potential for major impacts occurs when any of the habitats or resources would be stressed beyond the ability to fully recover once the impacting agent is removed, even with mitigations orchestrated. In particular, any activity with the following results would have potentially major impacts:

- Take (whether permitted or not) of species protected under the ESA, MBTA, BGEPA, or MMPA through harassment, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting, or attempting any of the aforementioned (16 U.S.C. § 1532 (19));
- Destruction of habitat (directly or indirectly) resulting in take or otherwise past the point of recovery;
- Diminishment of the quality of wetlands or waterways through pollution, destruction, damage, or other impairment; or,
- Introduction of nonnative (alien or invasive) species into an ecosystem.

The scale and intensity of impacts would have bearing on their “significance,” but any of the above acts that resulted in regional or local extirpation of a protected species would be significant. CBP activities could interact within a wide spectrum of biological resources and areas with a wide-spectrum of activity levels. This PEIS identifies the potential level of impacts to biological resources from CBP activities based on the general level of impacts expected to different resource categories presuming site-specific consultation, planning and execution that would incorporate practices to mitigate against major impacts in the vast majority of cases.

When conducting analysis of impacts to biological resources from site-specific proposed projects, CBP would take into account the ecological integrity of resources by employing analytical tools such as conceptual ecological models when appropriate. In particular, CBP would use conceptual ecological models as a tool to address resources on DOI managed lands or otherwise protected natural resources under DOI jurisdiction. Because CBP does not have a mission to manage biological resources outside of mitigation and compensation responsibilities that may be associated with its construction or operation-related activities, CBP would use models to determine the relative amount of impairment or reduction of a resource by CBP activities. CBP will rely largely on existing information from recognized sources on the attributes of ecological integrity for biological resources. These sources might include NatureServe, final Federal or state management plans [for species, habitat, and designated land use areas], or other available conservation data sets with scientifically collected information on ecological attributes. This PEIS hereby incorporates by reference, the “Ecological Integrity Assessment Framework”⁴ prepared for the NPS as a basis for framing analysis of site specific impacts to biological resources managed within the purview of DOI units.

⁴ [Unnasch et al., 2009] Unnasch, R. S., D. P. Braun, P. J. Comer, and G. E. Eckerty. 2009. The ecological integrity assessment framework: A framework for assessing the ecological integrity of biological and ecological resources of the national park system. Technical report.

CBP will use attributes of ecological integrity of a given resource based around its size/number, its existing condition/health, and the landscape/resource context. CBP, as appropriate and feasible, will determine indicators within each attribute that indicate how much an activity's impacts retard the viability of the resource. CBP will base these indicators using existing information on species viability and will develop them in coordination or consultation with or advisement of agencies with jurisdiction and or/authority to protect, preserve, or conserve specific biological resources.

Beneficial impacts would occur if any activity improved habitat stability, added to habitat size or connectivity, or improved conditions for protected and native species in a sustainable manner.

3.3.3 ACTIVITIES WITH ENVIRONMENTAL CONSEQUENCES TO BIOLOGICAL RESOURCES

Activities considered with the proposal and alternatives of this PEIS that could affect biological resources are grouped into three general categories (construction, operation, and maintenance) and may include, but are not limited to, the following activities:

- Construction of:
 - Pedestrian or vehicle fences or other physical barriers;
 - Extensions, upgrades, or repairs of access roads, fences, drag roads, bridges, culverts, and low-water crossings;
 - New Border Patrol stations (BPSs), forward operating bases (FOBs), communications towers, and air and marine operational facilities;
 - Modifications/upgrades of existing POEs, BPSs, hangars, and other facilities in support of CBP operations; and,
 - Construction/set-up of permanent traffic checkpoints.
- Operation activities including
 - Ground surveillance/patrols and situational response activities (including motorized and nonmotorized, on-road and off-road, snowmobiles, canine, and horseback patrols);
 - Set up/operation of mobile traffic checkpoints;
 - Use of unattended ground sensors (UGS) and other technology;
 - Aircraft surveillance/patrols and situational response activities (manned and unmanned);
 - Maritime surveillance/patrols and situational response activities; and,
 - Implementation and deployment of remote video surveillance systems (RVSS), mobile surveillance systems (MSS), Customs Area Surveillance Centers (CASC), and Operational Integration Centers (OIC).
- Operations at fixed facilities including:
 - Routine activities at POEs including agricultural inspections;

- Continued standardizing and modernizing of the Office of Air and Marine (OAM) fleet;
 - Use of nonintrusive/nondestructive inspection and detection technologies;
 - Operation of small-arms weapons training ranges; and,
 - Enforcement of I-68 Canadian Border Boat Landing Program for recreational boaters.
- Maintenance and repair of all of the above.

3.4 GEOLOGY AND SOILS

3.4.1 CONTEXT FOR AFFECTED ENVIRONMENT

Geology is the study of the earth's history as recorded in rock formations. Often these rocks serve as the parent rock for soils present at and below the surface of the earth. Geologic resources are the subsurface and surficial materials of the earth. Within a specific physiographic province (area of land formations), these resources can be described according to soils, minerals, or topography. Soils analysis uses soil-order classifications, which group soil characteristics specific to location, parent material, and other factors that influence formation.

The geologic aspects along the Northern Border PEIS area of consideration vary widely along the entirety of the border and within the four geographic regions subdividing this PEIS. The analysis here is based on the broad characterization of geologic formations and geographical locations.

3.4.1.1 Geologic Conditions

Regional Glaciation

Changes to the land surface are caused over time by the action of glaciers forming and retreating through time. Glaciers ("permanent" bodies of ice, including mountain glaciers, ice sheets, and ice shelves) are responsible for both transporting and depositing sediment materials across distances, and for eroding landforms at small (polishing rock formations) and large (creating or expanding valley formations) scales.

Seismicity and Tectonics

"Seismicity" refers to the geographical and historical distribution of earthquakes. "Tectonics" refers to rock-deforming processes and the resulting structures that occur over large sections of the outer solid part of the earth, including the crust and the uppermost mantle.

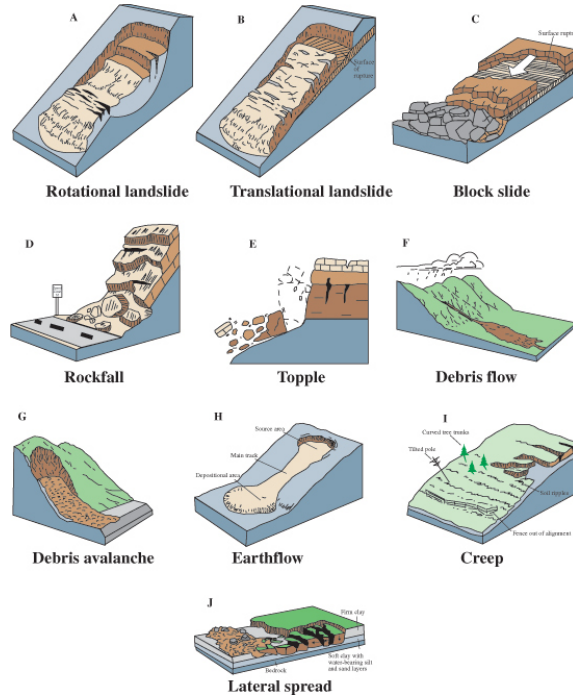
Landslides

A landslide is the downward movement of rock, soil, mud, and/or other debris on a slope (Figure 3.4-1). The mass movement of earth materials can be either fairly slow or very sudden.

Landslide is a general term; there are many different types and causes of landslides. Along the northern border, most landslides occur along the steep slopes of the many mountain ranges.

Landslides can be triggered by various mechanisms, including seismicity, rainfall, snowmelt, volcanic events, and human activities (e.g., site development, mining, and deforestation). The water content of the soil or rock in a sloped area is a major factor in an area's risk for landslides (Lane County, 2010).

Figure 3.4-1. Landslide Types



Source: USDO, 2004a

Karst Topography

Karst topography is a landscape dominated by carbonate bedrock, including limestone, dolomite, and marble. These formations are susceptible to dissolution by water, which can make an area prone to land subsidence (Figure 3.4-2). Throughout the United States, subsidence occurs in at least 45 states and affects approximately 17,000 square miles of land. NPS land requires special protections for karst terrain. The existence of karst topography is often related to aquifers. Along the northern border, karst landscapes occur from coast to coast.

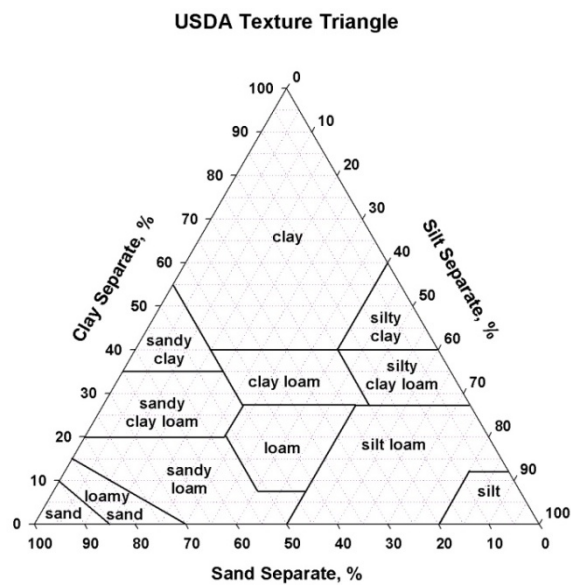
Figure 3.4-2. Sink Hole in Karst Topography



Soils

Soil taxonomy is the science of classifying soils based on physical qualities and characteristics (Figure 3.4-3). Appendix N provides detailed descriptions of these soil orders.

Figure 3.4-3. Soil Classification Based on the Fraction of Clay Sand and Silt in a Soil



The erosion potential for various soil types can be determined by quantifying factors such as:

- Soil permeability;
- Slope gradient;
- Wind and water action; and,
- Soil particle texture (Table 3.4-1).

Table 3.4-1. Soil Texture and Particle Size

Type of Material	Size (mm)
Sand	2.0 – 0.06
Silt	0.06 – 0.002
Clay	Under0.002

Soils with low permeability have more potential for erosion by both wind and water due to the inability for water or wind to move through its strata. These soils often have small particle textures, and are therefore less likely to allow water or wind to infiltrate. Soils with high amounts of silt and fine sand are the most susceptible to erosion by wind or water. The smallest particles, clays, usually have lower erosion potential because the particles tend to bind to one another. However, some clays are prone to erosion due to expansion or swelling when wet, followed by desiccation or shrinking when dried. The dry stage can lead to desiccation cracks, thus lessening particle binding and increasing erosion potential. Though clays may not be as affected by water as silts and fine sands, they can contribute to higher runoff due to their low permeability (NCSCC, 2006). Where erosion ends, deposition begins. This is the point that the eroded particles drop from the medium that carried them, and are deposited on surrounding areas of land or water.

Slope gradient is a major factor in erosion potential. Many of the soils on the northern border fall into a high-gradient category. In areas of high relief, rain can cause erosion due to the water’s downslope movement at high velocity. A soil’s susceptibility to erosion on a slope depends upon the amount of vegetative cover as well as the soil texture. Vegetative cover is the best method of reducing erosion on slopes, because it slows flow velocity, allows infiltration, disperses flow, and protects the surface from the impact of falling rain (NCSCC, 2006).

Soil erosion also decreases soil productivity by removing and displacing topsoil. While erosion is a normal and natural geologic process, manmade actions can increase its rate and impacts.

The Farmland Protection Policy Act (FPPA) was created to minimize impacts by the Federal Government on farmland by regulating the conversion of agricultural land to other uses. “Prime and Unique Farmland” is a designation created by the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) to identify lands with soils that are highly productive and economically valuable to the country. To qualify as prime farmland, land must meet specific criteria, including access to a dependable water supply, a sufficient growing season, adequate amounts of acid or base in the soil, specific sodium content, and small particle size. Prime farmland soils are typically well-drained and permeable (USDA, No Date). The NRCS has developed a rating system through which farmland is scored; the score must sit within the recommended allowable range. Form AD-1006 is used to complete the assessment and assign the farmland conversion impact rating.

3.4.2 FRAMEWORK FOR CHARACTERIZING RESOURCE IMPACTS

This PEIS does not attempt to categorize every potential geologic structure or soil type along the entire northern border. It provides the analytical tools to conduct a specific impact assessment for a given future site-specific project or activity, and offers examples of the types of geological

resource considerations along the border. It also analyzes how, in which settings, and to what extent various CBP activities might create impacts and it provides guidelines as necessary to minimize, mitigate, or avoid such impacts. Relevant physical considerations for analyzing impacts include factors such as:

- Erodibility;
- Permeability;
- Prime farmland status;
- Seismicity;
- Productivity; and,
- Changes to the character of the landscape.

The following alterations could potentially have major adverse impacts on geological aspects, including soil performance characteristics:

- Substantial changes in soil stability, permeability, or productivity, such as the removal of surface vegetative cover or an increase in impermeable surfaces, allowing increased erosion of soil by wind and stormwater runoff; and,
- Substantial changes in risk to humans and property due to seismic events, such as the construction of facilities that do not adhere to applicable building codes in areas of high seismic risk.

CBP does not undertake any activities, such as subsurface injection of fluids or wastes (excluding use of onsite septic systems at some facilities), that could substantially change the physical characteristics of subsurface geological formations. Nor does CBP substantially alter the physical character of natural landforms and surface features by cutting roads into hillsides or participating in mining operations. CBP may need to put a facility or a structure (tower) on a hillside requiring some alteration of slopes in the immediate footprint of the construction. Tunnel-remediation and hillside construction would be exceptional activities along the northern border. These activities would require detailed site-specific analysis to address the unique characteristics of their implementation.

3.4.3 CBP ACTIVITIES WITH ENVIRONMENTAL CONSEQUENCES TO GEOLOGIC AND SOIL RESOURCES

Activities considered within the proposal and alternatives of this PEIS that could affect geological and soil resources fall into three general categories (construction, operation, and maintenance) and may include, but are not limited to, the activities below:

- Construction of:
 - Pedestrian or vehicle fences or other physical barriers;
 - Extensions, upgrades, or repairs of access roads, fences, drag roads, bridges, culverts, and low-water crossings;
 - New BPSs, FOBs, communications towers, and air and marine operational facilities;

- Modifications/upgrades to existing POEs, BPSs, hangars, and other facilities in support of CBP operations; and,
- Set up of permanent traffic checkpoints.
- Operation activities including:
 - Small-arms weapons training ranges; and,
 - Ground surveillance/patrols and situational response activities (including motorized and nonmotorized, on-road and off-road, snowmobiles, canine and horseback patrols, set up/operation of mobile traffic checkpoints, use of UGSs and other technology).
- Maintenance and repair of all of the above.

3.5 WATER RESOURCES

3.5.1 CONTEXT FOR AFFECTED ENVIRONMENT

Due to the vast area considered in this document, as well as the terrorism and criminal activity threat-driven nature of CBP operations, site-specific characteristics of water resources are too numerous to depict in detail and cannot be definitively aligned with changes in activity intensity over the next five to seven years. Instead, the affected environment is described using resources categorized by the potential impact from a proponent's typical actions and alternatives, performing broad-based analyses, and developing best management practices and mitigations. These will prove useful to decision-makers and for future site-specific assessments and other environmental analyses. Following this principle, the resources in this section are characterized in one of three categories as follows.

3.5.1.1 Hydrology and Groundwater

The hydrology and groundwater resources of a region refer to the quality and availability of a safe water supply for drinking and other purposes for which an uncontaminated water source is necessary. Groundwater is extracted for beneficial use from below ground where it rests in geologic storage reservoirs known as aquifers. Percolation of rainwater and other precipitation through overlying layers of soil recharges the aquifers. Surface waters, such as a river or stream, can also recharge an aquifer. Primary regulatory protection for hydrologic and groundwater resources is provided by the Safe Drinking Water Act and its amendments, and by waste regulations such as the Resource Conservation and Recovery Act and its amendments that prevent entry of hazardous wastes into areas that will contaminate water sources.

3.5.1.2 Surface Waters and Waters of the United States

Section 404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers and USEPA to regulate activities that affect U.S. waters; this section defines those resources described as surface waters and waters of the United States. Although Section 404 specifically regulates wetlands, for the current analysis, surface waters and waters of the United States refer to water bodies generally referred to as lakes, reservoirs, rivers, streams, ponds, and creeks. Wetlands are addressed in the biological resources section (3.2) of this chapter due to their unique value as a habitat and the particular qualities that define wetlands. The quality and quantity of water in

surface waters and waters of the United States are primarily affected by precipitation and ensuing runoff, in addition to usage through activities such as irrigation and industrial use.

3.5.1.3 Floodplains

Floodplains sit adjacent to surface waterways and store or hold floodwaters. These lands are typically low, flat areas. Generally, they are identified and regulated as 100-year floodplains—areas subject to a 1 percent chance of flooding in any given year. Preserving the area's functionality and minimizing the spread of floodwaters by regulating development that can occur within the designated floodplain limits is desirable. Floodplain preservation and development restrictions are managed in accordance with EO 11988, Floodplain Management. Federal Emergency Management Agency (FEMA) flood insurance rate maps identifying land falling within the 100-year floodplain boundaries can be obtained for most of the study area along the northern border.

3.5.2 FRAMEWORK FOR CHARACTERIZING RESOURCE IMPACTS

This section provides the analytical tools to conduct a specific impact assessment for a future site-specific project or activity. It also offers examples of the types of water resources that exist along the northern border. It analyzes how, in which settings, and to what extent various CBP activities might affect water resources and provides guidelines, as necessary, to minimize, mitigate, or avoid such impacts. Using resource-specific criteria, this section characterizes potential impacts as major, moderate, minor, or negligible.

Anticipated activities and actions that result in the following consequences can affect water resources:

- Fuel spills and leaks from vehicles, equipment, or storage tanks that runoff impervious surfaces or otherwise transport to make a groundwater aquifer unsuitable for withdrawing drinking water or impair surface waters;
- High sediment loads in runoff from construction sites or that harm impair surface waters and aquatic organisms;
- Construction projects that redirect surface waters during or after completion of the facilities and infrastructure; and,
- Substantial withdrawals from an aquifer that change the local water table and cause some existing wells to dry up.

A proposed project or activity would potentially have a major impact on water resources under these conditions:

- Substantial adverse changes in the quality of water supply sources due to contamination from activities;
- Substantial adverse changes in the availability or quantity of a water supply source;
- Substantial adverse changes in surface water quality due to contamination from activities;
- Substantial adverse changes in streamflow patterns; and,

- Substantial adverse changes in the capacity of watercourses to carry floodwaters.

3.5.3 ACTIVITIES WITH ENVIRONMENTAL CONSEQUENCES TO WATER RESOURCES

Activities considered within the proposal and alternatives of this PEIS that could affect the supply (availability) or quality of water resources are grouped into three general categories (construction, operation, and maintenance) and may include, but are not limited to, the activities below:

- Construction of:
 - Pedestrian or vehicle fences or other physical barriers;
 - Extensions, upgrades, or repairs of access roads, fences, drag roads, bridges, culverts, and low-water crossings;
 - New BPSs, FOBs, communications towers, and air and marine operational facilities;
 - Modifications/upgrades of existing POEs, BPSs, hangars, and other facilities in support of CBP operations; and,
 - Set up of permanent traffic checkpoints.
- Operation activities including:
 - Ground surveillance/patrols and situational response activities (including motorized and nonmotorized, on-road and off-road, snowmobiles, canine and horseback patrols, set up/operation of mobile traffic checkpoints, use of UGSs and other technology);
 - Aircraft surveillance/patrols and situational response activities (manned and unmanned);
 - Maritime surveillance/patrols and situational response activities; and,
 - Implementation and deployment of RVSS, MSS, CASC, and OIC.
- Operations at fixed facilities including:
 - Continued standardizing and modernizing of the OAM fleet;
 - Operation of small-arms weapons training ranges; and,
 - Enforcement of I-68 Canadian Border Boat Landing Program for recreational boaters.
- Maintenance and repair of all of the above.

Although CBP does perform work in waters such as constructing low-water crossings in streams, piers, and boat slips in or around lakes, it does not engage in permanent construction within floodways that could raise floodwater elevations thereby endangering people and property.

3.6 NOISE

3.6.1 CONTEXT FOR AFFECTED ENVIRONMENT

Sound is a physical phenomenon consisting of vibrations that travel through media, such as air or water, and are sensed by the human ear. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise, the distance between the noise source and the receptor, the receptor sensitivity, and the time of day. Noise is often generated by activities essential to a community’s quality of life, such as construction or vehicular traffic.

Sound varies by both intensity and frequency. Sound pressure level, in decibels (dB), is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Because the human ear responds differently to different frequencies, “A-weighting” was developed to approximate the frequency response of the human ear. The A-weighting curve has been widely adopted for environmental noise measurement and is standard in many sound level meters. The A-weighted decibel (dBA) levels of common sounds of daily life are provided in Table 3.6-1.

The dBA noise metric describes steady noise levels, although, in fact, very few noises are constant. Therefore, the measurement Day-Night Sound Level (DNL) has been developed. DNL is defined as the average sound energy in a 24-hour period with a 10-dB penalty added to the nighttime levels (10 p.m. to 7 a.m.). DNL is a useful descriptor for noise because: (1) it averages ongoing yet intermittent noise and (2) it measures total sound energy over a 24-hour period. In addition, Equivalent Sound Level (L_{eq}) is often used to describe the overall noise environment. L_{eq} is the average sound level in dB.

Table 3.6-1. Common Sound Levels

Outdoor	Sound level (dBA)	Indoor
Snowmobile	100	Subway train
Tractor	90	Garbage disposal
Downtown (large city)	80	Ringling telephone
Freeway traffic	70	TV audio
Normal conversation	60	Sewing machine
Rainfall	50	Refrigerator
Quiet residential area	40	Library

Notes: dBA = A-weighted decibel. Sound level provided is as generally perceived by an operator or a close observer of the equipment or situation listed.

Source: (Harris, 1998).

The northern border study area contains many soundscapes and noise-sensitive receptors (such as national parks, residences, or schools) that could be impacted by implementation of any of the proposed alternatives. The mere presence of a noise-sensitive area, such as a national park, residence, or school, does not guarantee that it would be significantly impacted by CBP activities or that the overall impacts would be major under NEPA. For descriptions of the regional affected environments for noise, see Sections 4.6.2 (WOR), 5.6.2 (EOR), 6.6.2 (Great Lakes), and 7.6.2 (New England).

3.6.1.1 Regulations and Requirements for Noise Control

The Noise Control Act of 1972 (PL 92-574) directs Federal agencies to comply with applicable Federal, state, interstate, and local noise control regulations. In 1974, the USEPA provided information suggesting continuous and long-term noise levels in excess of DNL 65 dBA are normally unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals.

State and local governments have the opportunity to regulate noise in their jurisdictions. These regulations are typically guidelines for activities that generate noise and the hours that such activities may be performed. A municipal noise ordinance might address the hours that heavy equipment can be operated, the distance heavy equipment can be operated in proximity of noise-sensitive receptors (i.e., schools, hospitals, churches, and residences), and the duration of operation of a single noise source considered to be annoying to the public, such as a diesel-powered generator. Some set specific not-to-exceed noise levels and others are simple nuisance noise ordinances.

A number of sources of noise may be addressed for rural areas such as parades, vendors, social engagements with music, and animal noises. Construction noise is typically exempt from noise ordinances in rural areas. In addition, noise regulations in urban settings take into account the constant noise sources of urban living, such as large HVAC units, public transportation (trains and buses), emergency vehicles, and heavy traffic. Because urban noise levels are already relatively high, adding a noise source for an extended period of time can be highly annoying to some people, thus hours of construction and operation of heavy equipment are often limited. A typical ordinance in a major city will restrict construction-related noise sources between the hours of 10:00 p.m. and 7:00 a.m.

3.6.2 FRAMEWORK FOR CHARACTERIZING RESOURCE IMPACTS

To analyze the potential for CBP activities to increase noise along the northern border, this PEIS makes the following assessments:

- Characterizes the areas where CBP's activities would be implemented as:
 - Very rural and remote;
 - Very quiet suburban and rural residential;
 - Quiet suburban residential;
 - Urban and noisy suburban residential; or,
 - Areas of special interest such as national parks.

- Characterizes the sources of noise as either:
 - Short-term sources (e.g., construction and infrastructure upgrades); or,
 - Long-term sources (e.g., generators, automobiles, off-road vehicles, unmanned aircraft systems, and truck traffic).
- Compares noise associated with the activities to incompatibility and regulatory thresholds, such as the 65 dBA DNL limit.

This PEIS uses a systematic process to evaluate the level of impact for noise. This process compares predictions to significance criteria based on legal and regulatory constraints, along with team members' professional technical judgment. Specifically, this approach assumes that a project or activity has the potential to create a major adverse effect due to noise if it:

- Affects a substantial swath of land by generating long-term or permanent sound levels greater than 65 dBA DNL in noise-sensitive areas;
- Generates noise that is not manageable through scheduling, or uses engineering controls that may violate Federal, state, or local noise regulations; or,
- Generates noise in a unit of the NPS that exceeds significant effects thresholds as outlined by the NPS.

3.6.3 ACTIVITIES WITH ENVIRONMENTAL CONSEQUENCES TO NOISE

CBP activities considered within the proposal and alternatives of this PEIS that could affect the noise environment include the following:

- Construction of:
 - Pedestrian or vehicle fences or other physical barriers;
 - Extensions, upgrades, or repairs of access roads, fences, drag roads, bridges, culverts, and low-water crossings;
 - New BPSs, FOBs, communications towers, and air and marine operational facilities;
 - Modifications/upgrades of existing POEs, BPSs, hangars, and other facilities in support of CBP operations; and,
 - Set up of permanent traffic checkpoints.
- Operational activities including
 - Ground surveillance/patrols and situational response activities (including motorized and nonmotorized, on-road and off-road, snowmobiles, canine and horseback patrols, set up/operation of mobile traffic checkpoints, use of UGSs and other technology);
 - Aircraft surveillance/patrols and situational response activities (manned and unmanned);
 - Maritime surveillance/patrols and situational response activities; and,
 - Implementation and deployment of RVSS, MSS, CASC, and OIC.
- Operations at fixed facilities including:

- Continued standardizing and modernizing of the OAM fleet;
 - Use of nonintrusive/nondestructive inspection and detection technologies;
 - Operation of small-arms weapons training ranges;
 - Operation of standby generators; and,
 - Enforcement of I-68 Canadian Border Boat Landing Program for recreational boaters.
- Maintenance and repair of all of the above.

3.7 CLIMATE CHANGE AND SUSTAINABILITY

3.7.1 CONTEXT FOR AFFECTED ENVIRONMENT

3.7.1.1 Global Climate Change

The goal of Executive Order (EO) 13514, “Federal Leadership in Environmental, Energy, and Economic Performance”(October 5, 2009), is “to establish an integrated strategy towards sustainability in the Federal Government and to make reduction of greenhouse gas emissions (GHG) a priority for Federal agencies.”

According to the United Nations (UN), climate change “refers to a change in the state of the climate that can be identified (e.g., using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or to external forces, or to persistent anthropogenic changes in the composition of the atmosphere or land use.”

Climate change research reports from the United Nations Intergovernmental Panel on Climate Change (IPCC), the U.S. Climate Change Science Programs Science Synthesis and Assessment Products, and the U.S. Global Change Research Program (USGCRP) conclude that the Earth’s climate is already changing. The change is expected to accelerate (USDA, 2009). Some observed changes include shrinking of glaciers, thawing of permafrost, delayed freezing and earlier break-up of ice on rivers and lakes, lengthening of growing seasons, shifts in plant and animal ranges, and earlier flowering of trees (IPCC, 2007).

Temperature increases may be associated with human-induced increases in GHG emissions released into the atmosphere as a result of combustion. Common GHGs such as carbon dioxide, methane, and nitrous oxide trap radiant heat from the Earth, causing the average temperature to rise. Federal agencies, states, and local communities address global warming by preparing GHG inventories and adopting policies that will result in a decrease of GHG emissions. EO 13514 specifically requires Federal agencies to measure, report, and reduce GHG emissions from both their direct and indirect activities. Direct activities include actions related to sources the agencies own and control and the generation of electricity, heat, or steam they purchase. Indirect activities include actions of vendor supply chains, delivery services, and employee travel and commuting. “Instructions for Implementing Climate Change Adaptation Planning in Accordance with EO 13514” was also issued on March 4, 2011 to provide more guidance for Federal agencies.

The Council on Environmental Quality (CEQ) has issued draft guidance for considering global climate change in documents prepared pursuant to NEPA (CEQ, 2010; USDA, 2009). The draft guidance identifies two aspects of global climate change:

- The potential for Federal agencies to influence global climatic change (e.g., increased emissions or sinks of GHG); and,
- The potential for global climatic change to affect Federal actions (e.g., feasibility of coastal projects in light of projected sea level rise).

3.7.1.2 Sustainability

Sustainable development means meeting the needs of the present without compromising the ability of future generations to meet their own needs. For CBP, sustainability includes the ability to adjust to changing geopolitical realities while preserving the environment and working to improve the quality of life for American residents and visitors to the United States.



To reduce environmental impacts and address potential future resource limitations, the Department of Homeland Security (DHS) prepared a Strategic Sustainability Performance Plan (SSPP) to promote sustainable planning, design, development, and operations. The SSPP sets goals for DHS to decrease energy use, minimize reliance on traditional fossil fuels, protect and conserve water, and reduce the environmental impact of materials use and disposal. In compliance with the DHS SSPP, CBP developed an operational sustainability performance plan (OSPP) which lays out a strategy for meeting sustainability-related federal requirement goals and targets. CBP's overarching goal is to size, plan, and develop future facilities in a manner that is sustainable, aiding preservation and protection of finite resources.

Regulations and Requirements Related to Climate Change and Sustainability

All Federal agencies must take necessary actions to integrate environmental accountability into day-to-day decision making and long-term planning processes, across all agency missions, activities, and functions. Consequently, environmental management considerations must be a fundamental and integral component of all Federal agencies' policies, operations, planning, and management. The following Federal mandates and regulations shape CBP's responsibilities related to climate change and sustainability:

- EO 13514, "Federal Leadership in Environmental, Energy, and Economic Performance";
- EO 13423, "Strengthening Federal Environmental, Energy, and Transportation Management";
- The Energy Independence and Security Act of 2007;
- The Federal Leadership in High Performance and Sustainable Building Memorandum of Understanding (MOU) 2006;
- The Energy Policy Act of 2005;
- EO 13031, "Federal Alternative Fuel Vehicle Leadership";

- EO 13352, “Facilitation of Cooperative Conservation”;
- Pollution Prevention Act; and
- Resource Conservation and Recovery Act

Operational Sustainability Performance Plan

To comply with EO 13514, “Federal Leadership in Environmental, Energy, and Economic Performance,” DHS must adhere to sustainable principles and implement sustainable practices throughout the Agency. In keeping with this mandate, DHS directed all of its components to complete implementation plans known as Operational Sustainability Performance Plans, or OSPPs. The purpose of an OSPP is to outline a series of milestones and objectives that will accomplish the goals of EO 13514. CBP updates the OSPP every year.

CBP’s is currently revising its environmental management policy. The CBP Office of Administration (OA), Facilities Management and Engineering (FM&E), Environmental and Energy Division (EED) plans to issue the revised policy in the fourth quarter of FY2012.

The OSPP lists 8 goals and outlines CBP’s strategy to achieve these goals. Numerous accomplishments related to these goals have already been made. The goals are as follows:

- Goal 1: Scope 1 and 2 GHG Reduction
- Goal 2: Scope 3 GHG Reduction & Inventory
- Goal 3: High-Performance Sustainable Building (HPSB) Design and Regional and Local Planning
- Goal 4: Water Use Efficiency and Management
- Goal 5: Pollution Prevention and Waste Limitation
- Goal 6: Sustainable Acquisition
- Goal 7: Electronic Stewardship Training
- Goal 8: Departmental Innovation

3.7.2 FRAMEWORK FOR CHARACTERIZING RESOURCE IMPACTS

An impact on climate or resource sustainability occurs when an activity:

- Contributes cumulatively to change in regional climate along the northern border;
- Causes substantial emissions of GHG;
- Uses a substantial amount of non-renewable resources; or,
- Is inconsistent with existing climate authority, guidelines, or management plans.

Consideration of whether a CBP activity could have a major adverse impact on climate or resource sustainability would largely be based on determinations made in other resource areas such as emissions of greenhouse gases, impacts to utility systems, or large-scale failure to meet goals in EOs or DHS sustainability initiatives.

3.7.3 ACTIVITIES WITH ENVIRONMENTAL CONSEQUENCES TO CLIMATE CHANGE AND SUSTAINABILITY

This PEIS characterizes climate and resource use across the northern border at a general level. It also analyzes the potential of CBP's proposed actions to contribute to climate change precursors and otherwise impact resource sustainability.

The study area includes portions of the United States within 100 miles of the border and land in Canada within two miles of the border. Due to the nature of climate change, direct climate impacts from CBP activities cannot be measured, would not necessarily occur proximate to the border (on either side), and would by their very nature be combined with other factors and sources. For example, construction projects near the border that cause GHG emissions could potentially contribute to climatic alterations locally, regionally, nationally, or globally.

Activities included within CBP's proposals and alternatives that could contribute to climate change precursors or decreased sustainability of resources include:

- Construction or expansion of facilities, towers, and associated infrastructure;
- Increases in various patrol types that emit GHGs; and,
- Construction of access roads.

3.8 LAND USE

3.8.1 CONTEXT FOR AFFECTED ENVIRONMENT

The study area for land use includes areas in the United States within 100 miles of the border and within two miles of the border in Canada. Land cover and land use classifications are defined by the U.S. Geological Survey (USGS) and Natural Resources Canada (NRC).

Land use classifications reflect a spectrum of levels of more natural preservation versus more human development or resource use related activities at a given location. The spectrum of undeveloped uses to more developed uses roughly progresses as: undeveloped land and water areas (conservation areas, wild lands, parks); military and defense (training areas); resource production and extraction (forestry, mining, or agriculture); culture and recreation; commercial trade and services; transportation and utilities; industrial/manufacturing; and residential. Management plans, policies, and regulations specify the type and extent of land use allowable in specific areas, as well as the protection designated for environmentally sensitive areas.

3.8.1.1 Land Use Management

Some impacts to land use discussed in Chapter 8, Environmental Consequences, are as likely to occur on the Canadian side of the border as on the U.S. side. This is particularly true for impacts that could reduce the suitability of land to support its current or planned use. For example, construction projects along the border that introduce noise and light pollution as well as checkpoints that stop traffic may affect land use activities on both sides of the border. On the other hand, some types of impact, such as direct removal of land from existing uses for CBP-related infrastructure construction, would not be relevant on the Canadian side. The analysis for this PEIS evaluates impacts in Canada within a decreased area (two miles from the border) to

account for only those land uses closest to border activities that may be affected by the CBP activities covered here.

The land use analysis discusses the types of impacts that specific actions within the proposed action and alternatives could cause. It analyzes the potential extent of such impacts given the existing context for the action at the program level, which includes adjacent land use, zoning, regulatory compliance, and extent of physical impacts, among others. It also includes planning guidelines for avoiding, managing, mitigating, or minimizing these impacts.

3.8.1.2 Recreation and Conservation Resource Areas

CBP's law enforcement jurisdiction frequently places its operational activities within areas designated or otherwise used for recreation and conservation purposes. This PEIS's analysis of areas most likely used for recreation in the United States includes lands within the designations listed beneath (government landowner in parentheses, when applicable):

- National park units – national park, national historic park, national parkway, national recreation area, national trail (NPS);
- National scenic byways (DOT);
- Other state parks and recreation lands;
- Parks – city, county, state/state historical, private;
- Recreation areas – national recreation area, recreational trail, scenic area U.S. Forest Service (USFS) or military or national recreation area (DOD);
- Recreation areas (city or state);
- Recreation trails;
- Scenic areas; and,
- Rivers – wild, scenic, and recreational rivers (Bureau of Land Management [BLM] or (USFS).

To identify the lands most likely used for recreation in Canada, this analysis considers the following land owners and designations (government landowner in parentheses, when applicable):

- Game preserves;
- National parks – national park of Canada, national park and historic site, or national park and reserve (Parks Canada Agency);
- Nature parks – natural environment park and nature park (Parks Canada Agency);
- Parks – provincial camping park, provincial park, territorial park, and wilderness park;
- Provincial recreation areas;
- Recreation areas; and,
- Recreation sites.

Together, these land types form the category of recreational land for the land use analysis. The category includes more land than that referenced in Section 3.17 (Recreation), which focuses specifically on major Federal recreation sites.

Recreation also occurs on other land not specifically designated for the activity. For example, wildlife viewing or hiking may be permitted on some conservation or natural areas in the study area. In addition, hunting and snowmobiling may occur on public or private forested land areas. Absent information on the specific distribution of recreational activities across the landscape, this analysis relies on the above categories of land as a low-end estimate of the area in which recreation is likely taking place.

To identify the lands most likely used for conservation in the United States, this analysis combines the following land designations (government landowner in parentheses, when applicable):

- City conservation easement, preserve, or natural areas;
- Conservation easements (USFWS, NPS, or USFS);
- Conservation/natural areas;
- County areas – county conservation easements or preserves, county wildlife refuges or wildlife management areas;
- Ecological preserve or natural areas;
- Ecological reserves (DOD);
- Habitat protection areas (USFS);
- International historic sites (NPS);
- Local land trust easement or land trust preserves;
- National outstanding natural areas (BLM);
- National preserve or natural reserves (NPS);
- National wildlife refuges (USFWS);
- Natural areas (USFS);
- Natural resource management areas;
- Nature Conservancy cooperative managed properties;
- Nature Conservancy fee lands;
- Other NPS protected areas (NPS);
- Private conservation easement/conservation deed restrictions;
- Private institutions—managed for biodiversity;
- Research natural areas (BLM, USFWS, or USFS);
- Research or demonstration areas (USFS);

- State lands – state conservation lands, state ecological reserves, state habitat areas, state managed conservation easements, state natural reserves or preserves, state trust lands, state wetland conservation areas, state wilderness areas, and state wildlife management areas;
- University research and demonstration land;
- Waterfowl production area (USFWS);
- Watershed conservancy land;
- Wilderness area (USFWS, NPS, or USFS);
- Wilderness study area (BLM);
- Wildlife management area (USFWS); and,
- Wildlife protection area (USACE/DOD).

To identify the lands most likely used for conservation in Canada, this analysis considers the following landowners and designations:

- Biodiversity reserve;
- Community pasture;
- Conservancy;
- Conservancy protected area;
- Conservation area or conservation reserve;
- Ecological reserve;
- Exceptional forest ecosystem;
- Fish and Wildlife development fund lands;
- Game sanctuary;
- Grizzly bear sanctuary;
- Habitat of a threatened or vulnerable plant or wildlife species;
- Habitat protection act lands;
- Habitat protection area;
- Heritage area, heritage rangeland, or heritage rangeland natural area;
- Inlet marine, marine park, marine protected area, or national marine park of Canada;
- Migratory bird sanctuary;
- National park reserve;
- National wildlife area;
- Natural area;

- Park reserve;
- Proposed aquatic reserve;
- Proposed biodiversity reserve;
- Protected area;
- Provincial parks of historical, natural environment, nature reserve, waterway, or wilderness class designations;
- Public reserve;
- Special management area;
- Watershed authority lands;
- Waterfowl gathering area;
- Wilderness area, preserve, or reserve;
- Wildlife management area, refuge, preserve, or reserve; and,
- White-tailed deer yard.

3.8.1.3 CBP Responsibilities on Federal Lands

When operating on Federal lands, CBP has responsibilities under several Federal land management laws, including NEPA, the National Historic Preservation Act, the Wilderness Act, and the ESA. CBP must obtain permission or a permit from Federal land management agencies before CBP can maintain roads and install surveillance equipment on these lands. Because land management agencies are also responsible for ensuring compliance with land management laws, CBP generally coordinates its responsibilities under these laws with land management agencies through national and local interagency agreements. The most comprehensive agreement is a 2006 Memorandum of Understanding (MOU) intended to guide CBP's U.S. Border Patrol (USBP) activities on Federal lands (USDHS, 2006). This MOU affirmed CBP's commitment to coordinate efforts in several key areas, including:

- Sharing information regarding border security threats on Federal lands;
- Sharing budget requests, deployment plans, and maintenance plans for infrastructure and technology for use on Federal lands;
- Sharing operational plans, including deployment of staff and resources, changes in staffing levels, and patrol methods that best align with Federal laws to protect the environment and endangered species; and,
- Allowing USBP access to Federal lands and waterways to conduct border security operations, such as tracking and interdicting individuals and installing remote-detection systems, consistent with applicable Federal laws.

In addition, the MOU states, "DHS, DOI and USDA recognize that Border Patrol access to Federal lands can facilitate the rescue of cross-border violators, protect these lands from environmental damage, and have a role in protecting wilderness and wildlife resources." It includes provisions that detail the conditions and processes by which CBP is authorized to

conduct surveillance, pursuit, and apprehension using motorized vehicles in areas not previously authorized for such use (wilderness areas, areas recommended for wilderness designation, or wilderness study areas).

For projects on non-Federal lands, CBP will comply with state or local land use regulations where applicable or where not specifically preempted from doing so, as long as such compliance does not impede execution of its congressionally mandated mission.

3.8.1.4 Consistency with Enforceable Policies of the Coastal Zone Management Act

The National Oceanic and Atmospheric Administration (NOAA) Office of Ocean and Coastal Resource Management administers the Coastal Zone Management Act (CZMA) of 1972, 16 U.S.C. §1451 et seq. with the goal of providing management of the Nation’s coastal resources, including the Great Lakes, and balancing economic development with environmental conservation. The CZMA outlines two national programs: the National Coastal Zone Management Program (CZMP) and the National Estuarine Research Reserve System. State coastal programs balance competing land and water issues in the coastal zone, while estuarine reserves serve as field laboratories to provide a greater understanding of estuaries and the human impact on them. The CZMP does not create any new Federal regulatory authority, nor does it mandate the adoption of any additional state regulations. The overall program objectives, as expressed in Section 303 of the Act (16 U.S.C. § 1452), are to “preserve, protect, develop, and where possible, to restore or enhance the resources of the nation’s coastal zone.”

Section 307 of the Act (16 U.S.C. §1456) requires that Federal agency activities be consistent to the maximum extent practicable with the enforceable policies of an approved management program. The consistency requirement is an important mechanism to address coastal impacts, ensure Federal consideration of state management programs, and avoid conflicts between states and Federal agencies by fostering early consultation and coordination. The Federal regulations implementing Section 307 are found in 15 C.F.R. Part 930.

A Federal activity is any development or function performed by or for a Federal agency, and requires a “Federal consistency determination.” The determination describes the activity and whether that activity affects coastal resources within a state’s coastal zone as defined for the purposes of the CZMA. If the activity does affect coastal resources, a statement must be provided stating that the activity is consistent, to the maximum extent practicable, with the enforceable policies in the relevant state laws.

3.8.2 FRAMEWORK FOR CHARACTERIZING RESOURCE IMPACTS

This PEIS characterizes land uses across the northern border at a general level and analyzes potential land use impacts by integrating the following land cover and landownership classifications:

- Land cover – developed, cultivated crops, forested, pasture/hay, barren, snow/ice, open water;
- Public and other non-private land ownership – by Federal agency, Canadian National Parks and Indian Reservations, and state; and,

- Designations of CBP facilities and identification of cities with populations in excess of 250,000 residents.

There is the potential for a land use impact to occur when an activity:

- Disrupts an existing or planned land use;
- Reduces the land's suitability to support its current or planned use;
- Constitutes a fundamental change in land use;
- Is inconsistent with existing land use authority, guidelines, or management plans; and,
- Is incompatible with plans and management objectives of adjacent areas under the control of other entities.

3.8.3 ACTIVITIES WITH ENVIRONMENTAL CONSEQUENCES TO LAND USE

Activities considered with the proposal and alternatives of this PEIS that could affect land use are grouped into three general categories (construction, operation, and maintenance) and may include, but are not limited to, the activities below:

- Construction of:
 - Extensions, upgrades, or repairs of access roads, fences, drag roads, bridges, culverts, and low-water crossings;
 - New BPSs, FOBs, communications towers, and air and marine operational facilities;
 - Installation of communications or surveillance towers and associated infrastructure;
 - Modifications/upgrades of existing POEs, BPSs, hangars, and other facilities in support of CBP operations; and,
 - Set up of permanent traffic checkpoints.
- Operational activities including:
 - Increases in various patrol types when they compete with recreational value for existing use; and
 - Ground surveillance/patrols and situational response activities (including motorized and nonmotorized, on-road and off-road, snowmobiles, canine and horseback patrols);
 - Set up/operation of mobile traffic checkpoints;
 - Use of UGS and other technology;
 - Aircraft surveillance/patrols and situational response activities (manned and unmanned);
 - Maritime surveillance/patrols and situational response activities; and,
 - Implementation and deployment of RVSS, MSS, CASC, and OIC.
- Operations at fixed facilities including:

- Routine activities at POEs including agricultural inspections;
 - Continued standardizing and modernizing of the OAM fleet;
 - Use of nonintrusive/nondestructive inspection and detection technologies;
 - Operation of small-arms weapons training ranges; and,
 - Enforcement of I-68 Canadian Border Boat Landing Program for recreational boaters.
- Maintenance and repair of all of the above.

Land use analysis in areas proposed for site-specific projects would be carried out at a narrowly defined geospatial level, providing information on specific types of human activities (mining, silviculture, zoning-level uses) within the broad categories considered.

3.9 AESTHETIC AND VISUAL RESOURCES

3.9.1 CONTEXT FOR AFFECTED ENVIRONMENT

Visual resources include those features that define the visual character of an area: natural features, vistas, or viewsheds, and even urban or community visual characteristics that include architecture, skylines, or other characteristics. Visual resources and aesthetics are important because of their unique qualities and the responses they inspire in human beings. This section provides the analytical tools to conduct a precise visual impact assessment for future site-specific projects or activities; it also offers examples of the types of landscapes that exist along the northern border. It does not characterize every potential vista or visual landscape along the entire northern border, but provides guidelines for minimizing, mitigating, or avoiding such impacts. This section:

- Characterizes the visual landscape types that could be affected by CBP's No Action Alternative and action alternatives;
- Describes the types of landscapes most sensitive to visual impacts (wilderness areas, recreation areas, etc.); and,
- Characterizes various viewer/user groups based on the context in which they could experience visual impacts.

Developed over 30 years ago, the BLM's Visual Resource Management (VRM) system is a tool that provides a way to identify and evaluate the aesthetic value of an area and analyze a project's potential impact on the visual resources of that area (See Appendix G for more detailed information). BLM's VRM system assigns visual resource classes to public lands to provide:

- (1) an inventory tool that portrays the relative value of the visual resources; and,
- (2) a management tool that portrays the visual management objectives for the affected resources (USDOI, 2012).

For the purposes of this PEIS, BLM's VRM classification system was used as basis for defining the aesthetic value of an area and the potential impact of a project on a visual resource.

3.9.1.1 Affected Landscapes and Visual Resources

Four broadly defined landscapes occur within the potential settings of the proposed project: natural, rural, urban, and industrial (USDOT, 1999).

Natural Landscapes

Natural landscapes are those in which natural landforms and vegetation predominate, and signs of human activity are not apparent (USDOT, 1999). Coastlines, water bodies, mountains, and areas of varied relief are the most striking and tend to be the most conspicuous. Some natural landscapes are designated specifically for outdoor recreation. BLM, USFS, USFWS, NPS, and state and local parks own most of these recreational lands.

The “natural lightscape” or “night sky” is often a specific aspect of a natural landscape. The U.S. Department of the Interior (DOI) defines a “natural lightscape” as an environment that is undisturbed by light and air pollution. (See Chapter 3.2 for discussion of air pollution in Class I areas). As defined by the NPS, such places or environments are “characterized by the natural rhythm of the sun and moon cycles, clean air, and of dark nights unperturbed by artificial light” (USDO, 2007a).

“Natural lightscapes” have natural, cultural, and scenic importance. Animals often depend on darkness in order to hunt, conceal their location, navigate, or reproduce, and for nocturnal animals, light pollution is a disruption in habitat. Additionally, plants can be affected by artificial light because it disrupts their natural cycles. Dark night skies are also culturally important because they are a resource common to all cultures (USDO, 2012).

Rural Landscapes

Rural landscapes include features such as croplands, orchards, fields, fences, and farm-related structures (USDOT, 1999). While border POEs and BPSs along the northern border tend to be in rural, less densely populated areas well outside of major cities, the majority of the population in the study area lives in larger, more densely populated centers. Agricultural areas are predominantly flat or have gently rolling hills; these landscapes tend to be restricted to valleys and lowlands, and they are not typically found at higher elevations or in areas with complex topography. Native vegetation is often found in confined areas where land is steep or soils are unproductive. Views may extend for some distance, with vertical elements typically consisting of relatively low farm buildings, silos, water towers, utility poles, fencing, and trees. Distinct geometric patterns, such as rectangular or circular fields and property boundaries divided by section lines, may characterize the landscape. Towns are small and have relatively low skylines. In general, the few structures in such areas can be of aesthetic interest. Agriculture greatly influences the landscape, and land use groups can sometimes categorize different agriculture practices. Other rural areas include forests or deserts, which are influenced by roadways, the presence of small towns, and land-clearing activities, such as timber harvesting, strip mining, ski areas, and large reservoirs.

Urban Landscapes

Urban landscapes represent only a fraction of the Nation’s entire land area, but are the dominant visual environment of roughly three-quarters of the American population (USDOT, 1999). Residential and suburban areas represent much of the urban landscape, with centralized primary

commercial centers and business districts defining the most dominant visual characteristics. The scale of development in major urban areas is large and dominated by structures, highways, infrastructure, and trees. Most urban landscapes are clustered around areas of usable natural resources, such as waterways.

Industrial Landscapes

Heavy and light industrial landscapes tend to be scattered, situated in specific zones or districts such as along roads and waterfronts or near airports. The relative presence of industrial landscapes varies among the regions and states along the northern border.

Industrial Plant on River



Source: (USDOJ, 2008).

3.9.1.2 Areas with High Visual Sensitivity

Visual sensitivity refers to the level of viewer awareness and the value placed on a particular scene. The VRM system applies a sensitivity rating to a tract of land according to the level of public concern for scenic quality or visual appeal. Some areas have a high degree of visual sensitivity, usually due to their unique visual features or to their use by recreational users. Highly sensitive areas are significant to the general public. In these areas, most modifications to the visual environment would result in a major significantly adverse impact, and any visual impact should be avoided or mitigated if possible. Natural areas with Federal or state protection often fall into this category. Recreational users of public lands have expressed concern about visual impacts stemming from CBP activities (USDHS, 2010a). Among the northern border regions, the WOR Region has a greater amount of public land sensitive to visual impacts than do the other regions.

The following is a list of managed land types with high visual sensitivity:

- National Landscape Conservation System lands;
- Units of the NPS;
- Areas of critical environmental concern;

- Wildlife refuges;
- Wild and scenic rivers;
- Wilderness areas;
- Wildlife management areas;
- Special recreation management areas;
- Areas allocated in existing land use plans to maintain wilderness characteristics or to have right-of-way avoidance or exclusion;
- Wildlife movement corridors;
- Areas for which an agency or organization is committed to take certain actions with respect to sensitive species habitats;
- Backcountry byways;
- National Scenic Byways;
- Areas of known tribal concerns; and,
- Areas with a known high density of cultural sites.

3.9.1.3 Affected User Groups

Specific viewer groups within the study area can gauge viewer sensitivity and assure the selection of appropriate, representative viewpoints during the visual impact evaluation. While POEs and BPSs along the U.S.-Canada border are generally in rural, less densely populated areas outside of major metropolitan areas, most of the population in the study area lives in larger population centers. The following four categories of viewer/user groups were identified within the study area: commuters and through travelers, local residents, business employees, and recreational users.

Commuters and Through Travelers

These viewers pass through the study area on a regular basis in automobiles on their way to work or other destinations. On most roads within the study area, the views are from street level. Typically, drivers have limited views of CBP infrastructure and activity, except at locations where CBP actions cross the road. Commuters and through travelers are typically moving, have a relatively narrow visual field due to roadside vegetation or structures, and generally are preoccupied with traffic and navigating the roadways. For these reasons, commuters and through travelers' perception of (and sensitivity to) visual quality and changes in the visual environment are likely to remain relatively low. Passengers in moving vehicles, however, have greater opportunities for off-road views of a project than do drivers.

Local Residents

These individuals may view the proposed actions from stationary locations, such as yards and homes, and while driving along local roads. The sensitivity of residents to visual quality varies and may be tempered by a viewer's exposure to existing CBP actions and infrastructure and other visually-varied features already in existence. Presumably, most residents will be highly sensitive to changes in the landscape viewable from their homes and neighborhoods. CBP also

considers visual impacts to Native American sacred sites and trust resources before carrying out a project.

Business Employees

These individuals work at local businesses, primarily in the commercial portions of the study area. Business employees will generally experience limited views of the actions being considered in the alternatives, except at road crossings while driving to work or where CBP infrastructure and activity occurs near their place of employment. Most business employees work in one- or two-story structures that may or may not have outside views. Those with views often look out on numerous, often varied, built features, and the employees within buildings are focused on their jobs. For these reasons, business employees are not likely to be sensitive to landscape changes.

Recreational Users

This group generally includes local residents and tourists involved in outdoor recreation at local parks, recreational facilities, and natural areas: hikers, bicyclists, joggers, and those involved in more passive activities (e.g., picnicking, walking, and nature observation). Scenery and visual quality may or may not be an important part of the recreational experience for these viewers. In general, recreational enjoyment is almost always enhanced by a setting that has not been visually degraded. For some recreational users, scenery may constitute a very important part of their experience, and their activities may afford continuous views of landscape features over relatively long periods of time. Such viewers are likely to have a high appreciation for visual quality and a high sensitivity to visual change.

3.9.2 FRAMEWORK FOR CHARACTERIZING RESOURCE IMPACTS

3.9.2.1 Analysis Methodology

Aesthetic judgment, especially related to landscape views, is often subjective. BLM's VRM places lands into one of four visual resource inventory classes that represent their relative visual value. Visual resource inventory classes are assigned a Class I – IV through the inventory process.

Class I is assigned to those areas where a management decision has been previously made to maintain a natural landscape. This includes areas such as national wilderness areas, the wild section of national wild and scenic rivers, and other congressionally and administratively designated areas where decisions have been made to preserve a natural landscape. Classes II, III, and IV are assigned based on a combination of scenic quality, sensitivity level, and distance zones.

- Scenic quality is a measure of the visual appeal of a tract of land. The visual resource inventory process assigns a numeric value to each of seven key factors: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. The values are totaled and correspond to a rating of A (16 or more) having the greatest scenic quality, B (12-16), or C (11 or less). It is important to note that all lands have scenic value, but areas with the most variety and most harmonious composition have the greatest. Another important concept is that the evaluation of scenic quality is done in relationship to the natural landscape. This means that man-made features may not

necessarily detract from the scenic value of the landscape, but instead enhance the scenic value, if complimentary to the landscape (USDOJ). Natural landscapes are typically rated “A” for scenic quality and urban and industrial landscapes “C”.

- Sensitivity levels are a measure of public concern for scenic quality. The BLM visual resource inventory process assigns lands as having high, medium, or low sensitivity levels by analyzing the various indicators of public concern. Factors considered include: type of users, amount of use, public interest, adjacent land uses, and special areas. Frequently, areas with a “high” visual sensitivity rating would also have a high scenic quality rating (“A”). Natural landscapes fall into this category.

BLM describes their objectives for visual resource classes as follows:

- Class I Objective - To preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention. Natural landscapes fall into this class.
- Class II Objective - To retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- Class III Objective - To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- Class IV Objective - To provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements (USDOJ). Urban and industrial landscapes usually fall into this class because major changes to the visual environment can occur without major impacts to the visual environment or viewer groups due to their existing dominant visual features.

Visual resource inventory classes, scenic quality ratings, and visual sensitivity levels are referenced throughout the remainder of this document. Delineation of distance zones was not incorporated outside of boundaries already defined for resources by their associated land management units.

3.9.2.2 Impact Definition

Aesthetic impact occurs when there is a detrimental impact on the perceived character of a place or structure. A major aesthetic impact is one that may diminish public enjoyment and appreciation of an inventoried resource or that impairs the character or quality of such a place. Using the concepts noted, this analytic approach assumes that a project or activity would create an adverse visual impact if it:

- Has a substantial adverse impact on a scenic vista (e.g., constructing towers in a wilderness viewshed);
- Substantially damages scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings (e.g., creating cleared right-of-way in scenic areas);
- Substantially degrades the existing visual character or quality of the site and its surroundings (e.g., constructing a FOB in a protected forest); or,
- Creates a new source of substantial light or glare (e.g., locating new or substantially upgraded facilities in an area that previously did not have a significant amount of light or glare).

Impacts of project activities will be based on their:

- Effects on scenic resources;
- Effects on views;
- Modifications of the visual setting;
- Level of contrast of the project to the setting and the dominance of change within the setting; and,
- Consistency with Federal and state land management standards and guidelines.

3.9.2.3 Visual Feature Considerations

Certain characteristics of both a feature and the surrounding area can affect the visual impact of the feature. The characteristics evaluated here are magnitude, distance, and competing interests. Their definitions and impacts are as follows:

- The magnitude of a visual impact results from the dominance of a feature and its interpretation by the viewer, or how much attention the feature attracts. The landscape type and scenic quality, viewer group, and distance between potential viewers and the feature or action jointly determine the impact level.
- Distance affects the degree of contrast an object has with the surrounding landscape. An object loses much of its identity with greater distance. Irregular skylines are more complex and tend to mask the appearance of an added element, such as a tower.
- A competing interest exists when a feature of strong visual interest is included within the view of a proposed action. Such features commonly include farm buildings, dominant mountain crests, and lakes. Competing interests are not necessarily directly adjacent to visual features but depend on the viewer's angle. The visual impact of any single feature

or action declines if the landscape contains many competing interests or irregular skylines, such as urban, industrial, or mountainous natural landscapes.

These photos provide a general illustration of how competing interest and structure can decrease the visual impact of a tower (left) or increase the visual impact by drawing attention (right)



Source: (Arizona Republic, 2007; Rapp News, 2010).

3.9.3 ACTIVITIES WITH ENVIRONMENTAL CONSEQUENCES TO AESTHETIC AND VISUAL RESOURCES

Examples of activities that could create visual impacts include:

- Constructing, upgrading, renovating, or relocating facilities that would degrade a wilderness viewshed or introduce new sources of light and glare;
- Creating cleared rights-of-way (ROW) in scenic areas for creation or expansion of infrastructure; and,
- Constructing or installing technology or infrastructure that would degrade protected forested cover within a viewshed.

3.10 SOCIOECONOMIC RESOURCES

3.10.1 CONTEXT FOR AFFECTED ENVIRONMENT

The study area includes areas in the United States and Canada within 100 miles of the border. Some socioeconomic impacts are as likely on the Canadian side of the border as on the U.S. side. For example, time delays at border crossings may affect populations and businesses on both sides of the border. In addition, much of the economic activity in U.S. border regions involves cross-border movement of people and goods; therefore, this PEIS considers the impacts of CBP activities on Canadian socioeconomic resources as well as on those of the United States. The impacts of CBP actions on communities and regional economies in Canada are most likely felt closest to the border. However, since it is not possible to delineate precisely how far beyond the border an impact may extend, this report provides information on the area up to 100 miles north

of the border, mirroring the study area in the United States. This definition of the study area does not suggest that impacts would be equivalent in Canada and in the United States.

Two approaches characterize the relevant socioeconomic resources across each border region:

- A series of tables and maps with accompanying text describing relevant statistics from the U.S. and Canadian censuses and publicly available information on regional economies with the following data for each border region:
 - Population level and distribution;
 - Recent population growth or decline;
 - POEs and BPSs within population centers (defined as metropolitan statistical areas (MSAs) in the United States and census metropolitan areas in Canada);
 - Median household income;
 - Poverty rates;
 - Unemployment; and,
 - Median property values.

The tables and accompanying text present these data for areas (i.e., census tracts or counties) that fall within the border region as well as the broader state/province and nation for comparison.

- Demographic and economic profiles of a subset of POEs within each region. These sites include the major POEs (“major” is defined by annual vehicle crossings), as well as POEs with distinctive characteristics (e.g., sites that include ferry crossings or represent a significant level of trade value). These profiles mix qualitative and quantitative information, including:
 - Total border crossings;
 - Trade value of imports and exports;
 - Key industries operating within the POE counties; and,
 - Key activities constituting POE traffic.

3.10.2 FRAMEWORK FOR CHARACTERIZING RESOURCES IMPACTS

A socioeconomic impact may be caused by an activity that:

- Disrupts the flow of goods, services, and people across the border;
- Disrupts the social fabric of border communities;
- Changes regional income or employment levels, directly or indirectly;
- Affects population levels or population distribution;
- Changes a population’s demographics;
- Limits the level or quality of regional economic activity (e.g., by reducing the opportunity for regional development or degrading land used for recreation); or,

- Reduces property values or otherwise affects housing markets.

3.10.3 ACTIVITIES WITH ENVIRONMENTAL CONSEQUENCES TO SOCIOECONOMIC RESOURCES

CBP activities that could result in one or more types of socioeconomic impact include:

- Construction or expansion of facilities (POEs, BPSs, etc.);
- Installation of communication or surveillance towers and associated infrastructure;
- Construction of new traffic checkpoints;
- Installation of pedestrian or vehicle fences or barriers;
- Construction of access roads through undisturbed areas; and,
- Increases in various patrol types.

3.11 CULTURAL AND PALEONTOLOGICAL RESOURCES

3.11.1 CONTEXT FOR AFFECTED ENVIRONMENT

For each state along the northern border, a document and literature search was conducted to develop prehistoric (precontact) and historic contexts. Notable resources within the 100-mile corridor are presented on the macro-level without enumerating specific resources, sites, or listed properties. Information about the potential location of Native American cultural resources, sacred sites, and traditional cultural properties (TCP) is based on the geographic location of Native American groups, both historically and in the present, and an overview of the current understanding of paleontological site probability in the WOR Region. Appendix H provides information on the cultural context and history of CBP's operational area along the northern border, which offers a basis for the relevant sections that follow.

3.11.2 FRAMEWORK FOR CHARACTERIZING RESOURCE IMPACTS

Impacts to cultural and paleontological resources include demolition of structures listed on or eligible for listing on the National Register of Historic Places, introduction of visual intrusions to historic landscapes, and complete or partial destruction of archaeological sites, TCPs, or paleontological deposits. Impacts to historic buildings, structures, objects, or collections of above-ground resources can range from negligible to major, depending on whether the proposed design affects the historical integrity or setting of the historic property. This analysis defines impacts as negligible, minor adverse, moderate adverse, major or beneficial.

Impacts on cultural resources could be significant if a proposed undertaking directly (physically) affects properties listed, or eligible for listing, in the National Register of Historic Places. The level of impact could range from negligible to major depending on the type of resource identified. Impacts on above-ground resources could also range from negligible to major depending on whether a proposed undertaking affects the visual setting or viewshed of a historic property.

3.11.3 ACTIVITIES WITH ENVIRONMENTAL CONSEQUENCES TO CULTURAL AND PALEONTOLOGICAL RESOURCES

CBP actions that could potentially affect cultural or paleontological resources include facility expansion, new construction, installation of detection and communication towers, as well as destructive activities, such as tunnel demolition. The specific components of the action alternatives with the greatest potential for impacts on cultural and paleontological resources could range from minor to major adverse in some cases, or beneficial in others. These include:

- Construction, modification, or repair of POEs, BPSs, OAM bases, training facilities, or permanent traffic checkpoint facilities;
- Construction of roads, fences, barriers, and related infrastructure;
- Installation of remote video surveillance systems (RVSS);
- Installation of detection and communication towers;
- Remediation of illegal tunnels; and,
- Installation of unattended ground sensors.

In general, CBP's day-to-day operations do not have a direct physical impact on cultural or paleontological resources, nor do they produce a permanent visual change in the viewshed of cultural resources. CBP's day-to-day operations activities include but are not limited to processing of visitors, cargo inspection, canine enforcement teams, fraud prevention, aerial surveillance, line-watch operations, ground patrols, and aircraft, watercraft and vehicle maintenance.

3.12 ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

3.12.1 CONTEXT FOR AFFECTED ENVIRONMENT

3.12.1.1 Definitions of Affected Populations

For this assessment, the following definitions apply to the relevant environmental justice populations:

- **Minority Populations:** To assess environmental justice under NEPA, the CEQ defines a minority population as one in which the percentage of minorities exceeds 50 percent or is meaningfully greater than the minority population percentage in the general population (or some other appropriate unit of geographic analysis) (CEQ, 1997). Individuals are categorized as minority if they identify themselves as belonging to any of the following protected groups: Hispanic (may include individuals of any other category); Black or African American (not of Hispanic origin); American Indian or Alaska Native; Asian, Native Hawaiian, or Other Pacific Islander. If individuals select multiple categories to reflect their ethnic or racial origins, they are considered minority if any one of the categories is among the recognized minority groups. For the Canadian portions of the study area, Aboriginal Peoples are also included in the minority category. Recognized by the Canadian Constitution, Aboriginal Peoples are descendants of the original inhabitants of North America and include Indians (commonly designated First Nations), Métis, and

Inuit populations. According to the 2006 Census of Canada, more than one million people identify themselves as Aboriginal Peoples (INAC, 2010).

- **Low-income Populations:** Identification of low-income populations in an affected area is based on the statistical poverty thresholds established by the U.S. Census Bureau (USCB) population reports on income and poverty. According to the CEQ (1997), a community is either a group of individuals living near one another, or a set of individuals (such as migrant workers or Native Americans) irrespective of geographic proximity; either group may experience common conditions of environmental exposure or effect. For the Canadian portions of the study area, a comparable rate for the poverty threshold is defined on the basis of the percentage of “low-income” persons in a geographically defined area or a set of individuals.

The Census determination of the poverty threshold is based on a comparison of the person’s total family income with the poverty threshold appropriate for that person’s family size and composition. If the total family income is less than the appropriate threshold, then the individual and all family members are considered below the poverty line. For individuals who do not live with family members, their personal income is compared with the appropriate threshold (USDOC, 2003).

- **Children:** As defined by the USCB, children are unmarried individuals under the age of 18 years (USDOC, 2003). This category may be further subdivided to include especially susceptible populations, including children less than 5 years of age and children 5 to 14 years of age.

3.12.1.2 Study Area and Analysis Methods

The study area for evaluating environmental justice impacts and environmental health and safety risks to children includes those border communities in or overlapping the geographic area within 100 miles of the U.S.-Canada border. The administrative boundaries of U.S. counties define the border communities. For the study area in Canada, Canadian census divisions define the border communities. For this assessment, the study area for environmental justice impacts includes the entire set of border communities on either side of the international line. The study area is further subdivided into four separate regions, with each described separately.

Analysis of environmental justice impacts begins with identification of minority and low-income populations as a percentage of the general populations for the study areas in each border state. The description of the affected environment is presented as a series of comparison tables showing relevant minority and income statistics for these areas. Age distributions for the general population of each study area and its respective state are presented in detail for the entire study area for persons less than 18 years of age in the United States and for persons less than 20 years of age in Canada. Specific areas where minority or low-income populations represent a high percentage of the affected population are noted.

The analysis then considers potential impacts to all resource areas associated with the specific actions proposed under all alternatives. Environmental justice impacts would occur if a given activity results in potentially high and adverse impacts on the natural or human environment that disproportionately affect minority communities (including Native Americans or Aboriginal

Peoples in Canada) and low-income populations, or if it created a disproportionately high and adverse risk to human health or safety for children in the resident populations.

3.12.2 FRAMEWORK FOR CHARACTERIZING RESOURCE IMPACTS

Examining potential consequences of the proposed action for environmental justice requires three main components:

- A demographic assessment of the affected community to identify the presence of minority or low-income populations potentially affected;
- An assessment of all identified potential impacts to determine if any cause significant adverse impact to the affected environment; and,
- An integrated assessment to determine whether any disproportionately high and adverse impacts exist for minority and low-income groups in the study area.

For an environmental justice impact to occur, the human health or environmental consequences must be adverse, high, and disproportionate. CEQ guidance for establishing disproportionately high and adverse impacts includes the following criteria (CEQ, 1997):

- For human health impacts, assessing whether:
 - The impacts—including bodily impairment, infirmity, illness, or death—are significant or above generally accepted norms;
 - The risk or rate of hazard exposure by a minority population, low-income population, or Native American Tribe to an environmental hazard is significant and appreciably exceeds, or is likely to appreciably exceed, the risk or rate to the general population or another appropriate comparison group; and,
 - The impacts occur in a minority population, low-income population, or Native American Tribe affected by cumulative or multiple adverse exposures to environmental hazards.
- For environmental impacts, assessing whether:
 - There is or will be an impact on the natural or physical environment—ecological, cultural, human health, economic, or social—that significantly and adversely affects a minority population, low-income population, or Native American Tribe when that impact worsens the impacts on the natural or physical environment;
 - The environmental impacts are significant and are, or may be, having an adverse impact on minority populations, low-income populations, or Native American Tribes that appreciably exceeds, or is likely to appreciably exceed, those on the general population or another appropriate comparison group; and,
 - The environmental impacts occur, or would occur, in a minority population, low-income population, or Native American Tribe affected by cumulative or multiple adverse exposures to environmental hazards.

If a particular action is not expected to affect the general population at all, or its potential impacts are considered low for all populations, it is eliminated from further consideration as a part of this

analysis. If high and adverse impacts to the general population are identified for a particular resource area, or if a given resource area is likely to have a disproportionately high potential to affect minority or low-income communities despite minor impacts on the larger population, the potential for impact is based on the proximity of the minority or low-income community to the impact source.

This analysis does not attempt to predict environmental justice impacts for a given CBP activity or for the program as a whole. Rather, it addresses the types of impacts that relevant actions could produce on minority and low-income communities. It addresses the potential severity of these impacts in the context of site-specific circumstances. Environmental justice analysis for actions included here is necessarily site-specific; that is, the direct impacts of these actions affect resident populations at the specific locations where the actions occur and not at the larger regional or national level. As a result, evaluating individual actions on a site-specific basis through tiered Environmental Impact Statement (EIS) and Environmental Assessment (EA) processes proves more effective.

Major issues related to the actions proposed under the alternatives in this PEIS include those that might differentially affect minority and low-income populations or children, including potential risks to human health or safety near the proposed action. Impacts from any of the alternatives may also include the potential for these populations to become displaced, suffer a loss of employment or income, or otherwise experience adverse social effects.

3.12.3 ACTIVITIES WITH ENVIRONMENTAL CONSEQUENCES TO ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

Types of CBP actions that could produce environmental justice impacts include:

- Expansion of POEs, BPSs, OAM bases, and training facilities;
- Construction of new POEs, BPSs, aircraft operations, or other facilities in or close to minority or low-income communities or tribal lands;
- Upgrades, expansions, or renovations of existing facilities in minority or low-income communities;
- Installation of communications or surveillance towers and associated infrastructure; and,
- Construction of infrastructure in or passing through minority or low-income communities.

3.13 HUMAN HEALTH AND SAFETY

3.13.1 CONTEXT FOR AFFECTED ENVIRONMENT

The analysis of the affected environment includes a broad overview of all CBP activities that could impact human health and safety. Information is provided on the types of training for all CBP agents, covering land and water patrols, interdictions, inspections, weapons handling, contraband seizures, and emergency preparedness. The analysis also includes safety and environmental compliance measures used by CBP firing ranges. It considers CBP techniques and safety procedures regarding canine and horse training, the use of radiation technologies by CBP, and operation of electro-magnetic field (EMF)-emitting communications facilities and

nonintrusive inspection (NII) technology relating to human health and safety. Regulatory requirements related to human health and safety (such as adherence to Occupational Safety and Health Administration [OSHA] standards) are also covered.

This PEIS assesses potential impacts to human health and safety from ongoing and future CBP activities. At the programmatic level, the discussion is necessarily broad, with impacts based on where specific activities take place and which technologies are used. Both beneficial and adverse impacts are discussed (e.g., prevention of terrorist attacks from CBP patrol/interdiction would obviously be a significant beneficial impact).

3.13.2 FRAMEWORK FOR CHARACTERIZING RESOURCE IMPACTS

The types of potential adverse impacts to human health and safety that could result from situations incidental to or stemming accidentally from CBP activities are:

- Death;
- Injury;
- Illness;
- Disability;
- Increased risk of exposure to a source of illness; and,
- Increased risk of exposure to unknown health risk factors.

Health and safety impacts from CBP activities may be:

- Long-term and chronic;
- Acute and severe;
- Unforeseen or unknown; and/or,
- Unable to be avoided, remedied, cured, or alleviated to the point of manageability.

3.13.3 ACTIVITIES WITH ENVIRONMENTAL CONSEQUENCES TO HUMAN HEALTH AND SAFETY

The description of human health and safety risks and impacts along the northern border is driven by the types of impacts CBP's actions have produced in the past and have the potential to produce in the future. The significance of an impact to human health and safety depends on the type of and frequency of an activity along with the incidence of accidents or exposures occurring. Information is limited to the previous ten years for all CBP activities. This information is used to extrapolate the frequency and types of accident and exposure incidence that could occur from ongoing and future CBP activities. The use of weaponry, vehicles, checkpoints, horses, radiation technologies, construction of EMF-emitting communications infrastructure, and other pursuits present different types of human health and safety considerations and different levels of risks to CBP agents and officers versus those to the general public.

3.14 HAZARDOUS AND OTHER REGULATED MATERIALS

3.14.1 CONTEXT FOR AFFECTED ENVIRONMENT

Hazardous materials are materials that are capable of posing an unreasonable risk to health, safety, and prosperity. Hazardous materials can be classified into roughly three categories:

- Hazardous or regulated substances (HRS);
- Hazardous or regulated waste (HRW); and,
- Special hazards.

The resources described in this section are categorized as follows:

- Hazardous materials include cleaners and solvents; petroleum, oils, and lubricants; fuels; and other hazardous materials; and,
- Hazardous wastes include used cleaners and solvents; used petroleum, oils, and lubricants; fuel wastes; and other hazardous wastes.

This section does not characterize every potential hazardous material or hazardous waste within the entire northern border. It provides the analytical tools to conduct a specific impact assessment for future site-specific projects or activities, and it gives examples of the types of hazardous materials and hazardous wastes that exist along the northern border. It analyzes how, in which settings, and to what extent the various CBP alternative actions might create impacts related to hazardous materials and hazardous wastes, and provides guidelines, as necessary, for minimizing, mitigating, or avoiding such impacts.

3.14.1.1 Hazardous Substances

Any substances that are considered severely harmful to human health or the environment may be classified as “hazardous.” Hazardous substances take many forms. Many are commonly used substances that are harmless in their normal uses but that are quite dangerous when released. They are defined in terms of those substances either specifically designated as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as the Superfund Law, or those substances identified under other laws (USEPA, 2011a). A great deal is known about hazardous substances and their effects. This information helps responders act quickly and safely in order to reduce the risks from emergency situations (USEPA, 2011b).

Hazardous substances considered in this study fall in the following categories: cleaning solvents; petroleum, fuel, oils, and lubricants; munitions, munitions constituents, and explosive materials; and other hazardous substances.

Code of Federal Regulation Hazardous Materials Definition

Hazardous materials are defined by 49 CFR 171.8 as “hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in 49 CFR 172.101 Hazardous Materials Table, and materials that meet the defining criteria for hazard classes and divisions in 49 CFR 173.”

Cleaning Solvents

Cleaning solvents are fabricated chemicals used in cleaning products, primarily for the industrial community. Cleaning solvents can be found in degreasers, carpet-cleaning solutions, dry-cleaning products, soaps, polishes, and lubricants.

Petroleum, Fuel, Oils, and Lubricants

Petroleum products are used throughout the study area for various functions, including aircraft maintenance and aircraft ground equipment maintenance. Fuels (e.g., jet fuel, diesel, and gasoline) are stored in large storage tanks. Oil and fuel spills can result from leaking vehicles, aircraft, or storage tanks (USDHS, 2008a).

Motor oil contains inherent toxic chemical and additive properties that are hazardous to humans, plants, and animals. In addition, used motor oil picks up additional toxic elements from vehicle engines. Prompt attention is given by CBP to vehicle oil leaks as a means of preventing environmental motor oil contamination. If a leak or spill occurs, it is cleaned up prior to a rain event to avoid dispersion. Spills of hazardous wastes or materials, including any affected soil or water, should be stored as hazardous waste and disposed of properly.

Munitions, Munitions Constituents and Explosive Materials

As a law enforcement component, CBP agents and officers use and train with a variety of small-caliber weapons and ammunition. During the course of daily inspection and interdiction activities, caches of ammunition and explosive materials are identified, confiscated, and destroyed or stored as evidence. The type of material encountered may be likened to munitions and explosives of concern (MEC) classified in the military as discarded military munitions (DMM), unexploded ordnances (UXO), or munitions constituents (MC). This includes ammunition products and components such as confined gas, liquid, and solid propellants; explosives; pyrotechnics; chemical and riot control agents; smokes and incendiaries; bulk explosives; rockets; bombs; warheads; mortar rounds; and a variety of other military grade munitions, demolition charges, and devices and components thereof.

Other Hazardous Substances

A number of common construction materials are considered to be hazardous substances when spilled or leaked. These materials include concrete curing compounds, asphalt products, paints, stains, wood preservatives, roofing tar, and palliatives.

3.14.1.2 Hazardous Waste

Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA) as a solid waste, or combination of solid wastes, that because of its quantity, concentration, or physical, chemical, or infectious characteristics may:

- Cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or,
- Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Hazardous wastes fall into two categories: characteristic wastes and listed wastes. Characteristic hazardous wastes are materials that are known or tested to exhibit a hazardous trait such as ignitability (i.e., flammable), reactivity, corrosiveness, and toxicity. Listed hazardous wastes are materials specifically listed by USEPA or a state regulation as a hazardous waste. Hazardous wastes listed by EPA also fall into two categories:

- Process wastes from general activities (F-listed) and from specific industrial processes (K-listed); and,
- Unused or off-specification chemicals, container residues, and spill cleanup residues of acute hazardous waste chemicals (P-listed) and other chemicals (U-listed).

These wastes may be found in different physical states as gases, liquids, or solids. Furthermore, a waste is deemed hazardous if it cannot be disposed of by common means like other byproducts of our everyday lives. Depending on the physical state of the waste, treatment and solidification processes might be available. In other cases, however, there is not much that can be done to prevent some degree of harm (Leonard, 2009).

Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes, and their associated regulatory requirements are specified in 40 CFR 273. Four types of waste are currently covered under the universal waste regulations: hazardous waste batteries; hazardous waste pesticides that are either recalled or collected in waste pesticide collection programs; hazardous waste thermostats; and hazardous waste lamps.

The RCRA regulates the management and disposal of hazardous waste. One common method of treatment is hazardous combustion (i.e., incineration), which is used to destroy hazardous organic components and reduce the volume of waste (USEPA, 2009).

Used Cleaners and Solvents

Unless testing proves that it can be handled otherwise, spent solvents are managed as a hazardous waste. Waste solvents are stored in containers that are in good condition and that are made of or lined with materials that are compatible with the stored wastes. The container must be closed during storage, except when it is necessary to add or remove wastes. The container also cannot be opened, handled, or stored in a manner that may cause it to rupture or leak. Containers holding hazardous waste must be clearly marked with the words "hazardous waste" and the date on which accumulation of the waste began (ARA, 2010).

Used Petroleum, Fuel, Oils, and Lubricants

Petroleum waste-generating operations include aircraft maintenance, vehicle maintenance, and civil engineering. These hazardous wastes include varying quantities of spent solvents, fuels, stripping chemicals, paint, oils, and batteries. These wastes are tracked to ensure proper identification, storage, transportation, and disposal, as well as implementation of waste minimization programs (USDHS, 2008a).

3.14.1.3 Special Hazards

Special hazards are those substances that might pose a risk to human health; they are addressed separately from other hazardous materials. Special hazards include asbestos-containing material (ACM), polychlorinated biphenyls (PCBs), and lead-based paint (LBP). The USEPA has the authority to regulate these special hazard substances under the Toxic Substances Control Act (TSCA) 15 U.S.C. 53. The USEPA has established regulations regarding asbestos abatement and worker safety under 40 CFR 763, with additional regulation concerning emissions (40 CFR 61). Depending on the quantity or concentration, the disposal of LBP waste is potentially regulated by the RCRA at 40 CFR 260. The disposal of PCBs is addressed in 40 CFR Parts 750 and 761.

Asbestos-Containing Material (ACM)

Due to the age of some of the BPSs located within the study area, the potential for the facilities to contain asbestos exists. Asbestos is typically found in wall and ceiling coverings, floor tiles, exterior siding, and thermal system insulation. At one time, asbestos was added to paint to provide decorative texture (ECY, 2010).

Polychlorinated Biphenyls (PCBs)

PCBs were domestically manufactured from 1929 until their manufacture was banned in 1979. PCBs have a range of toxicity and vary in consistency from thin, light-colored liquids to yellow or black waxy solids. Due to their non-flammability, chemical stability, high boiling point, and electrical insulating properties; PCBs were used in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics, and rubber products; in pigments, dyes, and carbonless copy paper; and in many other industrial applications (USEPA, 2010a).

Other products that may contain PCBs include:

- Transformers and capacitors;
- Other electrical equipment including voltage regulators, switches, reclosers, bushings, and electromagnets;
- Oil used in motors and hydraulic systems;
- Old electrical devices or appliances containing PCB capacitors;
- Fluorescent light ballasts;
- Cable insulation;
- Thermal insulation material, including fiberglass, felt, foam, and cork;
- Adhesives and tapes;
- Oil-based paint;
- Caulking;
- Plastics;
- Carbonless copy paper; and,

- Floor finishes.

Lead-Based Paint (LBP)

Lead is a naturally occurring, bluish-gray metal used for many household and industrial items. Lead found in structures is usually in the form of compounds of refined metallic lead and other chemicals. Lead cannot be broken down, and it cannot deteriorate into less toxic substances. Metallic or elemental lead is a heavy, dull, gray metal. Compounds of lead were used in older paints, pipes, and plumbing fixtures, and are still used in construction products (ECY, 2010).

Lead dust or fumes are created when LBP is dry-scraped, dry-sanded, or heated during renovation or maintenance. Dust also forms when painted surfaces bump or rub together through normal use. Lead chips and dust can get on surfaces and objects that people touch. Settled dust can re-enter the air when people vacuum, sweep, or walk through it (ECY, 2010).

Due to the age of some of the facilities, the potential for lead-based paint in BPSs exists. From 1920 through 1978 lead was used in paint and plumbing. All buildings constructed before 1980 are considered to contain some lead-based paint. Paint with regulated dangerous waste components may also cover asbestos-containing building materials, such as pipe-wrapping or siding.

The USEPA, along with other state and Federal agencies and programs, regulates lead and lead-contaminated debris from renovation and demolition work when it is disposed of or recycled as a waste under USEPA’s Dangerous Waste Regulations (USEPA, 2010b).

Table 3.14-1 shows the location of hazardous materials typically found in buildings.

Table 3.14-1. Building Components in Which Hazardous Materials Are Found

Substance	Building Components and Materials
Asbestos	<ul style="list-style-type: none"> • Roofs and tiles • Glue • Sound insulation • Fire-resistant sealing • Wall plaster
PVC	<ul style="list-style-type: none"> • Gutters and pipes • Roofs and tiles • Electrical cable
Lead	<ul style="list-style-type: none"> • Roofs and tiles • Electrical cables
Cadmium	<ul style="list-style-type: none"> • Plastic (cable, pipes and plates) • Occurring with zinc

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Substance	Building Components and Materials
	<ul style="list-style-type: none"> • Occurring with concrete
Mercury	<ul style="list-style-type: none"> • Fluorescent tubes • Switches and relays (electrical installations) • Other (concrete)
Nickel	<ul style="list-style-type: none"> • Stainless steel • Surface treatment
Chromium	<ul style="list-style-type: none"> • Stainless steel • Other (painted surfaces)
Copper	<ul style="list-style-type: none"> • Cables and wires • Permanent installations • Temporary installations • Roofs and pipes • Screws and locks
Zinc	<ul style="list-style-type: none"> • Gutters/pipes and galvanized products • Plastic (especially gutters and pipes)
PCB	<ul style="list-style-type: none"> • Small capacitors and electrical installations • Double-glazed windows (glue) • Sealant (softener) • Paint (pigments) • Fire-resistant additive (paint, glue/binder)
Chlorinated paraffin	<ul style="list-style-type: none"> • Plastic (in general) • Sealant (softener) • Others (glue)
CFCs	<ul style="list-style-type: none"> • Thermal insulation—polyurethane foam • Other insulation materials
HCFCs and HCTs	<ul style="list-style-type: none"> • Thermal insulation—polyurethane foam • Foam for joints
Sulphur hexafluoride	<ul style="list-style-type: none"> • Soundproof windows

Source: (Strufe, 2004).

3.14.1.4 Hazardous Materials Regulatory Requirements

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 42 USC § 9601 et seq.

CERCLA provides Federal authority over releases or threatened releases of hazardous substances that may endanger public health or the environment, establishes requirements for closed and abandoned hazardous waste sites, and provides for the liability of persons responsible for the release of hazardous substances. Site contamination at CBP facilities could trigger these requirements but would more likely have to comply with Brownfield requirements designed to allow redevelopment of contaminated sites with provisions to protect the public and the environment.

Community Environmental Response Facilitation Act (CERFA), 42 USC §9620(h).

CERFA amends CERCLA to require the Federal Government, before termination of Federal activities on any real property owned by the Government, to identify real property where no hazardous substance was stored, released, or disposed of. This Act requires CBP to perform environmental site assessments to identify land free of hazardous substances in land transfers when it terminates operations at a location and transfers the property to a third party. CBP is responsible for any cleanup costs required after the transfer.

3.14.2 FRAMEWORK FOR CHARACTERIZING RESOURCE IMPACTS

A proposed project or activity would potentially have major impacts related to hazardous materials or other regulated materials under the following conditions:

- Substantial adverse changes in the procedures for procuring, storing, handling, or disposing of hazardous materials that may violate Federal, state, or local laws and regulations;
- Substantial adverse changes in the procedures for generating, storing, handling, or disposing of hazardous wastes that may violate Federal, state, or local laws and regulations; or,
- Substantial increases in the volume of hazardous waste generated if methods for reducing the volume are available, such as the use of a hazardous solvent when a non-hazardous cleaner is available and achieves the same or a similar purpose.

3.14.3 ACTIVITIES WITH HAZARDOUS AND OTHER REGULATED MATERIALS ENVIRONMENTAL CONSEQUENCES

Construction Activities

- Construction of or modification of fixed-point facilities including:
 - New BPSs, FOBs, communications towers, and air and marine operational facilities;
 - Modification/upgrade of existing POEs, BPSs, hangars, and other facilities in support of CBP operations; and,

- Set up of permanent traffic checkpoints.
- Construction of linear facilities including:
 - New or extended tactical security physical barriers, such as point-specific pedestrian or vehicle fences or other physical barriers; and,
 - New or extended access roads, drag roads, bridges, culverts, and low-water crossings.
- Operations at fixed facilities including:
 - Routine activities at POEs including agricultural inspections;
 - Continue standardizing and modernizing Office of Air and Marine (OAM) fleet;
 - Use of nonintrusive/nondestructive inspection and detection technologies;
 - Implementation and deployment of RVSS, MSS, CASC, and OIC;
 - Operation of small-arms weapons training ranges; and,
 - Enforce I-68 Canadian Border Boat Landing Program for recreational boaters.
- Maintenance and repair of all of the above.

Operations Activities

- Field surveillance operations including:
 - Unmanned aircraft systems (UAS) missions and manned aerial surveillance patrols;
 - Waterborne patrols;
 - Off-road-vehicle (ORV) and all-terrain-vehicle (ATV) patrols;
 - Snowmobile patrols;
 - On-road vehicle patrols;
 - Canine patrols;
 - Horse patrols;
 - Set up of mobile traffic checkpoints; and,
 - Install and maintain UGSs.

3.15 UTILITIES AND INFRASTRUCTURE

3.15.1 CONTEXT FOR AFFECTED ENVIRONMENT

Utilities and infrastructure refer to the system of public works, utilities, and transportation networks that provide the basic framework for a community. Utilities include water, power supply, and waste management. Section 3.16 Roadways and Traffic addresses transportation networks.

The “affected environment” sections for each region describe the types and ranges of utility systems and infrastructure in the CBP facilities portfolio for that region. These include:

- Water supply (municipal or onsite water supply);
- Electrical generator or grid;
- Fuel supply (heat, ventilation, and air conditioning) including grid pipelines and onsite storage tanks; and,
- Wastewater management (sewer connection or septic system).

This section describes ranges of use for each utility resource based on recent CBP site-specific analyses of protection, relocation, construction, and operation of BPSs, and construction, modernization, and operation of POEs. This section then describes the utility resources of most CBP facilities: BPSs, POEs, FOBs, traffic checkpoints, and communication towers.

CBP's initiatives and ongoing operations are analyzed to determine its compliance with relevant Federal regulations and utility capacity. This information is used to predict CBP's continued compliance with relevant Federal regulations and various utility systems' capacities. According to EO 13148, "Greening the Government," all Federal agencies must take necessary actions to integrate environmental accountability into day-to-day decision-making and long-term planning across all agency missions, activities, and functions. Consequently, environmental management must become a fundamental and integral component of all Federal agencies' policies, operations, planning, and management.

3.15.2 FRAMEWORK FOR CHARACTERIZING RESOURCE IMPACTS

Utility analysis in the NEPA context is necessarily site-specific. Programmatic analysis discusses the potential impacts of relevant actions on the four utility categories by region, focusing on the most prevalent systems within each category (depending on available data). This analysis assesses the potential severity of these impacts given site-specific circumstances and characterizes potential impacts as major (significant), moderate, minor, or negligible using resource-specific criteria. Exceeding any of the three utility capacities or violation of wastewater treatment or discharge standards constitutes a major impact.

Utility system elements have fixed maximum supply and treatment capacities, above which system performance can become negatively affected. CBP activities would have adverse impacts to utilities and infrastructure if they cause a demand or condition that:

- Exceeds existing wastewater treatment capacity serving the project site;
- Exceeds permitted potable water supply capacity serving the project site;
- Exceeds existing energy supply capacity serving the project site; or,
- Violates wastewater treatment or discharge standards.

3.15.3 ACTIVITIES WITH ENVIRONMENTAL CONSEQUENCES TO UTILITIES AND INFRASTRUCTURE

The following activities are expected to have environmental consequences to utilities and infrastructure:

- Modification to POEs;

- Repairs and maintenance of existing POEs;
- Construction or modification of existing BPSs;
- Construction of communication towers;
- Small additions to OAM facilities;
- Construction of new FOBs;
- Trade and travel processing at POEs;
- Use of NII systems; and,
- Use of other detection systems.

3.16 ROADWAYS AND TRAFFIC

3.16.1 CONTEXT FOR AFFECTED ENVIRONMENT

Impact analysis includes discussion of the types of potential impacts, the potential severity based on specific context, and mitigation. The analysis is broken down by both alternative and geographic region. Specifically, this section provides a bounded analysis for CBP activities for which less-than-significant impacts are expected. It also offers guidelines to determine if transportation and traffic as a resource area can be eliminated from tiered NEPA documentation for specific activities. Finally, it supplies an analytical tool to evaluate activities that either have the potential to cause significant adverse impacts or for which information is not available to determine impact levels. The analysis characterizes potential impacts as major (significant), moderate, minor, or negligible using resource-specific criteria. It outlines regulatory requirements, best management practices, and possible ways to mitigate significant impacts.

3.16.2 FRAMEWORK FOR CHARACTERIZING RESOURCE IMPACTS

To analyze the potential for CBP activities to cause transportation traffic impacts along the northern border, this PEIS:

- Characterizes the areas (remote, rural, suburban, and urban) and critical infrastructure where CBP's proposed action and alternatives would be implemented;
- Characterizes both CBP and non-CBP infrastructure within the study area that may affect transportation resources;
- Characterizes temporary and permanent changes to different modes of transportation, including vehicle traffic, roadway infrastructure, off-road activities, public transit, and air traffic;
- Compares the changes in transportation volumes and modes to traditional activity levels in each area; and,
- Reviews each activity for its potential to affect critical infrastructure.

This PEIS uses a systematic process to evaluate the level of impact for roadways and traffic. This process compares the predictions to the significance criteria based on legal and regulatory constraints and on team members' professional technical judgment. Specifically, this approach

assumes that a project or activity has the potential to create an adverse impact on transportation if:

- Increased permanent roadway traffic (e.g., on-road automobile and truck traffic) would likely reduce service at nearby intersections or roadways to unacceptable levels;
- The project cannot comply fully with local, state, and Federal laws and design guidelines; and,
- The project would interfere considerably with public transit, rail, air, or pedestrian travel.

The degree to which an impact might be major depends upon how much loss of functionality affected communities would suffer from changes to roadway access or increases in traffic due to rerouting or slowing movement of traffic through the border.

3.16.3 ACTIVITIES WITH ENVIRONMENTAL CONSEQUENCES TO TRANSPORTATION RESOURCES

Activities that could affect transportation resources include:

- Construction projects;
- New trade and travel processing operations;
- Motorized ground operations;
- Aircraft operations; and,
- Vessel operations.

3.17 RECREATION

3.17.1 CONTEXT FOR AFFECTED ENVIRONMENT

There is a wide variety of recreation areas along the northern border on both the U.S. and Canadian sides. On the U.S. side these recreation areas include national parks (NP) and other units of the national park system, national recreation areas (NRA), national forests (NF), national wildlife refuges (NWR), and designated wilderness areas. On the Canadian side they include national park reserves, provincial parks, protected areas, and natural areas. U.S. recreation categories are described briefly below, since the type of designation bears on the nature of activities that can be conducted there.

3.17.1.1 Definitions

National parks are managed by the NPS to “preserve unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations” (USDOJ, No Date). The emphasis placed on wilderness preservation and recreation varies from park to park, as do the types of recreation activities permitted.

National forests are managed by the USFS “to restore and enhance landscapes, protect and enhance water resources, develop climate change resiliency and help create jobs that will sustain

communities” (USDA, 2011). As with the national parks, the value of recreation, preserving the wilderness, forestry, and other economic activities vary considerably between national forests.

National recreation areas and lakeshores can be managed by either the NPS or the USFSe. These areas are managed primarily to preserve recreational use.

National wildlife refuges are managed by the USFWS. The mission of the National wildlife refuge system is “to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (USDOJ, 2009a).

Rivers in the WOR Region may be designated as national wild and scenic rivers. The Wild and Scenic Rivers Act of 1968 establishes that certain rivers which “possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values, shall be preserved in free-flowing condition” (16 U.S.C. 1271). While individual river designations focus on specific attributes to be preserved, designation does not necessarily restrict all development; it does, however, prohibit Federal support for any action that may harm the river’s free-flowing condition, water quality, or outstanding resource values, such as construction of a dam (National Wild and Scenic River System, 2010). Designated Wild and Scenic Rivers are identified in the recreation profiles within the larger property in which they are located.

3.17.1.2 Analysis Methods

The analysis of recreational impacts in the NEPA context is site-specific. This analysis discusses the impacts of various activities on recreational values. The discussion also provides some examples of where these recreational values or pursuits exist in each region along the border. These recreational values include:

- Hiking (including backcountry and wilderness);
- Scenic quality;
- Sport hunting and fishing;
- Boating, swimming, and other water sports;
- Skiing, snowshoeing, and other winter sports;
- Camping (at developed sites and backcountry);
- Eco-tourism;
- Wildlife viewing; and,
- Use of motorized vehicles (as allowed).

Due to the wide range of recreational uses along the northern border, categorizing recreational areas by the type and intensity of use can prove useful. Federal land agencies employ various recreation categorization approaches in their land-management planning. For example, BLM uses a recreation opportunity spectrum (ROS), which identifies six categories of recreational areas (USDOJ, 2007) to use as in-depth land use descriptions in resource management plans and site-specific environmental impact statements.

These classes categorize land in greater detail by recreational use, amount and types of development existing on the land, visual quality, and visitor expectations. In the least-developed class, designated as primitive, visitors expect physical challenges and little to no evidence of other people. The classification gradient then moves to semi-primitive, nonmotorized land; semi-primitive, motorized land; roaded natural areas; roaded modified areas; rural areas; and urban land, which includes high levels of human activity and development.

For programmatic analysis, we use a simplified approach, employing three “impact use” categories. A given national park or national forest may contain use areas of many types. These categories are:

Low-impact Use Areas: These areas are managed to protect their wilderness character and may include designated wilderness areas. Minimal, rustic, or primitive developments exist in these areas. Typical recreation may include backcountry camping, snowshoeing, cross-country skiing, and hiking, alone or in small groups. These activities have a relatively low physical and human impact on the area, and priority values are solitude, privacy, and observation of nature. Carefully regulated hunting and fishing may be allowed in certain areas. Visitors should encounter very few other people and minimal infrastructure. These areas include most of the national wildlife refuges, as well as some national parks and national forests. An entity may be included in this category even if it has non-wilderness, more-developed areas.

Medium-impact Use Areas: These areas include the majority of national parks, national forests, national wilderness areas, and national wildlife recreation areas. They may include some wilderness sections, but also have small to medium zones developed for recreational use. The management of these areas strikes a balance between solitary wilderness experiences for a small number of visitors and low to medium-impact recreation for a larger number of visitors. These areas are usually not developed for high-impact recreation, such as motorized vehicle use, snowmobile use, downhill skiing, or intensive water sports, although these activities may occasionally be permitted. Some developed lodging may exist in addition to opportunities for wilderness experiences. Typical recreation activities may include camping, backcountry camping, vehicle camping, hunting, fishing, swimming, cross-country skiing, and hiking.

High-impact Use Areas: These high-impact areas are the most developed and are managed for tourism or local recreational use. While there may be some low-impact use in these areas, a significant portion has extensive infrastructure to facilitate use. High and medium-impact uses are usually permitted in many areas of the park. They contain developed lodging and well-maintained trails, along with boat launches and marinas, where appropriate. Typical recreation activities may include RV and car camping, cabin lodging, off-road vehicle use, snowmobile use, downhill skiing, motor boating, guided tours, and activities. While some visitors may seek solitary wilderness experiences, most expect to see other people and infrastructure.

These use categories relate to the recreation opportunity spectrum in the following way:

- High-impact use areas include land categorized as urban, rural, and most roaded, modified areas;
- Medium-impact use areas include some roaded, modified areas, most roaded natural areas, and most semi-primitive motorized areas; and,

- Low-impact use areas include semi-primitive, nonmotorized areas and primitive areas.

Table 3.17-1 summarizes the recreational values and activities associated with each site category.

Table 3.17-1. Federal Recreation Areas along the Northern Border by Intensity of Use

Area Use Type	Recreational Values Emphasized	Typical Recreation Activities
Low-impact use areas	Hiking Scenic quality Camping Wildlife viewing Low-impact water and winter sports	Backcountry camping Snowshoeing Cross-country skiing Hiking Photography Limited hunting and fishing
Medium-impact use areas	Hiking Scenic quality Sport hunting and fishing Water sports (nonmotorized) Winter sports Camping Eco-tourism Wildlife viewing	Backcountry camping Vehicle campground camping Cross-country skiing Hiking Hunting Fishing Scenic driving along roads Boating (nonmotorized)
High-impact use areas	Scenic quality Sport hunting and fishing Water sports Winter sports Ecotourism Motorized vehicle use	RV and vehicle campground camping Cabin lodgings Off-road vehicle riding Snowmobile riding Downhill skiing Motor boating and other water sports Guided tours and activities Scenic driving along roads Day hiking

Most national parks, national forests, national wilderness areas, and national wildlife recreation areas include some elements of all of the categories in the table. These broad categories are, therefore, imperfect and decisions about developments in any protected area require a more in-depth understanding. To analyze programmatic impacts for a variety of actions, these categories should prove helpful.

3.17.2 FRAMEWORK FOR CHARACTERIZING RESOURCE IMPACTS

Impacts on recreation would occur if an activity:

- Eliminates areas of important or unique recreational opportunities or facilities (e.g., constructing facilities on a relatively undisturbed recreational site, or positioning a facility so close that it destroys the recreational value);
- Degrades the quality of the recreational experience (e.g., altering the vista, soundscape, lightscape, terrain, frequency of interactions with other people, or other wilderness value); or,

- Limits access to recreational areas by physical or administrative restrictions (e.g., constructing physical barriers or instituting closures).

The degree to which an impact to recreation would be major is dependent upon the permanence or degradation of access to or quality of a recreation resource and upon the particular sensitivity of a recreational area based on its impact use category. Low-impact use areas would more easily suffer major impacts than high-impact use areas.

3.17.3 ACTIVITIES WITH ENVIRONMENTAL CONSEQUENCES TO RECREATION RESOURCES

The types of CBP actions that could produce recreation impacts include:

- Construction of new CBP facilities, such as BPSs, FOBs, or other facilities in, or close to, areas used for the recreational values identified above;
- Upgrades, expansions, or renovations of existing facilities on or near recreational sites;
- Occurrence of increased pedestrian, vehicle, marine, canine, horse, or aerial-patrol traffic that degrades recreational values by altering the soundscape, lightscape, scenic value, or terrain; and,
- Construction of infrastructure on or through recreational areas (e.g., transmission lines, pipelines, wastewater treatment, etc.).

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Final

Programmatic Environmental Impact Statement For Northern Border Activities

Section 4: West of the Rockies Region



July 2012

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CONTENTS

4	West of the Rockies Region.....	4-1
4.1	Introduction.....	4-1
4.2	Air Quality.....	4-4
4.2.1	Introduction.....	4-4
4.2.2	Affected Environment.....	4-4
4.2.2.1	National Ambient Air Quality Standards and Attainment Status.....	4-4
4.2.2.2	Class I Areas.....	4-6
4.3	Biological Resources.....	4-8
4.3.1	Introduction.....	4-8
4.3.2	Affected Environment.....	4-10
4.3.2.1	Blocks of Regionally Significant Habitat.....	4-10
4.3.2.2	Sensitive Habitats.....	4-13
4.3.2.3	Threatened and Endangered Species.....	4-15
4.3.2.4	Wildlife Typically Found in the Region.....	4-18
4.3.2.5	Vegetative Habitat Typically Found in the Region.....	4-19
4.3.2.6	Wetlands and Waterways.....	4-20
4.3.2.7	Aquatic Resources in the Region.....	4-21
4.4	Geology and Soils.....	4-23
4.4.1	Introduction.....	4-23
4.4.2	Affected Environment.....	4-23
4.4.2.1	Physiographic Provinces.....	4-23
4.4.2.2	Geologic Conditions.....	4-27
4.4.2.3	Soils.....	4-35
4.4.2.4	Prime and Unique Farmland.....	4-36
4.5	Water Resources.....	4-39
4.5.1	Introduction.....	4-39
4.5.2	Affected Environment.....	4-39
4.5.2.1	Groundwater.....	4-39
4.5.2.2	Surface Waters and Waters of the United States.....	4-40
4.5.2.3	Floodplains.....	4-43
4.5.2.4	Transboundary Water Agreements.....	4-44
4.6	Noise.....	4-45
4.6.1	Introduction.....	4-45
4.6.2	Affected Environment.....	4-45

4.6.2.1	Regulatory Review.....	4-46
4.6.2.2	CBP Noise Sources.....	4-46
4.6.2.3	Non-CBP Noise Sources.....	4-47
4.6.2.4	Background Noise Levels.....	4-48
4.6.2.5	National Parks.....	4-49
4.7	Climate Change and Sustainability.....	4-51
4.7.1	Introduction.....	4-51
4.7.2	Affected Environment.....	4-51
4.7.2.1	Climate Regions of the Northern Border—Overview.....	4-51
4.7.2.2	Climate in the WOR Region.....	4-51
4.7.2.3	Climate Change in the United States—Pacific Northwest Regional Assessment	4-52
4.8	Land Use.....	4-54
4.8.1	Introduction.....	4-54
4.8.2	Affected Environment.....	4-54
4.8.2.1	Land Cover and Related Land Uses in the WOR Region.....	4-54
4.8.2.2	Land Cover and Related Land Uses in the Areas North of the WOR Region.....	4-58
4.8.2.3	Land Ownership in the WOR Region.....	4-63
4.8.2.4	Land Ownership in Canada North of the WOR Region.....	4-66
4.8.2.5	Land Use Management.....	4-67
4.8.2.6	Consistency with Enforceable Policies of the Coastal Zone Management Act	4-67
4.9	Aesthetic and Visual Resources.....	4-68
4.9.1	Introduction.....	4-68
4.9.2	Affected Environment.....	4-68
4.9.2.1	Affected Landscapes.....	4-68
4.9.2.2	Areas with High Visual Sensitivity.....	4-69
4.9.2.3	Affected User Groups.....	4-69
4.10	Socioeconomic Resources.....	4-71
4.10.1	Introduction.....	4-71
4.10.2	Affected Environment.....	4-71
4.10.2.1	Regional Demographics.....	4-71
4.10.2.2	Population and Growth Trends.....	4-72
4.10.2.3	Income, Poverty, and Unemployment.....	4-76
4.10.2.4	Property Values.....	4-79

4.10.2.5	Regional Economies	4-80
4.10.2.6	Economic Profiles of POEs and BPSs in the WOR Region	4-83
4.11	Cultural and Paleontological Resources	4-91
4.11.1	Introduction.....	4-91
4.11.2	Affected Environment.....	4-91
4.11.2.1	Archaeological Resources: Prehistoric/Precontact Context.....	4-91
4.11.2.2	Prehistoric Archaeological Site Probability.....	4-92
4.11.2.3	Historic Context.....	4-93
4.11.2.4	Historic/Protohistoric Archaeological Site Probability	4-94
4.11.2.5	Above-Ground Historic Properties	4-95
4.11.2.6	Native American Cultural Resources.....	4-102
4.11.2.7	Paleontological Resources	4-106
4.12	Environmental Justice and Protection of Children	4-108
4.12.1	Introduction.....	4-108
4.12.2	Affected Environment.....	4-108
4.12.2.1	Minority Populations	4-108
4.12.2.2	Low-Income Populations	4-110
4.12.2.3	Population of Children Under 18 Years of Age.....	4-112
4.13	Human Health and Safety	4-114
4.13.1	Introduction.....	4-114
4.13.2	Affected Environment.....	4-114
4.14	Hazardous and Otherwise Regulated materials	4-122
4.14.1	Introduction.....	4-122
4.14.1.1	Hazardous Substances.....	4-122
4.14.1.2	Hazardous Waste	4-122
4.14.1.3	Special Hazards and Otherwise Regulated Materials	4-123
4.14.2	Affected Environment.....	4-123
4.14.2.1	Hazardous Substances, Hazardous Wastes, Special Hazards, and Otherwise Regulated Materials	4-123
4.15	Utilities and Infrastructure	4-124
4.15.1	Introduction.....	4-124
4.15.2	Affected Environment.....	4-124
4.15.2.1	Water Supply	4-124
4.15.2.2	Electrical and Communications Utilities	4-124
4.15.2.3	Fuel Supply	4-125

4.15.2.4	Wastewater Management.....	4-125
4.16	Roadways and Traffic.....	4-127
4.16.1	Introduction.....	4-127
4.16.2	Affected Environment.....	4-127
4.16.2.1	Existing Roadway Network and Roadway Effectiveness.....	4-127
4.16.2.2	Level of Service.....	4-128
4.16.2.3	Variability.....	4-128
4.16.2.4	Urban and Suburban Transportation Networks.....	4-129
4.16.2.5	Rural and Remote Transportation Networks.....	4-129
4.16.2.6	Federal and State Transportation Regulations.....	4-130
4.16.2.7	CBP Activities Affecting Roadways and Traffic.....	4-130
4.17	Recreation.....	4-133
4.17.1	Introduction.....	4-133
4.17.2	Affected Environment.....	4-135
4.17.2.1	Washington.....	4-135
4.17.2.2	Idaho.....	4-139
4.17.2.3	Montana.....	4-139

FIGURES

Figure 4.1-1. The WOR Region and U.S. Customs and Border Protection Facilities.....	4-1
Figure 4.2-1. Nonattainment Areas in the WOR Region.....	4-5
Figure 4.2-2. Maintenance Areas in the WOR Region.....	4-6
Figure 4.2-3. Class I Areas along the WOR Region.....	4-7
Figure 4.3-1. Ecoregions of the WOR Region.....	4-9
Figure 4.3-2. Blocks of Regionally Significant Habitat in the WOR Region.....	4-12
Figure 4.4-1. Physiographic Provinces, Divisions, and Sections of the WOR Region	4-24
Figure 4.4-2. Geologic Conditions of the WOR Region	4-28
Figure 4.4-3. Expanse of the Cordilleran Ice Sheet.....	4-29
Figure 4.4-4. Seismicity in the WOR Region	4-31
Figure 4.4-5. Incidence of Landslides in the WOR Region.....	4-33
Figure 4.4-6. Karst Topography in the WOR Region.....	4-34
Figure 4.4-7. Soil Orders in the WOR Region.....	4-37
Figure 4.4-8. Prime Farmland in the WOR Region.....	4-38
Figure 4.5-1. WOR Region Groundwater Aquifers.....	4-40
Figure 4.5-2. River Basins in the WOR Region	4-42
Figure 4.5-3. Basalt cliffs and crescent bar on Columbia River.....	4-42
Figure 4.6-1. Background Noise Levels in the WOR Region	4-49
Figure 4.8-1. Land Cover in the WOR Region.....	4-61
Figure 4.8-2. Land Use in the WOR Region	4-62
Figure 4.8-3. Land Ownership in the WOR Region	4-65
Figure 4.10-1. Percent Change in WOR Region Population, 2000–2009	4-73
Figure 4.10-2. Percent Change in Canadian Population North of the WOR Region, 1996–2006	4-75
Figure 4.10-3. Locations of POEs and BPSs in the WOR Region	4-86
Figure 4.11-1. Native American Lands within the 100-mile PEIS Corridor Crossing Washington, Idaho, and Western Montana.....	4-103
Figure 4.11-2. Nineteenth-Century Cessions, Reservations, and Portages (1907).....	4-104
Figure 4.11-3. Judicially Established Indian Land Areas as of 1978	4-105
Figure 4.11-4. Early Tribal, Cultural, and Linguistic Areas.....	4-106
Figure 4.13-1. U.S., Interstate, State, and County Roads along WOR Northern Border	4-115
Figure 4.13-2. Navigable Water in the WOR Region.....	4-117

Figure 4.13-3 CBP Officers Train at Firing Range..... 4-120

Figure 4.17-1. Federally Protected Recreation Areas, Including National Forests, Parks, Recreation Areas, and Wildlife Refuges in the WOR Region..... 4-134

TABLES

Table 4.4-1. Physiographic Provinces in the WOR Region..... 4-25

Table 4.5-1. Water Use in the WOR Region in 2005 4-39

Table 4.6-1. Common Sound Levels 4-45

Table 4.6-2. CBP Noise Sources..... 4-47

Table 4.6-3. Description of Background Noise Levels..... 4-49

Table 4.6-4. National Parks in the WOR Region..... 4-50

Table 4.8-1. Land Cover in the WOR Region 4-55

Table 4.8-2. Recreational Land Use in the WOR Region..... 4-57

Table 4.8-3. Conservation Land Use in the WOR Region 4-57

Table 4.8-4. Land Cover in Canada North of the WOR Region..... 4-59

Table 4.8-5. Recreational Land Use in Canada North of the WOR Region 4-60

Table 4.8-6. Conservation Land Use in Canada North of the WOR Region..... 4-60

Table 4.8-7. Land Ownership in the WOR Region* 4-64

Table 4.8-8. Land Ownership in Canada North of the WOR Region* 4-66

Table 4.8-9. Aboriginal Land in Canada North of the WOR Region* 4-66

Table 4.10-1. Population of the WOR Region* 4-72

Table 4.10-2. Population Centers in the WOR Region* 4-74

Table 4.10-3. Population North of the WOR Region in Canada 4-75

Table 4.10-4. Population in Census Metropolitan Areas in Study Area North of the WOR Region 4-76

Table 4.10-5. Income and Poverty Statistics for States in the WOR Region 4-77

Table 4.10-6. Unemployment Rates for the WOR Region 4-77

Table 4.10-7. Income and Poverty Statistics North of the WOR Region in Canada 4-78

Table 4.10-8. Unemployment Rates North of the WOR Region in Canada 4-78

Table 4.10-9. Median Property Values for the WOR Region..... 4-79

Table 4.10-10. Median Property Value North of the WOR Region in Canada 4-80

Table 4.10-11. Canadian Visitors Entering the WOR Region by Surface Transportation* 4-82

Table 4.10-12. POE and BPS Sites Profiled in the WOR Region 4-84

Table 4.11-1. Cultural Resources in the Vicinity of CBP Facilities in Montana..... 4-96

Table 4.11-2. Historic Buildings on CBP Property in Montana 4-97

Table 4.11-3. Cultural Resources in the Vicinity of CBP Facilities in Idaho..... 4-99

Table 4.11-4. Cultural Resources in the Vicinity of CBP Facilities in Washington 4-99

Table 4.11-5. Historic Buildings on CBP Property in Washington..... 4-101

Table 4.11-6. Native-American Tribes That Have a Reservation, Judicially Established Interest, or Established Traditional Ties to Land within the 100-mile PEIS Corridor 4-102

Table 4.12-1. Minority Statistics for the WOR Region (Percent of Population)..... 4-109

Table 4.12-2. Visible Minority Statistics North of the WOR Region in Canada* (Percent of Population)..... 4-110

Table 4.12-3. Income and Poverty Statistics for the WOR Region 4-111

Table 4.12-4. Income and Poverty Statistics North of the WOR Region in Canada 4-112

Table 4.12-5. Age Distribution in the WOR Region (Percent of Population)..... 4-113

Table 4.12-6. Age Distribution North of the WOR Region in Canada (Percent of Population) 4-113

Table 4.16-1. Percent Distribution of Traffic by Vehicle Class, Total United States 4-127

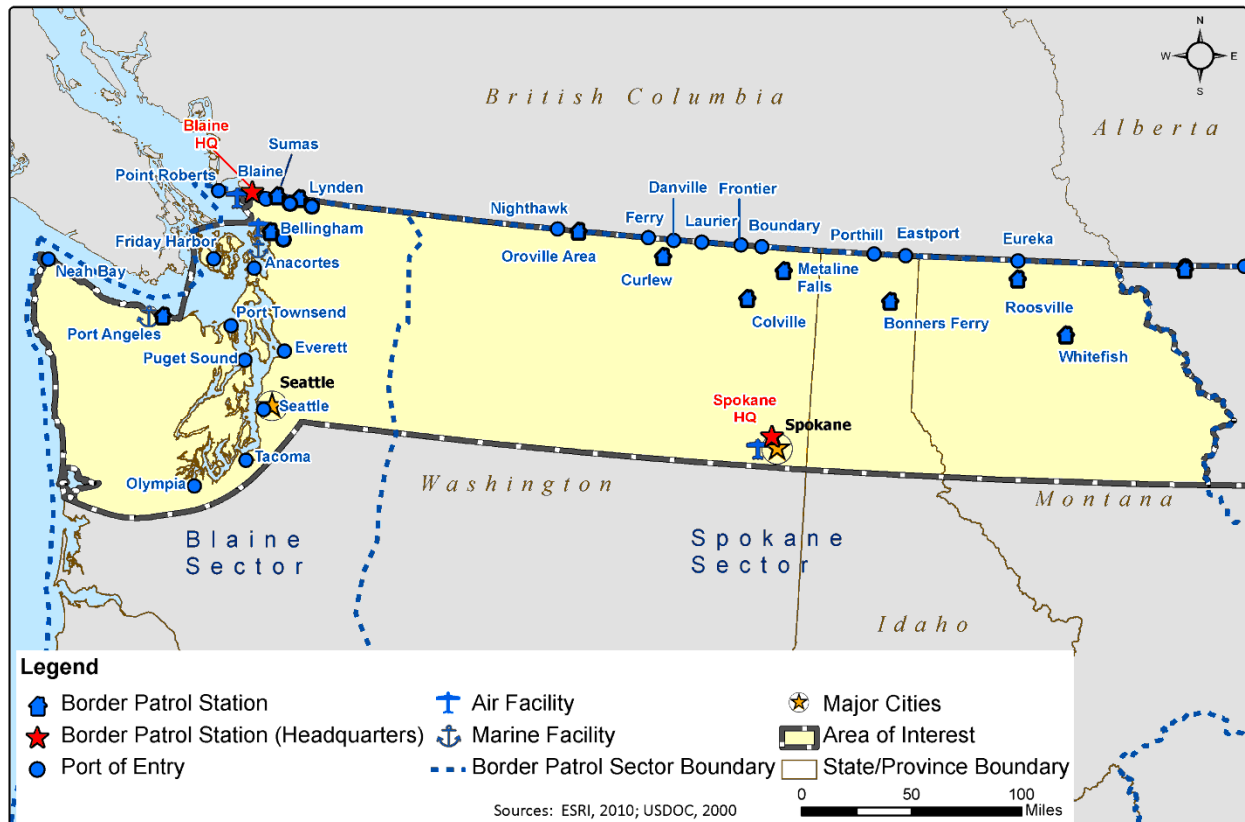
Table 4.16-2. Busiest POEs for Passenger Vehicles in the WOR Region..... 4-131

4 WEST OF THE ROCKIES REGION

4.1 INTRODUCTION

This chapter analyzes the potential environmental effects from U.S. Customs and Border Protection (CBP) actions in the West of the Rockies (WOR) Region within about 100 miles of the northern border. The WOR Region includes Washington, Idaho, and the part of Montana that is west of the Continental Divide (Figure 4.1-1).

Figure 4.1-1. The WOR Region and U.S. Customs and Border Protection Facilities



The northern border environment in the WOR Region has a wide variety of habitats and terrain types. Within Washington state these habitats include grasslands, badlands and coulees, foothills, mountain and alpine habitats, large river valleys and associated watersheds (including Ross Lake, Ososyoos Lake, the Similkameen River, the Kettle River, the Columbia River, and the Pend Oreille River), dense conifer and deciduous forests, wetlands and arid habitats, glacial and coastal habitats, and human developments of various densities.

The habitat within the Idaho portion of the region is mostly a combination of rugged, moist, forest; mountain and alpine habitats; large river valleys and associated watersheds (including the Kootenai River and the Moyie River); and human developments of various densities.

In Montana, habitats include prairie potholes, grasslands, badlands and coulees, foothills, mountain and alpine habitats, large river valleys and associated watersheds (including Lake Kooconusa, North Fork Flathead National Wild and Scenic River, Waterton Lake, Saint Mary

River, and Milk River), dense conifer and deciduous forests, wetlands and arid habitats, glacial and coastal habitats, and human developments of various densities.

Territory within the WOR Region is a combination of privately owned land, state trust property (Crawford State Park), Bureau of Land Management (BLM) land (managed by the BLM Field Offices in Spokane, Washington; Coeur d'Alene, Idaho; and Miles City, Glasgow, and Malta, Montana), national forest area (Mt. Baker Snoqualmie, Okanogan, Idaho Panhandle, Colville, and Kootenai National Forests), wilderness area (Mt. Baker Wilderness, Stephen Mather Wilderness, Pasayten Wilderness, and Salmo-Priest Wilderness), national park area (North Cascades and Glacier/Waterton), Indian reservation (the Kootenai Indian Reservation), and trail (the Pacific Crest and Idaho State Centennial Trails).

U.S. Border Patrol in the WOR Region

The U.S. Border Patrol (USBP) in this region employs several hundred agents, who operate from 11 Border Patrol stations (BPSs) along 600 miles of the northern border. The large swaths of difficult-to-access terrain pose a challenge for surveillance, which leads to use of diverse patrols including on- and off-road-vehicle, snowmobile, pedestrian, horse, aerial, and waterborne patrols. The rough terrain in much of the region also requires heavy reliance on partnerships with Government agencies (Federal law enforcement and land management agencies, state departments of natural resources, and Canadian authorities) and private entities (communities, landowners, and interboundary groups) for both law enforcement and intelligence missions.

The region's 11 BPSs are divided into two sectors: Blaine, Washington and Spokane, Washington (see Figure 4-1-1). Border Patrol's access to roads managed by the U.S. Forest Service (USFS) is important throughout the border area. The following areas pose specific access challenges: national forest areas (Mt. Baker Snoqualmie, Okanogan, Idaho Panhandle, Colville, and Kootenai National Forests) and wilderness areas (Mt. Baker Wilderness, Stephen Mather Wilderness, Pasayten Wilderness, and Salmo-Priest Wilderness). Both CBP and USFS are acting under a Memorandum of Understanding (MOU) signed in 2006 between the Department of Homeland Security (DHS), the U.S. Department of Agriculture (USDA), and the U.S. Department of the Interior (DOI). One area of cooperation provides for DHS to have access to USFS lands for implementing its security mission. Section 4.8 on Land Use describes this MOU in more detail. Access to existing USFS roads will be a continuing concern as additional areas within the Metaline Falls station area are considered for wilderness designation.

USBP sectors within the region deploy a combination of static permanent surveillance, ground radar, and acoustic sensors with repeaters for extended line-of-sight coverage. Forward operating bases are deployed in parts of this region, as are occasional mobile traffic checkpoints, in coordination with each state's department of transportation.

Office of Air and Marine in the WOR Region

The CBP Office of Air and Marine (OAM) in Blaine, Washington deploys aircraft from Bellingham Airport and watercraft from marinas in Bellingham, a U.S. Coast Guard (USCG) facility and Port Angeles. Several dozen pilots conduct airplane and helicopter patrols of land, air, and maritime coastal areas, and a similar number of boat operators conduct day and night patrols to the international border (an average patrol is 12 miles). OAM in Spokane, Washington

operates from Felts Field but plans to move to the Fairchild Air Force Base, which is outside Spokane (Smith, 2010).

Marine patrols are coordinated with the U.S. Coast Guard. Nighttime patrols are conducted using navigational lighting.

Office of Field Operations in the WOR Region

Each CBP Office of Field Operations (OFO) region includes a large regional port of entry (POE) and the smaller POEs within its purview. This region includes the Blaine, Washington large, commercial POE and its associated smaller ports as well as the Great Falls, Montana POE and several ports it manages in Idaho and western Montana. (Note: Since most of the ports under the Great Falls POE are located in the East of the Rockies Region, these ports and the Great Falls POE are evaluated in the East of the Rockies chapter.)

The Blaine POE is a full-service port that oversees several maritime crossings, three medium POEs, and several smaller POEs. The Blaine POE itself processes over 10,000 passenger cars, 1,000 commercial vehicles, and 40-60 buses per day. Blaine is also the largest agriculture port on the northern border, employing several dozen agricultural specialists.

The POEs in Idaho and Montana that are west of the Rockies are generally small “permit” ports catering to specific commodities and are under the management of the Great Falls, Montana service port.

4.2 AIR QUALITY

4.2.1 INTRODUCTION

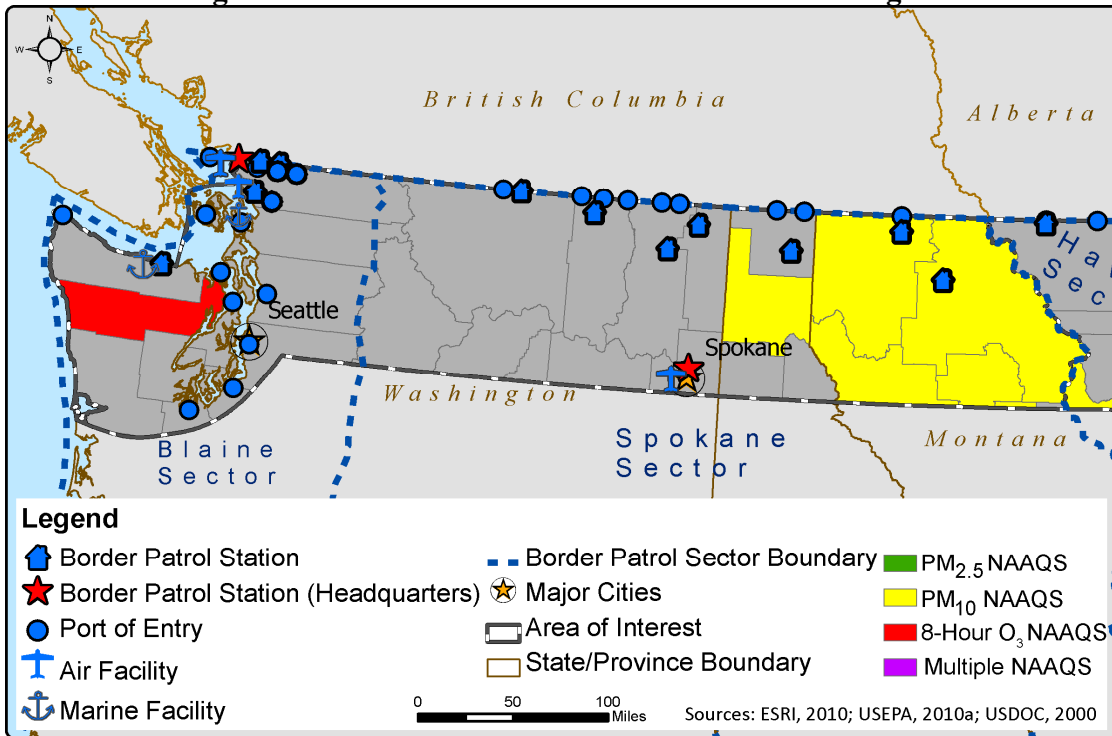
The WOR Region study area contains many air quality control regions (AQCR) and Class I areas that could experience impacts due to the proposed action and alternatives in this Programmatic Environmental Impact Statement (PEIS). However, the mere presence of a sensitive area, such as a nonattainment, maintenance, or Class I areas, does not guarantee that that area would be impacted by CBP activities. (Class I areas are Federal lands, designated by Congress as of August 7, 1977, that have air quality restrictions under Section 162(a) of the Clean Air Act that are more stringent than the standards that apply elsewhere.) Chapter 3, Section 3.2 provides more information on generally applicable national standards and requirements used to describe and determine effects to air quality resources.

4.2.2 AFFECTED ENVIRONMENT

4.2.2.1 National Ambient Air Quality Standards and Attainment Status

Nonattainment areas within 100 miles of the border are shown in Figure 4.2-1. In Montana and part of Idaho, there are large areas of nonattainment for PM₁₀ (particulate matter that is 10 micrometers in diameter and smaller). In these two states, narrow valleys and regional climate often cause temperature inversions that trap pollutants in cold air along valley floors. Federal regulations designate AQCRs that were once classified as nonattainment but have lowered levels of pollutants through the use of regional controls, as maintenance areas. Consistent with the nonattainment areas, Figure 4.2-2 shows maintenance areas in the near Seattle and Spokane. A complete list of nonattainment and maintenance areas organized by state and county is located in Appendix J.

Figure 4.2-1. Nonattainment Areas in the WOR Region

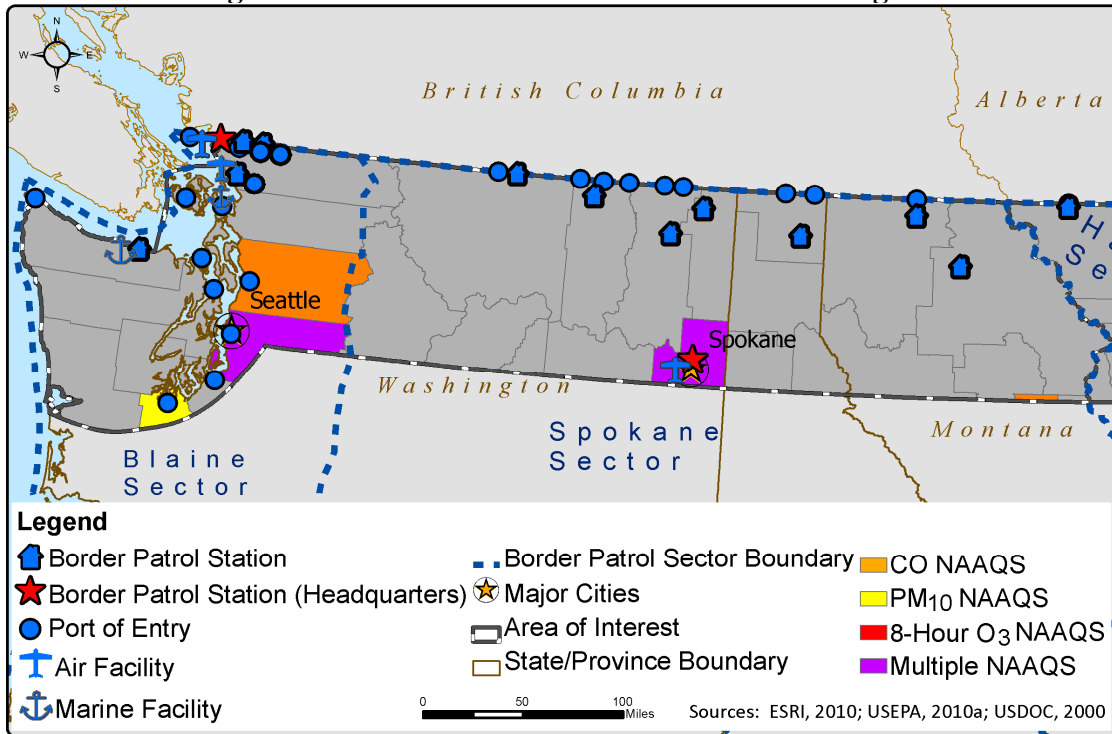


Notes:

NAAQS: National Ambient Air Quality Standards

PM_{2.5}: particulate matter that is 2.5 micrometers in diameter and smaller

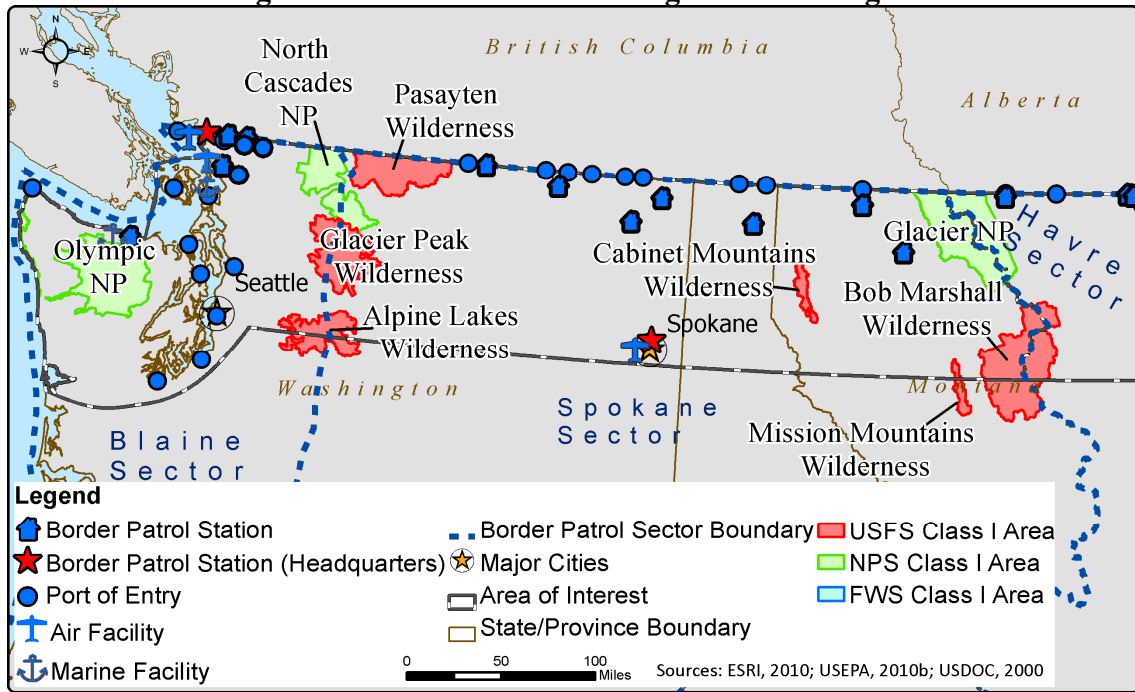
Figure 4.2-2. Maintenance Areas in the WOR Region



4.2.2.2 Class I Areas

The Clean Air Act (CAA) protects areas where air quality exceeds the national standards established by the U.S. Environmental Protection Agency (USEPA). These standards prevent significant deterioration of air quality (PSD). The more stringent restrictions in effect in Class I areas are largely meant to maintain unimpaired visibility in areas such as “national parks, national wilderness areas, national monuments, national seashores, and other areas of special natural, recreational, scenic, or historic value.” In general, "clean air areas" are protected through ceilings on the additional amounts of certain air pollutants over a baseline level. The PSD increment amounts vary based on the area’s classification. Class I areas and major CBP facilities in the WOR Region are shown on the map in Figure 4.2-3.

Figure 4.2-3. Class I Areas along the WOR Region



4.3 BIOLOGICAL RESOURCES

4.3.1 INTRODUCTION

The WOR Region falls within portions of the following states: Montana, Idaho, and Washington. Biologically the region can be divided into five major ecoregions:

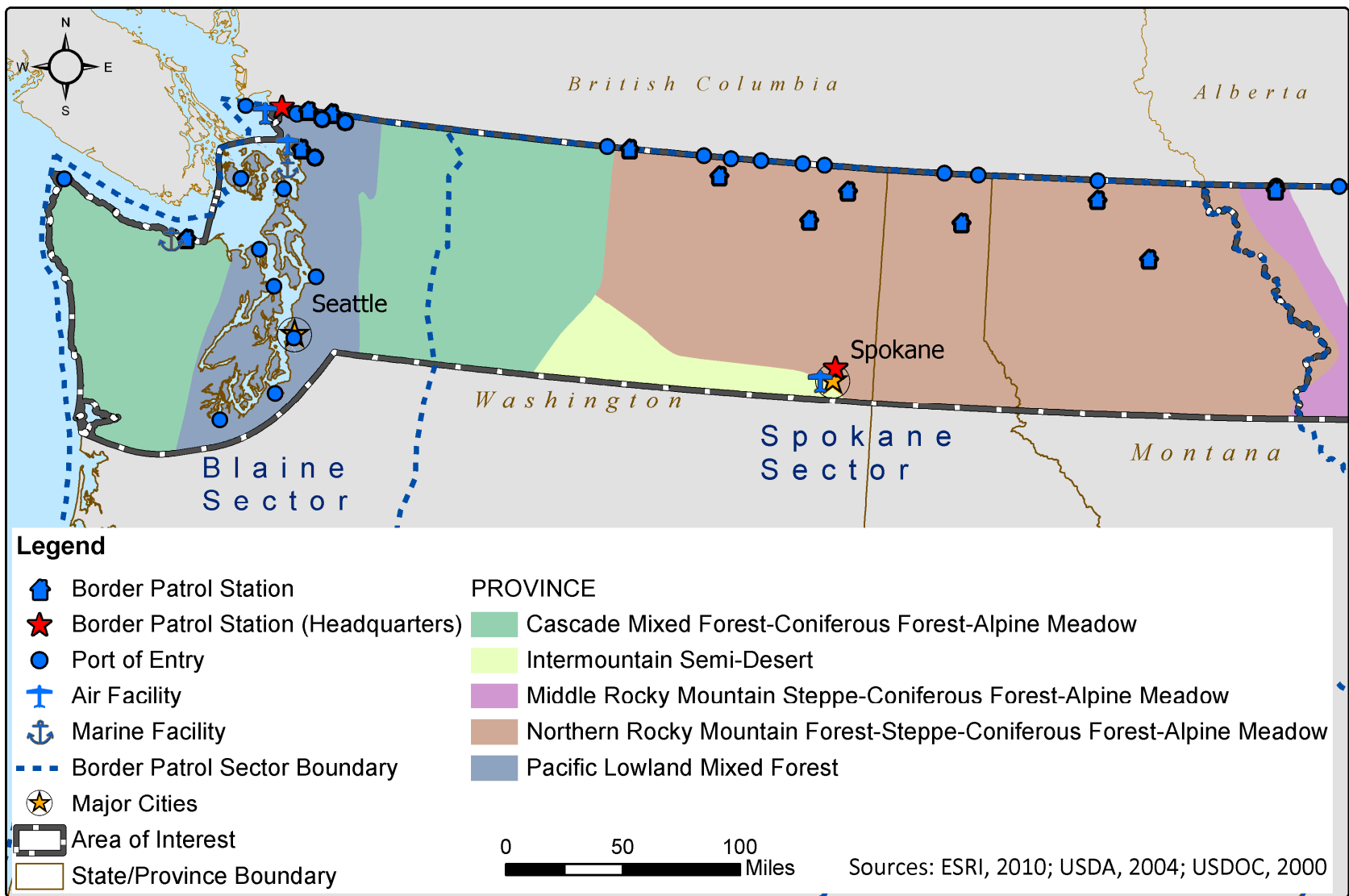
- Northern Rocky Mountain Forest Steppe–Coniferous Forest–Alpine Meadow;
- Middle Rocky Mountain Steppe–Coniferous Forest–Alpine Meadow;
- Intermountain Semi-desert;
- Cascade Mixed Forest–Coniferous Forest–Alpine Meadow; and
- Pacific Lowland Mixed Forest.

Generally, these ecoregions continue north of the U.S.–Canada border (Figure 4.3-1). For a complete description of the above ecoregions, see Appendix L.

Map resources for the ecoregion map in this section were developed from the U.S. Census Bureau (USCB), U.S. Geological Survey (USGS), and ESRI databases.

Each ecoregion has a unique set of biological, climatic, and topographical characteristics along with unique challenges and opportunities for CBP.

Figure 4.3-1. Ecoregions of the WOR Region



4.3.2 AFFECTED ENVIRONMENT

4.3.2.1 Blocks of Regionally Significant Habitat

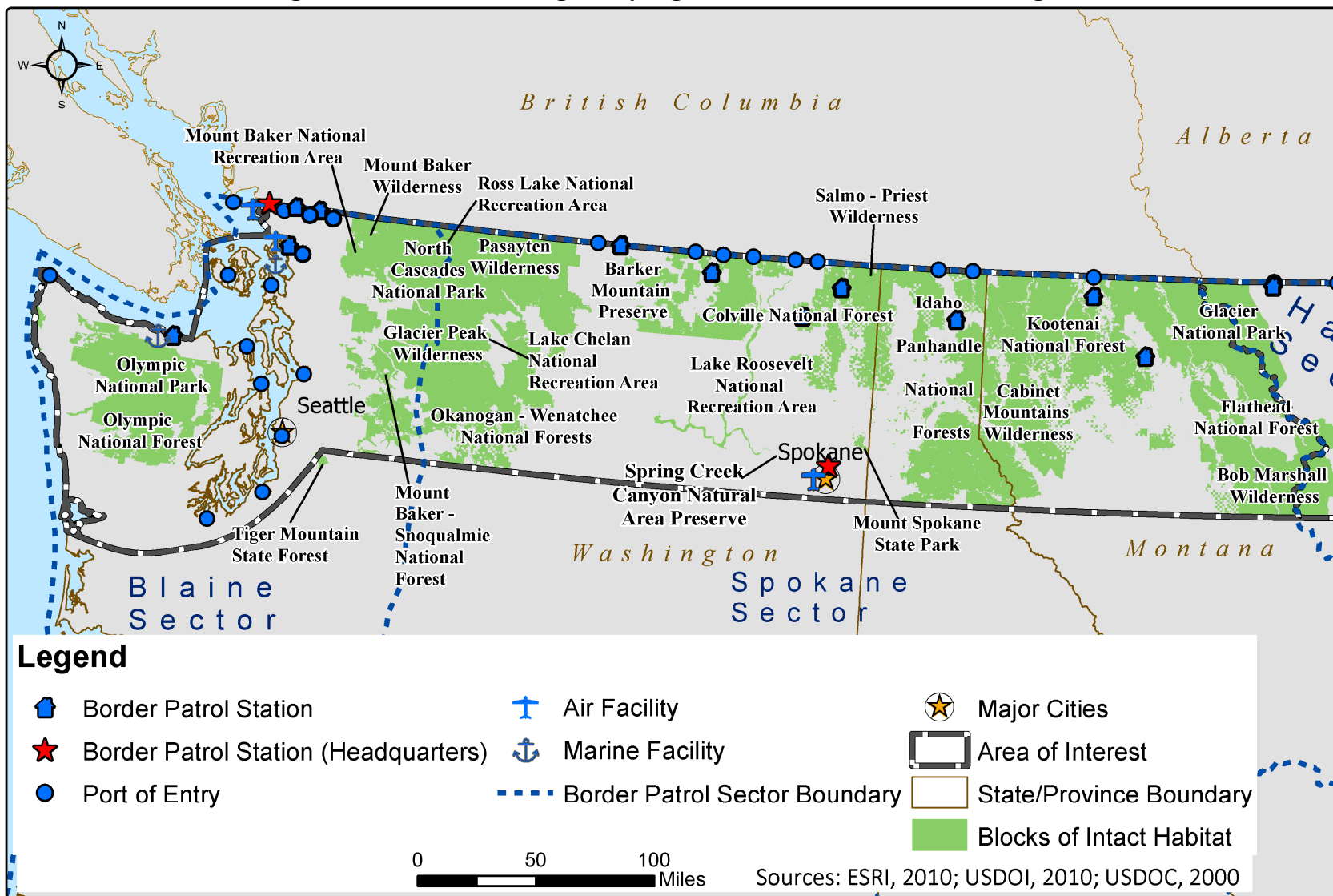
The blocks of regionally significant habitat listed below and shown in Figure 4.3-2 are relatively undeveloped and are intact habitat protected as wilderness, state parks, and state and national forests. Intact habitat refers to areas of largely unfragmented habitat with few alterations or disturbances, such as improved roads or other development. Most areas listed are protected by law (wilderness areas, national parks), while others may occupy private lands and often cross state and country boundaries. Selected regionally significant blocks that represent this region include:

- Barker Mountain Natural Area Preserve (Washington);
- Bob Marshall Wilderness (Montana);
- Cabinet Mountains Wilderness (Montana);
- Coeur d'Alene National Forest (Idaho);
- Colville National Forest (Washington);
- Coulee Dam National Recreation Area (Washington);
- Flathead National Forest (Montana);
- Glacier National Park (Montana, U.S.)/Akamina Kishinena Provincial Park (British Columbia, Canada);
- Glacier Peak Wilderness (Washington);
- Kaniksu National Forest (Washington, Idaho, Montana);
- Kootenai National Forest (Idaho);
- Lake Chelan National Recreation Area (Washington);
- Mount Baker National Recreation Area (Washington);
- Mount Baker Wilderness (Washington);
- Mt. Spokane State Park (Washington);
- North Cascades National Park (Washington, U.S.)/Skagit Valley Provincial Park and EC Manning Provincial Park (British Columbia, Canada);
- Okanogan National Forest (Washington, U.S.)/Cathedral Provincial Park and Protected Area (British Columbia, Canada);
- Olympic National Forest (Washington);
- Olympic National Park (Washington);
- Pasayten Wilderness (Washington);
- Ross Lake National Recreation Area (Washington);
- Salmo-Priest Wilderness (Washington);

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

- Snoqualmie National Forest (Washington);
- Spring Creek Canyon Natural Area Preserve (Washington);
- Stephen Mather Wilderness (Washington);
- Tiger Mt. State Forest (Washington) ; and,
- Wenatchee National Forest (Washington).

Figure 4.3-2. Blocks of Regionally Significant Habitat in the WOR Region



4.3.2.2 Sensitive Habitats

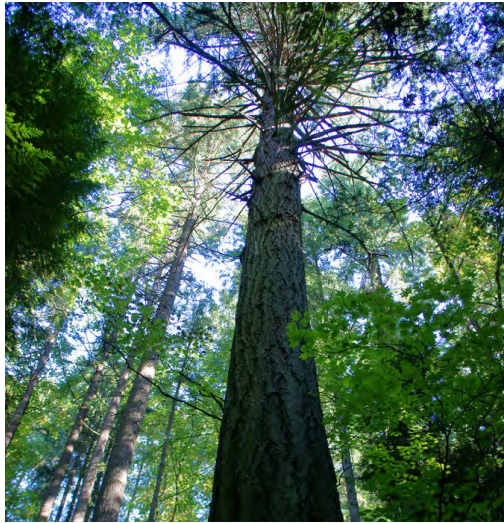
Within a 100-mile zone adjacent to the U.S.–Canada border in the WOR Region are several ecological communities representing sensitive habitats. The sensitive habitats described here occur in many of the larger habitat areas listed in Section 4.3.2.1, and are home to many of the threatened and endangered species listed in the next section. For example, alpine meadows exist in many mountainous areas in this broad geographic region, such as Glacier National Park, and house many protected species like the grizzly bear (*Ursus arctos horribilis*) and common plant species like beargrass (*Xerophyllum tenax*). Some descriptive habitats lower down, such as old growth/mature forest, span many regional boundaries and are more general in meaning. Others, such as Great Plains ponderosa pine woodlands (plant communities dominated by ponderosa pines), define more specific ecological associations.

Many of these habitats are very fine in scale (they cover small areas in a mosaic of various habitats) and form a patchwork of biologically sensitive and diverse areas. The list of sensitive habitats is based on those enumerated and described by the World Wildlife Fund (2001) ecological system descriptions within the NatureServe.org database, and each state's respective natural resources agency. The habitats are as follows:

- Alpine dwarf-shrubland—dwarf-shrubs or dwarf willows forming a heath-type ground cover;
- Alpine meadows—open meadows at and above the timberline;
- Aspen stands—pure or mixed stands of aspen greater than 0.4 ha (1 acre);
- Biodiversity areas and corridors—biologically diverse cities or urban growth with habitat valuable to fish or wildlife, mostly with native vegetation; corridors are zones of relatively undisturbed and unbroken tracks of vegetation that connect fish and wildlife habitat conservation areas, priority habitats, areas identified as biologically diverse or valuable within city or urban growth areas;
- Coastal nearshore—relatively undisturbed, nearshore estuaries of Washington's outer coast;
- Douglas-fir and ponderosa pine forest, as well as shrub-grassland ecosystems;
- Dry conifer forest—northern Rocky Mountain western larch woodland in mountainous regions at 2,000 to 9,800-foot elevation;
- Eastside steppe—non-forested vegetation dominated by forbs, perennial bunchgrasses, or a combination;
- Freshwater wetlands and fresh deepwater—lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered by shallow water; deepwater habitats are permanently flooded lands below the deepwater boundary of wetlands;
- Great Plains ponderosa pine woodland and savanna-ponderosa pine woodlands surrounded by grasslands;
- Herbaceous balds—variable-sized patches of grasses and forbs on shallow soils over bedrock, commonly fringed by forest or woodland;

- Inland dunes—sand dunes formed by wind action, not necessarily near water bodies;
- Instream habitats—a combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources;
- Juniper savannah/juniper woodlands—grassland with scattered junipers, grading into a zone with more junipers and less grass cover;
- Northern conifer forest—northern Rocky Mountain hemlock—western red cedar forest;
- Northern Rocky Mountain Douglas—fir forest and woodland—mixed deciduous/coniferous forests;
- Old growth/mature forest—a forest of great age exhibiting unique structural and ecological features;

Douglas-firs in an old-growth forest



Source: (NDL, No Date).

- Open coast nearshore—relatively undisturbed, non-estuarine nearshore areas of Washington’s outer coast;
- Oregon white oak woodlands—stands of oak or oak/conifer associations where canopy coverage of the oak component exceeds 25 percent;
- Palouse prairie (of the Columbia Basin)—gentle, rolling terrain at elevations of 2000 to 3,000 feet;
- Riparian zones—areas adjacent to flowing or standing freshwater aquatic systems;
- Rocky Mountain riparian woodland and shrubland—within the flood zone of rivers, on islands, sand and gravel bars, and adjacent streambanks;
- Rocky Mountain subalpine spruce-fir forest and woodland—spruce-fir forests of the mountainous and subalpine zones of the Rocky Mountains; these systems are a substantial part of the subalpine forests of the Cascades and Rocky Mountains from southern British Columbia east into Alberta and southward;

- Rocky Mountain subalpine—montane fen—mountain wetland fed by mineral-rich surface water or groundwater; below alpine areas in elevation;
- Rocky Mountain wooded vernal pool—temporary pools, usually devoid of fish, that allow development of amphibian and insect species;
- Shrub-grassland ecosystems (shrub-steppe), including antelope bitterbrush/Idaho fescue habitat;
- Shrub-steppe—non-forested vegetation with one or more layers of perennial bunchgrasses and a conspicuous, but discontinuous, layer of shrubs;
- Subalpine forest—northern Rocky Mountain subalpine dry parkland, Rocky Mountain lodgepole pine forest, Rocky Mountain subalpine dry-mesic spruce-fir forest and woodland; and,
- Westside prairie—herbaceous, non-forested plant communities; either dry or wet prairie.

4.3.2.3 Threatened and Endangered Species

Federally listed threatened and endangered species are protected by the Endangered Species Act (ESA) of 1973. The purpose of the ESA is to protect and recover imperiled species and the ecosystems upon which they depend.

Appendix M lists the threatened or endangered species by county in the WOR Region. Species are listed as threatened or endangered at either the Federal and/or state level. There are six federally listed threatened animal species: chinook salmon (*Oncorhynchus tshawytscha*), steelhead (*Oncorhynchus mykiss*), bull trout (*Salvelinus confluentus*), marbled murrelet (*Brachyramphus marmoratus*), northern spotted owl (*Strix occidentalis caurina*), and Canada lynx (*Lynx Canadensis*), and one federally listed endangered animal species, the killer whale (*Orcinus orca*), with designated critical habitat in the region.

Some states differ in how they list and protect threatened and endangered species. The following list gives the specific agencies and listing differences (if applicable) in the WOR Region.

- Idaho does not have an endangered species act for animals, but does legally recognize threatened, endangered, and specially protected species in the state per Idaho Administrative Code 13.01.06. In addition, the Idaho Department of Fish and Game (IDFG) maintains a list of species of special concern (NANFA, 2011). Idaho does not list species as state threatened or endangered but defers to Federal listings.
- Montana has an endangered species act that covers animals but not plants. More species are listed as species of concern (NANFA, 2011). Montana Fish, Wildlife, and Parks lists some species as species of concern in place of either threatened, or endangered or threatened listing. The status represents a separate category, described as “potentially at risk because of limited and/or declining numbers, range and/or habitat, even though it may be abundant in some areas” (MT FWP, 2010).
- Washington has an endangered species law that covers animals but not plants. Recovery plans are required, although critical habitat designation and agency consultation are not. The Washington Department of Fish and Wildlife (WDFW) maintains a list of threatened, endangered, special concern, and sensitive species (NANFA, 2011).

The following examples of some of the threatened and endangered species in the WOR Region show the wide range of fauna and flora affected.

The Selkirk Mountains population of woodland caribou (*Rangifer tarandus caribou*) is one of the federally endangered species in the region. The population in the Selkirk recovery zone is estimated at 40 to 50 individuals (USDOI, 2008a).

Woodland Caribou, *Rangifer tarandus caribou*



Source: (NDL, No Date).

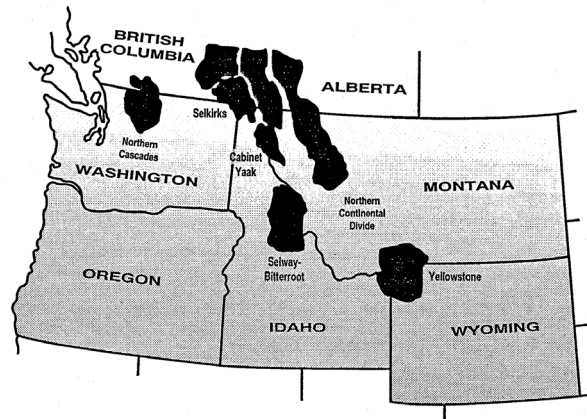
The grizzly bear (*Ursus arctos horribilis*) is an example of a rare species with a large home range, frequently traveling between the United States and Canada. This species is especially sensitive to habitat disturbance. The grizzly bear requires contiguous, relatively undisturbed, mountainous habitat with noteworthy vegetative and topographic diversity. Grizzly bears have a low reproductive rate and are slow to recover from high mortality rates. The U.S. Fish and Wildlife Service (USFWS) identified recovery zones needed for the recovery of the grizzly bear (USDOI, 1993). In Washington, two grizzly bear recovery zones exist: the northern Cascades zone, and the Selkirk recovery zone in northeast Pend Oreille County. The northern Cascades zone currently has a remnant population of fewer than 20 bears (USDOI, 2010a) but is capable of supporting a larger population. The Northern Continental Divide Ecosystem (NCDE) in northwestern Montana straddles the Rocky Mountains encompassing about 9,600 square miles (including Glacier National Park and parts of the Flathead, Helena, Kootenai, Lewis and Clark and Lolo forests) and wilderness areas (Bob Marshall, Mission Mountains, Great bear and Scapegoat), and one wilderness study area (Deep Creek north). It potentially harbors the greatest number of grizzly bears of all domestic recovery zones. The area is currently the subject of Northern Divide Grizzly Bear Project, a study to determine the size of the bear population in the area (USDOI, 2011e).

Grizzly Bear



Source: (NDL, No Date; USDO, 1993).

Recovery Zone Map



Another example is the leatherback turtle (*Dermochelys coriacea*), the only sea turtle capable of surviving in cold waters and lives in the Northwest coastal region. It ranges more widely than other sea turtles and can be found north to the coasts of Washington and British Columbia. Leatherbacks are listed as endangered in both the United States and Canada.

Leatherback Turtle



Source: (NDL, No Date).

The northern spotted owl (*Strix occidentalis*) and marbled murrelet (*Brachyramphus marmoratus*) are both listed as federally threatened species in the region and require old-growth conifer forests for breeding.

Northern Spotted Owl–Left; Marbled Murrelet–Right

Source: (NDL, No Date; NDL, No Date).

4.3.2.4 Wildlife Typically Found in the Region

The alpine meadows, subalpine forests and high-elevation grasslands in this ecoregion are home to numerous wildlife species. Many bird species annually migrate into or out of this region during the spring and fall. Typical avian species include Clark’s nutcracker (*Nucifraga columbiana*), Steller’s jay (*Cyanocitta stelleri*), common raven (*Corvus corax*), Williamson’s sapsucker (*Sphyrapicus thyroideus*), Wilson’s warbler (*Wilsonia pusilla*), blue grouse (*Dendragapus obscurus*), fox sparrow (*Passarella iliaca*), Swainson’s thrush (*Catharus ustulatus*), American pipit (*Anthus rubescens*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), mountain bluebird (*Sialia currucoides*), and western tanager (*Piranga ludoviciana*). These avian species, along with over 200 others, are distributed broadly within the forested and open habitats of the WOR Region, according to their preferred vegetation and ecological niche.

A wide variety of mammals and some “permanent-resident” bird species remain in the region throughout the year. Common large and medium-sized mammal species include elk (*Cervus canadensis*), mule deer (*Odocoileus hemionus*), mountain goat (*Oreamnos americanus*), moose (*Alces alces*), mountain lion (*Puma concolor*), black bear (*Ursus americanus*), American beaver (*Castor canadensis*), and porcupine (*Erethizon dorsatum*). Many small mammals, including rabbits, ground and arboreal squirrels, and other rodents are also present along with a variety of reptile and amphibian species, including snakes, turtles, lizards, frogs, and salamanders and are distributed by habitat and vegetation type.

Orcas (or killer whales, *Orcinus orca*), seals (Suborder–Pinniped), whales (Order–Cetacean), and sea otters (*Enhydra lutris*) inhabit the region’s coastal area. Chinook (*Oncorhynchus tshawytscha*), pink (*O. gorbuscha*), chum (*O. keta*), sockeye (*O. nerka*), and coho salmon (*O. kisutch*) and steelhead trout (or sea-run rainbow trout, *O. mykiss*) move in and out of Puget Sound. All marine mammals are protected under the Marine Mammal Protection Act (MMPA)

of 1972. This act prohibits, with certain exceptions, the take of marine mammals in U.S. waters. The Department of Interior (DOI) oversees protection of the sea otter, walrus, polar bear, dugong, and manatee and the Department of Commerce (DOC) oversees the protection of pinnipeds (other than walrus) and cetaceans (whales) (Bailey, 1995; EOE, 2009; WADFW, no date; Montana Field Guide, 2010; IDFG, 2009).

4.3.2.5 Vegetative Habitat Typically Found in the Region

The region's vegetation is dominated by mixed evergreen-deciduous forests primarily comprising Douglas-fir (*Pseudotsuga menziesii*), western red cedar (*Thuja plicata*), and western hemlock (*Tsuga heterophylla*). Grasses and sagebrush may cover the lower slopes and valleys of some areas, constituting a "semi-desert" (Bailey, 1995). Alpine meadows, grasslands, wooded riparian stands, and higher-elevation treeline/alpine communities are also common in this ecoregion.

Much of the central area of the WOR Region is made up largely of sagebrush (primarily big sagebrush, *Artemisia tridentata*) and shadscale (*Atriplex confertifolia*), with some short grasses. In many areas, ground-layer vegetation makes up less than 25 percent of the total cover, with a dense shrub layer. Adjacent to streams near the mountains are valleys lined with willows (*Salix* spp.) and sedges (*Carex* spp.), which may be replaced by greasewood and other alkaline-tolerant plants further away from the mountains (McNab and Avers, 1994). Areas in the Columbia River basin that experience more than 10 inches (26 cm) of rainfall per year are vegetated with bunchgrass species. Riparian zones in this ecoregion are often bordered by cottonwoods (*Populus deltoides*) and willows.

Cottonwood Stand



Source: (NDL, No Date).

The Cascade Mixed Forest is the second largest ecoregion west of the Rockies. It is mountainous, with elevations from sea level to above 5,000 feet (1,500 m). It is located along the Pacific Coast of Washington and the Cascade Mountains. Douglas-fir is the most abundant species at low elevations, along with numerous shrub species. In the Olympic Mountains, the shade-tolerant Pacific silver fir (*Abies amabilis*) takes the place of hemlock. A dry forest composed primarily of ponderosa pine (*Pinus ponderosa*) grows on the dry eastern slopes of the Cascade Mountain Range.

The Pacific Lowland Mixed Forest Province is situated primarily between prominent mountain ranges (Cascade and Olympic mountains), varying in elevation from sea level to above 1,500 feet (460 meters). In Washington, this area has been largely modified by human uses and cultivation. At the lowest elevations with native forest cover, dense conifers include western red cedar, western hemlock, and Douglas-fir. In the Puget Sound region and interior valleys, coniferous tree species are less abundant than in coastal areas. In these habitats, deciduous trees, such as big-leaf maple (*Acer macrophyllum*), Oregon ash (*Fraxinus latifolia*), and black cottonwood, become more common. Some remaining prairies have oaks, but also include groves of Douglas-fir, Oregon white oak (*Quercus garryana*), and Pacific madrone (*Arbutus menziesii*). Wetlands with swamp or bog plant communities are also present (WWF, 2001).

Invasive (non-native) plant species pose a serious threat to the natural areas in this region. For example, scotch broom (*Cytisus scoparius*), native to Europe and North Africa, is an invasive shrub that is deteriorating the integrity of oak forests. Scotch broom is a competitive species with the capacity to dominate a forest shrub community and form dense monotypic stands. It currently occupies more than 700,000 acres in the northwest coastal regions of the western coastal states and is posing a serious problem for reforestation (Bailey, 1995; EOE, 2009; WADFW, no date; Montana Field Guide, 2010; IDFG, 2010).

4.3.2.6 Wetlands and Waterways

Wetland types in this region include:

- Forested/scrub-shrub wetlands;
- Freshwater emergent wetlands;
- Riverine habitats;
- Deepwater marine and estuarine habitats;
- Marine and estuarine wetlands; and,
- Riverine habitats.

The Puget Sound and its associated habitats represent an important marine resource. As such, the Sound is the focus of multi-agency, multi-disciplinary conservation efforts (Puget Sound Partnership, 2009). Puget Sound is home to a complex estuarine system of interconnected marine waterways and basins, as well as about 3.4 million people (USDOC, 2009). Highly seasonal fresh waters from the Olympic and Cascade Mountains feed this large saltwater system of estuaries. Orcas and seals live throughout the sound and are protected under the MMPA.

Estuaries feature a mixture of salt and fresh water and are extremely biologically productive and important to marine life. The estuaries of Washington state have deltas, mudflats, and salt marshes. Many estuaries contain abundant eelgrass communities, which are highly productive areas for marine life and as well as many birds. Aquatic resources in this region are of great importance and diversity (detailed in the following section and Section 4.5).

Washington state identifies more than 300 rivers, creeks, and other waterways protected under its Shoreline Management Act. The Washington Administrative Code (WAC) Chapter 173-18 defines protected reaches of these waterways. Washington also has 127 marine protected areas that cover 6 million feet of coastline (Van Cleve et al., 2009).

The inland wetlands and waterways of Idaho and Montana are of high natural value. Alpine lakes, streams, bogs, fens, wet meadows, marshes, and other wetlands provide wildlife habitat. Non-alpine wetlands have become increasingly valued due to their importance in water quality protection, stormwater control, and role in maintaining groundwater levels.

4.3.2.7 Aquatic Resources in the Region

Fisheries and aquatic resources are of great importance in this region. This area is rich with rivers, lakes, reservoirs, ponds and has considerable coastline along the Pacific Ocean. Alpine lakes and streams are of critical importance to fish and aquatic wildlife; any available surface waters are especially important in the arid intermountain semi-desert regions.

The marine and coastal region of Washington forms a complex marine border with the Canadian Province of British Columbia. It stretches along the Olympic Peninsula, the Strait of Juan de Fuca, Haro Strait, Boundary Pass, the Strait of Georgia, and the Salt Spring Islands of Canada. The area from the outer Pacific Coast to the Strait of Georgia (also called Georgia Basin) is a rich, productive cold-water environment for many marine and coastal organisms. Much of it is also an area of considerable human use with extensive shipping channels, commercial and sport fisheries, and ferryboats. Steep cliffs border many areas. Much of this outer rocky shore is home to thick kelp beds, which form key habitat for many marine organisms, including sea otters and abalone. Rocky intertidal areas—shallow areas exposed at some time between high and low tides—along the Pacific coast also provide important habitat for many marine organisms.

Fast-flowing major rivers are important habitat for various salmon and trout species. Chum salmon (*Oncorhynchus keta*), coho salmon (*O. kisutch*), pink salmon (*O. gorbuscha*), sockeye salmon (*O. nerka*), and Chinook salmon and steelhead are among the Pacific Northwest's most sought-after species. Rivers, such as the Skagit and Skykomish, are of great economic importance to the human population of the region and remain important for native salmon.

Other major rivers in this region include: a portion of the Clarke Fork, Moyie River (which flows south from Canada), Kootenai, Similkameen, Coeur d'Alene, Pack, and Priest rivers. The Clark Fork River drains into Lake Pend Oreille; the Pend Oreille River drains out of Lake Pend Oreille.

The Flathead, Skagit, and Missouri river systems are designated as National Wild and Scenic Rivers. Protected by the Wild & Scenic Rivers act of 1968, these rivers and their immediate environments possess outstandingly remarkable and various scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar attributes.

Major lakes in the region include but are not limited to, Lake Pend Oreille, Rufus Wood, Banks, Long, Palmer, Osoyoos, Kalispell, Sullivan, Priest, and Hayden lakes, Boundary Reservoir, a portion of Coeur d'Alene Lake, and Little Bitterroot, Swan, Flathead, Whitefish, and Medicine lakes.

Many lakes and major rivers are connected by smaller waterways and wetland complexes, making aquatic resources in the WOR Region of considerable importance economically and ecologically (Bailey, 1995; EOE, 2009).

4.4 GEOLOGY AND SOILS

4.4.1 INTRODUCTION

The geology and soils in the WOR Region in the northern border study area vary widely throughout the region. Geology is the study of the earth's history through rock formations. These rocks often serve as the parent rock for soils present at and below the surface. Topography is considered to be the physical expression of geologic or man-made conditions of a region taken collectively. Topographically, the WOR Region ranges from mountains and volcanoes to low valleys and shorelines to relatively flat plains.

This section addresses the geologic conditions in the WOR Region and describes the potential impacts of CBP program alternatives on geologic resources. The study area contains significantly different topographic features ranging from the bay-type features of the Puget Sound and Cascade Mountains or volcanoes in Washington to relatively flat plains in Montana. Geologic formations including glacial deposits, lava from volcanoes or fissure flows, intruded granitic rocks, and soil conditions are all present within the WOR Region and have been shaped over thousands of years by glacial, water, and wind mechanisms.

4.4.2 AFFECTED ENVIRONMENT

4.4.2.1 Physiographic Provinces

Three physiographic divisions span the WOR Region in the northern border area. These divisions are subdivided into provinces as well as some sections (Figure 4.4-1, Table 4.4-1).

The Pacific Mountain System forms the westernmost physiographic division of the WOR Region. In the area of study, this division is divided into two provinces: the Pacific Border Province and the Cascade-Sierra Range. The Pacific Border Province in the study area is further divided into the Olympic Mountain section, Puget Trough section, and Oregon Coast range. The Cascade-Sierra Range division of the study area includes the Northern Cascade section.

The Intermontane Plateaus make up the physiographic region east of the Pacific Mountain System. The Columbia Plateau is a province of the Intermontane Plateaus and is divided into sections. The Walla Walla Plateau is the section of focus within the study area.

The final physiographic division is the Rocky Mountain System (Rockies). The northern Rockies form the province of interest and are not further divided into sections. Table 4.4-1 provides details on the geology of these areas. Appendix N features a geologic time scale showing the ages of the geologic time periods with which rock formations are dated.

Figure 4.4-1. Physiographic Provinces, Divisions, and Sections of the WOR Region

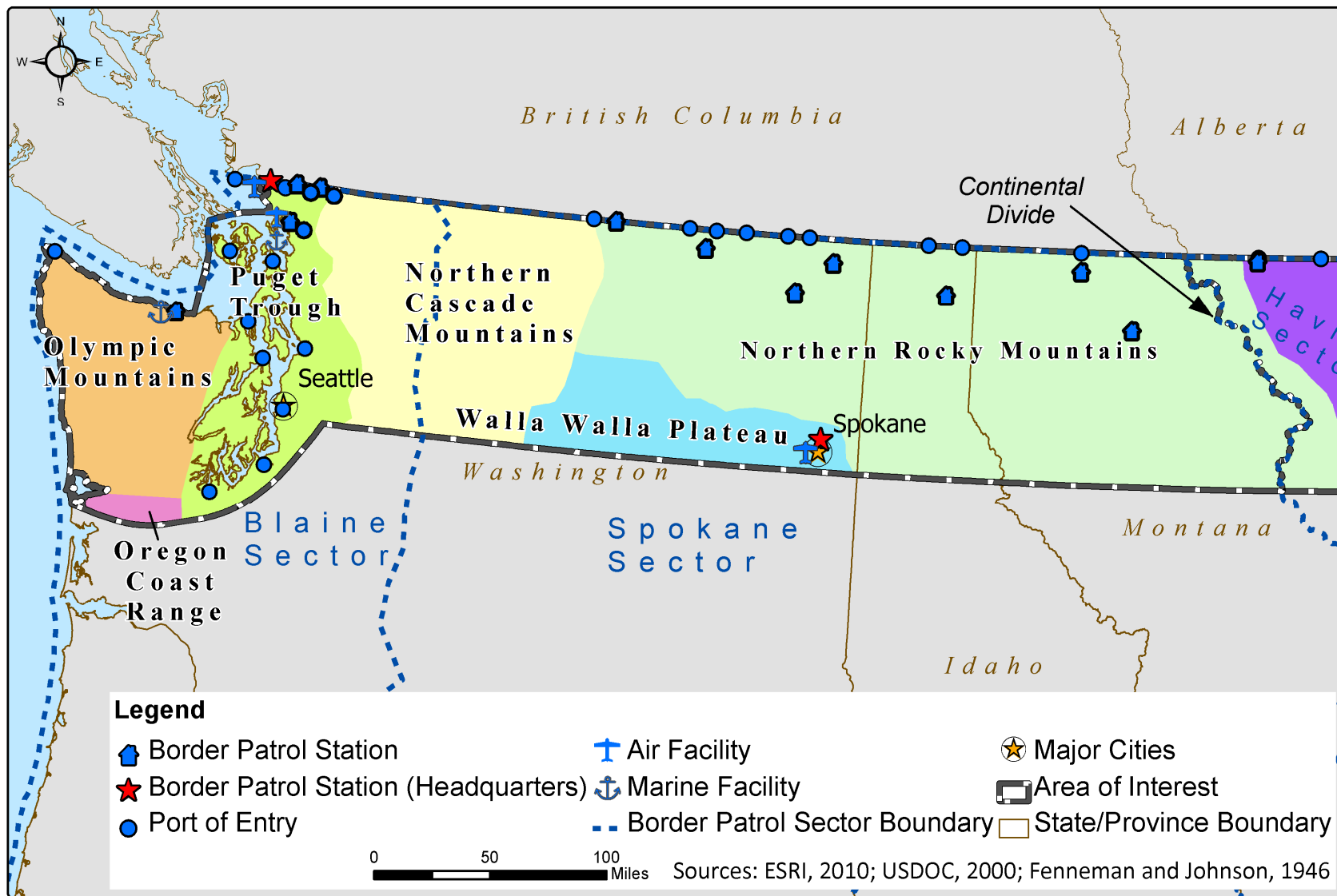


Table 4.4-1. Physiographic Provinces in the WOR Region

Division	Province	Section	Terrain Texture including Topography	Geologic Structure and History	Generalized Rock Types
Pacific Mountain System	Pacific Border Province	Olympic Mountains	Elevations in the Olympic Mountains range around 5,000 ft (1,524 m) but top 7,965 ft (2,448 m) on Mount Olympus. The range is circular with a 46 mi (74 km) average diameter (USDOI, 2004b).	Mountains formed during the middle to late Miocene (Figure 4.4-1, Figure 4.4-2) due to subduction of the Juan de Fuca tectonic plate under the North American plate. On the northern and eastern flanks, Pleistocene erosion and deposition occurred from glacier advance and retreat.	Basement rocks are mainly basalts, manganese deposits, marine sediments, and limestones. Glacial deposits of sand and gravel in the valleys and coastal plains (WSDNR, 2011a).
Pacific Mountain System	Pacific Border Province	Puget Trough	Low-lying area between the Olympic Mountains and the Cascade Range.	Tectonically active zone created by the subduction of the Juan de Fuca plate under the North American Plate. Unconsolidated early Quaternary sediments overlay Tertiary sedimentary rock. As many as four glaciations here, evidenced by Quaternary glacial deposits.	Thick (3,700 ft, 1,130 m) unconsolidated glacial sediments cover sedimentary bedrock, which is up to 10,000 ft (3,050 m) thick (CEC, 2007).
Pacific Mountain System	Pacific Border Province	Oregon Coast Range	Range is 200 miles long with average elevations of 1,500 ft (457.5 m) and a maximum elevation at Mary's Peak of 4,097 ft (1249 m). Slopes are steep, nearing 50 degrees in some areas.	Oregon Coast Range created during subduction of the Juan de Fuca plate under the Pacific plate. East of the Cascadia Subduction Zone; called a forearc (region closest to the sea in an area of volcanic activity). Forearc contains rocks from the subducting plate, scraped off during subduction.	Rocks originated as oceanic sediment with the oldest from the Paleocene to middle Eocene. Uplift and deposition produced sandstone and siltstone (University of Oregon, 2008).

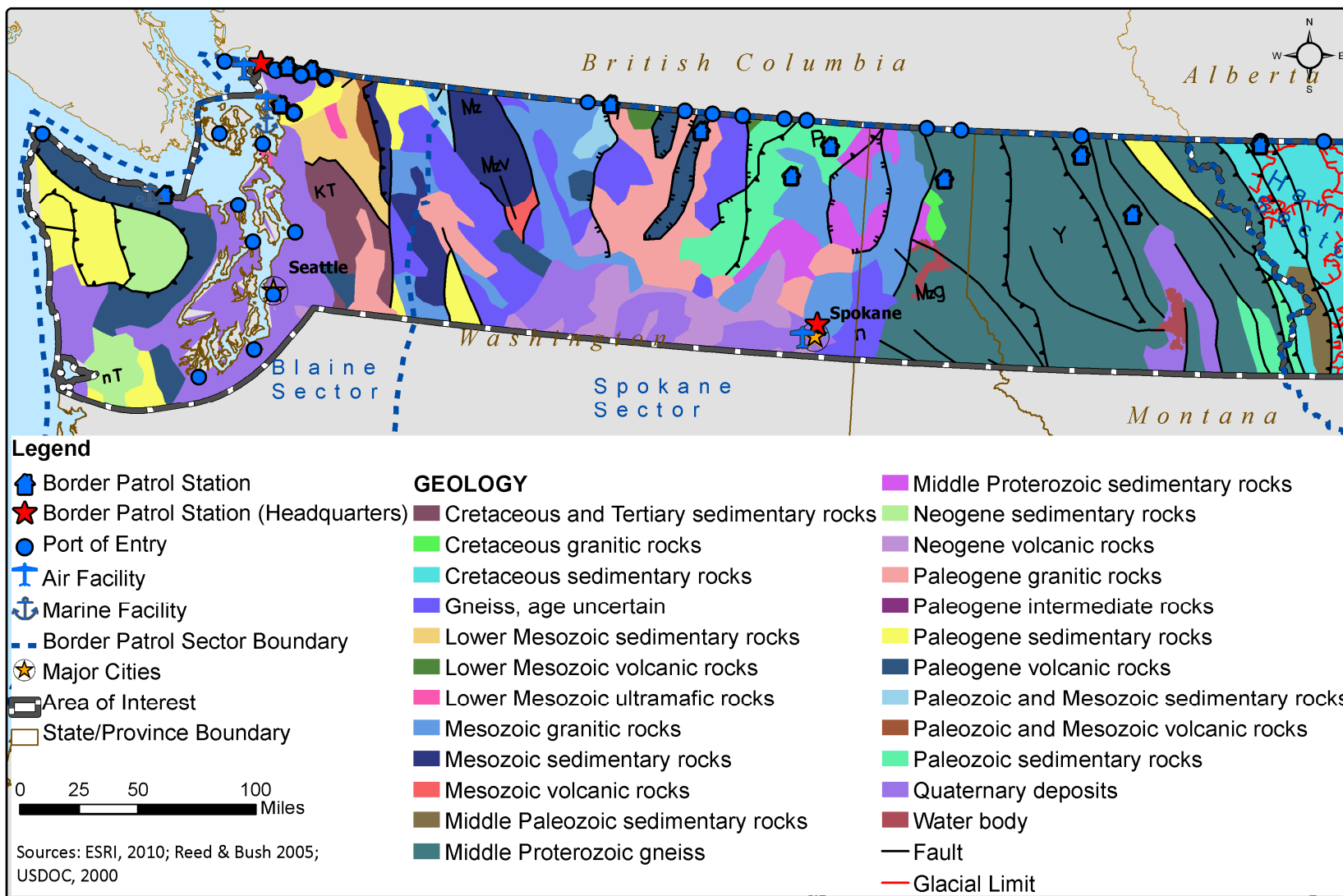
PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Division	Province	Section	Terrain Texture including Topography	Geologic Structure and History	Generalized Rock Types
Pacific Mountain System	Cascade-Sierra Range	Northern Cascade Mountains	Mountain chain of high peaks and U-shaped valleys carved by Holocene glaciers. Highest peak is Mt. Baker at 10,781 ft. (3286 m).	Still tectonically active, range developed by subduction of the oceanic northeast Pacific plate under the North American plate during the Mesozoic. Ages of rocks vary from the Permian to the Tertiary. Geology is extremely complicated and not fully understood.	The section is mainly comprised of crystalline and metamorphic rock, mylonite, and unconsolidated rare rocks called <i>mélange</i> , formed from sedimentary parent rock (WSDNR, 2011b). Some locations have thick beds (up to 60,000 ft, 18,000 m) of sedimentary rock.
Intermontaine Plateaus	Columbia Plateau	Walla Walla Plateau	Topography of the plateau varies, including areas of high and low relief, rolling hills, narrow valleys, and entrenched streams.	Plateau had series of major lava flows, up to two miles (3.2 km) thick, due to fissures in the surface of the land throughout the Miocene. Later, tectonic movement caused extensive folding, faulting, and uplift. Pleistocene glaciation shaped the landscape by scouring the surface and depositing loess (windblown silt). Ice dam failure after glaciation caused a huge flood, depositing alluvium onto the Pleistocene sediments (WWBWC, 2004).	Basin base rock is of layers of basalt (Columbia River basalts) topped off with unconsolidated gravels and clays. Loess and alluvial deposits cover much of these gravels and clays (WWBWC, 2004).
Rocky Mountain System	Northern Rocky Mountains	N/A	Steep, glaciated mountains and peaked alpine ridges. Elevations from 3,000 to 10,000 ft (920 to 3,100 m)	Northern Rockies formed during Laramide Orogeny, about 70 to 40 million years ago. Likely cause of Rocky Mountains development is an unusual oceanic subduction under the North American Plate. Most plates subduct at a high angle; the subduction that formed the Rockies occurred at a lower angle (USDOI, 2000).	Rock types include Precambrian sedimentary deposits (partially metamorphosed), upper Tertiary sedimentary deposits, and glacial deposits (USDOI, No Date).

4.4.2.2 Geologic Conditions

The geologic conditions within the WOR Region are extremely complex, resulting from tectonic and related activities (e.g., faulting, volcanic activities, and seismic sea waves) and glacial activities along with erosive actions of wind and water. The WOR Region contains consolidated geologic formations consisting of sedimentary, igneous, and metamorphic rocks. The WOR Region also contains unconsolidated geologic formations consisting of: alluvium; terrace deposits; glacial deposits and other mixtures of sands, silts, and clays with various mixtures of rocks. The geologic formations are shown on Figure 4.4-2.

Figure 4.4-2. Geologic Conditions of the WOR Region



Regional Glaciation

During the last ice age, two ice sheets extended over the Canadian border into the United States. One was the Cordilleran Ice Sheet, which flowed into the United States from western Canada and covered the northern reaches of Washington, Idaho, and Montana between the Pacific Ocean and the Continental Divide (USDOJ, 2002) (Figure 4.4-3). In addition to the ice sheets, mountain glaciers also expanded at high elevations.

The effects of glacial advances are readily apparent in the northern United States. Polished and striated outcroppings, rounded hills, moraines, valley fills of glacial till and outwash, and other typical glacial features are evidence of Pleistocene glaciation. All along the northern border, till deposits, erratics, and moraines are common (Nelson, 2003). Till, a sedimentary deposit derived from glacial erosion, was deposited throughout the northern United States as the ice sheets receded.

Figure 4.4-3. Expanse of the Cordilleran Ice Sheet



Seismicity and Tectonics

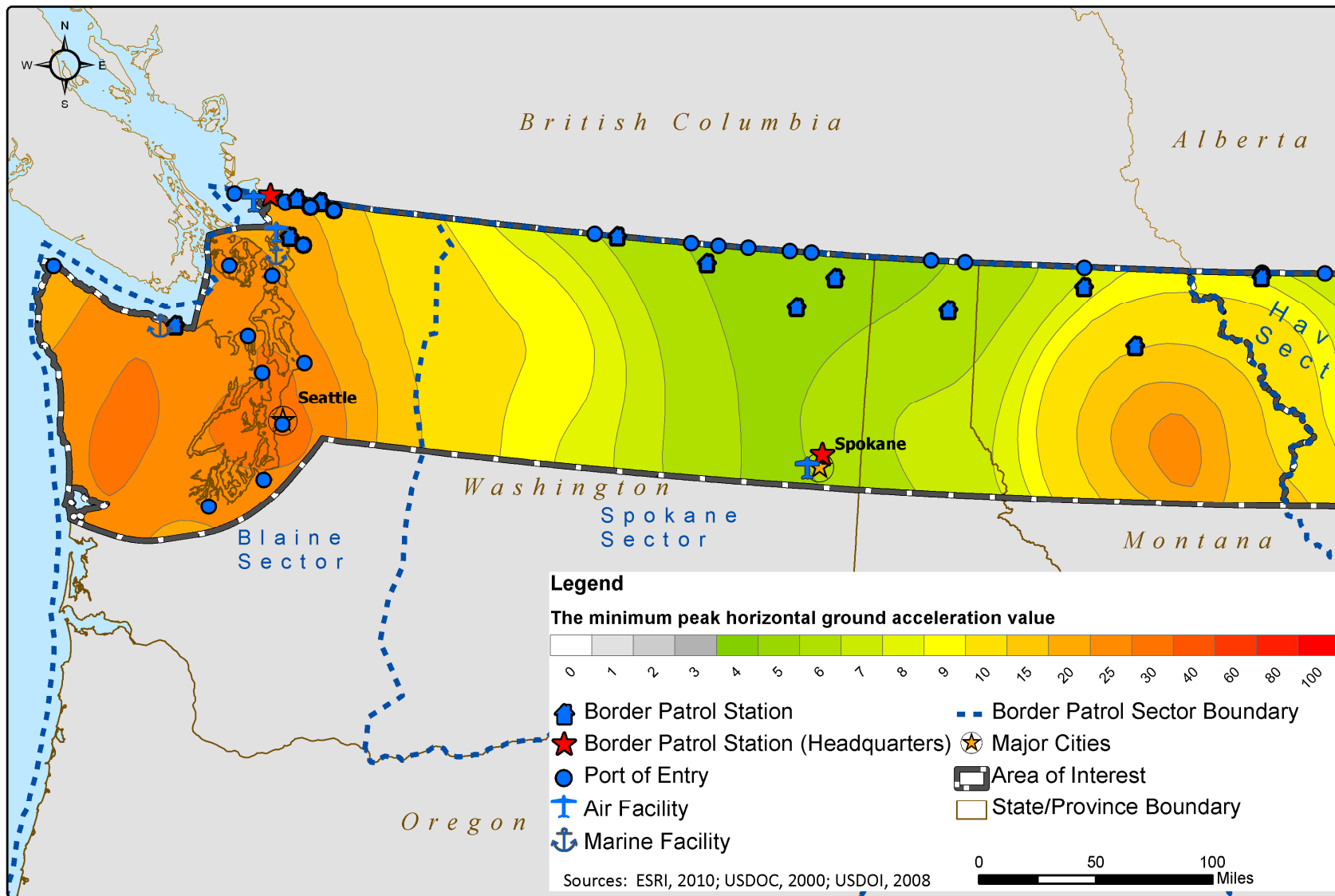
Seismic activity in the WOR Region occurs in the Cascadia Subduction Zone as well as the Intermountain Seismic Belt (Figure 4.4-4). Seismic hazards are described in terms of minimum peak horizontal ground acceleration values. The U.S. Geological Survey (USGS) describes this value as the fastest speed of horizontal particle movement at ground level due to an earthquake. Appendix N, Geology and Soils, describes the Cascadia Subduction Zone and the Intermountain Seismic Belt in greater detail.

Tsunamis or seismic sea waves pose a risk to coastal areas related to regional seismic activity along the Cascadia Subduction Zone or from other areas within the “Ring of Fire.” The Cascadia Subduction Zone ranges from British Columbia, Canada to northern California. Earthquakes along this zone have the potential to generate large seismic sea waves. Research by the Washington State Department of Natural Resources suggests that locally generated tsunamis would not allow much response time for residents. Communities within tsunami hazard zones do have emergency management plans in place if a tsunami occurs (WSDNR, 2004).

Volcanic Hazards

One primary location in the WOR Region study area contains areas of volcanic hazard. In the Pacific Mountain Region, the Cascade Range is a growing and tectonically active mountain system. It forms the boundary of two plates: the Juan de Fuca and the North American. The subduction of the Juan de Fuca plate under the North American plate takes place as the two plates converge, creating high pressure and temperatures that deform and melt rock along the plate boundaries. Magma created during this process sometimes rises to the surface as volcanic eruptions. The Cascade Range is the volcanic chain that developed as a long-term result of these processes (USDOI, 2007).

Figure 4.4-4. Seismicity in the WOR Region



Landslides

A landslide is the sudden downward movement of rock, soil, mud, or debris on a slope. Landslide is a general term; there are many different types and causes of landslides. Along the northern border of the United States, most landslides occur along the steep slopes of the many mountain ranges in the region (Figure 4.4-5). Much of the Cascade region and the northern Rockies are susceptible to landslides due to their steep slopes. The Cascades, in particular, are at risk due to the large amounts of precipitation common to the region.

Landslides can be triggered by various mechanisms, including seismicity, rainfall, snowmelt, volcanic events, and human activities (e.g., site development, mining, and deforestation). In the Cascades area, most landslides occur due to rainfall, along with seismic and volcanic activity (Nyborg, 2003). Landslide hazards in Montana result from seismic and human activities (State of Montana, 2004).

Karst Topography

In the WOR Region, karst landscapes occur in small areas (Figure 4.4-6) scattered through Washington, Idaho, and Montana. Long, short, and pseudokarst karst types all exist in these areas. Appendix N provides details on these pockets of karst terrain.

Figure 4.4-5. Incidence of Landslides in the WOR Region

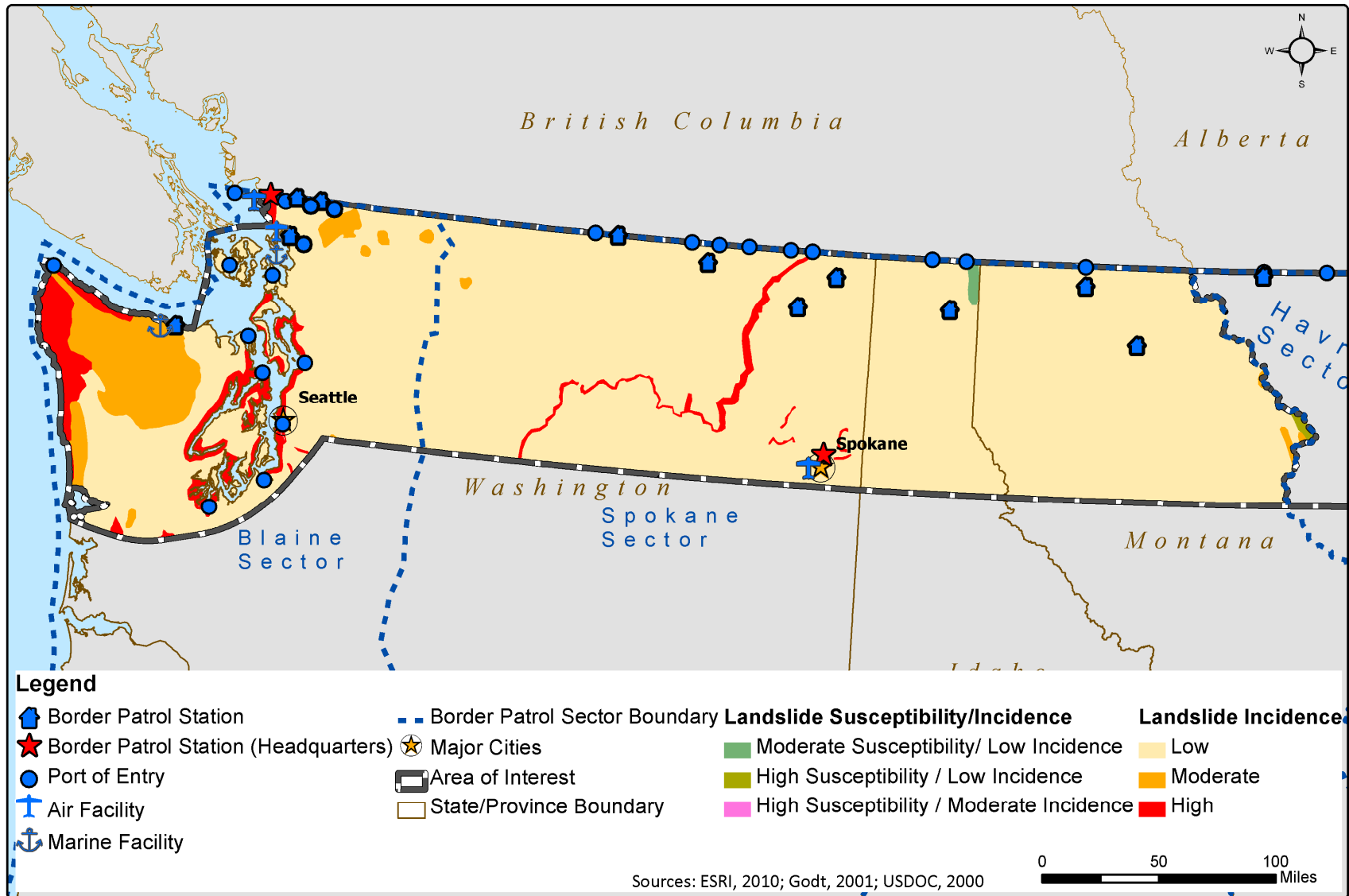
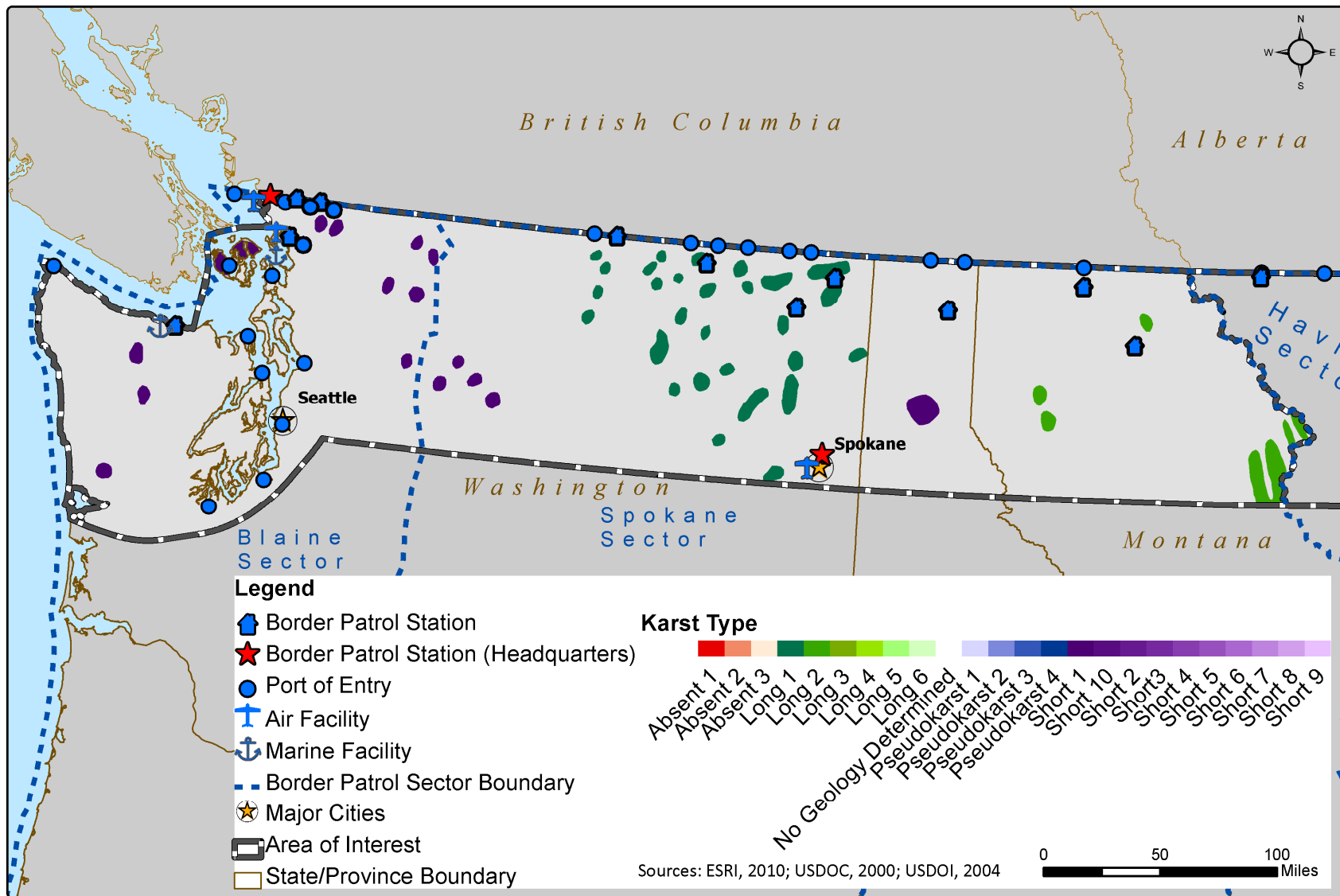


Figure 4.4-6. Karst Topography in the WOR Region



4.4.2.3 Soils

In the WOR Region, nine major soil groups, or “orders,” occur (Figure 4.4-7).

In the WOR Region, soils contain a wide range of particle sizes. One of the most dominant soil types—inceptisols—spans all three states and has a high potential for erosion. These soils develop on surfaces that have not had adequate time to develop soil profiles, thus they do not have extensive soil horizons. Both the lack of horizon development, as well their locations on steep slopes, contributes to their high erosion potential (University of Idaho, No Date). Soils with high glass content (andisols), such as those in areas of volcanic activity, tend to have lower erosion rates (Busacca, et al., No Date).

Western Washington state also has spodosols throughout. This soil order is acidic and can be found in forested areas. They are not agriculturally productive without management because of the high acid content, but have sub layers of humus, or stable organic matter (University of Idaho, No Date). To a lesser degree, ultisols and entisols are present in western Washington. Ultisols are soils with a high acid content, low fertility, and have been leached of minerals by the processes of weathering. Low soil fertility is due to a lack of nutrients in the soil resulting in the decreased ability to support plant life. While not productive as agricultural lands, ultisols are often found in highly productive forested areas (University of Idaho, No Date). Entisols are soils that do not fit into any of the other 12 soil orders. These are young soils and have only an A Horizon. Entisols are the most extensive soils in the world and can be very diverse based on the parent material from which they develop (University of Idaho, No Date). This soil order is often the transition layer between other soil orders and non-soil parent rock.

In addition to inceptisols, andisols, and entisols, eastern Washington and Idaho contain mollisols and a small amount of aridisols and histosols. These soils are common in grassland regions and are extremely agriculturally productive. In the United States, this is the most common soil order. The thick upper horizon (or layer) is a result of the decayed organic materials (University of Idaho, No Date). The development of this order is most often related to the weathering of sedimentary parent rock, and in some cases, the weathering of glacial deposits. Mollisol soil texture can vary to a great degree from sandy to fine loams (See table 3.4.2-1). This soil order is prone to erosion, especially by water in cultivated areas (University of Wisconsin, 1999). Aridisols are not agriculturally productive due to their location in arid regions. A major component of these soils is calcium carbonate in addition to clays, silica, and other soluble salts (University of Idaho, No Date). They tend to have low permeability and low nutrient content (University of Wisconsin, 1999). Histosols in this region are mainly found in areas of poor drainage. This water accumulation decomposes organic materials and creates peaty and mucky conditions. They have a low weight-bearing capacity and if drained of water, land subsidence may occur (University of Idaho, No Date).

Western Montana has alfisols, which is a soil order that is not present in the other parts of the region. Alfisols are often found in forested areas but can also be found in prairies and grasslands. Most often located in temperate climates, they can develop in sub-tropical

and tropical areas as well (University of Idaho, No Date). The primary component of this soil order is clay as a result of mineral weathering (University of Wisconsin, 1999).

4.4.2.4 Prime and Unique Farmland

In the WOR Region, Prime and Unique Farmland is most concentrated in Idaho where it ranges from six to ten percent of state land (Figure 4.4-8). In Washington, the percent is lower at four to six percent. Montana has the lowest percentage, with only zero to two percent of state land designated. As a whole, the region contains a low percentage of designated Prime and Unique Farmland.

Figure 4.4-7. Soil Orders in the WOR Region

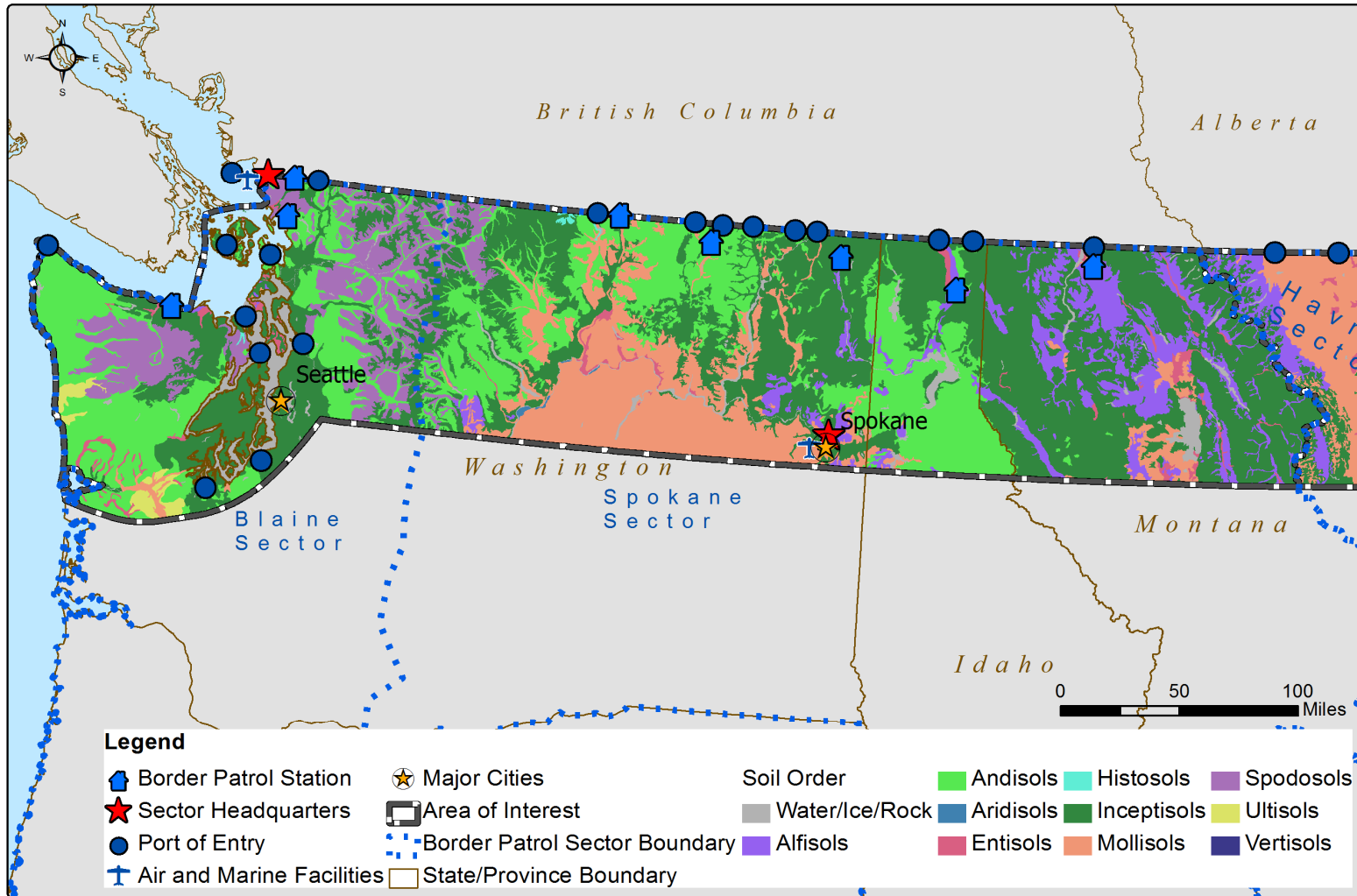
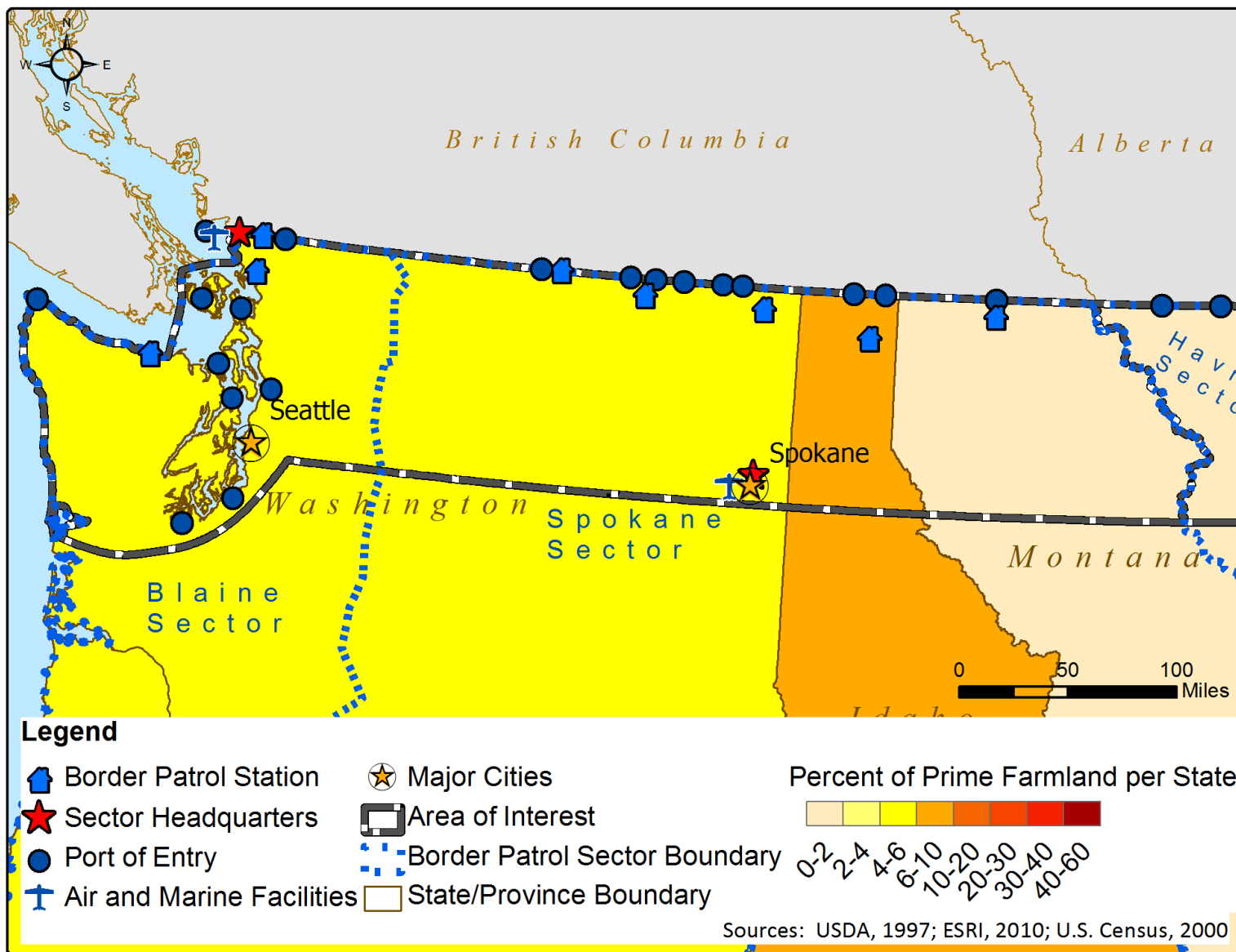


Figure 4.4-8. Prime Farmland in the WOR Region



4.5 WATER RESOURCES

4.5.1 INTRODUCTION

Water resources are distributed widely throughout the 100-mile PEIS study corridor in the states of Washington, Idaho, and Montana west of the Continental Divide. For the purposes of this study, this resource area consists of hydrologic and groundwater resources (aquifers, subterranean watercourses, and recharge areas), surface water and waters of the United States (lakes, ponds, rivers, streams, and channels), and floodplains. Water resources include several beneficial elements, such as water supply quantity and quality, habitat for aquatic organisms, recreation, and flood storage capacity, which are subject to effects from proposed activities.

4.5.2 AFFECTED ENVIRONMENT

4.5.2.1 Groundwater

Groundwater resources are sources of water that result from precipitation infiltrating the ground surface. Groundwater is contained in either confined or unconfined aquifers. When the water table or piezometric surface reaches the ground surface, groundwater will reappear as either streams, surface bodies of water, or wetlands. This exchange between surface water and groundwater is an important feature of the hydrologic cycle.

Groundwater has a variety of beneficial uses. In the WOR Region, as in the rest of the country, groundwater is a primary source for a wide variety of water uses including irrigation, domestic water supply, fish propagation, commercial water supply, industrial uses, and livestock. Table 4.5-1 shows the categories of groundwater use for states within the WOR Region.

Table 4.5-1. Water Use in the WOR Region in 2005

State	Irrigation Use (%)	Public Water Supply (%)	Industrial Use (%)	Rural Domestic, Livestock (%)
Montana	95.7	1.4	1.9	1.0
Idaho	85.0	1.2	0.5	13.3
Washington	62.8	17.7	16.7	2.8

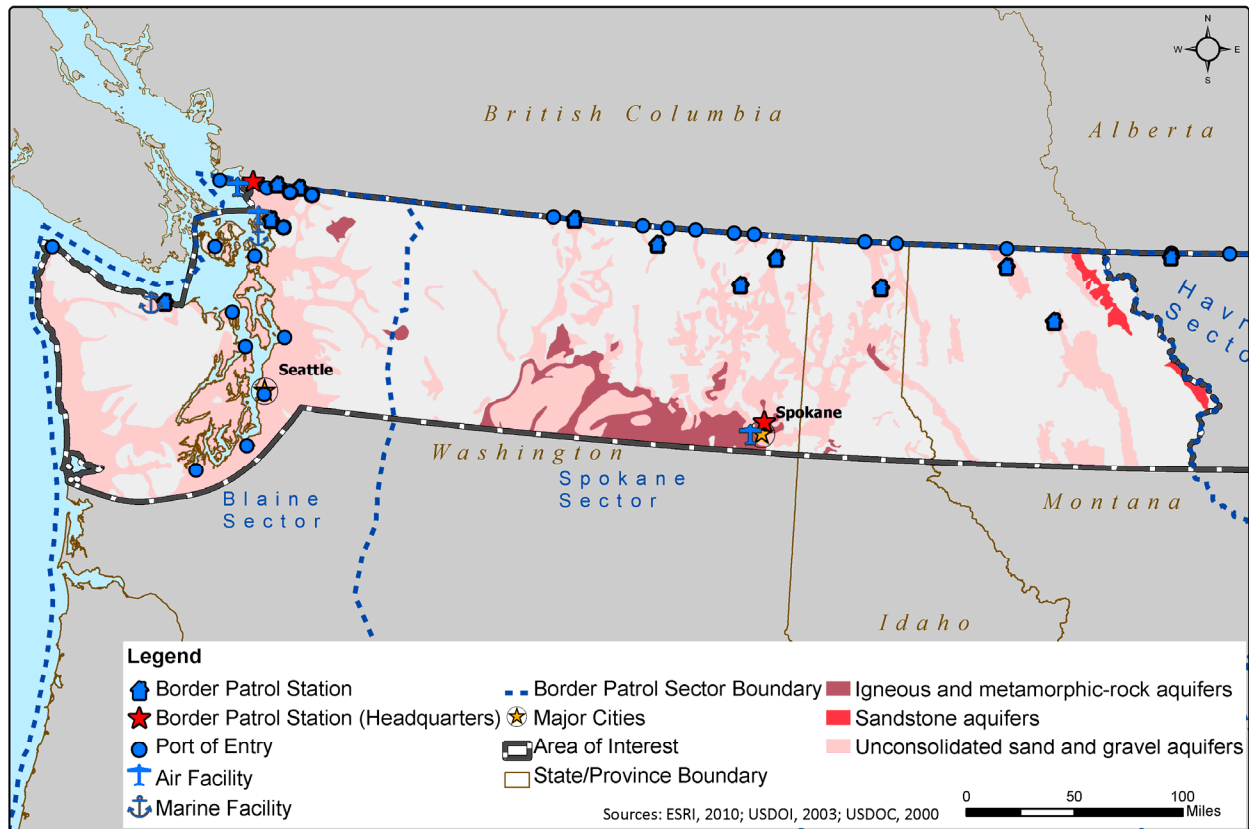
Source: (Kenny et al., 2009).

Groundwater occurs in porous geologic formations called aquifers, which may be large and regional, such as the Ogallala Aquifer that underlies many states in the Great Plains. Aquifers may also be very small and localized.

In the WOR Region, there is a large regional aquifer known as the Columbia River Basalt Aquifer. Although this aquifer is large, only a small amount of its northern portion underlies the 100-mile corridor that is the basis of this PEIS. The aquifers underlying the area within the corridor are glacial drift aquifers, valley-fill aquifers, or smaller localized aquifers. Glacial drift aquifers are formed from glacial outwash and the more permeable materials within glacial till. It has mostly unconsolidated sand and gravel but also has silt, clay, and consolidated till (hardpan). Valley-fill aquifers have mostly sand and gravel, providing yields of only a few gallons per

minute, which is enough for single-family domestic use. Figure 4.5-1 shows principal aquifers in the WOR Region.

Figure 4.5-1. WOR Region Groundwater Aquifers



4.5.2.2 Surface Waters and Waters of the United States

Surface water is water found in lakes, rivers, ponds, wetlands, and oceans. It is the most abundant and visible form of water resource, with the greatest variety of uses. In addition to irrigation, domestic water supply, fish propagation, commercial water supply, industrial uses, and livestock, surface water supports recreation, fish and wildlife habitat, hydropower, and transportation. Section 4.3.2.7 provides a discussion of the regional affected environment for aquatic resources. Surface water is often identified by the basin or watershed in which it is found. A watershed is simply the topographic area defined by the drainage of a single body of water.

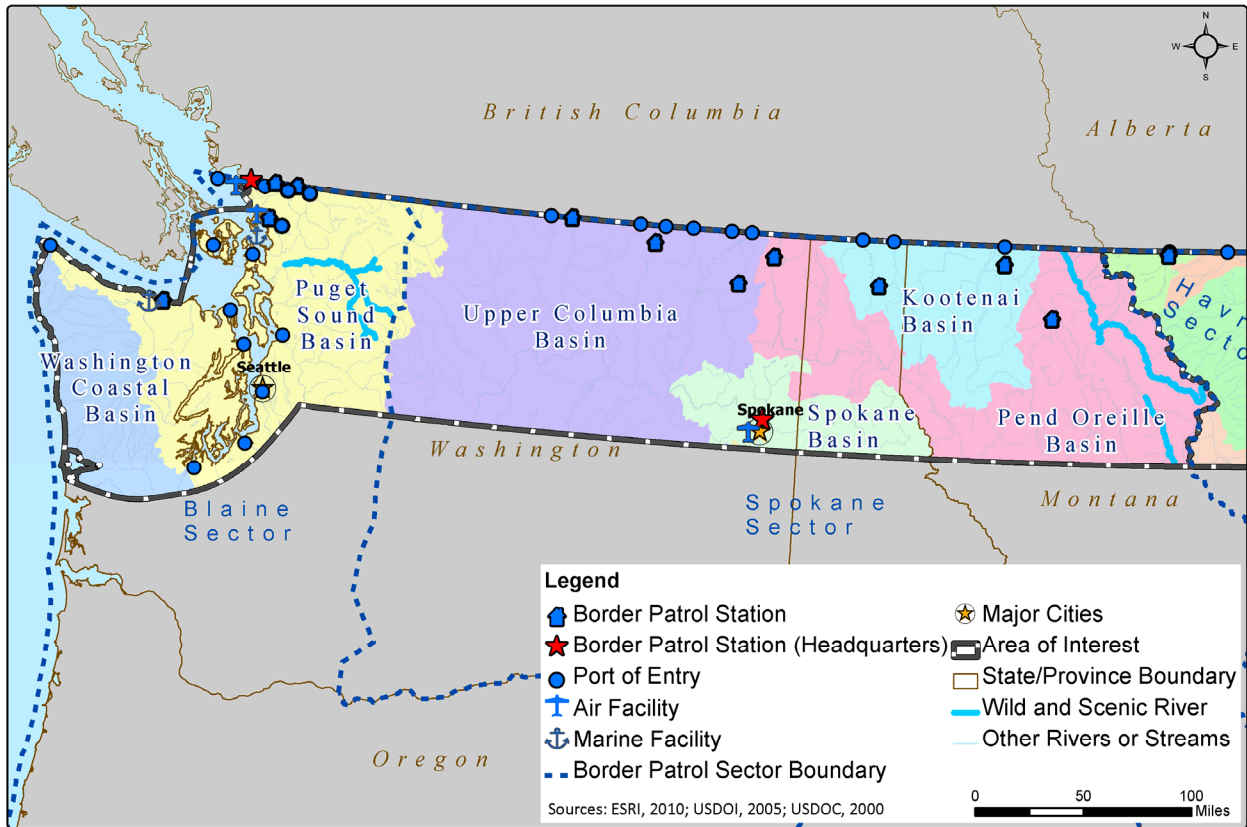
There are two designated Wild and Scenic Rivers within the WOR Region: the Skagit River in Washington and the Flathead River in Montana. Figure 4.5-2 shows Wild and Scenic Rivers as well as the river basins found within the 100-mile corridor for the WOR Region.

The Flathead River has a mean annual discharge of nine million acre-feet. It’s North Fork flows from southeast British Columbia into northwest Montana forming the western boundary of Glacier National Park. The Flathead empties into the Clark Fork River at Paradise, Montana. The nearly 10,000 square mile Flathead Subbasin extends roughly 90 miles east to and around 200 miles north to south, providing northereastern drainage of the Columbia River. Just over

600 square miles (7 percent) of the subbasin are in British Columbia mostly as land administered by the BC Ministry of Forests. The remainder in the United States is mostly on Forest Service, National Park Service (NPS), and Confederated Salish and Kootenai Tribes' land with smaller amounts owned by the State of Montana and private landholders.¹

¹ Confederated Salish and Kootenai Tribes and Montana Fish, Wildlife & Parks. 2004. Flathead Subbasin, Plan: Executive Summary. A report prepared for the Northwest Power and Conservation Council. Portland, OR.

Figure 4.5-2. River Basins in the WOR Region



The Columbia River Basin is the dominant watershed in the WOR Region, covering areas that include western Montana, northern Idaho, and the eastern two-thirds of Washington. The basin also extends across the border northward into Canada. Major watersheds in western Washington include the Puget Sound and coastal drainage basins.

Figure 4.5-3. Basalt cliffs and crescent bar on Columbia River



The Columbia River Basin is the second largest basin in North America, draining more than 260,000 square miles into a river with a length of 1,200 miles. The average flow of 7,785 cubic meters per second is second in the United States only to that of the Mississippi-Missouri River.

The system of dams in the basin has resulted in 250 large reservoirs and more than 100 large hydroelectric projects, making it one of the most developed river systems in the world.

Federal dams on the river generate an average of 8,664 megawatts (MW) of electricity. Non-Federal dams generate 5,368 MW. Combined, these dams produce enough power for eight million homes, or 13 cities the size of Seattle (NPCC, 2010). Hydroelectric plants at dams on the Columbia River within the 100-mile PEIS corridor include the Grand Coulee Dam operated by U.S. Bureau of Reclamation at Grand Coulee, Washington; the Chief Joseph Dam operated by the U.S. Army Corps of Engineers (USACE) near Bridgeport, Washington; and the Wells Dam operated by the Douglas County Public Utilities District south of Pateros, Washington.

The river is vital to fisheries of the region with salmon and steelhead runs that are among the largest in the world. Washington legislation passed in 2006 enables access to water resources while at the same time helping to restore salmon and other species (WSDE, 2009).

4.5.2.3 Floodplains

Floodplain management seeks to preserve the flood storage capacity for the river corridor. This may be achieved in several ways. Local communities often have floodplain management or zoning ordinances that restrict development within the floodplain. The Federal Emergency Management Agency (FEMA) manages the National Flood Insurance Program (NFIP). FEMA also provides floodplain management assistance, including mapping of 100-year floodplain limits, to over 20,000 communities. The information provided by FEMA's flood management program is useful to CBP planners who seek to avoid effects from flooding conditions. This is most relevant for CBP border facilities, such as POEs that are planned at locations where rivers define the northern border. While there are rivers of this type in other regions along the northern border with existing nearby CBP facilities, there are no rivers of this type in the WOR Region.

4.5.2.4 TRANSBOUNDARY WATER AGREEMENTS

Boundary Waters Treaty

This treaty provides the basis for resolving disputes involving diverting or obstructing projects impacting water quantity and water across the boundary between Canada and the United States. It establishes an International Joint Commission with authority to approve projects on either side of the border that would alter transboundary water levels. The treaty was initiated between the United States and Great Britain in 1909 to settle issues of distribution of waters of the St. Mary and Milk Rivers for irrigation purposes between Canada and the United States.

Flathead Watershed Agreement with British Columbia

Montana and British Columbia have an agreement on policies and practices that protect the water environmental values of the Flathead River Basin and promote more sustainable energy practices and actions to lessen contributions to climate change. The agreement seeks to increase sharing of environmental information, enhance fish and wildlife management cooperation, and initiate collaboration assessing environmental impacts of significant cross-border projects with potential to degrade land or water qualities. It also seeks to discourage mining, oil and gas, and coal development as allowed land uses in the basin. The State of Montana and the Province of British Columbia signed the agreement in February of 2010 with the Ktunaza Nation and the Confederated Salish and Kootenai Tribes witnessing.

This treaty provides the basis for resolving disputes involving diverting or obstructing projects impacting water quantity and water across the boundary between Canada and the United States. It establishes an International Joint Commission with authority to approve projects on either side of the border that would alter transboundary water levels. The treaty was initiated between the United States and Great Britain in 1909 to settle issues of distribution of waters of the St. Mary and Milk Rivers for irrigation purposes between Canada and the United States.

Columbia River Treaty

This treaty provides for the cooperative development of hydropower resources in the Columbia River Basin.

High Ross Treaty

This treaty was established to forestall (until 2065) Seattle City Light raising the Ross Dam within the Ross Lake National Recreation Area (ROLA) in Washington, which would flood the upper Skagit River Valley in British Columbia, Canada. The treaty also established the Skagit Environmental Endowment Fund and Commission to enhance recreational opportunities and to conserve and protect wilderness and fish and wildlife habitat in the Upper Skagit Watershed until 2065 through mechanisms such as acquisition of timber and mineral rights and execution of projects such as trail system development.

4.6 NOISE

4.6.1 INTRODUCTION

The study area contains many soundscapes and noise-sensitive receptors that could experience impacts due to the alternatives that CBP is considering. However, the mere presence of a noise-sensitive area, such as a national park, residence, or school, does not guarantee that it would be significantly impacted by CBP’s activities or that the overall impacts would be major under the National Environmental Policy Act (NEPA). As with other topics in this Programmatic PEIS, the programmatic approach to describing noise is driven by the planning objective of the document and the potential for actual impacts.

4.6.2 AFFECTED ENVIRONMENT

Sound is a physical phenomenon consisting of vibrations that travel through a medium like air and are sensed by the human ear. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise, distance between the noise source and the receptor, receptor sensitivity, and time of day. Noise is often generated by activities essential to a community’s quality of life, such as construction or vehicular traffic.

Sound varies by both intensity and frequency. Sound pressure level, in decibels (dB), is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Because the human ear responds differently to different frequencies, “A-weighting” was developed to approximate the frequency response of the human ear. The A-weighting curve has been widely adopted for environmental noise measurement and is standard in many sound level meters. The dBA levels of common sounds of daily life are provided in Table 4.6-1.

Table 4.6-1. Common Sound Levels

Outdoor	Sound level (dBA)	Indoor
Snowmobile	100	Subway train
Tractor	90	Garbage disposal
Downtown (large city)	80	Ringling telephone
Freeway traffic	70	TV audio
Normal conversation	60	Sewing machine
Rainfall	50	Refrigerator
Quiet residential area	40	Library

Notes: dBA = A-weighted decibel. Sound level provided is as generally perceived by an operator or a close observer of the equipment or situation listed.

Source: Harris, 1998.

The dBA noise metric describes steady noise levels, although very few noises are, in fact, constant. Therefore, the measurement day-night sound level (DNL) has been developed. DNL is defined as the average sound energy in a 24-hour period with a 10-dB penalty added to the nighttime levels (10 p.m. to 7 a.m.). DNL is a useful descriptor for noise because: (1) it averages ongoing yet intermittent noise, and (2) it measures total sound energy over a 24-hour period. In addition, Equivalent Sound Level (L_{eq}) is often used to describe the overall noise environment. L_{eq} is the average sound level in dB.

4.6.2.1 Regulatory Review

The Noise Control Act of 1972 (PL 92-574) directs Federal agencies to comply with applicable Federal, state, interstate, and local noise control regulations. In 1974, the USEPA provided information suggesting continuous and long-term noise levels in excess of DNL 65 dBA are normally unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals.

State and local governments have the opportunity to regulate noise in their jurisdictions. These regulations are typically guidelines for activities that generate noise and the hours that such activities may be performed. Noise is typically regulated at the local level. A municipal noise ordinance might address the hours that heavy equipment can be operated, the distance heavy equipment can be operated in proximity of noise-sensitive receptors (i.e., schools, hospitals, churches, and residences), and the duration of operation of a single noise source considered to be annoying to the public, such as a diesel-powered generator. Some set specific not-to-exceed noise levels, and others are simple nuisance noise ordinances.

A number of sources of noise may be addressed for rural areas, such as parades, vendors, social engagements with music, and animal noises. Construction noise is typically exempt from noise ordinances in rural areas. In addition, noise regulations in an urban setting take into account the constant noise sources of urban living, such as large heating, ventilation, and air conditioning (HVAC) units, public transportation (trains and buses), emergency vehicles, and heavy traffic. Because urban noise levels are already relatively high, adding a source for an extended period can be highly annoying to some people, hours of construction and operation of heavy equipment are often limited. A typical ordinance in a major city will restrict construction related noise sources between the hours of 10:00 p.m. and 7:00 a.m.

4.6.2.2 CBP Noise Sources

The CBP operates 24 hours a day and 7 days a week. The level of operation can be determined by the measures required to secure the border or necessary for normal facility activities. Table 4.6-2 lists CBP's operations and describes of the noise levels of these activities.

Table 4.6-2. CBP Noise Sources

Operation	Description
Use of mobile surveillance systems (MSS) and surveillance towers	Very little noise is generated by the motor. In remote areas, standby generators may be used to supplement electric power.
Firing ranges and armories	CBP conducts small-arms training at many of its POEs and BPS. Small-arms weapon fire is clearly audible in areas surrounding these ranges during training activities. Usually these activities are limited to daytime hours.
Maritime patrols	Boating noise is typically audible during marine patrols near the shoreline. This noise is widespread and at most locations only sporadic. The watercraft used are generally selected for their noise-suppression features because of the nature of their mission.
Patrols by foot, horse, off-road vehicle (ORV), and snowmobile	Foot and horse patrols are typically quiet. Noise from ORVs and snowmobiles is audible for a mile or more in remote, quiet areas. This noise is widespread and at most locations only sporadic. Areas near POEs and BPSs may have more concentrated noise associated with these activities.
Added and expanded POEs and checkpoints	This action may require construction, which would end at the completion of the project.
Operation of expanded BPS	Additional personnel would be required for addition or expansion of newly constructed facilities. The possibility of canine facilities, firing ranges, and patrol vehicles may be required for operations at some new/expanded facilities.
Aircraft operations	Air operations at CBP are diverse: Helicopters, fixed-wing aircraft, and unmanned aerial systems (UAS) may be used regularly at some locations, although not all aircraft are used simultaneously. Along with regular operations, training exercises are also a source of aircraft noise at some facilities.
Construction activities	CBP conducts both large and small construction projects. Each has some level of heavy equipment and truck transport noise.
Maintenance activities	Maintenance operations at CBP are as diverse as the facilities themselves. The noise associated with these actions can involve training to maintain each category listed above. These noise sources may be one major repair using heavy equipment, monthly routine maintenance, or daily maintenance in the case of dogs, horses, and vehicles.

Source: USDHS, 2010.

4.6.2.3 Non-CBP Noise Sources

The sources of noise along the WOR border vary greatly, although most of the region is rural or remote. Sounds dominating the rural areas are aircraft overflights, bird and animal vocalizations, and very light traffic. Farming is a major activity in some of the rural areas identified with the project area. Farming is seasonal in this region and may create major sources of noise during planting, and even more during harvest in August through October when several large combines may operate concurrently. Although the majority of land is remote, the city of Seattle is in this region with significantly higher levels of noise. A complete list of counties with their population and current background noise levels can be found in Appendix O. Notably, these levels are estimated average background levels based on population. Actual site-specific levels may vary base on location.

4.6.2.4 Background Noise Levels

Estimated background noise levels for areas within 100 miles of the border are shown in Figure 4.6-1 and described in Table 4.6-3. The majority of areas within 100 miles of the border would be classified as remote or rural residential and are isolated, far from significant sources of sound. Townships and small cities are scattered throughout the 100-mile buffer area; however, more remote land areas cover most of the project area. These smaller cities can be described as rural-residential and quiet-commercial.

Figure 4.6-1. Background Noise Levels in the WOR Region

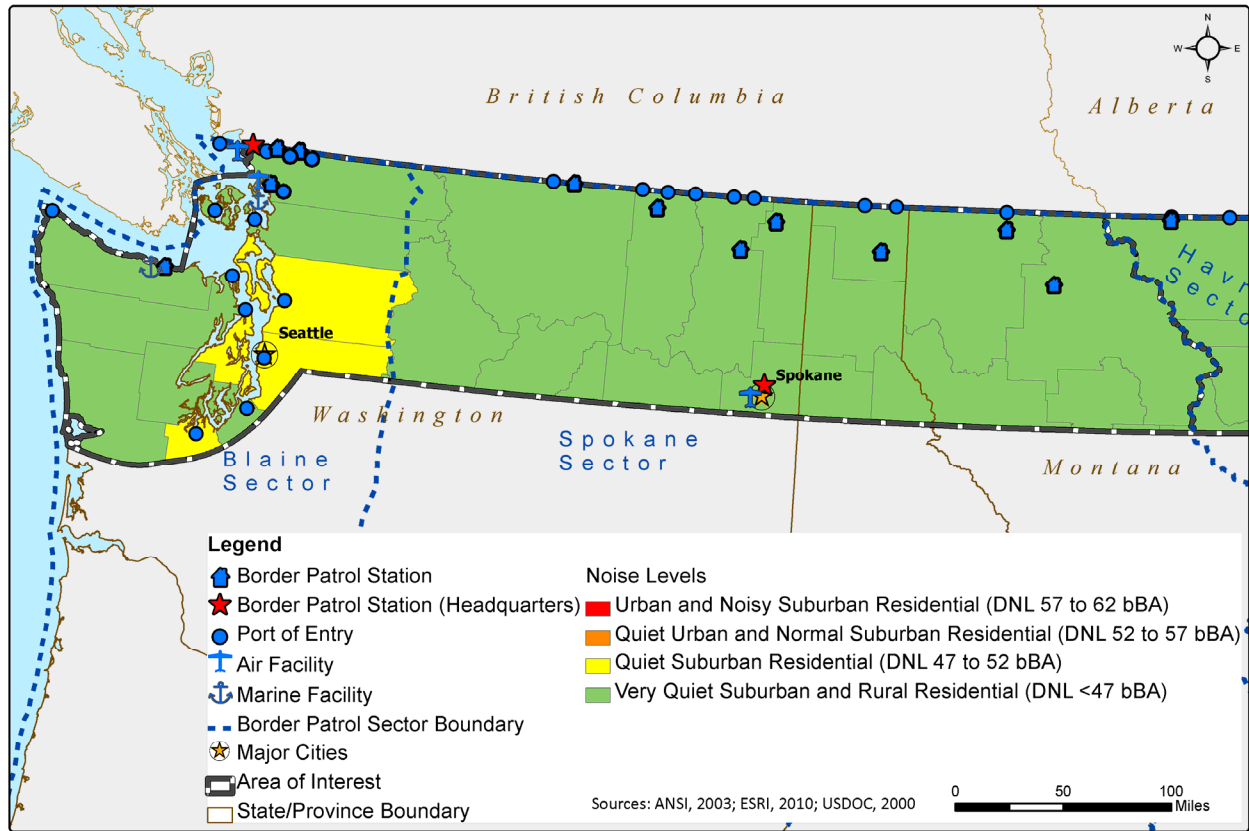


Table 4.6-3. Description of Background Noise Levels

Intensity Level	Example Land Use Category	Average Residential Intensity (people per acre)	Leq (dBA)		
			DNL	Daytime	Nighttime
Low	Quiet suburban residential	2	49	48	42
Medium-low		4	52	53	47
Medium	Quiet urban residential	9	55	56	50
Medium-high	Quiet commercial, industrial, and normal urban residential	16	58	58	52
High		20	59	60	54

Source: ANSI, 2003.

Notes: Leq = equivalent sound pressure level
 dBA = A-weighted decibels

4.6.2.5 National Parks

NPS recognizes the natural soundscape of each national park unit as an inherent resource, and manages this resource in order to “restore degraded soundscapes to the natural conditions wherever possible, and protect natural soundscapes from degradation due to noise” (USDOJ, 2000). Non-impairment of natural soundscapes is mandated by the Organic Act of 1916 and is part of the NPS management goals and objectives. Each region of the project area has locations

of special interest such as national parks. The national parks within 100 miles of the border in the WOR Region are listed in Table 4.6-4 and shown in Section 4.2 Air Quality, Figure 4.2-3.

Table 4.6-4. National Parks in the WOR Region

State	National Park	Acres
Montana	Glacier National Park	1,012,599
Washington	Mount Rainier National Park	235,239
Washington	North Cascades National Park	503,277
Washington	Olympic National Park	892,578

Source: (USEPA, 2010).

4.7 CLIMATE CHANGE AND SUSTAINABILITY

4.7.1 INTRODUCTION

According to the 2009 U.S. Global Change Research Program (USGCRP) report, “Global Climate Change Impacts in the United States,” documented impacts to the Nation from climate change include increased average temperatures, more frequent heat waves, high-intensity precipitation events, sea-level rise, more prolonged droughts, and more acidic ocean waters, among others. Global and national temperature changes are not distributed evenly. Greater increases occur at high, northern latitudes (CEQ, 2010). In 2010, DHS identified global climate change as a long-term trend and global challenge that threatens America’s national-security interests (USDHS, 2010).

Sustainability and smart growth are approaches to human activity that aim to meet the needs of the present without compromising the ability of future generations to meet their own needs. For CBP, the concepts of sustainability and smart growth include the ability to adjust to changing geopolitical realities while preserving the environment and working to improve the quality of life for American residents and visitors.

To reduce environmental impacts and address the challenge of limited resources, the DHS prepared a “Strategic Sustainability Performance Plan” to promote sustainable planning, design, development, and operations. The guidelines aim to decrease energy use, minimize reliance on traditional fossil fuels, protect and conserve water, and reduce the environmental impact of materials use and disposal. CBP’s overarching goal is to size, plan, and carry out proposed development in a manner that is sustainable and that works to preserve and protect limited resources.

4.7.2 AFFECTED ENVIRONMENT

4.7.2.1 Climate Regions of the Northern Border—Overview

The climate along the northern border is characterized by mild summers and very cold to extremely cold winters. January is the coldest month. July is the warmest month throughout the entire project area, and its temperature can fluctuate 20-30 degrees Fahrenheit between day and evening (Idcide, 2010). Precipitation is evenly distributed throughout the year. The average annual precipitation across the entire northern border is approximately 31 inches. There are three recognized climatic zones within the WOR Region: Midlatitude Steppe Climate, Highland (Alpine) Climate, and Marine West Coast Climate. A discussion of these zones is provided in the following subsection.

4.7.2.2 Climate in the WOR Region

Midlatitude Steppe Climate

The Midlatitude Steppe Climate is found within temperate regions of the midlatitudes in the interior regions of continents and where air masses are forced to lift up over higher elevations. In the United States, these climates are found in the Great Plains and western states in the rain shadow of major interior mountain ranges at great distances from sources of moisture.

Temperatures in these regions vary with latitude, elevation, and position within the continent. Thus, the northern Great Plains experiences some of the lowest temperatures in this region. Average temperatures increase at the southern limits of this climate region.

The region is classified as semi-arid. Peak precipitation occurs during the summer months (Ritter, 2006).

Highland (Alpine) Climate

The Highland (Alpine) Climate is found in mountainous regions of the western United States that are above timberline. It is one of the coldest climates found in the United States due to its high altitude. It is similar to tundra and Arctic climate zones in that it is cold and dry throughout the year. Growing seasons are short—about 180 days—and night temperatures are almost always below freezing. Thinner atmospheres can allow often dangerous exposure to ultraviolet radiation.

Marine West Coast Climate

The Marine West Coast Climate is found along coastal Oregon, Washington, British Columbia, and southern Alaska. Climate characteristics are controlled by the coastal location in the midlatitudes. Maritime polar air masses bring ashore mild temperatures and high humidity. The orientation of mountains has a large effect on the geographic distribution of the climate. In North and South America, mountains tend to be north-south oriented and act as a barrier to oceanic air masses from the westerly winds, forcing them to rise and cool, producing cloudy, rainy conditions along the coast. The dry summer at the northern border near Vancouver is due in part to subsiding, subtropical high pressure lying to the south.

This climate has mild summers and winters and a small annual temperature range. Its West-Coast location in the midlatitudes means the climate receives a constant influx of oceanic air throughout the year from the westerlies. The mild air temperatures result from the moderating influence of ocean bodies. Temperature ranges increase as one moves inland.

The climate also features heavy cloud cover and high humidity through much of the year. This is especially true in the Pacific Northwest, where uplift of air masses crossing mountain ranges is an important climate control. Maritime polar air masses forced to rise up windward, western slopes create significant cloud cover and precipitation. The climate is dominated by cyclonic activity embedded in the westerlies. Frequent cyclonic storms bring prolonged periods of rain, drizzle, and fog to these west coast locations.

4.7.2.3 Climate Change in the United States—Pacific Northwest Regional Assessment

The Pacific Northwest Region became warmer and wetter during the course of the twentieth century. Average annual temperature warmed by 1 degree Fahrenheit to 3 degrees Fahrenheit (0.5 degree Celsius to 1.7 degrees Celsius) with the warming spread equally across the region and the summer and winter seasons. During the same period, precipitation has increased by 10 percent.

There are recurrent patterns of year-to-year variability in the climate. Warm years are dry with low streamflow and light snowpack. Cool years are wet with high streamflow and heavy snowpack. The variability has an apparent effect on regional resources, such as summer water

shortages in warmer, drier years that result in less-abundant salmon and increased risk of forest fires.

The variations are closely correlated with two large-scale climate variation patterns over the Pacific Ocean: the El Nino/Southern Oscillation every few years and the Pacific Decadal Oscillation every few decades (USGCRP, 2010).

4.8 LAND USE

4.8.1 INTRODUCTION

This section characterizes land uses in the WOR Region and describes some land uses on the Canadian side of the border that could be affected by some CBP activities. For example, construction projects that introduce noise and light pollution along the border could affect the suitability of land to support its current or planned use on both sides of the border. Other actions, however, such as direct removal of land from existing uses for CBP-related infrastructure construction, would not affect the Canadian side. The USGS and Natural Resources Canada (NRC) define land cover and land use classifications.

4.8.2 AFFECTED ENVIRONMENT

This section describes land use and cover for the WOR Region. The summary tables characterize land use and cover according to the USGS Multi-Resolution Land Characteristics Consortium (MRLC) National Land Cover Database (NLCD) and USGS's Gap Analysis Program (USDOI, 2001; USDOI, 2010). The summary tables for Canada synthesize land use and cover according to NRC's Advanced Very High Resolution Radiometer (AVHRR) land-cover data and NRC's protected areas data on regions of ten square kilometers or larger, as compiled by the Canadian Council on Ecological Areas (CCEA) (NRC, 2009; NRC, 2007).

4.8.2.1 Land Cover and Related Land Uses in the WOR Region

The WOR Region covers 32.6 million acres—approximately 16.8 percent of the land area in the region's states, Washington, Idaho, and Montana. The most prevalent land cover within the study area is forested (62.6 percent), followed by snow/ice/barren land (18.4 percent) (Table 4.8-1). Agricultural land covers 5.5 percent of the total study area (3.8 percent in cultivated crops and 1.7 percent in pasture/hay). Each of the remaining types account for less than five percent of land area with herbaceous at 4.9 percent, developed at 4.5 percent, and water/wetlands at 4.2 percent.

Table 4.8-1. Land Cover in the WOR Region

Border State		Total Land Area (Thousands of Acres)	Developed (%)	Cultivated Crops (%)	Pasture/Hay (%)	Herbaceous (%)	Forested (%)	Water (%)	Snow/Ice/Barren Land* (%)
Idaho	Study Area	3,107	1.9	1.9	0.4	2.0	79.7	6.2	7.8
	Statewide	55,278	1.6	9.3	14.9	13.2	32.8	1.8	39.7
Montana (WOR Region)	Study Area	7,687	1.1	1.2	6.1	4.3	74.7	4.0	13.0
	Statewide	95,383	1.3	14.2	43.8	42.1	22.2	2.4	16.0
Washington	Study Area	21,848	6.0	4.9	7.4	5.5	55.9	3.9	21.9
	Statewide	43,859	5.7	14.7	7.7	5.6	42.6	3.5	25.7
WOR Region	Study Area	32,643	4.5	3.8	1.7	4.9	62.6	4.2	18.4
	Selected States	194,521	2.4	12.9	1.8	25.6	29.8	2.5	24.9
Total United States**		2,053,000	5.0		21.9	14.1	31.2		27.7

The WOR Region includes all areas 100 miles south of the U.S.-Canada border in Idaho, Washington, and the portion of Montana west of the Rocky Mountains.

* “Barren Land” includes the NLCD land classification “Shrub/Scrub.”

** Data for the United States as a whole are shown as calculated in USEPA, 2008. This report sums land-cover categories for cultivated crops and pasture/hay to account for total agricultural cover, and sums Snow/Ice, Barren, and Wetlands land cover. This table aggregates the USEPA, 2008, calculation of water and shrub/scrub land cover with the category of Snow/Ice/Barren/Wetlands, though water alone covers 1.6 percent of the land area in the United States, while Ice/Snow/Barren/Wetlands cover 5.7 and shrub/scrub covers 20.4 percent.

Source: (USDOJ, 2001).

The study area includes a high percentage of forested lands and a low percentage of agricultural lands (particularly cultivated crops) relative to the entire country. The amount of developed land in the study area is similar to the country as a whole. Herbaceous land cover is substantially less prevalent in the study area relative to the country. Within the study area in each state, forests cover the majority of total land area. The amount of forested land in the study area of each state is also higher than that of each state as a whole.

Figures 4.8-1 and 4.8-2 show maps of land cover and use in the WOR Region.

Recreation also occurs on other land not specifically designated for the activity and land other than that profiled in Section 4.17 (Recreation), which focuses specifically on major Federal recreation sites. For example, wildlife viewing or hiking may be permitted on some conservation or natural areas in the study area. In addition, hunting and snowmobiling may occur on public or private forested land areas. Absent information on the specific distribution of recreational activities across the landscape, this analysis relies on the above categories of land as a low-end estimate of the area in which recreation is likely taking place.

Recreational land use in the WOR Region accounts for 2.6 million acres or 7.9 percent of the total land area—lower than the share of recreational land use for the country as a whole (10.1 percent) (Table 4.8-2). NPS manages the most land (over 2.3 million acres) in the region used, in part, for recreational purposes. More than half (1.7 million acres) of these NPS-managed lands are in Washington. Much of the NPS land in the WOR Region sits in national parks (Olympic and North Cascades, both in Washington, and Glacier in Montana) and national recreation areas, such as Lake Roosevelt, which is also in Washington. Section 4.17 discusses the potential impacts of CBP activities on lands designated and otherwise used for recreational purposes. Appendix I provides the profiles of major Federal U.S. and Canadian protected and set-aside areas often used for recreational purposes in the study area.

Conservation areas in the WOR Region account for about 5.7 million acres or 17.3 percent of the total land area (Table 4.8-3).

The largest conservation areas that overlap the WOR Region are the Bob Marshall Wilderness in Montana and the Glacier Peak Wilderness and Pasayten Wilderness (in the Okanogan-Wenatchee National Forest) in Washington. The USFS manages almost half of all conservation land in the WOR Region (2.7 million acres). The majority of this USFS land is in Washington, almost a million acres of which is in the Okanogan-Wenatchee National Forest.

The WOR Region uniquely hosts two World Heritage Sites. The Waterton-Glacier International Peace Park combines Waterton Lakes National Park in Alberta, Canada, with the Glacier National Park in Montana to provide a unique climate and prairie to mountain connectivity as well as unique scenery.¹ Olympic National Park in Washington has around a 60 mile undeveloped coastline and a diverse ecosystem.² As a signatory to the World Heritage

¹ <http://whc.unesco.org/en/list/354>, May 11, 2012

² <http://whc.unesco.org/en/list/151>, May 11, 2012

Convention, the United States maintains responsible for and sovereignty over the protection, of these sites as places of great intrinsic natural and cultural value for the heritage of humanity.³

Table 4.8-2. Recreational Land Use in the WOR Region

Border State		Recreational Land Use* (Thousands of Acres)	Share of Recreational Land Use (%)
Idaho	Study Area	12	0.4
	Statewide	16,453	29.8
Montana (WOR Region)	Study Area	686	8.9
	Statewide	14,344	15.0
Washington	Study Area	1,881	8.6
	Statewide	8,683	19.8
WOR Region	Study Area	2,579	7.9
	Selected States	39,480	20.3
Total United States		208,088	10.1

The WOR Region includes all areas 100 miles south of the U.S.-Canada border in Idaho, Washington, and the portion of Montana west of the Rocky Mountains.

* Recreation lands all lands clearly identified by USGS title of land type as intended for recreation (e.g., parks, scenic areas, or recreation areas).

Source: (USDOI, 2010).

Table 4.8-3. Conservation Land Use in the WOR Region

Border State		Conservation Land Use (Thousands of Acres)	Share of Conservation Land* Use (%)
Idaho	Study Area	315	10.1
	Statewide	7,475	13.5
Montana (WOR Region)	Study Area	1,331	17.3
	Statewide	11,800	12.4
Washington	Study Area	4,017	18.4
	Statewide	6,630	15.1
WOR Region	Study Area	5,663	17.3
	Selected States	25,904	13.3

³ <http://www.nps.gov/oia/topics/worldheritage/worldheritage.htm>, May 11, 2012.

Border State		Conservation Land Use (Thousands of Acres)	Share of Conservation Land* Use (%)
Total United States		300,149	14.6

The WOR Region includes all areas 100 miles south of the U.S.-Canada border in Idaho, Washington, and the portion of Montana west of the Rocky Mountains.

* Conservation lands are all lands clearly identified by USGS title of land type as intended for conservation (e.g., reserves, preserves, conservation land, and natural areas).

Source: (USDOJ, 2010)

4.8.2.2 Land Cover and Related Land Uses in the Areas North of the WOR Region

This section considers resources north of the border from the WOR Region extending 2 miles into Canada. The region covers about 585,000 acres, slightly less than 0.3 percent of land area for the entire Province of British Columbia (Table 4.8-4). Almost three-quarters of this area is forested (73.3 percent); however, forested land is less prevalent in this area than in the province as a whole (82 percent forested). The next most common land cover type is water/wetlands (14.8 percent), which is double the percentage of water/wetlands in the country as a whole and three times the percentage of water/wetlands in the province. Agricultural land covers about 11 percent of the area north of the WOR Region (4.4 percent cultivated crops; 6.6 percent pasture/hay), a substantially greater portion than for the province as a whole. Developed areas and snow/ice/barren lands each make up less than 1 percent of land cover. Although very little identified snow/ice land cover occurs in Canada just north of the WOR Region, 38.2 percent of land cover in Canada as a whole is snow/ice. Relative to the entire country, the study area has a small amount of barren land. Figures 4.8-1 and 4.8-2 show maps of land cover and land use north of the WOR Region.

Table 4.8-4. Land Cover in Canada North of the WOR Region

Border Province		Total Land Area (Thousands of Acres)	Developed (%)	Cultivated Crops (%)	Pasture/ Hay (%)	Forested (%)	Water/ Wetlands (%)	Snow/Ice/ Barren Land* (%)
British Columbia	Study Area	585	0.0	4.4	6.6	73.3	14.8	0.8
	Province	221,714	0.1	0.7	0.6	82.0	4.8	11.8
Total Canada		2,071,476	0.1	1.7	6.0	46.7	7.3	38.2

* The areas north of the WOR Region in Canada include the portions of the Province of British Columbia extending 2 miles north of the U.S.-Canada border.

Source: (NRC, 2009).

Table 4.8-5 indicates that recreational land use in the areas north of the border from the WOR Region accounts for almost 71,000 acres, or 12.1 percent of the total land area. This figure is almost double the proportion of recreational land use in Canada as a whole (6.1 percent).

The share of recreational land use in the areas north of the border from the WOR Region is similar to recreational land use in the province as a whole. Provincial parks make up the majority of recreation land area.

Conservation areas north of the border from the WOR Region account for about 29,000 acres, which is 4.9 percent of the total land area. This percentage is similar to the proportion of conservation areas in Canada as a whole (4.7 percent) (Table 4.8-6). The proportion of conservation land north of the border from the WOR Region is more than double that of the province.

Table 4.8-5. Recreational Land Use in Canada North of the WOR Region

Border Province		Recreational Land Use (Thousands of Acres)	Share of Recreational Land Use (%)
British Columbia	Study Area	71	12.1
	Province	25,982	11.7
Total Canada		126,389	6.1

The areas north of the WOR Region in Canada include the portions of the Province of British Columbia extending 2 miles north of the U.S.-Canada border.

Note: Recreation Lands are all lands clearly identified in the NRC dataset as intended for recreation; for example, they are described as parks or recreation areas.

Source: (NRC, 2007).

Table 4.8-6. Conservation Land Use in Canada North of the WOR Region

Border Province		Conservation Land Use (Thousands of Acres)	Share of Conservation Land Use (%)
British Columbia	Study Area	29	4.9
	Province	4,884	2.2
Total Canada		98,234	4.7

The areas north of the WOR Region in Canada include the portions of the Province of British Columbia extending 2 miles north of the U.S.-Canada border.

Note: Conservation lands are all lands clearly identified in the NRC dataset as intended for conservation; for example, described as reserves, preserves, protected areas, or habitat areas.

Source: (NRC, 2007).

Figure 4.8-1. Land Cover in the WOR Region

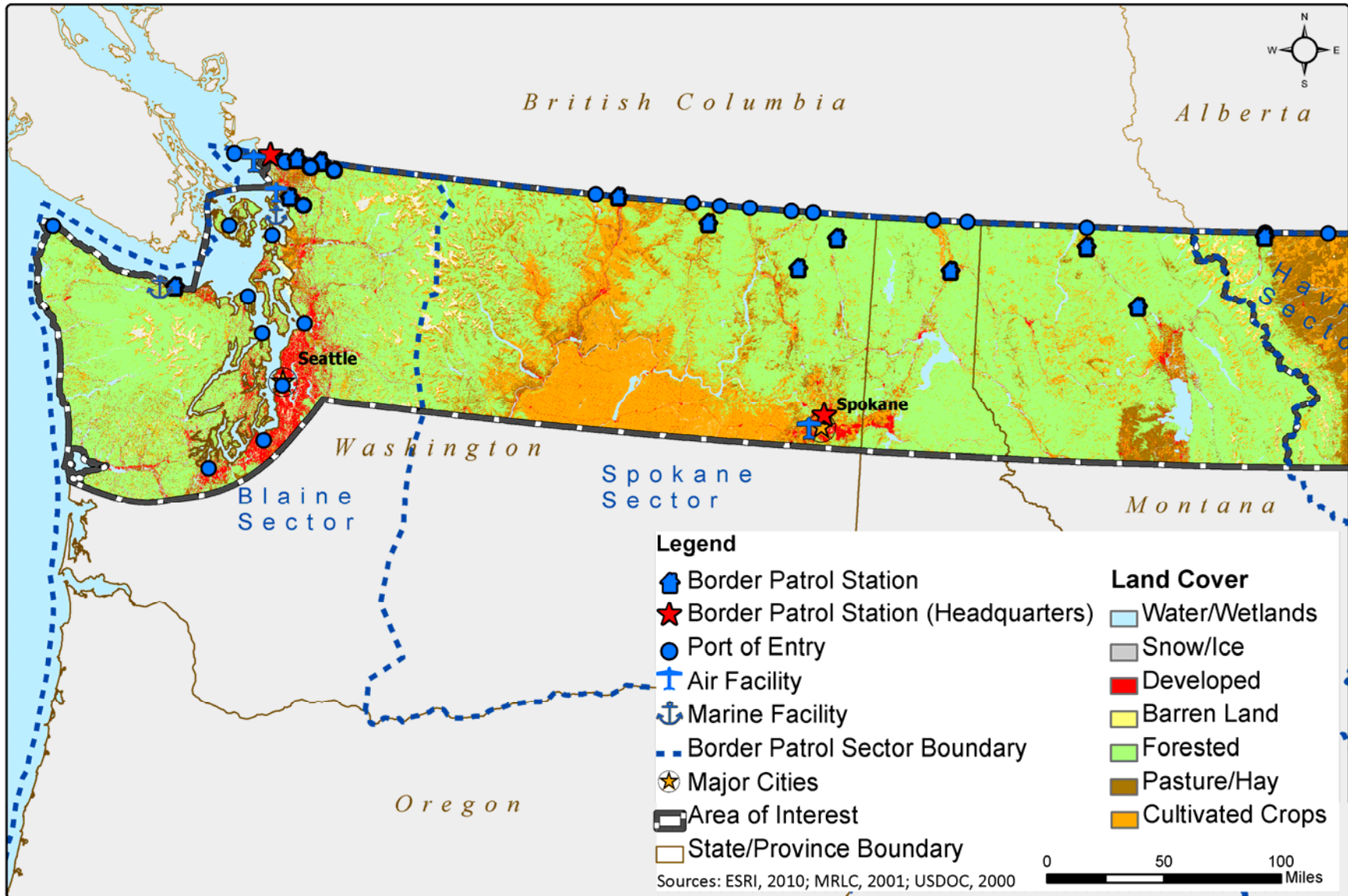
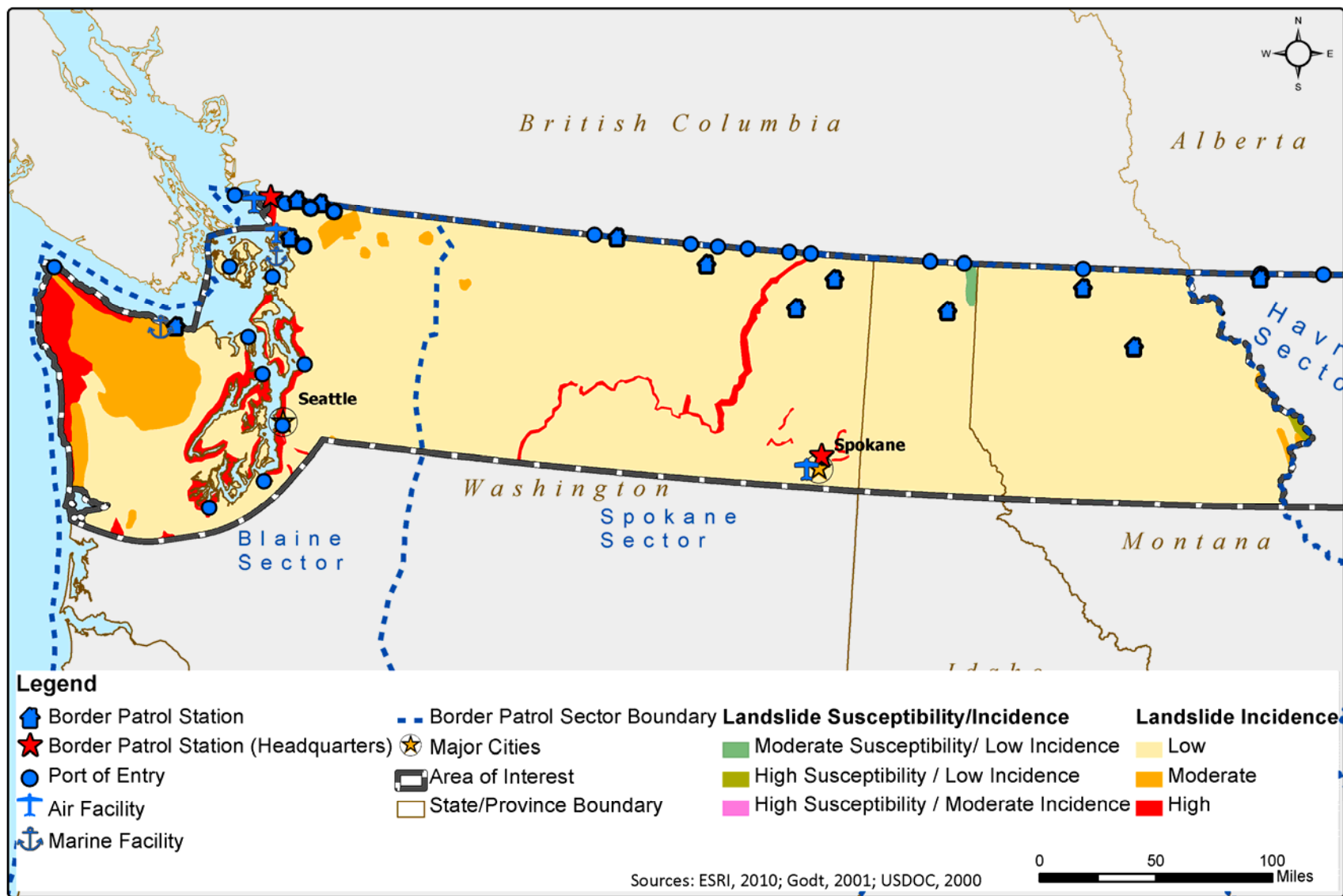


Figure 4.8-2. Land Use in the WOR Region



4.8.2.3 Land Ownership in the WOR Region

The major categories of land ownership in the WOR Region are Federal (46.4 percent), state (8.2 percent), tribal (10.4 percent), and private (0.8 percent) (Table 4.8-7). Federal lands include national parks, national forests, conservation areas, and military lands and are managed by BLM, Bureau of Reclamation (BOR), Department of Defense (DOD), Department of Energy (DOE), U.S. Fish & Wildlife Service (USFWS), USFS, NPS, or are classified as “other Federal land.” State lands are properties owned by state departments of conservation, departments of land, departments of natural resources, departments of transportation, fish and wildlife, historical societies, state land boards, parks and recreation, or classified as “other state land.” Tribal land accounts for regions owned by Native American Tribes and are recognized by the Federal Government. Federal laws and the Constitution grant Tribal Nations greater sovereignty than that granted to state or local governments. Private lands are those owned by the Audubon Society, the Rocky Mountain Elk Foundation, The Nature Conservancy (TNC), private universities, other conservation groups, or private non-profits, or classified as “private conservation easement/conservation deed restriction,” “private conservation land,” or “private institution–managed for biodiversity.”

The WOR Region includes 15.1 million acres of Federal land, accounting for 46.4 percent of land ownership. Federal land in the portion of Montana west of the Rocky Mountains accounts for about 5.1 million acres (one-third of all Federal land in the WOR Region) and Federal land in Washington makes up 8.4 million acres (about 55 percent of all Federal land in the region). The three states in this region account for the greatest share of Federal land ownership across all northern border states. The USFS manages the majority of this Federal land.

Approximately 2.7 million acres of land is state-owned within the WOR Region. This 8.2 percent of ownership share is slightly lower than the 9.2 percent average in the United States.

Tribal lands make up a little under 2 million acres of land area in the WOR Region. All 546,000 acres of tribal land within the WOR Region in Montana occurs in the Flathead Reservation. The largest area of tribal lands within the region in Washington is the Colville Reservation (1.35 million acres). The Quinault Reservation on the west coast and the Spokane Reservation adjacent southeast of the Colville Reservation are the next largest areas with approximately 352,000 total acres. The remaining small, and predominately coastal, reservations within Washington state combine to about 111,000 acres in area. The Neah Bay POE, located on the tip of the Olympic Peninsula, sits within the Makah Reservation. The proportion of tribal land found in the study area (10.4 percent) is greater than the overall proportion in the selected states (7.0 percent). This percentage is almost double the proportion of tribal lands within the United States as a whole (4.9 percent). Section 4.11 provides a more complete discussion of Native American resources in the WOR Region.

This region also includes about 249,000 acres of land area classified as private. The majority of this private land occurs in the western portion of Montana (almost 200,000 acres), most of which is under state-managed conservation easements, although the Rocky Mountain Elk Foundation and TNC also own portions of the region’s private land. The share of private land ownership in the study area is equivalent to the share of private land ownership for the country as a whole. Figure 4.8-3 shows a map of land ownership within the WOR Region.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

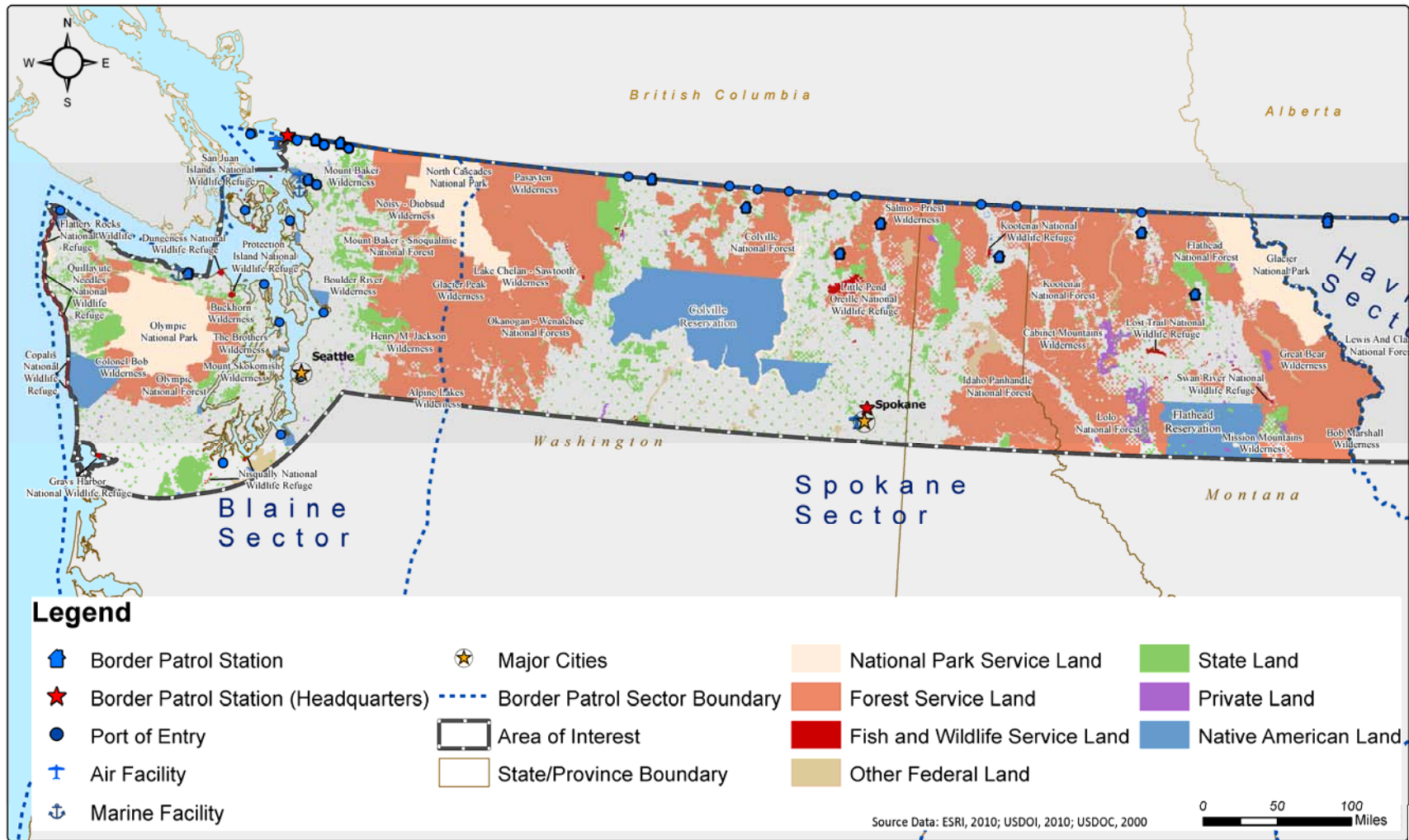
Table 4.8-7. Land Ownership in the WOR Region*

Border State (Thousands of Acres)		Federal Land		State Land		Tribal Land		Privately Held Conservation Land		Total Conservation & Tribal Lands	
		Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area
Idaho	Study Area 3,109	1,707	54.9	310	10	337	10.8	6	0.2	2,360	76
	Statewide 52,891	33,700	63.7	2,710	5.1	1,779	3.4	110	0.2	38,299	72
Montana (WOR)	Study Area 7,691	5,084	66.1	314	4.1	1239	16.1	198	2.6	6,835	89
	Statewide 93,149	26,975	29.0	5,646	6.1	8,248	8.9	2,998	3.2	43,867	47
Washington	Study Area 21,825	8,359	38.3	2,041	9.4	1,816	8.3	45	0.2	12,261	56
	Statewide 42,531	12,789	30.1	3,886	9.1	3,159	7.4	95	0.2	19,929	47
WOR Region	Study Area 32,625	15,150	46.4	2,665	8.2	3,392	10.4	249	0.8	21,456	66
	Selected States 189,161	73,464	38.8	12,242	6.5	13,186	7.0	3,203	1.7	102,095	54
Total United States		657,885	32	189,314	9.2	100,574	4.9	15,918	0.8	963,691	47

* The WOR Region includes all areas 100 miles south of the U.S.-Canada border in Idaho, Washington, and the portion of Montana west of the Rocky Mountains. Land ownership estimates do not add up to 100 percent for a given area due to gaps in information on land ownership within border states. Sources: (USDOI, 2010), (USDOC, 2012).

Note: For a more complete discussion of Native American resources along the northern border, refer to Section 4.11 of this report.

Figure 4.8-3. Land Ownership in the WOR Region



4.8.2.4 Land Ownership in Canada North of the WOR Region

Federal and provincial land ownership is characterized using the protected areas data compiled by NRC. As a result, ownership (excluding aboriginal lands) is determined for only about 10.8 percent of the entire land area of the country. The following discussion, therefore, reflects only the relatively small portion in Canada for which landowners are identified.

The share of Federal land ownership in the area north of the WOR Region is significantly lower than that throughout the country as a whole (Table 4.8-8) (0.1 percent in the region versus 4.8 percent in the country). The region also includes a lower proportion of Federal land compared to the entire province. The proportion of provincial ownership in the north of the WOR Region is, however, greater than for Canada as a whole.

Aboriginal land is characterized using NRC data of Native American reserves, land claim settlement lands, and related aboriginal designations. Table 4.8-9 shows the share of aboriginal land in the areas in Canada north of the WOR Region (1 percent) is less than the share of aboriginal land countrywide (7.4 percent). However, the area north of the WOR Region includes a larger proportion of aboriginal lands as compared to the broader Province of British Columbia.

Table 4.8-8. Land Ownership in Canada North of the WOR Region*

Border Province		Federal Land		Provincial Land	
		Total Land Area	Share (%)	Total Land Area	Share (%)
British Columbia	Study Area	0.4	0.1	99	16.9
	Province	1,599	0.7	29,268	13.2
Total Canada		98,844	4.8	125,779	6.1

* The areas north of the WOR Region in Canada include the portions of the Province of British Columbia extending 2 miles north of the U.S.-Canada border.

Notes: Federal lands are all lands with the designation national park, migratory bird sanctuary, national wildlife area, Prairie Farm Rehabilitation Administration, and marine protected area. Provincial lands are all lands designated under provincial administration, which often includes funding and support from Federal agencies.

Source: (NRC, 2007).

Table 4.8-9. Aboriginal Land in Canada North of the WOR Region*

Border Province		Aboriginal Lands (Thousands of Acres)	Share (%)
British Columbia	Study Area	6	1.0
	Province	867	0.4
Total Canada		152,965	7.4

* The areas north of the WOR Region in Canada include the portions of the Province of British Columbia extending 2 miles north of the U.S.-Canada border.

Source: (NRC, 2010).

4.8.2.5 Land Use Management

In the WOR Region, access to Forest Service roads remains an important factor in maintaining situational awareness throughout the border area. Access to these areas for securing lookouts or conducting surveillance is balanced with the land management activities that ensure habitat protection for public-trust species. The following areas pose specific access challenges to CBP: national forest areas (Mt. Baker-Snoqualmie, Okanogan, Idaho Panhandle, Colville, and Kootenai) and wilderness areas (Mt. Baker, Stephen Mather, Pasayten, and Salmo-Priest).

4.8.2.6 Consistency with Enforceable Policies of the Coastal Zone Management Act

In the WOR Region, CBP activities in Washington affect coastal zones associated with the northern border and must comply with the appropriate state “enforceable policies” outlined generally below. Most CBP activities in the state coastal zones are anticipated to fall in the negligible to moderate range and must comply with the Federal consistency requirements and procedures established by the individual states, identified below for Washington state.

Washington

Washington’s northern border coastal zone consists of all land in the coastal counties that front salt water and sit within the 100-mile zone that CBP has identified south of the border. The Washington Coastal Zone Management Program (CZMP) document, “Managing Washington’s Coast” (WSDE, 2001), defines the Washington program; the Department of Ecology administers the act to ensure consistency. Federal agencies must review activities for consistency under six laws:

- Shoreline Management Act (including local government shoreline master programs);
- State Environmental Policy Act;
- Clean Water Act;
- Clean Air Act;
- Energy Facility Site Evaluation Council; and,
- Ocean Resource Management Act.

Chapter 5 of “Managing Washington’s Coast” explains the procedures for demonstrating consistency with the enforceable policies of the Washington CZMP (WSDE, 2001).

4.9 AESTHETIC AND VISUAL RESOURCES

4.9.1 INTRODUCTION

Visual resources include those features that define the visual character of an area—natural features, vistas, or viewsheds, and even urban or community visual characteristics that include architecture, skylines, or other characteristics. Visual resources and aesthetics are important due to their unique qualities and the responses they inspire in humans. This section provides the analytical tools to conduct a precise visual impact assessment for future site-specific projects or activities; it also offers examples of the types of landscapes that exist along the border. It analyzes how, in which settings, to what extent, and with which viewer groups the various CBP activities might create visual impacts. It does not characterize every potential vista or visual landscape along the entire northern border, but does provide guidelines for minimizing, mitigating, or avoiding such impacts.

The Visual Resource Management (VRM) system developed by BLM defines the visual sensitivity of an area and the potential effect of a project on a visual resource. It assigns ratings of Classes I to IV based on combinations of scenic quality, sensitivity levels, and distance zones (for the Framework for Characterizing Resource Impacts on the northern border, see Chapter 3, Section 3.9).

4.9.2 AFFECTED ENVIRONMENT

4.9.2.1 Affected Landscapes

Four broadly defined landscapes occur within the potential settings of the proposed project. These four landscapes are: natural, rural, urban, and industrial (USDOT, 1999), and are briefly described below.

Natural Landscapes

A significant portion of the land in the WOR region is covered by forest. In the part of Idaho in the area of study, up to 79.7 percent of the land is forested. More sparsely vegetated mountainous areas in the western United States are dominated by geological landforms, such as rock outcroppings, ridges, escarpments, and plateaus. Even where significant topographic relief occurs, the heavily forested landforms are undistinguished and tend to confine a viewer's attention to the immediate foreground. Many of these landscapes would fall into the "A" category for scenic quality and thus be sensitive to visual modifications. The natural lightscape of heavily forested areas such as the North Cascades National Park in Washington state and its 600,000 acres designated as the Stephen Mather Wilderness, is free from the disturbance of man-made lights. In Montana, Glacier National Park is the United States part of the first international peace park (IPP), the Waterton-Glacier IPP. This joint United States-Canada park is described on the *World Heritage Convention* website as, "an area of significant scenic values with abundant and diverse flora and fauna" with "a distinctive climate, physiographic setting, mountain-prairie interface, and tri-ocean hydrographical divide."⁴

⁴ <http://whc.unesco.org/en/list/354>, 2012 Apr 25, 11:36 a.m.

Rural Landscapes

Rural landscapes include features such as croplands, orchards, fields, fences, and farm-related structures (USDOT, 1999). While border POEs and BPS along the U.S.-Canadian border tend to be in rural, less densely populated areas well outside of major cities, the majority of the population in the study area lives in larger population centers.

Urban Landscapes

In the WOR Region, most major cities are clustered near ocean access. Although these large urban areas are not the most significant features of the region, they still represent the visual setting for the largest portion of the population. Unlike in many other states along the northern border, in Washington POEs and BPS are often located in large urban areas. These landscapes already contain sizable amounts of infrastructure and would be able to absorb a greater amount of change and more additions to the visual environment than rural or natural landscapes. The largest concern in urban landscapes is the number and sensitivity of the visual user groups (see Section 4.9.2.3).

Industrial Landscapes

Heavy and light industrial landscapes tend to be scattered, situated in specific zones or districts such as along roads and waterfronts or near airports. Relatively few industrial landscapes exist along the northern border in the WOR Region. Such landscapes can absorb the greatest degree of visual change, due to existing dominant visual features and their generally low scenic quality ("C" category). These landscapes are usually classified as Visual Resource Class IV in which major changes to the visual environment can occur without major impacts to the visual environment or viewer groups.

4.9.2.2 Areas with High Visual Sensitivity

The WOR Region has a greater amount of public land sensitive to visual impacts compared to other regions. Washington state has about 1.9 million acres of recreational land and 21.7 percent of it falls in the northern border study area. It has about 4 million acres of conservation land in the study area (some is also considered recreational land), which would be negatively affected by changes in the Affected User Groups

Commuters and Through Travelers

These viewers pass through the study area on a regular basis in automobiles on their way to work or other destinations. On most roads within the study area, the views are from street level. Typically, drivers have limited views of CBP infrastructure and activity, except at locations where CBP actions cross the road. Commuters and through travelers are typically moving, have a relatively narrow visual field due to roadside vegetation or structures, and generally are preoccupied with traffic and navigating the roadways. For these reasons, commuters and through travelers' perception of (and sensitivity to) visual quality and changes in the visual environment are likely to remain relatively low. Passengers in moving vehicles, however, have greater opportunities for off-road views of a project than do drivers.

Local Residents

These individuals may view the proposed actions from stationary locations, such as yards and homes, and while driving along local roads. The sensitivity of residents to visual quality varies

and may be tempered by a viewer's exposure to existing CBP actions and infrastructure and other visually varied features already in existence. Presumably, most residents will be highly sensitive to changes in the landscape viewable from their homes and neighborhoods. CBP also considers visual impacts to Native American sacred sites or trust resources before carrying out a project.

Business Employees

These individuals work at local businesses, primarily in the commercial portions of the study area. Business employees will generally experience limited views of the alternative actions except at road crossings while driving to work or where CBP infrastructure and activity occurs near their place of employment. Most business employees work in one and two-story structures that may or may not have outside views. Those with views often look out on numerous, often varied, built features and the employees within are focused on their jobs. For these reasons, business employees are not likely to be sensitive to landscape changes

Recreational Users

The states with the greatest share of Federal land ownership are Idaho (54.9 percent), Washington (38.3 percent), and Montana (27.6 percent). Given the amount of public land (including recreational and conservation lands) in the WOR Region, recreational users could represent a much larger viewer group than other regions. Certain recreational users within the study area, however, already have clear views of current CBP infrastructure and activities. Proximity to existing infrastructure and activity may decrease their expectations of visual quality and their sensitivity to visual change.

4.10 SOCIOECONOMIC RESOURCES

4.10.1 INTRODUCTION

This section provides a socioeconomic profile of the WOR Region, and discusses potential impacts of CBP's program alternatives on these resources. The study area includes areas in the United States and Canada within 100 miles of the border. Some categories of socioeconomic impacts, as discussed in the Environmental Consequences section, are as likely to be on the Canadian side of the border as the U.S. side. For example, time delays at border crossings may affect populations and businesses on both sides of the border. In addition, much of the economic activity in American border regions involves cross-border movement of people and goods; therefore, the impacts of CBP activities on Canadian socioeconomic resources are considered in addition to the impacts on U.S. resources. The impacts of CBP actions on communities and regional economies in Canada are most likely closest to the border. But since delineating precisely how far from the border impacts may extend is not possible, this analysis includes information on the area 100 miles north of the border, mirroring the study area in the United States. This definition of the study area does not imply that impacts are necessarily equivalent in the two countries.

Much of the economic data presented here for Canada are not available below the provincial level, so the provinces provide the best available representation of the border region. Provincial data does not necessarily illustrate the scope of economic impacts; it merely reflects the level at which demographic and economic data are available. All monetary values are expressed in 2009 U.S. dollars, unless otherwise indicated.

The socioeconomic environment includes people and their communities, accounting for such things as population movement, density, and age distribution. It also includes economic considerations such as income levels, opportunities for employment, and overall economic trends. Section 4.10.2 provides an overview of the socioeconomic resources across the WOR Region and north of the region in British Columbia. It then offers a more detailed characterization of the regional demography, including population levels and distribution, regional growth trends, income, employment levels, poverty statistics, and property values. This section also profiles the regional economy, indexing important economic sectors in terms of income and employment. It further provides regionally focused information on important economic sectors for six POEs and BPS. These sites include the most active POEs in terms of the annual number of crossings and the value of cargo transported.

4.10.2 AFFECTED ENVIRONMENT

4.10.2.1 Regional Demographics

To provide context for the potential impacts of CBP actions, some basic, descriptive, socioeconomic information is provided for the WOR Region and the area north of this region in Canada and is compared to the broader states, provinces, and national economies, where possible. While the profiled region is defined as the area both 100 miles north and south of the U.S.-Canada border, the statistics in the various tables and text within this section include data for all U.S. counties and Canadian census divisions overlapping these 100-mile regions. These areas represent the finest geographic resolution available for these data and are used, therefore, to approximate values for populations and other demographic variables.

4.10.2.2 Population and Growth Trends

In the United States, approximately 5.9 million people live in the WOR Region (Table 4.10-1). The segment of the population residing in border communities accounts for 64.6 percent of the population in the WOR states of Idaho, Montana, and Washington. Washington has the largest population in the region with nearly 5.5 million people in the border zone. The border communities in Idaho and Montana are far less populated.

Between 2000 and 2009, the population growth in WOR border communities in Idaho (20.1 percent), Montana (14.9 percent), and Washington (11.9 percent) outpaced population growth for the United States as a whole (8.7 percent) (Figure 4.10-1). Since the 2000 census, Idaho has been the fifth fastest growing state in the country.

Table 4.10-1. Population of the WOR Region*

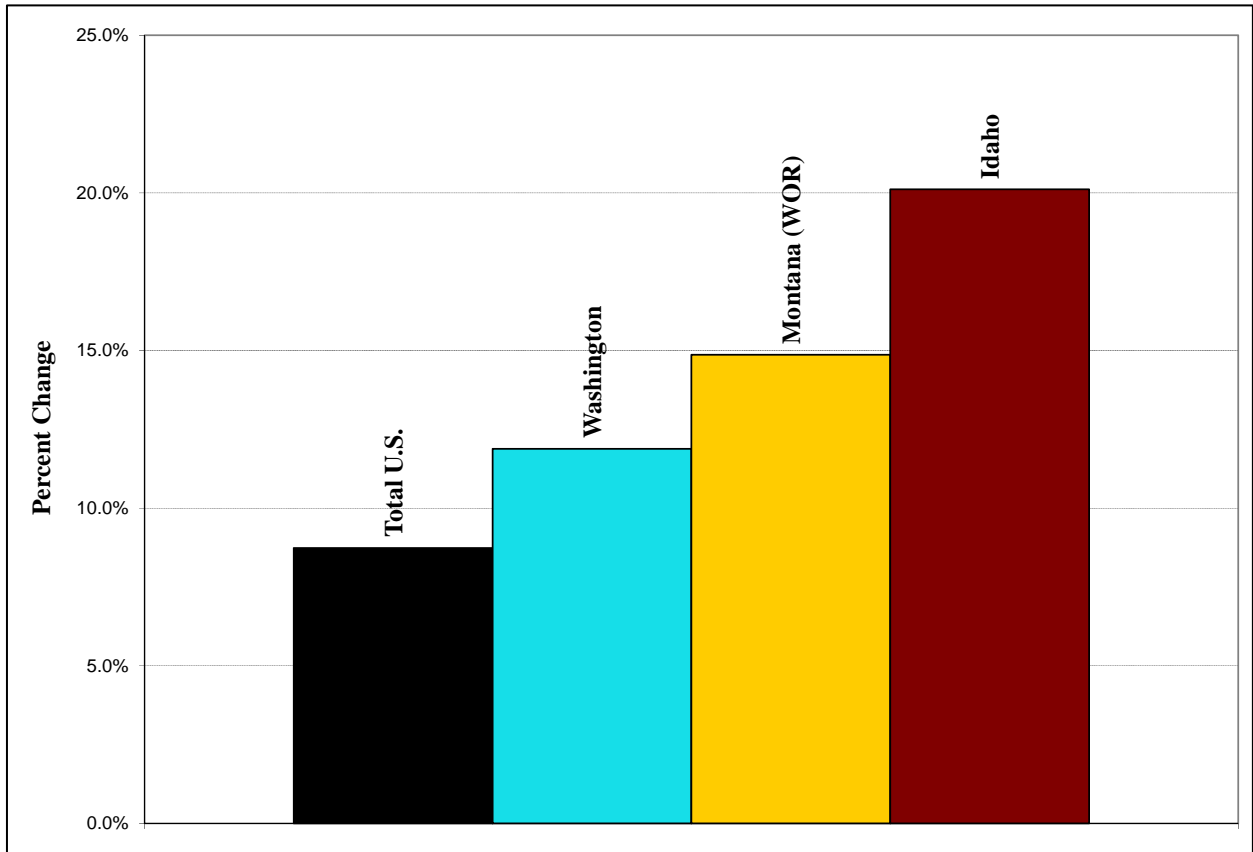
Border State	Population within the Border Area**	Population Overall	Percent of Population within the Border Area
Idaho	204,404	1,545,801	13.2
Montana (WOR)	263,754	974,989	27.1
Washington	5,462,961	6,664,195	82.0
Total WOR Region	5,931,119	9,184,985	64.6
Total United States	28,412,077	310,973,729	9.1

* The American Community Survey provides estimates of demographic, social, economic, and housing characteristics every year for all states, as well as for all cities, counties, metropolitan areas, and population groups of 65,000 people or more (USDOC, 200a).

** Statistics in this column account only for those portions of the states within the WOR Region. Total United States accounts only for those portions of the border area of all four regions.

While border POEs and BPSs along the U.S.-Canada border tend to be in rural, less densely populated areas outside major metropolitan areas, the majority of the population in the region lives in larger population centers. Population centers in this report include all of the counties that overlap a metropolitan statistical area (MSA), which is defined by the Office of Management and Budget and used by the USCB to report demographic statistics. Overall, for the WOR Region in the United States, approximately 84.6 percent of the population lives in population centers (Table 4.10-2). The WOR Region in Washington includes the Seattle-Tacoma-Bellevue MSA.

Figure 4.10-1. Percent Change in WOR Region Population, 2000–2009



Source: (USDOC, 2009a).

Table 4.10-2. Population Centers in the WOR Region*

Border State	Population Center	State's WOR Population Living in Population Centers**	Total State Population in the WOR Region	Percent of State's WOR Population in Population Centers
Idaho***	Coeur d'Alene	139,390	204,404	68.2%
Montana (WOR)***	Great Falls	82,178	263,754	31.2
Washington	Bellingham	200,434	5,462,961	3.7
	Bremerton-Silverdale	240,862		4.4
	Mount Vernon-Anacortes	119,534		2.2
	Olympia	250,979		4.6
	Seattle-Tacoma-Bellevue	3,407,848		62.4
	Spokane	468,684		8.6
	Wenatchee	109,937		2.0
	Total Washington State	4,798,278		87.8
Total WOR Region		5,019,846	5,931,119	84.6
Total United States****		261,110,826	310,973,729	84.0

* The American Community Survey provides estimates of demographic, social, economic, and housing characteristics every year for all states, as well as for all cities, counties, metropolitan areas, and population groups of 65,000 people or more.

** Statistics in this column account only for those portions of the WOR Region within each state.

*** The WOR Region in Idaho and Montana includes only one population center per state. Thus, no state total column is presented, as for Washington.

**** Population statistics in this row represent the proportion of the total American population residing in population centers across the whole country.

In Canada, approximately 3.7 million people reside in the study area north of the WOR Region (Table 4.10-3). Most major cities sit in the southern part of the country; therefore, Canada's population is more heavily concentrated along the border than the American population. For example, in British Columbia, approximately 91.9 percent of the population lives in border communities. British Columbia has some of the largest populations living in border communities in Canada. As some census divisions overlapping the 100-mile buffer area are large and extend well beyond 100 miles from the border, this analysis may overstate the Canadian population in the study area north of the WOR Region.

Between 1996 and 2006, the population of Canada grew 9.5 percent. More recently, according to Statistics Canada, about two-thirds of Canada's growth between 2009 and 2010 was attributable to net international migration. The number of immigrants to Canada increased from 245,300 between 2008 and 2009 to 270,500 between 2009 and 2010. During the economic recession in 2009 and 2010, however, a decrease in the net flow of non-permanent residents occurred, with more immigrants leaving the country, resulting in overall lower net international

migration in 2010 than the previous year. Population growth in British Columbia (12.4 percent) outpaced growth for Canada as a whole (Figure 4.10-2).

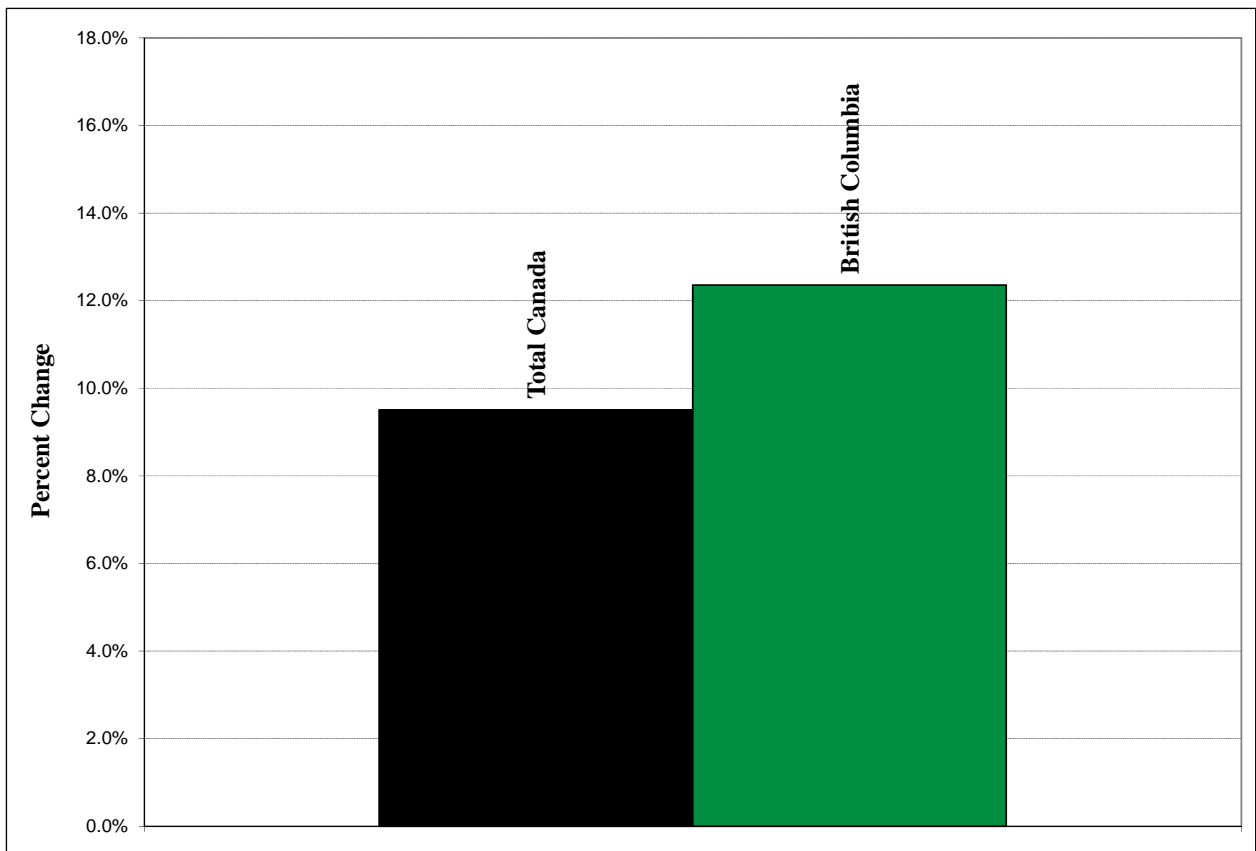
Approximately 68.9 percent of the Canadian population in the study area north of the WOR Region resides within population centers (Table 4.10-4).

Table 4.10-3. Population North of the WOR Region in Canada

Border Province	Study Area Population North of the WOR Region*	Total Population in the Province	Percent of Total Province Population Residing in the Study Area North of the WOR Region
British Columbia	3,745,365	4,074,385	91.9
Total Canada	25,562,910	31,241,030	81.8

* Statistics in this column account only for those portions of the provinces within the study area. Total Canada accounts only for those portions of the provinces within the study area for all four regions.
Source: (StatCan, 2006a).

Figure 4.10-2. Percent Change in Canadian Population North of the WOR Region, 1996–2006



Sources: (StatCan, 1996); StatCan, 2006a)

Table 4.10-4. Population in Census Metropolitan Areas in Study Area North of the WOR Region

Border Province	Population Center	Study Area Population Living in Population Centers North of the WOR Region*	Total Study Area Population North of the WOR Region*	Percent of Total Study Area Population North of the WOR Region Living in Population Centers
British Columbia	Abbotsford-Mission	156,640	3,745,365	4.2
	Vancouver	2,097,960		56.0
	Victoria	325,065		8.7
	Total Province	2,579,665		68.9
Total Canada**		21,508,575	31,241,030	68.8

* Population statistics in these columns account only for those portions of the census metropolitan areas (CMAs) and provinces within the study area.

** Population statistics in this row represent the proportion of the total Canadian population that resides in population centers across the whole country.

Source: (StatCan, 2006a).

4.10.2.3 Income, Poverty, and Unemployment

Border communities in Washington, including Seattle, have the highest median household income of all border communities across the U.S.-Canada border. Montana has the lowest median income of all border states (Table 4.10-5).

The poverty rate is defined as the number of individuals included in the poverty count as a percentage of the population for whom the poverty status is determined. The poverty rate in the border region of Washington is the lowest of the three states (9.9 percent); Montana has the highest rate (15.1 percent).

The unemployment rates in Idaho, Montana, and Washington are lower than the national average (Table 4.10-6). In Idaho and Montana, the unemployment rate is higher in the border region than for the state as a whole. In Washington, the unemployment rate is slightly lower in the border region than in the state.

Table 4.10-5. Income and Poverty Statistics for States in the WOR Region

Border State and WOR Region*		Median Household Income** (\$)	Population Below the Poverty Line***	Percent of Population Below the Poverty Line
Idaho	WOR Region	44,906	20,638	12.4
	Statewide	47,465	148,732	11.8
Montana	WOR Region	41,353	34,056	15.1
	Statewide	41,720	128,355	14.6
Washington	WOR Region	59,394	473,375	9.9
	Statewide	57,829	612,370	10.6
Total WOR Region	WOR Region	58,132	528,069	10.2
	Selected States	54,375	889,457	11.2
Total United States		53,051	33,899,812	12.4

* Statistics in the non-shaded rows account only for portions of the states within the WOR Region.

** Median household income is reported in inflation-adjusted 2009 dollars.

***To determine the poverty rate in the United States, the Census Bureau references income thresholds that vary by family size and ages of family members. If a family’s total income, not including noncash benefits (such as food stamps and housing subsidies), is below the family’s income threshold, every individual in the family is included in the poverty count.

Source: (USDOC, 2000a; USDOC, 2000b).

Table 4.10-6. Unemployment Rates for the WOR Region

Border State or WOR Region*		Unemployment Rate (%)
Idaho	WOR Region	9.7
	Statewide	8.0
Montana	WOR Region	8.5
	Statewide	6.2
Washington	WOR Region	8.7
	Statewide	8.9
Total WOR Region	WOR Region	8.7
	Selected States	8.5
Total United States		9.3

* Statistics presented in the non-shaded rows account only for portions of the states within the WOR Region.

Source: (USDOL, 2009a)

The median household income in Canada north of the border region is approximately \$48,600 (in 2009 U.S. dollars) compared with \$49,400 for Canada as a whole (Table 4.10-7).

The poverty rate in Canadian communities is defined as the percentage of low-income “economic families.” (See note in Table 4.107 for explanation of “economic family.”) This threshold-based designation is comparable to the poverty statistics in the USCB. In the study area north of the WOR Region, the poverty rate is approximately 13.6 percent compared with 11.6 percent for Canada as a whole (Table 4.10-7). Border communities in British Columbia have the highest poverty rates of all border communities north of the U.S.-Canada border.

The unemployment rate in Canada north of the WOR Region was 5.7 percent in 2006 compared to 6.0 percent for British Columbia as a whole and 6.6 percent for all of Canada (Table 4.10-8).

Table 4.10-7. Income and Poverty Statistics North of the WOR Region in Canada

Border Province and Study Area North of WOR Region*		Median Household Income** (\$US)	Number of Low-Income Economic Families***	Percent of Low-Income Economic Families***
British Columbia	Study area north of WOR Region	48,644	139,851	13.6
	Province	48,541	148,004	13.3
Total Canada		49,393	1,006,911	11.6

* Statistics in the non-shaded rows account only for portions of the provinces within the study area.

** Median household income is reported in inflation-adjusted 2009 U.S. dollars.

*** The Canadian Census reports statistics for low-income economic families. This threshold-based designation is comparable to the poverty statistics in the USCB. The term “economic family” refers to a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common-law, or adoption. A couple may be of the opposite or same sex. Foster children are included.

Source: (StatCan, 2006b).

Table 4.10-8. Unemployment Rates North of the WOR Region in Canada

Border Province and Study Area North of WOR Region*		Unemployment Rate (%)
British Columbia	Study area north of WOR Region	5.7
	Province	6.0
Total Canada		6.6

* Statistics in the non-shaded rows account only for portions of the provinces within the study area.

Source: (StatCan, 2006c).

4.10.2.4 Property Values

The WOR Region has the highest median property value of all regions along the northern border. In the WOR Region, the median property value between 2006 and 2008 was approximately \$315,400, which is significantly higher than the median property value for the United States as a whole (\$192,400) during the same time period (Table 4.10-9). Notably, the highest median property values among all border communities across the northern border from Washington to Maine occur in Washington (median property value of \$321,400), Idaho (\$234,900), and Montana (WOR) (\$226,700), the three states within the WOR Region. In each of the states, the median property value in the WOR Region is higher than the median property value for the state as a whole.

Table 4.10-9. Median Property Values for the WOR Region

Border State and WOR Region		Median Home Value* (\$)
Idaho	WOR Region	234,900
	Statewide	174,800
Montana	WOR Region	226,700
	Statewide	168,200
Washington	WOR Region	321,400
	Statewide	293,000
Total WOR Region	WOR Region	315,400
	Selected States	260,200
Total United States		192,400

* The American Community Survey provides estimates of housing characteristics for all geographic areas with populations of 20,000 or more, including the Nation, all states and the District of Columbia, all congressional districts, and approximately 1,800 counties every 3 years. Due to the use of value categories rather than specific amounts collected for each individual housing unit in 2006 and 2007, property values cannot be adjusted for inflation. Property values are reported in nominal dollar terms.

Source: (USDOC, 2008a).

British Columbia has the highest median property values in Canada. In the study area north of the WOR Region, the median property value in 2006 was approximately \$396,000 (in 2009 U.S. dollars) compared with \$232,200 for Canada as a whole (Table 4.10-10). Border communities in British Columbia have the highest median property values among all border communities north of the U.S.-Canada border.

Table 4.10-10. Median Property Value North of the WOR Region in Canada

Border Province and Study Area North of WOR Region*		Average Value of Dwelling** (\$US)
British Columbia	Study area north of WOR Region	396,000
	Province	369,200
Total Canada		232,200

* Statistics in the non-shaded rows account only for those portions of the provinces within the study area.

** A dwelling is defined as a set of living quarters designed for or converted for human habitation in which a person or group of persons reside or could reside. In addition, a private dwelling must have a source of heat or power and must be an enclosed space that provides shelter from the elements, as evidenced by complete and enclosed walls and roof and by doors and windows that protect from wind, rain, and snow. Property values are reported in 2006 U.S. dollars.

Source: (StatCan, 2006b).

4.10.2.5 Regional Economies

Tourism is a major component of economic activity along the northern border. Canada is the top country of origin for visitors to the United States. In 2008, the number of Canadian visitors staying one or more nights in the United States was nearly 19 million (USDOC, 2008b). In this context, “Canadian visitors” refers to Canadian residents visiting the United States. The WOR

Trade with Canada
<p>The flow of goods, services, and people across the border contributes significantly to economic activity in border communities. Canada is the largest trading partner of the United States. In 2009, the total value of merchandise trade with Canada was approximately \$429.6 billion—\$204.7 billion in exports and \$224.9 billion in imports. Shipments by surface modes of transportation, excluding pipelines, account for approximately 79 percent of total merchandise trade with Canada. The top exports to Canada by surface transportation are automobiles and automotive parts and accessories, and other machinery, appliances, and equipment. The top imports from Canada are automobiles and automotive parts and accessories, other machinery and appliances, and processed paper and pulp products. On average, approximately \$930 million in merchandise crosses the northern border by surface transportation every day (USDOT, 2009a). Appendix Q provides trade statistics for surface transportation between the United States and Canada.</p>

Region includes significant tourist destinations; Washington state is the third most visited state by Canadians, after New York and Florida.

Crossing the northern border using surface modes of transportation forms the principal means of entry for Canadians visiting the United States, accounting for two-thirds (12.6 million) of all Canadian visitor entries (USDOC, 2008c). Although approximately 21 percent of Canadian visitors entering the United States by surface transportation visited the WOR Region, spending in this region accounted for a relatively low percentage (less than 8 percent) of total spending in the country by these visitors. Canadian visitors entering by surface transportation contributed approximately \$622 million to the WOR Region in 2008 (Table 4.10-11). The average visitor

spent approximately \$237 per visit. The most common stated purposes for visiting states in the WOR Region are vacation (75 percent), visiting friends or relatives (19 percent), and business or employment (6 percent). The WOR Region has the second highest percentage of travel due to business or employment. While business travelers tend to spend more per trip, they also rely more heavily on air travel and travel further from the border.

In 2008, Washington state generated the third highest volume of visitors from the United States entering Canada (StatCan, 2008a). The average Washington visitor spent approximately \$387 per visit compared with \$399 for the average visitor from the United States (StatCan, 2008b). Washington, the only state in the WOR Region for which data on travel to Canada are available, contributed approximately \$447 million to the Canadian economy in 2008.

Table 4.10-11. Canadian Visitors Entering the WOR Region by Surface Transportation*

Destination	Visitors		Spending			Purpose of Trip		
	Number of Visitors (000s)	Average Nights Per Visit	Visitor Spending (\$US millions)	Spending per Visitor (\$US)	Average Daily Spending per Visitor (\$US)	Business, Convention, or Employment (%)	Visiting Friends or Relatives (%)	Holiday, Vacation, or Other (%)
Idaho	—**	—**	—**	—**	—**	—**	—**	—**
Montana	634	3.1	189.4	299	96	5.1	11.7	83.2
Washington	1,991	2.8	432.7	217	77	6.5	20.9	72.5
Border States in WOR Region	2,625	2.9	622.1	237	83	6.1	18.7	75.1

* Surface modes of transportation include autos, buses, and other non-air modes of transportation. Average nights per visit and average daily spending per visitor are based on total visitors, including air travelers.

** The Office of Travel & Tourism Industries suppresses state data for which the sample size is less than 400,000.

Sources: (USDOC, 2008b; USDOC, 2008c).

4.10.2.6 Economic Profiles of POEs and BPSs in the WOR Region

This section provides regional economic profiles for border communities in the United States and Canada that surround selected POEs in the WOR Region. The purpose of this section is to characterize socioeconomic resources of specific border communities in the region, providing context for the discussion of potential consequences of CBP's alternative actions, and highlighting the diversity in regional economies surrounding POEs and BPSs along the northern border. Appendix Q contains data on trade, employment, and payroll statistics by economic sector for U.S. counties and Canadian provinces that contain profiled POEs and BPSs in the four border regions.

This section profiles six sites in the WOR Region, which includes the most heavily used POEs along the border in the region in terms of total crossings and total value of trade, along with some smaller, more rural POE sites. Additionally, the sites were chosen based on their unique characteristics to reflect different socioeconomic conditions in border communities. For example, sites profiled in the WOR Region include the POE with the greatest number of international ferry crossings. Table 4.10-12 lists sites ranked by crossing volume and provides information on associated crossing activity.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Table 4.10-12. POE and BPS Sites Profiled in the WOR Region

Port	Annual Individual Crossings (% of Total)	Annual Vehicle Crossings (% of Total)	National Rank by Crossing Volume	Annual Trade Value (Surface Mode)	Rank by Trade Value	Two Largest Commodities (% of Port's Trade Value)	Important Features
WA: Blaine	6,644,535 (10.8%)	3,169,214 (9.9%)	3	\$14,617,814,401 (4.3%)	6	<ul style="list-style-type: none"> Nuclear reactors, boilers, machinery, and mechanical appliances (10.6%) Electrical machinery and equipment (7.4%) Vehicles and parts (7.2%) 	<ul style="list-style-type: none"> Roughly collocated with Blaine BPS
WA: Sumas	1,548,662 (2.5%)	801,864 (2.5%)	8	\$1,980,353,093 (0.6%)	15	<ul style="list-style-type: none"> Wood and articles thereof (22%) Nuclear reactors, boilers, machinery, and mechanical appliances (10.3%) 	<ul style="list-style-type: none"> Roughly collocated with Sumas BPS
WA: Point Roberts	1,340,525 (2.2%)	741,040 (2.3%)	12	\$8,399,803 (0.002%)	64	<ul style="list-style-type: none"> Electrical machinery and equipment (16.8%) Ships, boats, and floating structures (15.9%) 	
ID: Porthill	292,234 (0.5%)	165,496 (0.5%)	29	\$12,749,234 (0.004%)	57	<ul style="list-style-type: none"> Beverages, spirits, and vinegar (38.4%) Wood and articles thereof (37.7%) 	<ul style="list-style-type: none"> Largest in ID*

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

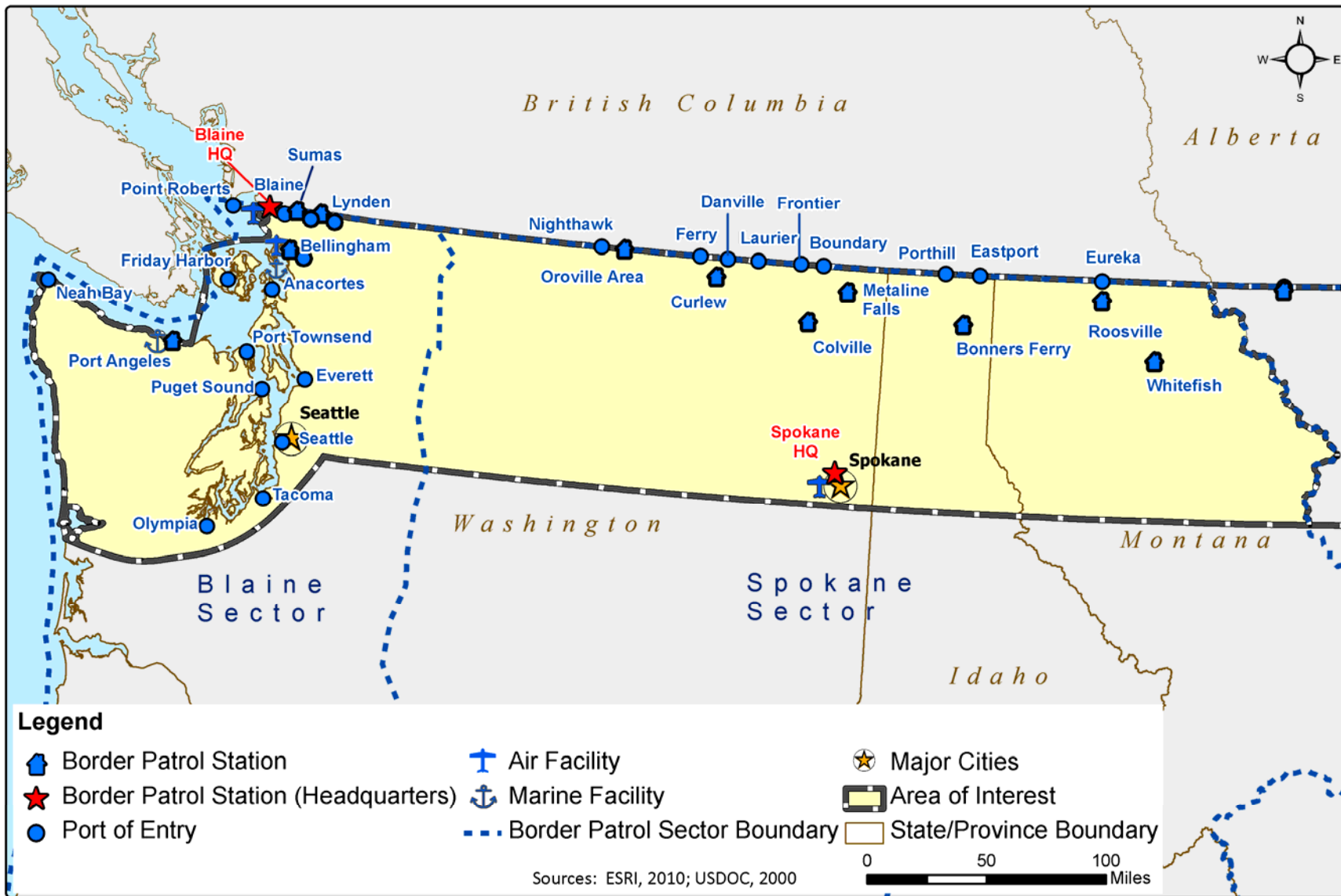
Port	Annual Individual Crossings (% of Total)	Annual Vehicle Crossings (% of Total)	National Rank by Crossing Volume	Annual Trade Value (Surface Mode)	Rank by Trade Value	Two Largest Commodities (% of Port's Trade Value)	Important Features
MT: Eureka/ Roosville	246,674 (0.4%)	118,857 (0.4%)	30	\$49,775,465 (0.02%)	42	<ul style="list-style-type: none"> • Wood and articles thereof (54.3%) • Mineral fuels, mineral oils, and products thereof 16.6%) 	<ul style="list-style-type: none"> • Roosville POE is colocated with Eureka BPS
WA: Port Angeles	132,178 (0.2%)	58,708 (0.2%)	39	\$17,351,984 (0.005%)	51	<ul style="list-style-type: none"> • Fertilizers (12.7%) • Nuclear reactors, boilers, machinery, and mechanical appliances (6.9%) 	<ul style="list-style-type: none"> • Largest with ferry*; Colocated with Port Angeles BPS

* Size based on number of individual border crossings.

** Bureau of Transportation Statistics does not provide data on commodities and crossings at BPSs.

Sources: (IEc analysis of Bureau of Transportation Statistics data. USDOT, 2009a; USDOT, 2009b; USDOT, 2009c).

Figure 4.10-3. Locations of POEs and BPSs in the WOR Region



The remainder of this section characterizes the regional economies of the U.S. counties and Canadian provinces containing the WOR Region sites identified in Table 4.10-12 and Figure 4.10-3.

Clallam County, Washington

Across the border from British Columbia, Clallam County, Washington contains one of the profiled sites: Port Angeles. Clallam County sits on the northern half of the state's Olympic Peninsula and includes part of Olympic National Park. Much of the land surrounding the park is national forest. The population on the peninsula is sparse with most of the inhabitants in villages on the eastern and northern coasts, including Port Angeles (USAT, 2010). Clallam County includes a border inspection station at Port Angeles for the passenger ferry crossing to Victoria, British Columbia. The major economic sectors in Clallam County by annual payroll are health care and social assistance (\$127 million), retail trade (\$95 million), and manufacturing (\$72 million). These three sectors account for nearly half of all private, nonfarm jobs in the county.

- **Port Angeles POE and BPS:** Port Angeles is the largest ferry crossing between the United States and Canada. It is, however, a relatively small POE in terms of total crossings, accounting for approximately 0.2 percent of individual border crossings per year (132,000 individuals) and less than 0.01 percent of total U.S.-Canada trade (\$17.4 million). The primary commodities crossing the border are agricultural products, including fertilizers (12.7 percent), vegetables, roots, and tubers (6.8 percent); and machinery and mechanical appliances and parts (6.9 percent).

A Note on Data Sources

All statistics for private, nonfarm employment, unless otherwise noted, come from USCB County Business Patterns for 2008. All statistics on agricultural production employment, unless otherwise noted, are from the USDA, Census of Agriculture for 2007. All Canadian statistics, unless otherwise noted, come from the Statistics Canada 2006 Census. All detail on border crossings and trade value, unless otherwise noted, are from the U.S. Department of Transportation Bureau of Transportation Statistics' Transborder Freight Data for 2009. Monetary values are expressed in 2009 U.S. dollars.

Whatcom County, Washington

Whatcom County is in the northwestern part of the state and contains three major POEs along the border with British Columbia (Blaine, Sumas, and Port Roberts). These POEs collectively accounted for 9.5 million (15.5 percent) of all individual border crossings and \$16.6 billion (4.9 percent) of all U.S.-Canada cross-border trade in 2009. Cross-border trade heavily supports the regional economy. Whatcom County is home to several import/export warehouses, freight and courier services, and gas stations serving long-haul cargo trucks (USDHS, 2008).

Manufacturing is the largest sector of Whatcom County's economy, contributing \$460 million in annual payroll and providing more than 9,400 jobs. The Conoco-Phillips refinery at Neptune Beach, the BP West Coast Products refinery at Cherry Point, and the Alcoa Intalco aluminum refinery at Cherry Point are some of the largest employers in the county (WCCP, 2010a). In the last 20 years, Canadian manufacturing investment in Whatcom County has significantly increased, taking advantage of lower energy costs and easy access to U.S. markets. The next

largest economic sectors by contribution to annual payroll are construction (\$436 million), health care and social assistance (\$392 million), and retail trade (\$276 million).

Historically, resource-based industries—agriculture, farming, fishing, logging, and mining—accounted for a large percentage of the regional economy in Whatcom County. Agriculture remains an important sector in terms of employment, accounting for more than 6,800 jobs. Over 92 percent of the land in unincorporated Whatcom County is zoned rural, forestry, or agriculture (WCCP, 2010a). More private lands have been developed for urban or rural use, however, and the amount of land in agricultural production has declined. Logging, while subject to environmental limitations, provides many jobs. In October 2008 and November 2009, Whatcom County took steps to transfer 8,400 acres of forests from state to county management to create the new Lake Whatcom Forest Preserve to protect the Lake Whatcom watershed and limit commercial logging in that area (CNW, 2010).

A significant portion of Whatcom County's economy is supported by travel and tourism from British Columbia. According to the Washington State Department of Commerce, visitors spent approximately \$435.5 million in Whatcom County and supported approximately 7,120 travel and tourism jobs in 2009 (DRA, 2009). Travel-related economic activity accounted for 5.7 percent of all jobs and 2.5 percent of all earnings in 2009. Furthermore, in the mid-1990s, the county estimated that 30 to 40 percent of retail activity depended upon Canadian consumers (WCCP, 2010b). The Bellis Fair Mall, which opened in 1988, is a major destination for Canadian consumers seeking to pay lower taxes on goods and services. The impact of Canadian consumer activity, however, has fluctuated with the value of the Canadian dollar and changes to border security.

- Point Roberts POE: Point Roberts sits on a peninsula extending from mainland Canada and has no land border with the contiguous United States. While physically connected to Canada, the community of Point Roberts is part of the United States. The Point Roberts POE is a four-lane border crossing for motor vehicles, bicycles, and pedestrians, connecting with British Columbia. Point Roberts has a population of less than 1,500; students above the third grade must travel across the border daily to attend school in Blaine, a trip that involves a 40-minute drive, as well as two border crossings. Much of the local Point Roberts economy is affected by recreational and weekend visitors from the greater Vancouver area (PRCOC, 2006). While Point Roberts accounts for a large number of border crossings (1.34 million, the twelfth largest in the United States) the total value of trade is very small (\$8.4 million, or 0.002 percent of total U.S.-Canada trade). The major commodities crossing the border in 2009 were electrical machinery and equipment (16.8 percent) and ships and boats (15.9 percent).
- Blaine POE and BPS: Blaine, often referred to as “The Gateway to the Pacific Northwest,” is adjacent to Boundary Bay at the northernmost point of Interstate 5 in Washington. Interstate 5 serves as a major north-south thoroughfare from Seattle to Vancouver. The Blaine POE consists of two separate border inspection stations between Blaine, Washington and Surrey, British Columbia. The Peace Arch Crossing (Douglas Crossing), the primary passenger vehicle POE, is in Peace Arch Park, which straddles the U.S.-Canada border. Peace Arch Park also contains a pedestrian border crossing. All trucks and commercial vehicles must cross the border at the Pacific Highway crossing,

also known as the “Truck Crossing,” along Highway 15 and Washington State Route 543. Blaine is the third busiest border crossing by crossing volume and the sixth largest by trade value. It is the largest crossing in the western part of the United States and Canada. More than \$14.6 billion in goods crossed the border through Blaine in 2009, approximately 4.3 percent of all U.S.-Canada merchandise trade. The major commodities crossing the border are machinery and mechanical appliances and parts (10.6 percent), electrical machinery and equipment (7.4 percent), and vehicles and parts (7.2 percent).

- **Sumas POE and BPS:** The 24-hour border crossing at Sumas is often a less-congested alternative to nearby Blaine. The crossing is near Highway 1 in Canada, centered between Bellingham, Washington and Vancouver, British Columbia (USDHS, 2008). The Sumas POE experiences the second largest number of pedestrian crossings of all the POEs on the Canadian border but accounts for only 2.5 percent of total crossings. Sumas is a small town with fewer than 1,400 residents, lying across the border from Abbotsford, British Columbia. Sumas is a smaller commercial POE than Blaine. Approximately \$2.0 billion in goods crossed the border in 2009 at Sumas, less than 1 percent of all U.S.-Canada merchandise trade. The major commodities crossing the border are wood and articles of wood (22.0 percent), machinery, mechanical appliances, and parts (10.3 percent), and vehicles and parts (7.3 percent).

Boundary County, Idaho

Boundary County, Idaho, located at the northern tip of the state, shares its northern border with British Columbia and contains one POE (Porthill). The population is slightly over 10,000 and has been growing at a faster pace than the entire United States—approximately 11 percent since 2000. While Boundary County has an attractive natural environment for outdoor recreation as well as a destination resort casino, many tourists spend only one or two nights in the area or pass through without stopping (THC, 2009). The three largest economic sectors by annual payroll—health care and social assistance (\$14.5 million), manufacturing (\$10.7 million), and retail trade (\$10.1 million)—account for approximately half of all private, nonfarm jobs in the region.

- **Porthill POE:** The Porthill POE in Boundary County connects Idaho State Highway 1 and British Columbia Highway 21. The Porthill POE is the largest border crossing in Idaho, but accounts for less than 0.5 percent of total U.S. crossings and less than 0.01 percent of total U.S.-Canada merchandise trade. Two groups of commodities account for the vast majority of cross-border commerce—beverages, spirits, and vinegar (38.4 percent) and wood and articles of wood (37.7 percent).

Lincoln County, Montana

Lincoln County, Montana is located in the northwestern corner of the state and contains one POE (Roosville) and one BPS (Eureka) along the border with British Columbia. The county has a population of approximately 18,700 people. Unlike much of the rest of the WOR border region, Lincoln County’s population has not experienced population growth since 2000, decreasing by approximately 0.6 percent. The county is home to portions of three national forests; natural resources play a prominent role in the region’s economy. The three largest non-farm economic sectors by annual payroll are health care and social assistance (\$22.3 million), hunting, fishing,

forestry, and support activities for agriculture (\$14.7 million), and retail trade (\$14.1 million). These three economic sectors account for approximately 42 percent of the county's employment.

- **Roosville POE and Eureka BPS:** The Roosville POE in Lincoln County links U.S. Highway 93 with British Columbia Provincial Highway 93. The crossing accounts for less than 0.4 percent of total U.S.-Canada border crossings and less than 0.02 percent of the total value of U.S.-Canada trade. Wood and wood products make up over 54 percent of the POE's total trade value; mineral products contribute an additional 17 percent. The BPS is in the town of Eureka, approximately 9 miles south of the Roosville POE.

British Columbia, Canada

The six profiled sites in the WOR Region fall within British Columbia on the northern side of the border. British Columbia is the westernmost Canadian province and the third most populated. British Columbia is a popular tourism destination for outdoor activities and recreation, including boating, golfing, hiking, and skiing (TBC, 2010). The province's Whistler Blackcomb is considered one of the best ski resorts in North America. Vancouver Island is also a major tourist destination and home to the Pacific Rim National Park Preserve, one of the world's most diverse ecosystems. Victoria, the capital of British Columbia, is on Vancouver Island, accessible by ferry from Port Angeles and Seattle, Washington. Vancouver is the largest city in British Columbia and the third largest city in Canada. The city was a major travel destination as host of the 2010 Winter Olympic Games, and remains a popular destination for shopping, dining, and other cultural attractions.

Manufacturing is the largest economic sector in British Columbia, contributing \$8.2 billion in annual payrolls and providing more than 189,000 jobs. Manufacturing is followed by professional, scientific, and technical services (\$7.9 billion) and health care and social assistance (\$7.5 billion). Retail trade is the largest economic sector in terms of employment, supporting nearly 250,000 jobs and \$5.8 billion in annual payroll. Tourism accounted for nearly 120,000 jobs and generated \$9.8 billion in revenues in 2005 (CTABC, 2010). British Columbia Public Service is the largest employer in the province.

4.11 CULTURAL AND PALEONTOLOGICAL RESOURCES

4.11.1 INTRODUCTION

This section provides an overview of cultural and paleontological resources located in the WOR Region of the northern border and discusses potential impacts of CBP's program alternatives on those resources.

4.11.2 AFFECTED ENVIRONMENT

4.11.2.1 Archaeological Resources: Prehistoric/Precontact Context

Among the known cultural resources in the WOR Region are archaeological sites from the prehistoric and pre-European contact periods. This section provides an overview of those periods. An expanded prehistoric and pre-European contact-period context and references can be found in Appendix H. In North America, the Prehistoric/Precontact Era is generally divided into three broad periods: Paleo-Indian, Archaic, and Woodland/Ceramic/Late. During the Prehistoric Era, North American groups evolved from highly nomadic big-game hunters to politically sophisticated and sedentary Tribes and nations employing large-scale agriculture. There are thousands of known archaeological sites within the WOR Region, which represent a fraction of the potential sites that may exist in the region. This record of known sites has been built up over the years as a result of reports by amateurs and vocational archaeologists as well as the result of formal archaeological surveys conducted by professionals and academics. In parallel with the evolution of prehistoric groups from nomadic hunting to sedentary agriculture/aquaculture and the resulting increases in population, sites from the earlier periods (ca. 12,000 to ca. 7,000 years before present [B.P.]) are rare. Sites from the later periods account for the bulk of the known sites in the region.

Paleo-Indian Period

The Paleo-Indian period (ca. 12,000 to ca. 10,000 B.P.) is similar in much of the study area and was characterized by people inhabiting the recently deglaciated environment. Subsistence was dominated by big-game hunting of mastodon, mammoth, caribou, horse, bison, musk-ox, giant ground sloth, white-tailed deer, elk, moose, and wapiti, along with species of smaller mammals, birds, fish, reptiles, and shellfish. These early hunting groups generally had highly mobile lifeways. There are several types of Paleo-Indian sites including small camps; workshops/quarries; kill sites; rockshelters/cave camps; major, recurrently occupied camps; and possible cremation sites.

Archaic Period

During the Archaic period (ca. 10,000 to ca. 3,000 B.P.), the environment changed from unstable post-glacial conditions to an essentially modern state. In the context of this changing landscape came numerous cultural and technological changes. People gradually adopted less-mobile lifestyles. At the same time, they broadened the variety of resources on which they depended for food and shelter. Some groups began regularly interacting and trading with other people across large distances—sometimes over a thousand miles away. There are relatively few sites from the first 3,000 years of the Archaic known in the northern portion of the United States, a fact probably related to the continually changing climate and environment. Sites from the last 4,000 years of the period are more common and show people had developed a great variety of tool

types and styles, mostly made from stone, bone, and wood. In general, Archaic sites are found along water and on lake plains.

Woodland/Ceramic/Late Period

The Woodland/Ceramic/Late period lasted from 3,000 B.P. to the time when European trade goods reached Indian groups (450 to 250 B.P.). During this time, people invented several new technologies, including clay pots and the bow and arrow. Long-distance trade intensified. Groups adopted agriculture, developed even less-mobile lifeways than before, and started living in larger settlements, some with over 1,000 inhabitants. People in the Northwest lived in large villages (some with distinctive pithouses) centered on rivers and relied increasingly on salmon fishing for subsistence.

4.11.2.2 Prehistoric Archaeological Site Probability

Archaeologists use a variety of information and techniques to carry out *predictive modeling*, the process of assessing the probability of the existence of archaeological sites in a given location. This section provides an overview of the current understanding of archaeological site probability in the WOR Region.

Washington and Idaho

The WOR Region project area transects archaeologically sensitive landforms within both the Northwest Coast and Plateau Culture Areas. The most sensitive landforms for prehistoric archaeological resources include coastal and river-valley features such as cusped forelands (geographical features found on coastlines and lakeshores that are created primarily by long shore drift and extend outward from the shoreline) and spits, natural beach berms and shorelines in protected bays, river terraces, and alluvial fans. Native American land use was concentrated in these areas, especially near estuaries and the confluences of major rivers, and so these areas would therefore have the greatest sensitivity for villages, campsites, and specialized resource-procurement sites. There is potential for such archaeological deposits to be deeply buried depending upon the local geology and geomorphology of a particular area. Although upland and mountain landforms, in general, have much less potential for the remains of long-term residential sites, certain upland areas exhibit evidence of concentrated human activity and therefore retain some potential for prehistoric archaeological sites. These areas include upland lakes and wetlands, outcrops of stone that was used for tools, and mountain passes, saddles, and ridgelines.

Other important considerations for archaeological site probability include the age and extent of previous disturbance of landforms. In general, the age of a particular surface constrains the potential antiquity of archaeological resources that may be found there. Also, probability must be assessed in terms of the extent of historic and modern development that may have previously disturbed or destroyed prehistoric archaeological site deposits.

Montana

No standardized or widely accepted site-location predictive or probability model for the presence of prehistoric sites exists for the Montana. Only a small fraction of the northern border area of Montana has been previously inventoried and evaluated for prehistoric sites. Actual numbers of recorded sites and previous project survey boundaries exist in the Montana State Historical Preservation Office (SHPO) database, but exact numbers of cultural resources are not available

for this overview. It is estimated that at least 1,000 prehistoric/precontact sites have been recorded within 100 miles of the Montana-Canada border. Most of the project area in Montana is sparsely populated, so the probability of finding intact precontact sites is very high.

4.11.2.3 Historic Context

This section provides a brief historic context that describes the development of the WOR Region after European contact. An expanded historic context and references can be found in Appendix H.

Contact between Indigenous people and Europeans began in the late 1500s along the West Coast of what is now the United States with the infrequent arrival of adventurous explorers. Sustained interactions only began during the middle of the eighteenth century as Russian, Spanish, and English settlers arrived to establish communities near water resources in the region. The United States began exploring the region after 1805 with the expedition of Meriwether Lewis and William Clark. After 1805, the Pacific Fur Company tried to compete in the fur trade by establishing an overland system of posts combined with a maritime trading network, but the War of 1812 damaged their interests. The United States claimed an area comprising present-day Oregon, Washington, Idaho, western Montana, and most of British Columbia as American territory from 1810 to the 1840s. However, the area was jointly claimed by the United States and Great Britain from 1818 to 1846 by the Anglo-American Convention of 1818. In 1846, the 49th parallel was established by the Oregon Treaty as the boundary between the United States and Canada.

The Oregon Territory was established in 1848 and included all of the land in the WOR Region. Territorial population grew, although few were drawn away from the coast to the interior. From the 1840s, waves of settlers were drawn to the region by the area's rich mineral wealth. Gold was the earliest draw, but later iron, silver, copper, lead, and bauxite became sought-after commodities. By the end of the Civil War, mining and agricultural communities had been established throughout the region. Improvements in transportation became the major determinant of growth, as settlements first developed along Indian trails and waterways. Settlement expanded as the Federal Government and mining companies carved roads from the countryside. Later, railroads were constructed in the region and remained important until after World War II.

Several land acts were passed to encourage settlement, and the Timber and Stone Act of 1878 and the Forest Homestead Act of 1906 were widely used for claims in heavily timbered areas. Settlers also purchased property from the railroads, which advertised and sold portions of their grants, or in later years from lumber companies that offered cheap, cut-over lands (McLaughlin, 1994). Mining and timbering were the predominant industries, and both experienced cycles of booms and busts into the twentieth century. The emergence of irrigation transformed other parts of the semi-arid interior. Apples, cherries, and other fruit trees thrived on irrigated lands. The construction of the Grand Coulee Dam (1942) led to the development of the Columbia Basin Project, an ambitious effort to irrigate more than one-half million arid acres for alfalfa, sugar beets, potatoes and a variety of other crops. Near the Idaho-Washington border, the Rathdrum Prairie was also irrigated for agricultural production, although financed by several private ventures.

During the twentieth century the leading cities within the PEIS project area — Seattle, Tacoma, and Spokane, Washington — initiated most of the economic activity in the region, serving as labor pools, trade and transportation centers, and the principal markets for the rest of Washington and northern Idaho.

4.11.2.4 Historic/Protohistoric Archaeological Site Probability

Among the known cultural resources in the WOR Region are archaeological sites from the historic and post-European contact periods. This section provides an overview of the current understanding of historic archaeological site probability in the WOR Region. This section includes the Protohistoric period (defined as the time between the initial arrival of European goods and diseases and actual contact between Native Americans and non-Natives), which extended from about A.D. 1700 to A.D. 1810. Items including guns and horses were quickly integrated into indigenous economic and subsistence systems.

The earliest direct contacts between Native Americans and Europeans in the Northwest were interactions between groups of coastal Indians and Spanish and British explorers in the late 1700s. Later, after the 1805 Lewis and Clark expedition, American involvement in the area intensified. The first fifty years of the contact period in the area primarily involved interaction between Native American groups and non-Native fur traders and Christian missionaries.

Washington and Idaho

Washington and Idaho have not developed statewide predictive models for historic archaeological site probability, but review of previously recorded sites suggests that the most sensitive areas for historic archaeological sites are very similar to those for prehistoric sites. Coastal and river-valley features and particularly protected bays, river terraces, and alluvial fans continued to be common occupation sites in the historic period. Early settlement focused on these types of areas where fertile soils, water supplies, and easy access made subsistence easier. Generous land laws in the nineteenth century also encouraged land development in more remote areas, as did reclamation efforts, but proximity to water and transportation routes continued to be major determinants of settlement. Early trails and roads often followed routes initially used by Native Americans and could be found along ridgelines and through mountain passes.

Montana

Like Washington and Idaho, western Montana has no standardized or widely accepted site-location predictive or sensitivity model for historic archaeological sites. Only a small fraction of the northern border area of Montana has been previously inventoried and evaluated for historic-period cultural sites. Actual numbers of recorded sites and previous project survey boundaries exist in the Montana SHPO database, but exact numbers of cultural resources are not readily available for this overview. It is estimated that at least 100 historic-period archaeological sites are recorded within 100 miles of the western Montana-Canada border.

In general for the entire area, historic archaeological sites can occur in or near present-day municipalities and villages as well as along historic-period roads, particularly cross-roads. Sites may also be found along certain railway sections and waterways.

4.11.2.5 Above-Ground Historic Properties

There are numerous above-ground historic properties in the WOR border area that are National Register listed or eligible or potentially eligible for listing. The highest densities are located in the western third of Washington State. During the Contact and Exploration period (mid-1700s to mid-1800s) in the inland areas of Washington and northern Idaho, early traders often followed well-established overland routes and interacted with Native peoples of the region, sometimes establishing semi-permanent occupation sites that could include cabins as well as caches and storage structures. During this period, any building construction most likely consisted of logs either laid horizontally or in the Hudson's Bay Style with vertical log posts and horizontal log infill mortised to uprights. Property types relating to early exploration of the region include both temporary camps that would likely have only archaeological components and semi-permanent occupation sites that may consist of above-ground contributing resources such as caches, sheds, or wooden shelters.

In the frontier period, fur-trade companies erected a number of forts and smaller outposts to conduct the trade and provide a base of operations for employees. Missionaries sometimes built mission complexes at strategic locations. Semi-permanent and permanent-occupation sites are property types that could include forts, trading posts, cabins, and missions as well as associated storage, domestic, and food-processing structures. The North American Boundary Commission's survey (1858–1862) was a joint U.S.-Great Britain expedition formed after the Oregon Treaty of 1846 to determine the location of the 49th parallel and mark the border. Property types associated with the expedition include temporary camp sites as well as markers, stone cairns, and other transportation features.

The development of various transportation networks brought new settlement to Washington and Idaho and ultimately encouraged the growth of industry and commerce as improved water routes, roads, and rail lines connected the region to the outside world. These property types correspond to travel by water, land, and air. Agricultural property types reflect the environmental and geographic conditions that dictate the kinds of farming, grazing, or other agricultural activities taking place in a specific area. Agricultural property types include animal husbandry, grazing, and crop-production properties as well as storage, processing, and maintenance facilities. Among the prominent features of animal-related agricultural properties are barns, corrals, birthing sheds, and small-animal pens. Grazing properties may include stock driveways, holding pens and chutes, fencing and pastures, and salting areas. Contributing to crop-related properties are fields, orchards, gardens, and fences. Storage properties are represented by barns, hay sheds, silos, granaries, and milk houses, while smokehouses and stills are examples of common processing properties. In addition, irrigation systems are a type of agricultural property prevalent in the arid and semi-arid portions of the region; contributing features may include dams, reservoirs, and pump facilities as well as systems of ditches, canals, flumes, and pipes. Many of these agricultural property types may also be associated with domestic buildings and structures such as dwellings, privies, or other outbuildings that frequently characterize small farmsteads or independently run agricultural operations.

The early economies of Washington and Idaho relied on logging and mining as their primary industries, although fish- and grain-processing, concrete manufacturing, and energy production were among a number of other industries that made use of the region's rich natural resources. Properties for each of these industries can be related to extraction, processing, maintenance,

storage, and manufacture. A number of coastal cities and Spokane in the interior became commercial centers not only for regional but also international trade. Towns of all sizes developed commercial districts that provided retail, supply, and storage facilities. Historic property types associated with commerce and trade include retail, wholesale, and professional properties as well as organizational and storage facilities.

Early settlement in Idaho and Washington (1820s) focused on river drainages and coastal lowlands, but generous land laws also encouraged claims in more remote areas. Early dwellings were often built as a requirement for “proving up” on these properties. Many towns grew on transportation routes or were built by companies for their workers, and as cities grew, neighborhood development was often based on a variety of socio-economic factors. Domestic property types along the northern border include single-family and multiple-occupancy dwellings, hotels, institutional housing, and camps.

A small fraction of the WOR area has been previously inventoried and evaluated for historic structures. Actual numbers of recorded above-ground historic properties and previous project survey boundaries exist in SHPO databases and files, but exact numbers of cultural resources are not readily available for this overview. As is the case with other site types in the project area, there is a high probability of discovering previously unrecorded and significant above-ground historic properties that will meet the criteria for listing in the National Register.

Tables 4.11-1, 4.11-3, and 4.11-4 identify historic properties that have been designated as historically important at the national, state, and local levels and briefly describe the historic environments in the vicinity of CBP facilities in the WOR area of study. Tables 4.11-2 and 4.11-5 list the historic buildings located on CBP properties.

Table 4.11-1. Cultural Resources in the Vicinity of CBP Facilities in Montana

Component*	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Del Bonita (East of the Rockies)	4071 Chalk Butte Road Cut Bank, MT 59427	City; county seat; end of the Cherokee Trail or Rocky Mountain Trail; location of Captain Meriwether Lewis skirmish with Blackfeet in the vicinity; no National Register properties in the vicinity
OFO	POE	Piegian (East of the Rockies)	4999 Highway 89 North Babb, MT 59411	Small community on the Blackfeet Reservation; Piegian Border station and Quarters and the Chief Mountain Border station and Quarters are both National Register properties; one National Register district in the vicinity
OFO	POE	Roosville	7915 Highway 93 North Eureka, MT 59917	Small town; two National Register properties in the vicinity
USBP	BPS	Shelby	25 Airport Road Shelby, MT 59474	City; three National Register properties in the vicinity

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Component*	Type**	Name	Address	National, State, and Local Historical Designations and Environment
USBP	BPS	Sainte Mary (EOR)	4999 US Highway 89 Babb, MT 59411	See previous description for the Piegan POE
OFO	POE	Sweetgrass Area (EOR)	39825 Interstate 15 Sweetgrass, MT 59484	Small community; U.S. Customs Building is a National Register property; no other listings in the vicinity
USBP	BPS	Eureka	7695 Airport Road Eureka, MT 59917	See previous description for the Roosville POE
USBP	BPS	Whitefish	1295 Highway 93 West Whitefish, MT 59937	City; three National Register properties in the vicinity

*OFO = CBP Office of Field Operations, OAM = CBP Office of Air and Marine, USBP = U.S. Border Patrol

**POE = Port of Entry, BPS = Border Patrol station

Table 4.11-2. Historic Buildings on CBP Property in Montana

Building Name	Type	City	Number	Year Finished	Rating Class*
Chief Mountain Border station	Border station	Babb (EOR)	MT0501AD	1939	National Register Listed
Chief Mountain Border Station Pump House	Other	Babb (EOR)	MT0503AD	1939	Not rated
Chief Mountain Border Station Garage	Garage	Babb (EOR)	MT0502AD	1939	Not rated
Piegan Border Station Apartment Complex	Border Station	Babb (EOR)	MT0551AE	1933	5a
Roosville Border Station Residence Customs	Residence	Eureka	MT0703AG	1933	5a
Roosville Border Station Residence Immigration	Residence	Eureka	MT0702AG	1933	5a
Roosville Border Station	Border Station	Eureka	MT0701AG	1933	5a

Source: USGSA, 1999; Appendix C, GSA Historic Buildings.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

*GSA Historic Rating Class 5a: A building 50-yearsold or older that has not been evaluated for National Register eligibility but is likely eligible, such as a courthouse, custom house, or historic office building (“Held in Public Trust” Appendix C; see footnote above).

Table 4.11-3. Cultural Resources in the Vicinity of CBP Facilities in Idaho

Component*	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Eastport	Highway 95 North at the Border Eastport, ID 83826	Rural community; Two National Register properties in the vicinity
OFO	POE	Porthill	Highway 1 at the Border Porthill, ID 83853	Rural community; no National Register properties in the vicinity
USBP	BPS	Bonnars Ferry	7167 First Street Bonnars Ferry, ID 83805	Small city; county seat, situated on south bank of Kootenai River; Six National Register properties in the vicinity
USBP	BPS	Twin Falls	2496 Addison Avenue East Twin Falls, ID 83301	City; county seat; oldest dated artifacts in North America found at excavations at nearby Wilson Butte Cave; 4 National Register districts; 15 National Register properties in the vicinity

*OFO = CBP Office of Field Operations, USBP = U.S. Border Patrol

**POE = Port of Entry, BPS = Border Patrol station

Table 4.11-4. Cultural Resources in the Vicinity of CBP Facilities in Washington

Component*	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Blaine	9901 Pacific Highway Blaine, WA 98230	City; Three historic and one prehistoric National Register properties in the vicinity
OFO	POE	Pacific Highway Crossing	WSR 543 (I-5), Blaine, WA 98230	See description for Blaine above.
OFO	POE	Peace Arch	WSR 543 (I-5), Blaine, WA 98230	The Peace Arch is National Register listed
OFO	POE	Longview	1450 Terminal Way Longview, WA 98631	City (on confluence of Cowlitz and Columbia Rivers); 21 National Register properties and 1 state-listed property in the vicinity; Longview built on location of Mount Coffin, a Native American burial ground.
OFO	POE	Seattle	1000 Second Avenue Seattle, WA 98104	City (largest in Washington and Pacific Northwest); 6 National Register districts; 150+ National Register properties; 4 state-listed Historic Districts/Blocks; 76 state-listed properties in the vicinity
OFO	POE	Sumas	103 Cherry Street Sumas, WA 98295	Small town; U.S. Border Station at Sumas is National Register listed; no other National Register properties in the vicinity; One state-listed property in the vicinity

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Component*	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Tacoma	2202 Port of Tacoma Road Tacoma, WA 98421	Mid-sized urban port city; 5 National Register districts; 87 National Register properties; 1 state-listed historic district not on National Register; 22 state-listed properties not on National Register in the vicinity
USBP	BPS	Sumas	9648 Garrison Road Sumas, WA 98295	See previous description for the Sumas POE.
USBP	BPS	Port Angeles	138 West 1 st Street Port Angeles, WA 98263	City (on northern edge of Olympic Peninsula); 11 National Register properties in the vicinity; 8 state-listed properties not on National Register including P'e'nis Clallam Indian Village in the vicinity
USBP	Sector HQ	Blaine	1580 H Street Blaine, WA 98230	See previous description for the Blaine POE.
OAM	Air Facility	Blaine	1580 H Street Blaine, WA 98230	See previous description for the Blaine POE.
USBP	BPS	Bellingham	2745 McLeod Road Bellingham, WA 98225	City (12 th largest in the state, situated on Bellingham Bay); county seat; 2 National Register districts; 36 National Register properties; 8 state-listed historic properties not on National Register in the vicinity
USBP	BPS	Metaline Falls	105 Highway 31 Metaline, WA 99152	Very small town; no National Register properties in the vicinity
USBP	BPS	Oroville	1105 Main Street Oroville, WA 98844	Small city; Enloe Dam and Power plant are National Register properties; One other National Register property in the vicinity
USBP	BPS	Colville	209 East Juniper Colville, WA 99114	Small city; county seat; founded near Fort Colville (1825) and later fort named the same (1859); Nine National Register properties in the vicinity; One state-listed historic property not on National Register
USBP	BPS	Curlew	5 Forest Lane Curlew, WA 99118	Rural community at confluence of Long Alec Creek & Keller River; Three National Register properties in the vicinity
USBP	Sector HQ	Spokane	10710 N. Newport Highway Spokane, Washington 99218	Large city (located on Spokane River); county seat; approximately 20 National Register districts and blocks; 80+ National Register properties; 2 state-listed Historic Districts/Blocks not on National Register; 12 state-listed properties not on National Register in the vicinity

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Component*	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OAM	Air Facility	Spokane	10710 N. Newport Highway Spokane, Washington 99218	See description for Spokane above.

*OFO = CBP Office of Field Operations, USBP = U.S. Border Patrol, OAM = CBP Office of Air and Marine

**POE = Port of Entry, BPS = Border Patrol station

Table 4.11-5. Historic Buildings on CBP Property in Washington

Building Name	Type	City	Number	Year Finished	Rating Class*
U.S. Border Station & Quarters, Curlew, WA	Border station	Curlew	WA0551FB	1937	5a
U.S. Border Station, Laurier, WA	Border station	Laurier	WA0601LB	1936	
U.S. Border Station, Metaline Falls, WA	Border station	Metaline Falls	WA0611MB	1932	National Register Listed
U.S. Border Station Residence, Laurier, WA	Residence	Laurier	WA0603LB	1936	
U.S. Border Station Residence, Laurier, WA	Residence	Laurier	WA0602LB	1936	
U.S. Border Station Residence #1, Metaline Falls, WA	Residence	Metaline Falls	WA0612MB	1932	
U.S. Border Station Residence #2, Metaline Falls, WA	Residence	Metaline Falls	WA0613MB	1932	
U.S. Port of Entry/Point Roberts Border Station, Point Roberts, WA	Border station	Point Roberts	WA0119ZZ	1997	
U.S. Border Station, Oroville, WA	Border station	Oroville	not assigned	1933	Not rated

Source: USGSA, 1999; Appendix C, GSA Historic Buildings.

*GSA Historic Rating Class 5a: A building 50-years-old or older that has not been evaluated for National Register eligibility but is likely eligible, such as a courthouse, custom house, or historic office building (“Held in Public Trust” Appendix C; see footnote above).

4.11.2.6 Native American Cultural Resources

This section provides information about the potential location of Native American cultural resources, sacred sites, and traditional cultural properties (TCPs) in the WOR Region, based on the geographic location of Native Americans both historically and in the present. There are 33 tribal groups within the WOR area (Table 4.11-6). Twenty-five of these Tribes have reservations within the WOR study area (Figure 4.11-1).

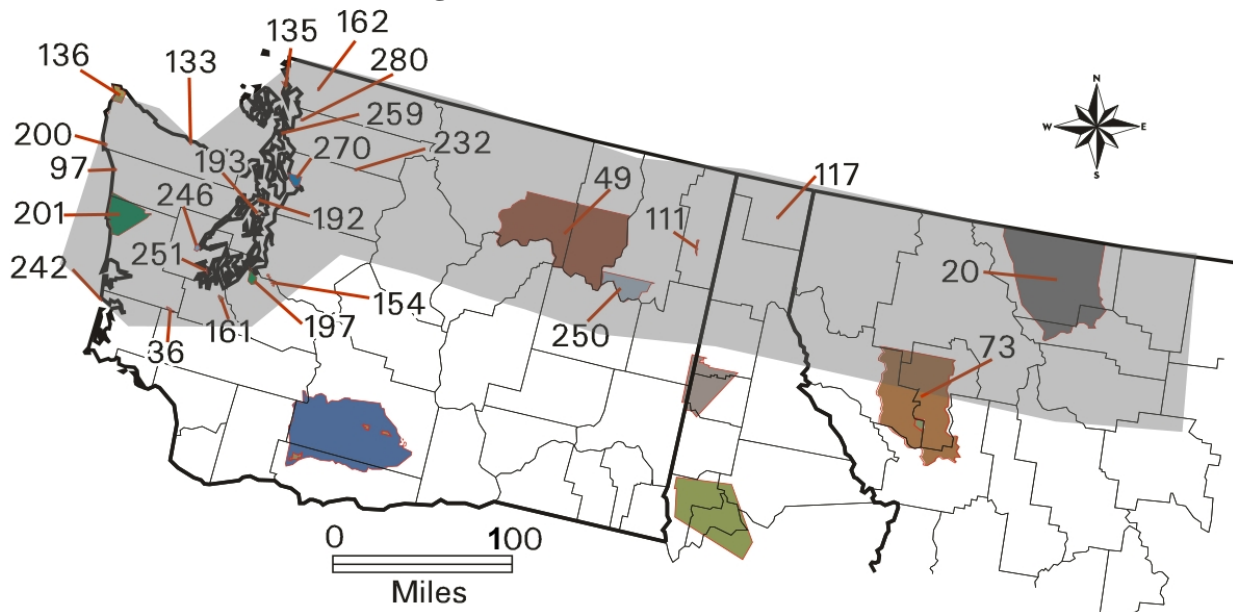
Table 4.11-6. Native-American Tribes That Have a Reservation, Judicially Established Interest, or Established Traditional Ties to Land within the 100-mile PEIS Corridor

Blackfeet Tribe of the Blackfeet Indian Reservation of Montana	Port Gamble Indian Community of the Port Gamble Reservation
Coeur D'Alene Tribe of the Coeur D'Alene Reservation	Puyallup Tribe of the Puyallup Reservation
Confederated Salish & Kootenai Tribes of the Flathead Reservation	Quileute Tribe of the Quileute Reservation
Confederated Tribes of the Chehalis Reservation	Quinault Tribe of the Quinault Reservation
Confederated Tribes of the Colville Reservation	Samish Indian Tribe
Confederated Tribes and Bands of the Yakama	Sauk-Suiattle Indian Tribe of Washington
Cowlitz Indian Tribe	Shoalwater Bay Tribe of the Shoalwater Bay Indian Reservation
Hoh Indian Tribe of the Hoh Indian Reservation	Skokomish Indian Tribe of the Skokomish Reservation
Jamestown S'Klallam Tribe of Washington	Snoqualmie Tribe
Kalispel Indian Community of the Kalispel Reservation	Spokane Tribe of the Spokane Reservation
Kootenai Tribe of Idaho	Squaxin Island Tribe of the Squaxin Island Reservation
Lower Elwha Tribal Community of the Lower Elwha Reservation	Stillaguamish Tribe of Washington
Lummi Tribe of the Lummi Reservation	Suquamish Indian Tribe of the Port Madison Reservation
Makah Indian Tribe of the Makah Indian Reservation	Swinomish Indians of the Swinomish Reservation
Muckleshoot Indian Tribe of the Muckleshoot Reservation	Tulalip Tribes of the Tulalip Reservation
Nisqually Indian Tribe of the Nisqually Reservation	Upper Skagit Indian Tribe of Washington
Nooksack Indian Tribe of Washington	

The following maps indicate federally recognized Tribes that have a reservation within approximately 100 miles of the Canadian border, have a judicially established connection to land within the 100-mile corridor, or have established traditional ties that may involve traditional cultural properties or archaeological sites. The maps include:

1. A map of Indian reservations located within the 100-mile corridor (Figure 4.11-1);
2. A USGS map showing nineteenth-century cessions, reservations, and portages (Figure 4.11-2). This map was retrieved from ancestry.com; while the sourcing is unclear, the accuracy is corroborated by a 1992 map compiled by the Bureau of Indian Affairs and a 1998 GIS layer created by USGS (not included). The map shows Tribes that had a presence along the northern border 100 years ago and indicates cases where Indian lands were ceded prior to that period;
3. A USGS map showing judicially established Indian land areas as of 1978 (Figure 4.11-3). The map portrays the results of cases before the U.S. Indian Claims Commission or U.S. Court of Claims in which an American Indian Tribe proved its original tribal occupancy of a tract within the continental United States; and,
4. A USGS map indicating early tribal, cultural, and linguistic areas (Figure 4.11-4). The information was derived from anthropological, archaeological, and linguistic studies. The map generally corroborates the other maps with regard to traditional tribal areas.

Figure 4.11-1. Native American Lands within the 100-mile PEIS Corridor Crossing Washington, Idaho, and Western Montana



Key to Figure 4.11-1			
			200 Quileute Tribe of the Quileute Reservation
20	Blackfoot Tribe of the Blackfoot Indian Reservation of Montana	135	Lummi Tribe of the Lummi Reservation
36	Confederated Tribes of the Chehalis Reservation	136	Makah Indian Tribe of the Makah Indian Reservation
49	Confederated Tribes of the Colville Reservation	154	Muckleshoot Indian Tribe of the Muckleshoot Reservation
73	Confederated Salish & Kootenai Tribes of the	161	Nisqually Indian Tribe of the Nisqually Reservation
			201 Quinault Tribe of the Quinault Reservation
			232 Sauk-Suiattle Indian Tribe of Washington
			242 Shoalwater Bay Tribe of the Shoalwater Bay Indian Reservation
			246 Skokomish Indian Tribe of the Skokomish Reservation

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

	Flathead Reservation				
97	Hoh Indian Tribe of the Hoh Indian Reservation	162	Nooksack Indian Tribe of Washington	250	Spokane Tribe of the Spokane Reservation
111	Kalispel Indian Community of the Kalispel Reservation	192	Port Gamble Indian Community of the Port Gamble Reservation	251	Squaxin Island Tribe of the Squaxin Island Reservation
117	Kootenai Tribe of Idaho	193	Suquamish Indian Tribe of the Port Madison Reservation	259	Swinomish Indians of the Swinomish Reservation
133	Lower Elwha Tribal Community of the Lower Elwha Reservation	197	Puyallup Tribe of the Puyallup Reservation	280	Upper Skagit Indian Tribe of Washington

Source: (USDOJ, 2010).

Note: A shaded 100-mile corridor has been added.

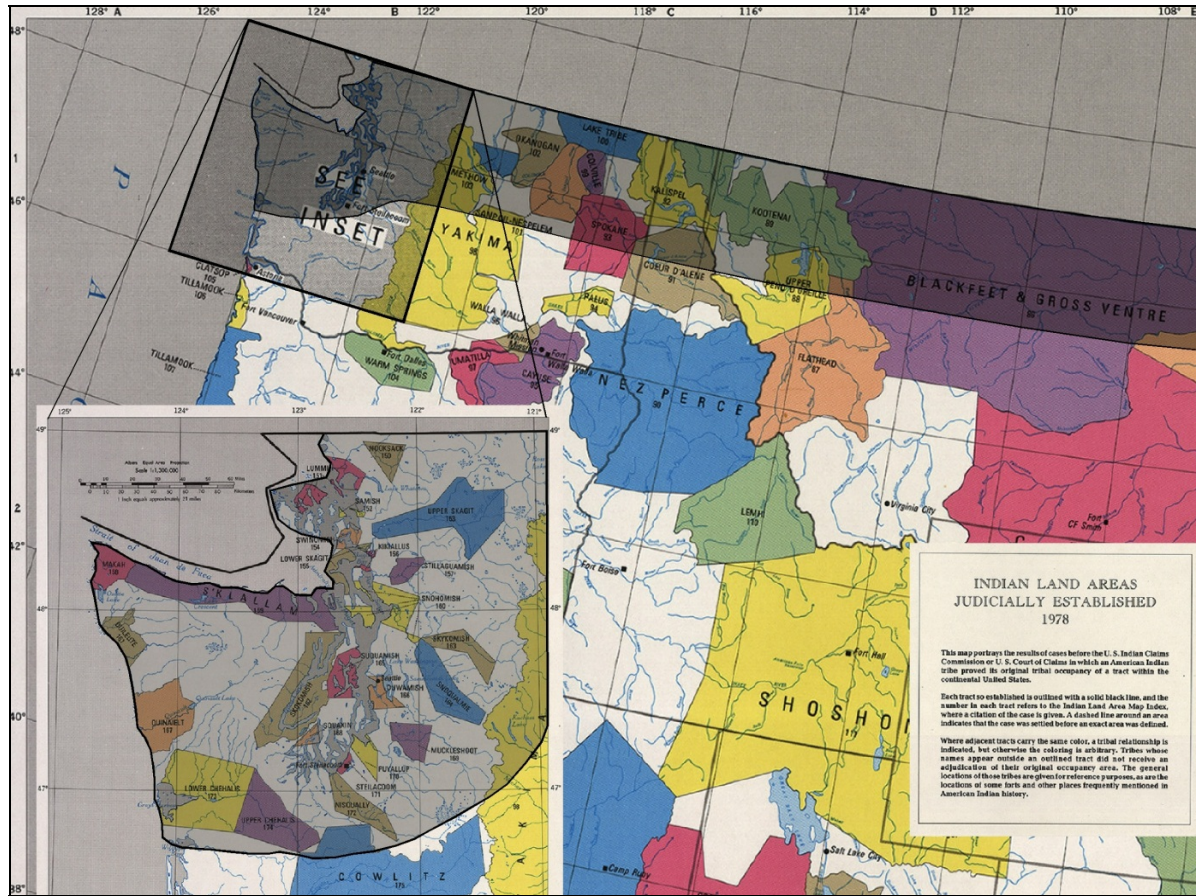
Figure 4.11-2. Nineteenth-Century Cessions, Reservations, and Portages (1907)



Source: (Ancestry.com, No Date).

Note: A shaded 100-mile corridor has been added.

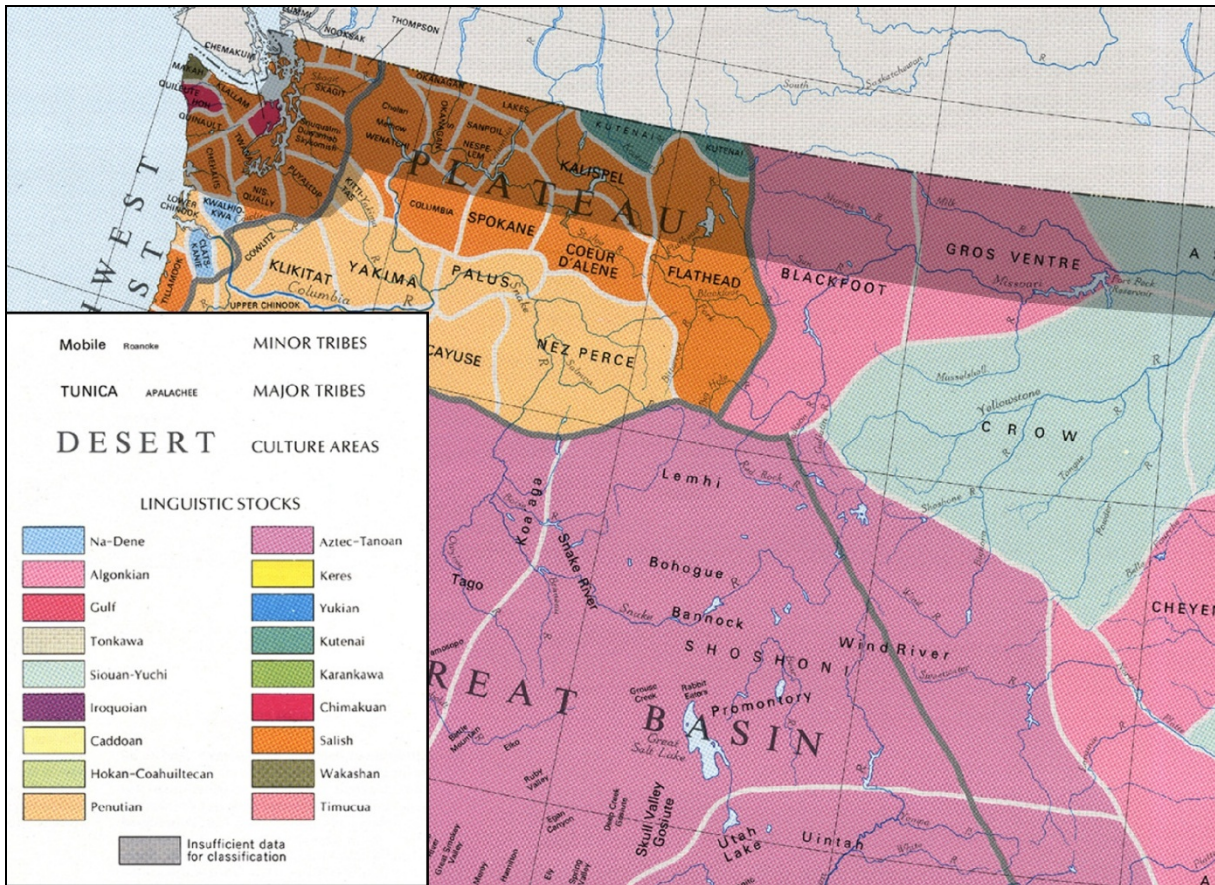
Figure 4.11-3. Judicially Established Indian Land Areas as of 1978



Source: (USDOI, 1978).

Note: A shaded 100-mile corridor has been added.

Figure 4.11-4. Early Tribal, Cultural, and Linguistic Areas



Source: (USDOI, 1991).

Note: A shaded 100-mile corridor has been added.

4.11.2.7 Paleontological Resources

As with archaeology, paleontologists use a variety of information and techniques to carry out predictive modeling, the process of assessing the probability of existence of paleontological sites in a given location. This section provides an overview of the current understanding of paleontological site probability in the WOR Region. An expanded discussion of paleontological resources and references can be found in Appendix H.

Within the study area, four major geological groups were identified: sedimentary, volcanic, plutonic, and metamorphic. Of these rock groups, only sedimentary rocks have a high or moderate potential for containing paleontological materials. Both plutonic and volcanic rocks rarely contain fossils because igneous environments are not suitable for living things. Metamorphic rocks rarely contain fossils because the conditions of metamorphism tend to alter the texture of the rocks and destroy any fossils contained within.

Washington

Paleontological-sensitive geological units in Washington include Precambrian rocks, Paleozoic sandstone, shale, limestone from ancient shorelines, and Mesozoic deep and shallow marine

sediments. Cenozoic deposits include shallow marine sandstone and siltstone as well as glacial deposits containing large-vertebrate fossils.

Idaho

Paleontologically sensitive geological units in Idaho include Precambrian, Paleozoic, Mesozoic, and Cenozoic deposits. Precambrian deposits contain stromatolites (formed in shallow water) and trace fossils. Paleozoic deposits are terrestrial and marine and represent fluctuating sea levels. Mesozoic deposits are shallow, marine sedimentary rocks. Cenozoic deposits consist of lake and river deposits as well as retreating glacial deposits containing large-vertebrate fossils.

Montana

Paleontologically sensitive geological units in Montana consist predominantly of Precambrian, Cretaceous, and Tertiary sedimentary units. Precambrian sedimentary units include shallow sea stromatolites and trace fossils. Paleozoic deposits are from warm and shallow marine waters that created a thin blanket over almost all of Montana. Mesozoic deposits are of terrestrial and tropical marine origin. The Cenozoic marks the retreat of the ocean and the onset of a colder period. Deposits from the Cenozoic thus range from tropical shallow seas to glacial deposits.

4.12 ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

4.12.1 INTRODUCTION

Executive Order (EO) 12898 of February 11, 1994 (EO 12898, 1994), titled “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” requires that each Federal agency identify and address any disproportionately high and adverse effect of its programs, policies, and activities on minority and low-income populations. The USEPA defines *environmental justice* as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies” (USEPA, 2010).

EO 13045 of April 21, 1997 (EO 13045), titled “Protection of Children from Environmental Health Risks and Safety Risks,” places a high priority on the identification and assessment of environmental health and safety risks that may disproportionately affect children. The order requires that each agency “ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health or safety risks.” EO 13045 considers that physiological and social development of children makes them more sensitive than adults to adverse health and safety risks and recognizes that children in minority, low-income, and indigenous populations are more likely to be exposed to, and have increased health risks from, environmental contamination than the general population (USEPA, 2010).

4.12.2 AFFECTED ENVIRONMENT

This section describes the affected environment for the assessment of potential environmental-justice effects that could result from implementation of any of the CBP program alternatives in the WOR Region. The affected environment section identifies and describes minority and low-income populations, as well as populations of children that may be present in the defined study area and that may be differentially affected by actions proposed under each of the alternatives considered in this PEIS.

The study area for the evaluation of environmental justice effects is defined—in accordance with Section 4.10, Socioeconomic Resources—as the border communities in both the United States and Canada within 100 miles of the U.S.-Canada border. The U.S. portion of this study area (WOR Region) includes the border communities in the states of Washington, Idaho, and Montana west of the Continental Divide. The study area north of the WOR Region in Canada includes the border communities in the Province of British Columbia. For comparison purposes, the analysis also includes the population(s) of the respective border states and Canadian province as a whole. Border communities are defined geographically by the administrative boundaries of U.S. counties and Canadian census divisions contained within or overlapping the study area. A detailed demographic analysis of the study area is in Section 4.10.

4.12.2.1 Minority Populations

The most recent USCB data for minority populations available for all counties and states in the United States are part of the Decennial Census for the year 2000 (USDOC, 2000a). Statistical data from this census have been used to characterize the minority populations within the WOR

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Region. Summary statistics for minority populations in the WOR Region, their respective states, and the Nation are presented in Table 4.12-1.

For individual states within the region, the minority percentage of the population in the border communities is lower than, or roughly equal to, the minority component of the respective state population. Populations in the category of Asian, Native Hawaiian, Pacific Islander, and Other constitute the largest single minority identification within the border communities. These populations represent a slightly higher percentage of the study-area population than for the combined population of the three states that make up the WOR Region.

**Table 4.12-1. Minority Statistics for the WOR Region
(Percent of Population)**

Border State/Region*		White	Black or African American	American Indian and Alaska Native	Asian, Native Hawaiian, Pacific Islander, Other	More Than One Group	Hispanic Origin**
Idaho	WOR Region	95.8	0.2	1.2	1.1	1.8	2.2
	Statewide	90.9	0.4	1.4	5.2	2.1	7.9
Montana	WOR Region	92.2	0.1	4.5	1.2	2.0	1.7
	Statewide	90.6	0.3	6.1	1.1	1.9	2.0
Washington	WOR Region	81.6	3.6	1.5	9.2	4.1	5.7
	Statewide	81.7	3.1	1.5	9.7	3.9	7.5
WOR Region Total	WOR Region	82.6	3.3	1.6	8.6	3.9	5.4
	Selected States	84.2	2.4	2.0	8.0	3.4	6.9
Total United States		75.1	12.2	0.9	9.2	2.6	12.5

Source: (USDOC, 2000a).

*Statistics presented in the unshaded rows include only those portions of the states that lie within the study area; this includes all counties overlapping the area within 100 miles south of the border.

**Hispanic origin is an ethnicity that may include individuals who are also represented in other categories (such as White or Black). Therefore, Hispanic origin is a separate measure and is calculated separately from the other categories.

Data on minority populations north of the WOR Region in Canada were taken from the 2006 Census of Canada (Table 4.12-2). For British Columbia, minority populations constitute 26.6 percent of the total population of the border communities. This is somewhat higher than the 24.8 percent minority population of the province as a whole and substantially higher than the 16.2 percent visible minority population of Canada as a whole.

The “Other Visible Minority” population (including multiple ethnicities) constitutes the largest single minority category in both the study area and the Province of British Columbia. This category consists primarily of the following groups: Chinese, South Asian, Arab, West Asian, Filipino, Southeast Asian, Latin American, Japanese, and Korean. However, Aboriginal Peoples constitute the largest single identifiable minority within this study area.

Table 4.12-2. Visible Minority Statistics North of the WOR Region in Canada* (Percent of Population)

Border Province**		Not a Visible Minority	Black	Other Visible Minority* **	Two or More Visible Minorities	Aboriginal Peoples****
British Columbia	North of the WOR Region	73.4	0.7	25.2	0.7	3.6
	Province	75.2	0.7	23.4	0.6	4.8
Total Canada		83.8	2.5	13.3	0.4	3.8

Source: (StatCan, 2006a).

*Canada’s Employment Equity Act (2005) defines *visible minorities* as “persons, other than Aboriginal peoples, who are non-Caucasian in race or non-white in color.”

**Statistics presented in the unshaded row account only for those portions of the province that lie within the study area; this includes all census divisions overlapping the area within 100 miles north of the border.

***The “Other Visible Minority” population consists mainly of the following groups: Chinese, South Asian, Black, Arab, West Asian, Filipino, Southeast Asian, Latin American, Japanese, and Korean.

****Self-identification by Aboriginal Peoples does not preclude self-identification inclusion in one of the other categories. The “Aboriginal Peoples” column of this table is, therefore, not additive with the other columns.

4.12.2.2 Low-Income Populations

Data from the most recently completed USCB (USDOC, 2000b; USDOC, 2000c) were used to characterize low-income minority populations in the WOR Region. Median household income and poverty rates are in Table 4.12-3.

For the WOR Region, the median household income is \$4,127 higher than the median for the total U.S. border region and \$5,081 higher than the median for the Nation as a whole. However, in both Idaho and Montana, the median household income in the WOR Region is lower than that for the state as a whole. Median income for the border communities in Washington is \$1,565 higher than the statewide median.

For the state of Washington, individuals at or below the poverty line in the border communities represent a smaller percentage of the population, 9.9 percent, than for either the state or the Nation as a whole. Poverty rates for the Montana portion of the WOR study area are slightly higher, 0.5 percent, than for the state as a whole, but substantially higher, 2.7 percent, than the percentage for the national population. Poverty rates for the Idaho segment of the WOR study area are also slightly higher than for the state but comparable to national levels.

Table 4.12-3. Income and Poverty Statistics for the WOR Region

Border State/Region*		Median Household Income** (\$)	Percent of Population Below the Poverty Line
Idaho	WOR Region	44,906	12.4
	Statewide	47,465	11.8
Montana	WOR Region	41,353	15.1
	Statewide	41,720	14.6
Washington	WOR Region	59,394	9.9
	Statewide	57,829	10.6
WOR Region Total	WOR Region	58,132	10.2
	Selected States	54,375	11.2
Total United States		53,051	12.4

Source: (USDOC, 2000b; USDOC, 2000c).

*Statistics presented in the unshaded rows include only those portions of the states that lie within the study area; this includes all counties overlapping the area within 100 miles south of the border.

**Median household income is reported from the 2000 USCB in inflation-adjusted 2009 U.S. dollars.

Data on median household income and populations living below the poverty level north of the WOR Region in Canada were gathered from the 2006 Census of Canada. Statistics for British Columbia are in Table 4.12-4.

The median income for the border communities in British Columbia is \$48,644. This is slightly higher than the median for the province as a whole, but somewhat lower than the national median. Based on the percentage of low-income economic families, the poverty rate for the study area in Canada is approximately 2 percentage points higher than the national rate. However, the study area rate is only slightly higher than the 13.3-percent rate for the province as a whole.

Table 4.12-4. Income and Poverty Statistics North of the WOR Region in Canada

Border Province*		Median Household Income** (\$US)	Percent of Low-Income Economic Families***
British Columbia	North of the WOR Region	48,644	13.6
	Province	48,541	13.3
Total Canada		49,393	11.6

Source: (StatCan, 2006b).

*Statistics presented in the unshaded row include only those portions of the province that lie within the study area; this includes all census divisions overlapping the area within 100 miles north of the border.

**Median household income is reported from the 2006 Canadian Census in inflation-adjusted 2009 U.S. dollars.

***The Canadian Census reports statistics for “low-income” economic families. This threshold-based designation is comparable to the poverty statistics reported in the USCB. An *economic family* is a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common-law, or adoption. A couple may be of opposite or same sex. Foster children are included.

4.12.2.3 Population of Children Under 18 Years of Age

The distribution of population by age for the WOR Region is provided in Table 4.12-5. Within individual states of the region, both Montana and Washington have smaller percentages of children in the populations of the border communities than is found in the national population. The study area in Washington state has the smallest percentage of children under 18 in its population, 24.9 percent, of any of the three state segments of the study area.

**Table 4.12-5. Age Distribution in the WOR Region
(Percent of Population)**

Border State/Region*		Under 18	18-24	25-34	35-44	45-54	55-64	65+
Idaho	WOR Region	26.5	7.9	11.6	15.6	15.4	10.0	13.0
	Statewide	28.5	10.7	13.0	15.1	13.1	8.3	11.3
Montana	WOR Region	24.6	10.5	11.7	15.8	15.5	9.6	12.3
	Statewide	25.5	9.5	11.4	15.9	14.9	9.4	13.4
Washington	WOR Region	24.9	9.3	14.5	17.0	14.5	8.4	11.3
	Statewide	25.6	9.4	14.2	16.8	14.3	8.4	11.2
WOR Region Total	WOR Region	25.0	9.3	14.2	16.9	14.6	8.5	11.4
	Selected States	26.1	9.7	13.7	16.4	14.2	8.5	11.5
Total United States		25.6	9.6	14.1	16.3	13.4	8.6	12.4

Source: (USDOC, 2000c).

*Statistics presented in the unshaded rows account only for those portions of the states that lie within the study area; this includes all counties overlapping the area within 100 miles south of the border.

The distribution of population by age for the study area north of the WOR Region in Canada is provided in Table 4.12-6. For this study area, children under 20 years of age represent 23.0 percent of the population of the Province of British Columbia. This is a slightly lower percentage than for the province as a whole but noticeably higher than the percentage of children under 20 years of age in the national population. For both the study area and the province as a whole, the percentage of children is slightly more than for the nation as a whole.

**Table 4.12-6. Age Distribution North of the WOR Region in Canada
(Percent of Population)**

Border Province*		Under 20	20-24	25-34	35-44	45-54	55-64	65+
British Columbia	North of the WOR Region	23.0	6.5	12.3	15.3	16.2	12.4	14.4
	Province	23.4	6.5	12.2	15.3	16.2	12.3	14.0
Total Canada		24.7	6.6	12.8	15.3	15.8	11.7	13.0

Source: (StatCan, 2006c).

*Statistics presented in the unshaded row account only for those portions of the province that lie within the study area; this includes all census divisions overlapping the area within 100 miles north of the border.

4.13 HUMAN HEALTH AND SAFETY

4.13.1 INTRODUCTION

Many of the routine activities conducted by CBP in the WOR Region have the potential to affect human health and safety (HH&S). HH&S relates to the health and safety of the general public (including vehicle occupants), CBP and station employees, and maintenance personnel. Safety can also refer to safe operations of aircraft or other equipment. This section considers the potential adverse and beneficial impacts of CBP's alternative actions on HH&S.

4.13.2 AFFECTED ENVIRONMENT

Construction

HH&S concerns during construction and modernizing of facilities involve exposing workers to conditions that pose a health or safety risk. Construction site safety is largely a matter of adherence to regulatory requirements. These regulatory requirements are imposed for the benefit of employees, and they implement operational practices that reduce risks of illness, injury, death, and property damage. The U.S. Occupational Safety and Health Administration (OSHA) issues standards that specify the amount and type of safety training and education required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits with respect to workplace stressors (29 CFR 1910). CBP applies and adheres to these standards in policy and practice.

Routine Operations

Trade and Travel Processing at POEs

The affected environment of agricultural inspections is the inspection location. Agricultural inspections are typically conducted onsite at POEs, but officers sometimes escort the shipment to the receiver site for inspection (USDHS, 2011). Inspections can also take place on the vessel or train transporting cargo into the United States. After inspection, many types of shipments are released to the appropriate agency. This region contains the Blaine POE, the largest port for agricultural products along the northern border, with over two dozen agricultural specialists.

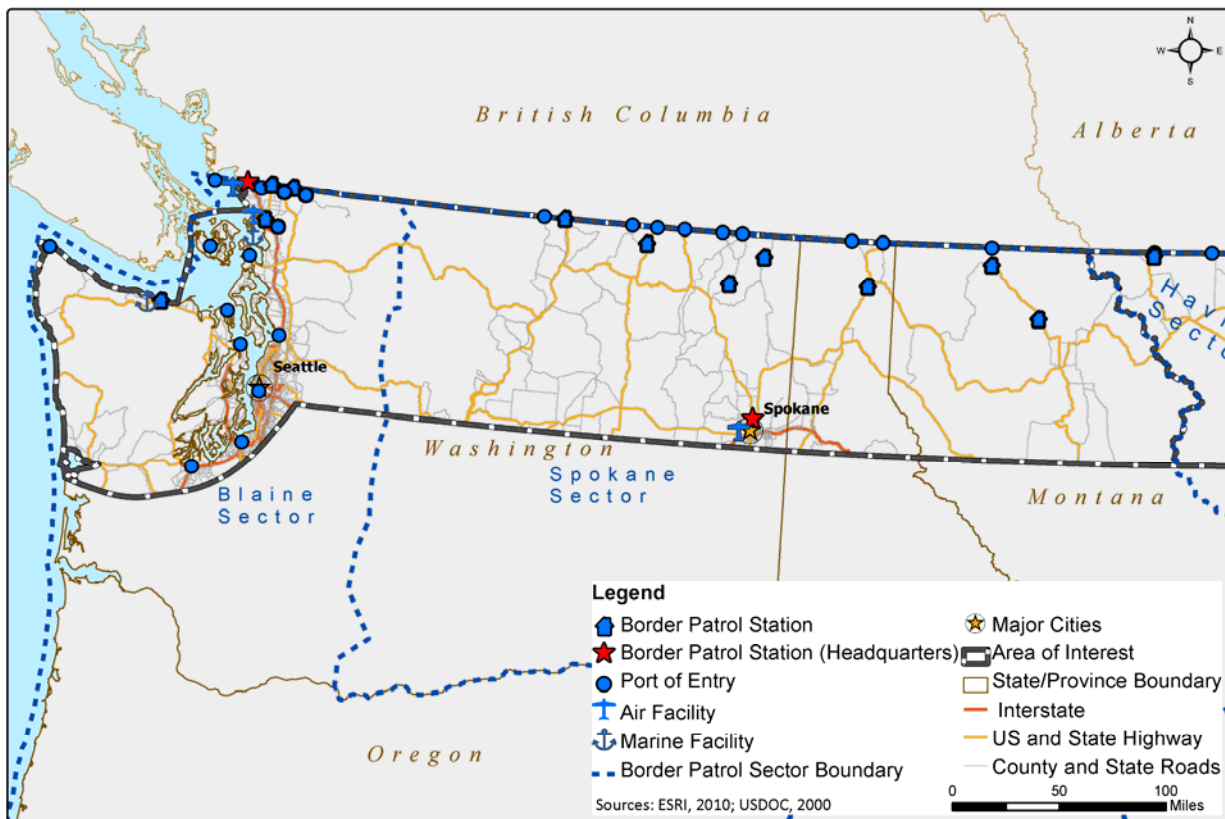
During these interceptions, HH&S effects are possible. Release of nonindigenous diseases into the United States would be harmful to HH&S. To prevent nonindigenous diseases from entering the United States, CBP places bans on certain animals, animal products, and other possible carriers of disease. In 2003 in Canada a positive case of bovine spongiform encephalopathy ("mad cow" disease) touched off an immediate ban on ruminant meat from Canada into the United States. That same year, there was an outbreak of monkey pox in the United States. This outbreak was linked to exotic animals being imported into the United States as pets. A ban was immediately imposed on certain live rodents from Africa, and agricultural specialists still enforce this ban (USDHS, 2004a). Preventing nonindigenous diseases from entering the United States has a beneficial effect on HH&S because it limits the outbreak of disease.

Ground Surveillance and Situational Response Activities

Motorized and Nonmotorized Patrols

Motorized patrols take place on U.S. national, state, county, and local municipalities’ paved roads. Figure 4.13-1 shows U.S. national, state, and county roads that USBP agents can use for motorized patrolling in the WOR Region. In rural areas along the border, USBP agents also use dirt roads for motorized and nonmotorized patrols. Dirt roads along the border region were built to be 24-feet wide, but due to vegetation growth, the roads are now typically less than 10-feet wide (USDHS, 2011). USBP agents also use other Federal agencies’ roads, including roads in national forests and national parks. When possible, the USBP agents remain on existing roads to apprehend cross-border violators but when required, they go off-road. Off-road vehicles and nonmotorized patrols take place off-road and in remote areas along the border.

Figure 4.13-1. U.S., Interstate, State, and County Roads along WOR Northern Border



Aircraft Operations

Manned surveillance patrols are operated between 300 feet above ground level (AGL) and flight level (FL) 250. Aircraft patrols are operated at different heights based on different operational and environmental conditions including weather conditions and high-traffic environments. Manned aerial surveillance patrols are conducted along the WOR border and can be operated out of the Bellingham Air and Marine Branch, Blaine Air Branch, and Spokane Air Branch. These

branches possess different equipment and resources for aerial patrols. In order to fly for CBP, OAM agents must have a Federal Aviation Administration (FAA) issued license (USDHS, 2010a). Accidents during manned aerial surveillance patrols could potentially injure OAM officers or members of the general public.

Unmanned Aircraft Systems (UAS) are remotely piloted aircraft, and patrols can occur along the WOR Region. UASs are operated at 18,000 feet above ground level or higher.

The FAA sets the constraints for where a UAS may operate and how these operations may be conducted safely in the National Airspace System (NAS). Their main focus when evaluating UAS operations in the NAS is to make sure a UAS will not endanger other users of the NAS or compromise the safety of persons or property on the ground.

The FAA recognizes the great potential of UASs in homeland security and strives to accommodate the DHS's needs for UAS operations, without jeopardizing safety. Because airspace is a finite resource, the FAA sets aside Restricted or Prohibited Areas to help mitigate risks. These Restricted or Prohibited Areas are for an operator's exclusive use when needed.

For CBP's UASs to gain access to the civil airspace, CBP must go through the FAA's Certificate of Waiver or Authorization (COA) process. This is the avenue by which public users (Government agencies and Federal, state, and local law enforcement) that wish to fly a UAS can gain access to the NAS, provided that the risks of flying the UAS in the civil airspace can be appropriately mitigated.

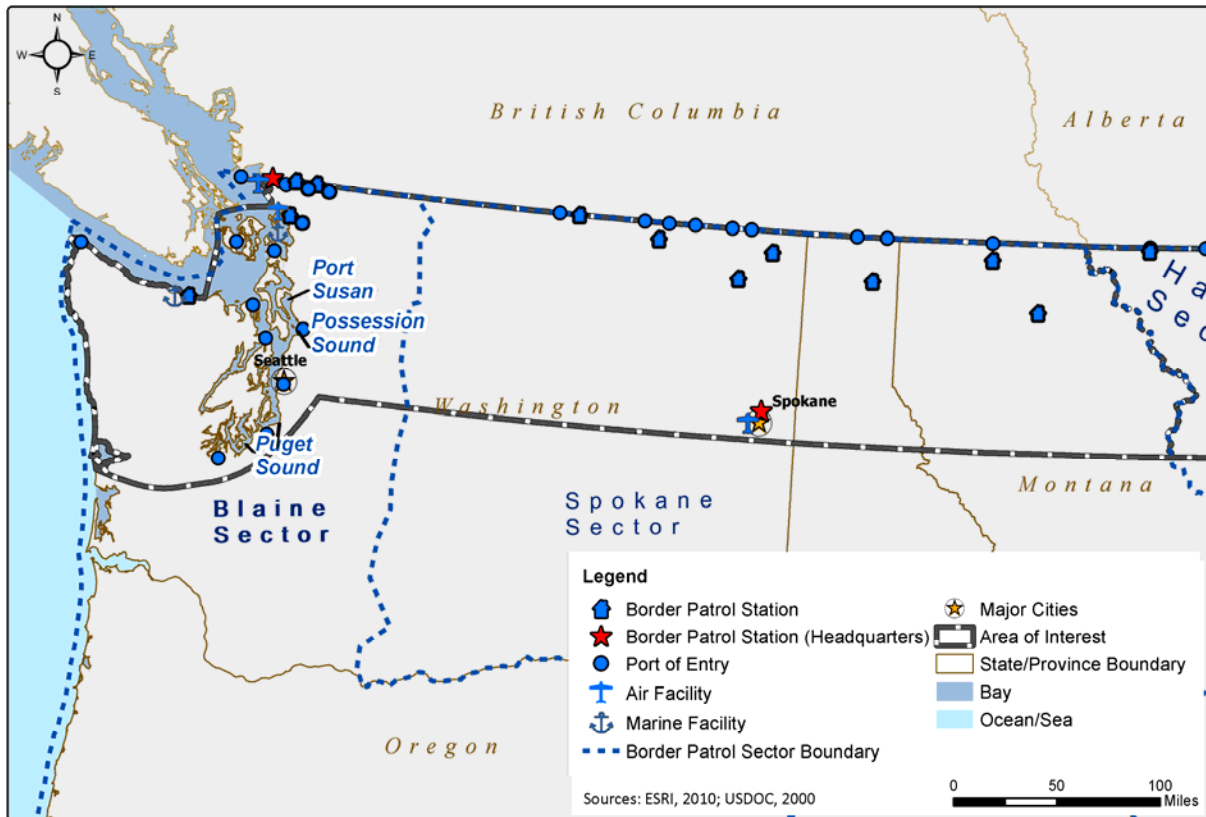
To minimize the risk of operating a UAS, the FAA frequently requires risk mitigations before granting a COA. These mitigations include special provisions unique to the requested type of operation. For example, the applicant may be restricted to operating only in a defined airspace or operating only during certain times of the day. The UAS may be required to have a transponder if it is to be flown in a certain type of airspace. Other safety enhancements may be required, depending on the nature of the proposed operation. To ensure safety, the COA application is reviewed for feasibility; airspace experts review and ensure that the operation will not severely impact the efficiency of the NAS. As of April, 2011, CBP has been issued 12 COAs.

Given that there are emergency and disaster situations where the use of UASs has saved lives and otherwise mitigated emergency situations, the FAA has issued three special disaster COAs, one of which was to CBP (Kalinowski & Allen, 2010).

Vessel Operations

Approximately 2,063 square miles of navigable water exists along the WOR Region northern border (ESRI, 2010). Figure 4.13-2 shows the navigable waters in this region. To assist in river or lake patrols, OAM provides the USBP agents in this region with a range of watercrafts (USDHS, 2011). Accidents during patrols could take place between CBP, cross-border violators, and the general public.

Figure 4.13-2. Navigable Water in the WOR Region



Radiation

CBP uses X-rays and gamma rays to inspect merchandise and conveyances, eliminating the need for an intrusive manual search. These detection systems provide images of material enclosed in cars, trucks, railcars, sea containers, personal luggage, packages, parcels, and mail (USDHS, 2009a). Increasing the efficiency and the number of searches can have a beneficial effect on HH&S. Beneficial effects could result if the number of interdictions increases and the occurrence of intentional destructive acts (IDAs) decreases as a result of using X-ray and gamma rays. The affected environment includes the location of equipment that produces X-rays and gamma rays, as well as the area immediately surrounding the equipment.

Occupational dose is the dose received by an individual in a restricted area or in the course of employment in which the individual’s assigned duties involve exposure to radiation and to radioactive material from licensed and unlicensed sources of radiation, whether in the possession of the licensee or other person. The individuals subject to the occupational dose classification must closely monitor their degree of radiation exposure using dosimeters (USDHS, 2004b).

Exposure dose is the dose received by a member of the public from exposure to radiation and to radioactive material released by a licensee, or to another source of radiation either within a licensee’s controlled area or in unrestricted areas (USDHS, 2004b).

X-rays and gamma rays have the potential to expose people to ionizing radiation. The Nuclear Regulatory Commission (NRC) sets regulations and establishes standards for protection against radiation arising from activities conducted under licenses it issues. CBP has adopted the NRC

standard because OSHA addresses only occupational dose exposure limits. These requirements are set forth in 10 CFR Part 20 (USDHS, 2004b).

In 10 CFR Part 20, the NRC identifies two classifications of radiation dose: occupational dose and exposure dose (USDHS, 2004b). Neither of these doses includes background radiation, radiation patients receive from medical practices, radiation received from participation in medical research programs, or radiation received as a member of the general public.

As set by the NRC in 10 CFR Part 20, the maximum permissible level of radiation dose to individual members of the general public in unrestricted areas (i.e., exposure dose) is 0.1 rem per year above the typical 0.360 rem per year dose provided by natural and man-made background radiation.

As part of its “as low as is reasonably achievable” (ALARA) program, CBP has determined that the radiation dose received by its personnel shall not exceed the public dose (USDHS, 2004b).

In 10 CFR 20.1003, NRC defines the philosophy of ALARA in relation to exposure:

ALARA (acronym for “as low as is reasonably achievable”) means making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

Exposure to radiation can be harmful to HH&S. Because of the difficulties in determining if the health effects demonstrated at high radiation doses are also present at low doses, current radiation protection standards and practices are based on the premise that any radiation dose may result in detrimental health effects, such as cancer and hereditary genetic damage.

When discussing potential impacts caused by radiation exposure it is important to relate how much exposure is anticipated. In an August 2004 revised position statement on radiation risk, the Health Physics Society recommended against the quantitative estimation of health risks below an individual dose of 0.5 rem in one year or a lifetime dose of 10 rem above that received from natural sources. Doses from natural background radiation in the United States average about 0.360 rem per year (HPS, 2004).

Radio Frequency

The radio frequency (RF) environment refers to the presence of electromagnetic (EM) radiation emitted by radio waves and microwaves on the human and biological environment. RF waves have a frequency or rate of oscillation within the range of approximately 3 Hertz (Hz) to 300 gigahertz (GHz). This energy can interact with matter (USDHS, 2008a).

OSHA regulates RF and EM emissions for employees under 29 CFR 1910. The Federal Communications Commission (FCC) is responsible for licensing frequencies and ensuring that the approved use does not interfere with television or radio broadcasts, or substantially affect the natural or human environment (USDHS, 2008a). The FCC has adopted a modified version of the American National Standards Institute (ANSI) guidelines and Institute of Electrical and Electronics Engineers (IEEE) standards to evaluate exposure due to RF transmitters licensed and authorized by the FCC. The FCC's guidelines also reflect the National Council of Radiation Protection and Measurements exposure guidelines.

Uncontrolled exposure occurs when the general public is exposed or when persons employed are not made fully aware of the potential for exposure or cannot exercise control over their exposure (USDHS, 2008a).

Controlled exposure occurs when a person is exposed to RF fields as part of their employment and the person has been made fully aware of the potential exposure and can exercise control over their exposure. (USDHS, 2008a).

The National Council of Radiation Protection and Measurements and ANSI/IEEE exposure criteria identify the same threshold level at which harmful biological effects may occur. The whole-human-body absorption of RF energy varies with the frequency of the RF signal. The most restrictive limits on exposure are in the frequency range from 30 to 300 megahertz where the human body absorbs RF energy most (USDHS, 2008a).

There are two tiers of exposure limits: occupational or "controlled," and general or "uncontrolled." In order for a transmitting facility or operation to be out of compliance with the FCC's RF guidelines in an area where levels exceed maximum permissible exposure (MPE) limits, it must first be accessible to the public. The MPE limits indicate levels above which people may not be safely exposed regardless of the location where those levels occur (USDHS, 2008a).

Adverse biological effects associated with RF energy are typically related to the heating of tissue by RF energy. This is typically referred to as a thermal effect, where the EM radiation emitted by an RF antenna passes through and rapidly heats biological tissue; similar to the way a microwave oven cooks food. According to the Health Physics Society, numerous studies have shown that environmental levels of RF energy routinely encountered by the general public are typically far below levels necessary to produce significant heating and increased body temperature. RF energy that would produce harmful heating is generally associated only with workplace environments near high-powered RF sources, such as those used for molding plastics or processing food products. In such cases, exposure of human beings to RF energy could exceed MPE, and restrictive measures or actions would thus be required to ensure the public's safety (USDHS, 2008a).

There is also some concern that signals from some RF devices could interfere with pacemakers or other implanted medical devices; however, electromagnetic shielding has been incorporated into the design of modern pacemakers to prevent RF signals from interfering with the electronic circuitry in the pacemaker (USDHS, 2008a).

Because RF devices emit RF energy and EM radiation, adverse impacts could occur. The severity of these impacts depends on the equipment used and the elevation of the tower (USDHS, 2008a).

Beneficial impacts from RF devices could also occur. The use of RF could increase the frequency of interdictions along the northern border, improving the HH&S of the American population.

Firing Ranges

HH&S can be affected by noise levels and exposure to lead from firing ranges on both indoor and outdoor ranges in this region. Humans become exposed to lead associated with shooting ranges through lead-contaminated soil. Another potential pathway is through inhalation of lead dust by shooters during firing when airflow on the firing line is blocked. Range workers may also be exposed to lead dust while performing routine maintenance operations, such as raking or cleaning out bullet traps. Each of these pathways is site specific and may or may not occur at individual ranges (USDA, 2010).

Figure 4.13-3 CBP Officers Train at Firing Range



Source: (USDHS, No Date).

OSHA sets regulations for protecting workers who handle or are exposed to lead, including airborne lead at indoor firing ranges (NSSF, 2001; 29 CFR 1910.1025). The OSHA standard for airborne lead exposure is 30 micrograms per cubic meter of air with an 8-hour time-weighted average (29 CFR 1910.1025).

Spent ammunition on ranges is not regulated as solid/hazardous waste unless it is discarded and left to accumulate for a long period of time. It is not regulated if it is recovered or reclaimed on a regular basis. If the range poses an imminent or substantial danger to human health or the environment, it can be addressed through the Resource Conservation and Recovery Act (RCRA).

USEPA regions also set guidelines and establish best management practices (BMPs) for building new ranges and for remediating outdoor ranges. These guidelines are in place to help minimize lead contamination in soil and water. HH&S would be adversely affected if CBP agents were exposed to lead on firing ranges or if the public's water supply was contaminated with lead (USEPA, 2003). The frequency and severity of response to lead exposure in humans depend on the amount of exposure. Symptoms include neurological, gastrointestinal, reproductive, and renal effects (NYDH, 2009).

In addition to lead exposure, the noise generated on firing ranges may have an adverse effect on the health of CBP agents. Exposure to harmful levels of noise over a long time period can damage sensitive structures in the ear, resulting in noise-induced hearing loss (NIDCD, 2008). To protect employees from noises at harmful levels, OSHA sets noise standards and guidelines for the work environment. The OSHA noise exposure limit is set at a maximum permissible exposure limit of 90 decibels, A-weighted (dBA), averaged over an 8-hour time period (29 CFR 1910.95).

4.14 HAZARDOUS AND OTHERWISE REGULATED MATERIALS

4.14.1 INTRODUCTION

Hazardous materials are materials that are capable of posing an unreasonable risk to health, safety, and prosperity. Hazardous materials can be classified into roughly three categories:

- Hazardous or regulated substances;
- Hazardous or regulated waste; and,
- Special hazards.

4.14.1.1 Hazardous Substances

Any substances that are considered severely harmful to human health or the environment may be classified as “hazardous.” Hazardous substances take many forms. Many are commonly used substances that are harmless in their normal uses but are quite dangerous when released. They are defined in terms of those substances either specifically designated as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as the Superfund Law, or those substances identified under other laws (USEPA, 2011a). A great deal is known about hazardous substances and their effects. This information helps responders act quickly and safely to reduce the risks from emergency situations (USEPA, 2011b).

4.14.1.2 Hazardous Waste

A hazardous waste is defined by the Resource Conservation and Recovery Act (RCRA) as a solid waste, or combination of solid wastes, that, because of its quantity; concentration; or physical, chemical, or infectious characteristics may:

- Cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or
- Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Hazardous wastes fall into two categories: characteristic wastes and listed wastes. Characteristic hazardous wastes are materials that are known or tested to exhibit a hazardous trait such as ignitability (i.e., flammability), reactivity, corrosiveness, and toxicity. Listed hazardous wastes are materials specifically listed by the USEPA or a state regulation as a hazardous waste.

Hazardous wastes listed by the USEPA fall into two categories:

- Process wastes from general activities (F-listed) and from specific industrial processes (K-listed); and,
- Unused or off-specification chemicals, container residues, and spill cleanup residues of acute hazardous-waste chemicals (P-listed) and other chemicals (U-listed).

These wastes may be found in different physical states as gases, liquids, or solids. Furthermore, a waste is deemed hazardous if it cannot be disposed of by common means like other byproducts of our everyday lives. Depending on the physical state of the waste, treatment and solidification

processes might be available. In other cases, however, there is not much that can be done to prevent harm (Leonard, 2009).

Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes; their associated regulatory requirements are specified in 40 CFR 273. Four types of waste are currently covered under the universal waste regulations: hazardous-waste batteries, hazardous-waste pesticides that are either recalled or collected in waste pesticide collection programs, hazardous-waste thermostats, and hazardous-waste lamps.

The RCRA regulates the management and disposal of hazardous waste. One common method of treatment is hazardous combustion, or incineration, which is used to destroy hazardous organic components and reduce the volume of waste (USEPA, 2009a).

4.14.1.3 Special Hazards and Otherwise Regulated Materials

Special hazards are those substances that might pose a risk to human health; they are addressed separately from other hazardous materials. Special hazards include asbestos-containing material, polychlorinated biphenyls (PCBs), and lead-based paint (LBP). The USEPA has the authority to regulate these special-hazard substances under the Toxic Substances Control Act 15 U.S.C. 53. The USEPA has established regulations regarding asbestos abatement and worker safety under 40 CFR 763, with additional regulation concerning emissions (40 CFR 61). Depending on the quantity or concentration, the disposal of LBP waste is potentially regulated by the RCRA at 40 CFR 260. The disposal of PCBs is addressed in 40 CFR Parts 750 and 761.

4.14.2 AFFECTED ENVIRONMENT

4.14.2.1 Hazardous Substances, Hazardous Wastes, Special Hazards, and Otherwise Regulated Materials

Due to the duplicative discussion of hazardous substances, hazardous wastes, special hazards and otherwise regulated materials, complete descriptions of the range of hazards are found in Section 3.14.

4.15 UTILITIES AND INFRASTRUCTURE

4.15.1 INTRODUCTION

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly man-made; generally, the more urban and developed an area, the more infrastructure it has (USDHS, 2008a). This section describes ranges of use for each utility resource based on recent CBP site-specific analyses of protection, relocation, construction, and operation of BPSs, and construction, modernization, and operation of POEs. This section then describes the utility resources of most CBP facilities: BPSs, POEs, forward operating bases (FOBs), traffic checkpoints, and communication towers.

4.15.2 AFFECTED ENVIRONMENT

4.15.2.1 Water Supply

Municipal water systems or rural lines, which supply CBP facilities such as Peace Arch, Pacific Highway, and Point Roberts POEs, and the Bonners Ferry Border Patrol station, pump up to 1.7 million gallons of water per day from nearby reservoirs, lakes, or a system of groundwater wells (WSDOH, 2009). An adequate-to-substantial reserve capacity remains in these lakes, reservoirs, and aquifers (Banham, 2011).

For sites with wells present, such as the Boundary, Frontier, and Nighthawk POEs in Washington, a number of scenarios for water provisioning may be employed. Some sites utilize onsite wells by tapping a nearby water main. In more remote locations (where tapping a water main is not feasible), potable water is provided by an onsite well. Generally, wells are within 90 feet of the main building; water is pumped through an inline water filter system and stored in multiple storage tanks. When necessary (and possible), water is filtered, softened, distilled, or treated as required for potable uses. If no usable onsite well exists for potable water, the water may come from a leased-offsite well located several hundred yards away. In a few locations, well water is run through a chlorination or reverse osmosis system for nondrinking usage.

When onsite wells are rendered obsolete or no well exists, as is often the case in this region due to high lead content, CBP supplies drinking water in commercial water bottles. At larger facilities, the delivered potable water is stored in 5-gallon jugs and is sometimes used for cooking. For those few facilities where bottled water is delivered, on average between 50 and 60 gallons are used per month.

4.15.2.2 Electrical and Communications Utilities

Electrical power is provided to most CBP facilities by a commercial grid system. These local or regional utility cooperatives and distribution companies serve from 340,000 to 1,500,000 customers over a 30,000 to 300,000-square-mile area throughout the WOR Region (AU, 2011; BPA, 2008). Electrical power is fed from the main service to an automatic transfer switch and electrical panels, then through the buildings. Primary electrical service is provided by overhead transmission lines to the facilities, and secondary electrical service is provided from a pole-mounted transformer. Many of these facilities have an onsite emergency electric generator with a 200-, 250-, or 1,000-gallon diesel fuel tank (USDHS, 2003a; USDHS, 2003b; USDHS, 2003c).

At seasonal facilities in more rural areas, electricity is provided by one or two smaller generators connected to automatic transfer switches and the building power system.

Monopole communication towers do not utilize more than 3,650 kilowatt (kW)-hours per month from commercial grid power (USDHS, 2008b). Primary power is provided to most monopole towers by the commercial power grid, but some in remote locations, are powered by solar photovoltaic arrays with battery storage systems. Communication relay towers (CRTs) typically utilize a 17-kW generator. Remote video surveillance system (RVSS) are connected to the commercial grid where available. If commercial power is not available, the towers are supplied by either a generator of up to 30-kW or a solar photovoltaic generator (USDHS, 2008b). If a commercial power grid is not immediately available when towers are deployed, primary power is supplied by a 30-kW generator with a propane-fueled motor supplied by a 2,000-gallon tank until the commercial power infrastructure is in place. Back-up power for each tower site would be provided by a battery back-up system. All power lines are installed overhead from the main trunk power line to the tower-site shelter and then on elevated cable trays to the tower, with the primary power source being the commercial grid. At facilities lacking communication towers, antennas are mounted on posts attached to the main building.

Most POEs are provided telephone service by a nearby telephone substation. Existing telephone lines run underground or overhead (or some combination of the two) and, when possible, follow a highway right-of-way. Most consist of one or two T-1 (fiber optic) lines and one to three dial tone lines. Where T-1 or fiber-optic service is not available, Internet service is accessed through telephone modems.

4.15.2.3 Fuel Supply

Propane or natural gas supplies fuel for heating, ventilation, and air conditioning (HVAC) systems. Propane, which can also power emergency generators, is stored in one or two 500-gallon onsite liquid propane tanks (USDHS, 2009a). Some facilities are serviced by interconnections with commercial natural gas suppliers through underground natural gas pipelines.

All towers that normally receive electric power through connection to a commercial grid have a 500-gallon propane tank to fuel the back-up generator in case of potential power outages (USDHS, 2008c). Each 500-gallon tank would be refueled every two months, assuming approximately two hours of run time monthly for a generator maintenance check and other operations as needed (USDHS, 2008c). When commercial grid power is not immediately available upon tower deployment, primary power would be supplied temporarily by a 30-kW generator, and a larger, 2,000-gallon propane tank. Refueling of these larger propane tanks would occur approximately every seven days (USDHS, 2008c).

4.15.2.4 Wastewater Management

Urban CBP facilities such as the Peace Arch, Pacific Highway, and Point Roberts POEs in Washington are connected via municipal piping systems to wastewater treatment plants, which permit up to 3.1 million gallons per day (mgd) (CoB, 2010). Such a facility has a 0.8 mgd annual average daily flow (AADF) and a 3.2 mgd peak hourly flow (PHF) (SPI, 2010). Newer wastewater treatment facilities, such as the Lighthouse Point Wastewater Reclamation Facility in

Blaine, Washington utilize membrane bioreactor technology to produce reuse-quality effluent water for irrigation and industrial purposes (USGSA, 2006).

In more rural locations like the Frontier, Nighthawk, and Boundary POEs in Washington, sanitary waste is disposed to an onsite septic tank. Types of septic tanks vary; some have a grinder pump, a lift station, or two venting pipes, but all are connected to the appropriate drainage mound and field or leach field. Solid waste is removed from sites by a cleaning contractor or a private disposal company. Average septic tanks are pumped once every two years and treated twice a year, but those approaching capacity can be pumped as often as once every three months.

The state department of transportation (DOT) or appropriate county-level department generally provides snow removal on state highways, and onsite snow removal service is contracted out to a janitor or maintenance company (USDHS, 2009a). At some POEs, facility staff handle light-duty snow removal (USDHS, 2009a).

4.16 ROADWAYS AND TRAFFIC

4.16.1 INTRODUCTION

The United States relies heavily on a vast transportation network to expedite the flow of goods and people to and from Canada. CBP’s mandate to enable efficient border crossings while providing the highest level of security and safety for all motorists is of utmost importance. Over the past decade, many POEs have received technological and highway safety-related upgrades, as well as upgrades related to ease of access. States and municipalities maintain the roadways leading to the borders to allow for tourism and trade in their areas. The following text provides an overview of traffic and transportation regulations and describes the general traffic conditions for urban, suburban, rural, and remote areas.

4.16.2 AFFECTED ENVIRONMENT

4.16.2.1 Existing Roadway Network and Roadway Effectiveness

The majority of the roadways within 100 miles of the northern border within the WOR Region are primarily secondary and tertiary paved roads, although there are some state highways located throughout the region. Many of the areas in the WOR Region are remote, and some include travel destinations such as national parks, national forests, and wilderness areas.

The number of motor vehicles in the United States has been steadily increasing, with more than 254 million vehicles registered in 2009 (BTS 2012). Annual travel on U.S. roadways reached an estimated 2.9 trillion vehicle-miles, or about three times the level reported in 1960. Travel grew about 47 percent during the 1960s, another 38 percent in the 1970s, and another 41 percent in the 1980s. Travel in urban areas in 2009 accounted for 1.9 trillion vehicle-miles, or 66 percent of total travel, compared to 44 percent in 1960 (BTS 2012a). On the rural interstate system, automobiles, light trucks, and buses account for 77 percent of average daily traffic volumes, with heavy trucks representing the remainder. Percent distribution of traffic for commercial and noncommercial vehicles in both rural and urban areas is shown in Table 4.16-1.

Table 4.16-1. Percent Distribution of Traffic by Vehicle Class, Total United States

Type of Roadway	Vehicles (%)	
	Noncommercial	Commercial
Rural		
Interstate	81.6	18.4
Other principal arterials	87.2	12.8
Minor arterial, collector and local	88.5	11.5
Rural average	86.6	13.4
Urban		
Interstate	88.2	11.8
Other freeways and expressways	90.5	9.5
Other principal arterials	89.5	10.5

Type of Roadway	Vehicles (%)	
	Noncommercial	Commercial
Minor arterials	90.4	9.6
Collectors	90.3	9.7
Local	91.0	9.0
Urban average	89.8	10.2

Source: (USDOT, 1996).

4.16.2.2 Level of Service

Level of service (LOS) is a qualitative measure of the operating conditions of an intersection or other transportation facility. There are six levels of service (A through F): LOS A represents the best operating conditions with no congestion; LOS F represents the worst operating conditions with heavy congestion. Roadways and intersections with LOS E or F are those with traffic conditions at or above capacity. This means that traffic patterns in these areas are congested, unstable, and normally unacceptable to individuals attempting to access and use roadways and intersections (TRB, 2000). The LOS concept has been used to facilitate a general discussion of traffic conditions in urban, suburban, rural, and remote areas. This discussion of typical patterns for different types of roadway networks is not meant to substitute for local studies and analyses that may be required.

4.16.2.3 Variability

Traffic varies by month of the year, day of the week, and hour of the day. Often the capacity of the roadway system can be exceeded by the volume of traffic using it. This can cause a breakdown in flow (i.e., LOS E or F) and can initiate effects that extend far beyond the time during which the demand exceeded capacity. Traffic in these circumstances may take several hours to dissipate. Seasonal peaks in traffic demand are also of importance, particularly for recreational facilities.

Seasonal fluctuations in traffic demand reflect the social and economic activity of the area being served by the highway. These seasonal fluctuations typically exhibit several relevant characteristics:

- Monthly variations are more severe on rural routes than on urban routes;
- Monthly variations are more severe on rural routes serving primarily recreational traffic than on rural routes serving primarily business traffic; and
- Daily traffic patterns vary by month of year most severely for recreational routes.

Traffic variations by day of the week are related to roadway type. Normally, weekend traffic volumes are lower than weekday traffic volumes for highways serving predominantly business travel, such as urban freeways. In comparison, peak traffic occurs on weekends on main rural and recreational highways. Furthermore, the magnitude of daily variation is highest for recreational access routes and lowest for urban commuter routes.

Typical hourly variation in traffic is related to highway type and day of the week. The typical morning and evening peak hours are evident for urban commuter routes on weekdays. The evening peak is generally somewhat more intense than the morning peak. On weekends, urban routes show a peak travel period that is less intense and more spread out, occurring in early to mid afternoon. Recreational routes also have single daily peaks. Saturday peaks on such routes tend to occur in the late morning or early afternoon (as travelers go to their recreational destination) and in late afternoon or early evening on Sundays (as they return home).

Traffic analysis focuses on the peak hour of traffic volume because it represents the most critical period for operations and has the highest capacity requirements. If the highest hourly volumes for a given location were listed in descending order, a large variation in the data would be observed, depending on the type of roadway.

4.16.2.4 Urban and Suburban Transportation Networks

Delays and heavy traffic can be prevalent in all major cities. These delays are most frequent during rush hour times: 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m., Monday through Friday. Other reasons for congestion in urban areas are emergency vehicles, accidents, and vehicle breakdowns. Seattle and Spokane are the only urban areas in the WOR Region.

The ability of urban streets to function well is generally limited by the capacity of signalized intersections, with traffic normally uninterrupted on roadway segments between intersections. Signal timing plays a major role in the capacity of urban streets, limiting the portion of time available for movement between intersections. Traffic conditions may vary greatly, and such factors as curb parking, transit buses, lane widths, upstream intersections, and other factors may substantially affect roadway conditions. In urban areas, LOS at critical intersections is typically be E or F during peak periods, and is characterized by very unstable or forced traffic flow.

Urban streets show less variation than other areas. Most users are daily commuters or frequent users, and special event traffic is less common. Furthermore, many urban routes are filled to capacity during each peak hour, and variation is therefore severely constrained.

Traffic in suburban areas is similar to that in urban areas; however, traffic delays are less of an issue unless traffic is being routed through residential areas. As with urban areas, there may be heavy traffic during rush hour; typically 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. Traffic congestion in suburban areas is normally confined to primary and secondary arterials, not residential areas. Public transportation is often provided, and traffic reports are available for updated roadway conditions.

4.16.2.5 Rural and Remote Transportation Networks

In rural and remote areas, traffic is mainly affected by roadway conditions. Heavy traffic volumes are rare and normally only occur due to road closure and construction activities. Rural highways in the United States and Canada rarely operate at volumes approaching capacity. In addition, rural and recreational routes often show a wide variation in peak-hour volumes. Extremely high volumes occur on a few weekends or in other peak periods, and traffic during the rest of the year is substantially less, even during the peak hour. For example, highways serving resorts and recreational areas may be virtually unused during much of the year, only to be subject to oversaturated conditions during peak summer periods.

Seasonal weather conditions are the primary cause of inefficient access on rural and remote roadways. Snow, flooding, and mudflows can make roads impassable; these events usually occur between October (when snow accumulations begin) and April (when melting snow and rains can cause flooding and mudslides). Local municipalities are prepared for maintenance of rural roadways, and residents often have alternate means of transportation, such as snowmobiles, ATVs, and horses. Remote areas, by definition, are sparsely populated, but the few residences within these areas normally have alternate transportation sources in case of emergencies. Television, radio, and NPS traffic reports are the primary sources of updates for rural and remote roadway conditions (USDOJ, 2010).

4.16.2.6 Federal and State Transportation Regulations

POEs across the regions are accessed by a number of highways that are maintained by each state's DOT or municipal highway authority. In remote areas where trails and gravel roadways are used, it is the maintaining agencies responsibility to inform the public of road and trail closures. In the United States, each state has its own regulations and governing agency, although most regulations are similar for the purpose of uniformity. In most states, the roadway design manual is based upon recommendations in the American Association of State Highway and Transportation Officials (AASHTO) Policy on Geometric Design of Highways and Streets, commonly referred to as the "Green Book." The Green Book is not a design manual but rather a series of recommended roadway design parameters (USDOT, 2010). In addition, many Federal departments have also adopted their own traffic code for enforcement on their respective reservations (e.g., national parks and military bases). A list of the state DOTs and regulatory agencies that plan and administer the roadway design regulations is provided in Appendix S.

4.16.2.7 CBP Activities Affecting Roadways and Traffic

CBP activities include enforcement of customs, immigration, and agriculture regulations at U.S. borders, and CBP has a primary responsibility for preventing unlawful entry into the United States while ensuring the safe and efficient flow of goods and people. For the northern border within this region, these activities are focused around the POEs, but construction activities, the operation of other facilities, and patrol activities have some effects on transportation resources. A general description of these activities is provided in Chapter 2. This section outlines these activities from a transportation and traffic standpoint.

Ports of Entry

Many different roadways including interstates, U.S. national highways, state highways, and rural roadways approach the POEs along the northern border within this region. These cross-border access points are often colocated with towns and cities adjacent to the border, and roadways facilitate traffic approaching and departing from the POEs.

Vehicles entering POEs from Canada proceed across the border and then separate into inspection lanes. Often inspections of commercial vehicles and passenger vehicles are conducted in separate areas. These are normally parking areas for vehicles that are selected for secondary inspection, with dedicated truck lanes to help facilitate the flow of larger vehicles. At some of the larger facilities, there are committed areas for secondary truck inspections that may involve offloading and detailed examination.

As with any other roadway, cross-border traffic varies by month, day of the week, and hour of the day. Seasonal fluctuations in traffic demand reflect the social and economic activity of the area being served by the facility. Canadian traffic reaches a peak in either July or August and ebbs to a low point in February. Summer peaks are consistently 65 to 75 percent higher than winter lows (BPRI, 2010). Normally, weekend volumes are lower than weekday volumes for POEs serving predominantly business travel. Monthly variations are more severe on rural POEs than on urban entry points. Vehicle queues are common, particularly at urban POEs, and can last for several minutes to several hours in rare cases. In general, queue length and wait times determine the overall LOS of a POE from a transportation and traffic standpoint. The busiest POEs in the WOR Region are shown in Table 4.16-2. A complete list of POEs and their level of use by transportation mode is provided in Appendix S.

Table 4.16-2. Busiest POEs for Passenger Vehicles in the WOR Region

Rank	Port Name	Annual Personal Vehicles	Annual Personal Vehicle Passengers
1	WA: Blaine	2,842,631	5,966,409
2	WA: Point Roberts	722,725	1,300,852
3	WA: Sumas	672,262	1,353,153

Source: (USDOT, 2009).

At POEs in urban areas, special lanes are used for frequent travelers and commercial vehicles with Nexpress radio frequency units for fewer delays. Buses are provided for public transportation, and pedestrian walkways provided for tourists. CBP and other non-government organizations provide real-time traffic information via the internet, Twitter, and mobile applications (USDHS, 2010). Other technologies used to improve the functionality of POEs are described in Chapter 2.

Vacation travel and occasional same-day shopping trips are important travel purposes along most of the border. Several Canadian and U.S. near-border cities and towns are common consumer destinations. Vacation and same-day recreational travel are less frequent and more seasonal than consumer trips in the paired-cities model. In addition, these types of travel are highly discretionary and are easily influenced by exchange rates and economic conditions (BPRI, 2010).

All POEs facilitate pedestrians and cyclists. However, pedestrian and bicycle circulation is infrequent at most rural POEs because of their remote locations and distance from residential areas. Some POEs have provisions for bike storage. Many POEs have boat and seaplane landing areas.

Transportation Checkpoints

Traffic checkpoints are conducted on roads leading from the border and consist of inspections of interior-bound conveyances, including passenger vehicles (cars, trucks, vans, and buses) and container vehicles and cargo trucks. These checkpoints provide CBP with an opportunity to detect and interdict cross-border violators that have thus far avoided apprehension. Vehicle checkpoints are generally traffic lanes temporarily controlled by CBP. Checkpoints may include

support buildings to provide temporary office and holding space, as well as lights, signage, and other support equipment.

Checkpoints are established at airports for commercial aircraft and at locations along railroad lines for passenger and freight trains.

Non-road/Off-road Activities

Off-road traffic surveillance operations can include agents stationed at specific observation points or driving predetermined routes (line watch); detection of disturbances in natural terrain that could indicate the passage of people, animals, or vehicles (sign cutting); and road patrols. All sectors use a variety of vehicles, including four-wheel drive vehicles, sedans, scope trucks, ATVs, motorcycles, snowmobiles, and bike patrols in urban areas or over rough terrain.

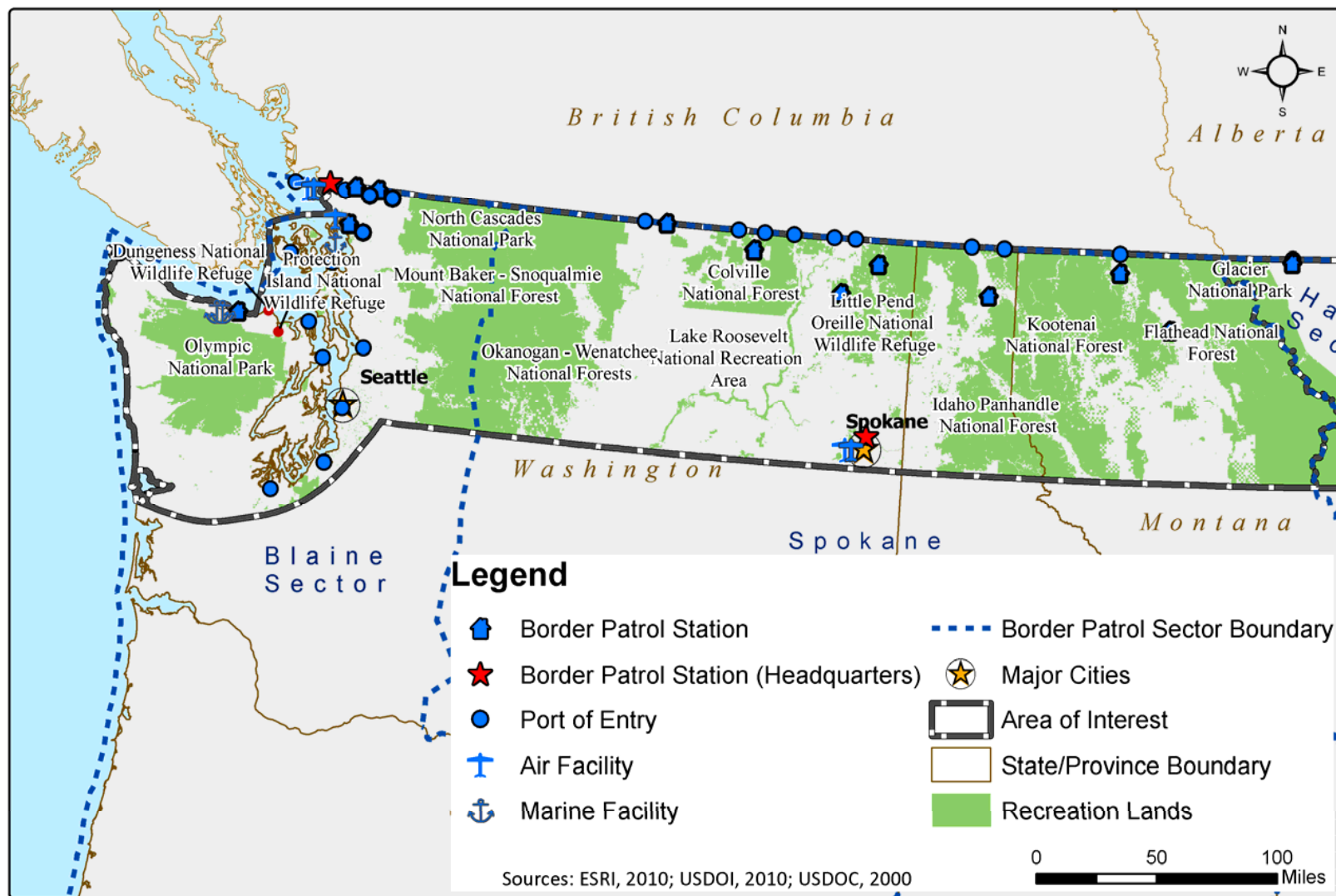
BPSs vary in size and typically include any or all of the following components: administrative and support buildings, vehicle maintenance garages, equine and canine facilities, vehicle wash facilities, fuel tanks, small arms practice ranges, illegal immigrant processing and temporary holding facilities, confiscated vehicle storage facilities, and agent and visitor parking. CBP agents use a variety of off-road transportation modes to patrol border areas. These consist of four-wheel drive vehicles, ATVs, snowmobiles, horses, and, in some sensitive habitats, agents operating on foot. As outlined in Chapter 2, CBP activities that may affect transportation resources include UAS activities, manned aerial surveillance patrols, and other patrols.

4.17 RECREATION

4.17.1 INTRODUCTION

A wide variety of recreation areas exist along the northern border on both the U.S. and Canadian sides. On the U.S. side, these recreation areas include national parks (NP), national recreation areas (NRA), lakeshores, national forests (NF), national wildlife refuges (NWR), and designated wilderness areas. On the Canadian side, recreational areas include national park reserves, provincial parks, protected areas, and natural areas. U.S. recreation categories are described briefly below, since the designation bears on the nature of activities permitted. Figure 4.17-1 shows a map of federally protected recreation areas in the WOR Region.

Figure 4.17-1. Federally Protected Recreation Areas, Including National Forests, Parks, Recreation Areas, and Wildlife Refuges in the WOR Region



4.17.2 AFFECTED ENVIRONMENT

National parks, national forests, national wilderness areas, national wildlife refuges, and national recreation areas within the WOR study area are profiled below by the impact category they most closely match. In addition to that national protected areas that form the primary focus of this analysis, many state and regional parks and protected areas along the northern border have recreation areas that could be affected by activities along the border.

As noted in Section 4.8.2 on land use, the WOR Region contains a high proportion of state or federally owned land. This study area contains more national parks and forests than any other northern border region. Much of this land is designated for various forms of recreation. The impact use profiles of these recreation lands varies with low-impact and medium-impact use categorizations slightly more prevalent than high-impact use areas (Section 3.17, discusses the categorization of recreational sites). Some of the most common recreation activities are camping (both backcountry and at campsites), biking, and hiking. Less common activities include off-highway vehicle riding, skiing, and swimming.

The following sections provide recreation profiles of the U.S. national parks, national recreation areas, national forests, and national wildlife refuges. Appendix I contains profiles of Canadian protected areas.

4.17.2.1 Washington

North Cascades National Park Complex

The North Cascades Complex comprises three units (North Cascades National Park, Ross Lake National Recreation Area, and Lake Chelan National Recreation Area) that are collectively managed by the National Park Service as a single administrative entity.

Approximately 94% of the North Cascades Complex is designated as the Stephen Mather Wilderness, which is immediately surrounded by approximately 1.3 million acres of federally designated wilderness. Taken together, these wilderness areas collectively represent perhaps the most rugged and remote alpine landscapes in the contiguous United States. Wilderness is a fundamental resource and value for the greater North Cascades ecosystem in general and for the North Cascades Complex in particular. The national park portion of the Complex is almost entirely within wilderness (99 percent) with very limited, primitive facilities.

North Cascades National Park

The region of the North Cascades NP Complex adjacent to the border is primarily backcountry wilderness. Most of the area is designated as cross-country II zone in which small parties may hike, camp, and boat, and use private stock. Trails, minor roads, and backcountry campsites exist in this area.

North Cascades National Park Complex



Source: (USDOI, 2009b).

A smaller portion of this area of the park is designated as a trail zone with more established trails and many campgrounds. Between 2000 and 2009, annual visitation ranged between 16,912 and 26,972 visitors per year (for the park outside of Ross Lake NRA and Lake Chelan NRA). Most of this park can be categorized as low- or medium-impact use areas (USDOI, 2010a; USDOI, 2009b).

Lake Chelan National Recreation Area

Lake Chelan NRA forms the southern part of the North Cascades NP and does not touch the northern border. This NRA contains both cross-country II zones for use by small parties as well as trail zones. The entire recreation area has numerous campgrounds, picnic areas, developed lodging, and well-maintained trails. Between 2000 and 2009, annual visitation ranged between 25,139 and 42,548 visitors per year. Much of this park can be categorized as high-impact use area (USDOI, 2010a; USDOI 2009c).

Ross Lake National Recreation Area

Ross Lake National Recreation Area (ROLA) is the most accessible unit and receives the highest visitation. Recreational amenities in ROLA include several important front country areas with developed campgrounds, boat launching facilities and associated amenities. Approximately 66 percent of ROLA is designated as wilderness

Ross Lake NRA is part of the North Cascades NP Complex and is divided into four major management zones. The two zones adjacent to the northern border are designated as backcountry and wilderness. Backcountry zones have limited visitor facilities and structured opportunities for visitor recreation. Wilderness zones (the dominant zone in ROLA) are dominated by natural conditions, with very limited primitive visitor facilities. Both of these areas along the border are undeveloped with few campgrounds, roads, and trails. Farther south, the area along the North Cascades Highway is designated as “front country” and is developed for a range of recreational and educational visitor opportunities. Seattle City Light (SCL) has developed the hydroelectric zone for hydroelectric power generation. ROLA also includes the Skagit River, which is managed for preservation of its natural and cultural resources. The Skagit River has been recommended for designation as a Wild and Scenic River from Gorge Powerhouse to the eastern boundary of the area. Between 2000 and 2009, annual visitation ranged between 253,333 and 387,216 visitors per year. Most of this park (relevant to the

northern border) can be categorized as a low-impact use area with some medium-impact use areas (USDOI, 2009d).

Lake Roosevelt National Recreation Area

Lake Roosevelt NRA sits along the shoreline of Lake Roosevelt and the Columbia River. A small portion of the area is close to the northern border. Major recreation activities involve boating, fishing, camping, picnicking, swimming, and walking or hiking along the shoreline (Figure 4.17-4). The area of the NRA closest to the border is well developed for visitor recreation. It includes boating facilities (such as fuel launches and marinas) as well as boat-in campsites on islands, visitor stations, trails, and paved and unpaved roads. Park visitation varies between 1.3 and 1.5 million visitors per year (2000 to 2009). Much of this park can be categorized as a high-impact use area (USDOI, 2006a; USDOI, 2009e).

Protection Island National Wildlife Refuge

Protection Island NWR is located in Discovery Bay in the Strait of Juan de Fuca. This 364-acre refuge includes the 48-acre Zella M. Schultz Seabird Sanctuary. The refuge is closed to the public except for nine families and a research group, who received special access during establishment of the NWR. Most of this area can be categorized as a low-impact use area (USDOI, 2009f).

Dungeness National Wildlife Refuge

The Dungeness NWR sits on a strip of land in Dungeness Bay, approximately ten miles south of the marine Canadian border. The refuge consists of 636 acres. No camping is allowed within the refuge, but can take place in the adjoining Dungeness Recreation Area. Jogging, swimming, and other beach activities are allowed only in select areas during certain times of the year. Bikes, kites, other sports equipment, and pets are prohibited. The main recreation activities are hiking and walking. Most of this area can be categorized as a low-impact use area (USDOI, 2010b).

Little Pend Oreille National Wildlife Refuge

This refuge is near the Colville National Forest, approximately 40 miles south of the border and consists of 41,568 acres. Camping is allowed in six established campgrounds. Other recreational activities include hiking, hunting, fishing, biking, horseback riding, and snowmobile riding in certain areas. Much of this refuge can be categorized as a medium-impact use area (USDOI, 2010c).

Olympic National Park

Olympic National Park sits on the northwest tip of Washington. While it does not physically touch the border, it is very close to Juan de Fuca Strait, which is crossed by the border (in water). The central 95 percent of the park is designated as wilderness. The area of the park closest to the northern border is more developed and has more visitor facilities and includes paved and unpaved roads, parking areas, campgrounds, well-developed visitor center facilities, and ranger stations. It includes areas designated for day use and development and some wilderness area. Visitors engage in hiking, educational activities, camping, beachcombing, fishing, and driving along scenic routes. Overall, the park contains 14 developed visitor areas, 4 lodges, 16 campgrounds, and 600 miles of trails. Between 2000 and 2009, visitation ranged between

2,749,197 and 3,691,310 visitors per year. Much of this area can be categorized as a medium-impact use area (USDOJ, 2009g; USDOJ, 2010d).

Colville National Forest

Colville National Forest is in the upper northeast corner of Washington and crosses into Idaho. This forest has over 60 trails, most of which are suitable for hiking, horseback riding, and biking, and several that are suitable for skiing. As of 1981, when the national forest's forest management plan (FMP) was written, 367 miles of trails in the forest (41 of these miles were in wilderness) existed. Currently, there are 28 developed campgrounds, which may include amenities such as highway access, boat launches, and picnic tables along with boating facilities and facilities for winter sports. As of the 1981 FMP, 67 developed recreational facilities existed. Other recreation activities include hunting, fishing, picnicking, and driving through scenic highways and roads. There is also backcountry camping and about two thirds of all recreation activities occur outside developed campgrounds. In 1981, 30,613 acres of the park were allocated as the Salmo-Priest Wilderness, 857,544 acres were roaded non-wilderness, and 206,843 acres were unroaded non-wilderness. There were 41.5 miles of trails and an average of 1,800 visits per year in the Salmo-Priest Wilderness area as of 1981. The wilderness contains zones designated as semi-primitive, nonmotorized, primitive (trailed), and primitive (trail-less). In the FMP, a desire and plan was expressed for more developed trails to increase use. The annual visitation estimate for forest visits is 335,700 visits. Much of this area can be categorized as medium-impact use area (USDA, 2010a; USDA, 2010b).

Nisqually National Wildlife Refuge

Nisqually National Wildlife Refuge is also near Colville National Forest and is south of the border. The refuge has 2 miles of walking trails, one of which is a 1-mile boardwalk trail. In addition to walking and hiking, recreation includes fishing from boats, boating, and waterfowl hunting. Most of this area can be categorized as a low-impact use area (USDOJ, 2010e).

Mount Baker-Snoqualmie National Forest

The Mount Baker-Snoqualmie National Forest extends from the northern border, adjacent to the Northern Cascades NP Complex south to Mount Rainier NP. The section of forest closest to the northern border includes two forest service centers. Part of the Skagit Wild and Scenic River flows through this park. In addition, 48 percent of the Mount Baker-Snoqualmie National Forest is designated as wilderness. This includes part or all of Alpine Lakes, Boulder River, Clearwater, Glacier Peak, Henry M. Jackson, Mount Baker and Noisy Diobsud, Norse Peak, and Wild Sky wilderness areas. The forest contains over 30 different campgrounds as well as infrastructure for fishing, picnicking, and winter sports. There are 1,500 miles of trails, including trails for mountain biking and off-highway vehicles. Other recreation activities include mountain climbing and scenic driving. The park also includes Mount Baker NRA, which is managed for snowmobile and cross-country skiing. The annual visitation estimate for forest visits is 1,677,500 visits. Much of this park can be categorized as high-impact use area with some low- and medium-impact use areas (USDA, 2008a; USDA, 2009a).

4.17.2.2 Idaho

Idaho Panhandle National Forest (includes Coeur d'Alene National Forest and Kaniksu National Forest)

This national forest stretches from approximately 25 miles south of the border (Kaniksu National Forest) south to the Coeur d'Alene National Forest. The forest includes part of the Salmo-Priest Wilderness (11,950 acres). Several other areas are also recommended for wilderness area designation (146,700 acres). Within the park are over 100 miles of trails suitable for biking. For camping, the forest includes rental cabins, lookouts, campgrounds with amenities, campgrounds for Recreational Vehicles, and backcountry camping. Other recreational activities include water sports, climbing, horse riding, hunting, scenic driving, and picnicking. The forest includes two Wild and Scenic Rivers, the St. Joe River, and the Upper Priest River. In the 1987 FMP developed for the forest, the Coeur d'Alene River, the Little North Fork Clearwater River, and the Pack River were identified as having the potential to be Wild and Scenic rivers. The annual visitation estimate is 1,277,700 visits. Much of this area can be categorized as a medium-impact use area (USDA, 2009b; USDA, 2009c).

Okanogan National Forest and Wenatchee National Forest (managed singly) (Idaho and Washington)

The Okanogan portion of the national forest sits along the northern border, while the Wenatchee area is further south. Approximately 40 percent of the forest is designated as wilderness, spread among eight areas. This forest includes a large part of the 529,477 acres of the Pasayten Wilderness (a small portion falls within Mount Baker-Snoqualmie National Forest). The Boundary Trail is a major trail in the Pasayten Wilderness that goes north from the southeast corner along the Canadian border for more than 73 miles. The forest also includes all or part of Lake Chelan-Sawtooth (145,667 acres), Goat Rocks Wilderness (105,633 acres), Glacier Peak Wilderness (576,900 acres), Henry M. Jackson Wilderness (103,591 acres total; 27,242 acres within Wenatchee), Norse Peak Wilderness (50,923 acres), and William O. Douglas Wilderness (166,000 acres). No roads or developments occur within wilderness areas. There are 800 miles of wilderness trails as well as well-maintained trails accessible to people with disabilities. The forest includes over 24 developed campgrounds and is open to backcountry camping as well. Other recreational activities include off-highway vehicle use, fishing, climbing, mountain biking, horse riding, and small-scale prospecting. The annual visitation estimate for Okanogan National Forest is 678,900 visits with 2,312,200 visits per year for Wenatchee National Forest. Much of this park can be categorized as medium-impact and low-impact use areas (USDA, 2010c; USDA, 2009d; USDA, 2009e).

4.17.2.3 Montana

Kootenai National Forest

Kootenai National Forest is located in the northwest corner of Montana along the northern border. In the center of Kootenai NF is the 93,000-acre Cabinet Mountains Wilderness. In the forest, 39 developed campgrounds are accessible by car or boat along with several rental lookouts and cabins. There are also hundreds of miles of hiking, horse, and bicycle trails. Additional recreational activities include water recreation, fishing, rock climbing, scenic driving, gold panning, downhill and cross-country skiing, and snowmobiling. The annual visitation

estimate is 919,300 visits. Much of this area can be categorized as a medium-impact use area with some high-impact use areas (USDA, 2009f; USDA, 2008b).

Glacier National Park

Glacier NP sits in north-central Montana along the northern border and in combination with the Waterton Lakes National Park in Canada comprises the first (Waterton-Glacier) International Peace Park, a World Heritage Site. Glacier and Waterton are both biosphere reserves with 95 percent of Glacier managed as recommended wilderness and 85 percent of Waterton Lakes National Park designated as wilderness. This park is managed to protect its natural processes although some developments occur in this area, including trails, campsites, primitive signs, sanitation facilities, and patrol cabins. There are many recreational opportunities including backcountry camping, camping at designated campgrounds, hiking along developed and undeveloped trails, skiing, snowshoeing, private and guided horseback riding, boating, and fishing. Overall, most of the area of Glacier NP closest to the northern border is undeveloped backcountry with unpaved trails, campsites, and primitive facilities. It also includes more developed day-use trails as well as bridges, overlooks, sanitation facilities, contact and customs stations, boat docks, corrals, administrative facilities, and employee housing. There are paved and unpaved roads, small parking lots, trails and trailheads, employee housing, ranger stations, small boat launching facilities, interpretive signs, and campgrounds in the park. The middle fork of the Flathead River is designated as a Wild and Scenic River, however, this portion of the river is not in either border region. Glacier NP visitation ranged from 1,664,046 to 2,083,329 people per year between 2000 and 2009. Most of this area (relevant to the northern border) can be categorized as a low-impact use area (USDOJ, 2009h; USDOJ, 2010h).

Flathead National Forest

The Flathead National Forest is approximately 50 miles south of the northern border in Montana. This forest manages the largest part of the Bob Marshall Wilderness Complex, which includes the Great Bear Wilderness, the Bob Marshall Wilderness, and the Scapegoat Wilderness and a total of 1.5 million acres. In addition, the North Fork, Middle Fork, and portions of the South Fork of the Flathead River lie within the National Wild and Scenic River's system and are used for floating excursions. Within the park, 12 cabins are available for rent as well as 31 campgrounds. Backcountry camping is also permitted as well as downhill skiing, berry picking, hunting and fishing, and scenic driving through non-wilderness areas. The annual visitation estimate is 1,077 thousand visits. Much of this area can be categorized as a low impact use area (USDA, 2010d; USDA, 2009g).

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Final

Programmatic Environmental Impact Statement For Northern Border Activities

Section 5: East of the Rockies Region



July 2012

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CONTENTS

5	East of the Rockies Region	5-1
5.1	Introduction	5-1
5.2	Air Quality	5-4
5.2.1	Introduction	5-4
5.2.2	Affected Environment	5-4
5.2.2.1	National Ambient Air Quality Standards and Attainment Status	5-4
5.2.2.2	Class I Areas	5-6
5.3	Biological Resources	5-8
5.3.1	Introduction	5-8
5.3.2	Affected Environment	5-10
5.3.2.1	Blocks of Regionally Significant Habitat	5-10
5.3.2.2	Sensitive Habitats	5-13
5.3.2.3	Threatened and Endangered Species	5-15
5.3.2.4	Wildlife Typically Found in the Region	5-17
5.3.2.5	Vegetative Habitat Typically Found in the Region	5-18
5.3.2.6	Wetlands and Waterways	5-20
5.3.2.7	Aquatic Resources in the Region	5-21
5.4	Geology and Soils	5-22
5.4.1	Introduction	5-22
5.4.2	Affected Environment	5-22
5.4.2.1	Physiographic Provinces	5-22
5.4.2.2	Geologic Conditions	5-26
5.4.2.3	Soils	5-33
5.4.2.4	Prime and Unique Farmland	5-33
5.5	Water Resources	5-36
5.5.1	Introduction	5-36
5.5.2	Affected Environment	5-36
5.5.2.1	Groundwater	5-36
5.5.2.2	Surface Waters and Waters of the United States	5-38
5.5.2.3	Floodplains	5-40
5.5.2.4	Transboundary Water Agreements	5-40
5.6	Noise	5-42
5.6.1	Introduction	5-42
5.6.2	Affected Environment	5-42

5.6.2.1	Regulatory Review.....	5-43
5.6.2.2	CBP Noise Sources.....	5-43
5.6.2.3	Non-CBP Noise Sources.....	5-44
5.6.2.4	Background Noise Levels.....	5-45
5.6.2.5	National Parks.....	5-46
5.7	Climate Change and Sustainability.....	5-47
5.7.1	Introduction.....	5-47
5.7.2	Affected Environment.....	5-47
5.7.2.1	Climate Regions of the Northern Border—Overview.....	5-47
5.7.2.2	Climate in the EOR Region.....	5-47
5.7.2.3	Climate Change in the United States—Northern Great Plains Regional Assessment.....	5-48
5.8	Land Use.....	5-49
5.8.1	Introduction.....	5-49
5.8.2	Affected Environment.....	5-49
5.8.2.1	Land Cover and Related Land Uses in the EOR Region.....	5-49
5.8.2.2	Land Cover and Related Land Uses in the Areas North of the EOR Region.....	5-53
5.8.2.3	Land Ownership in the EOR Region in the United States.....	5-59
5.8.2.4	Land Ownership in Canada North of the EOR Region.....	5-62
5.8.2.5	Land Use Management.....	5-63
5.8.2.6	Consistency with Enforceable Policies of the Coastal Zone Management Act.....	5-63
5.9	Aesthetic and Visual Resources.....	5-65
5.9.1	Introduction.....	5-65
5.9.2	Affected Environment.....	5-65
5.9.2.1	Affected Landscapes.....	5-65
5.9.2.2	Areas with High Visual Sensitivity.....	5-67
5.9.2.3	Affected User Groups.....	5-68
5.10	Socioeconomic Resources.....	5-70
5.10.1	Introduction.....	5-70
5.10.2	Affected Environment.....	5-70
5.10.2.1	Regional Demographics.....	5-70
5.10.2.2	Population and Growth Trends.....	5-71
5.10.2.3	Income, Poverty, and Unemployment.....	5-76
5.10.2.4	Property Values.....	5-79

5.10.2.5	Regional Economies	5-81
5.10.2.6	Economic Profiles of POEs and BPSs in the EOR Region	5-84
5.11	Cultural and Paleontological Resources	5-92
5.11.1	Introduction.....	5-92
5.11.2	Affected Environment.....	5-92
5.11.2.1	Archaeological Resources: Prehistoric/Precontact Context.....	5-92
5.11.2.2	Prehistoric Archaeological Site Probability.....	5-93
5.11.2.3	Historic Context.....	5-94
5.11.2.4	Historic/Protohistoric Archaeological Site Probability	5-95
5.11.2.5	Above-Ground Historic Properties	5-96
5.11.2.6	Native American Cultural Resources.....	5-104
5.11.2.7	Paleontological Resources	5-108
5.12	Environmental Justice and Protection of Children	5-110
5.12.1	Introduction.....	5-110
5.12.1	Affected Environment.....	5-110
5.12.1.1	Minority Populations	5-110
5.12.1.2	Low-Income Populations	5-112
5.12.1.3	Population of Children under 18 Years of Age	5-114
5.13	Human Health and Safety	5-117
5.13.1	Introduction.....	5-117
5.13.2	Affected Environment.....	5-117
5.14	Hazardous Materials	5-127
5.14.1	Introduction.....	5-127
5.14.1.1	Hazardous Substances.....	5-127
5.14.1.2	Hazardous Waste	5-127
5.14.1.3	Special Hazards and Otherwise Regulated Materials	5-128
5.14.2	Affected Environment.....	5-128
5.14.2.1	Hazardous Substances, Hazardous Wastes, Special Hazards, and Otherwise Regulated Materials	5-128
5.15	Utilities and Infrastructure	5-129
5.15.1	Introduction.....	5-129
5.15.2	Affected Environment.....	5-129
5.15.2.1	Water Supply	5-129
5.15.2.2	Electrical and Communications Utilities	5-129
5.15.2.3	Fuel Supply	5-130

5.15.2.4 Wastewater Management..... 5-130

5.16 Roadways and Traffic 5-132

5.16.1 Introduction..... 5-132

5.16.2 Affected Environment..... 5-132

5.16.2.1 Existing Roadway Network and Roadway Effectiveness..... 5-132

5.16.2.2 Level of Service 5-133

5.16.2.3 Variability 5-133

5.16.2.4 Urban and Suburban Transportation Networks 5-134

5.16.2.5 Rural and Remote Transportation Networks 5-134

5.16.2.6 Federal and State Transportation Regulations 5-135

5.16.2.7 CBP’s Activities Affecting Roadways and Traffic..... 5-135

5.17 Recreation 5-138

5.17.1 Introduction..... 5-138

5.17.2 Affected Environment..... 5-140

5.17.2.1 Montana 5-140

5.17.2.2 North Dakota..... 5-141

5.17.2.3 Minnesota..... 5-141

FIGURES

Figure 5.1-1. The EOR Region and CBP Facilities 5-1

Figure 5.2-1. Nonattainment Areas in the EOR Region 5-5

Figure 5.2-2. Maintenance Areas in the EOR Region 5-6

Figure 5.2-3. Class I Areas in the EOR Region 5-7

Figure 5.3-1. Ecoregions of the EOR Region 5-9

Figure 5.3-2. Blocks of Regionally Significant Habitat in the EOR Region 5-12

Figure 5.4-1. Physiographic Provinces, Divisions, and Sections of the EOR Region 5-23

Figure 5.4-2. Geologic Conditions of the EOR Region 5-27

Figure 5.4-3. Extent of the Laurentide Ice Sheet 5-28

Figure 5.4-4. Seismicity in the EOR Region 5-29

Figure 5.4-5. Landslide Incidence in the EOR Region 5-31

Figure 5.4-6. Karst Topography in the EOR Region 5-32

Figure 5.4-7. Soil Orders in the EOR Region 5-34

Figure 5.5-1. EOR Groundwater Aquifers 5-38

Figure 5.5-2. River Basins in the EOR Region 5-39

Figure 5.5-3. Rainy River Basin in Minnesota 5-40

Figure 5.6-1. Background Noise Levels in the EOR Region 5-45

Figure 5.8-1. Land Cover in the EOR Region 5-57

Figure 5.8-2. Land Use in the EOR Region 5-58

Figure 5.8-3. Land Ownership in the EOR Region 5-61

Figure 5.10-1. Percent Change in the EOR Region Population, 2000–2009 5-72

Figure 5.10-2. Percent Change in Canadian Population North of the EOR Region, 1996–2006 5-75

Figure 5.10-3. Locations of POEs and BPSs in the EOR Region 5-87

Figure 5.11-1. Native American Lands Within the 100-mile PEIS Corridor Crossing Minnesota, North Dakota, and the Eastern Two-Thirds of Montana* 5-106

Figure 5.11-2. Nineteenth-Century Cessions, Reservations, and Portages (1907) 5-107

Figure 5.11-3. Judicially Established Indian Land Areas as of 1978 5-107

Figure 5.11-4. Early Tribal, Cultural, and Linguistic Areas 5-108

Figure 5.13-1. U.S., Interstate, State, and County Roads in the EOR Region 5-119

Figure 5.13-2. Navigable Water in the EOR Region 5-122

Figure 5.13-3. CBP Officers Train at Firing Range 5-125

Figure 5.17-1. Federally protected recreation areas, including Protected Recreation Areas, Including National Forests, Parks, Recreation Areas, and Wildlife Refuges in the EOR Region 5-139

TABLES

Table 5.4-1. Physiographic Provinces in the EOR Region	5-24
Table 5.5-1. Water Use in the EOR Region in 2005	5-36
Table 5.6-1. Common Sound Levels	5-42
Table 5.6-2. CBP Noise Sources.....	5-44
Table 5.6-3. Description of Background Noise Levels.....	5-46
Table 5.6-4. National Parks in the EOR Region	5-46
Table 5.8-1. Land Cover for the EOR Region	5-50
Table 5.8-2. Recreational Land Use in the EOR Region.....	5-52
Table 5.8-3. Conservation Land Use in the EOR Region.....	5-52
Table 5.8-4. Land Cover in Canada North of the EOR Region.....	5-54
Table 5.8-5. Recreational Land Use in Canada North of the EOR Region	5-55
Table 5.8-6. Conservation Land Use in Canada North of the EOR Region	5-56
Table 5.8-7. Land Ownership in the EOR Region*	5-60
Table 5.8-8. Land Ownership in Canada North of the EOR Region	5-62
Table 5.8-9. Aboriginal Land in Canada North of the EOR Region	5-63
Table 5.10-1. Population of the EOR Region*	5-71
Table 5.10-2. Population Centers in the EOR Region*	5-73
Table 5.10-3. Population North of the EOR Region in Canada.....	5-74
Table 5.10-4. Population in Census Metropolitan Areas in Study Area North of the EOR Region in Canada	5-76
Table 5.10-5. Income and Poverty Statistics for States in the EOR Region.....	5-77
Table 5.10-6. Unemployment Rates for the EOR Region	5-77
Table 5.10-7. Income and Poverty Statistics North of the EOR Region in Canada	5-78
Table 5.10-8. Unemployment Rates North of the EOR Region in Canada	5-79
Table 5.10-9. Median Property Value for the EOR Region	5-80
Table 5.10-10. Median Property Value North of the EOR Region in Canada	5-81
Table 5.10-11. Canadian Visitors Entering the EOR Region by Surface Transportation*	5-83

Table 5.10-12. Point of Entry and Border Patrol Station Sites Profiled in the EOR Region ... 5-85

Table 5.11-1. Cultural Resources in the Vicinity of CBP Facilities in Minnesota 5-97

Table 5.11-2. Historic Buildings on CBP Property in Minnesota 5-98

Table 5.11-3. Cultural Resources in the Vicinity of CBP Facilities in North Dakota 5-99

Table 5.11-4. Historic Buildings on CBP Property in North Dakota 5-101

Table 5.11-5. Cultural Resources in the Vicinity of CBP Facilities in Montana 5-102

Table 5.11-6. Historic Buildings on CBP Property in Montana 5-104

Table 5.11-7. Native American Tribes that Have a Reservation, Judicially Established Interest, or Established Traditional Ties to Land within the 100-mile PEIS Corridor 5-105

Table 5.12-1. Minority Statistics for the EOR Region (Percent of Population) 5-111

Table 5.12-2. Visible Minority Statistics North of the EOR Region in Canada* (Percent of Population) 5-112

Table 5.12-3. Income and Poverty Statistics for the EOR Region 5-113

Table 5.12-4. Income and Poverty Statistics North of the EOR Region in Canada 5-114

Table 5.12-5. Age Distribution in the EOR Region (Percent of Population) 5-115

Table 5.12-6. Age Distribution North of the EOR Region in Canada (Percent of Population) 5-116

Table 5.16-1. Percent Distribution of Traffic by Vehicle Class, Total U.S. 5-132

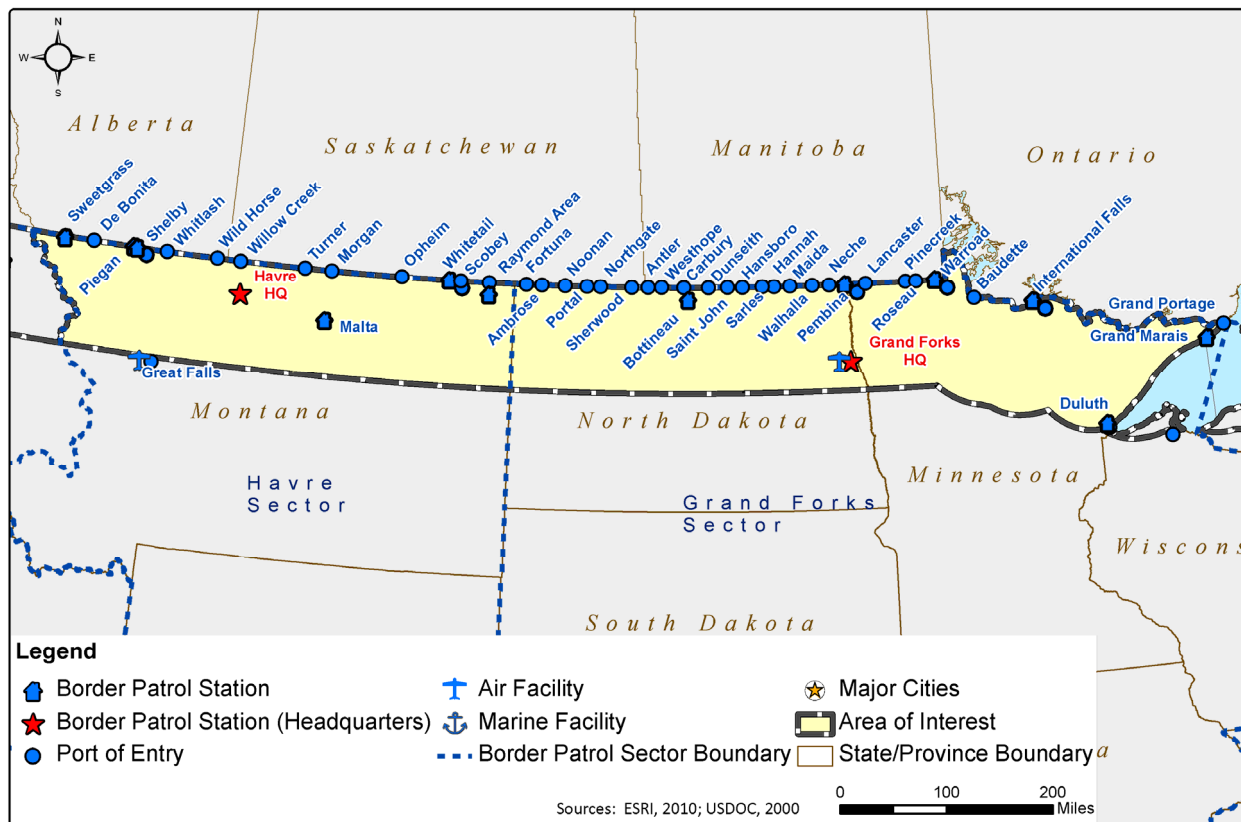
Table 5.16-2. Busiest POEs for Passenger Vehicles in the EOR Region 5-136

5 EAST OF THE ROCKIES REGION

5.1 INTRODUCTION

This chapter analyzes potential environmental effects in the East of the Rockies (EOR) Region arising from U.S. Customs and Border Protection (CBP) actions related to its homeland security mission. The EOR Region includes the areas of Minnesota, North Dakota, and Montana east of the Continental Divide that fall within about 100 miles of the northern border. Figure 5.1-1 displays the territory and CBP facilities of the region.

Figure 5.1-1. The EOR Region and CBP Facilities



The northern border environment in the EOR Region has a wide variety of habitats and terrain types that include heavily forested lands, semi-arid plains, rolling hills, and deep river valleys and associated watersheds, including the Milk River, Marais River, Missouri River, Souris River, Red River, Lake of the Woods, Rainy River, Rainy Lake, and Lake Superior. The region is dominated by open scrub-shrub, grass, and open prairie lands that account for approximately 67 percent of all land cover types in this region. Forested land, found mostly in Minnesota and the Montana Rockies, accounts for another 20 percent of the land cover area.

U.S. Border Patrol in the EOR Region

There are two U.S. Border Patrol (USBP) sectors within the EOR Region: the Havre and Grand Forks sectors. The Havre sector has 456 miles of international border, starting along the Montana-North Dakota border to the east and ending at the Continental Divide to the west. The sector consists of seven Border Patrol stations (BPS) in Montana (Plentywood, Scobey, Havre,

Malta, St. Mary, Shelby, and Sweetgrass) and two substations, also in Montana (Billings and Twin Falls). Billings and Twin Falls are deep interior stations, while the other stations are within a 45-minute drive of the northern border.

The Grand Forks sector has 861 miles of international border starting at Lake Superior on the east and ending at the Montana-North Dakota border on the west. The sector consists of eight BPSs (Grand Forks, North Dakota; Bottineau, North Dakota; Duluth, Minnesota; Grand Marais, Minnesota; International Falls, Minnesota; Pembina, North Dakota; Portal, North Dakota; and Warroad, Minnesota).

The large swaths of remote terrain pose a challenge for surveillance. CBP uses diverse patrols, including on- and off-road-vehicle, snowmobile, pedestrian, and aerial patrols. Because this region is remote, CBP makes use of partnerships with Government agencies (Federal law enforcement and land management agencies, state departments of natural resources, and Canadian authorities) and private entities (communities, landowners, and inter-boundary groups) for both law enforcement and intelligence missions.

The national forest areas and wilderness areas, listed in Table 5.1-1, pose specific access challenges. Both CBP and the U.S. Forest Service (USFS) are working to fully implement a memorandum of understanding (MOU) signed in 2006 between the Department of Homeland Security (DHS), the Department of Agriculture (USDA), and the Department of the Interior (DOI). The MOU sets out a framework for cooperation and provides for DHS access to USFS lands to implement its security mission.

Border Patrol sectors within the region deploy a combination of static permanent surveillance, ground radar, and acoustic sensors, with repeaters for extended line-of-sight coverage. Forward operating bases (FOBs) are deployed in parts of this region.

Office of Air and Marine in the EOR Region

The Montana Great Falls Air Branch of the CBP Office of Air and Marine (OAM) deploys aircraft from the Great Falls Airport in Montana. Several dozen pilots conduct airplane and helicopter patrols of land and air space areas. The North Dakota Grand Forks Air Branch of OAM operates from Grand Forks Air Force Base in Grand Forks, North Dakota. In addition to standard surveillance aircraft, the North Dakota Grand Forks Air Branch also operates the only unmanned aerial systems (UAS) on the northern border. The allowable service range of UAS in this region was recently extended to the northern border between Land of Lakes, Minnesota and Spokane, Washington.

Office of Field Operations in the EOR Region

CBP Office of Field Operations (OFO) port-of-entry personnel are the face at the border for most visitors entering the United States. Each OFO region includes one or more large ports of entry (POEs) that may oversee smaller ports of varying sizes. CBP enforces the import and export laws and regulations of the U.S. Federal Government and implements immigration policy and programs. Agriculture is also inspected at POEs to protect the United States from carriers of animal and plant pests and diseases that could cause serious damage to U.S. crops, livestock, pets, and environment.

Montana POEs under the management of OFO include the large service port at Great Falls. A service port is an OFO location that has a full range of cargo processing functions, including inspections, entry, collections, and verification. There are also larger area ports with responsibilities for more than one port at Sweetwater and Raymond. Other EOR ports in the state include Butte Airport, Del Bonita, Kalispell Airport, Morgan, Opheim, Scobey, Turner, Whitetail, Whitlash, Wild Horse, and Willow Creek.

North Dakota POEs under the management of OFO include the large service port at Pembina. Other EOR ports in the state include Ambrose, Antler, Carbury, Dunseith, Fortuna, Grand Forks, Hannah, Hansboro, Fargo, Maida, Minot International Airport, Neche, Noonan, Northgate, Portal, Sarles, Sherwood, Saint John, Walhalla, Westhope, and Williston Sloulin Field International Airport.

Minnesota POEs under the management of OFO include the large service port at Minneapolis. Other EOR ports in the state include Baudette, Duluth, Grand Portage, International Falls, Lancaster, Pinecreek, Rochester, Roseau, and Warroad.

5.2 AIR QUALITY

The EOR Region study area contains many air quality control regions (AQCR) and Class I areas that could experience impacts due to the proposed action and alternatives in this Programmatic Environmental Impact Statement (PEIS). Class I areas are Federal lands, designated by Congress as of August 7, 1977, that have air quality restrictions under Section 162(a) of the Clean Air Act (CAA) that are more stringent than the standards that apply elsewhere. However, the mere presence of a sensitive area, such as a nonattainment, maintenance, or Class I areas, does not guarantee that that area would be impacted by CBP activities. Chapter 3, Section 3.2 provides more detailed information on national standards and requirements used to describe and determine effects to air quality resources.

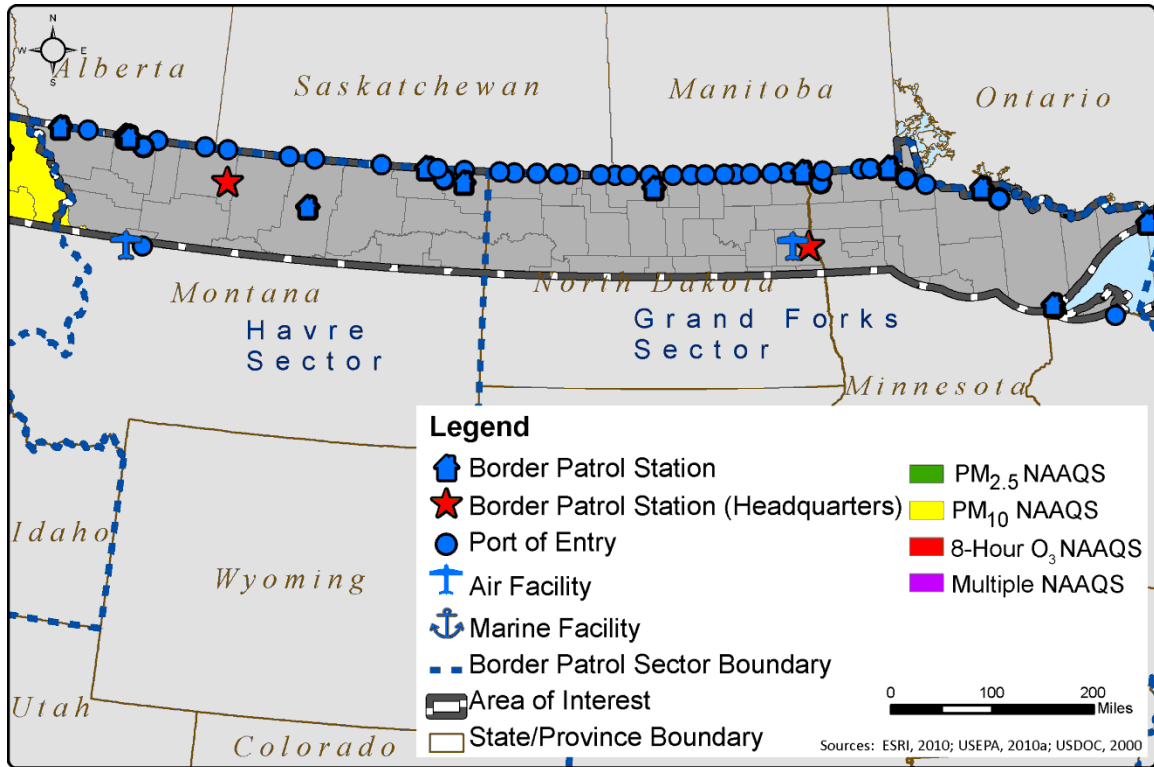
5.2.1 AFFECTED ENVIRONMENT

5.2.1.1 National Ambient Air Quality Standards and Attainment Status

Nonattainment areas within 100 miles of the border are shown in Figure 5.2-1. The narrow valleys and regional climate often cause temperature inversions that trap pollutants in cold air along valley floors. Inversions become even more problematic in urban areas where vehicle exhaust, smoke from wood stoves, and industrial processes are more concentrated (MDEQ, 2010; IDEQ, 2010). Major cities usually have high traffic volumes and large industrialized areas that can contribute to elevated O₃ and PM_{2.5} (particulate matter that is 2.5 micrometers in diameter and smaller). There is a small section of land in Montana in nonattainment for PM₁₀ (particulate matter that is 10 micrometers in diameter and smaller). The entire EOR Region has some of the best air quality in the United States, with much of this region being remote.

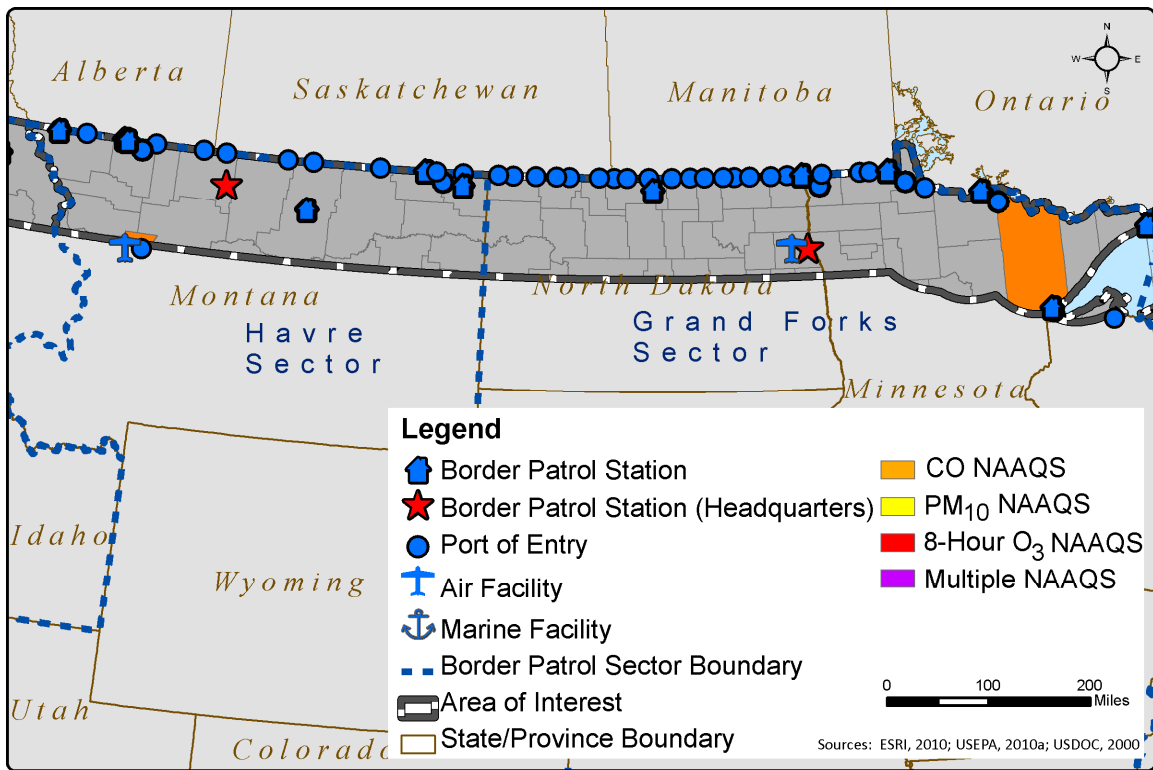
Federal regulations designate AQCRs that were once classified as nonattainment but that have lowered levels of pollutants through the use of regional controls as maintenance areas. Consistent with the nonattainment areas, Figure 5.2-2 shows one maintenance area in the EOR Region in Saint Louis County, Minnesota for carbon monoxide (CO). A complete list of nonattainment and maintenance areas organized by state and county is located in Appendix J.

Figure 5.2-1. Nonattainment Areas in the EOR Region



NAAQS: National Ambient Air Quality Standards

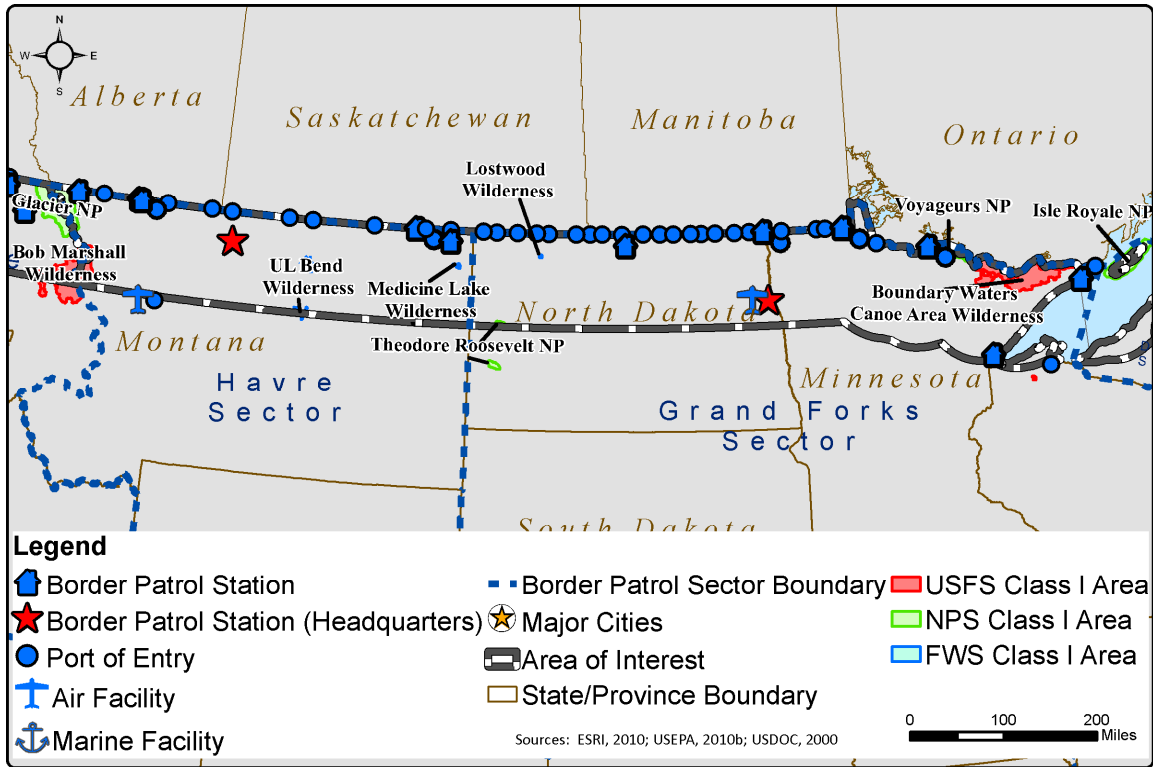
Figure 5.2-2. Maintenance Areas in the EOR Region



5.2.1.2 Class I Areas

The CAA protects areas where air quality exceeds national standards established by the U.S. Environmental Protection Agency (USEPA) by measures to prevent significant deterioration of air quality (PSD). The more stringent restrictions in effect in Class I areas are largely meant to maintain unimpaired visibility in areas such as “national parks, national wilderness areas, national monuments, national seashores, and other areas of special natural, recreational, scenic, or historic value.” In general, "clean air areas" are protected through ceilings on the additional amounts of certain air pollutants over a baseline level. The PSD increment amounts vary based on the area’s classification. Class I areas and major CBP facilities in the EOR Region are shown on the map in Figure 5.2-3.

5.2-3. Class I Areas in the EOR Region



USFS: United States Forest Service
 NPS: National Park Service
 FWS: U.S. Fish and Wildlife Service

5.3 BIOLOGICAL RESOURCES

5.3.1 INTRODUCTION

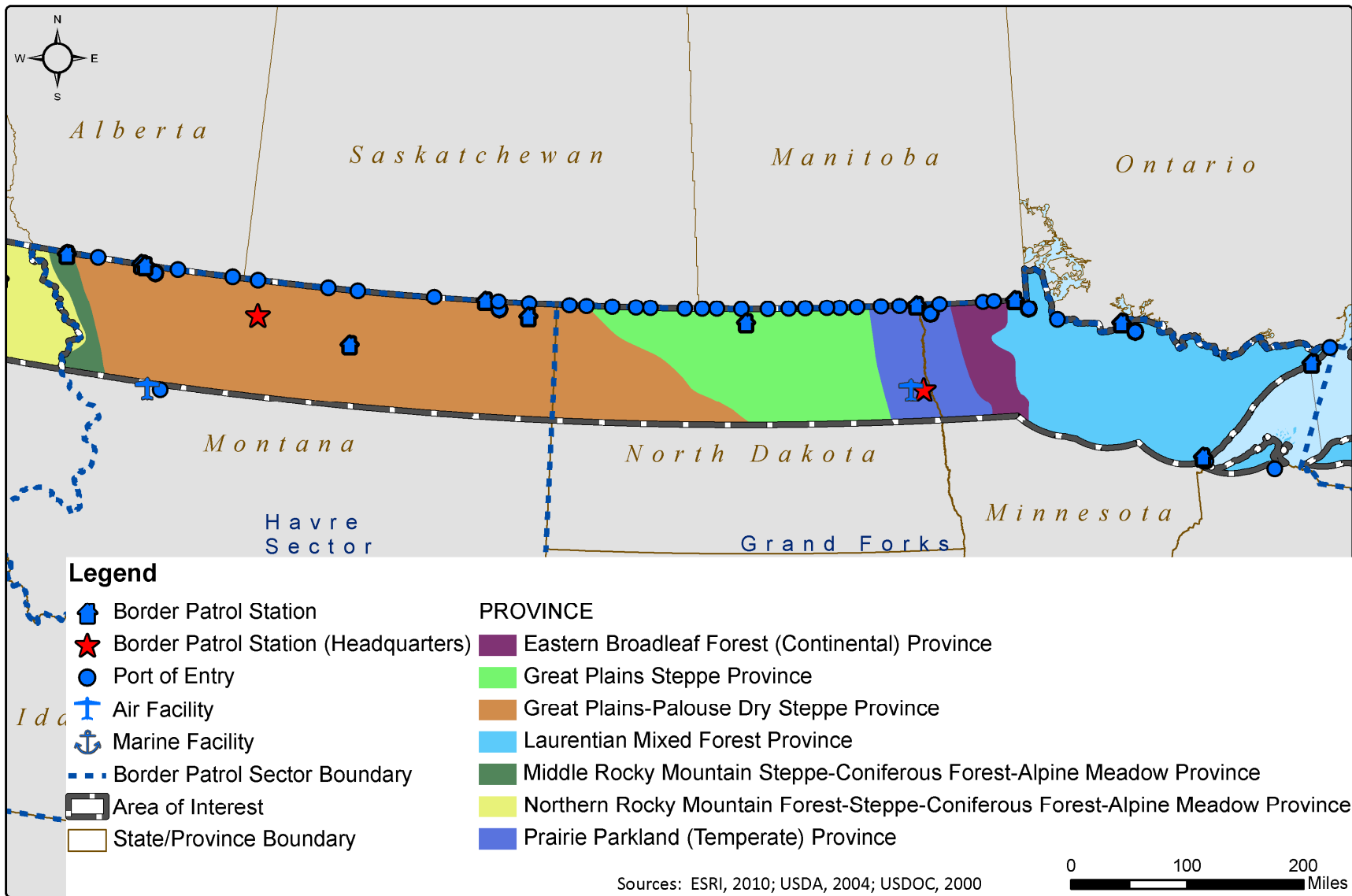
The EOR Region falls within portions of the following states: Montana, North Dakota, and Minnesota. Biologically, the EOR Region can be divided into six major ecoregions:

- Middle Rocky Mountain Steppe–Coniferous Forest–Alpine Meadow;
- Great Plains–Palouse Dry Steppe;
- Great Plains Steppe;
- Prairie Parkland;
- Eastern Broadleaf Forest (continental); and,
- Laurentian Mixed Forest.

Generally, these ecoregions continue north of the U.S.-Canada border (Figure 5.3-1). For a complete description of the above ecoregions, refer to Appendix L.

Map resources for the ecoregion map in this section were developed from the U.S. Census Bureau (USCB), U.S. Geological Survey (USGS), and Environmental Systems Research Institute (ESRI) databases. Each ecoregion has a unique set of biological, climatic, and topographical characteristics along with unique challenges and opportunities for CBP.

Figure 5.3-1. Ecoregions of the EOR Region



5.3.2 AFFECTED ENVIRONMENT

5.3.2.1 Blocks of Regionally Significant Habitat

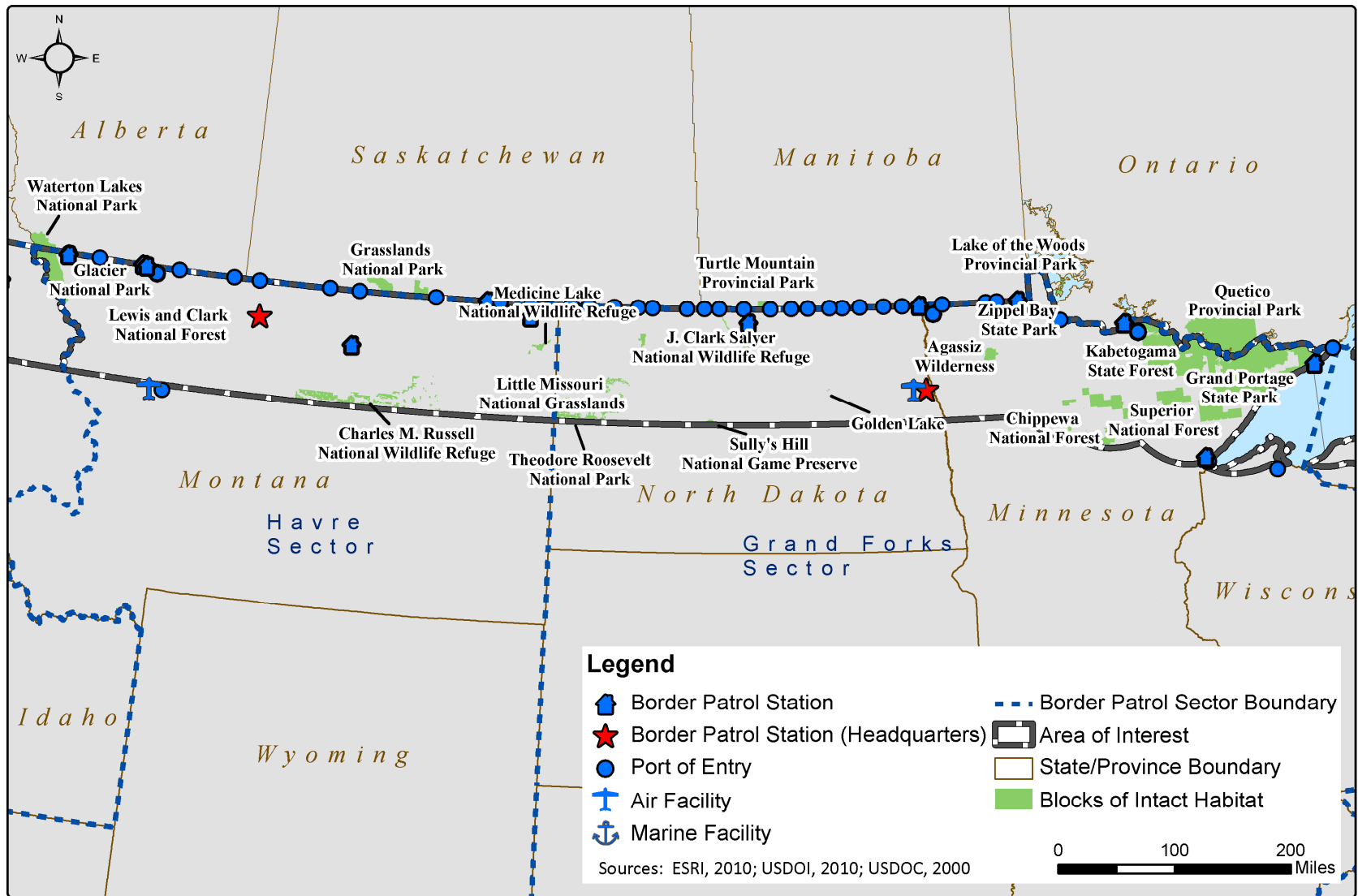
The blocks of regionally significant habitat listed below and shown in Figure 5.3-2 are relatively undeveloped and intact habitat protected as wilderness, state parks, and state and national forests. “Intact habitat” refers to areas of largely unfragmented habitat with few alterations or disturbances, such as improved roads or other development. Most areas listed are protected by law (wilderness areas, national parks), while others may occupy private lands and often cross state and country boundaries.

Selected regionally significant blocks that represent this region include:

- Agassiz Beach Ridges (Minnesota);
- Agassiz Wilderness (Minnesota);
- Akamina-Kishinena Provincial Park (British Columbia, Canada);
- Audubon National Wildlife Refuge (North Dakota);
- Bluestem Prairie Scientific and Natural Area (Minnesota);
- Boundary Waters Canoe Area Wilderness (Minnesota);
- Bowdoin National Wildlife Refuge (Montana);
- Charles M. Russell National Wildlife Refuge (Montana);
- Chase Lake Wilderness (North Dakota);
- Chippewa National Forest (Minnesota);
- Comertown Pothole Prairie Preserve (Montana);
- Forest River Biology Area (North Dakota);
- Garden Island State Recreation Area (Minnesota);
- Glacier National Park (Montana, USA)/Waterton Lakes National Park and Akamina-Kishinena Provincial Park (Alberta and British Columbia, Canada);
- Golden Lake SWMA (North Dakota);
- Grand Portage National Monument (Minnesota) ;
- Grand Portage State Park (Minnesota);
- Grasslands National Park of Canada (Alberta, Canada);
- Gunlogson Arboretum Nature Preserve (North Dakota);
- H.R. Morgan State Nature Preserve (North Dakota);
- J. Clark Salyer National Wildlife Refuge (North Dakota);
- Kabetogama State Forest (Minnesota, USA)/ Sandpoint Island Provincial Park and Quetico Provincial Park (Ontario, Canada);
- Kennedy Coulee (Alberta, Canada);

- La Verendrye Provincial Park (Ontario, Canada);
- Lake of the Woods Provincial Park (Ontario, Canada);
- Lewis and Clark National Forest lands (portions) (Montana);
- Little Missouri National Grassland (North Dakota);
- Lostwood National Wildlife Refuge (North Dakota);
- Lostwood Wilderness (North Dakota);
- Lower Yellowstone River (Montana);
- Malmberg Prairie (Minnesota);
- Medicine Lake National Wildlife Refuge (Montana);
- Medicine Lake Wilderness (Montana);
- Milk River Natural Area (Alberta, Canada);
- Mirror Pool Wildlife Management Area (WMA) (North Dakota);
- Missouri Coteau (North Dakota);
- North Dakota State Forest Lands and Willow Lake National Wildlife Refuge (North Dakota, USA)/Turtle Mountain Provincial Park (Manitoba, Canada);
- Northern Montana prairies (Montana);
- Outpost Wetlands Natural Area and Police Outpost Provincial Park (Alberta, Canada);
- Pembina Gorge (North Dakota);
- Pembina Trail Preserve (Minnesota);
- Pigeon River Provincial Park (Ontario, Canada);
- Pine Butte Swamp Preserve (Montana);
- Sable Islands Provincial Nature Reserve (Ontario, Canada);
- Sully's Hill National Game Preserve (North Dakota);
- Superior National Forest (Minnesota);
- Theodore Roosevelt National Park (within the Little Missouri National Grassland) (North Dakota);
- Theodore Roosevelt Wilderness (North Dakota);
- Turtle Mountain Wetland areas on the Blackfeet Indian Homeland/Reservation (Montana);
- UL Bend Wilderness (Montana);
- Voyageurs National Park (Minnesota); and,
- Zippel Bay State Park (Minnesota).

Figure 5.3-2. Blocks of Regionally Significant Habitat in the EOR Region



5.3.2.2 Sensitive Habitats

Within a 100-mile zone adjacent to the U.S.–Canada border in this region are several ecological communities representing sensitive habitats. The sensitive habitats described here occur in many of the larger habitat areas listed in Section 5.3.2.1, and are home to many of the threatened and endangered species in the next section. For example, Eastern Great Plains Tallgrass Aspen Parkland occurs in many grassland areas in this broad geographic region, home to protected species and common plants such as little bluestem (*Schizachyrium scoparium*). Some descriptive habitat names used below, such as cedar/tamarack swamps, span many regional boundaries and are more general in meaning. Others, such as calcareous fens (a wetland plant community), define much more specific ecological associations.

Many of these habitats are very fine in scale and form a patchwork of biologically sensitive and diverse areas. The list of sensitive habitats is based on those enumerated and described by the World Wildlife Fund (WWF, 2001), ecological system descriptions within the NatureServe.org database, and each state’s respective natural resources agency (NatureServe, 2010).

- Alpine dwarf-shrubland—dwarf-shrubs or dwarf willows forming a heath-type ground cover;
- Alpine meadows—open meadows at and above the timberline;
- Bogs—wetland type that accumulates acidic peat (deposits of dead plant material);
- Calcareous fens—rarest wetland community in Minnesota and Wisconsin, with input of alkaline mineral-rich groundwater;
- Cedar/tamarack swamps—forested wetland characterized by one or both of these tree species;
- Eastern Great Plains Tallgrass Aspen Parkland—mosaic or combination of tallgrass prairie, brush prairie, aspen-oak mixed woodlands, and wet prairie (see photo above);
- Eastern Great Plains wet meadow, prairie, and marsh—distinguished from upland prairie systems by exhibiting seasonal inundation (wetlands with near-surface groundwater), in conjunction with silty, dense clay, often hydric soils;
- Flowages—series of connected lakes;
- Freshwater estuaries—ecological community where lake and river waters mix;
- Great Lakes beaches and shorelines—Great Lakes beach community at interface of land and water, adjacent to margins of Lake Superior, often with sparsely vegetated dunes;
- Great Plains ponderosa pine woodland and savanna—ponderosa pine woodlands surrounded by grasslands;
- Great Plains sand prairie—often considered part of the tallgrass or mixed-grass regions in the Great Plains, with a mixture of elements from the Western Great Plains shortgrass prairie, Central mixed-grass prairie, and northwestern Great Plains mixed-grass prairie, and soils derived from sandstone weathering;
- Hardwood swamps—deciduous forested wetland;

- Inland lake shorelines—beaches of inland lakes characterized by water-level fluctuation that prevents development of stable shoreline plant communities, instead supporting more-specialized biota adapted to sandy or gravelly shorelines;
- Middle Rocky Mountain montane Douglas-fir forest and woodland—mixed deciduous/coniferous montane forest.
- Northwestern Great Plains mixed-grass prairie—grassland of medium-height grasses, on fine-textured and well-drained soils;
- Prairie Potholes—water-holding depressions of glacial origin, primary wetland habitat;

Prairie pothole



Source: (NDL, No Date).

- Rocky Mountain riparian woodland and shrubland—within the flood zone of rivers, on islands, sand and gravel bars, and adjacent streambanks;
- Rocky Mountain subalpine-fen—a mountain wetland fed by mineral-rich surface water or groundwater and below alpine areas in elevation;
- Sedge meadow—wetland dominated by sedges growing on saturated soils typically composed of peat or muck.
- Shorelines-dunes-cliffs/talus—rock outcrops that contain sparsely vegetated native plant communities;
- Tallgrass prairie—extensive area of flat or rolling, predominantly treeless grassland, native to central North America;
- The Red River Valley shoreline—area of fertile soils subject to flooding;
- Vernal pool—temporary pools, usually devoid of fish, that allow development of natal amphibian and insect species; and,
- Wooded areas—commonly found on moist hillsides.

5.3.2.3 Threatened and Endangered Species

The Endangered Species Act (ESA) of 1973 protects federally listed threatened and endangered species. The purpose of the ESA is to protect and recover imperiled species and the ecosystems upon which they depend.

Appendix M lists the threatened or endangered species by county in the EOR Region. Species are listed as threatened or endangered at either the Federal and/or state level. Two animal species have designated critical habitat in the region: the piping plover (*Charadrius melodus*) is listed as federally endangered in Wisconsin, Ohio, and Pennsylvania and threatened in Michigan and New York; and the Canada lynx (*Lynx canadensis*) is listed as federally threatened.

Some states differ in how they list and protect threatened and endangered species. The following list gives the specific agencies and listing differences (if applicable) in the EOR Region.

- Minnesota has an endangered species act that covers animals and plants (NANFA, 2011). The Minnesota Department of Natural Resources designates rare species as threatened, endangered, or special concern.
- Montana has an endangered species act that covers animals, but not plants (NANFA, 2011). Montana Fish, Wildlife, and Parks lists some species as species of concern, in place of either a threatened or endangered listing. The status represents a separate category, described as, “Potentially at risk because of limited and/or declining numbers, range and/or habitat, even though it may be abundant in some areas” (MT FWP, 2010).
- North Dakota does not have an endangered species act (NANFA, 2011); however, the North Dakota Game and Fish Department has identified 100 non-game species as species of conservation priority under North Dakota's Comprehensive Wildlife Conservation Strategy (CWCS). The CWCS includes information relating to the distribution, abundance, habitat requirements, threats, management goals, and monitoring techniques for each of these species. North Dakota uses a different system to rank species in greatest need of conservation, from Level I (greatest need) to Level III (moderate need). Within these ranks, the state also designates the abundance of the species as rare, uncommon, fairly common, common, or abundant.

Following are examples of some of the threatened and endangered species in the EOR Region:

The whooping crane (*Grus americana*) is one of the world's rarest birds. It annually migrates through the EOR Region, traveling from the species' breeding grounds in Canada's Northwest Territories to the Gulf Coast of Texas, returning northward in spring. Whooping cranes inhabit marshes and prairie potholes in the summer. In winter, they inhabit coastal marshes and prairies. This species has had its critical habitat designated by U.S. Fish and Wildlife Service (USFWS), but this habitat sits outside of the 100-mile project area.

Whooping Cranes



Source: (NDL, No Date).

The black-footed ferret (*Mustela nigripes*) is a member of the weasel family and is closely associated with the extensive grassland habitat in this region, particularly in North Dakota. Historically, black-footed ferrets occupied plains habitat ranging from Texas to southern Saskatchewan. Now black-footed ferrets are limited to seven captive populations and a few wild populations. The black-footed ferret is one of the most endangered mammals in the United States (USDOI, 2008b).

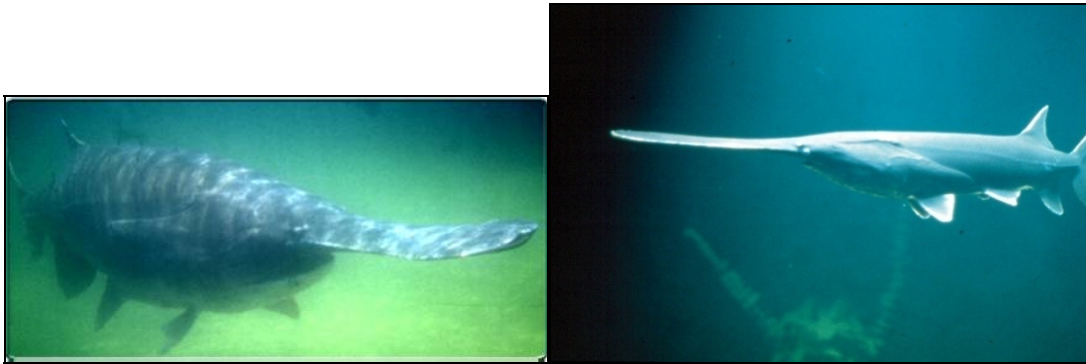
Black-footed ferret



Source: (NDL, No Date).

The paddlefish is a fish species at risk in the Missouri River of Montana and North Dakota. The cause of decline for this species is loss of habitat due to channelization and impoundment. Any construction activities that result in channelizing or impounding portions of rivers where paddlefish live may amplify the decline.

Paddlefish



Source: (USDOJ, No Date; IDNR, No Date).

5.3.2.4 Wildlife Typically Found in the Region

Many bird, mammal, reptile, and amphibian species remain in the ecoregions covering the year-round.

Common wildlife species include the mule deer (*Odocoileus hemionus*), black bear (*Ursus americanus*), long-eared myotis (*Myotis evotis*), and yellow-bellied marmot (*Marmota flaviventris*).

Mule deer



Source: (NDL, No Date).

The prairie pothole wetlands and grasslands in this province are home to a variety of wildlife species, including both game (legally hunted) species, and non-game (legally protected, but not endangered or threatened and not hunted) species. Species, such as the northern pintail (*Anas acuta*), green-winged teal (*A. crecca*), American wigeon (*A. americana*), and canvasback (*Aythya valisineria*), while not threatened or endangered may be declining due to wetland destruction or degradation in some areas.

Northern Pintail



Source: (NDL, No Date).

A variety of native reptiles, amphibians, birds, aquatic insects, mussels, and crustaceans also thrive in and around wetlands in this region. The Canadian toad (*Bufo hemiophrys*), snapping turtle (*Chelydra serpentina*), smooth green snake (*Opheodrys vernalis*), northern redbelly snake (*Storeria occipitomaculata*), silver-spotted skipper (*Hesperia comma*), great blue heron (*Ardea herodias*), northern prairie skink (*Eumeces septentrionalis*), pearl dace (*Margariscus margarita*), three-ridge mussel (*Amblema neislerii*), and giant floater mussel (*Pyganodon grandis*) are some of the more common aquatic species in this area, especially near the Red River (Bailey, 1995; EOE, 2009; Montana Field Guide, 2010; NDGFD, 2011; MNDNR, 2011).

5.3.2.5 Vegetative Habitat Typically Found in the Region

Vegetation in the EOR Region ranges from prairie to mixed forest to a relatively narrow zone of alpine habitats.

Vegetative cover in the Laurentian Ecoregion Province is dominated by forested habitats. Mixed forest stands are made up of several species of conifers, particularly white pine (*Pinus strobus*), along with a mix of deciduous trees. Typical cover consists of mixed pine with aspen-birch, white pine, red pine (*Pinus resinosa*), jack pine (*P. banksiana*), black spruce (*Picea mariana*), eastern hemlock (*Tsuga canadensis*), balsam fir (*Abies balsamea*), and white cedar (*Thuja occidentalis*), among others (Bailey, 1995).

Vegetative cover within the Eastern Broadleaf Forest Province is also dominated by forested habitats. Typical vegetative cover consists mainly of oak-hickory forests with increasing prevalence of maple-beech forests and elm (*Ulmus* spp.) in wetter areas. This province typically has a well-developed understory made up of flowering dogwood (*Cornus florida*), sassafras (*Sassafras albidum*), and hophornbeam (*Ostrya virginiana*) along with other shrubs, evergreens, and wildflower species. Existing wetland types include cattail marshes, wooded wetlands/swamps, and wet meadows (EOE, 2009).

Vegetative cover within the Prairie Parkland (Temperate) Province is dominated by tallgrass prairie and some riparian deciduous forest habitats. Typical vegetative cover consists of a variety of grasses—big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium*

scoparium), switchgrass (*Panicum virgatum*), and Indian grass (*Sorghastrum nutans*). Extensive areas of prairie-pothole wetlands and oak-hickory forests still remain. Upland forest (white oak-shagbark hickory) occurs on more-dissected land, grading into bottomland forests and wet bottomland prairies along rivers.

Vegetative cover within the Great Plains Steppe Province is dominated by nearly level and rolling plains habitats. Most of this land consists of young glacial drifts and dissected till plains. Typical vegetative cover consists of various tall and short grasses, including little bluestem and blue grama (*Bouteloua gracilis*). Other species include buffalograss (*Bouteloua dactyloides*), needle-and-thread grass (*Hesperostipa comata*), galleta (*Pleuraphis jamesii*), sunflower (*Helianthus annuus*), and goldenrods (*Solidago* spp.). Wetlands in this province include pothole lakes and streams (Stewart and Kantrudi, 1972).

Agriculture has replaced much of the native vegetation (primarily grasses) in the Great Plains Palouse Dry Steppe Province. Idaho fescue (*Festuca idahoensis*) and bluebunch wheatgrass (*Pseudoroegneria spicata*) are the more prominent species in the arid western portion of this area. Many areas are too dry to support forest vegetation; however, ponderosa pine (*Pinus ponderosa*), juniper (*Juniperus communis*), and some aspen (*Populus* spp.) inhabit areas of North Dakota. Common shrubs growing in draws and along streams include the Western snowberry (*Symphoricarpos occidentalis*), prairie rose (*Rosa arkansana*), buffaloberry (*Shepherdia* spp.), chokecherry (*Prunus virginiana*), and sagebrush (*Artemisia* spp.).

Palouse prairie mixed with agriculture



Source: (USDOI, 2003).

The Middle of the Rocky Mountain Steppe ecoregion is a small sliver of land starting at the continental divide in Glacier National Park and extending east. Altitudinal zones are prominent features of this ecoregion province. Below the subalpine zone, Douglas-fir (*Pseudotsuga menziesii*) is the dominant coniferous tree species. Lodgepole pines (*Pinus contorta*) occur

primarily in the eastern part of the province. A semi-desert vegetation of sagebrush or grass-covered steppe covers the lower-elevation slopes of the mountains and plains (Bailey, 1995). In addition to the extensive conifer forests, the ecoregion contains several other plant communities: alpine meadows, grasslands, wooded riparian stands, and higher-elevation treeline/alpine communities (Bailey, 1995; EOE, 2009; Montana Field Guide, 2010; NDGFD, 2011; MNDNR, 2011).

Invasive, non-native, plant species—many of which are also designated as noxious weeds incurring legal regulations—pose a serious threat to the natural areas in this region. Invasive species expected to develop substantial issues or already producing problems in this region include: spotted knapweed (*Centaurea maculosa*), leafy spurge (*Euphorbia esula*), Canada thistle (*Cirsium arvense*), yellow toadflax (*Linaria vulgaris*), Russian knapweed (*Acroptilon repens*), and field bindweed (*Convolvulus arvensis*), to name only a few (CIPM, 2010).

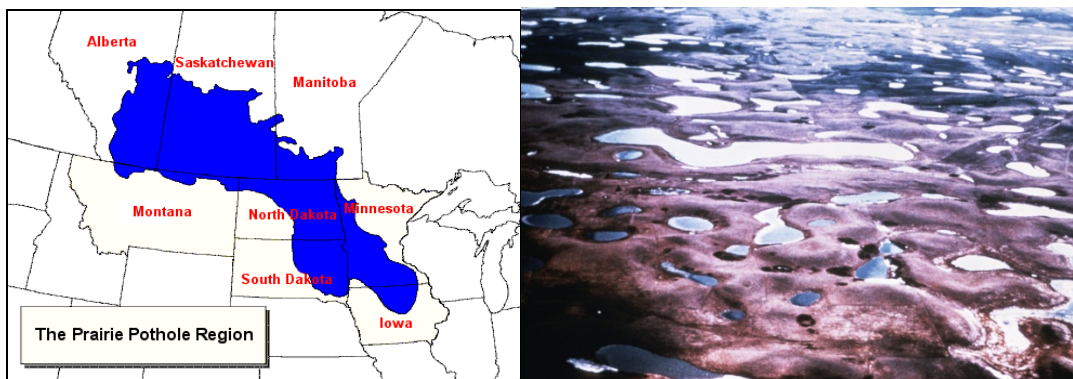
5.3.2.6 Wetlands and Waterways

Wetland types in the EOR Region include:

- Palustrine forested/scrub shrub wetlands (swamps and bogs);
- Palustrine emergent wetlands (marshes, fens, wet meadows, sedge meadows, wet prairies);
- Lacustrine wetlands (lakes);
- Palustrine open water (ponds);
- Riverine habitat (rivers and streams);
- Prairie potholes; and,
- Kettle wetlands.

This region has high concentrations of temporary and seasonal emergent pothole and kettle wetlands that create favorable conditions for duck nesting and migration (Bryce et al., 1996; Woods et al., 2002). The wetlands are generally smaller and scattered in isolated depressions, known as prairie potholes, and swamps tend to be scrub-shrub swamps rather than forested.

Prairie pothole region map—Left; Aerial photo of prairie pothole region –Right



Source: (USDOJ, 2011b; NDL, No Date).

High-density, dendritic (a branching pattern) drainages are common in the northwestern glaciated plains. These drainages typically occur in areas of exposed marine shales where first-order streams feed into long, structurally controlled, second and third-order streams with low gradients.

Major rivers include the Rainy, Red, Roseau, Red Lake, Crow Wing, Minnesota, and North Fork Crow in Minnesota; the Red, Pembina, Tongue, Park, and Forest rivers in North Dakota; and the Foothill Grassland River Breaks, Milk, St. Mary, and Marias rivers in Montana. Numerous smaller rivers, streams, and tributaries (perennial and intermittent) also flow throughout the region.

The entire Missouri River, including the section in eastern Montana, is under examination by the Army Corps of Engineers (Omaha District) to improve the natural functioning of the river through the ACOE's Missouri River Recovery Program.

5.3.2.7 Aquatic Resources in the Region

Aquatic resources are highly regarded within the EOR Region because these aquatic resources support an abundance of ducks, game, and fish. Abundant lakes, rivers, ponds, and wetlands—the remnants of glacial recession—are dominant features on the landscape. One of the Great Lakes, Lake Superior, borders this region on the east side of Minnesota (Bailey, 1995; EOE, 2009).

These aquatic resources support a diverse fishery. Notable fish species include lake sturgeon (*Acipenser fulvescens*), channel catfish (*Ictalurus punctatus*), walleye (*Sander vitreus*), northern pike (*Esox lucius*), muskellunge (*E. masquinongy*), smallmouth bass (*Micropterus dolomieu*), brook trout (*Salvelinus fontinalis*), lake trout (*S. namaycush*), yellow perch (*Perca flavescens*), white sucker (*Catostomus commersonii*), and the common shiner (*Luxilus cornutus*). Various native reptiles, amphibians, waterbirds, aquatic insects, mussels, and crustaceans also thrive in these waters (USDOC, 2010a).

Several very large lakes are located within the Minnesota portion of the project area (Mullet, Mille Lacs, Leech, Gogebic, Mud, Kabetogama, Rainy, and Vermilion lakes, Red Lakes, and Lake of the Woods). Numerous smaller lakes and ponds also fall within this area.

Accidental introductions of invasive species have serious impacts on aquatic resources, damaging fisheries and native habitats. Invasive aquatic animal species of concern, also called aquatic nuisance species, include the rusty crayfish (*Orconectes rusticus*), sea lamprey (*Petromyzon marinus*), zebra mussels (*Dreissena polymorpha*), quagga mussels (*D. rostriformis bugensis*), and the silver carp (*Hypophthalmichthys molitrix*), among many others (USDA, 2003).

5.4 GEOLOGY AND SOILS

5.4.1 INTRODUCTION

The geology and soils in the EOR Region in the northern border study area vary widely throughout the region. Geology can be described as the study of the earth's history through rock formations. These rocks often serve as the parent rock for soils present at and below the surface. The topography of a given area on earth can be described as its surface, shape, or features.

This section addresses the geologic conditions in the EOR Region and describes the potential impacts of CBP program alternatives on geologic resources. The study area contains slightly different topographic features ranging from the relatively flat plains from Montana through North Dakota, followed by the lake region of Minnesota. Geologic formations ranging from glacial deposits to the Canadian Shield are present within the EOR Region and have been shaped over thousands of years by glacial, water, and wind mechanisms.

5.4.2 AFFECTED ENVIRONMENT

5.4.2.1 Physiographic Provinces

Four physiographic divisions span the EOR Region. These divisions are subdivided into provinces as well as some Sections (Figure 5.4-1, Table 5.4-1).

The Northern Rocky Mountains are the westernmost physiographic division along the northern border and is a part of the larger Rocky Mountain system (the Rockies). To the east, the Missouri Plateau borders the northern Rockies. The Missouri Plateau is a part of the Interior Plains division and is divided into two sections: glaciated and unglaciated. The Western Lake section of the Central Lowland province borders the Missouri Plateaus. Finally, the Superior Upland is the last province in the EOR Region. Table 5.4-1 provides details on the geology of these areas. Appendix N features a geologic time scale showing the ages of the geologic time periods with which rock formations are dated.

Figure 5.4-1. Physiographic Provinces, Divisions, and Sections of the EOR Region

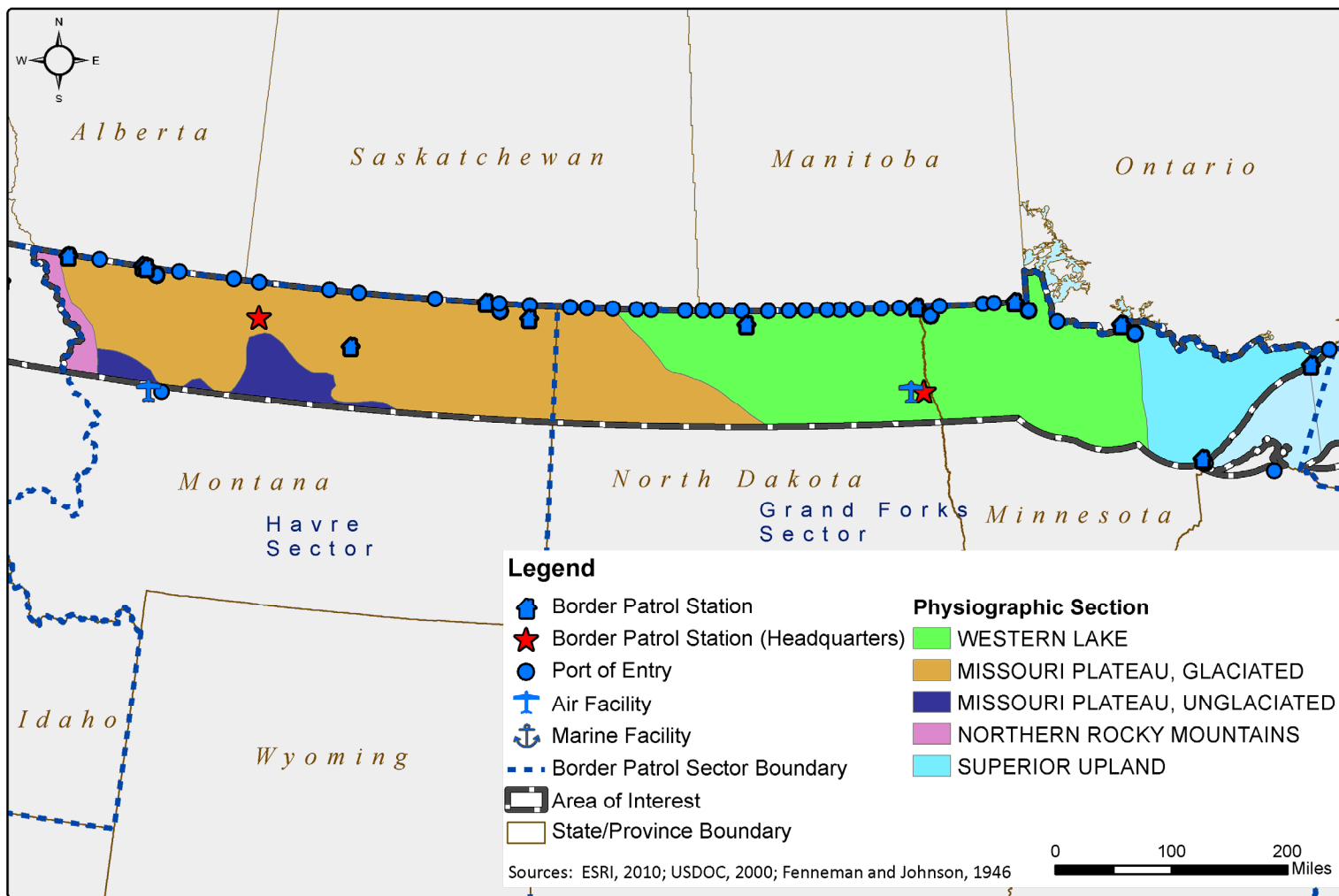


Table 5.4-1. Physiographic Provinces in the EOR Region

Division	Province	Section	Terrain Texture including Topography	Geologic Structure and History	Generalized Rock Types
Rocky Mountain System	Northern Rockies	N/A	Steep, glaciated mountains and peaked alpine ridges. Elevations range from 3,000 to 10,000 ft (920 to 3,100 m).	The northern Rockies formed during the Laramide Orogeny, about 70 to 40 million years ago. Likely cause of Rocky Mountains development is an unusual oceanic subduction under the North American Plate. Most plates subduct at a high angle; the subduction that formed the Rockies occurred at a lower angle (USDOI, 2000).	Rock types include Precambrian sedimentary deposits (partially metamorphisized), upper Tertiary sedimentary deposits, and glacial deposits (USDOI, No Date).
Interior Plains	Great Plains Province	Missouri Plateau, Glaciated	Elevation ranges from 2,500 to 5,000 ft (763 to 1,525 m). Level to gently rolling continental glacial till plains with steep slopes bordering some of the larger rivers (USDOI, 1994). Includes kettle holes and moraines. Rocks deposited during glaciation also occur, mostly 1 to 2 feet (0.3 to 0.6 m) in diameter; some nearly 5 feet (1.5 m).	Extreme advance of continental ice sheets influenced topography. As the sheets thinned, gradually gave way to scattered boulders that indicate the edge of the glaciated Missouri Plateau from the unglaciated Missouri Plateau (Fenneman, 1928).	Beneath glacial till are soft Cretaceous marine shales and Lower Tertiary non-marine sedimentary rocks (USDOI, 1994).
Interior Plains	Great Plains Province	Missouri Plateau, Unglaciated	Topography due to degradation, with extensive fluvial terraces. Monadnocks or exhumed mountains show degradation. Recent erosion has created badlands (Fenneman, 1928).	Unglaciated plains, from which the original sedimentary surface has been entirely stripped (Fenneman, 1928).	Beneath glacial till are soft Cretaceous marine shale and Lower Tertiary non-marine sedimentary rocks (USDOI, 1994).

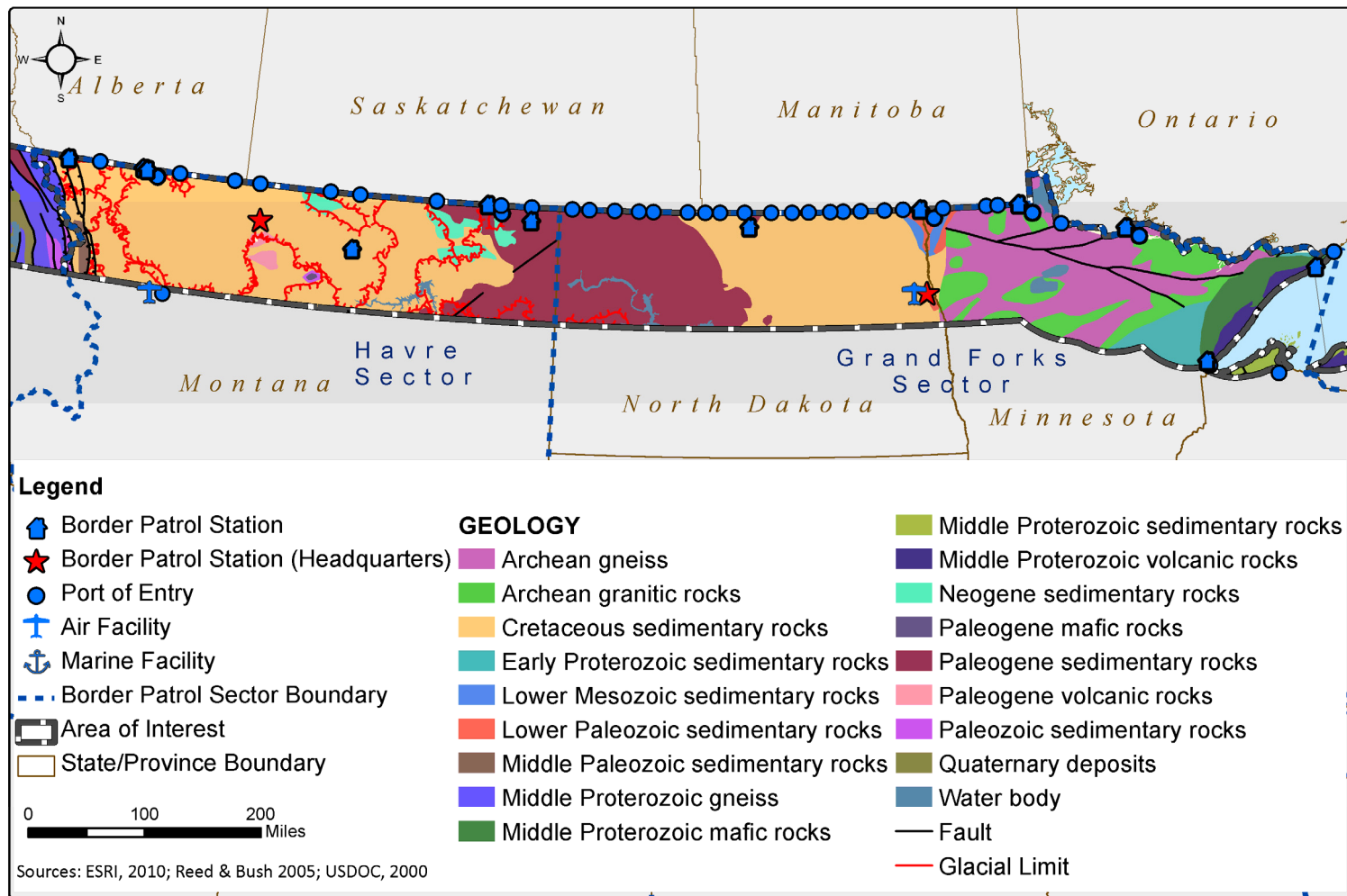
PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Division	Province	Section	Terrain Texture including Topography	Geologic Structure and History	Generalized Rock Types
Interior Plains	Central Lowland	Western Lake	In the north, rolling hills, minimally eroded, and poorly drained land (Fenneman, 1928).	Northern portion has a vast lacustrine plain, evidence of glacial Lake Agassiz. Includes flat and broad valley of the Red River of the North (Fenneman, 1928).	Glacial till on Cretaceous marine shale.
Laurentian Upland	Superior Upland	N/A	Elevation ranges from 600 to 2,280 ft (183 to 695 m). Most prominent of the uplands are elevated linear features trending southwest-northeast along the Lake Superior shore and parallel ranges of Meabi and Vermillion in the north (USDOI, 1994).	Known as the Canadian Shield, the Superior Upland is the largest American surface exposure of the ancient (2.6 to 1.6 billion years old) core of the North American continent (USDOI, 2000).	Mostly Precambrian metamorphic rocks and overlying Paleozoic rocks (Cambrian) covered by thin veneer of glacial deposits from melting glaciers at the end of the Pleistocene (USDOI, 2004b).

5.4.2.2 Geologic Conditions

The geologic conditions within the EOR Region are extremely complex, resulting from tectonic and related activities (e.g., faulting, volcanic activities, and seismic sea waves) and glacial activities along with erosive actions of wind and water. The EOR Region contains consolidated geologic formations consisting of sedimentary, igneous, and metamorphic rocks. The EOR Region also contains unconsolidated geologic formations consisting of alluvium; terrace deposits; glacial deposits; and other mixtures of sands, silts, and clays with various mixtures of rocks. The geologic formations are shown on Figure 5.4-2.

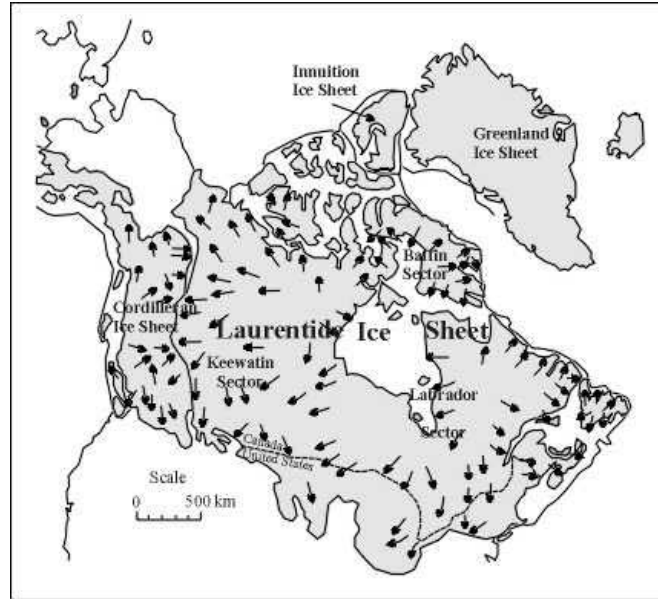
Figure 5.4-2. Geologic Conditions of the EOR Region



Regional Glaciation

During the last ice age, two ice sheets extended over the Canadian border into the United States. The Laurentide sheet covered much of the EOR Region (Figure 5.4-3). In addition to ice sheets, mountain glaciers also expanded in high elevations.

Figure 5.4-3. Extent of the Laurentide Ice Sheet

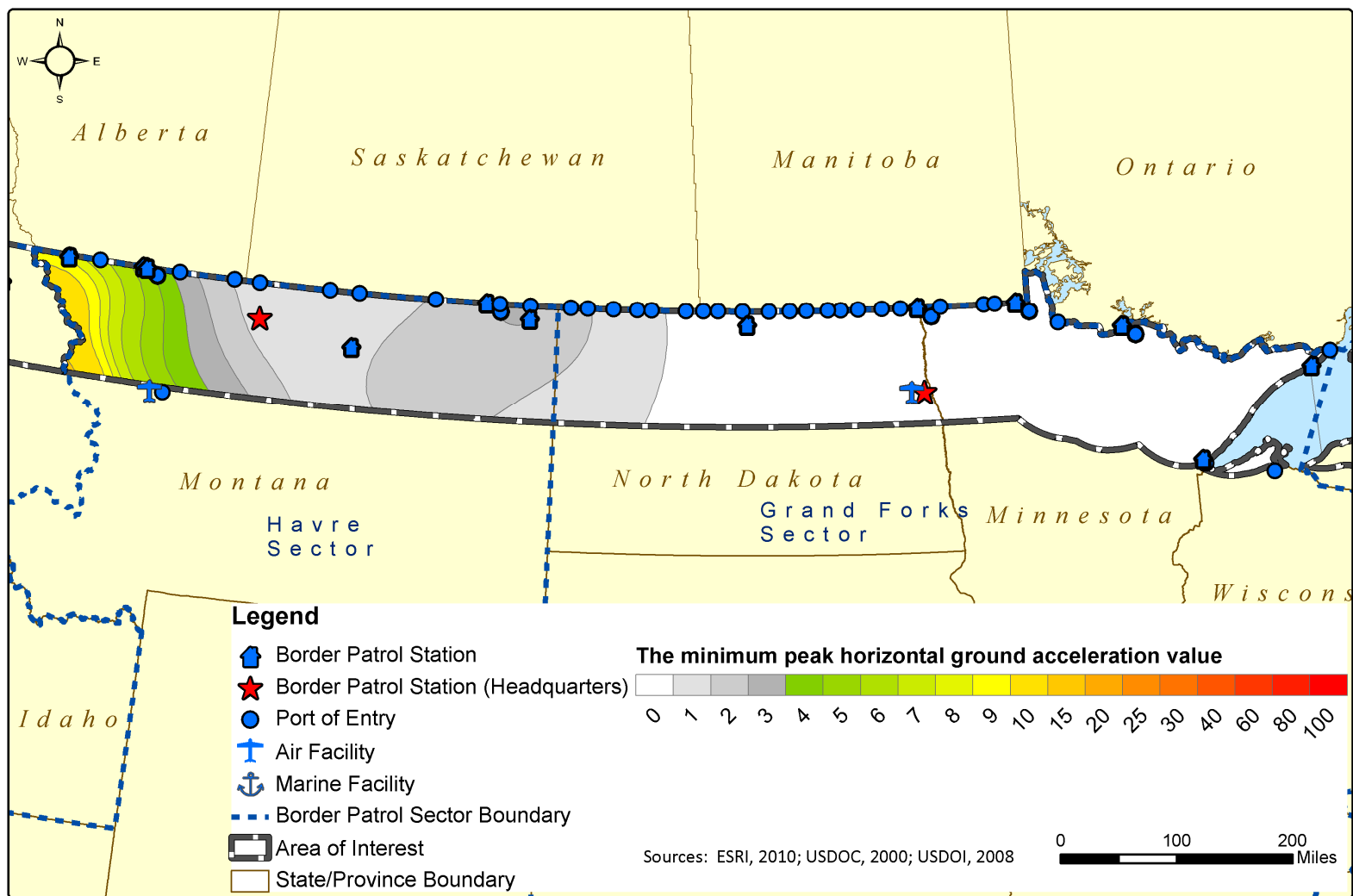


The effects of glacial advances remain apparent in the northern United States. Polished and striated outcroppings, rounded hills, moraines, valley fills of glacial till and outwash, and other typical glacial features are evidence of Pleistocene glaciation. All along the northern border, till deposits, erratics, and moraines are common (Nelson, 2003). Till, a sedimentary deposit derived from glacial erosion, was deposited throughout the northern United States as the ice sheets receded.

Seismicity and Tectonics

Seismic activity in the EOR Region is rare but can occur in the far reaches of Montana within the study area (Figure 5.4-4). This location is adjacent to the Intermountain Seismic Belt described in Appendix N, Geology and Soils. The USGS describes this value as the fastest speed of horizontal particle movement at ground level due to an earthquake.

Figure 5.4-4. Seismicity in the EOR Region



Landslides

Much of the EOR Region is susceptible to landslides due to slopes and shale bedrock (Figure 5.4-5). While most of the region has a low incidence of slides, it also has large areas that are moderately to highly susceptible. In the EOR Region, most landslides occur because of rainfall events, snowmelt, and human activities (State of Montana, 2004).

Karst Topography

Often the existence of karst topography is related to aquifers. In the EOR Region, karst landscapes are not found anywhere except in small locations in Montana (Figure 5.4-6). These areas of karst are long formations, over 1,000 ft, in various types of carbonate rock. Appendix N provides explanations on karst terrain.

Figure 5.4-5. Landslide Incidence in the EOR Region

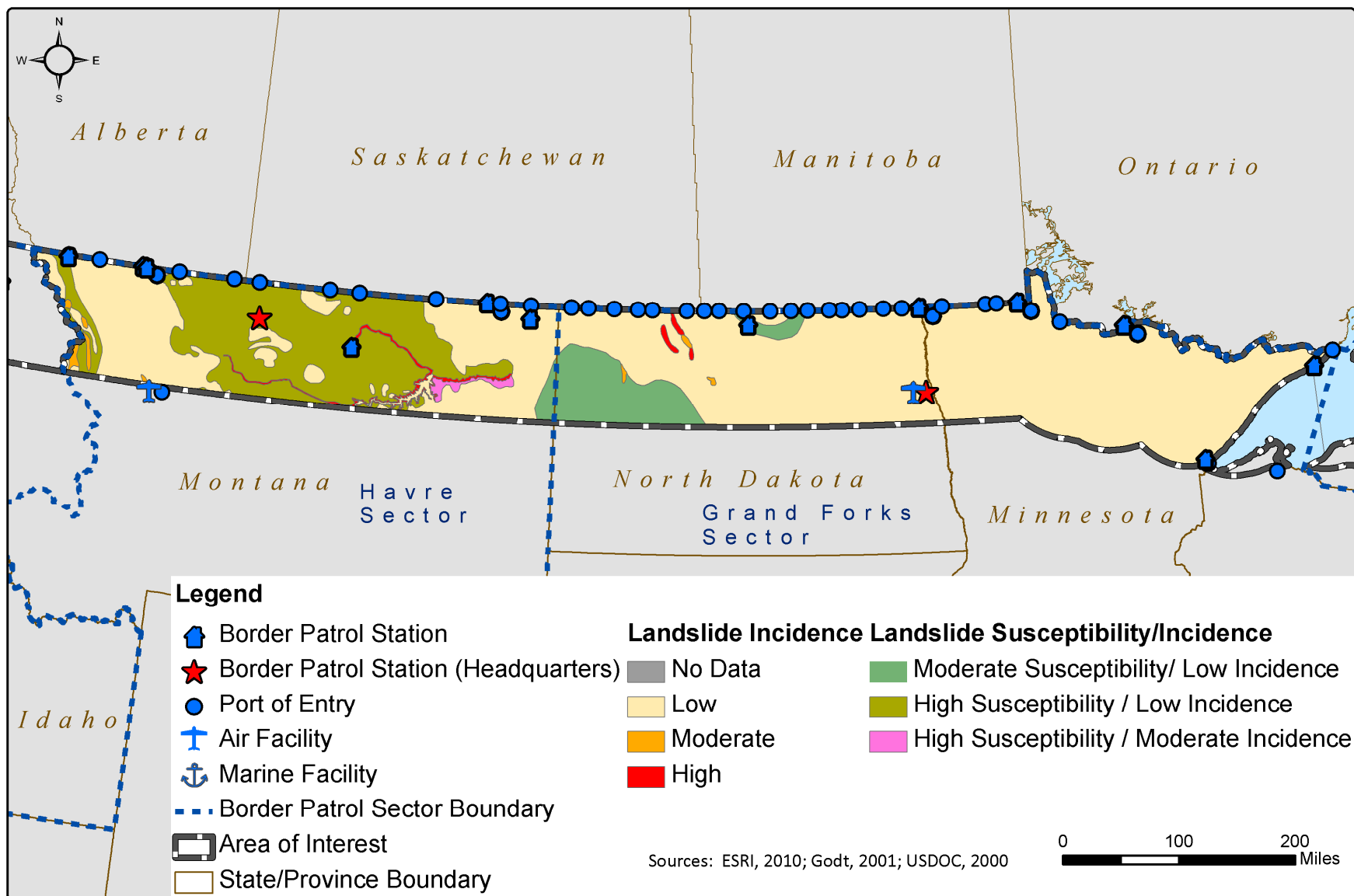
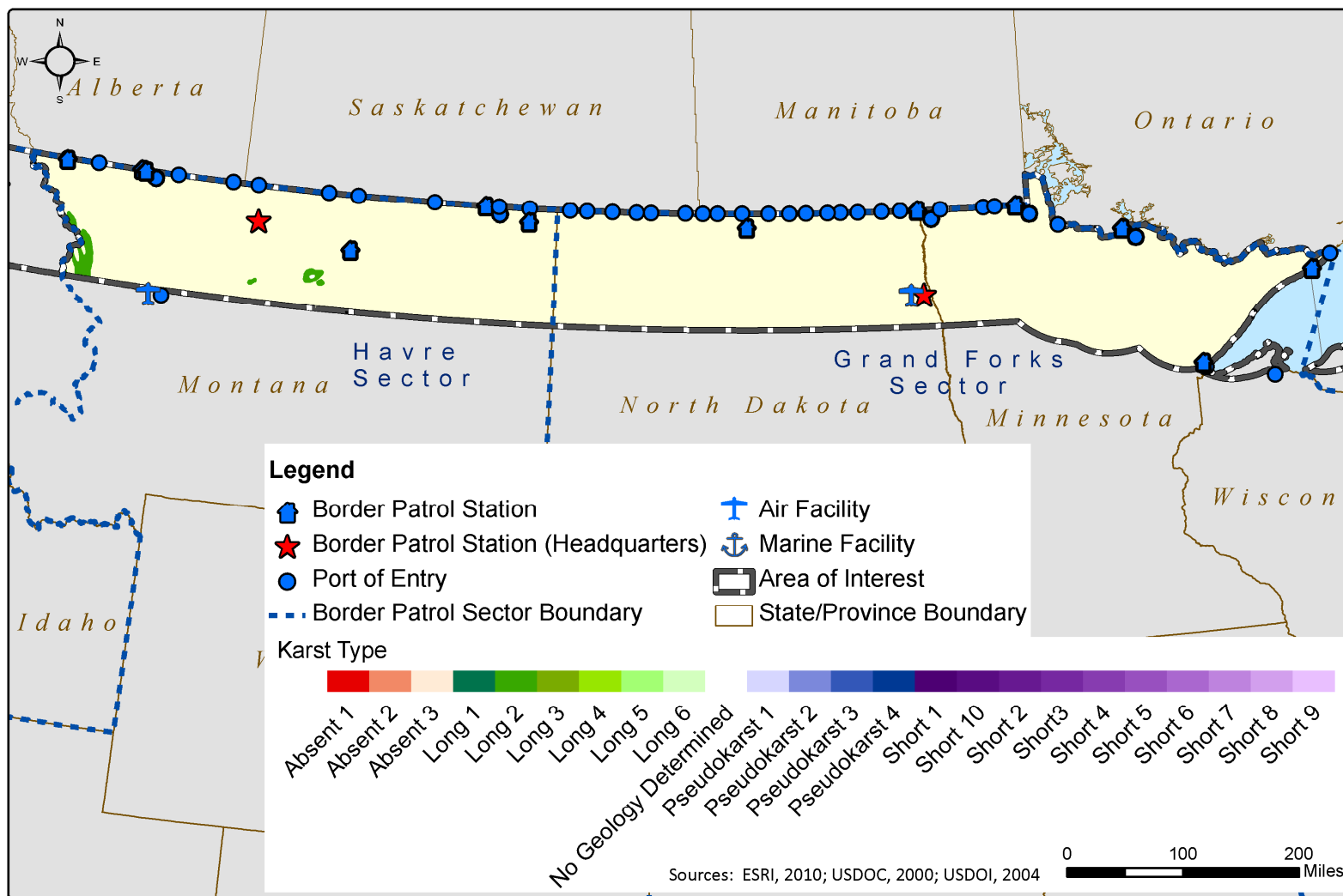


Figure 5.4-6. Karst Topography in the EOR Region



5.4.2.3 Soils

In the EOR Region, six major soil groups, or “orders” occur (Figure 5.4-7). In the EOR Region, soils contain a wide range of particle sizes. One of the most dominant soil types—mollisols—occurs in all three EOR Region states. These soils are common in grasslands and are quite agriculturally productive. In the United States, mollisols form the most common soil order. The thick upper horizon (or layer) is a result of the decayed organic materials (University of Idaho, No Date). Mollisol soil texture can vary to a great degree from sandy to fine loams (Table 5.4-1). This soil order is prone to erosion, especially by water in cultivated areas (University of Wisconsin, 1999).

Also prevalent throughout the region are entisols, alfisols, and to a lesser degree, vertisols. Entisols are soils that do not fit into any of the other 12 soil orders. These are young soils and have only an A horizon. Entisols are the most extensive soils in the world, and can be very diverse based on the parent material from which they develop (University of Idaho, No Date). This soil order is often the transition layer between soils and non-soil parent rock. Alfisols are often found in forested areas, but can also be found in prairies and grasslands. Most often located in temperate climates, they can develop in sub-tropical and tropical areas as well (University of Idaho, No Date). The primary component of this soil order is clay as a result of mineral weathering (University of Wisconsin, 1999). Vertisols are not well suited for development due to their potential to swell when wet, and shrink when dry. Because of these traits, distinct horizons are not usually present in this soil order (University of Idaho, No Date).

Wind erosion is an issue in the rest of the region because many of the soils are sandy. In western North Dakota, soil erosion has occurred during past periods of drought, so vegetative cover is crucial for maintaining soil integrity.

5.4.2.4 Prime and Unique Farmland

In the EOR Region, Prime and Unique Farmland is most concentrated in Minnesota, ranging from 30 to 40 percent of state land (Figure 5.4-8). In North Dakota, the percent is lower at 20 to 30 percent. Montana has the lowest percentage of Prime and Unique Farmland with only 0 to 2 percent of state land designated. In areas where Prime and Unique Farmland occurs in high concentration, Form AD-1006 will be necessary to assess impacts.

Figure 5.4-7. Soil Orders in the EOR Region

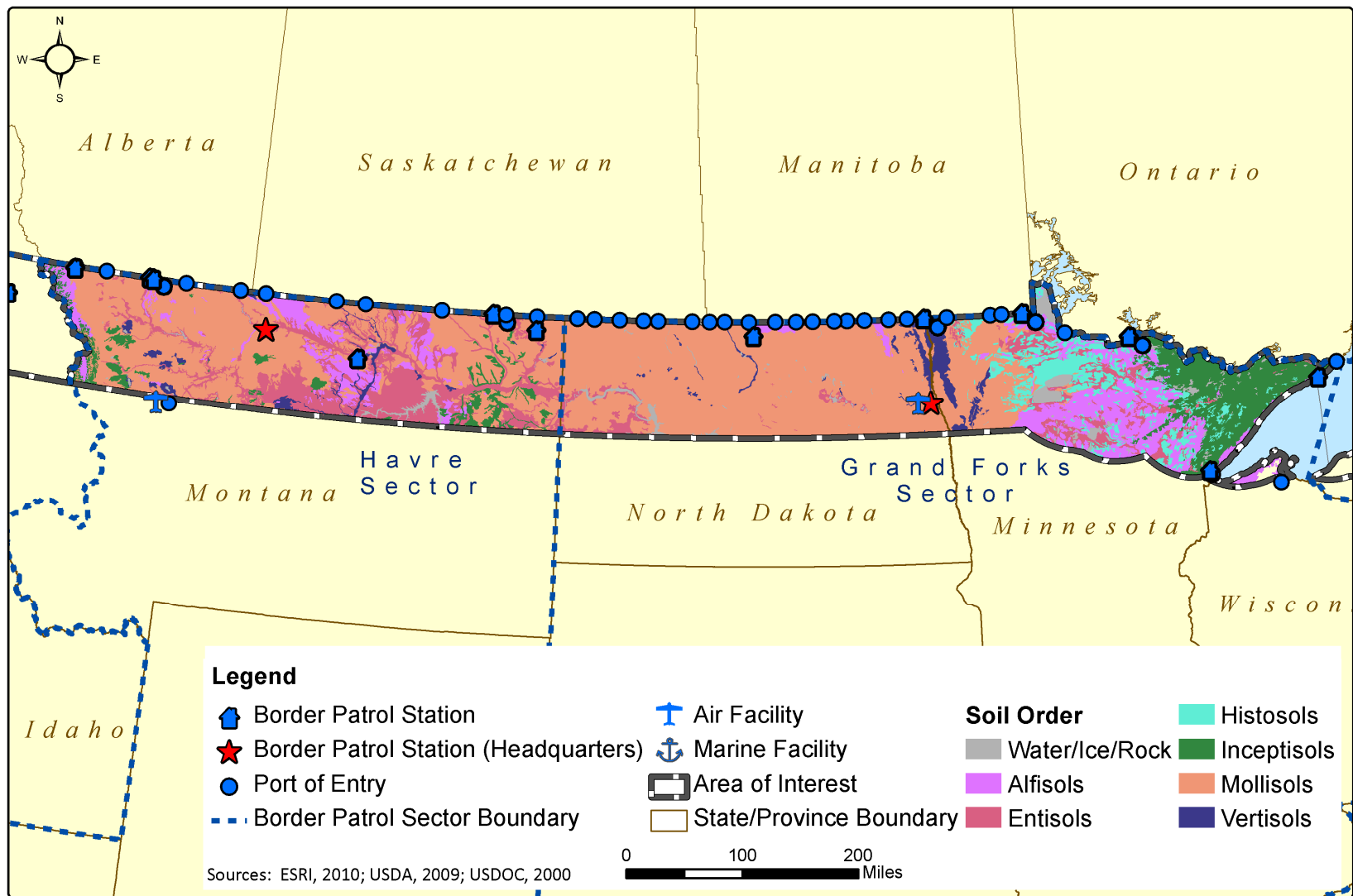
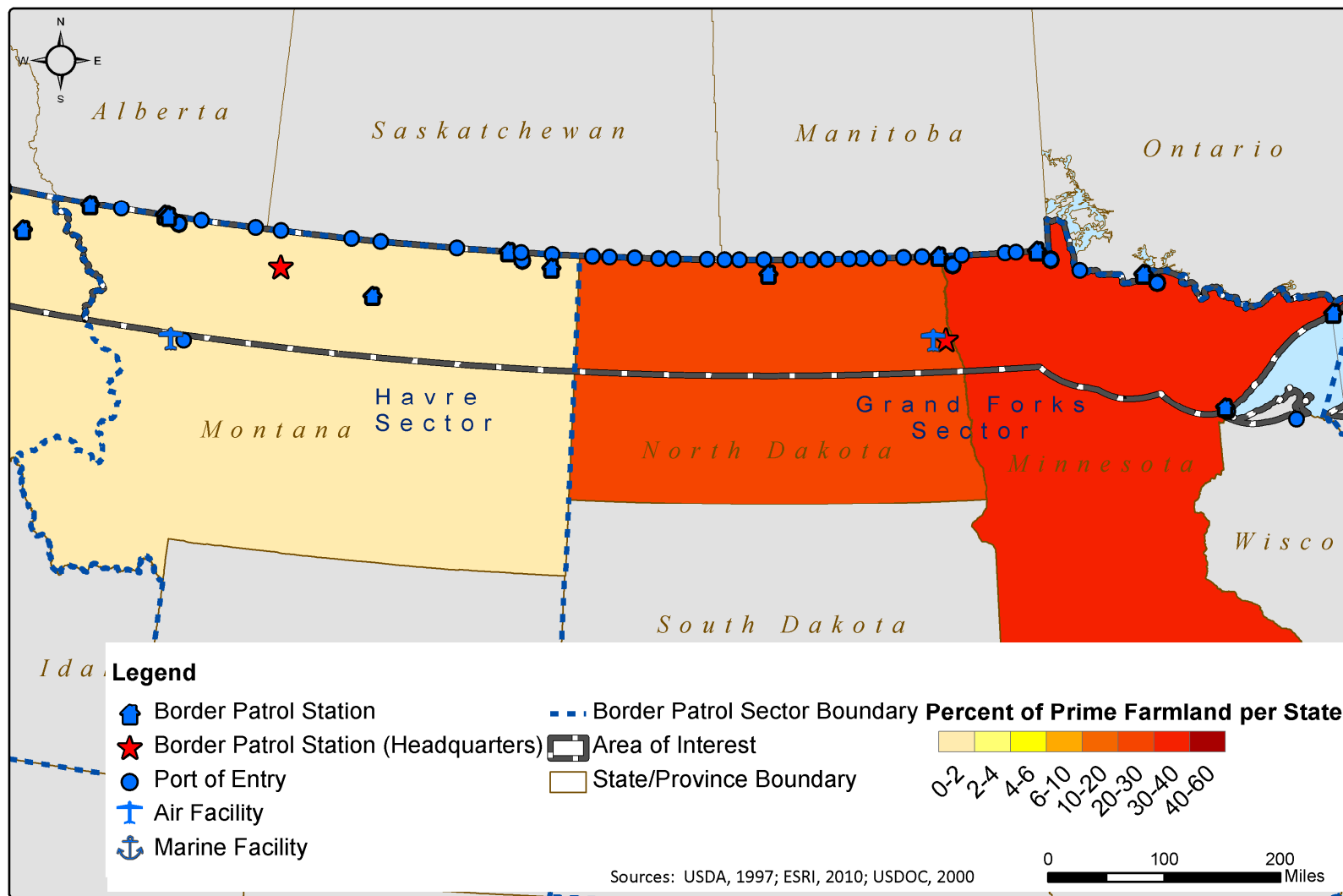


Figure 5.4-8. Prime Farmland in the EOR Region



5.5 WATER RESOURCES

5.5.1 INTRODUCTION

Water resources are distributed widely throughout the 100-mile PEIS study corridor in the states of Minnesota, North Dakota, and Montana east of the Continental Divide. For the purposes of this study, this resource area consists of hydrologic and groundwater resources (aquifers, subterranean watercourses, and recharge areas), surface water and waters of the United States (lakes, ponds, rivers, streams, and channels), and floodplains. Water resources include several beneficial elements, such as water supply quantity and quality, habitat for aquatic organisms, recreation, and flood storage capacity, which are subject to effects from proposed activities.

5.5.2 AFFECTED ENVIRONMENT

5.5.2.1 Groundwater

Groundwater resources are sources of water that result from precipitation infiltrating the ground surface. Groundwater is contained in either confined reservoirs or unconfined aquifers. Where the water table or piezometric surface reaches the ground surface, groundwater will reappear as either streams, surface bodies of water, or wetlands. This exchange between surface water and groundwater is an important feature of the hydrologic cycle.

Groundwater has a variety of beneficial uses. In the EOR Region, as in the rest of the country, groundwater is a primary source for a wide variety of water uses including irrigation, domestic water supply, fish propagation, commercial water supply, industrial uses, and livestock. Table 5.5-1 shows the categories of groundwater use for states within the EOR Region.

Table 5.5-1. Water Use in the EOR Region in 2005

State	Irrigation Use (%)	Public Water Supply (%)	Industrial Use (%)	Rural Domestic, Livestock (%)
Montana	96.5	1.3	1.6	0.6
North Dakota	11.3	5	80.6	2.8
Minnesota	6.0	13.3	74.6	6.2

Source: (Kenny et al., 2009).

Groundwater occurs in porous geologic formation layers called aquifers, which may be large and regional, such as the Ogallala Aquifer that underlies many states in the Great Plains. Aquifers may also be very small and localized.

Five major aquifers of the Northern Great Plains Aquifer System have a coverage area of approximately 300,000 square miles underneath nearly all of North Dakota and half of Montana. These five aquifers include the lower Tertiary, upper Cretaceous, lower Cretaceous, upper Paleozoic, and lower Paleozoic aquifers. Most of the system lies in the structural troughs identified as the Williston Basin (North Dakota) and Powder River Basin (Montana).

Recharge into the aquifer system results mostly from rainfall and snow melt. Nearly all of the recharge occurs through areas of outcrop along aquifers exposed by erosion. Streams also play a

key role in the aquifer recharge. Water from streams percolates through stream beds into the aquifers near outcrops. Some recharge occurs as a result of over-irrigation. This minor form of recharge occurs in only a few places.

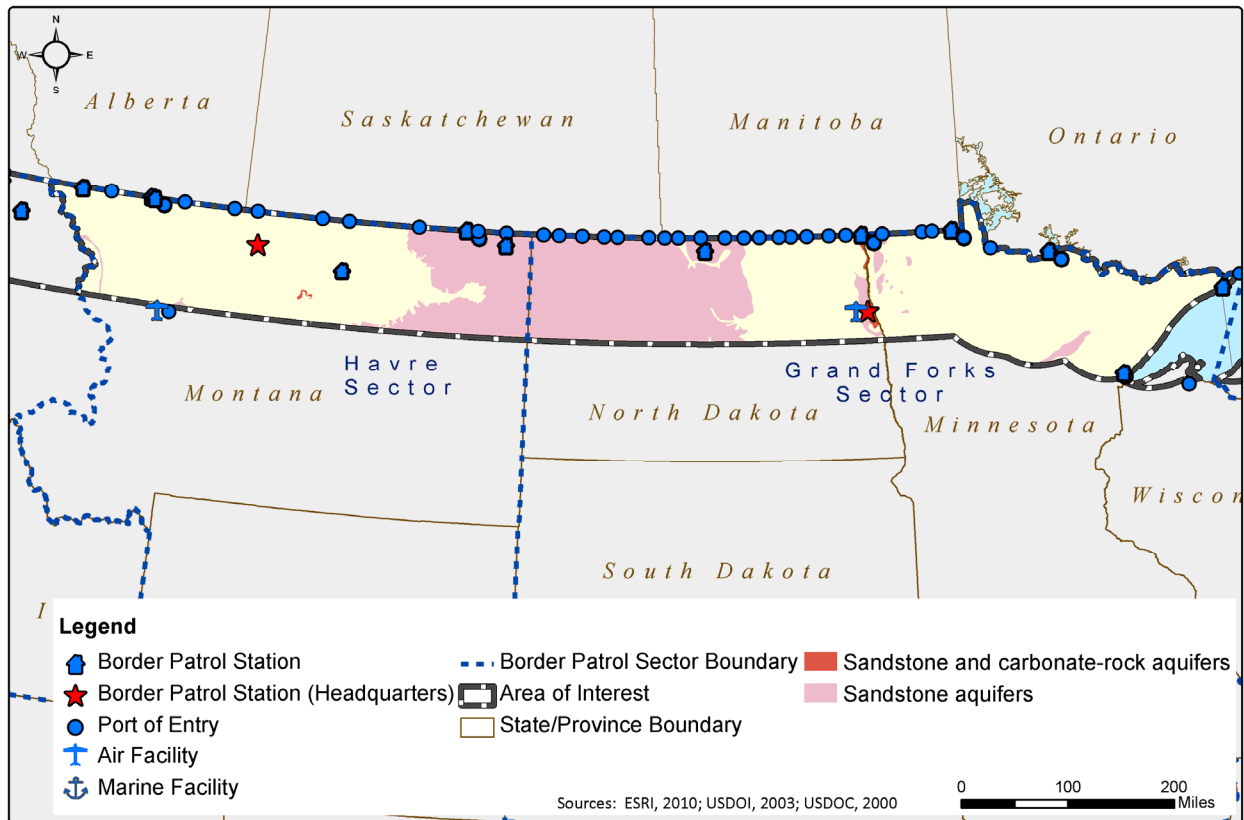
The lower Tertiary and upper Cretaceous aquifers in the system both have local flow systems. Highly mineralized and saline water moving in the aquifer takes short flow paths into lakes, streams, and springs. Other parts of the aquifer system have long, regional flow paths from areas at high altitudes following the dip of the aquifers. A large majority of this water flows through the Williston and Powder River basins along long flow paths that are usually very deep, due to the great depth of the aquifers (Vogelsberg, 2007).

The occurrence of groundwater in Minnesota is related primarily to local geologic conditions that determine the type and properties of aquifers. Within the 100-mile corridor of the EOR Region, the aquifers occur in two general geologic settings. The first is bedrock made of hard and very old igneous and metamorphic rocks. Groundwater in these rocks occurs mostly in fractures that may not yield usable quantities of water. The other setting is unconsolidated sediments deposited by glaciers, streams, and lakes (MDNR, 2011).

The unconsolidated glacial sediments in the northwest are typically clayey and may contain limited-extent surficial and buried sand aquifers. The fractured bedrock here is usually buried deep beneath the glacial sediments and is only locally used as an aquifer (MDNR, 2011).

The unconsolidated sediments in the northeast are thin or absent and are therefore not used or are relatively unimportant, except in major river valleys where sediment thickness is greater. These sediments are underlain by hard fractured bedrock that typically has limited groundwater yield (MDNR, 2011).

Figure 5.5-1. EOR Groundwater Aquifers

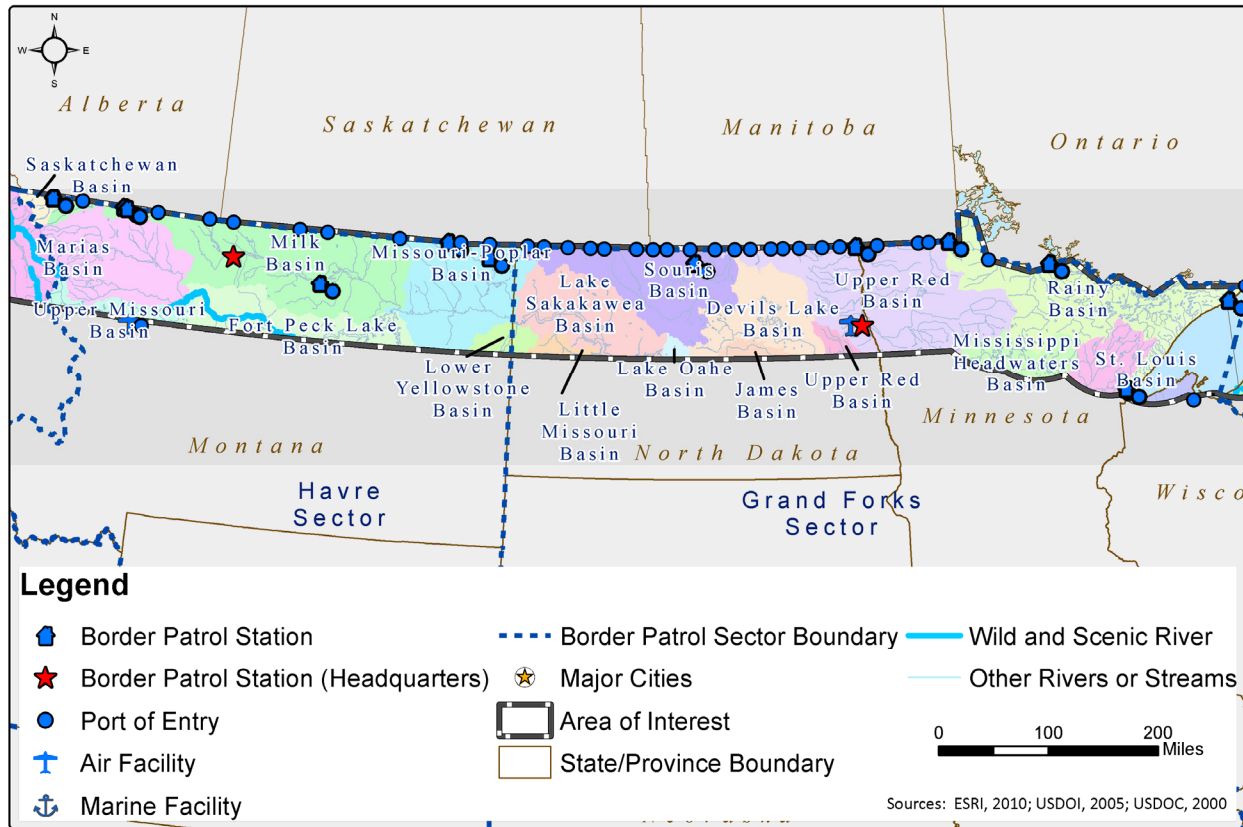


5.5.2.2 Surface Waters and Waters of the United States

Surface water is water found in lakes, rivers, ponds, wetlands, and oceans. It is the most abundant and visible form of water resource, with the greatest variety of uses. In addition to irrigation, domestic water supply, fish propagation, commercial water supply, industrial uses, and livestock, surface water supports recreation, fish and wildlife habitat, hydropower, and transportation. Section 5.3.2.7 provides a discussion of the regional affected environment for aquatic resources. Surface water is often identified by the basin or watershed in which it is found. A watershed is simply the topographic area defined by the drainage of a single body of water.

There is one designated Wild and Scenic River within the 100-mile corridor of the EOR Region: the Upper Missouri River in Montana. Figure 5.5-2 shows this Wild and Scenic River as well as the other river basins found within the 100-mile corridor for the EOR Region.

Figure 5.5-2. River Basins in the EOR Region



The upper Missouri River Basin occupies 56 percent of the state of Montana and all of the area within Montana’s 100-mile corridor for the EOR Region. Water discharged from the state of Montana through this basin averages 7.3 million acre-feet per year. The basin includes the Jefferson, Madison, Gallatin, Dearborn, Smith, Sun, Teton, Marias, Judith, and Musselshell river basins, which enter the river above the Fort Peck Reservoir, and the Milk River, which enters below the reservoir. The river receives about 450,000 acre-feet of water from the Canadian portion of the basin (MRBC, 1981).

There are several reservoirs in the basin. The largest is the Fort Peck Reservoir, which has a storage capacity of 19 million acre-feet. The combined storage capacities of the Canyon Ferry and Elwell (Tiber) Reservoirs are 3.3 million acre-feet. There are 38 reservoirs in the basin with storage capacities exceeding 5,000 acre-feet. In addition, there are several thousand small reservoirs and stock ponds used for irrigation, flood prevention, and stock watering (MRBC, 1981).

The Souris River originates in the Province of Saskatchewan, crosses into the EOR 100-mile corridor in North Dakota, and then crosses into Manitoba before joining the Assiniboine River and ultimately the Red River. Its total length is approximately 435 miles. The river valley is flat and shallow, and its semi-arid prairie is cultivated. Major reservoirs are found in both the U.S. and Canadian portions of the basin, including Boundary, Rafferty, and Alameda Reservoirs in Saskatchewan, and Lake Darling in North Dakota. The basin also includes a number of wildlife refuges and small impoundments along the U.S. portion of the river (IJC, 2011).

The Red River of the North Basin stretches from northeastern South Dakota and west-central Minnesota northward through eastern North Dakota and northwestern Minnesota into southern Manitoba. It ends where the Red River empties into the southern end of Lake Winnipeg (MPCA, 2010). It is an international and multi-jurisdictional area, approximately 45,000 square miles in size and includes the Devil's Lake Basin (3,180 square miles) in North Dakota. The Assiniboine River joins the Red River in downtown Winnipeg. Nearly 40,000 square miles of the basin is in the United States; the remaining 5,000 square miles are in Canada (RRB, 2000).

Figure 5.5-3. Rainy River Basin in Minnesota



The Rainy River Basin has a total area of 27,114 square miles, of which 11,244 square miles (41 percent) are in Minnesota and 15,870 square miles (59 percent) are in Ontario. The Rainy River Basin is home to many forest and water resources. Voyageurs National Park and the Boundary Waters Canoe Area Wilderness (BWCA) are located within the Rainy River Basin, as are several of the state's walleye fisheries and many trout streams. The majority of the land within the Basin is forested. Prominent uses of natural resources in the Basin are forestry, mining, and various forms of recreation (MPCA, 2001).

5.5.2.3 Floodplains

Floodplain management seeks to preserve the flood storage capacity for the river corridor, and this may be achieved in several ways. Local communities often have floodplain management or zoning ordinances that restrict development within the floodplain. The Federal Emergency Management Agency (FEMA) manages the National Flood Insurance Program (NFIP). FEMA also provides floodplain management assistance, including mapping of 100-year floodplain limits, to over 20,000 communities. The information provided by FEMA's flood management program is useful to CBP planners who seek to avoid effects from flooding conditions. This is most relevant for CBP border facilities, such as POEs, that are planned at locations where rivers define the northern border. Pigeon River and Rainy River, both in Minnesota, are rivers of this type in the EOR Region.

5.5.2.4 Transboundary Water Agreements

Boundary Waters Treaty

This treaty provides the basis for resolving disputes involving diverting or obstructing projects impacting water quantity and water across the boundary between Canada and the United States.

It establishes an International Joint Commission with authority to approve projects on either side of the border that would alter transboundary water levels. The treaty was initiated between the United States and Great Britain in 1909 to settle issues of distribution of waters of the St. Mary and Milk Rivers for irrigation purposes between Canada and the United States.

Agreement for Water Supply and Flood Control in the Souris River Basin

In 1989, Canada and the United States entered into an agreement for water supply and flood control in the Souris River Basin. The agreement involved the construction, operation, and maintenance of reservoir projects in Canada that would provide water supply benefits in Canada and flood control benefits in the United States consistent with the International Boundary Waters Treaty Act.

5.6 NOISE

5.6.1 INTRODUCTION

The study area contains many soundscapes and noise-sensitive receptors that could experience impacts due to the alternatives that CBP is considering. However, the mere presence of a noise-sensitive area, such as a national park, residence, or school, does not guarantee that it would be significantly impacted by CBP’s activities or that the overall impacts would be major under the National Environmental Policy Act (NEPA). As with other topics in this PEIS, the programmatic approach to describing noise is driven by the planning objective of the document and the potential for actual impacts.

5.6.2 AFFECTED ENVIRONMENT

Sound is a physical phenomenon consisting of vibrations that travel through a medium like air and are sensed by the human ear. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise, the distance between the noise source and the receptor, the receptor’s sensitivity, and the time of day. Noise is often generated by activities essential to a community’s quality of life, such as construction or vehicular traffic.

Sound varies by both intensity and frequency. Sound pressure level, in decibels (dB), is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Because the human ear responds differently to different frequencies, “A-weighting” was developed to approximate the frequency response of the human ear. The A-weighting curve has been widely adopted for environmental noise measurement and is standard in many sound level meters. The dBA levels of common sounds of daily life are provided in Table 5.6-1.

Table 5.6-1. Common Sound Levels

Outdoor	Sound level (dBA)	Indoor
Snowmobile	100	Subway train
Tractor	90	Garbage disposal
Downtown (large city)	80	Ringling telephone
Freeway traffic	70	TV audio
Normal conversation	60	Sewing machine
Rainfall	50	Refrigerator
Quiet residential area	40	Library

Notes: dBA = A-weighted decibel. Sound level provided is as generally perceived by an operator or a close observer of the equipment or situation listed.

Source: Harris, 1998.

The dBA noise metric describes steady noise levels, although very few noises are, in fact, constant. Therefore, the measurement day-night sound level (DNL) has been developed. DNL is defined as the average sound energy in a 24-hour period with a 10-dB penalty added to the nighttime levels (10 p.m. to 7 a.m.). DNL is a useful descriptor for noise because: (1) it averages ongoing yet intermittent noise, and (2) it measures total sound energy over a 24-hour period. In addition, Equivalent Sound Level (L_{eq}) is often used to describe the overall noise environment. L_{eq} is the average sound level in dB.

5.6.2.1 Regulatory Review

The Noise Control Act of 1972 (PL 92-574) directs Federal agencies to comply with applicable Federal, state, interstate, and local noise control regulations. In 1974, the USEPA provided information suggesting continuous and long-term noise levels in excess of DNL 65 dBA are normally unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals.

State and local governments have the opportunity to regulate noise in their jurisdictions. These regulations are typically guidelines for activities that generate noise and the hours that such activities may be performed. Noise is typically regulated at the local level. A municipal noise ordinance might address the hours that heavy equipment can be operated, the distance heavy equipment can be operated in proximity of noise-sensitive receptors (i.e., schools, hospitals, churches, and residences), and the duration of operation of a single noise source considered to be annoying to the public, such as a diesel-powered generator. Some set specific not-to-exceed noise levels, and others are simple nuisance noise ordinances.

A number of sources of noise may be addressed for rural areas, such as parades, vendors, social engagements with music, and animal noises. Construction noise is typically exempt from noise ordinances in rural areas. In addition, noise regulations in an urban setting take into account the constant noise sources of urban living, such as large heating, ventilation, and air conditioning (HVAC) units, public transportation (trains and buses), emergency vehicles, and heavy traffic. Because urban noise levels are already relatively high, adding a source for an extended period can be highly annoying to some people, hours of construction and operation of heavy equipment are often limited. A typical ordinance in a major city will restrict construction related noise sources between the hours of 10:00 p.m. and 7:00 a.m.

5.6.2.2 CBP Noise Sources

The CBP operates 24 hours a day and 7 days a week. The level of operation can be determined by the measures required to secure the border or necessary for normal facility activities. Table 5.6-2 lists CBP's operations and describes of the noise levels of these activities.

Table 5.6-2. CBP Noise Sources

Operation	Description
Use of mobile surveillance systems (MSS) and surveillance towers	Very little noise is generated by the motor. In remote areas, standby generators may be used to supplement electric power.
Firing ranges and armories	CBP conducts small-arms training at many of its POEs and BPS. Small-arms weapon fire is clearly audible in areas surrounding these ranges during training activities. Usually these activities are limited to daytime hours.
Maritime patrols	Boating noise is typically audible during marine patrols near the shoreline. This noise is widespread and at most locations only sporadic. The watercraft used are generally selected for their noise-suppression features because of the nature of their mission.
Patrols by foot, horse, off-road vehicle (ORV), and snowmobile	Foot and horse patrols are typically quiet. Noise from ORVs and snowmobiles is audible for a mile or more in remote, quiet areas. This noise is widespread and at most locations only sporadic. Areas near POEs and BPSs may have more concentrated noise associated with these activities.
Added and expanded POEs and checkpoints	This action may require construction, which would end at the completion of the project.
Operation of expanded BPS	Additional personnel would be required for addition or expansion of newly constructed facilities. The possibility of canine facilities, firing ranges, and patrol vehicles may be required for operations at some new/expanded facilities.
Aircraft operations	Air operations at CBP are diverse: Helicopters, fixed-wing aircraft, and unmanned aerial systems (UAS) may be used regularly at some locations, although not all aircraft are used simultaneously. Along with regular operations, training exercises are also a source of aircraft noise at some facilities.
Construction activities	CBP conducts both large and small construction projects. Each has some level of heavy equipment and truck transport noise.
Maintenance activities	Maintenance operations at CBP are as diverse as the facilities themselves. The noise associated with these actions can involve training to maintain each category listed above. These noise sources may be one major repair using heavy equipment, monthly routine maintenance, or daily maintenance in the case of dogs, horses, and vehicles.

Source: USDHS, 2010.

5.6.2.3 Non-CBP Noise Sources

The sources of noise along the border in the EOR Region vary greatly, although most of the region is rural or remote. Sounds dominating the rural areas are aircraft overflights, bird and animal vocalizations, and very light traffic. Farming is a major activity in some of the rural areas identified within the project area. Farming is seasonal in this region and may create major sources of noise during planting, and even more during harvest in August through October, when several large combines may operate concurrently. A complete list of counties with their population and current background noise levels can be

found in Appendix O. Notably, these levels are estimated average background levels based on population. Actual site-specific levels may vary base on location.

5.6.2.4 Background Noise Levels

Estimated background noise levels for areas within 100 miles of the border are shown in Figure 5.6-1 and described in Table 5.6-3. The majority of areas within 100 miles of the border would be classified as remote or rural residential and are isolated, far from significant sources of sound.

Townships and small cities are scattered throughout the 100-mile buffer area; however, more remote land areas cover most of the project area. These smaller cities can be described as rural-residential and quiet-commercial.

Figure 5.6-1. Background Noise Levels in the EOR Region

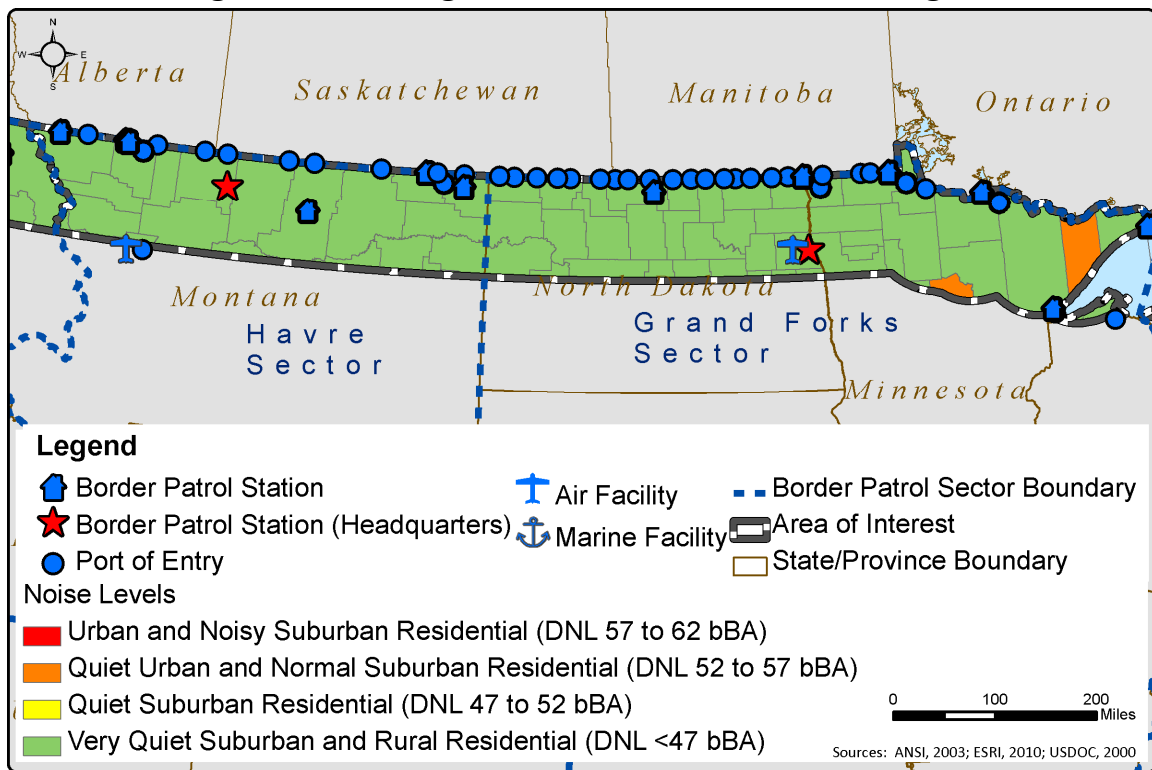


Table 5.6-3. Description of Background Noise Levels

Intensity Level	Example Land Use Category	Average Residential Intensity (people per acre)	Leq (dBA)		
			DNL	Daytime	Nighttime
Low	Quiet suburban residential	2	49	48	42
Medium-low		4	52	53	47
Existing		4.5	52	53	47
Medium	Quiet urban residential	9	55	56	50
Medium-high	Quiet commercial, industrial, and normal urban residential	16	58	58	52
High		20	59	60	54

Source: ANSI, 2003.

5.6.2.5 National Parks

The National Park Service (NPS) recognizes the natural soundscape of each national park unit as an inherent resource, and manages this resource in order to “restore degraded soundscapes to the natural conditions wherever possible, and protect natural soundscapes from degradation due to noise” (USDOJ, 2000). Non-impairment of natural soundscapes is mandated by the Organic Act of 1916 and is part of the NPS management goals and objectives. Each region of the project area has locations of special interest such as national parks. The national parks within 100 miles of the border in the East of the Rockies Region are listed in Table 5.6-4.

Table 5.6-4. National Parks in the EOR Region

State	National Park	Acres
Minnesota	Voyageurs National Park	218,054
Montana	Glacier National Park	1,012,599
North Dakota	Theodore Roosevelt National Park	69,657

Source: USEPA, 2010.

5.7 CLIMATE CHANGE AND SUSTAINABILITY

5.7.1 INTRODUCTION

According to the 2009 U.S. Global Change Research Program (USGCRP) report, “Global Climate Change Impacts in the United States,” documented impacts to the Nation from climate change include increased average temperatures, more frequent heat waves, high-intensity precipitation events, sea-level rise, more prolonged droughts, and more acidic ocean waters, among others. Global and national temperature changes are not distributed evenly. Greater increases occur at high, northern latitudes (CEQ, 2010). In 2010, DHS identified global climate change as a long-term trend and global challenge that threatens America’s national-security interests (USDHS, 2010).

Sustainability and smart growth are approaches to human activity that aim to meet the needs of the present without compromising the ability of future generations to meet their own needs. For CBP, the concepts of sustainability and smart growth include the ability to adjust to changing geopolitical realities while preserving the environment and working to improve the quality of life for American residents and visitors.

To reduce environmental impacts and address the challenge of limited resources, DHS prepared a “Strategic Sustainability Performance Plan” to promote sustainable planning, design, development, and operations. The guidelines aim to decrease energy use, minimize reliance on traditional fossil fuels, protect and conserve water, and reduce the environmental impact of materials use and disposal. CBP’s overarching goal is to size, plan, and carry out proposed development in a manner that is sustainable and that works to preserve and protect limited resources.

5.7.2 AFFECTED ENVIRONMENT

5.7.2.1 Climate Regions of the Northern Border—Overview

The climate along the northern border is characterized by mild summers and very cold to extremely cold winters. January is the coldest month. July is the warmest month throughout the entire project area, and its temperature can fluctuate 20-30 degrees Fahrenheit between day and evening (Idcide, 2010). Precipitation is evenly distributed throughout the year. The average annual precipitation across the entire Canadian border is approximately 31 inches. There are two recognized climatic zones within the EOR Region: Midlatitude Steppe Climate and Highland (Alpine) Climate. A discussion of these zones is provided in the following subsection.

5.7.2.2 Climate in the EOR Region

Midlatitude Steppe Climate

The Midlatitude Steppe Climate is found within temperate regions of the midlatitudes in the interior regions of continents and where air masses are forced to lift up over higher elevations. In the United States, these climates are found in the Great Plains and western states in the rain shadow of major interior mountain ranges at great distances from sources of moisture.

Temperatures in these regions vary with latitude, elevation, and position within the continent. Thus, the northern Great Plains experiences some of the lowest temperatures in this region. Average temperatures increase at the southern limits of this climate region.

The region is classified as semi-arid. Peak precipitation occurs during the summer months (Ritter, 2006).

Highland (Alpine) Climate

The highland climate is found in mountainous regions of the western United States that are above timberline. It is one of the coldest climates in the United States due to high altitude. It is similar to tundra and Arctic climate zones in that it is cold and dry throughout the year. Growing seasons are short—about 180 days—and night temperatures are almost always below freezing. Thinner atmospheres can allow often dangerous exposure to ultraviolet radiation.

5.7.2.3 Climate Change in the United States—Northern Great Plains Regional Assessment

In the Northern and Central Great Plains, average temperatures have risen 2 degrees Fahrenheit (1 degree Celsius) in the past century, with increases of up to 5.5 degrees Fahrenheit (3 degrees Celsius) in parts of Montana, North Dakota, and South Dakota. During the same period, annual precipitation has decreased 10 percent in eastern Montana, North Dakota, eastern Wyoming, and Colorado.

Climate models project continued regional increases in temperature, with the largest increases in the western part of the Great Plains. More warming is expected in winter and spring than in summer and fall. The models project precipitation increases in the Northern Great Plains Region and decreases in the lee areas of the Rocky Mountains. However, overall, rising air temperatures will increase evaporation rates, leading to a net soil-moisture decline for large parts of the region (USGCRP, 2010).

5.8 LAND USE

5.8.1 INTRODUCTION

This section characterizes land uses in the EOR Region and describes some land use on the Canadian side of the border that could be affected by some CBP activities. For example, construction projects that introduce noise and light pollution along the border could affect the suitability of land to support its current or planned use on both sides of the border. Other actions, however, such as direct removal of land from existing uses for CBP-related infrastructure construction, would not affect the Canadian side. USGS and Natural Resources Canada (NRC) define land cover and land use classifications.

5.8.2 AFFECTED ENVIRONMENT

This section describes land use and cover for the EOR Region. The summary tables characterize land use and cover according to the USGS Multi-Resolution Land Characteristics Consortium (MRLC) National Land Cover Database (NLCD) and USGS's Gap Analysis Program (USDOI, 2001; USDOI, 2010). The summary tables for Canada summarize land use and cover according to NRC's Advanced Very High Resolution Radiometer (AVHRR) land cover data and NRC's protected areas data on regions of ten square kilometers or larger compiled by the Canadian Council on Ecological Areas (CCEA) (NRC, 2009; NRC, 2007).

5.8.2.1 Land Cover and Related Land Uses in the EOR Region

The EOR Region covers about 68 million acres, approximately 34.7 percent of the land area of the states in the region (Minnesota, Montana, and North Dakota). The most prevalent land cover type within the study area is agricultural land (39.0 percent total with 35.3 percent in cultivated crops and 3.7 percent in pasture/hay), which makes up the majority of the study area in North Dakota (62.3 percent). Herbaceous land cover (26.1 percent) is the next most prevalent land cover type and covers almost half of the study area in Montana (Table 5.8-1). Forest and water/wetlands together constitute about another quarter of the land cover of the EOR Region (14.8 percent forested and 13.0 percent water/wetlands), but make up three-quarters of the land cover of the study area in Minnesota (43.1 percent forested and 30 percent water/wetlands). Snow/ice/barren land cover (4.5 percent); and developed areas (2.7 percent) are the least prevalent.

The study area includes a high percentage of agricultural lands, specifically cultivated crops, and herbaceous land relative to the entire country, though their relative presence is proportional to the land cover in the states as a whole. The amount of developed land in the study area is low compared to the country, but similar to that of the region's states. The study area has a relatively low percentage of snow/ice/barren and water/wetlands land cover relative to the entire country.

Table 5.8-1. Land Cover for the EOR Region

Border State and Study Area East of the Rockies Region		Total Land Area (thousands of acres)	Developed (%)	Cultivated Crops (%)	Pasture/Hay (%)	Herbaceous (%)	Forested (%)	Water/Wetlands (%)	Snow/Ice/Barren Land** (%)
Minnesota	Study area EOR Region	19,636	2.4	16.8	3.9	1.1	43.1	30.0	2.7
	Statewide	55,687	5.1	38.1	7.8	2.7	26.7	18.2	1.4
Montana (EOR Region)	Study area EOR Region	27,911	1.7	33.9	0.7	48.0	4.2	3.0	8.5
	Statewide	95,383	1.3	14.2	1.8	42.1	22.2	2.4	16.0
North Dakota	Study area EOR Region	20,538	4.3	54.7	7.6	20.3	2.1	10.2	0.9
	Statewide	45,227	4.0	46.6	8.4	29.7	1.7	8.3	1.3
EOR Region	Study area EOR Region	68,085	2.7	35.3	3.7	26.1	14.8	13.0	4.5
	Selected states	196,298	3.0	28.4	5.0	28.1	18.8	8.2	8.5
Total United States***		2,053,000	5.0	21.9	14.1	31.2	27.7		

* The EOR Region includes all areas 100 miles south of the U.S.-Canada border in Minnesota, North Dakota, and the portion of Montana east of the Rocky Mountains.

** “Barren Land” includes the NLCD land classification “Shrub/Scrub.”

*** Data for the United States as a whole are shown as calculated in USEPA, 2008. This report sums land cover categories for cultivated crops and pasture/hay to account for total agricultural cover, and sums snow/ice, barren, and wetlands land cover. This table aggregates the USEPA, 2008 calculation of water and shrub/scrub land cover with their category of snow/ice/barren/wetlands, though water alone covers 1.6 percent of the land area in the United States, while snow/ice/barren/wetlands cover 5.7 and shrub/scrub covers 20.4 percent.

Source: (USDOJ, 2001.).

Figures 5.8.1 and 5.8.2 show maps of land cover and use in the EOR region.

Recreation also occurs on other land not specifically designated for the activity and land other than that profiled in Section 5.17 (Recreation), which focuses specifically on major Federal recreation sites. For example, wildlife viewing or hiking may be permitted on some conservation or natural areas in the study area. In addition, hunting and snowmobiling may occur on public or private forested land areas. Absent information on the specific distribution of recreational activities across the landscape, this analysis relies on the above categories of land as low-end estimates of the area in which recreation is likely taking place.

Recreational land use in the EOR Region accounts for 848,000 acres or 1.2 percent of the total land area, which is lower than the share of recreational land use for the country as a whole (10.1 percent) (Table 5.8-2). NPS manages the most land in the region used, in part, for recreational purposes, just over half of the total recreational acres. The majority of these NPS-managed lands are in Montana. Much of the NPS land in the EOR Region is in national parks (Voyageurs National Park in Minnesota, Theodore Roosevelt National Park in North Dakota, and Glacier National Park in Montana). Section 5.17 discusses the potential impacts of CBP activities on lands designated and otherwise used for recreational purposes. Appendix I provides the profiles of major Federal U.S. and Canadian protected and set-aside areas often used for recreational purposes in the study area.

Conservation areas in the EOR Region account for about 6.4 million acres or 9.4 percent of total land area (Table 5.8-3), slightly less than the share of conservation land in the country as a whole (14.6 percent), but similar to the amount of conservation land in the region's states (8.8 percent). The largest conservation areas that overlap the EOR Region are the Boundary Waters Canoe Area in Minnesota (managed by the USFS) and areas of state trust land in Montana held by the State Land Board.

Table 5.8-2. Recreational Land Use in the EOR Region

Border State and Study Area East of the Rockies Region		Recreational Land Use** (thousands of acres)	Share of Recreational Land Use (%)
Minnesota	Study area EOR Region	205	1.0
	Statewide	2,486	4.5
Montana (EOR Region)	Study area EOR Region	514	1.8
	Statewide	14,344	15.0
North Dakota	Study area EOR Region	129	0.6
	Statewide	187	0.4
EOR Region	Study area EOR Region	848	1.2
	Selected states	17,018	8.7
Total United States		208,088	10.1

* The EOR Region includes all areas 100 miles south of the U.S.-Canada border in Minnesota, North Dakota, and the portion of Montana east of the Rocky Mountains.

* Recreation lands are all lands clearly identified by USGS title of land type as intended for recreation (e.g., parks, scenic areas, or recreation areas).

Source: (USDOJ, 2010).

Table 5.8-3. Conservation Land Use in the EOR Region

Border State and Study Area East of the Rockies Region		Conservation Land Use (thousands of acres)	Share of Conservation Land Use (%)
Minnesota	Study area EOR Region	2,148	10.9
	Statewide	2,927	5.3
Montana (EOR Region)	Study area EOR Region	3,749	13.4
	Statewide	11,800	12.4
North Dakota	Study area EOR Region	470	2.3
	Statewide	2,493	5.5
EOR Region	Study area EOR Region	6,367	9.4
	Selected states	17,220	8.8
Total United States		300,149	14.6

* The EOR Region includes all areas 100 miles south of the U.S.-Canada border in Minnesota, North Dakota, and the portion of Montana east of the Rocky Mountains.

* Conservation lands are all lands clearly identified by USGS title of land type as intended for conservation (e.g., reserves, preserves, conservation land, natural areas).

Source: (USDOJ, 2010).

5.8.2.2 Land Cover and Related Land Uses in the Areas North of the EOR Region

This section considers resources north of the border from the EOR Region extending 2 miles into Canada and covering about 1.1 million acres (Table 5.8-4). Over 80 percent of this area is agricultural (38.1 percent cultivated crops and 43.7 percent pasture/hay). Agricultural land is substantially more prevalent in this area than in the related provinces (less than 30 percent agricultural). The next most common land cover type is forested (15.9 percent), which is substantially less widespread than in each of the selected provinces and less prevalent compared to the country as a whole. Developed areas make up an inconsequential portion of the study area. Whereas very little snow/ice/barren land cover occurs in Canada just north of the border from the EOR Region, 38.2 percent of land in all of Canada is classified as snow/ice/barren, due to the prevalence of tundra in the country's northern reaches. Water/wetlands are also less prevalent in the study area compared to the provinces and to the country as a whole.

Table 5.8-4. Land Cover in Canada North of the EOR Region

Border Province and Study Area EOR Region		Total Land Area (thousands of acres)	Developed (%)	Cultivated Crops (%)	Pasture/ Hay (%)	Forested (%)	Water/ Wetlands (%)	Snow/Ice/ Barren (%)
Alberta	Study area EOR Region	215	0.0	52.7	33.2	9.4	0.0	4.7
	Province	158,076	0.1	11.6	19.6	64.1	2.4	2.2
Manitoba	Study area EOR Region	369	0.0	1.5	55.9	38.6	4.0	0.0
	Province	141,884	0.1	1.2	10.3	54.2	11.6	22.7
Saskatchewan	Study area EOR Region	479	0.0	59.8	38.9	1.3	0.0	0.0
	Province	156,191	0.0	9.4	33.0	47.2	4.9	5.5
Selected provinces	Study area EOR Region	1,063	0.0	38.1	43.7	15.9	1.4	1.0
	Total for selected provinces	456,150	0.1	7.6	21.3	55.2	6.1	9.7
Total Canada		2,071,476	0.1	1.7	6.0	46.7	7.3	38.2

* The areas north of the EOR Region in Canada include the portions of Alberta, Manitoba, and Saskatchewan provinces extending 2 miles north of the U.S.-Canada border.

Source: (NRC, 2009).

As Table 5.8-5 indicates, recreational land use north of the border from the EOR Region accounts for about 52,000 acres, or 4.9 percent of the total land area, which is comparable to the proportion of recreational land use in Canada as a whole (6.1 percent).

In Alberta, the share of recreational land use in the areas north of the border from the EOR Region is greater than recreational land use in the province as a whole; the opposite is true in Manitoba. The majority of the recreational land area is in national parks (Grasslands National Park and Waterton Lakes National Park).

Conservation areas in the areas north of the EOR Region make up about 139,000 acres, or 13.1 percent of the total study area, which is greater than the proportion of conservation areas in Canada as a whole (4.7 percent). The proportion of conservation land in the areas north of the border from the EOR Region is more than four times that of the province (Table 5.8-6).

Table 5.8-5. Recreational Land Use in Canada North of the EOR Region

Border Province and Study Area EOR Region		Recreational Land Use (thousands of acres)	Share of Recreational Land Use (%)
Alberta	Study area EOR Region	24	10.9
	Province	10,782	6.8
Manitoba	Study area EOR Region	11	2.9
	Province	10,106	7.1
Saskatchewan	Study area EOR Region	18	3.7
	Province	4,187	2.7
Selected provinces	Study area EOR Region	52	4.9
	Total for selected provinces	25,075	5.5
Total Canada		126,389	6.1

* Areas north of the EOR Region in Canada include the portions of Alberta, Manitoba, and Saskatchewan provinces extending two miles north of the U.S.-Canada border.

Source: (NRC, 2007).

Note: Recreation Lands were identified as all lands clearly identified in the NRC dataset as intended for recreation, for example, described as parks or recreation areas.

Table 5.8-6. Conservation Land Use in Canada North of the EOR Region

Border Province and Study Area EOR Region		Conservation Land Use (thousands of acres)	Share of Conservation Land Use (%)
Alberta	Study area EOR Region	21	9.7
	Province	868	0.5
Manitoba	Study area EOR Region	1	0.3
	Province	3,449	2.4
Saskatchewan	Study area EOR Region	117	24.4
	Province	8,782	5.6
Selected provinces	Study area EOR Region	139	13.1
	Total for selected provinces	13,099	2.9
Total Canada		98,234	4.7

* Areas north of the EOR Region in Canada include the portions of Alberta, Manitoba, and Saskatchewan provinces extending two miles north of the U.S.-Canada border.

Source: (NRC, 2007).

Notes: Conservation lands are all lands clearly identified in the NRC dataset as intended for conservation; for example, described as reserves, preserves, protected areas, habitat areas.

Figure 5.8-1. Land Cover in the EOR Region

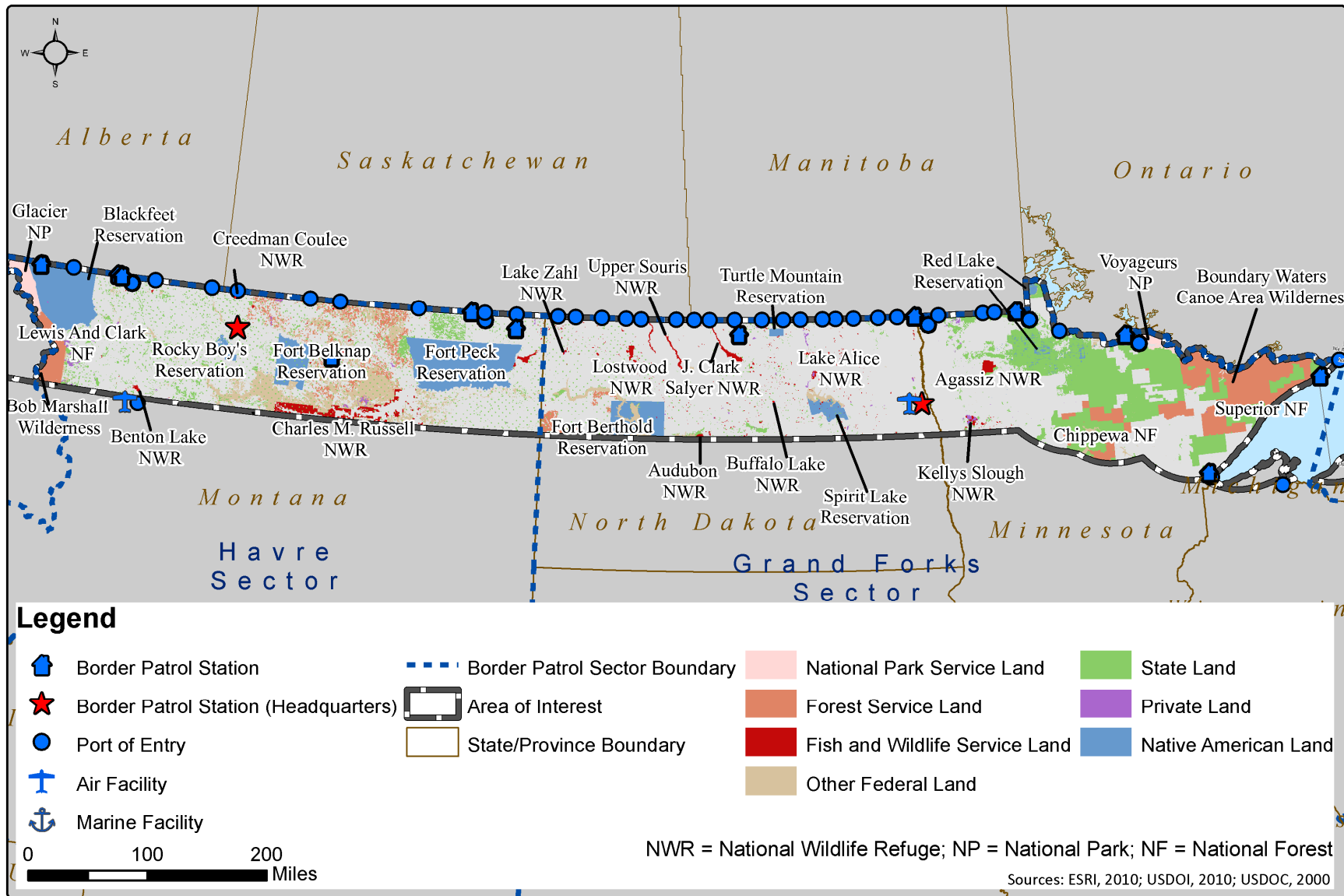
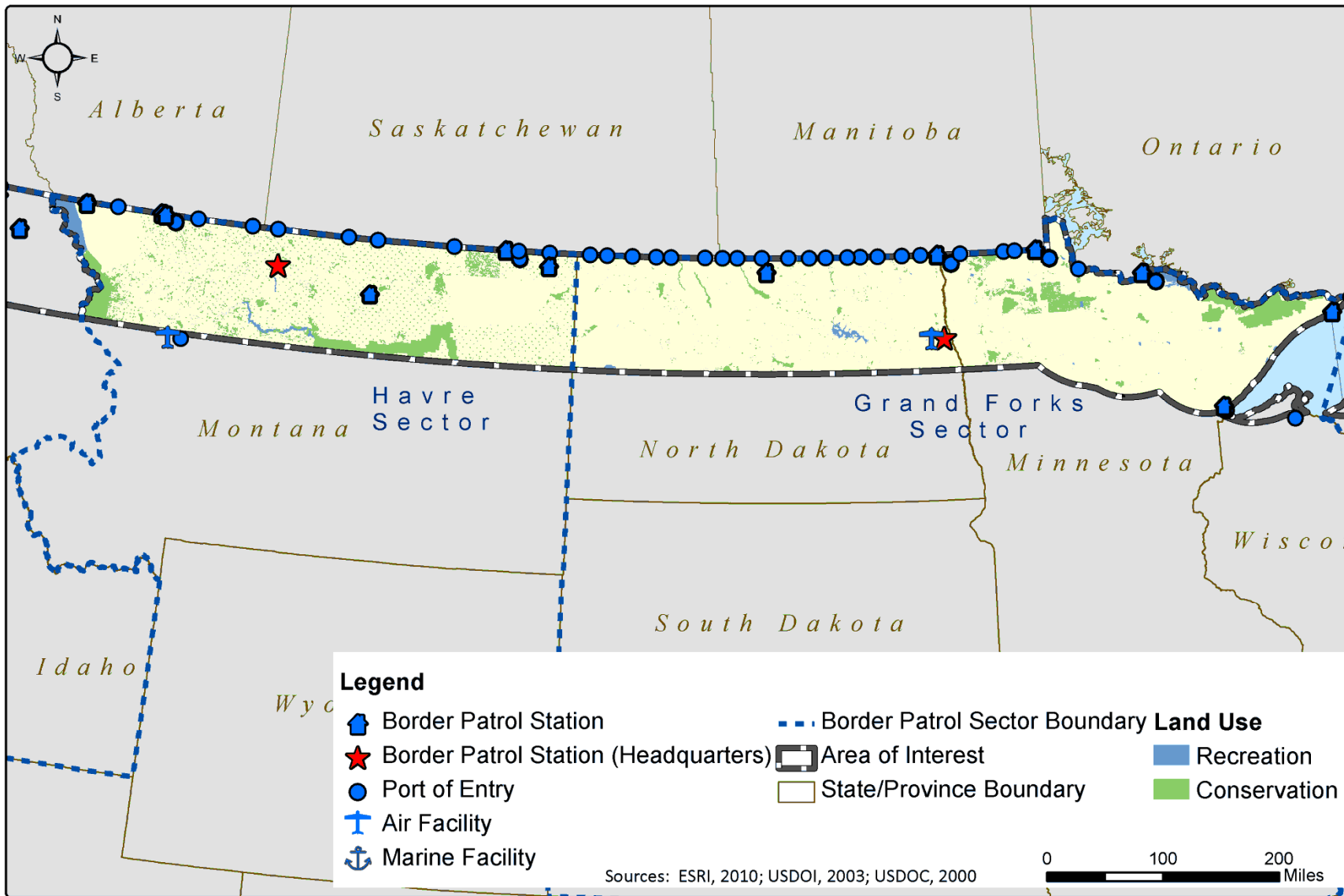


Figure 5.8-2. Land Use in the EOR Region



5.8.2.3 Land Ownership in the EOR Region in the United States

The major categories of land ownership in the EOR Region are Federal (13.3 percent), state (12.5 percent), tribal (10.2 percent), and minimal private lands (0.3 percent) (Table 5.8-7). Federal lands include national parks, national forests, conservation areas, and military lands managed by the Bureau of Land Management (BLM), Bureau of Reclamation (BOR), Department of Defense (DOD), Department of Energy (DOE), USFWS, USFS, NPS, or are classified as “other Federal land.” State lands are properties owned by state departments of conservation, departments of land, departments of natural resources, departments of transportation, fish and wildlife, historical societies, state land boards, parks and recreation, or classified as “other state land.” Tribal land accounts for regions owned by Native American Tribes and are recognized by the Federal Government. Federal laws and the Constitution grant Tribal Nations greater sovereignty than that granted to state or local governments. Private lands are those owned by the Audubon Society, the Rocky Mountain Elk Foundation, The Nature Conservancy (TNC), private universities, other conservation groups, or private non-profits, or classified as “private conservation easement/conservation deed restriction,” “private conservation land,” or “private institution–managed for biodiversity.”

The EOR Region includes about 9.1 million acres of Federal land, accounting for 13.3 percent of land ownership. The USFS manages the majority of Federal land in this region as national forests and national grasslands. In the study area in Montana, the BLM manages about 50 percent of Federal lands, 1.4 million acres of which is within the BLM’s Malta District.

Approximately 8.5 million acres of state land sit within the EOR Region, accounting for 12.6 percent of land ownership which is greater than the national average ratio for state land ownership. The majority of these lands—6.4 million acres—are state parks and wildlife management areas in Minnesota. Another 1.8 million acres are state trust land in Montana.

In the EOR Region, tribal lands account for about 6.2 million acres. Tribal land within the EOR Region in Montana includes the Blackfeet Reservation, Fort Belknap Reservation, Fort Peck Reservation, and Rocky Boy’s Reservation (Figure 5.8-3). The Blackfeet Reservation (1.5 million acres) lies on the border and contains the Piegan POE and the De Bonita POE. In North Dakota, the Spirit Lake Reservation, the Turtle Mountain Reservation, and almost all of the Fort Berthold Reservation are within the EOR Region. Tribal land within the Minnesota area of study includes the Red Lake Reservation, the Bois Forte Reservation, the Grand Portage Reservation, and most of the Leech Lake Reservation. Small portions of the White Earth and Fond du Lac Reservations skirt the area of study in Minnesota. The proportion of area that is tribal land is greater in the study area (10.2 percent) than in the selected states (6.5 percent) or in the country as a whole (4.9 percent). At nearly 2.1 million acres, the Fort Peck Reservation in Montana is the largest area of tribal lands in the region. For a more complete discussion of Native American resources along the northern border in the EOR Region, refer to Section 5.11.

The EOR Region includes about 210,000 acres of land area classified as private. The majority of this private land occurs in Montana (almost 200,000 acres) and is under state-managed conservation easements. The Nature Conservancy also own portions of this land in the region.

The share of private land ownership in the study area is less than that for the country as a whole. Figure 5.8-3 maps land ownership in the EOR Region.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

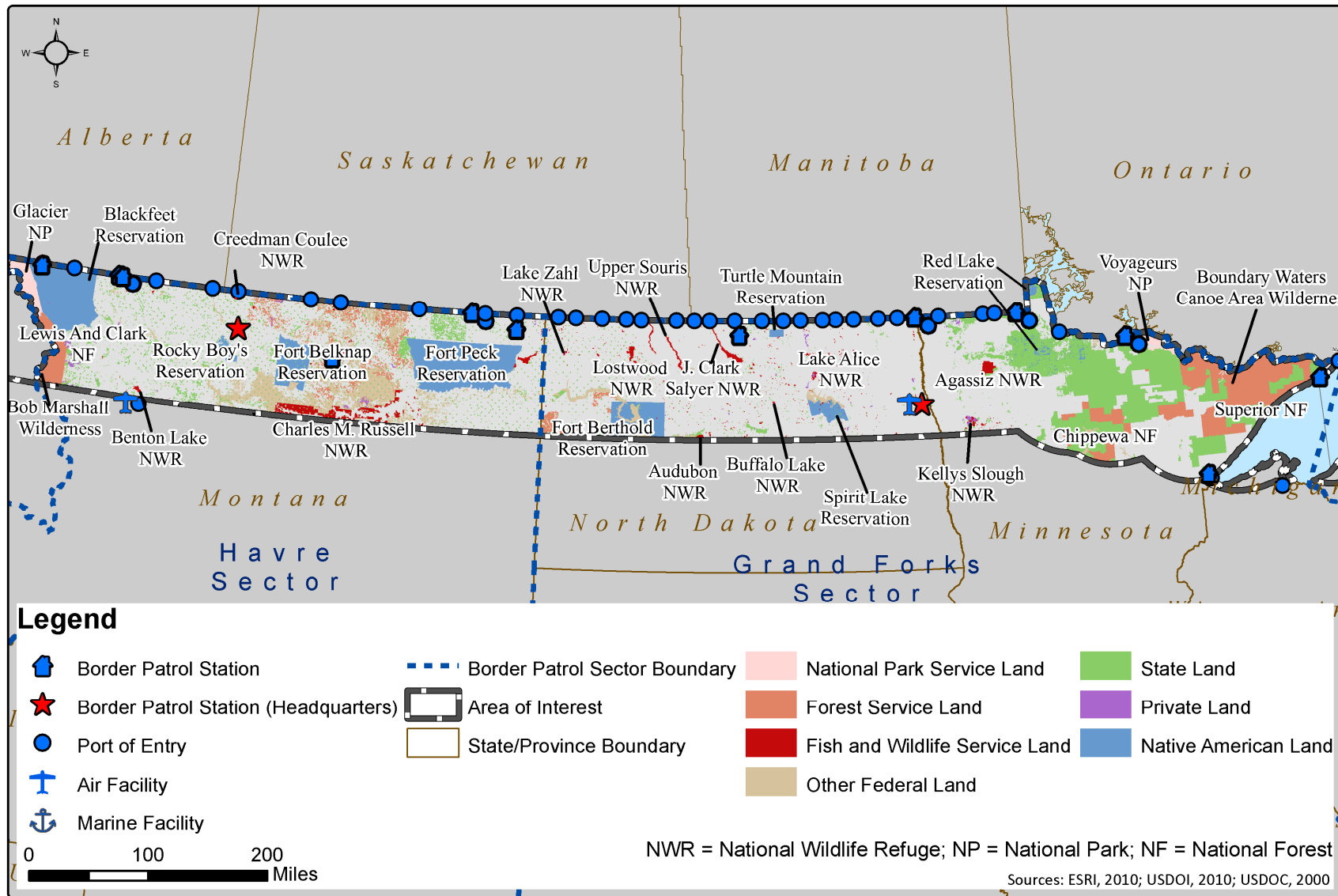
Table 5.8-7. Land Ownership in the EOR Region*

Border State (Thousands of Acres)		Federal Land		State Land		Tribal Land		Privately Held Conservation Land		Total Conservation & Tribal Lands	
		Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area
Minnesota	Study Area	3,262	16.6	6,219	31.6	1,362	6.9	52	0.3	10,895	55
	19,651										
	Statewide	4,042	7.9	9,115	17.9	2,163	4.2	253	0.5	15,573	31
	50,961										
Montana (EOR)	Study Area	4,730	16.9	1,905	6.8	4,382	15.7	123	0.4	11,140	40
	27,988										
	Statewide	26,975	29	5,646	6.1	8,248	8.9	2,998	3.2	43,867	47
	93,149										
North Dakota	Study Area	1,069	5.2	424	2.1	1,239	6.0	35	0.2	2,767	14
	20,558										
	Statewide	4,327	9.8	941	2.1	1,780	4.0	73	0.2	7,121	16
	44,161										
EOR Region	Study Area	9,061	13.3	8,548	12.5	6,983	10.2	210	0.3	24,802	36
	68,128										
	Selected States	35,344	18.8	15,702	8.3	12,191	6.5	3,324	1.8	66,561	35
	188,271										
Total United States		657,885	32	189,314	9.2	100,574	4.9	15,918	0.8	963,691	47

* The EOR Region includes all areas 100 miles south of the U.S.-Canada border in Minnesota, North Dakota, and the portion of Montana east of the Rocky Mountains. Land ownership estimates do not sum to 100 percent for a given area due to gaps in information regarding land ownership within border states. Sources: (USDOJ, 2010), (USDOC, 2012).

NOTE: For a complete discussion of Native American resources along the northern border, refer to Section 5.11 of this report.

Figure 5.8-3. Land Ownership in the EOR Region



5.8.2.4 Land Ownership in Canada North of the EOR Region

Federal and provincial land ownership is characterized using the protected-areas data compiled by NRC. As a result, ownership (excluding aboriginal lands) is only determined for about 10.8 percent of the entire land area of the country. The following discussion, therefore, reflects only the relatively small portion in Canada for which landowners are identified.

The share of Federal land ownership in Canada north of the EOR Region is more than double that for the country as a whole (10.0 percent in the region versus 4.8 percent for the country) (Table 5.8-8). The region also contains a considerably higher proportion of Federal land compared to the selected provinces. The proportion of provincial ownership north of the EOR Region is greater than that for the country.

Aboriginal land is characterized using NRC data of Indian reserves, land claim settlement lands, and related aboriginal designations. The share of aboriginal land in areas north of the EOR Region (0.7 percent) is less than the share of aboriginal land countrywide (7.4 percent) (Table 5.8-9).

Table 5.8-8. Land Ownership in Canada North of the EOR Region

Border Province and Study Area EOR Region		Federal Land		Provincial Land	
		Total Land Area	Share (%)	Total Land Area	Share (%)
Alberta	Study area EOR Region	23.5	10.9	21.0	9.7
	Province	4,887.6	3.1	6,762.4	4.3
Manitoba	Study area EOR Region	0.0	0.0	11.9	3.2
	Province	3,598.9	2.5	9,956.6	7.0
Saskatchewan	Study area EOR Region	83.0	17.3	51.4	10.7
	Province	3,045.2	1.9	9,923.7	6.4
Selected provinces	Study area EOR Region	106.5	10.0	84.3	7.9
	Total for selected provinces	11,531.7	2.5	26,642.7	5.8
Total Canada		98,843.7	4.8	125,778.8	6.1

* Areas north of the EOR Region in Canada include the portions of Alberta, Manitoba, and Saskatchewan provinces extending two miles north of the U.S.-Canada border.

Source: (NRC, 2007).

Notes: Federal lands are all lands with the designation national park, migratory bird sanctuary, national wildlife area, Prairie Farm Rehabilitation Administration, and marine protected area. Provincial lands are all lands designated under provincial administration, which often includes funding and support from Federal agencies.

Table 5.8-9. Aboriginal Land in Canada North of the EOR Region

Border Province and Study Area EOR Region		Aboriginal Lands (thousands of acres)	Share (%)
Alberta	Study area EOR Region	1	0.2
	Province	1,920	1.2
Manitoba	Study area EOR Region	7	1.8
	Province	1,102	0.8
Saskatchewan	Study area EOR Region	0	0.0
	Province	2,385	1.5
Selected provinces	Study area EOR Region	7	0.7
	Total for selected provinces	5,407	1.2
Total Canada		152,965	7.4

* Areas north of the EOR Region in Canada include the portions of Alberta, Manitoba, and Saskatchewan provinces extending two miles north of the U.S.-Canada border.

Source: (NRC, 2010).

5.8.2.5 Land Use Management

In the EOR Region, access to Forest Service roads is an important factor in maintaining situational awareness throughout the border area. Access to these areas to secure lookouts or conduct surveillance is balanced with land management activities intended to ensure habitat protection for public trust species. The following areas pose specific access challenges to CBP: Glacier National Park, Superior National Forest, Voyageurs National Park, and Boundary Waters Canoe Area (a wilderness area).

5.8.2.6 Consistency with Enforceable Policies of the Coastal Zone Management Act

In the EOR Region, CBP activities in Minnesota have coastal zones relevant to the northern border and must comply with appropriate state “enforceable policies” outlined generally below. Most CBP activities in the state coastal zones are anticipated to be in the negligible to moderate range and would be expected to comply with the Federal consistency requirements and procedures established by the individual states (identified below for Minnesota).

Minnesota

Minnesota’s northern border coastal zone is divided into three areas: the portion of the St. Louis River in Carlton County, south of Duluth; the City of Duluth and surrounding areas of urban growth and expansion to the north and west; and the region between the Duluth City limits north to the Canadian border, also known as the “North Shore,” which includes portions of St. Louis, Lake, and Cook Counties (USDOC, 2010). The Department of Natural Resources (DNR) is designated the lead agency for Minnesota’s Lake Superior Coastal Program. A coalition of state resource agencies, including the Pollution Control Agency, Board of Water and Soil Resources, Department of Health, and Department of Agriculture work with DNR to coordinate the administrative and implementation functions of the program (MDNR, 1999).

Actions of Federal agencies, including direct activities, Federal licenses, permits, or other required Federal approvals to non-Federal applicants, and financial assistance programs to state agencies and local governments must also be consistent with the enforceable state policies of Minnesota's Lake Superior Coastal Program. Enforceable state policies of this program include:

- Coastal land management (shoreland development, floodplain management;
- Coastal shoreline erosion (county, municipal, and township planning and development);
- Coastal water management (Public Waters Work Permit Program and wetlands programs);
- Air and water quality (air quality, water quality, groundwater protection, water supply, and waste management);
- Fish and wildlife management;
- Forest management;
- Mineral resources;
- Energy facility siting; and,
- Environmental review (Minnesota Environmental Rights Act, Minnesota Environmental Policy Act, and Environmental Review Program).

The procedures for demonstrating consistency with the enforceable policies of the Minnesota Lake Superior Coastal Program are found in its "Model Federal Consistency Determination for Federal Agencies" (MDNR, 1999).

5.9 AESTHETIC AND VISUAL RESOURCES

5.9.1 INTRODUCTION

Visual resources include those features that define the visual character of an area—natural features, vistas, or viewsheds, and even urban or community visual characteristics that include architecture, skylines, or other characteristics. Visual resources and aesthetics are important due to their unique qualities and the responses they inspire in humans. This section provides the analytical tools to conduct a precise visual impact assessment for future site-specific projects or activities; it also offers examples of the types of landscapes that exist along the border. It analyzes how, in which settings, to what extent, and with which viewer groups the various CBP activities might create visual impacts. It does not characterize every potential vista or visual landscape along the entire northern border, but does provide guidelines for minimizing, mitigating, or avoiding such impacts.

The Visual Resource Management (VRM) system developed by BLM defines the visual sensitivity of an area and the potential effect of a project on a visual resource. It assigns ratings of Classes I to IV based on combinations of scenic quality, sensitivity levels, and distance zones (for the Framework for Characterizing Resource Impacts on the northern border, see Chapter 3, Section 3.9).

5.9.2 AFFECTED ENVIRONMENT

5.9.2.1 Affected Landscapes

Four broadly defined landscapes occur within the potential settings of the proposed project. These four landscapes are: natural, rural, urban, and industrial (USDOT, 1999) and are briefly described below.

Natural Landscapes

More sparsely vegetated mountainous areas in the western United States are dominated by their geologic landforms, such as rock outcroppings, ridges, escarpments, and plateaus. Even where significant topographic relief occurs, the heavily forested landforms are undistinguished and tend to confine a viewer's attention to the immediate foreground. Many of these landscapes would fall into the "A" category for scenic quality and thus be sensitive to visual modifications. In locations like Voyageurs National Park in Minnesota, of which one third is water and exposed Precambrian rocky outcrops characterize the park's terrain, the natural lightscape is undisturbed, making for excellent astronomical viewing.

Glacier National Park, Montana



Source: (USDOJ, 2010a).

Rural Landscapes

Rural landscapes include features such as croplands, orchards, fields, fences, and farm-related structures (USDOT, 1999). While border POEs and BPSs along the U.S.–Canadian border tend to be in rural, less densely populated areas well outside of major cities, the majority of the population in the study area lives in larger population centers. Agricultural areas are predominantly flat or gently rolling hills; these landscapes tend to be restricted to valleys and lowlands in the EOR Region and are not typically found at higher elevation or in areas with complex topography. A significant portion of the land in the EOR Region is used for agriculture, especially in Montana and North Dakota, which are 70 percent and 62 percent agriculture, respectively. Native vegetation grows in confined areas where land is steep or soils are unproductive. Views may extend for some distance, with vertical elements typically consisting of relatively low farm buildings, silos, water towers, utility poles, and trees. Distinct geometric patterns, such as rectangular or circular fields and property boundaries divided by section lines, may characterize the landscape. Towns are small and have relatively low skylines. In general, the few structures in such areas can be of aesthetic interest. Agriculture greatly influences the landscape. Land-use groups can sometimes categorize different agriculture practices. Other rural areas include forests or desert, which are influenced by roadways, the presence of small towns, and land-clearing activities, such as timber harvesting, strip mining, ski areas, and large reservoirs.

Urban Landscapes

These landscapes represent only a fraction of the Nation's entire land area but are the dominant visual environment of roughly three-quarters of the American population (USDOT, 1999). Residential and suburban areas represent much of the urban landscape, with centralized primary commercial centers and business districts defining the most dominant visual characteristics. The scale of development in major urban areas is large and dominated by structures, highways, infrastructure, and trees. Urban landscapes can absorb a great degree of visual change because they already contain commanding visual features. Most urban landscapes are clustered around areas of usable natural resources, such as waterways and agricultural areas. In the EOR Region, most major cities, such as Duluth, Minnesota and Havre, Montana, are not adjacent to the border. Although these urban areas are not the most significant features in the EOR Region, they still represent the visual setting for the largest portion of the population. Here, as well as along other parts of the border, the POEs and BPSs are more often in rural areas. These landscapes already contain sizable amounts of infrastructure and would be able to absorb a greater amount of change and more additions to the visual environment than rural or natural landscapes. The largest concern in urban landscapes is the number and sensitivity of the visual user groups (see Section 5.9.2.3).

Industrial Landscapes

Heavy and light industrial landscapes tend to be scattered, situated in specific zones or districts, such as along roads and waterfronts or near airports. Unlike the Great Lakes Region, there are relatively few industrial landscapes along the northern border in the EOR Region. Such landscapes can absorb the greatest degree of visual change, due to existing dominant visual features and their generally low scenic quality ("C" category). These landscapes are usually classified as Visual Resource Class IV in which major changes to the visual environment can occur without major impacts to the visual environment or viewer groups.

Industrial Plant on River



Source: (USDOJ, 2008).

5.9.2.2 Areas with High Visual Sensitivity

The EOR Region has a larger amount of public lands sensitive to visual impacts compared with the other regions. Montana has about 1.2 million acres of recreational land in the study area, while 68.8 percent of the North Dakota study area is recreational land. Montana has about 5.1

million acres of conservation land in the study area (some of which is also considered recreational land), which may be negatively affected by changes in the visual environment.

Theodore Roosevelt National Park, North Dakota



Source: (USDOJ, 2011a).

5.9.2.3 Affected User Groups

Specific viewer groups within the study area can gauge viewer sensitivity and assure the selection of appropriate representative viewpoints during the visual impact evaluation. While POEs and BPSs along the U.S.–Canadian border are generally in rural, less densely populated areas outside of major metropolitan areas, most of the population in the study area lives in larger population centers. The following four categories of viewer/user groups were identified within the study area.

Commuters and Through Travelers

These viewers pass through the study area on a regular basis in automobiles on their way to work or other destinations. On most roads within the study area, the views are from street level. Typically, drivers have limited views of CBP infrastructure and activity, except at locations where CBP actions cross the road. Commuters and through travelers are typically moving, have a relatively narrow visual field due to roadside vegetation or structures, and generally are preoccupied with traffic and navigating the roadways. For these reasons, commuters and through travelers’ perception of (and sensitivity to) visual quality and changes in the visual environment are likely to remain relatively low. Passengers in moving vehicles, however, have greater opportunities for off-road views of a project than do drivers.

Local Residents

These individuals may view the proposed actions from stationary locations, such as yards and homes, and while driving along local roads. The sensitivity of residents to visual quality varies and may be tempered by a viewer’s exposure to existing CBP actions and infrastructure and other visually varied features already in existence. Presumably most residents will be highly sensitive to changes in the landscape viewable from their homes and neighborhoods. CBP also considers visual impacts to Native American sacred sites or trust resources before carrying out a project.

Business Employees

These individuals work at local businesses, primarily in the commercial portions of the study area. Business employees will generally experience limited views of the alternative actions except at road crossings while driving to work or where CBP infrastructure and activity occurs near their place of employment. Most business employees work in one and two-story structures that may or may not have outside views. Those with views often look out on numerous, often varied, built features and the employees within are focused on their jobs. For these reasons, business employees are not likely to be sensitive to landscape changes

Recreational Users

The states within the study area with the greatest share of Federal land ownership are Idaho (54.9 percent), Washington (38.3 percent), and Montana (27.6 percent). Given the amount of public land, which includes recreational and conservation lands, in the EOR Region, recreational users could represent a much larger viewer group than in either the Great Lakes or New England regions. Certain recreational users within the study area, however, already have clear views of current CBP infrastructure and activities. Proximity to existing infrastructure and activity may decrease their expectations of visual quality and their sensitivity to visual change.

5.10 SOCIOECONOMIC RESOURCES

5.10.1 INTRODUCTION

This section provides a socioeconomic profile of the EOR Region and discusses potential impacts of CBP's program alternatives on the region's resources. The study area includes areas in the United States and Canada within 100 miles of the border. Some categories of socioeconomic impacts, as discussed in the Environmental Consequences section, are as likely to be experienced on the Canadian side of the border as on the U.S. side. For example, time delays at border crossings may affect populations and businesses on both sides of the border. In addition, much of the economic activity in U.S. border regions involves cross-border movement of people and goods; therefore, the impacts of CBP activities on Canadian socioeconomic resources are considered along with the impacts to U.S. resources. The impacts of CBP actions on communities and regional economies in Canada are most likely to be felt closest to the border. But since it is not possible to delineate precisely how far from the border impacts may extend, information on the area 100 miles north of the border is provided to mirror the study area in the United States. This definition of the study area does not imply that impacts are necessarily equivalent in the two countries.

Much of the economic data presented here for Canada is not available below the provincial level, so the provinces provide the best available representation of the border region. This limitation does not necessarily suggest the scope of economic impacts; it merely reflects the level at which demographic and economic data are available. All monetary values are expressed in 2009 U.S. dollars, unless otherwise indicated.

The socioeconomic environment includes people and their communities, accounting for population movement, density, and age distribution, as well as economic considerations, including income levels, opportunities for employment, and overall economic trends. Section 5.10.2 provides an overview of the socioeconomic resources across the EOR Region and north of this region in Canada. It then provides a more detailed characterization of the regional demography, including population levels and distribution, regional growth trends, income, employment levels, poverty statistics, and property values. The section also profiles the regional economy, indexing important economic sectors in terms of income and employment. It further provides regionally focused information on important economic sectors for four POEs and BPSs. These sites include those POEs that are most active in terms of the annual number of crossings and the value of cargo transported.

5.10.2 AFFECTED ENVIRONMENT

5.10.2.1 Regional Demographics

To provide context for the potential impacts of CBP actions, some basic, descriptive, socioeconomic information is provided for the EOR Region and the area north of this region in Canada and is compared to the broader states, provinces, and national economies, where possible. While the profiled region is defined as the area both 100 miles north and south of the U.S.-Canada border, the statistics in the various tables and text within this section include data for all U.S. counties and Canadian census divisions overlapping these 100-mile regions. These areas represent the finest geographic resolution available for these data and are used, therefore, to approximate values for populations and other demographic variables.

5.10.2.2 Population and Growth Trends

In the United States, approximately 1.0 million people live in the EOR Region (Table 5.10-1). The segment of the population living in border communities accounts for 14.7 percent of the population in the EOR Region states of Minnesota, Montana (EOR), and North Dakota. Minnesota has the largest population in the region with nearly 470,000 people. The border communities in Montana (EOR) and North Dakota are less populated.

Between 2000 and 2009, while the population of the United States grew approximately 8.7 percent, border communities in Minnesota (-0.1 percent) and North Dakota (-5.1 percent) experienced population declines (Figure 5.10-1). The border communities in Montana (EOR), however, grew 3.5 percent.

Table 5.10-1. Population of the EOR Region*

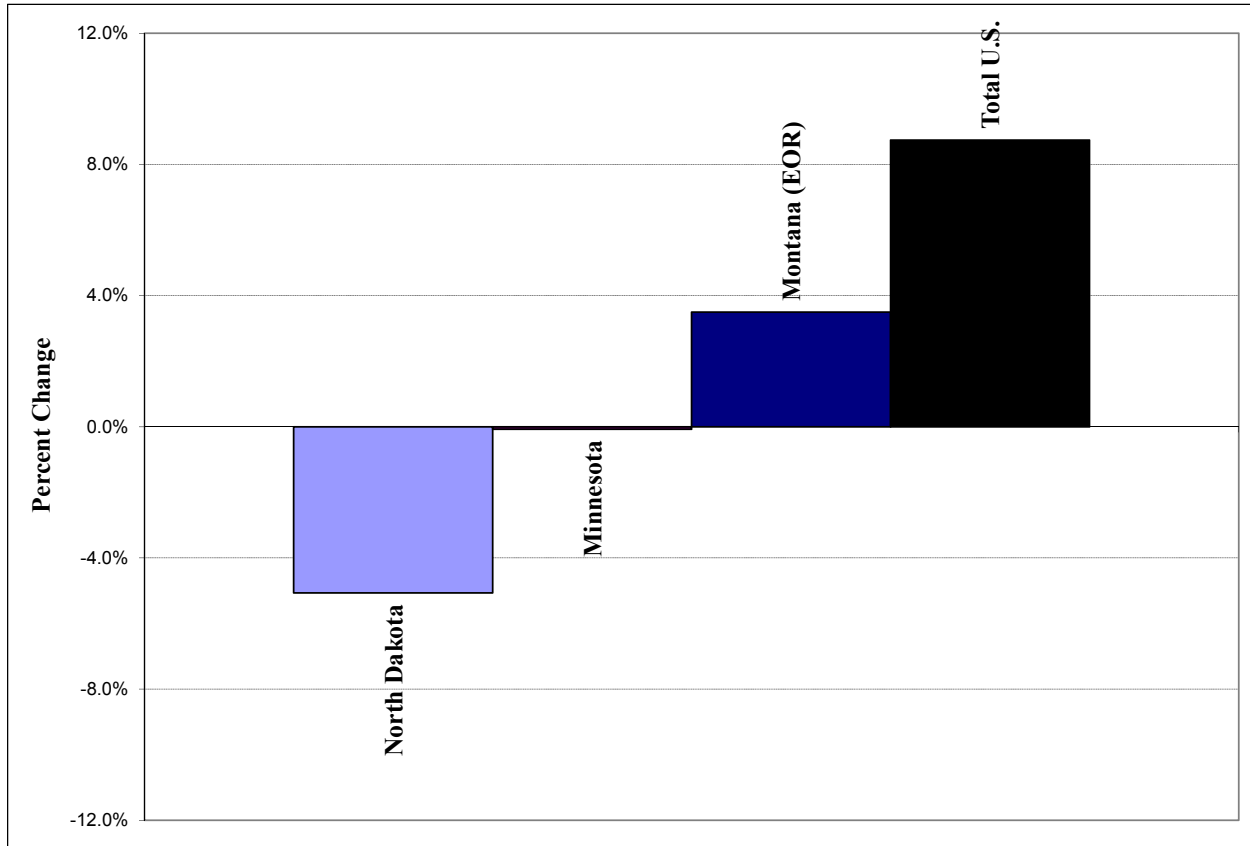
Border State	Population within the Border Area**	Population Overall	Percent of Population within the Border Area
Minnesota	469,275	5,266,214	8.9
Montana (EOR)	263,035	974,989	27.0
North Dakota	279,559	646,844	43.2
EOR Region total	1,011,869	6,888,047	14.7
Total United States	28,412,077	310,973,729	9.1

* The American Community Survey provides estimates of demographic, social, economic, and housing characteristics every year for all states, as well as for all cities, counties, metropolitan areas, and population groups of 65,000 people or over (USDOC, 2000a).

** Statistics in this column account only for those portions of the states within the EOR Region. Total United States accounts only for the border area of all four regions.

While border POEs and BPSs along the U.S.-Canada border tend to be in rural, less densely populated areas outside of major metropolitan areas, the majority of the region’s population lives in larger population centers. Population centers in this report include all of the counties that overlap a metropolitan statistical area (MSA), defined by the Office of Management and Budget and used by the USCB to report demographic statistics. Overall approximately 39.9 percent of the EOR Region’s population lives in population centers (Table 5.10-2).

Figure 5.10-1. Percent Change in the EOR Region Population, 2000–2009



Source: (USDOC, 2009a).

Table 5.10-2. Population Centers in the EOR Region*

Border State	Population Center	State's EOR Living in Population Centers**	Total State Population in the EOR Region	Percent of State's EOR Population Living in Population Centers
Minnesota	Duluth****	197,767	469,275	42.1
	Grand Forks****	30,776		6.6
	Minnesota State Total	228,543		48.7
Montana (EOR)***	Missoula	108,623	263,035	41.3
North Dakota***	Grand Forks****	66,414	279,559	23.8
EOR Region total		403,580	1,011,869	39.9
Total United States*****		261,110,826	310,973,729	84.0

* The American Community Survey provides estimates of demographic, social, economic, and housing characteristics every year for all states, as well as for all cities, counties, metropolitan areas, and population groups of 65,000 people or more.

** Statistics in this column account only for those portions of the EOR Region within each state.

*** The EOR Region in Montana and North Dakota has only one population center per state. Thus, no state total row is presented for these two states.

**** Population statistics for the Duluth population center are split between counties in Minnesota and Wisconsin (in the Great Lakes Region) and population statistics for the Grand Forks population center are split between counties in Minnesota and North Dakota.

***** Population statistics in this row represent the proportion of the total American population that resides in population centers across the whole country.

In Canada, approximately 2.9 million people reside in the study area north of the EOR Region (Table 5.10-3). Most major cities are in the southern part of the country; therefore, Canada's population is more heavily concentrated along the border than is the American population. For example, approximately 90.3 percent of the population lives in border communities in Manitoba. Alberta and Manitoba have some of the largest populations in border communities in Canada. As some census divisions overlapping the 100-mile buffer area are large and extend well beyond 100 miles from the border, this analysis may overstate the Canadian population in the study area north of the EOR Region.

Between 1996 and 2006, the population of Canada grew 9.5 percent. More recently, according to Statistics Canada, about two-thirds of Canada's growth between 2009 and 2010 was attributable to net international migration. The number of immigrants to Canada increased from 245,300 between 2008 and 2009 to 270,500 between 2009 and 2010. During the economic recession in 2009 and 2010, however, a decrease in the net flow of non-permanent residents took place, with more immigrants leaving the country, resulting in overall lower net international migration in 2010 than in the previous year. Overall, the area north of the EOR Region experienced population growth. Population growth in Alberta (27.0 percent) was the highest among the border provinces and outpaced growth for Canada as a whole (Figure 5.10-2).

Approximately 67.1 percent of the Canadian population in the study area north of the EOR resides within population centers (Table 5.10-4). While approximately 70 percent of the study area population within Alberta and Manitoba lives in population centers, less than half of the study area population within Saskatchewan does.

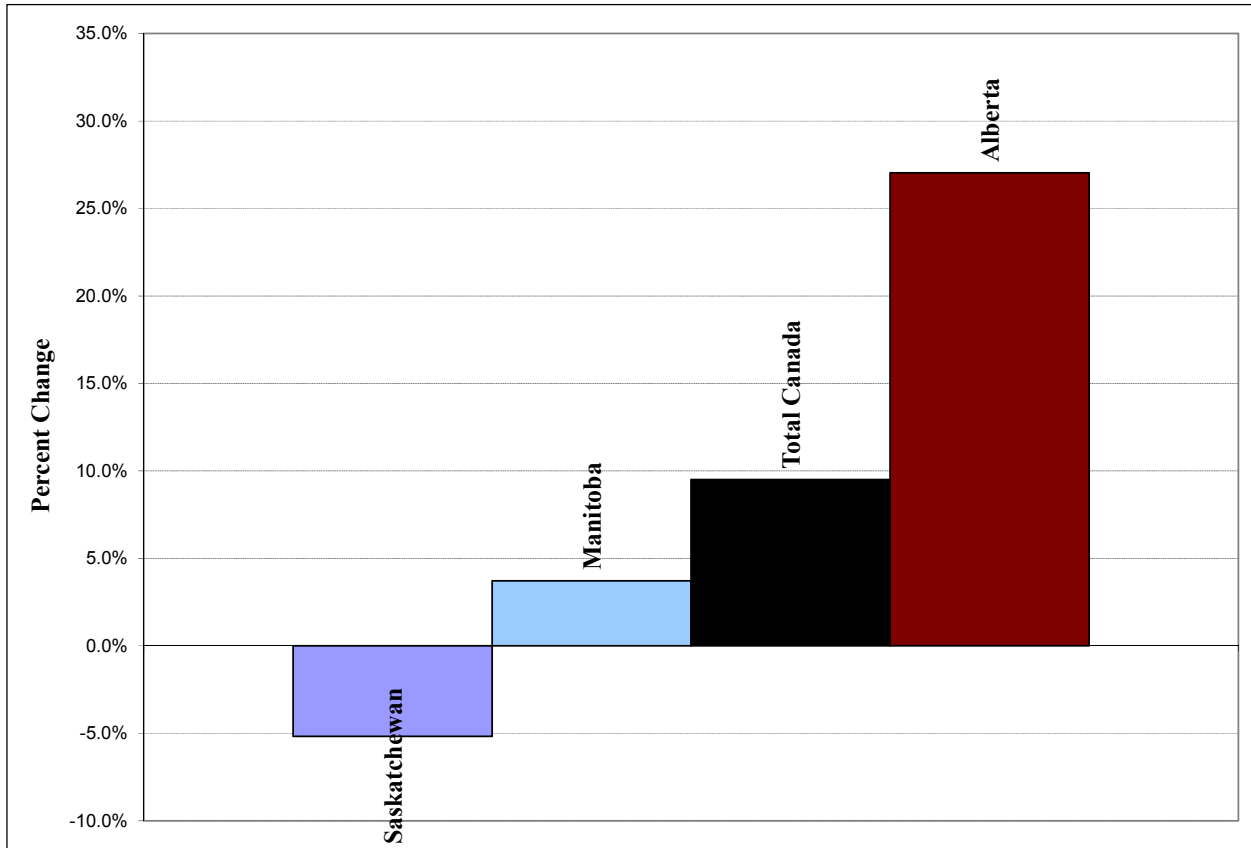
Table 5.10-3. Population North of the EOR Region in Canada

Border Province	Study Area Population North of the EOR Region*	Total Population in the Province	Percent of Total Province Population Residing in the Study Area North of the EOR Region
Alberta	1,486,400	3,256,360	45.6
Manitoba	1,023,460	1,133,515	90.3
Saskatchewan	393,290	953,850	41.2
EOR Region total	2,903,150	5,343,725	54.3
Total Canada	25,562,910	31,241,030	81.8

* Statistics in this column account only for those portions of the provinces within the study area. Total Canada accounts only for those portions of the provinces within the study area across all four regions.

Source: (StatCan, 2006a).

Figure 5.10-2. Percent Change in Canadian Population North of the EOR Region, 1996–2006



Sources: (StatCan, 1996; StatCan, 2006a).

Table 5.10-4. Population in Census Metropolitan Areas in Study Area North of the EOR Region in Canada

Border Province	Population Center	Study Area Population Living in Population Centers North of the EOR Region*	Total Study Area Population North of the EOR Region*	Percent of Total Study Area Population North of the EOR Region Living in Population Centers
Alberta**	Calgary	1,070,295	1,486,400	72.0
Manitoba**	Winnipeg	686,040	1,023,460	67.0
Saskatchewan**	Regina	192,440	393,290	48.9
EOR Region total		1,948,775	2,903,150	67.1
Total Canada***		21,508,575	31,241,030	68.8

* Population statistics in these columns account only for those portions of the CMAs and provinces within the study area.

** The study area north of the EOR Region in Alberta, Manitoba, and Saskatchewan includes only one population center in each province. Thus, no province total rows are presented.

*** Population statistics in this row represent the proportion of the total Canadian population that resides in population centers across the whole country.

Source: (StatCan, 2006a).

5.10.2.3 Income, Poverty, and Unemployment

Border communities in Montana (EOR) and North Dakota have the lowest median income among all border communities across the U.S.-Canada border (Table 5.10-5). In addition, border communities in the EOR Region are less wealthy than the state average (Minneapolis and St. Paul are outside of the study area).

The poverty rate is defined as the number of individuals included in the poverty count as a percentage of the population for whom the poverty status is determined. Border communities in the EOR Region of Montana and North Dakota have the highest poverty rates among all border communities across the U.S.-Canada border (Table 5.10-5). In Minnesota, the poverty rate for border communities is notably higher than the state average.

The unemployment rate in each state was below the national average, especially in North Dakota where the unemployment rate was about half the national average (Table 5.10-6). Except for Montana, the unemployment rate was higher in the border region than in the state as a whole.

Table 5.10-5. Income and Poverty Statistics for States in the EOR Region

Border State and Study Area EOR Region*		Median Household Income** (\$)	Population Below the Poverty Line***	Percent of Population Below the Poverty Line
Minnesota	Study area EOR Region	44,926	54,054	11.9
	Statewide	59,516	380,476	7.9
Montana (EOR)	Study area EOR Region	40,642	40,648	15.8
	Statewide	41,720	128,355	14.6
North Dakota	Study area EOR Region	41,654	37,654	13.2
	Statewide	43,716	73,457	11.9
EOR Region total	Study area EOR Region	42,891	132,356	13.3
	Selected states	55,462	582,288	9.3
Total United States		53,051	33,899,812	12.4

* Statistics in the non-shaded rows account only for portions of the states within the EOR Region.

** Median household income is reported in inflation-adjusted 2009 dollars.

***To determine the poverty rate in the United States, the Census Bureau references income thresholds that vary by family size and the ages of family members. If a family’s total income, not including noncash benefits (such as food stamps and housing subsidies), is below the family’s income threshold, every individual in the family is included in the poverty count.

Sources: (USDOC, 2000a; USDOC, 2000b).

Table 5.10-6. Unemployment Rates for the EOR Region

Border State and Study Area EOR Region*		Unemployment Rate (%)
Minnesota	Study area EOR Region	9.4
	Statewide	8.0
Montana (EOR)	Study area EOR Region	4.9
	Statewide	6.2
North Dakota	Study area EOR Region	4.5
	Statewide	4.3
EOR Region total	Study area EOR Region	6.9
	Selected states	7.4
Total United States		9.3

* Statistics in the non-shaded rows account only for portions of the states within the EOR Region.

Source: (USDOL, 2009a).

The median household income in Canada north of the EOR Region is approximately \$53,000 (in 2009 U.S. dollars) compared with approximately \$49,400 for Canada as a whole (Table 5.10-7). Alberta has the highest median household income among the border provinces.

The poverty rate in Canadian communities is defined as the percentage of low-income “economic families.” (See note in Table 5.10-7 for an explanation of economic family.) This threshold-based designation is comparable to the poverty statistics in the USCB. In the study area north of the EOR Region, the poverty rate is approximately 10.0 percent compared with 11.6 percent for Canada as a whole (Table 5.10-7). Border communities in Alberta and Saskatchewan have the lowest poverty rates among all border communities north of the U.S.-Canada border.

The unemployment rate in Canada north of the EOR Region was 4.4 percent in 2006 compared with 6.6 percent for Canada as a whole (Table 5.10-8). The unemployment rate in border communities was lower than the unemployment rate of the province as a whole. Border communities in Alberta and Saskatchewan have the lowest unemployment rates among all border communities north of the U.S.-Canada border.

Table 5.10-7. Income and Poverty Statistics North of the EOR Region in Canada

Border Province and Study Area North of the EOR Region*		Median Household Income** (\$US)	Number of Low-Income Economic Families***	Percent of Low-Income Economic Families***
Alberta	Study area north of EOR Region	60,101	35,886	8.8
	Province	58,928	77,399	8.7
Manitoba	Study area north of EOR Region	45,375	34,015	12.3
	Province	44,089	36,692	12.3
Saskatchewan	Study area north of EOR Region	46,024	9,699	8.8
	Province	43,012	26,166	10.2
EOR Region total	Study area north of EOR Region	53,002	79,600	10.0
	Selected provinces	52,939	140,257	9.7
Total Canada		49,393	1,006,911	11.6

* Statistics in the non-shaded rows account only for portions of the provinces within the study area.

** Median household income is reported in inflation-adjusted 2009 U.S. dollars.

*** The Canadian Census reports statistics for “low-income” economic families. This threshold-based designation is comparable to the poverty statistics in the USCB. The term “economic family” refers to a group of two or more persons who live in the same dwelling related to each other by blood, marriage, common-law, or adoption. A couple may be of opposite or same sex. Foster children are included.

Source: (StatCan, 2006d).

Table 5.10-8. Unemployment Rates North of the EOR Region in Canada

Border Province and Study Area North of the EOR Region*		Unemployment Rate (%)
Alberta	Study area north of EOR Region	4.0
	Province	4.3
Manitoba	Study area north of EOR Region	5.0
	Province	5.5
Saskatchewan	Study area north of EOR Region	4.5
	Province	5.6
EOR Region total	Study area north of EOR Region	4.4
	Selected provinces	4.7
Total Canada		6.6

* Statistics in the non-shaded rows account only for portions of the provinces within the study area.

Source: (StatCan, 2006c).

5.10.2.4 Property Values

In the EOR Region, the median property values within each state, between 2006 and 2008, were lower than the median property value for the United States as a whole (\$192,400) during the same time period (Table 5.10-9). Except for North Dakota, the median property value within the EOR border region is lower than the median property value for each state as a whole.

Table 5.10-9. Median Property Value for the EOR Region

Border State and Study Area EOR Region*		Median Home Value** (S)
Minnesota	Study area EOR Region	140,900
	Statewide	212,100
Montana (EOR)	Study area EOR Region	155,200
	Statewide	168,200
North Dakota	Study area EOR Region	125,400
	Statewide	106,200
EOR Region total	Study area EOR Region	140,900
	Selected states	195,500
Total United States		192,400

* Statistics in the non-shaded rows account only for those portions of the states within the EOR Region.

** The American Community Survey provides estimates of housing characteristics for all geographic areas with populations of 20,000 or more, including the Nation, all states and the District of Columbia, all congressional districts, and approximately 1,800 counties every 3 years. Due to the use of value categories rather than specific amounts collected for each individual housing unit in 2006 and 2007, property values cannot be inflation adjusted. Property values are reported in nominal dollar terms.

Sources: (USDOC, 2008a).

North of the EOR Region in Canada, the median property value in 2006 was approximately \$218,700 (in 2009 U.S. dollars) compared with \$232,200 for Canada as a whole (Table 5.10-10). Border communities in Alberta have the second highest median property values among all border communities north of the U.S.-Canada border. The median property value for border communities in Alberta is significantly higher than for the province as a whole. Conversely, border communities in Saskatchewan have the second lowest median property values among all border communities north of the U.S.-Canada border.

Table 5.10-10. Median Property Value North of the EOR Region in Canada

Border Province/Study Area North of the EOR Region*		Average Value of Dwelling** (\$US)
Alberta	Study area north of EOR Region	302,700
	Province	259,100
Manitoba	Study area north of EOR Region	137,300
	Province	135,200
Saskatchewan	Study area north of EOR Region	112,700
	Province	116,500
EOR Region total	EOR Region	218,700
	Selected provinces	207,300
Total Canada		232,200

* Statistics in the non-shaded rows account only for those portions of the provinces within the study area.

** A dwelling is defined as a set of living quarters designed for or converted for human habitation in which a person or group of persons reside or could reside. In addition, a private dwelling must have a source of heat or power and must be an enclosed space that provides shelter from the elements, as evidenced by complete and enclosed walls and roof and by doors and windows that protect from wind, rain and snow. Property values are reported in 2006 U.S. dollars.

Source: (StatCan, 2006b).

5.10.2.5 Regional Economies

Tourism is a major component of economic activity along the northern border. Canada is the top country of origin for visitors to the United States. In 2008, the number of Canadian visitors staying one or more nights in the United States was nearly 19 million (USDOC, 2008e). In this context, “Canadian visitors” refers to Canadian residents visiting the United States.

Trade with Canada

The flow of goods, services, and people across the border contributes significantly to economic activity in border communities. Canada is the largest trading partner of the United States. In 2009, the total value of merchandise trade with Canada was approximately \$429.6 billion—\$204.7 billion in exports and \$224.9 billion in imports. Shipments by surface modes of transportation, excluding pipelines, account for approximately 79 percent of total merchandise trade with Canada. The top exports to Canada by surface transportation are automobiles and automotive parts and accessories, and other machinery, appliances, and equipment. The top imports from Canada are automobiles and automotive parts and accessories, other machinery and appliances, and processed paper and pulp products. On average, approximately \$930 million in merchandise crosses the northern border by surface transportation every day (USBTS, 2009a). Appendix Q of this analysis provides trade statistics for surface transportation between the United States and Canada.

Crossing the northern border using surface modes of transportation is the principal means of entry for Canadians visiting the United States, accounting for two-thirds (12.6 million) of all

Canadian visitor entries (USDOC, 2008c). While approximately 15 percent of Canadian visitors who entered the United States by surface transportation visited states in the EOR Region, the spending in this region accounted for a relatively low percentage (less than 7 percent) of the visitors' total spending in the United States. Canadian visitors entering by surface transportation contributed approximately \$538 million to this region in 2008 (Table 5.10-11). The average visitor spent approximately \$286 per visit. The most common stated purposes for visiting states in the EOR Region were vacation (83 percent), visiting friends or relatives (12 percent), and business or employment (5 percent). The region had the third highest percentage of travel due to business or employment. While business travelers tend to spend more per trip, they rely more heavily on air travel and travel further from the border.

Table 5.10-11. Canadian Visitors Entering the EOR Region by Surface Transportation*

Destination	Visitors		Spending			Purpose of Trip		
	Number of Visitors (000s)	Average Nights Per Visit	Visitor Spending (\$US millions)	Spending per Visitor (\$US)	Average Daily Spending per Visitor (\$US)	Business, Convention, or Employment (%)	Visiting Friends or Relatives (%)	Holiday, Vacation, or Other (%)
Minnesota	530	2.6	162.5	307	119	8.9	16.7	74.3
Montana	634	3.1	189.4	299	96	5.1	11.7	83.2
North Dakota	718	2.1	186.4	259	123	2.5	8.7	88.8
EOR Region	1,882	2.6	538	286	111	5.2	12.0	82.8

* Surface modes of transportation include autos, buses, and other non-air modes of transportation. Average nights per visit and average daily spending per visitor are based on total visitors, including air travelers.

** The Office of Travel & Tourism Industries suppresses state data for which the sample size is fewer than 400,000.

Sources: (USDOC, 2008b, USDOC, 2008c; USDOC, 2008d).

5.10.2.6 Economic Profiles of POEs and BPSs in the EOR Region

This section provides regional economic profiles for border communities in the United States and Canada that surround selected POEs in the EOR Region. It characterizes the socioeconomic resources of specific border communities in the region to provide context for the discussion of potential consequences of CBP's alternative actions, and to highlight the diversity in regional economies surrounding POEs and BPSs along the northern border. Appendix Q of this report provides data on trade, employment, and payroll statistics by economic sector for U.S. counties and Canadian provinces that contain profiled POEs and BPSs in the four northern border regions.

This section profiles five sites in the EOR Region representing the most heavily used POEs along the U.S.-Canada border in the region in terms of total crossings and the total value of trade, along with some smaller, more rural POE sites. Additionally, sites were included based on their unique characteristics to reflect different socioeconomic conditions in border communities. For example, the sites profiled in the EOR Region include a POE on tribal lands. Table 5.10-12 lists the sites ranked by crossing volume and provides information on associated crossing activity.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Table 5.10-12. Point of Entry and Border Patrol Station Sites Profiled in the EOR Region

Port	Annual Individual Crossings (% of Total)	Annual Vehicle Crossings (% of Total)	National Rank by Crossing Volume	Annual Trade Value (Surface Mode)	Rank by Trade Value	Two Largest Commodities (% of Port's Trade Value)	Important Features
MN: International Falls	956,517 (1.6%)	478,935 (1.5%)	15	\$6,912,248,076 (2.0%)	10	<ul style="list-style-type: none"> Plastics and articles thereof (16%) Fertilizers (12.7%) 	<ul style="list-style-type: none"> Largest in MN* Roughly collocated with International Falls BPS
ND: Pembina	759,402 (1.2%)	456,886 (1.4%)	17	\$15,251,286,009 (4.5%)	5	<ul style="list-style-type: none"> Nuclear reactors, boilers, machinery and mechanical appliances (20.4%) Vehicles and parts (11.5%) 	<ul style="list-style-type: none"> Largest in ND*
MT: Sweetgrass	654,760 (1.1%)	381,912 (1.2%)	19	\$9,123,255,830 (2.7%)	9	<ul style="list-style-type: none"> Nuclear reactors, boilers, machinery and mechanical appliances (26.9%) Electrical machinery and equipment (6.7%) 	<ul style="list-style-type: none"> Largest in MT* Roughly 7 miles north of the Sweetgrass BPS
MT: Piegan	207,694 (0.3%)	103,869 (0.3%)	37	\$11,590,854 (0.003%)	61	<ul style="list-style-type: none"> Mineral fuels, mineral oils, bituminous substances (80.4%) Printed books and other products of the printing industry (3.5%) 	<ul style="list-style-type: none"> In tribal land (Blackfeet Indian Reservation)

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

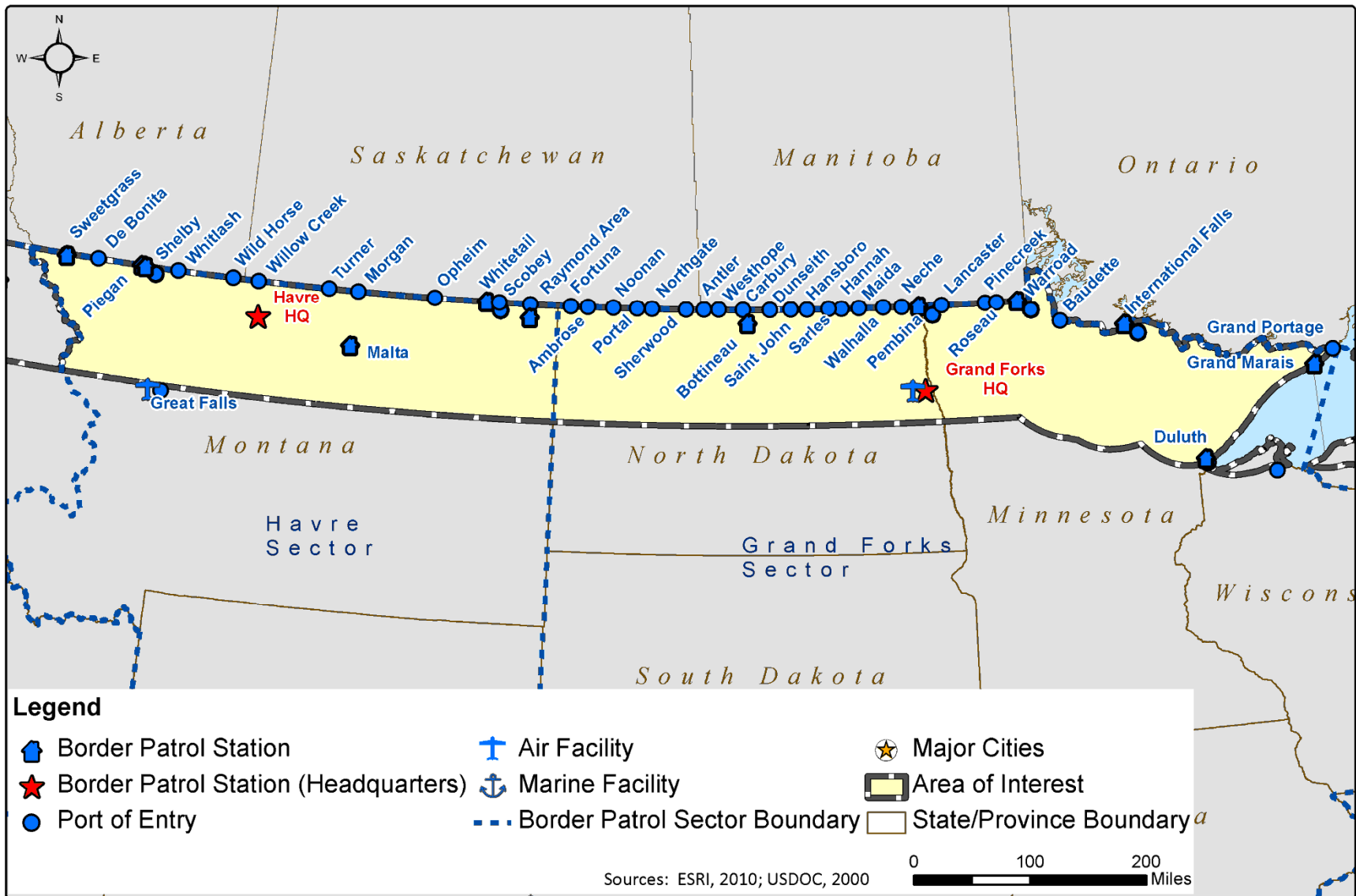
Port	Annual Individual Crossings (% of Total)	Annual Vehicle Crossings (% of Total)	National Rank by Crossing Volume	Annual Trade Value (Surface Mode)	Rank by Trade Value	Two Largest Commodities (% of Port's Trade Value)	Important Features
ND: Dunseith	150,886 (0.2%)	80,746 (0.3%)	38	38	38	<ul style="list-style-type: none"> • Live animals (28.3%) • Nuclear reactors, boilers, machinery and mechanical appliances (17.8%) 	<ul style="list-style-type: none"> • Adjacent to International Peace Garden tourist attraction

* Size based on number of individual border crossings.

** BTS does not provide data on commodities and crossings at BPSs.

Sources: (IEc analysis of Bureau of Transportation Statistics data: USDOT, 2009a; USDOT, 2009b; USDOT, 2009c).

Figure 5.10-3. Locations of POEs and BPSs in the EOR Region



The remainder of this section characterizes the regional economies of the U.S. counties and Canadian provinces containing the EOR Region sites identified in Table 5.10-12 and Figure 5.10-3.

Glacier County, Montana

Glacier County contains one of the profiled POEs (Piegan POE). The tribal lands of the Blackfeet Indian Reservation are also located in this county. The Blackfeet are one of the few remaining Tribes in the United States that still live on ancestral lands. The reservation is bordered by Alberta, Canada to the north and Glacier National Park and the Rockies to the west (BN, 2010). The population of Glacier County is slightly less than 14,000. According to the USCB, median household income is well below the median for Montana and the poverty rate is approximately 25 percent, more than 10 percentage points higher than for the state as a whole. The major economic sectors in Glacier County by annual payroll are health care and social assistance (\$21.0 million), retail trade (\$10.4 million), accommodation and food services (\$8.7 million), and mining, quarrying, and oil and gas extraction (\$7.2 million). These four sectors account for nearly two-thirds of the county’s employment.

A Note on Data Sources

All statistics on private, nonfarm employment, unless otherwise noted, are from USCB County Business Patterns for 2008. All statistics on agricultural production employment, unless otherwise noted, are from the U.S. Department of Agriculture, Census of Agriculture for 2007. All Canadian statistics, unless otherwise noted, are from the Statistics Canada 2006 Census. All detail on border crossings and trade value, unless otherwise noted, are from the U.S. Department of Transportation Bureau of Transportation Statistics’ Transborder Freight Data for 2009. Monetary values are expressed in 2009 U.S. dollars.

- **Piegan POE:** This POE lies in the Blackfeet Indian Reservation and connects U.S. Route 89 with Highway 2 en route to Calgary, Alberta. Piegan is a relatively small POE; in 2009, it accounted for approximately 208,000 individual border crossings (less than 0.5 percent of all U.S.-Canada crossings) and less than \$12 million in commercial trade (less than 0.01 percent of all U.S.-Canada trade). The primary commodity group—mineral fuels and oils—accounts for more than 80 percent of the total value of commerce at Piegan. Piegan is a “permit port,” which means that cargo must be approved in advance by the Great Falls Service Port.

Toole County, Montana

Toole County, Montana is 80 miles east of Glacier County and has a population of just over 5,000. Toole County contains one of the profiled POEs (Sweetgrass POE). The economy is heavily supported by agriculture and livestock as well as by oil and gas production (TCMT, 2010). The major economic sectors in Toole County by annual payroll are health care and social assistance (\$8.4 million), mining, quarrying, and oil and gas extraction (\$8.0 million), transportation and warehousing (\$6.0 million), and retail trade (\$3.4 million). The top private employer in Toole County is the Crossroads Correctional Facility. CBP is also a major employer in the area.

- **Sweetgrass POE:** The Sweetgrass POE, which connects Interstate 15 to Highway 4 in Alberta, has the highest volume of border traffic in Montana and is a 24-hour port. Sweetgrass is the ninth largest commercial land border crossing in terms of trade value, which totaled \$9.1 billion in 2009—approximately 2.7 percent of all U.S.-Canada trade.

Sweetgrass also has an airport. The top commodities by trade value are machinery and mechanical appliances and parts (26.9 percent), electrical machinery and equipment (6.7 percent), and meat products (6.5 percent). Sweetgrass is one of the primary locations for the transportation of meat products, accounting for more than 21 percent of U.S.-Canada trade. Built in 2004, the 100,000 square foot joint border facility contains six lanes of traffic flowing north into Canada and five lanes flowing south into the United States (TCMT, 2010).

Alberta, Canada

Alberta lies to the north of the Piegan and Sweetgrass POEs. Alberta, the fourth largest province in Canada, is landlocked and borders Montana. Alberta has one of the strongest economies in Canada, supported by oil and natural gas, technology, and forestry-based industries. Alberta holds 70 percent of Canada's coal reserves and ranks second, after Saudi Arabia, in terms of proven global crude oil reserves. Alberta contains four major petrochemical plants with a combined annual production capacity of 8.6 billion pounds. The plants at Joffre and Fort Saskatchewan are the world's largest (GOA, 2010). The province has the highest median household income in Canada. Calgary is Alberta's largest city (approximately 1 million people) and is a major distribution and transportation hub. Coutts, the Canadian site of the joint border facility with Sweetgrass, has a population of less than 400. The major economic sectors in Alberta by annual payroll are mining, quarrying, and oil and gas extraction (\$9.3 billion), construction (\$8.4 billion), professional, scientific, and technical services (\$7.8 billion), and manufacturing (\$6.5 billion). Retail trade, the sixth largest sector by contribution to regional income, is one of the largest sectors in terms of employment, providing over 206,000 jobs.

Rolette County, North Dakota

Rolette County, North Dakota has a population of about 14,000 and contains one of the profiled POEs (Dunseith POE). Approximately 71 percent of the county's population is Native American. Key economic sectors in terms of annual payroll are health care and social assistance (\$19.0 million) and retail trade (\$8.4 million). The county also supports electronics manufacturing and agricultural activities. Primary crops include wheat, durum, barley, and canola. Tourism and recreation are also important due to the swimming, fishing, hunting, and snowmobiling opportunities provided by the Turtle Mountains. In addition, the International Peace Garden, situated on the border between Manitoba and Rolette County, was established in 1932 as a symbol of friendship between the United States and Canada and attracts visitors from both countries. The botanical garden, along with a museum and monument attractions, spans 2,339 acres in both countries (RCND, 2011).

- **Dunseith POE:** The Dunseith POE occurs at the site of the International Peace Garden and connects Rolette County, North Dakota and Manitoba, Canada. The POE is open 24 hours and has approximately 151,000 individual border crossings per year (0.2 percent of all U.S.-Canada crossings in 2009). The Dunseith POE accounts for a relatively low fraction of total border trade value, supporting \$505 million, or 0.1 percent of all U.S.-Canada trade in 2009. A key characteristic of the POE is its situation at the International Peace Garden. While the POE constitutes only 0.2 percent of individual crossings and 0.3 percent of total vehicle crossings along the border, visitation to the garden for events may subject the crossing to periodic congestion.

Pembina County, North Dakota

Pembina County, North Dakota is located in the northeastern corner of the state and contains one of the profiled POEs (Pembina POE). The major economic sectors in Pembina County by annual payroll are wholesale trade (\$15.7 million), agriculture (\$13.9 million), construction (\$10.7 million), retail trade (\$8.6 million), and transportation and warehousing (\$7.3 million).

Wholesale trade, retail trade, and transportation and warehousing account for more than one-third of private, nonfarm jobs in Pembina. Major employers in Pembina County include CBP and a satellite manufacturing plant of Motor Coach Industries, which assembles intercity buses for customers including Greyhound Lines (TMVI, 2010).

- **Pembina POE:** The Pembina POE connects Interstate 29 in Pembina County, North Dakota to Manitoba Highway 75 in Emerson, Manitoba. Pembina has the largest number of crossings in North Dakota, with more than 759,000 individual border crossings or 1.2 percent of all U.S.-Canada crossings in 2009. It is a significant crossing for road traffic headed to and from Winnipeg, Manitoba. Winnipeg is also the only major city between Vancouver, British Columbia and Thunder Bay, Ontario with direct U.S. rail connections. The Pembina POE has the fifth highest value of border commerce, \$15.3 billion or 4.5 percent of all U.S.-Canada trade in 2009. The major commodities crossing the border at Pembina are machinery and mechanical appliances (20.4 percent), vehicles and parts (11.5 percent), electrical machinery and equipment (5.9 percent), and plastics (5.0 percent).

Manitoba, Canada

Manitoba lies to the north of the Dunseith and Pembina POEs. Manitoba is one of the three central prairies provinces. It shares its southern border with Minnesota and North Dakota. The province has a low population density, representing only 3.6 percent of the Canadian population. Approximately 60 percent of the population lives in the metropolitan area of Winnipeg. Agriculture, a vital part of the economy, occurs mostly in the southern half of the province. Approximately 12 percent of Canadian farmland is in Manitoba. The most common agricultural products in the province are cattle (34.6 percent), assorted grains (19.0 percent) and oilseed (7.9 percent) (StatCan, 2006e).

Manitoba is a popular destination for visitors seeking outdoor recreation and wildlife as well as historical and cultural sites. The Riding Mountain National Park of Canada attracts numerous visitors each year. Historically, Manitoba's unemployment rate has been below the unemployment rate for Canada as a whole, supported by a diverse agricultural sector and a robust manufacturing sector that accounts for nearly 63,000 jobs, more than 10 percent of employment in the province. The major economic sectors in terms of annual payroll in Manitoba are manufacturing (\$2.4 billion), health care and social assistance (\$2.3 billion), public administration (\$1.8 billion), education services (\$1.7 billion), retail trade (\$1.4 billion), and transportation and warehousing (\$1.3 billion).

Koochiching County, Minnesota

Koochiching County, Minnesota, containing the International Falls POE and BPS, is geographically one of the largest counties in Minnesota with a population of slightly over 13,000. The region is a popular destination for outdoor activities including boating, fishing, hunting, and bird and wildlife watching. The Bois Forte Indian Reservation lies partially in the

county. The major economic sectors by annual payroll in Koochiching County are health care and social assistance (\$19.7 million), retail trade (\$14.9 million), and finance and insurance (\$10.2 million). Accommodation and food services account for the third largest sector in terms of employment. In International Falls, often referred to as the “Icebox of the Nation,” cold weather testing of major automobile products forms also an important component of the winter economy (CIFMN, 2010). International Falls also has one of three foreign trade zones in Minnesota, which provide companies with economic incentives for warehousing, importing, and exporting goods.

- International Falls POE and BPS: The border crossing at International Falls connects U.S. Route 53 with Highway 11 in Fort Frances, Ontario. Major U.S. cities near International Falls include Duluth, Fargo, and Minneapolis, while major Canadian cities near International Falls include Thunder Bay, Ontario, and Winnipeg, Manitoba (CIFMN, 2010). Trucks and privately owned vehicles (POVs) are the primary vehicles using the POE; however, it does have a significant number of bus, train, and pedestrian crossings as well. International Falls is the largest POE in Minnesota, with more than 956,500 individual border crossings (1.6 percent of all U.S.-Canada crossings) and more than \$6.9 billion in trade value (2.0 percent of all U.S.-Canada trade in 2009). The major trade commodities crossing the border at International Falls are plastics (16.0 percent), fertilizers (12.7 percent), wood and articles of wood (10.7 percent), mineral fuels and oils (9.8 percent), and wood pulp and other scraps (9.0 percent). Of particular note, International Falls accounts for approximately 30 percent of all U.S.-Canada trade crossings for fertilizers and wood pulp and other scraps.

Ontario, Canada

Ontario lies to the north of the International Falls POE and BPS. Ontario is Canada’s largest province in terms of population. It is home to the Canada’s most populous city, Toronto, and the national capital, Ottawa. Ontario borders Minnesota, Michigan, and New York; Ohio and Pennsylvania lie across Lake Erie. Ontario is also home to the popular destination of Niagara Falls, which draws millions of tourists and provides upscale hotels, casinos, and cultural attractions in addition to the scenic views. Ontario accounts for more than half of the total value of all U.S.-Canada trade through the following POEs: Alexandria Bay/Cape Vincent, Buffalo-Niagara Falls, Detroit, International Falls, Port Huron, Massena, and Sault Ste. Marie.

Ontario contains Canada’s largest manufacturing sector and is the largest North American automobile manufacturer, ahead of Michigan and all of Mexico (GOO, 2010). There are major motor vehicle assembly plants in Ingersoll, Brampton, Windsor, Oakville, St. Thomas, Oshawa, Alliston, Cambridge, and Woodstock (ICAN, 2010). Ontario is also the center of high tech, financial services, and other knowledge-intensive industries, accounting for roughly half of all Canadian employment in those industries. In terms of annual payroll, the largest economic sectors in Ontario are manufacturing (\$42.2 billion), professional, scientific and technical services (\$24.1 billion), and health care and social assistance (\$21.5 billion). Retail trade accounts for the largest number of jobs after manufacturing.

5.11 CULTURAL AND PALEONTOLOGICAL RESOURCES

5.11.1 INTRODUCTION

This section provides an overview of cultural and paleontological resources located in the EOR Region of the northern border and discusses potential impacts of CBP's program alternatives on those resources.

5.11.2 AFFECTED ENVIRONMENT

5.11.2.1 Archaeological Resources: Prehistoric/Precontact Context

Among the known cultural resources in the EOR Region are archeological sites from the prehistoric and pre-European contact periods. This section provides an overview of those periods. An expanded prehistoric and pre-European contact-period context and references can be found in Appendix H. In North America, the Prehistoric/Precontact era is generally divided into three broad periods: Paleo-Indian, Archaic, and Woodland/Ceramic/Late. During the Prehistoric era, North-American groups evolved from highly nomadic big-game hunters to politically sophisticated and sedentary Tribes and nations employing large-scale agriculture. There are thousands of known archaeological sites within the EOR Region, which represent a fraction of the potential sites that may exist in the region. This record of known sites has been built up over the years as a result of reports by amateurs and vocational archaeologists as well as the result of formal archaeological surveys conducted by professionals and academics. In parallel with the evolution of prehistoric groups from nomadic hunting to sedentary agriculture and the resulting increases in population, sites from the earlier periods (ca. 12,000 to ca. 7,000 years before present [B.P.]) are rare. Sites from the later periods account for the bulk of the known sites in the region.

Paleo-Indian Period

The Paleo-Indian period (ca. 12,000 to ca. 10,000 B.P.) is similar in much of the study area and was characterized by people inhabiting the recently deglaciated environment. Subsistence was dominated by big-game hunting of mastodon, mammoth, caribou, horse, bison, musk-ox, giant ground sloth, white-tailed deer, elk, moose, and wapiti, along with species of smaller mammals, birds, fish, reptiles, and shellfish. These early hunting groups generally had highly mobile lifestyles. There are several types of Paleo-Indian sites including small camps; workshops/quarries; kill sites; rockshelters/cave camps; major, recurrently occupied camps; and possible cremation sites.

Archaic Period

During the Archaic period (ca. 10,000 to ca. 3,000 B.P.), the environment changed from unstable post-glacial conditions to an essentially modern state. In the context of this changing landscape came numerous cultural and technological changes. People gradually adopted less-mobile lifestyles. At the same time, they broadened the variety of resources on which they depended for food and shelter. Some groups began regularly interacting and trading with other people across large distances—sometimes over a thousand miles away. There are relatively few sites from the first 3,000 years of the Archaic known in the northern portion of the United States, a fact probably related to the continually changing climate and environment. Sites from the last 4,000 years of the period are more common and show people had developed a great variety of tool

types and styles, mostly made from stone, bone, and wood. In general, Archaic sites are found along water and on lake plains.

Woodland/Ceramic/Late Period

The Woodland/Ceramic/Late period lasted from 3,000 B.P. to the time when European trade goods reached Indian groups (450 to 250 B.P.). During this time, people invented several new technologies, including clay pots and the bow and arrow. Long-distance trade intensified. Groups adopted agriculture, developed even less-mobile lifeways than before, and started living in larger settlements, some with over 1,000 inhabitants. Plains groups began living in tepees and participating in bison kills.

5.11.2.2 Prehistoric Archaeological Site Probability

Archaeologists use a variety of information and techniques to carry out *predictive modeling*, the process of assessing the probability of the existence of archaeological sites in a given location. This section provides an overview of the current understanding of archaeological site probability in the EOR Region.

Minnesota

The Minnesota State Historic Preservation Office (SHPO) requires that all Federal projects be preceded by a Class I and Class III cultural-resource inventory and assessment. Such inventory projects are carried out under the guidelines of the Minnesota SHPO (2006) and the U.S. Secretary of Interior's Standards for Archeology and Historic Preservation (USDOT, 1993). These programs and guidelines follow the regulations established under the National Historic Preservation Act of 1966, as amended. A site-sensitivity model exists for prehistoric sites in Minnesota and is discussed below.

The Minnesota Department of Transportation (MNDOT) has developed a statewide archaeological predictive model, titled Mn/Model (Hudak et al., 2000), as a tool to assess the probability of encountering a prehistoric archaeological site anywhere on the landscape.¹ Such models are sometimes referred to as archaeological sensitivity maps because they indicate some locations as more sensitive for cultural resources than others. These predictive maps usually contain three zones: a high-sensitivity zone, where archaeological sites are most likely present; a medium-sensitivity zone, where sites are less likely; and a low-sensitivity zone, where sites are unlikely. These sensitivity maps serve as beneficial planning tools but by no means replace the appropriate project-level surveys, research, and thorough cultural-resource investigations.

North Dakota

No standardized or widely accepted site-location predictive or sensitivity model for prehistoric sites exists for North Dakota.

¹ Information on the use of the model may be obtained online at the MNDOT Mn/Model website (<http://www.mnmodel.dot.state.mn.us/index.html>) or by contacting the Office of the Chief Archaeologist, MNDOT.

A small fraction of the northern border area of North Dakota has been previously inventoried and evaluated for prehistoric sites. Actual numbers of recorded sites and previous project survey boundaries exist in the North Dakota SHPO database, but exact numbers of cultural resources are not available for this preliminary overview. It is estimated that at least 1,000 precontact/prehistoric sites are recorded within 100 miles of the North Dakota-Canada border.

Montana

No standardized or widely accepted site-location predictive or sensitivity model for prehistoric sites exists for the Montana. Only a small fraction of the northern border area of Montana has been previously inventoried and evaluated for prehistoric sites. Actual numbers of recorded sites and previous project survey boundaries exist in the Montana SHPO database, but exact numbers of cultural resources are not available for this preliminary overview. It is estimated that at least 1,000 precontact/prehistoric sites are recorded within 100 miles of the Montana-Canada border. Most of the project area in Montana is sparsely populated, so the probability of finding intact precontact sites is very high. There is also a strong possibility that sites to be discovered will be highly significant and will meet the eligibility criteria for listing in the National Register.

5.11.2.3 Historic Context

This section provides a brief historic context that describes the development of the EOR Region after European contact. An expanded historic context and references can be found in Appendix H.

The areas east of the Continental Divide were acquired by the United States from France in 1803 as part of the Louisiana Purchase. Contact between Indigenous people and Europeans began in the mid-eighteenth century as French fur traders ventured through the Northern Plains to explore the Rocky Mountains. Visits to the region by Europeans or Americans were infrequent until after 1804, when Lewis and Clark passed through the area. The region attained sufficient population densities by the 1860s to require parceling into territories, later becoming states. Pioneers were largely engaged in oat and wheat farming. Closer to the Rocky Mountains, mining was essential to the local economies and attracted waves of settlers beginning in the 1860s. Gold was the earliest draw, but later silver, copper, lead, coal, and oil became sought-after commodities.

The U.S. Army established numerous forts in this region beginning in the 1860s, and Montana was the scene of numerous battles between the army and various Tribes over control of the land, including the Battle of Little Big Horn with the Lakota and battles with the Nez Perce. By the end of the Indian wars in the 1890s, mining, open and fee-simple ranching, and Bonanza and dairy-farm operations had been established throughout the region. Improvements in transportation became the major determinant of growth, as settlements first developed along Indian and fort trails and waterways. In the 1880s, railroads began to be constructed in the region and remained important until after World War II.

Beginning in the late nineteenth century, the Federal Government began purchasing large swaths of territory to serve as national parks, with Yellowstone being the first. Other parks include Glacier and Badlands National Parks and more than 20 national wildlife refuges. In the 1950s, North Dakota became the home of two large Air-Force bases: Minot and Grand Forks. Oil and natural gas exploration became important industries at the end of the twentieth century. Montana

contains seven Indian reservations: Fort Peck Indian Reservation, Fort Belknap Indian Reservation, Northern Cheyenne Indian Reservation, Crow Indian Reservation, Rocky Boy's Indian Reservation, Blackfeet Indian Reservation, and Flathead Indian Reservation.

5.11.2.4 Historic/Protohistoric Archaeological Site Probability

Among the known cultural resources in the EOR Region are archeological sites from the historic and post-European contact periods. This section provides an overview of the current understanding of historic archaeological site probability in the EOR Region. This section includes the Protohistoric period (defined as the time between the initial arrival of European goods and diseases and actual contact between Native Americans and non-Natives), which extended from about A.D. 1700 to A.D. 1850. Guns, horses, and other elements of material culture were quickly integrated into indigenous economic and subsistence systems and had profound impacts on Native American lifeways throughout the Great Plains, most notably the increased importance of the buffalo. The earliest direct contacts between Native Americans and Europeans in the EOR area were interactions between native groups and French explorers and fur traders in the mideighteenth century. After about 1780, the changes to Native American lifeways brought about by the contact process in the Northern Plains are visible in the archaeological record and have been designated the Equestrian Nomadic Tradition. Archaeological sites from this time include battle sites, camps, and animal-kill sites.

Minnesota

No standardized or widely accepted site-location predictive or sensitivity model for historic archaeological sites exists for the Minnesota; however, one can look at research concerning historic land uses across the landscape—such as railroads, mining areas, and ranching—to make certain predictions regarding the potential for discovering historic archaeological deposits.

Only a small fraction of the northern border area of Minnesota has been previously inventoried and evaluated for historic-period cultural sites. Actual numbers of recorded sites and previous project survey boundaries exist in the Minnesota SHPO database and within the Mn/Model system. As is the case with prehistoric sites in the project area, there is a high probability of discovering previously unrecorded, significant, historic-period cultural properties that will meet the eligibility criteria for listing in the National Register.

North Dakota

No standardized or widely accepted site-location predictive or sensitivity model for historic archaeological sites exists for North Dakota.

A small fraction of the northern border of North Dakota has been previously inventoried and evaluated for historic-period cultural sites. Actual numbers of recorded sites and previous project survey boundaries exist in the North Dakota SHPO database, but exact numbers of cultural resources are not available for this preliminary overview. It is estimated that at least 200 historic-period archaeological sites are recorded within 100 miles of the North Dakota-Canada border. As is the case with prehistoric sites in the project area, there is a high probability of discovering previously unrecorded, significant, historic-period cultural properties that will meet the eligibility criteria for listing in the National Register.

Montana

No standardized or widely accepted site-location predictive or sensitivity model for historic archaeological sites exists for the Montana.

Only a small fraction of the northern border of Montana has been previously inventoried and evaluated for historic-period cultural sites. Actual numbers of recorded sites and previous project survey boundaries exist in the Montana SHPO database, but exact numbers of cultural resources are not available for this preliminary overview. It is estimated that at least 400 historic-period archaeological sites are recorded within 100 miles of the Montana-Canada border. As is the case with prehistoric sites in the project area, there is a high probability of discovering previously unrecorded, significant, historic-period cultural properties that will meet the eligibility criteria for listing in the National Register.

In general for the entire area, historic archaeological sites can occur in or near present-day municipalities and villages as well as along historic-period roads, particularly cross-roads. Sites may also be found along certain railway sections and waterways.

5.11.2.5 Above-Ground Historic Properties

There are numerous above-ground historic properties along the EOR border area that are National Register listed, eligible or potentially eligible for listing. The density of above-ground historic properties, however, decreases moving to the west toward the Rockies. The border area in Minnesota includes a wide range of architectural types: agricultural, commercial, industrial, residential, tourism/recreation, religious, transportation, and civic/governmental. Examples of all popular national architectural styles are represented in the state, ranging from frontier-type resource through the popular Craftsman and Prairie; particularly distinctive are the log, subsistence (non-log early settlement structures), and rustic. Minnesota also has distinctive grand lodges, hotels, resorts, health spas, camp facilities, dude ranches. These tourism/recreation resources include architect-designed buildings executed in rustic/park, frontier revival, and simple wood frame. Other property types include agriculture, agricultural process, and resources related to the state's lumber industry.

Across the large area encompassed by this study, architectural styles of historic structures and districts vary widely. Because Montana and North Dakota are rural, agriculturally dependent states, the majority of historic-resource types are associated with farms and ranches. In the 1920s, North Dakota, like other agricultural areas, experienced economic failure and a decade-long draught. During the Great Depression of the 1930s, numerous Federal relief construction work programs were initiated in the state. Two main stylistic tendencies, the Art Deco and Works Progress Administration-Rustic, characterize most Depression-era architecture. As one of the prominent historic industries in the state, the extraction industry (e.g., lignite) has left behind examples of its works as well.

A small fraction of the EOR area has been previously inventoried and evaluated for historic structures. Actual numbers of recorded above-ground historic properties and previous project survey boundaries exist in SHPO databases and files, but exact numbers of cultural resources are not readily available for this overview. As is the case with other site types in the project area, there is a high probability of discovering previously unrecorded and significant above-ground historic properties that will meet the criteria for listing in the National Register.

Tables 5.11-1, 5.11-2, and 5.11-3 identify historic properties that have been designated as historically important at the national, state, and local levels and briefly describe the historic environments in the vicinity of CBP facilities in the EOR states. Table 5.11-4 lists the historic buildings that reside on CBP property in Montana.

Table 5.11-1. Cultural Resources in the Vicinity of CBP Facilities in Minnesota

Component*	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Baudette	HWY 72 N Baudette, MN 56623	1 National Register property
OFO	POE	Duluth MN/ Superior WI	515 West First Street Duluth, MN 55802	Located at the National Register property 1929 U.S. Courthouse and Customs House in downtown Duluth; within the Duluth Civic Historic District, which consists of four additional properties: City Hall, County Jail, Soldiers and Sailors Monument, and County Courthouse; 159 National Register properties in Duluth; 18 National Register properties in Superior
OFO	POE	Grand Portage	9403 East Highway 61 Grand Portage, MN 55605	One National Register property (on Grand Portage Indian Reservation)
OFO	POE	Grand Marais Station	315 South Broadway Grand Marais, MN 55604	Four locally listed properties (including a lighthouse keeper's house)
OFO	POE	International Falls	2 Second Avenue International Falls, MN 56649	One State Register property; One local property
OFO	POE	Lancaster	4151 Highway 59 Lancaster, MN 56735	None
OFO	POE	Pine Creek	41937 State Highway 89 Roseau, MN 56751	None
OFO	POE	Roseau	41967 State Highway 310 Roseau, MN 56751	None
OFO	POE	Warroad	41059 State Highway 313 Warroad, MN 56763	None
USBP	BPS	Warroad	502 State Avenue South, Highway 11 Warroad, MN 56763	None

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Component*	Type**	Name	Address	National, State, and Local Historical Designations and Environment
USBP	BPS	Duluth	4431 Endeavor Drive Duluth, MN 55811	Located eight miles northwest of Duluth
USBP	BPS	International Falls	1580 Highway 11 International Falls, MN 56649	None
USBP	BPS	Pembina	4151 US Highway 75 Noyes, MN 56740	None
USBP	BPS	Grand Marais	315 South Broadway Grand Marais, MN 55604	See previous description for Grand Marais Station POE.

*OFO = CBP Office of Field Operations, USBP = U.S. Border Patrol

**POE = Port of Entry, BPS = Border Patrol station

Table 5.11-2. Historic Buildings on CBP Property in Minnesota

Building Name	Type	City	Number	Year Finished	Rating Class*
U.S. Border Station, Noyes, MN	Border Station	Noyes	MN0521NB	1932	

Table 5.11-3. Cultural Resources in the Vicinity of CBP Facilities in North Dakota

Component*	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Ambrose	10934 State Highway 42 Ambrose, ND 58833	None
OFO	POE	Antler	10945 Highway 256 Antler, ND 58711	One National Register property in the vicinity
OFO	POE	Carbury	10919 Highway 14 Northeast Souris, ND 58783	One National Register property in the vicinity
OFO	POE	Dunseith	10947 Highway 281 Dunseith, ND 58329	One National Register property in the vicinity
OFO	POE	Fortuna	10935 Highway 85 Northwest Fortuna, ND 58844	None
OFO	POE	Grand Forks	2787 Airport Drive Grand Forks, ND 58203	None
OFO	POE	Hannah	10951 Highway 13 Hannah, ND 58239	None
OFO	POE	Hansboro	10944 Highway 4 Hansboro, ND 58339	None
OFO	POE	Fargo	1801 23 rd Avenue, Room 105 Fargo, ND 58102	Three National Register properties on North Dakota State University campus
OFO	POE	Maida	10947 State Highway 1 Langdon, ND 58249	None
OFO	POE	Neché	10949 Highway 18 Neché, ND 58265	None
OFO	POE	Noonan	10945 North 40 Noonan, ND 58765	Two National Register properties in the vicinity (One farm, One hotel)
OFO	POE	Northgate	10921 Highway 8 Flaxton, ND 58737	None
OFO	POE	Pembina	10980 Highway 29 Pembina, ND 58271	U.S. Border and Customs House is a National Register property; in village of Pembina

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Component*	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Portal	301 West Railway Avenue Portal, ND 58772	Two National Register properties in the vicinity
OFO	POE	Sarles	10949 State Highway 20 Sarles, ND 58372	None
OFO	POE	Sherwood	10927 Highway 28 Sherwood, ND 58782	None
OFO	POE	Saint John	Route 1 Highway 30 North Saint John, ND 58369	One state-listed property; two miles NW (Saint Claude Mission)
OFO	POE	Walhalla	10955 State Highway 32 Walhalla, ND 58282	Two National Register properties: Gingras Trading Post three miles NE (also state listed) and the Walla Theater in the village; One state-listed property: Walhalla State Historic Site, birthplace of Walhalla, 0.5 mile NW
OFO	POE	Westhope	10923 Highway 83 Westhope, ND 58793	None
USBP	BPS	Portal Station	Railway Avenue and Makee Street Portal, ND 58772	None
USBP	BPS	Bottineau	1235 11 th Street East Bottineau, ND 58318	One National Register property in Bottineau (Main building, School of Forestry)
USBP	Sector HQ	Grand Forks	1816 17 th Street Northeast Grand Forks, ND 58203	None
OAM	Air Facility	Grand Forks	1816 17 th Street Northeast Grand Forks, ND 58203	None

*OFO = CBP Office of Field Operations, USBP = U.S. Border Patrol, OAM = CBP Office of Air and Marine

**POE = Port of Entry, BPS = Border Patrol station

Table 5.11-4. Historic Buildings on CBP Property in North Dakota

Building Name	Type	City	Number	Year Finished	Rating Class*
Ambrose Border Station Res 1, Ambrose, ND	Residence	Ambrose	ND0502AK	1932	
Ambrose Border Station Res 2, Ambrose, ND	Residence	Ambrose	ND0503AK	1932	
Sherwood Border Station Garage, Sherwood, ND	Garage	Sherwood	ND0552AP	1937	
St. John Border Station Res 1, St. John ND	Residence	St. John	ND0532AN	1931	
St. John Border Station Res 2, St. John, ND	Residence	St. John	ND0533AN	1931	
U.S. Border Station, Portal, ND	Border Station	Portal	ND0521AM	1932	
U.S. Border Station, St. John, ND	Border Station	St. John	ND0531AN	1931	
U.S. Border Station, Ambrose, ND	Border Station	Ambrose	ND0501AK	1932	

Table 5.11-5. Cultural Resources in the Vicinity of CBP Facilities in Montana

Component*	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Del Bonita	4071 Chalk Butte Road Cut Bank, MT 59427	City; county seat; end of the Cherokee Trail or Rocky Mountain Trail; location of Captain Meriwether Lewis skirmish with Blackfeet in the vicinity; no National Register properties in the vicinity
OFO	POE	Great Falls	2108 21 st Avenue South Great Falls, MT 59405	City (second largest in state); county seat; National Landmark: Great Fall Portage (Lewis & Clark 1805–06) in the vicinity; Four National Register districts; 19 National Register properties in the vicinity
OAM	Air Facility	Great Falls	2108 21 st Avenue South Great Falls, MT 59405	See description for Great Falls above.
OFO	POE	Morgan	53869 US Highway 191 N Loring, MT 59537	Small rural community; no National Register properties in the vicinity
OFO	POE	Opheim	6071 State Highway 24 North Opheim, MT 59250	Small rural community; no National Register properties in the vicinity
OFO	POE	Piegan	4999 Highway 89 North Babb, MT 59411	Small community on the Blackfeet Reservation; Piegan Border Station and Quarters and the Chief Mountain Border Station and Quarters are both National Register properties; One National Register district in the vicinity
OFO	POE	Raymond Area	Highway 16 North of Raymond Raymond, MT 59256	Small community; One National Register property in the vicinity
OFO	POE	Roosville (WOR)	7915 Highway 93 North Eureka, MT 59917	Small town; Two National Register properties in the vicinity
OFO	POE	Scobey	1440 Highway 13 North Scobey, MT 59263	Small city; Three National Register properties in the vicinity
OFO	POE	Sweetgrass Area	39825 Interstate 15 Sweetgrass, MT 59484	Small community; U.S. Customs Building is a National Register property; no other listings in the vicinity

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Component*	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Turner	Highway 24 at the Border Turner, MT 59542	Small rural community; 12 miles south of port of entry
OFO	POE	Whitetail	1281 Highway 511 North Whitetail, MT 59276	Small village; no National Register properties in the vicinity
OFO	POE	Whitlash	Highway 409 at the Border Whitlash, MT 59545	Rural community; near East Butte of the Sweet Grass Hills hunting/battle/spiritual grounds; no National Register properties in the vicinity
OFO	POE	Wild Horse	29966 Wild Horse Road Havre, MT 59501	City; One National Register district; Seven National Register properties including the Wahpa Chu`gn Buffalo Jump and Archeological Site (24HL101) and nineteenth-century Fort Assiniboine in the vicinity
OFO	POE	Willow Creek	29942 Saint Joe Road Havre, MT 59501	See description for Wild Horse above.
USBP	BPS	Shelby	25 Airport Road Shelby, MT 59474	City; Three National Register properties in the vicinity
USBP	BPS	Saint Mary	4999 US Highway 89 Babb, MT 59411	See previous description for the Piegan POE.
USBP	BPS	Sweetgrass	37 Nine Mile Road Sunburst, MT 59482	Rural town; no National Register properties in the vicinity
USBP	BPS	Scobey	131 C Highway 5 East Scobey, MT 59263	Small city; Three National Register properties in the vicinity
USBP	BPS	Plentywood	31 Highway 16 North Plentywood, MT 59254	Incorporated community; no National Register properties in the vicinity
USBP	BPS	Malta	47152 US Highway 2 Malta, MT 59538	City; Four dinosaur fossils found in the vicinity; Phillips County Carnegie Library on S. 1 st Street is a National Register property.
USBP	Sector HQ	Havre	345 16 th Avenue West Havre, MT 59501	See previous description for the Wild Horse POE.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Component*	Type**	Name	Address	National, State, and Local Historical Designations and Environment
USBP	BPS	Eureka (WOR)	7695 Airport Road Eureka, MT 59917	See previous description for the Roosville POE.
USBP	BPS	Whitefish (WOR)	1295 Highway 93 West Whitefish, MT 59937	City; Three National Register properties in the vicinity

*OFO = CBP Office of Field Operations, OAM = CBP Office of Air and Marine, USBP = U.S. Border Patrol

**POE = Port of Entry, BPS = Border Patrol station

Table 5.11-6. Historic Buildings on CBP Property in Montana

Building Name	Type	City	Number	Year Finished	Rating Class*
Chief Mountain Border Station ²	Border Station	Babb	MT0501AD	1939	National Register listed
Chief Mountain Border Station Pump House	Other	Babb	MT0503AD	1939	Not rated
Chief Mountain Border Station Garage	Garage	Babb	MT0502AD	1939	Not rated
Piegian Border Station Apartment Complex	Border Station	Babb	MT0551AE	1933	National Register listed
Roosville Border Station Residence Customs	Residence	Eureka	MT0703AG	1933	5a
Roosville Border Station Residence Immigration	Residence	Eureka	MT0702AG	1933	5a
Roosville Border Station	Border Station	Eureka	MT0701AG	1933	5a

Source:(USGSA, 1999; Appendix C, GSA Historic Buildings).

*GSA Historic Rating Class 5a: A building 50-yearsold or older that has not been evaluated for National Register eligibility but is likely eligible, such as a courthouse, custom house, or historic office building (“Held in Public Trust” Appendix C; see footnote above).

5.11.2.6 Native American Cultural Resources

This section provides information about the potential location of Native American cultural resources, sacred sites, and traditional cultural properties (TCPs) in the EOR Region, based on the geographic location of Native Americans both historically and in the present. There are 18

² <http://www.nationalregisterofhistoricplaces.com/mt/Glacier/state.html>, April 27, 2012, 15:32.

tribal groups within the EOR area (Table 5.11-5). Twelve of these Tribes have reservations within the EOR study area (Figure 5.11-1).

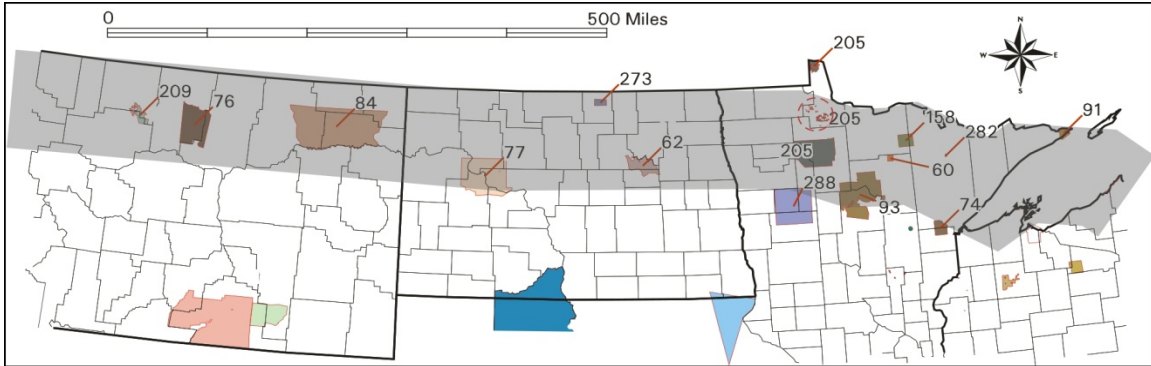
Table 5.11-5. Native American Tribes that Have a Reservation, Judicially Established Interest, or Established Traditional Ties to Land within the 100-mile PEIS Corridor

Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation	Minnesota Chippewa Tribe
Bois Forte Band of Chippewa Indians	Prairie Island Indian Community in the State of Minnesota
Chippewa-Cree Indians of the Rocky Boy's Reservation	Red Lake Band of Chippewa Indians
Fond du Lac Band	Shakopee Mdewakanton Sioux Community of Minnesota
Fort Belknap Indian Community of the Fort Belknap Reservation of Montana	Spirit Lake Tribe
Grand Portage Band of Lake Superior Chippewa	Standing Rock Sioux Tribe (North Dakota & South Dakota)
Leech Lake Band of Chippewa Indians	Three Affiliated Tribes of the Fort Berthold Reservation (Mandan, Arikara, and Hidatsa)
Lower Sioux Indian Community	Turtle Mountain Band of Chippewa Indians of North Dakota
Mille Lacs Band of Ojibwe	White Earth Band of Minnesota Chippewa

The following maps indicate federally recognized Tribes that have a reservation within approximately 100 miles of the Canadian border, have a judicially established connection to land within the 100-mile corridor, or have established traditional ties that may involve traditional cultural properties or archaeological sites. The maps include:

1. A map of Indian reservations located within the 100-mile corridor (Figure 5.11-1);
2. A USGS map showing nineteenth-century cessions, reservations, and portages (Figure 5.11-2). This map was retrieved from ancestry.com; while the sourcing is unclear, the accuracy is corroborated by a 1992 map compiled by the Bureau of Indian Affairs and a 1998 GIS layer created by USGS (not included). The map shows Tribes that had a presence along the Northern Border 100 years ago and indicates cases where Indian lands were ceded prior to that period;
3. A USGS map showing judicially established Indian land areas as of 1978 (Figure 5.11-3). The map portrays the results of cases before the U.S. Indian Claims Commission or U.S. Court of Claims in which an American-Indian Tribe proved its original tribal occupancy of a tract within the continental United States; and,
4. A USGS map indicating early tribal, cultural, and linguistic areas (Figure 5.11-4). The information was derived from anthropological, archaeological, and linguistic studies. The map generally corroborates the other maps with regard to traditional tribal areas.

Figure 5.11-1. Native American Lands Within the 100-mile PEIS Corridor Crossing Minnesota, North Dakota, and the Eastern Two-Thirds of Montana *



*Key to Figure 5.11-1		209	Chippewa-Cree Indians of the Rocky Boy's Reservation	205	Red Lake Band of Chippewa Indians
84	Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation	74	Fond du Lac Band	62	Spirit Lake Tribe (Sioux)
60	Bois Forte Band of Chippewa Indians (Deer Creek)	76	Fort Belknap Indian Community of the Fort Belknap Reservation of Montana	77	Three Affiliated Tribes of the Fort Berthold Reservation (Mandan, Arikara, and Hidatsa)
158	Bois Forte Band of Chippewa Indians (Nett Lake)	91	Grand Portage Band of Lake Superior Chippewa	273	Turtle Mountain Band of Chippewa Indians of North Dakota
282	Bois Forte Band of Chippewa Indians (Vermilion Lake)	93	Leech Lake Band of Chippewa Indians	288	White Earth Band of Minnesota Chippewa

Source:(USDOJ, 2010).

Note: A shaded 100-mile corridor has been added.

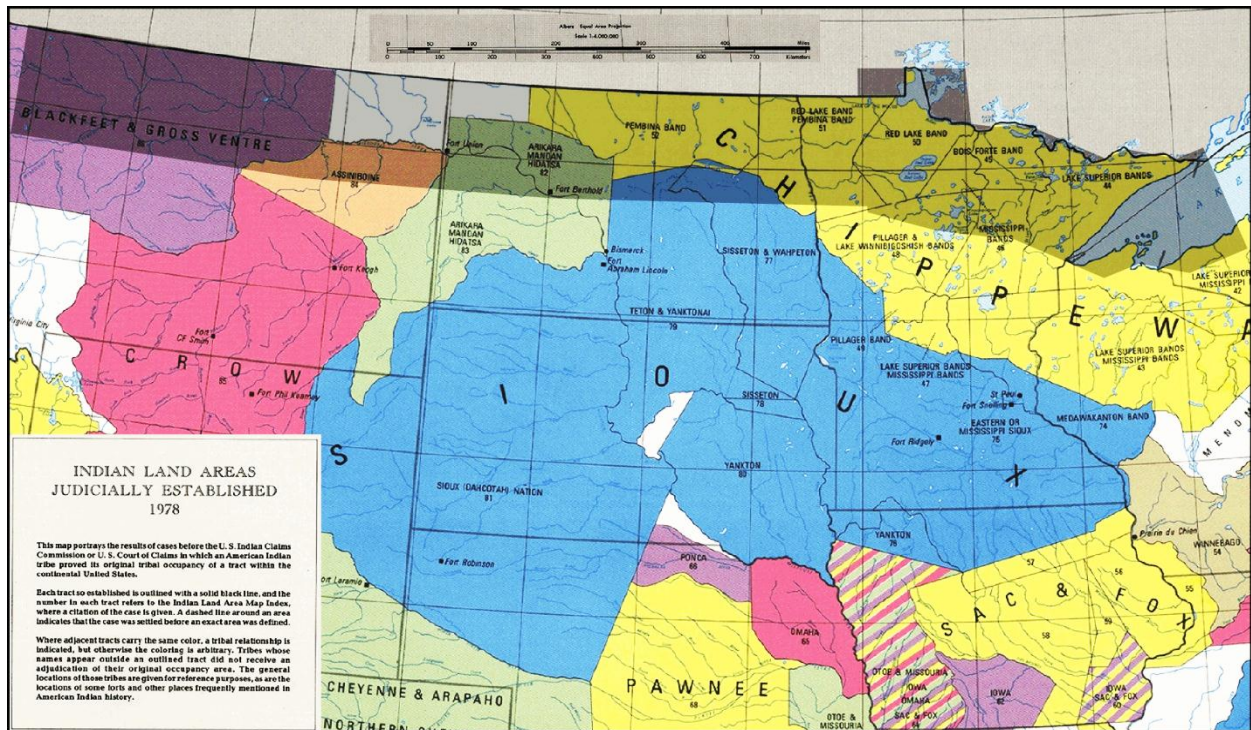
Figure 5.11-2. Nineteenth-Century Cessions, Reservations, and Portages (1907)



Source: (ancestry.com, No Date).

Note: A shaded 100-mile corridor has been added.

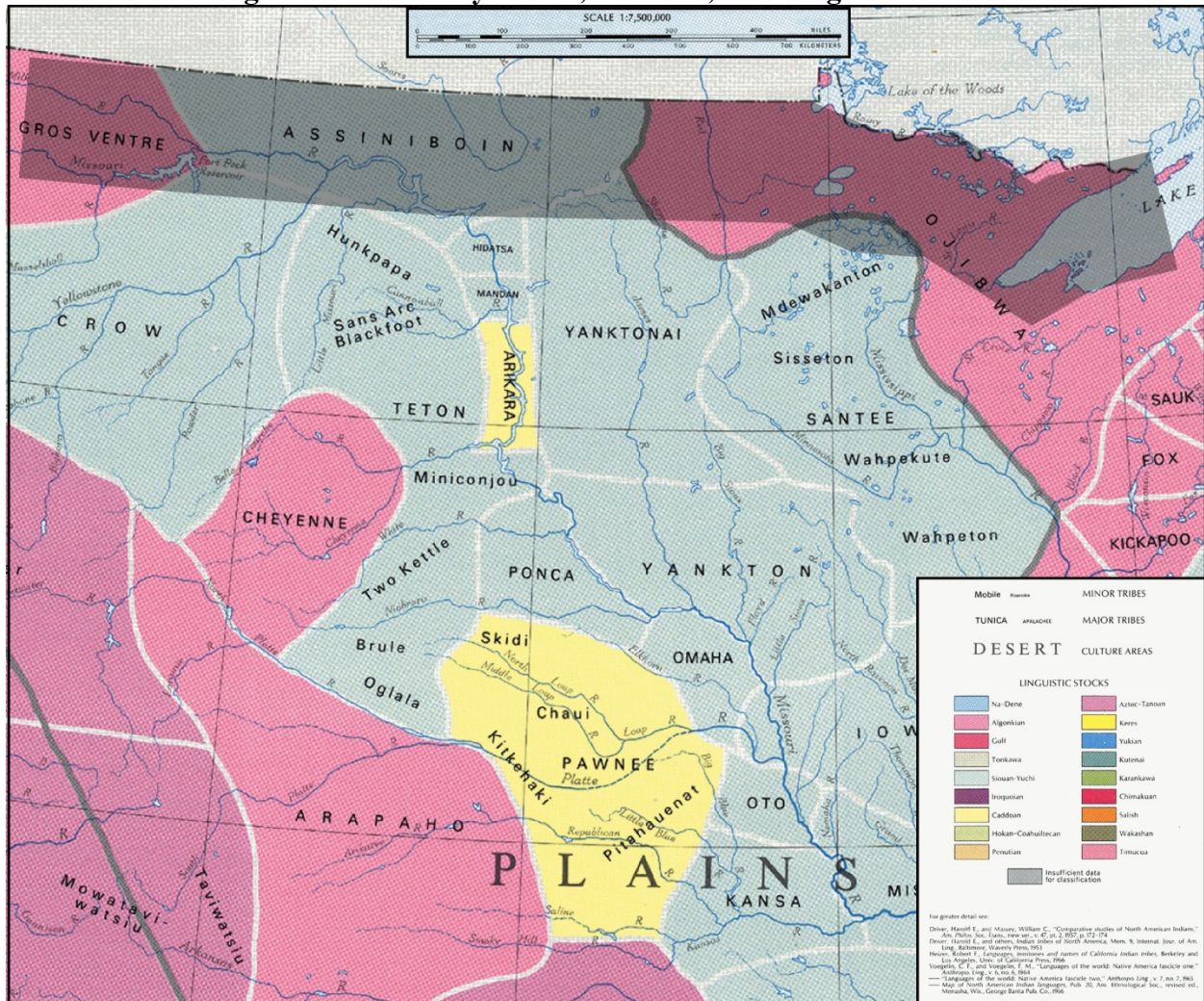
Figure 5.11-3. Judicially Established Indian Land Areas as of 1978



Source: (USDOI, 1978).

Note: A shaded 100-mile corridor has been added

Figure 5.11-4. Early Tribal, Cultural, and Linguistic Areas



Source: (USDOJ, 1991).

Note: A shaded 100-mile corridor has been added.

5.11.2.7 Paleontological Resources

As with archaeology, paleontologists use a variety of information and techniques to carry out *predictive modeling*, the process of assessing the probability of existence of paleontological sites in a given location. This section provides an overview of the current understanding of paleontological site probability in the EOR Region. An expanded discussion of paleontological resources and references can be found in Appendix H.

Within the study area, four major geological groups were identified: sedimentary, volcanic, plutonic, and metamorphic. Of these rock groups, only sedimentary rocks have a high or moderate potential for containing paleontological materials. Both plutonic and volcanic rocks rarely contain fossils because igneous environments are not suitable for living things.

Metamorphic rocks rarely contain fossils because the conditions of metamorphism tend to alter the texture of the rocks and destroy any fossils contained within.

Minnesota

Paleontologically sensitive geological units in Minnesota include predominantly Precambrian and Cenozoic deposits. Banded iron formations and stromatolites (formed in shallow water) mark Precambrian deposits. Paleozoic deposits consist of tropical sandy coastline and shallow marine deposits. Limestone and dolostone are common from this age. Cenozoic deposits in the study area include mostly glacial deposits containing mastodons, mammoths, musk ox, and other large mammals.

North Dakota

Paleontological-sensitive geological units in North Dakota consist predominantly of Mesozoic and Cenozoic deposits. Paleozoic deposits only exist in the study area in the most eastern part of the state. Paleozoic deposits represent fluctuating sea levels with large assemblages of different marine invertebrates. Mesozoic deposits are predominantly of shallow marine origin and include many fishes, reptiles, and birds. Cenozoic deposits range from subtropical, swampy lowlands to glacial deposits.

Montana

Paleontologically sensitive geological units in Montana consist predominantly of Precambrian, Cretaceous, and Tertiary sedimentary units. Precambrian sedimentary units include shallow sea stromatolites and trace fossils. Paleozoic deposits are from warm and shallow marine waters that created a thin blanket over almost all of Montana. Mesozoic deposits are of terrestrial and tropical marine origin. The Cenozoic marks the retreat of the ocean and the onset of a colder period. Deposits from the Cenozoic thus range from tropical shallow seas to glacial deposits.

5.12 ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

5.12.1 INTRODUCTION

Executive Order (EO) 12898 of February 11, 1994 (EO 12898, 1994), titled “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” requires that each Federal agency identify and address any disproportionately high and adverse effect of its programs, policies, and activities on minority and low-income populations. The USEPA defines *environmental justice* as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies” (USEPA, 2010).

EO 13045 of April 21, 1997 (EO 13045), titled “Protection of Children from Environmental Health Risks and Safety Risks,” places a high priority on the identification and assessment of environmental health and safety risks that may disproportionately affect children. The order requires that each agency “ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health or safety risks.” EO 13045 considers that physiological and social development of children makes them more sensitive than adults to adverse health and safety risks and recognizes that children in minority, low-income, and indigenous populations are more likely to be exposed to, and have increased health risks from, environmental contamination than the general population (USEPA, 2010).

5.12.2 AFFECTED ENVIRONMENT

This section describes the affected environment for the assessment of potential environmental-justice effects that could result from implementation of any of the CBP program alternatives in the EOR Region. The affected-environment section identifies and describes minority and low-income populations, as well as populations of children that may be present in the defined study area and that may be differentially affected by actions proposed under each of the alternatives considered in this PEIS.

The study area for the evaluation of environmental-justice effects is defined—in accordance with Section 5.10, Socioeconomic Resources—as the border communities in both the United States and Canada within 100 miles of the U.S.-Canada border. The U.S. portion of this study area (EOR Region) includes the border communities in the states of Minnesota, North Dakota, and Montana east of the Continental Divide. The study area north of the EOR Region in Canada includes the border communities in the Provinces of Alberta, Saskatchewan, and Manitoba. For comparison purposes, the analysis also includes the populations of the respective border states and Canadian provinces as a whole. Border communities are defined geographically by the administrative boundaries of U.S. counties and Canadian census divisions contained within or overlapping the study area. A detailed demographic analysis of the study area is in Section 5.10.

5.12.2.1 Minority Populations

The most recent USCB data for minority populations available for all counties and states in the United States are part of the Decennial Census for the year 2000 (UDOC, 2000a). Statistical data from this census have been used to characterize the minority populations within the EOR

Region. Summary statistics for minority populations in the EOR Region, their respective states, and the Nation are presented in Table 5.12-1.

The minority component of the border-communities population is lower than that for the state population as a whole in the state of Minnesota but slightly higher for the states of Montana and North Dakota. The individual study areas of both Montana and North Dakota also have a higher proportion of minorities in their populations than is present in the EOR Region as a whole. American-Indian and Native-Alaskan populations represent the largest single minority identification within the border communities, with 6.7 percent of the total study-area population. These populations also represent the largest category in each of the individual state study areas.

**Table 5.12-1. Minority Statistics for the EOR Region
(Percent of Population)**

Border State/Region*		White	Black or African American	American Indian and Alaska Native	Asian, Native Hawaiian, Pacific Islander, Other	More Than One Group	Hispanic Origin**
Minnesota	EOR Region	93.1	0.5	4.0	1.1	1.3	1.1
	Statewide	89.5	3.4	1.1	4.2	1.8	2.9
Montana	EOR Region	85.9	0.5	10.4	0.9	2.3	1.6
	Statewide	90.6	0.3	6.1	1.1	1.9	2.0
North Dakota	EOR Region	89.2	0.7	7.6	1.0	1.5	1.5
	Statewide	92.5	0.6	4.9	0.9	1.2	1.2
EOR Region Total	EOR Region	90.1	0.6	6.7	1.0	1.6	1.3
	Selected States	89.9	2.7	2.2	3.4	1.8	2.6
Total United States		75.1	12.2	0.9	9.2	2.6	12.5

Source: (USDOC, 2000a).

*Statistics presented in the unshaded rows include only those portions of the states that lie within the study area; this includes all counties overlapping the area within 100 miles south of the border.

**Hispanic origin is an ethnicity that may include individuals who are also represented in other categories (such as White or Black). Therefore, Hispanic origin is a separate measure and is calculated separately from the other categories.

Data on minority populations north of the EOR Region in Canada were taken from the 2006 Census of Canada (Table 5.12-2). The minority component of the border communities north of the EOR Region represents a slightly larger percentage of the population, 13 percent, than is present for the three provinces that contain the study area, 11.2 percent. However, both the study area and the three provinces that contain the study area have a smaller percentage of minorities in the population than the national population of Canada as a whole, 16.2 percent. Minority populations are present in greater proportions in the study area in Alberta Province, 17.2 percent, than for the total population of the study area north of the EOR Region in Canada. The study-

area segments of both the Provinces of Manitoba and Saskatchewan have smaller minority components in their populations.

The “Other Visible Minority” population (including multiple ethnicities) constitutes the largest single minority category in both the study area north of the EOR Region and in the three respective provinces. This category consists primarily of the following groups: Chinese, South Asian, Arab, West Asian, Filipino, Southeast Asian, Latin American, Japanese, and Korean. However, Aboriginal Peoples constitute the largest single identifiable minority within the study area.

Table 5.12-2. Visible Minority Statistics North of the EOR Region in Canada* (Percent of Population)

Border Province/Region**		Not a Visible Minority	Black	Other Visible Minority***	Two or More Visible Minorities	Aboriginal Peoples**** *
Alberta	North of the EOR Region	82.8	1.6	15.1	0.5	3.4
	Province	86.1	1.4	12.1	0.4	5.8
Manitoba	North of the EOR Region	89.5	1.5	8.7	0.3	11.8
	Province	90.4	1.4	8.0	0.3	15.5
Saskatchewan	North of the EOR Region	96.0	0.6	3.2	0.1	7.9
	Province	96.4	0.5	2.9	0.1	14.9
North of the EOR Region Total	North of the EOR Region	87.0	1.4	11.2	0.4	7.0
	Selected Provinces	88.8	1.3	9.6	0.3	9.5
Total Canada		83.8	2.5	13.3	0.4	3.8

Source: (StatCan, 2006a).

*Canada’s Employment Equity Act (2005) defines *visible minorities* as "persons, other than Aboriginal peoples, who are non-Caucasian in race or non-white in color."

**Statistics presented in the unshaded rows account only for those portions of the provinces that lie within the study area; this includes all census divisions overlapping the area within 100 miles north of the border.

***The “Other Visible Minority” population consists mainly of the following groups: Chinese, South Asian, Black, Arab, West Asian, Filipino, Southeast Asian, Latin American, Japanese, and Korean.

****Self-identification by Aboriginal Peoples does not preclude self-identification inclusion in one of the other categories. The “Aboriginal Peoples” column of this table is, therefore, not additive with the other columns.

5.12.2.2 Low-Income Populations

Data from the most recently completed USCB (USDOC, 2000b; USDOC, 2000c) were used to characterize low-income minority populations for the EOR Region. Median household income and poverty rates are in Table 5.12-3.

For the EOR Region, the median household income is \$11,114 lower than the median for the total American border region and \$10,160 lower than the median for the Nation as a whole. The median household income for border communities within each individual state is lower than the national median.

The percentage of populations below the poverty line is higher than the national median for border communities in the states of Montana and North Dakota but slightly lower for those in the state of Minnesota. In all three states, poverty rates for the study-area portion of the state exceed the rates for the state population as a whole.

Table 5.12-3. Income and Poverty Statistics for the EOR Region

Border State/Region*		Median Household Income** (\$US)	Percent of Population Below the Poverty Line
Minnesota	EOR Region	44,926	11.9
	Statewide	59,516	7.9
Montana	EOR Region	40,642	15.8
	Statewide	41,720	14.6
North Dakota	EOR Region	41,654	13.2
	Statewide	43,716	11.9
EOR Region Total	EOR Region	42,891	13.3
	Selected States	55,462	9.3
Total United States		53,051	12.4

Source: (USDOC, 2000b; USDOC, 2000c).

*Statistics presented in the unshaded rows include only those portions of the states that lie within the study area; this includes all counties overlapping the area within 100 miles south of the border.

**Median household income is reported from the 2000 USCB in inflation-adjusted 2009 U.S. dollars.

Data on median household income and populations living below the poverty level north of the EOR Region in Canada were gathered from the 2006 Census of Canada. Statistics for this study area are in Table 5.12-4.

The median income for the border communities north of the EOR Region in 2006 was \$53,002, or \$3,609 higher than the median for the Canadian population as a whole. Median income in the border communities of the Province of Alberta exceeded the national median. In all three provinces, the median household income in the study-area portion of the province was higher than the median for the respective province as a whole.

Based on the percentage of low-income economic families, the poverty rate for border communities north of the EOR Region is 1.6 percent lower than for the Nation as a whole. The study-area portions of both the Provinces of Saskatchewan and Alberta had poverty rates substantially below the national rate.

Table 5.12-4. Income and Poverty Statistics North of the EOR Region in Canada

Border Province/Region*		Median Household Income** (\$US)	Percent of Low-Income Economic Families***
Alberta	North of the EOR Region	60,101	8.8
	Province	58,928	8.7
Manitoba	North of the EOR Region	45,375	12.3
	Province	44,089	12.3
Saskatchewan	North of the EOR Region	46,024	8.8
	Province	43,012	10.2
North of the EOR Region Total	North of the EOR Region	53,002	10.0
	Selected Provinces	52,939	9.7
Total Canada		49,393	11.6

Source: (StatCan, 2006b).

*Statistics presented in the unshaded rows include only those portions of the provinces that lie within the study area; this includes all census divisions overlapping the area within 100 miles north of the border.

**Median household income is reported from the 2006 Canadian Census in inflation-adjusted 2009 U.S. dollars.

***The Canadian Census reports statistics for “low-income” economic families. This threshold-based designation is comparable to the poverty statistics reported in the USCB. An *economic family* is a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common-law, or adoption. A couple may be of opposite or same sex. Foster children are included.

5.12.2.3 Population of Children under 18 Years of Age

The distribution of population by age for the EOR Region is in Table 5.12-5. For the border communities within individual states, both Montana and North Dakota have larger percentages of children under 18 years of age than does the national population.

**Table 5.12-5. Age Distribution in the EOR Region
(Percent of Population)**

Border State/Region*		Under 18	18-24	25-34	35-44	45-54	55-64	65+
Minnesota	EOR Region	24.1	9.6	10.2	15.1	14.5	10.1	16.5
	Statewide	26.2	9.5	13.6	16.9	13.5	8.2	12.1
Montana	EOR Region	27.0	8.2	10.7	16.1	14.4	9.3	14.3
	Statewide	25.5	9.5	11.4	15.9	14.9	9.4	13.4
North Dakota	EOR Region	25.8	10.7	11.2	15.1	13.1	8.5	15.6
	Statewide	25.1	11.3	11.9	15.4	13.3	8.3	14.7
EOR Region Total	EOR Region	25.3	9.6	10.6	15.4	14.1	9.4	15.7
	Selected States	26.0	9.7	13.2	16.6	13.7	8.4	12.5
Total United States		25.6	9.6	14.1	16.3	13.4	8.6	12.4

Source: (USDOC, 2000c).

*Statistics presented in the unshaded rows account only for those portions of the states that lie within the study area; this includes all counties overlapping the area within 100 miles south of the border.

The distribution of population by age north of the EOR Region in Canada is in Table 5.12-6. For the border communities in all three provinces, children under 20 years of age represent 26.2 percent of the total population. This is slightly smaller than the percentage of children in the combined population of the three provinces that contain the study area, but 1.5 percent greater than the national percentage of 24.7. The percentage of children under 20 is greater than the percentage in the national population for border communities in each of the three individual provinces and for the population of the individual provinces as a whole.

**Table 5.12-6. Age Distribution North of the EOR Region in Canada
(Percent of Population)**

Border Province/Region*		Under 20	20-24	25-34	35-44	45-54	55-64	65+
Alberta	North of the EOR Region	26.1	7.5	15.0	15.9	15.8	9.7	9.9
	Province	26.7	7.7	14.5	15.4	15.6	9.8	10.2
Manitoba	North of the EOR Region	26.4	6.9	12.4	14.3	15.3	11.2	13.7
	Province	27.2	6.8	12.3	14.2	15.1	11.0	13.4
Saskatchewan	North of the EOR Region	25.8	6.7	11.7	13.5	15.8	11.0	15.4
	Province	27.5	7.0	11.8	13.3	15.2	10.6	14.6
North of the EOR Region Total	North of the EOR Region	26.2	7.2	13.6	15.0	15.6	10.4	12.0
	Selected Provinces	26.9	7.4	13.6	14.8	15.4	10.2	11.7
Total Canada		24.7	6.6	12.8	15.3	15.8	11.7	13.0

Source: (StatCan, 2006c).

*Statistics presented in the unshaded rows account only for those portions of the provinces that lie within the study area; this includes all census divisions overlapping the area within 100 miles north of the border.

5.13 HUMAN HEALTH AND SAFETY

5.13.1 INTRODUCTION

Many of the routine activities conducted by CBP in the EOR Region have the potential to affect human health and safety (HH&S). HH&S relates to the health and safety of the general public (including vehicle occupants), CBP and station employees, and maintenance personnel. Safety can also refer to safe operations of aircraft or other equipment.

This section considers the potential adverse and beneficial impacts of CBP's alternative actions on HH&S.

5.13.2 AFFECTED ENVIRONMENT

Construction

HH&S concerns during construction and modernizing of facilities involve exposing workers to conditions that pose a health or safety risk. Construction site safety is largely a matter of adherence to regulatory requirements. These regulatory requirements are imposed for the benefit of employees and they implement operational practices that reduce risks of illness, injury, death, and property damage. The U.S. Occupational Safety and Health Administration (OSHA) issues standards that specify the amount and type of safety training and education required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits with respect to workplace stressors (29 CFR 1910). CBP applies and adheres to these standards in policy and practice.

Routine Operations

Trade and Travel Processing at POEs

The affected environment of agricultural inspections is the inspection location. Agricultural inspections are typically conducted onsite at POEs, but officers sometimes escort the shipment to the receiver site for inspection (USDHS, 2011). Inspections can also take place on the vessel or train transporting cargo into the United States. After inspection, many types of shipments are released to the appropriate agency.

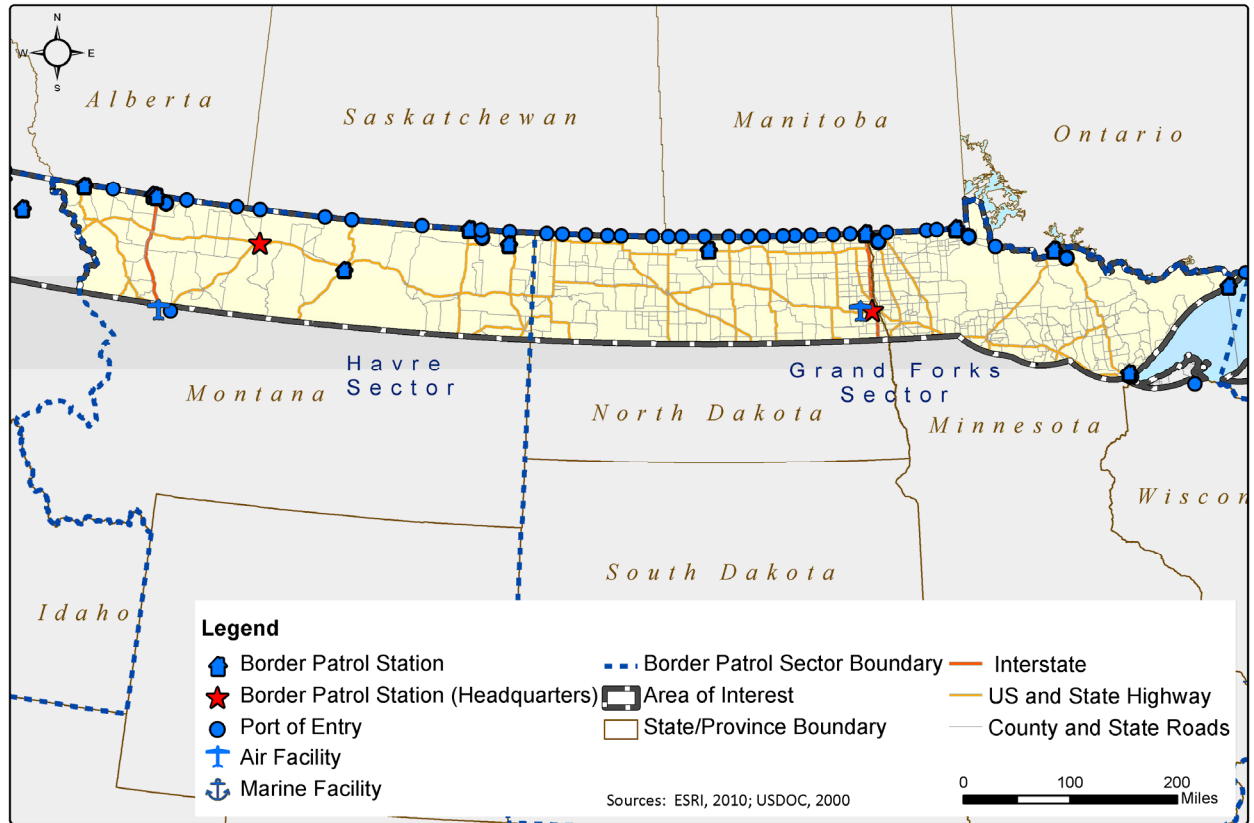
During these interceptions, HH&S effects are possible. Release of nonindigenous diseases into the United States would be harmful to HH&S. To prevent nonindigenous diseases from entering the United States, CBP places bans on certain animals, animal products, and other possible carriers of disease. In 2003, in Canada a positive case of bovine spongiform encephalopathy ("mad cow" disease) touched off an immediate ban on ruminant meat from Canada into the United States. That same year, there was an outbreak of monkeypox in the United States. This outbreak was linked to exotic animals being imported into the United States as pets. A ban was immediately imposed on certain live rodents from Africa, and agricultural specialists still enforce this ban (USDHS, 2004a). Preventing nonindigenous diseases from entering the United States has a beneficial effect on HH&S because it limits the outbreak of disease.

Ground Surveillance and Situational Response Activities

Motorized and Nonmotorized Patrols

Motorized patrols take place on U.S. national, state, county, and local municipalities' paved roads. Figure 5.13-1 shows U.S. national, state, and county roads that USBP agents can use for motorized patrolling in the EOR Region. In rural areas along the border, USBP agents also use dirt roads for motorized and nonmotorized patrols. Dirt roads along the border region were built to be 24-feet wide, but due to vegetation growth the roads are now typically less than 10 feet wide (USDHS, 2011). USBP agents also use other Federal agencies' roads, including roads in national forests and national parks. When possible, the USBP agents remain on existing roads to apprehend cross-border violators but when required they go off-road. Off-road vehicles and nonmotorized patrols take place off-road and in remote areas along the border.

Figure 5.13-1. U.S., Interstate, State, and County Roads in the EOR Region



Aircraft Operations

Manned aerial surveillance patrols are generally between 300 feet above ground level (AGL) and flight level (FL) 250. Aircraft patrols are operated at different heights based on different operational and environmental conditions including weather conditions and high-traffic environments. Manned aerial surveillance patrols are conducted along the EOR border, and can be operated out of the Grand Forks Air and Marine Branch. This Office of Marine and Air (OAM) branch possesses equipment and resources for aerial patrols. In order to fly for CBP, OAM agents must have a Federal Aviation Administration (FAA)-issued license (USDHS, 2010a). Accidents during manned aerial surveillance patrols could potentially injure OAM officers or members of the general public.

Unmanned Aircraft Systems (UAS) are remotely piloted aircraft. UAS patrols are conducted out of the Grand Forks Sector in the EOR Region. UASs are operated at 18,000 feet above ground level or higher. The FAA sets the constraints for where a UAS may operate and how these operations may be conducted safely in the National Airspace System (NAS). Their main focus when evaluating UAS operations in the NAS is to make sure a UAS will not endanger other users of the NAS or compromise the safety of persons or property on the ground.

The FAA recognizes the great potential of UASs in homeland security and strives to accommodate the DHS's needs for UAS operations, without jeopardizing safety. Because airspace is a finite resource, the FAA sets aside Restricted or Prohibited Areas to help mitigate risks. These Restricted or Prohibited Areas are for an operator's exclusive use when needed.

For CBP UASs to gain access to the civil airspace, CBP must go through the FAA's Certificate of Waiver or Authorization (COA) process. This is the avenue by which public users (Government agencies and Federal, state, and local law enforcement) that wish to fly a UAS can gain access to the NAS, provided that the risks of flying the UAS in the civil airspace can be appropriately mitigated.

To minimize the risk of operating a UAS, the FAA frequently requires risk mitigations before granting a COA. These mitigations include special provisions unique to the requested type of operation. For example, the applicant may be restricted to operating only in a defined airspace or operating only during certain times of the day. The UAS may be required to have a transponder if it is to be flown in a certain type of airspace. Other safety enhancements may be required, depending on the nature of the proposed operation. To ensure safety, the COA application is reviewed for feasibility; airspace experts review and ensure that the operation will not severely impact the efficiency of the NAS. As of April, 2011, CBP has been issued 12 COAs.

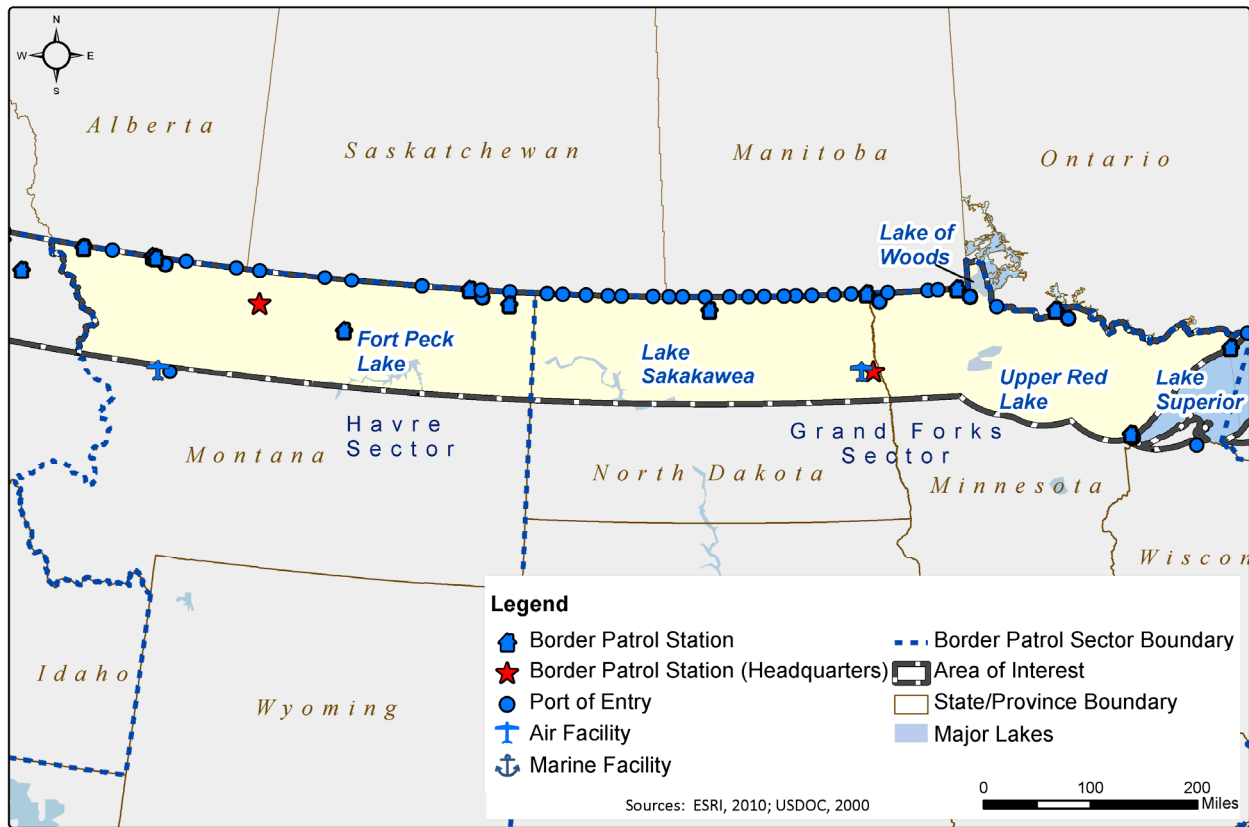
Given that there are emergency and disaster situations where the use of UASs has saved lives and otherwise mitigated emergency situations, the FAA has issued three special disaster COAs, one of which was to CBP (Kalinowski & Allen, 2010).

Vessel Operations

Waterways patrolled along the EOR Region mainly occur along the northern border in Minnesota. Figure 5.13-2 shows the approximately 1,735 square miles of navigable water in this

region (ESRI, 2010). To assist in river or lake patrols, OAM provides the USBP agents in this region with a range of watercraft (USDHS, 2011). Accidents during patrols could take place between CBP, cross-border violators, and the general public.

Figure 5.13-2. Navigable Water in the EOR Region



Radiation

CBP uses X-rays and gamma rays to inspect merchandise and conveyances, eliminating the need for an intrusive manual search. These detection systems provide images of material enclosed in cars, trucks, railcars, sea containers, personal luggage, packages, parcels, and mail (USDHS, 2009a). Increasing the efficiency and the number of searches can have a beneficial effect on HH&S. Beneficial effects could result if the number of interdictions increases and the occurrence of intentional destructive acts (IDAs) decreases as a result of using X-ray and gamma rays. The affected environment includes the location of equipment that produces X-rays and gamma rays, as well as the area immediately surrounding the equipment.

X-rays and gamma rays have the potential to expose people to ionizing radiation. The Nuclear Regulatory

Occupational dose is the dose received by an individual in a restricted area or in the course of employment in which the individual’s assigned duties involve exposure to radiation and to radioactive material from licensed and unlicensed sources of radiation, whether in the possession of the licensee or other person. The individuals subject to the occupational dose classification must closely monitor their degree of radiation exposure using dosimeters (USDHS, 2004b).

Exposure dose is the dose received by a member of the public from exposure to radiation and to radioactive material released by a licensee, or to another source of radiation either within a licensee’s controlled area or in unrestricted areas (USDHS, 2004b).

Commission (NRC) sets regulations and establishes standards for protection against radiation arising from activities conducted under licenses it issues. CBP has adopted the NRC standard because OSHA addresses only occupational dose exposure limits. These requirements are set forth in 10 CFR Part 20 (USDHS, 2004b).

In 10 CFR Part 20, the NRC identifies two classifications of radiation dose: occupational dose and exposure dose (USDHS, 2004b). Neither of these doses includes background radiation, radiation patients receive from medical practices, radiation received from participation in medical research programs, or radiation received as a member of the general public.

As set by the NRC in 10 CFR Part 20, the maximum permissible level of radiation dose to individual members of the general public in unrestricted areas (i.e., exposure dose) is 0.1 rem per year above the typical 0.360 rem per year dose provided by natural and man-made background radiation.

As part of its “as low as is reasonably achievable” (ALARA) program, CBP has determined that the radiation dose received by its personnel shall not exceed the public dose (USDHS, 2004b).

In 10 CFR 20.1003, NRC defines the philosophy of ALARA in relation to exposure:

ALARA (acronym for “as low as is reasonably achievable”) means making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

Exposure to radiation can be harmful to HH&S. Because of the difficulties in determining if the health effects that are demonstrated at high radiation doses are also present at low doses, current radiation protection standards and practices are based on the premise that any radiation dose may result in detrimental health effects, such as cancer and hereditary genetic damage.

When discussing potential impacts caused by radiation exposure it is important to relate how much exposure is anticipated. In an August 2004 revised position statement on radiation risk, the Health Physics Society recommended against the quantitative estimation of health risks below an individual dose of 0.5 rem in one year or a lifetime dose of 10 rem above that received from natural sources. Doses from natural background radiation in the United States average about 0.360 rem per year (HPS, 2004).

Radio Frequency

The radio frequency (RF) environment refers to the presence of electromagnetic (EM) radiation emitted by radio waves and microwaves on the human and biological environment. RF waves have a frequency or rate of oscillation within the range of approximately 3

Uncontrolled exposure occurs when the general public is exposed or when persons employed are not made fully aware of the potential for exposure or cannot exercise control over their exposure (USDHS, 2008a).

Controlled exposure occurs when a person is exposed to RF fields as part of their employment and the person has been made fully aware of the potential exposure and can exercise control over their exposure. (USDHS, 2008a).

Hertz (Hz) to 300 gigahertz (GHz). This energy can interact with matter (USDHS, 2008a).

OSHA regulates RF environment and EM radiation for employees under 29 CFR 1910. The Federal Communications Commission (FCC) is responsible for licensing frequencies and ensuring that the approved use does not interfere with television or radio broadcasts, or substantially affect the natural or human environment (USDHS, 2008a). The FCC has adopted a modified version of the American National Standards Institute (ANSI) guidelines and Institute of Electrical and Electronics Engineers (IEEE) standards to evaluate exposure due to RF transmitters licensed and authorized by the FCC. The FCC's guidelines also reflect the National Council of Radiation Protection and Measurements exposure guidelines.

The National Council of Radiation Protection and Measurements and ANSI/IEEE exposure criteria identify the same threshold level at which harmful biological effects may occur. The whole-human-body absorption of RF energy varies with the frequency of the RF signal. The most restrictive limits on exposure are in the frequency range from 30 to 300 megahertz where the human body absorbs RF energy most efficiently (USDHS, 2008a).

There are two tiers of exposure limits: occupational or "controlled," and general or "uncontrolled." In order for a transmitting facility or operation to be out of compliance with the FCC's RF guidelines in an area where levels exceed maximum permissible exposure (MPE) limits, it must first be accessible to the public. The MPE limits indicate levels above which people may not be safely exposed regardless of the location where those levels occur (USDHS, 2008a).

Adverse biological effects associated with RF energy are typically related to the heating of tissue by RF energy. This is typically referred to as a thermal effect, where the EM radiation emitted by an RF antenna passes through and rapidly heats biological tissue; similar to the way a microwave oven cooks food. According to the Health Physics Society, numerous studies have shown that environmental levels of RF energy routinely encountered by the general public are typically far below levels necessary to produce significant heating and increased body temperature; RF energy that would produce harmful heating is generally associated only with workplace environments near high-powered RF sources, such as those used for molding plastics or processing food products. In such cases, exposure of human beings to RF energy could exceed MPE and restrictive measures or actions would thus be required to ensure the public's safety (USDHS, 2008a).

There is also some concern that signals from some RF devices could interfere with pacemakers or other implanted medical devices; however, electromagnetic shielding has been incorporated into the design of modern pacemakers to prevent RF signals from interfering with the electronic circuitry in the pacemaker (USDHS, 2008a).

Because RF devices emit RF energy and EM radiation, adverse impacts could occur. The severity of these impacts depends on the equipment used and the elevation of the tower (USDHS, 2008a).

Beneficial impacts from RF devices could also occur. The use of RF could increase the frequency of interdictions along the northern border, improving the HH&S of the American population.

Firing Ranges

HH&S can be affected by noise levels and exposure to lead from firing ranges on both indoor and outdoor ranges in this region. Humans become exposed to lead associated with shooting ranges through lead-contaminated soil. Another potential pathway is through inhalation of lead dust by shooters during firing when airflow on the firing line is blocked. Range workers may also be exposed to lead dust while performing routine maintenance operations, such as raking or cleaning out bullet traps. Each of these pathways is site specific and may or may not occur at individual ranges (USDA, 2010).

Figure 5.13-3 CBP Officers Train at Firing Range



Source: (USDHS, No Date).

OSHA sets regulations for protecting workers who handle or are exposed to lead, including airborne lead at indoor firing ranges (NSSF, 2001; 29 CFR 1910.1025). The OSHA standard for airborne lead exposure is 30 micrograms per cubic meter of air with an eight-hour time-weighted average (29 CFR 1910.1025).

Spent ammunition on ranges is not regulated as solid/hazardous waste unless it is discarded and left to accumulate for a long period of time. It is not regulated if it is recovered or reclaimed on a regular basis. If the range poses an imminent or substantial danger to human health or the environment it can be addressed through the Resource Conservation and Recovery Act (RCRA).

USEPA regions also set guidelines and establish best management practices (BMPs) for building new ranges and for remediating outdoor ranges. These guidelines are in place to help minimize lead contamination in soil and water. HH&S would be adversely affected if USBP agents were exposed to lead on firing ranges or if the public's water supply was contaminated with lead (USEPA, 2003). The frequency and severity of response to lead exposure in humans depend on the amount of exposure. Symptoms include neurological, gastrointestinal, reproductive, and renal effects (NYDH, 2009).

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

In addition to lead exposure, the noise generated on firing ranges may have an adverse effect on the health of CBP agents. Exposure to harmful levels of noise over a long time period can damage sensitive structures in the ear, resulting in noise-induced hearing loss (NIDCD, 2008). To protect employees from noises at harmful levels, OSHA sets noise standards and guidelines for the work environment. The OSHA noise exposure limit is set at a maximum permissible exposure limit of 90 decibels, A-weighted (dBA), averaged over an 8-hour time period (29 CFR 1910.95).

5.14 HAZARDOUS MATERIALS

5.14.1 INTRODUCTION

Hazardous materials are materials that are capable of posing an unreasonable risk to health, safety, and prosperity. Hazardous materials can be classified into roughly three categories:

- Hazardous or regulated substances;
- Hazardous or regulated waste; and,
- Special hazards.

5.14.1.1 Hazardous Substances

Any substances that are considered severely harmful to human health or the environment may be classified as “hazardous.” Hazardous substances take many forms. Many are commonly used substances that are harmless in their normal uses but are quite dangerous when released. They are defined in terms of those substances either specifically designated as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as the Superfund Law, or those substances identified under other laws (USEPA, 2011a). A great deal is known about hazardous substances and their effects. This information helps responders act quickly and safely to reduce the risks from emergency situations (USEPA, 2011b).

5.14.1.2 Hazardous Waste

A hazardous waste is defined by the Resource Conservation and Recovery Act (RCRA) as a solid waste, or combination of solid wastes, that, because of its quantity; concentration; or physical, chemical, or infectious characteristics may:

- Cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or,
- Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Hazardous wastes fall into two categories: characteristic wastes and listed wastes. Characteristic hazardous wastes are materials that are known or tested to exhibit a hazardous trait such as ignitability (i.e., flammability), reactivity, corrosiveness, and toxicity. Listed hazardous wastes are materials specifically listed by the USEPA or a state regulation as a hazardous waste.

Hazardous wastes listed by the USEPA fall into two categories:

- Process wastes from general activities (F-listed) and from specific industrial processes (K-listed); and,
- Unused or off-specification chemicals, container residues, and spill cleanup residues of acute hazardous-waste chemicals (P-listed) and other chemicals (U-listed).

These wastes may be found in different physical states as gases, liquids, or solids. Furthermore, a waste is deemed hazardous if it cannot be disposed of by common means like other byproducts of our everyday lives. Depending on the physical state of the waste, treatment and solidification

processes might be available. In other cases, however, there is not much that can be done to prevent harm (Leonard, 2009).

Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes; their associated regulatory requirements are specified in 40 CFR 273. Four types of waste are currently covered under the universal waste regulations: hazardous-waste batteries, hazardous-waste pesticides that are either recalled or collected in waste pesticide collection programs, hazardous-waste thermostats, and hazardous-waste lamps.

The RCRA regulates the management and disposal of hazardous waste. One common method of treatment method is hazardous combustion, or incineration, which is used to destroy hazardous organic components and reduce the volume of waste (USEPA, 2009a).

5.14.1.3 Special Hazards and Otherwise Regulated Materials

Special hazards are those substances that might pose a risk to human health; they are addressed separately from other hazardous materials. Special hazards include asbestos-containing material, polychlorinated biphenyls (PCBs), and lead-based paint (LBP). The USEPA has the authority to regulate these special-hazard substances under the Toxic Substances Control Act 15 U.S.C. 53. The USEPA has established regulations regarding asbestos abatement and worker safety under 40 CFR 763, with additional regulation concerning emissions (40 CFR 61). Depending on the quantity or concentration, the disposal of LBP waste is potentially regulated by the RCRA at 40 CFR 260. The disposal of PCBs is addressed in 40 CFR Parts 750 and 761.

5.14.2 AFFECTED ENVIRONMENT

5.14.2.1 Hazardous Substances, Hazardous Wastes, Special Hazards, and Otherwise Regulated Materials

Due to the duplicative discussion of hazardous substances, hazardous wastes, special hazards and otherwise regulated materials, complete descriptions of the range of hazards are found in Section 3.14.

5.15 UTILITIES AND INFRASTRUCTURE

5.15.1 INTRODUCTION

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly man-made; generally, the more urban and developed an area, the more infrastructure it has (USDHS, 2008a). This section describes ranges of use for each utility resource based on recent CBP site-specific analyses of protection, relocation, construction, and operation of BPSs, and construction, modernization, and operation of POEs. This section then describes the utility resources of most CBP facilities: BPSs, POEs, forward operating bases (FOBs), traffic checkpoints, and communication towers.

5.15.2 AFFECTED ENVIRONMENT

5.15.2.1 Water Supply

Municipal water systems or rural lines, which supply facilities such as the Beddown OAM and Havre BPS, pump up to 1.87 million gallons of water per day from nearby reservoirs, lakes, or a system of groundwater wells (USDHS, 2008d). A substantial reserve capacity remains in these lakes or reservoirs. Such systems provide water to nearly 10,000 customers (COH, 2000).

For those sites with wells present, such as the Morgan, Wild Horse, and Del Bonita POEs in Montana, a number of scenarios for water provisioning may be employed. Some sites utilize onsite wells by tapping a nearby water main. In more remote locations (where tapping a water main is not feasible), potable water is provided by an onsite well, which can range from 90 to 610 feet from the main building (USDHS, 2009b; USDHS, 2010a). Generally, wells are within 90 feet of the main building; water is pumped through an in-line water filter system and stored in multiple storage tanks, with roughly 100 to 220 gallons of storage capacity (USDHS, 2009c; USDHS, 2009d). When necessary (and possible), water is filtered, softened, distilled, or treated as required for potable uses. If no usable onsite well exists for potable water, the water may come from a leased offsite well located several hundred yards away. In a few locations, well water is run through a chlorination or reverse osmosis system for non-drinking usage.

When onsite wells are rendered obsolete or no well exists, as is often the case in this region due to high lead content, CBP supplies drinking water in commercial water bottles. At larger facilities the delivered potable water is stored in five-gallon jugs and is sometimes used for cooking. For those few facilities where bottled water is delivered, on average between 50 and 60 gallons are used per month.

5.15.2.2 Electrical and Communications Utilities

Electrical power is provided to most CBP facilities by a commercial grid system. These local or regional utility cooperatives and distribution companies serve from 1,000 to 355,000 customers over a 30,000 to 168,000-square-mile area throughout the EOR Region (BFECI, 2010; MDUC, 2010). Service providers have a capacity of 42,125 kilowatt (KW) with peak demand at 23,314 kW (USDHS, 2008c). The electrical power is fed from the main service to an automatic transfer switch and electrical panels, then through the buildings. Primary electrical service is provided by overhead transmission lines to the facilities and secondary electrical service is provided from a

pole-mounted transformer. Many of these facilities have an onsite emergency electric generator with a 500-gallon diesel fuel tank (USDHS, 2010b).

At seasonal facilities in more rural areas, electricity is provided by one or two smaller generators connected to the automatic transfer switches and building power system.

Monopole communication towers do not utilize more than 3,650 kW-hours per month from commercial grid power (USDHS, 2008b). Primary power is provided to most monopole towers by the commercial power grid, but some in remote locations are powered by solar photovoltaic arrays with battery storage systems. Communication relay towers (CRTs) typically utilize a 17-kW generator. Remote video surveillance system (RVSS) are connected to the commercial grid where available. If commercial power is not available, the towers are supplied by either a generator of up to 30-kW or a solar photovoltaic generator (USDHS, 2008b). If a commercial power grid is not immediately available when towers are deployed, primary power is supplied by a 30-kW generator with a propane-fueled motor supplied by a 2,000-gallon tank until the commercial power infrastructure is in place. Back-up power for each tower site would be provided by a battery back-up system. All power lines are installed overhead from the main trunk power line to the tower-site shelter and then on elevated cable trays to the tower, with the primary power source being the commercial grid. At facilities lacking communication towers, antennas are mounted on posts attached to the main building.

Most POEs are provided telephone service by a nearby telephone substation. Existing telephone lines run underground or overhead (or some combination of the two) and when possible, follow a highway right-of-way. Most telephone lines consist of one or two T-1 lines and one to six dial tone lines. Where T-1 or fiber-optic service is not available, Internet service is accessed through telephone modems.

5.15.2.3 Fuel Supply

Propane or natural gas supplies fuel for heating, ventilation, and air conditioning (HVAC) systems. The propane, which can also power emergency generators, is stored in 250-, 500-, 1,000-, or 1,200-gallon onsite tanks (USDHS, 2009e; USDHS, 2009b). Some facilities are serviced by interconnections with commercial natural gas suppliers through underground natural gas pipelines.

Each tower that normally receives electric power from the commercial grid has a 500-gallon propane tank to fuel a back-up generator in case of power outages (USDHS, 2008b). Each 500-gallon tank would need to be refueled every two months (USDHS, 2008b), assuming approximately two hours of run time monthly for a generator maintenance check and other operations as needed. When commercial grid power is not immediately available upon tower deployment, primary power would be supplied temporarily by a 30-kW generator using a larger, 2,000-gallon propane tank. These larger propane tanks would be refueled approximately every seven days (USDHS, 2008b).

5.15.2.4 Wastewater Management

Urban CBP facilities, such as the Havre Border Patrol Station in Montana, are connected via municipal piping systems to wastewater treatment plants, which operate at up to a six million gallon capacity per day (mgd), or 3,000 gallons per minute (USDHS, 2008c; COH, 2000).

In rural locations like the Morgan and Wild Horse POEs in Montana, sanitary waste is disposed to one 1,500-gallon or two 66-gallon onsite septic tanks (USDHS, 2009f; USDHS, 2009d). Types of septic tanks vary; some have a grinder pump, a lift station, or two venting pipes, but all are connected to the appropriate drainage mound and field or leach field. An average ground drainage field is 2-feet high, 60-feet long, and 50-feet wide (USDHS, 2009d). Solid waste is removed from sites by a cleaning contractor or a private disposal company. Average septic tanks are pumped once every two years and are treated twice a year. However, those approaching capacity can be pumped as often as once every three months.

The state DOT or appropriate county department generally provides snow removal on state highways, and onsite snow removal service is contracted out to a janitor or maintenance company (USDHS, 2009g). At some POEs, facility staff utilizes snow blowers or tractors for snow removal (USDHS, 2009e).

5.16 ROADWAYS AND TRAFFIC

5.16.1 INTRODUCTION

The United States relies heavily on a vast transportation network to expedite the flow of goods and people to and from Canada. CBP’s mandate to enable efficient border crossing while providing the highest level of security and safety for all motorists is of utmost importance. Over the past decade, many POEs have been upgraded for highway safety, as well as technologically for ease of access. States and municipalities maintain the roadways leading to the borders to allow for tourism and trade in their areas. The following text provides an overview of traffic and transportation regulations and describes the general traffic conditions for urban, suburban, rural, and remote areas.

5.16.2 AFFECTED ENVIRONMENT

5.16.2.1 Existing Roadway Network and Roadway Effectiveness

The majority of the roadways within 100 miles of the northern border within this region are primarily secondary and tertiary paved roads, although there are state highways throughout. Many of the areas in the EOR region are remote, and some include travel destinations such as national parks, national forests, and wilderness areas.

The number of motor vehicles in the United States has been steadily increasing, with more than 254 million vehicles registered in 2009 (BTS 2012). Annual travel on U.S. roadways reached over 2.9 trillion vehicle-miles, or about three times the level reported in 1960. Travel grew about 47 percent during the 1960s, another 38 percent in the 1970s, and another 41 percent in the 1980s. Travel in urban areas in 2009 accounted for over 1.9 trillion vehicle-miles, or 66 percent of the total, compared to 44 percent in 1960 (BTS 2012a). On the rural interstate system, automobiles, light trucks, and buses account for 77 percent of average daily traffic volumes, with heavy trucks representing the remainder. Percent distribution of traffic for commercial and noncommercial vehicles in both rural and urban areas is shown in Table 5.17-1.

Table 5.16-1. Percent Distribution of Traffic by Vehicle Class, Total U.S.

Type of Roadway	Vehicles (%)	
	Noncommercial	Commercial
Rural		
Interstate	81.6	18.4
Other principal arterials	87.2	12.8
Minor arterial, collector and local	88.5	11.5
Rural average	86.6	13.4
Urban		
Interstate	88.2	11.8
Other freeways and expressways	90.5	9.5
Other principal arterials	89.5	10.5

Type of Roadway	Vehicles (%)	
	Noncommercial	Commercial
Minor arterials	90.4	9.6
Collectors	90.3	9.7
Local	91.0	9.0
Urban average	89.8	10.2

Source: USDOT, 1996.

5.16.2.2 Level of Service

Level of service (LOS) is a qualitative measure of the operating conditions of an intersection or other transportation facility. There are six levels of service (A through F): LOS A represents the best operating conditions with no congestion, and LOS F represents the worst operating conditions with heavy congestion. Roadways and intersections with LOS E or F are those with traffic conditions at or above capacity. Traffic patterns are congested, unstable, and normally unacceptable to individuals attempting to access and use roadways and intersections with LOS E or F (TRB, 2000). LOS has been used to facilitate a general discussion of traffic conditions in urban, suburban, rural, and remote areas. This discussion of typical patterns for different types of roadway networks is not meant to substitute for local studies and analyses that may be required.

5.16.2.3 Variability

Traffic varies by month of the year, day of the week, and hour of the day. Often the capacity of the roadway system can be exceeded by the volume of traffic using it. This can cause breakdown flow (i.e., LOS E or F) and initiate effects that extend far beyond the time during which the demand exceeded capacity. This type of traffic may take several hours to dissipate. Seasonal peaks in traffic demand are also of importance, particularly for recreational facilities.

Seasonal fluctuations in traffic demand reflect the social and economic activity of the area being served by the highway. These seasonal fluctuations typically exhibit several relevant characteristics:

- Monthly variations are more severe on rural routes than on urban routes;
- Monthly variations are more severe on rural routes serving primarily recreational traffic than on rural routes serving primarily business traffic; and,
- Daily traffic patterns vary by month of year most severely for recreational routes.

Traffic variations by day of the week are related to roadway type. Normally, weekend volumes are lower than weekday volumes for highways serving predominantly business travel, such as urban freeways. In comparison, peak traffic occurs on weekends on main rural and recreational highways. Furthermore, the magnitude of daily variation is highest for recreational access routes and lowest for urban commuter routes.

Typical hourly variation in traffic is related to highway type and day of the week. The typical morning and evening peak hours are evident for urban commuter routes on weekdays. The evening peak is generally somewhat more intense than the morning peak. On weekends, urban routes show a peak travel period that is less intense, more spread out, and occur in early to mid afternoon. Recreational routes also have single daily peaks. Saturday peaks on such routes tend to occur in the late morning or early afternoon (as travelers go to their recreational destination) and in late afternoon or early evening on Sundays (as they return home).

Traffic analysis focuses on the peak hour of traffic volume because it represents the most critical period for operations and has the highest capacity requirements. If the highest hourly volumes for a given location were listed in descending order, a large variation in the data would be observed, depending on the type of roadway.

5.16.2.4 Urban and Suburban Transportation Networks

Delays and heavy traffic can be prevalent in all major cities. These delays are most frequent during rush hour times, 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m., Monday through Friday. Other reasons for congestion in urban areas are emergency vehicles, accidents, and vehicle breakdowns. There are no urban areas in this region.

The ability of urban streets to function well is generally limited by the capacity of signalized intersections, with traffic normally uninterrupted on roadway segments between intersections. Signal timing plays a major role in the capacity of urban streets, limiting the portion of time available for movement between intersections. Traffic conditions may vary greatly, and such factors as curb parking, transit buses, lane widths, upstream intersections, and other factors may substantially affect roadway conditions. In urban areas, LOS at critical intersections would typically be E or F during peak periods, and would be characterized by very unstable or forced traffic flow.

Urban streets show less variation than other areas. Most users of these streets are daily commuters or frequent users, and special event traffic is less common. Furthermore, many urban routes are filled to capacity during each peak hour, and variation is therefore severely constrained.

Traffic in suburban areas is similar to that in urban areas; however, traffic delays are less of an issue unless traffic is being routed through residential areas. As with urban areas, there may be heavy traffic during rush hour; typically 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. Traffic congestion in suburban areas is normally confined to primary and secondary arterials and does not enter residential areas. Public transportation is often provided, and traffic reports are available for updated roadway conditions.

5.16.2.5 Rural and Remote Transportation Networks

In rural and remote areas, traffic is mainly affected by roadway conditions. Heavy traffic volumes are rare and normally only occur due to road closure and construction activities. Rural highways in the United States and Canada rarely operate at volumes approaching capacity. In addition, rural and recreational routes often show a wide variation in peak-hour volumes. Extremely high volumes occur on a few weekends or on other peak periods, and traffic during the rest of the year is substantially less, even during the peak hour. For example, highways

addition, rural and recreational routes often show a wide variation in peak-hour volumes. Extremely high volumes occur on a few weekends or on other peak periods, and traffic during the rest of the year is substantially less, even during the peak hour. For example, highways serving resorts and recreational areas may be virtually unused during much of the year, only to be subject to oversaturated conditions during peak summer periods.

Seasonal weather conditions are the primary cause of inefficient access on rural and remote roadways. Snow, flooding, and mudflows can make roads impassable; these events usually occur between October (when snow accumulations begin) and April (when melting snow and rains can cause flooding and mudslides). Local municipalities are prepared for maintenance of rural roadways, and residents often have alternate means of transportation, such as snowmobiles, ATVs, and horses. Remote areas, by definition, are sparsely populated, but the few residences within these areas normally have alternate transportation sources in case of emergencies. Television, radio, and National Park Service (NPS) traffic reports are the primary sources of updates for rural and remote roadway conditions (USDOJ, 2010).

5.16.2.6 Federal and State Transportation Regulations

POEs across the regions are accessed by a number of highways that are maintained by each state's DOT or municipal highway authority. In remote areas where trails and gravel roadways are used, it is the maintaining agency's responsibility to inform the public of road and trail closures. In the United States, each state has its own regulations and governing agency, although most regulations are similar for the purpose of uniformity. In most states, the roadway design manual is based upon recommendations in the American Association of State Highway and Transportation Officials (AASHTO) Policy on Geometric Design of Highways and Streets, commonly referred to as the "Green Book." The Green Book is not a design manual but rather a series of recommended roadway design parameters (USDOT, 2010). In addition, many Federal departments have also adopted their own traffic code for enforcement on their respective reservations (e.g., national parks and military bases). A list of the state DOTs and regulatory agencies that plan and administer the roadway design regulations is provided in Appendix K-1.

5.16.2.7 CBP's Activities Affecting Roadways and Traffic

CBP activities include enforcement of customs, immigration, and agriculture regulations at U.S. borders, and CBP has primary responsibility for preventing unlawful entry into the United States while ensuring the safe and efficient flow of goods and people. For the northern border within this region, these activities are focused around the POEs, but construction activities, the operation of other facilities, and patrol activities have some effects to transportation resources. A general description of these activities is provided in Chapter 2. This section outlines these activities from a transportation and traffic standpoint.

Ports of Entry (POEs)

Many different roadways including interstates, U.S. highways, state highways, and rural roadways approach the POEs along the northern border within this region. These cross-border access points are often colocated with towns and cities adjacent to the border, and roadways facilitate traffic approaching and departing from the POEs.

facilities, there are committed areas for secondary truck inspections that may involve offloading and detailed examination.

As with any other roadway, cross-border traffic varies by month, day of the week, and hour of the day. Seasonal fluctuations in traffic demand reflect the social and economic activity of the area being served by the facility. Canadian traffic reaches a peak in either July or August and ebbs to a low-point in February. Summer peaks are consistently 65 to 75 percent higher than winter lows (BPRI, 2010). Normally, weekend volumes are lower than weekday volumes for POEs serving predominantly business travel. Monthly variations are more severe on rural POEs than on urban entry points. Vehicle queues are common, particularly at urban POEs, and can last for several minutes to several hours in rare cases. In general, queue length and wait times determine the overall LOS of a POE from a transportation and traffic standpoint. The busiest POEs in the EOR region are in Table 5.15-2. A complete list of POEs and their level of use by transportation mode is provided in Appendix K.

Table 5.16-2. Busiest POEs for Passenger Vehicles in the EOR Region

Rank	Port Name	Annual Personal Vehicles	Annual Personal Vehicle Passengers
20	ND: Penbina	265,210	530,420
23	MN: Grand Portage	222,708	445,206
26	MN: Baudette	165,224	330,570
31	MN: Warroad	110,797	218,600
36	ND: Portal	80,758	149,892
40	ND: Dunseith	56,850	123,028
47	ND: Neche	44,223	85,380

Source: USDOT, 2009.

At POEs in urban areas, special lanes are used for frequent travelers and commercial vehicles with Nexpress radio frequency units for fewer delays. Buses are provided for public transportation and pedestrian walkways are provided for tourists. CBP and other non-government organizations provide real-time traffic information via the internet, twitter and mobile applications (USDHS, 2010). Other technologies used to improve the functionality of POE are described in Chapter 2.

Vacation travel and occasional same-day shopping trips are important travel purposes along most of the border. Several Canadian and U.S. near-border cities and towns are common consumer destinations. Vacation and same-day recreational travel are less frequent and more seasonal than consumer trips in the paired-cities model. In addition, these types of travel are highly discretionary and are easily influenced by exchange rates and economic conditions (BPRI, 2010).

All POEs facilitate pedestrians and cyclists. However, pedestrian and bicycle circulation is infrequent at most rural POEs because of their remote locations and distance from residential

areas. Some POEs have provisions for bike storage. Many POEs have boat and seaplane landing areas.

Transportation Checkpoints

Traffic checkpoints are conducted on roads leading from the border and consist of inspections of interior-bound conveyances, including passenger vehicles (cars, trucks, vans, and buses) and container vehicles and cargo trucks. These checkpoints provide an opportunity to detect and interdict cross-border violators that have thus far avoided apprehension. Vehicle checkpoints are generally traffic lanes temporarily controlled by CBP. Checkpoints may include support buildings to provide temporary office and holding space, as well as lights, signage, and other support equipment.

Checkpoints are established at airports for commercial aircraft and at locations along railroad lines for passenger and freight trains.

Non-road/Off-road Activities

Off-road traffic surveillance operations can include agents stationed at specific observation points or driving predetermined routes (line watch); detection of any disturbances in natural terrain that could indicate the passage of people, animals, or vehicles (sign cutting); and road patrols. All sectors use a variety of vehicles, including four-wheel drive vehicles, sedans, scope trucks, ATVs, motorcycles, snowmobiles, and bike patrols in urban areas or over rough terrain.

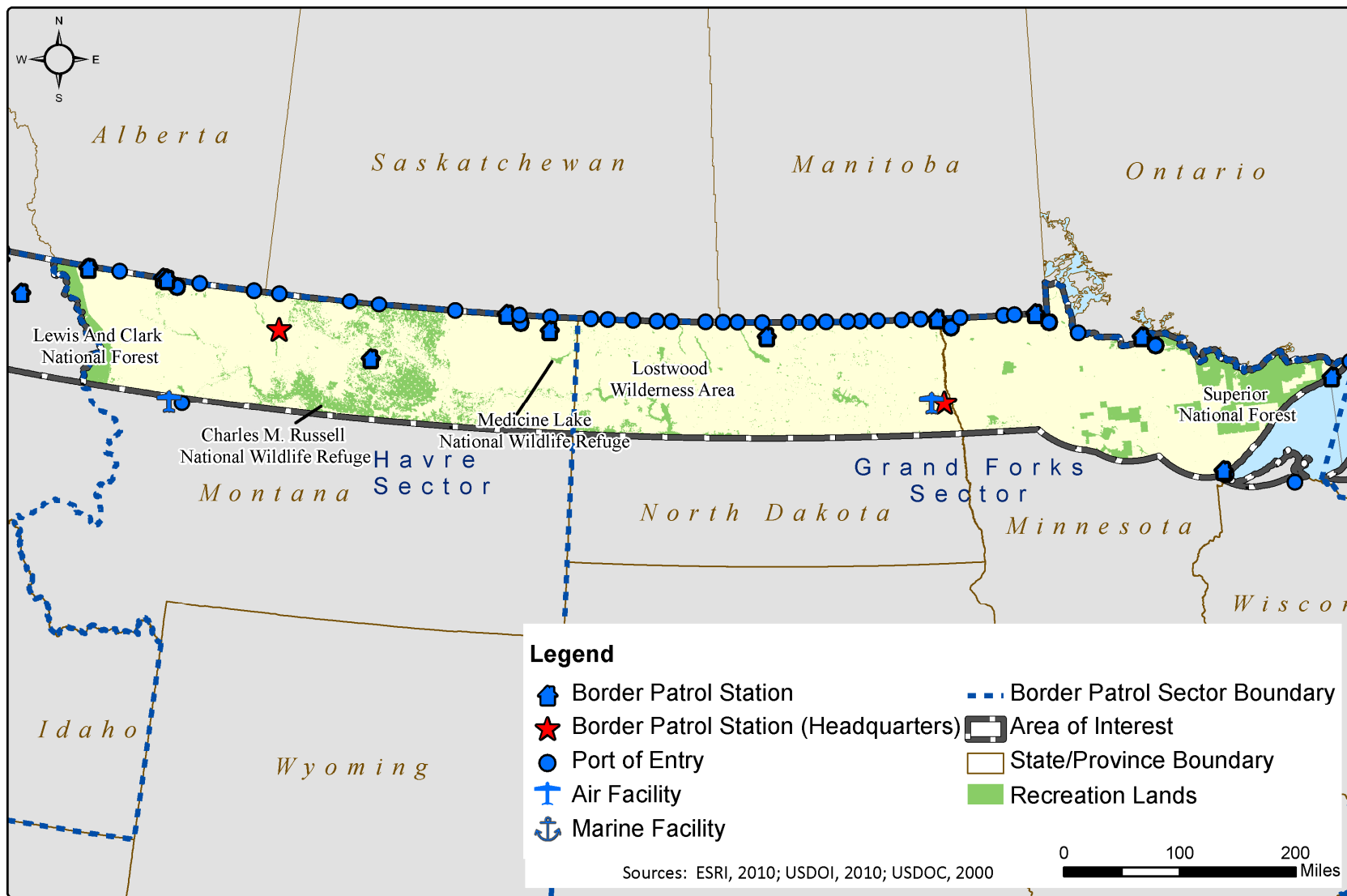
BPSs vary in size and typically include any or all of the following components: administrative and support buildings, vehicle maintenance garages, equine and canine facilities, vehicle wash facilities, fuel tanks, small arms practice ranges, illegal immigrant processing and temporary holding facilities, confiscated vehicle storage facilities, and agent and visitor parking. CBP agents use a variety of off-road transportation modes to patrol border areas. These consist of four-wheel drive vehicles, ATVs, snowmobiles, horses, and, in some sensitive habitats, agents operating on foot. As outlined in Chapter 2, CBP activities that may affect transportation resources include unmanned aerial surveillance (UAS) activities, manned aerial surveillance patrols, and other patrols.

5.17 RECREATION

5.17.1 INTRODUCTION

A wide variety of recreation areas exist along the northern border on both the U.S. and Canadian sides. On the U.S. side, recreational areas include national parks (NPs), national recreation areas (NRA), national forests (NF), lakesides, national wildlife refuges (NWR), and designated wilderness areas. On the Canadian side, recreational areas include National Park Reserves, Provincial Parks, Protected Areas, and Natural Areas. U.S. recreation categories are described briefly below, since the designation bears on the nature of activities permitted. Figure 5.17-1 shows a map of federally protected recreation areas in the EOR Region.

Figure 5.17-1. Federally protected recreation areas, including Protected Recreation Areas, Including National Forests, Parks, Recreation Areas, and Wildlife Refuges in the EOR Region



5.17.2 AFFECTED ENVIRONMENT

National parks, national forests, national wilderness areas, NWR, and NRA within the EOR study area are profiled below by the impact category they most closely match. In addition to national protected areas, which are the primary focus of this analysis, many state and regional parks and protected areas along the northern border include recreation areas that could be affected by activities along the border.

The EOR Region contains a significantly lower proportion of federally owned recreation lands compared to the other regions; national forests and NWR constitute the only Federal lands. Despite the small number of distinct federally protected areas, a large portion of this region is wilderness or otherwise undeveloped lands. These recreation areas are primarily low-impact use areas, with one medium-impact use area and one high-impact use area. Common recreation includes wildlife observation, hunting, fishing, hiking, and some camping and water sports. Appendix I contains profiles of Canadian protected areas.

American bittern with Plains garter snake in Medicine Lake NWR



Source: USDO, 2009j.

5.17.2.1 Montana

Medicine Lake National Wildlife Refuge

Medicine Lake NWR Complex includes Medicine Lake NWR, Northeast Montana Wetland Management District (WMD), and Lamesteer NWR. The complex totals 31,702 acres and consists of two separate tracts. Common recreational activities include photography, observation, hunting, fishing, and environmental education. Camping is not allowed. Most of this area can be categorized as a low-impact use area (USDO, 2009j).

UL Bend National Wildlife Refuge (inside Charles M. Russell National Wildlife Refuge)

UL Bend NWR is a “refuge within a refuge,” inside the Charles M. Russell NWR. This refuge contains 20,000 acres of designated wilderness. Recreational opportunities include fishing, hunting, and a self-guided auto tour. Most of this area can be categorized as a low-impact use area (USDO, 2009k).

Lewis and Clark National Forest

The Lewis and Clark NF is a small park in the center of Montana over 100 miles south of the northern border. A small portion of the Bob Marshall Wilderness Complex lies within the Lewis and Clark National Forest. This forest also includes 29 developed campsites and five rental

cabins. In addition to hiking, other activities include winter sports, such as skiing, scenic driving, and hunting. The annual visitation estimate for forest visits is 406,800. Much of this area could be categorized as a medium-impact use area (USDA, 2009h; USDA, 2010e).

5.17.2.2 North Dakota

Lostwood National Wildlife Refuge

Lostwood NWR sits approximately 20 miles south of the northern border in North Dakota. Lostwood is fairly small but the American Bird Conservancy named it one of America's top 500 globally important bird areas. The refuge habitat produces more ducks than any other region in the lower 48 states. Vehicle and hiking trails exist for public use as does a sharp-tailed grouse blind. In addition, the wilderness areas offer hiking during certain months, along with snowshoeing and cross-country skiing. Most of this area can be categorized as a low-impact use area (USDOI, 2009l).

A duck at Lostwood NWR



Source: USDOI, 2009l.

5.17.2.3 Minnesota

Superior National Forest

Superior NF is in the upper northeast corner of Minnesota, adjacent to the northern border and Lake Superior. The Boundary Waters Canoe Area Wilderness (1 million acres) lies within the forest. There are 2,000 miles of trails for different uses, including hiking, hunting, fishing, biking, horseback riding, cross-country skiing, snowmobile and ATV riding, and observing nature. There are 23 developed "fee" campgrounds, 18 rustic campgrounds, and more than 277 backcountry campsites, most of which are on a body of water. Water recreation includes boating, fishing, swimming, or picnicking at one of 77 lake accesses, 13 fishing piers, 10 swimming beaches, or 22 picnic areas. Three scenic byways are also in the park. The annual visitation estimate is 1,375,900 visits. Much of this park can be categorized as a high-impact use area (USDA, 2010f; USDA, 2009i).

Final

Programmatic Environmental Impact Statement For Northern Border Activities

Section 6: Great Lakes Region



July 2012

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CONTENTS

6	Great Lakes Region	6-1
6.1	Introduction.....	6-1
6.2	Air Quality	6-4
6.2.1	Introduction.....	6-4
6.2.2	Affected Environment.....	6-4
6.2.2.1	National Ambient Air Quality Standards and Attainment Status	6-4
6.2.2.2	Class I Areas	6-6
6.3	Biological Resources	6-8
6.3.1	Introduction.....	6-8
6.3.2	Affected Environment.....	6-10
6.3.2.1	Blocks of Regionally Significant Habitat	6-10
6.3.2.2	Sensitive Habitats.....	6-13
6.3.2.3	Threatened and Endangered Species	6-14
6.3.2.4	Wildlife Typically Found in the Region	6-17
6.3.2.5	Vegetative Habitat Typically Found in the Region	6-18
6.3.2.6	Wetlands and Waterways.....	6-19
6.3.2.7	Aquatic Resources in the Region.....	6-19
6.4	Geology and Soils	6-21
6.4.1	Introduction.....	6-21
6.4.2	Affected Environment.....	6-21
6.4.2.1	Physiographic Provinces.....	6-21
6.4.2.2	Geologic Conditions	6-21
6.4.2.3	Soils.....	6-32
6.4.2.4	Prime and Unique Farmland	6-34
6.5	Water Resources	6-36
6.5.1	Introduction.....	6-36
6.5.2	Affected Environment.....	6-36
6.5.2.1	Groundwater	6-36
6.5.2.2	Surface Waters and Waters of the United States	6-37
6.5.2.3	Floodplains.....	6-39
6.5.2.4	Transboundary Water Agreements	6-40
6.6	Noise	6-41
6.6.1	Introduction.....	6-41
6.6.2	Affected Environment.....	6-41

6.6.2.1	Regulatory Review.....	6-42
6.6.2.2	CBP Noise Sources.....	6-42
6.6.2.3	Non-CBP Noise Sources.....	6-43
6.6.2.4	Background Noise Levels.....	6-44
6.6.2.5	National Parks.....	6-45
6.7	Climate Change and Sustainability.....	6-46
6.7.1	Introduction.....	6-46
6.7.2	Affected Environment.....	6-46
6.7.2.1	Climate Regions of the Northern Border—Overview.....	6-46
6.7.2.2	Climate in the Great Lakes Region.....	6-46
6.7.2.3	Climate Change in the United States—Midwest Regional Assessment.....	6-47
6.8	Land Use.....	6-48
6.8.1	Introduction.....	6-48
6.8.2	Affected Environment.....	6-48
6.8.2.1	Land Cover and Related Land Uses in the Great Lakes Region.....	6-48
6.8.2.2	Land Cover and Related Land Uses in the Areas North of the Great Lakes Region.....	6-53
6.8.2.3	Land Ownership in the Great Lakes Region in the United States.....	6-58
6.8.2.4	Land Ownership in Canada North of the Great Lakes Region.....	6-61
6.8.2.5	Land Use Management.....	6-62
6.8.2.6	Consistency with Enforceable Policies of the Coastal Zone Management Act	6-62
6.9	Aesthetic and Visual Resources.....	6-66
6.9.1	Introduction.....	6-66
6.9.2	Affected Environment.....	6-66
6.9.2.1	Affected Landscapes.....	6-66
6.9.2.2	Areas with High Visual Sensitivity.....	6-68
6.9.2.3	Affected User Groups.....	6-69
6.10	Socioeconomic Resources.....	6-71
6.10.1	Introduction.....	6-71
6.10.2	Affected Environment.....	6-71
6.10.2.1	Regional Demographics.....	6-71
6.10.2.2	Population and Growth Trends.....	6-72
6.10.2.3	Income, Poverty, and Unemployment.....	6-77
6.10.2.4	Property Values.....	6-80

6.10.2.5	Regional Economies	6-82
6.10.2.6	Economic Profiles of POEs and BPSs in the Great Lakes Region	6-85
6.11	Cultural and Paleontological Resources	6-98
6.11.1	Introduction.....	6-98
6.11.2	Affected Environment.....	6-98
6.11.2.1	Archaeological Resources: Prehistoric/Precontact Context.....	6-98
6.11.2.2	Prehistoric Archaeological Site Probability.....	6-99
6.11.2.3	Historic Context.....	6-101
6.11.2.4	Historic/Protohistoric Archaeological Site Probability	6-103
6.11.2.5	Above-Ground Historic Properties	6-105
6.11.2.6	Native American Resources.....	6-117
6.11.2.6	Paleontological Resources	6-121
6.12	Environmental Justice and Protection of Children	6-123
6.12.1	Introduction.....	6-123
6.12.2	Affected Environment.....	6-123
6.12.1.1	Minority Populations	6-123
6.12.1.2	Low-Income Populations	6-126
6.12.1.3	Population of Children under 18 Years of Age	6-128
6.13	Human Health and Safety	6-131
6.13.1	Introduction.....	6-131
6.13.2	Affected Environment.....	6-131
6.14	Hazardous and Otherwise Regulated Materials.....	6-140
6.14.1	Introduction.....	6-140
6.14.1.1	Hazardous Substances.....	6-140
6.14.1.2	Hazardous Waste	6-140
6.14.1.3	Special Hazards and Otherwise Regulated Materials	6-141
6.14.2	Affected Environment.....	6-141
6.14.2.1	Hazardous Substances, Hazardous Wastes, Special Hazards, and Otherwise Regulated Materials	6-141
6.15	Utilities and Infrastructure	6-142
6.15.1	Introduction.....	6-142
6.15.2	Affected Environment.....	6-142
6.15.2.1	Water Supply	6-142
6.15.2.2	Electrical and Communications Utilities	6-142
6.15.2.3	Fuel Supply	6-143

6.15.2.4 Wastewater Management..... 6-144

6.16 Roadways and Traffic 6-145

6.16.1 Introduction..... 6-145

6.16.2 Affected Environment..... 6-145

6.16.2.1 Existing Roadway Network and Roadway Effectiveness..... 6-145

6.16.2.2 Level of Service 6-146

6.16.2.3 Variability 6-146

6.16.2.4 Urban and Suburban Transportation Networks 6-147

6.16.2.5 Rural and Remote Transportation Networks 6-148

6.16.2.6 Federal and State Transportation Regulations 6-148

6.16.2.7 CBP’s Activities Affecting Roadways and Traffic..... 6-148

6.17 Recreation 6-151

6.17.1 Introduction..... 6-151

6.17.2 Affected Environment..... 6-153

6.17.2.1 Michigan 6-153

6.17.2.2 New York..... 6-155

6.17.2.3 Ohio..... 6-156

6.17.2.4 Pennsylvania 6-156

6.17.2.5 Wisconsin..... 6-157

FIGURES

Figure 6.1-1. The Great Lakes Region and CBP Facilities..... 6-1

Figure 6.2-1. Nonattainment Areas in the Great Lakes Region..... 6-5

Figure 6.2-2. Maintenance Areas in the Great Lakes Region..... 6-6

Figure 6.2-3. Class I Areas in the Great Lakes Region 6-7

Figure 6.3-1. Ecoregions of the Great Lakes Region..... 6-9

Figure 6.3-2. Blocks of Intact Habitat in the Great Lakes Region 6-12

Figure 6.4-1. Physiographic Provinces, Divisions, and Sections of the Great Lakes Region .. 6-22

Figure 6.4-2. Geology of the Great Lakes Region..... 6-25

Figure 6.4-3. Extent of the Laurentide Ice Sheet..... 6-26

Figure 6.4-4. Seismicity in the Great Lakes Region..... 6-28

Figure 6.4-5. Landslide Incidence in the Great Lakes Region 6-29

Figure 6.4-6. An example of karst topography in the Great Lakes Region..... 6-30

Figure 6.4-7. Karst Topography in the Great Lakes Region..... 6-31

Figure 6.4-8. Soil Orders in the Great Lakes Region 6-33

Figure 6.5-1. Great Lakes Region Groundwater Aquifers..... 6-37

Figure 6.5-2. River Basins in the Great Lakes Region 6-38

Figure 6.6-1. Background Noise Levels in the Great Lakes Region 6-44

Figure 6.8-1. Land Cover in the Great Lakes Region..... 6-56

Figure 6.8-2. Land Use in the Great Lakes Region 6-57

Figure 6.8-3. Land Ownership in the Great Lakes Region 6-60

Figure 6.10-1. Percent Change in Great Lakes Region Population, 2000–2009 6-73

Figure 6.10-2. Percent Change in Canadian Population North of the Great Lakes Region, 1996–2006..... 6-76

Figure 6.10-3. Locations of Points of Entry and Border Patrol Stations in Great Lakes Region 6-89

Figure 6.11-1. Native American Lands Within the 100-mile PEIS Corridor Crossing Wisconsin, Michigan, Ohio, Pennsylvania, and New York 6-119

Figure 6.11-2. Nineteenth-Century Cessions, Reservations, and Portages (1907)..... 6-120

Figure 6.11-3. Judicially Established Indian Land Areas as of 1978 6-120

Figure 6.11-4. Early Tribal, Cultural, and Linguistic Areas..... 6-121

Figure 6.13-1. U.S., Interstate, State, and County Roads in the Great Lakes Region 6-133

Figure 6.13-2. Navigable Water in the Great Lakes Region..... 6-135

Figure 6.13-3 CBP Officers Train at Firing Range..... 6-139

Figure 6.17-1. Federally Protected Recreation Areas, Including National Forests, Parks, Recreation Areas, and Wildlife Refuges in the Great Lakes Region..... 6-152

TABLES

Table 6.4-1. Physiographic Provinces in the Great Lakes Region 6-23

Table 6.5-1. Water Use in the Great Lakes Region in 2005 6-36

Table 6.6-1. Common Sound Levels 6-41

Table 6.6-2. CBP Noise Sources..... 6-43

Table 6.6-3. Description of Background Noise Levels..... 6-45

Table 6.8-1. Land Cover in the Great Lakes Region* 6-50

Table 6.8-2. Recreational Land Use* in the Great Lakes Region 6-52

Table 6.8-3. Conservation Land Use* in the Great Lakes Region 6-53

Table 6.8-4. Land Cover in Canada North of the Great Lakes Region 6-54

Table 6.8-5. Recreational Land Use in Canada North of the Great Lakes Region* 6-55

Table 6.8-6. Conservation Land Use in Canada North of the Great Lakes Region* 6-55

Table 6.8-7. Land Ownership in the Great Lakes Region* 6-59

Table 6.8-8. Land Ownership in Canada North of the Great Lakes Region* 6-61

Table 6.8-9. Aboriginal Land in Canada North of the Great Lakes Region* 6-61

Table 6.10-1. Population of the Great Lakes Region* 6-72

Table 6.10-2. Population Centers in the Great Lakes Region* 6-74

Table 6.10-3. Population North of the Great Lakes Region in Canada 6-76

Table 6.10-4. Population in Central Metropolitan Areas in Study Area North of the Great Lakes Region in Canada 6-77

Table 6.10-5. Income and Poverty Statistics for the Great Lakes Region 6-78

Table 6.10-6. Unemployment Rates for the Great Lakes Region 6-79

Table 6.10-7. Income and Poverty Statistics North of the Great Lakes Region in Canada 6-80

Table 6.10-8. Unemployment Rates North of the Great Lakes Region in Canada 6-80

Table 6.10-9. Median Property Value for the Great Lakes Region 6-81

Table 6.10-10. Median Property Value North of the Great Lakes Region in Canada 6-82

Table 6.10-11. Canadian Visitors Entering the Great Lakes Region by Surface Transportation* 6-84

Table 6.10-12. Port of Entry and Border Patrol Stations Profiled in the Great Lakes Region . 6-86

Table 6.11-1. Cultural Resources in the Vicinity of CBP Facilities in New York and Pennsylvania 6-109

Table 6.11-2. Historic Buildings on CBP Property in New York 6-113

Table 6.11-3. Cultural Resources in the Vicinity of CBP Facilities in Michigan 6-114

Table 6.11-4. Cultural Resources in the Vicinity of CBP Facilities in Wisconsin 6-116

Table 6.11-5. Native American Tribes that Have a Reservation, Judicially Established Interest, or Established Traditional Ties to Land within the 100-mile PEIS Corridor 6-117

Table 6.12-1. Minority Statistics for the Great Lakes Region (Percent of Population)..... 6-125

Table 6.12-2. Visible Minority Statistics North of the Great Lakes Region in Canada (Percent of Population)..... 6-126

Table 6.12-3. Income and Poverty Statistics for the Great Lakes Region 6-127

Table 6.12-4. Income and Poverty Statistics North of the Great Lakes Region in Canada.... 6-128

Table 6.12-5. Age Distribution in the Great Lakes Region (Percent of Population)..... 6-129

Table 6.12-6. Age Distribution North of the Great Lakes Region in Canada (Percent of Population)..... 6-130

Table 6.16-1. Percent Distribution of Traffic by Vehicle Class, Total United States 6-146

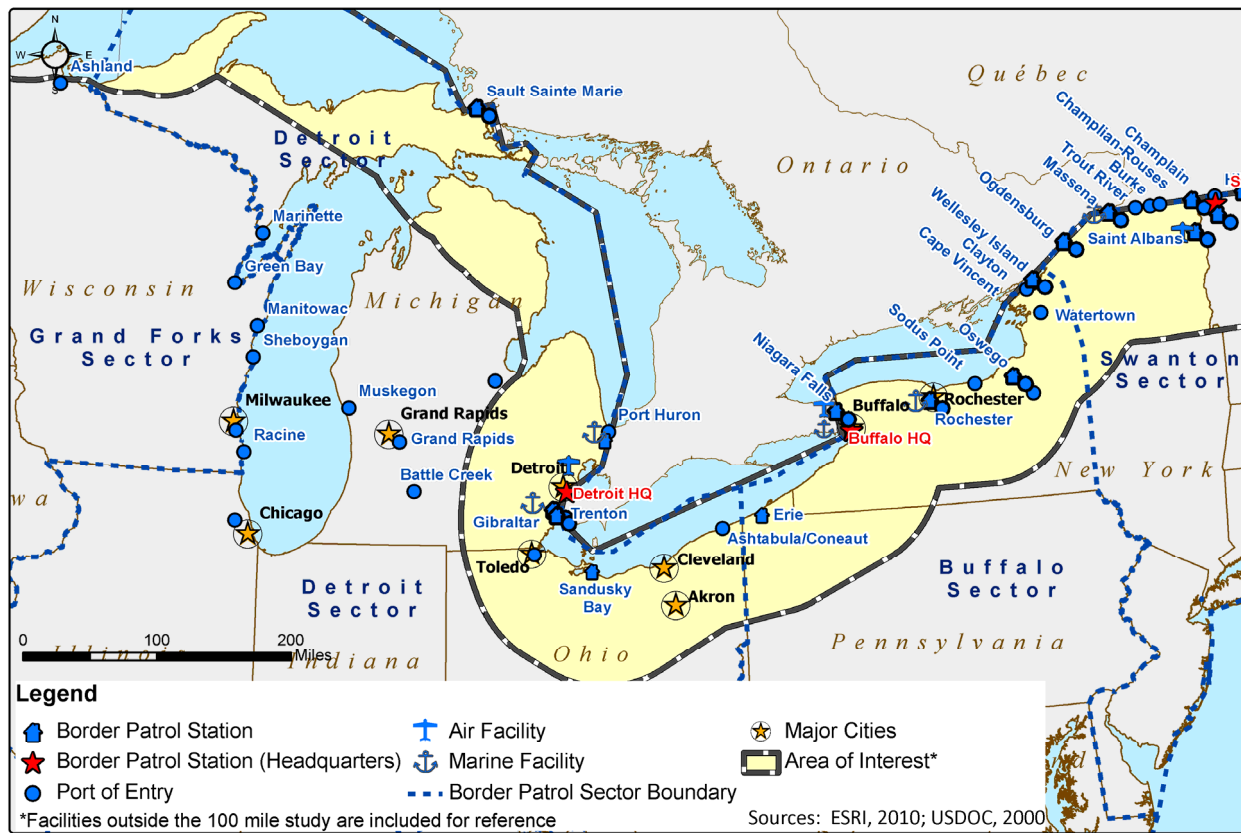
Table 6.16-2. Busiest Land Points of Entry for Passenger Vehicles in the Great Lakes Region 6-149

6 GREAT LAKES REGION

6.1 INTRODUCTION

This chapter analyzes potential environmental effects in the Great Lakes Region arising from U.S. Customs and Border Protection (CBP) actions related to its homeland-security mission. The chapter will address ongoing activities and long-range planning for security enhancement measures. The Great Lakes Region includes the areas of Wisconsin, Michigan, Ohio, Pennsylvania, and New York that fall within about 100 miles of the northern border. Figure 6.1-1 displays the territory and CBP facilities of the region.

Figure 6.1-1. The Great Lakes Region and U.S. Customs and Border Protection Facilities



The Great Lakes Region is dominated by four major metropolitan areas (Detroit, Michigan; Toledo, Ohio; Cleveland, Ohio; and Buffalo, New York), all five Great Lakes (Superior, Michigan, Huron, Ontario, and Erie) and their shoreline environments, and four ecoregion provinces (see Figure 6.1-1).

Land within the Great Lakes Region is a combination of privately owned land, state trust land, national forest area (Hiawatha, Huron, Manistee, Ottawa, Chequamegon, Nicolet, and Allegheny National Forests), national lakeshore area (Apostle Islands, Pictured Rocks, and Sleeping Bear Dunes National Lakeshores), and Native American land (Alleghany, Bay Mills, Cattaraugus, Cayuga, Grand Traverse, Hannahville, Isabella, Lac Court Oreilles, Lac du Flambeau, Menominee, Oil Springs, Potawatomi, Red Cliff, St. Regis Mohawk, Tonawanda, and Tuscarora Indian Reservations).

U.S. Border Patrol in the Great Lakes Region

The U.S. Border Patrol (USBP) in the Great Lakes Region employs several hundred agents, who operate from 14 Border Patrol stations (BPSs) (see Figure 6.1-1). The 14 stations include the Sault Sainte Marie, Port Huron, Detroit, Trenton, Erie, Buffalo, Niagara Falls, Rochester, Oswego, Wellesley Island, Ogdensburg, Massena, Burke, and Champlain Stations. They are divided among three sectors: Detroit, Buffalo, and Swanton.

The Great Lakes Region is characterized most notably by its long freshwater border. Large portions of the border lie within the Great Lakes and are well beyond the line of sight from shore. Much of the shoreline, particularly near metropolitan areas, is privately owned. These conditions present a challenge for observation, which leads to use of diverse surveillance methods including electronic surveillance, aerial and waterborne patrols, and the more typical on- and off-road-vehicle, snowmobile, and pedestrian patrols. The need to access private property requires a reliance on partnerships with private entities (communities, landowners, interboundary groups), for both law enforcement and intelligence missions.

Both CBP and the U.S. Forest Service (USFS) are acting pursuant to a memorandum of understanding (MOU) signed in 2006 between the Department of Homeland Security (DHS), the U.S. Department of Agriculture (USDA), and the Department of the Interior (DOI). The MOU sets out a framework for cooperation and provides for DHS access to USFS lands to implement its security mission. Section 6.8 on Land Use describes this MOU in more detail.

Office of Air and Marine in the Great Lakes Region

The Office of Air and Marine (OAM) Great lakes Air and Marine Branch, formerly the Detroit Air Branch, was established on March 1, 2002 by the legacy USBP Aviation Operations at the St. Clair County Airport. The branch opening was in direct response to the September 11, 2001 terrorist attack. The Great Lakes Air and Marine Branch has the last of the five Northern Border Air Wings that OAM proposed for installment on the U.S.-Canadian border. In January 2008, the name was changed from the Detroit Air Branch to the Great lakes Air and Maine Branch so that it would better represent the vast water boundary that forms the border area supported by this air branch. The Great Lakes Air and Marine Branch is staffed by between 25 and 35 CBP personnel. Over the next five to seven years, the branch will provide primary aviation and marine support to USBP Detroit Sector, which is responsible for securing more than 863 miles of the northern border.

The Buffalo Air and Marine Branch located in Buffalo, NY, is primarily responsible for covering approximately 341 linear miles of maritime international border on the Niagara River, St. Lawrence Seaway, and Great Lakes of Erie and Ontario. Within the Buffalo area of responsibility, the air and marine branch is under the tactical control of the Buffalo Sector Office of Border Patrol. The Buffalo Air and Marine Branch provides support to USBP and other Federal, state and local partners with a highly trained and professional air and maritime interdiction program. The air and marine interdiction agents make up a critical part component in establishing the correct blend of personnel, technology and infrastructure, CBP Air and Marine strives to maintain and share border awareness and intelligence through the directed patrols of the air and the maritime domain.

Office of Field Operations in the Great Lakes Region

CBP Office of Field Operations (OFO) port of entry (POE) personnel are the face at the border for most visitors entering the United States. Each CBP OFO region includes one or more large POE that may oversee smaller ports of varying sizes. There are a total of 21 POEs, including 3 service ports, within the project area overseen by the Great Lakes Regional field operations offices. Service ports are OFO locations that have a full range of cargo processing functions, including inspections, entry, collections, and verification. The Michigan POEs include the large service port at Detroit and the Sault Sainte Marie, Port Huron, and Gibraltar POEs. The Ohio POEs include Trenton, Toledo, and Ashtabula/Conneaut. Pennsylvania has one POE under the management of OFO located in Erie. The New York POEs include the large service ports at Buffalo and Champlain, and the POEs at Rochester, Sodus Point, Oswego, Watertown, Cape Vincent, Wellesley Island, Ogdensburg, Massena, Trout River, Burke, and Albany.

6.2 AIR QUALITY

6.2.1 INTRODUCTION

The Great Lakes study area contains many air quality control regions (AQCRs) and Class I areas that could experience impacts due to the proposed action and alternatives in this Programmatic Environmental Impact Statement (PEIS). (Class I areas are Federal lands, designated by Congress as of August 7, 1977, that have air quality restrictions under Section 162(a) of the Clean Air Act (CAA) that are more stringent than the standards that apply elsewhere.) However, the mere presence of a sensitive area, such as a nonattainment, maintenance, or Class I areas, does not guarantee that that area would be impacted by CBP activities. Chapter 3, Section 3.2 provides more detailed information on national standards and requirements used to describe and determine effects to air quality resources.

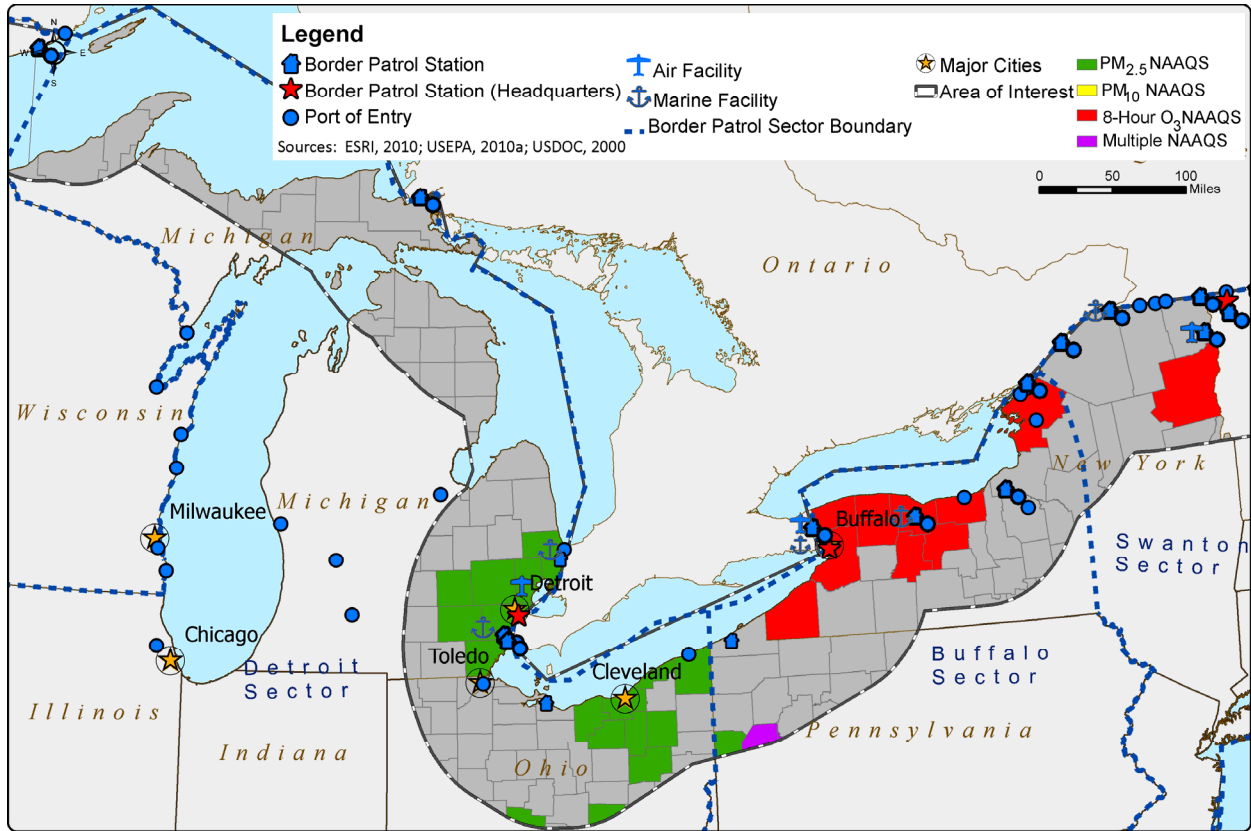
6.2.2 AFFECTED ENVIRONMENT

6.2.2.1 National Ambient Air Quality Standards and Attainment Status

Nonattainment areas within 100 miles of the border are shown in Figure 6.2-1. Inversions become even more problematic in urban areas, where vehicle exhaust, smoke from wood stoves, and industrial processes are more concentrated (MDEQ, 2010; IDEQ, 2010). Major cities usually have high traffic volumes and large industrialized areas that can contribute to elevated O₃ and PM_{2.5} (particulate matter that is 2.5 micrometers in diameter and smaller). The Great Lakes Region has more major cities than do any of the other northern border regions. Although there are several nonattainment areas, they are scattered throughout the major cities: Buffalo, Syracuse, and Niagara, New York; Chicago, Illinois; Detroit, Michigan; and Cleveland, Ohio (USEPA, 2010a).

Federal regulations designate AQCRs that were once classified as nonattainment but have lowered levels of pollutants through the use of regional controls, as maintenance areas. Consistent with the nonattainment areas, Figure 6.2-2 shows higher concentrations of maintenance areas scattered throughout central New York, northern Pennsylvania, lower Michigan, and northern Ohio.

Figure 6.2-1. Nonattainment Areas in the Great Lakes Region

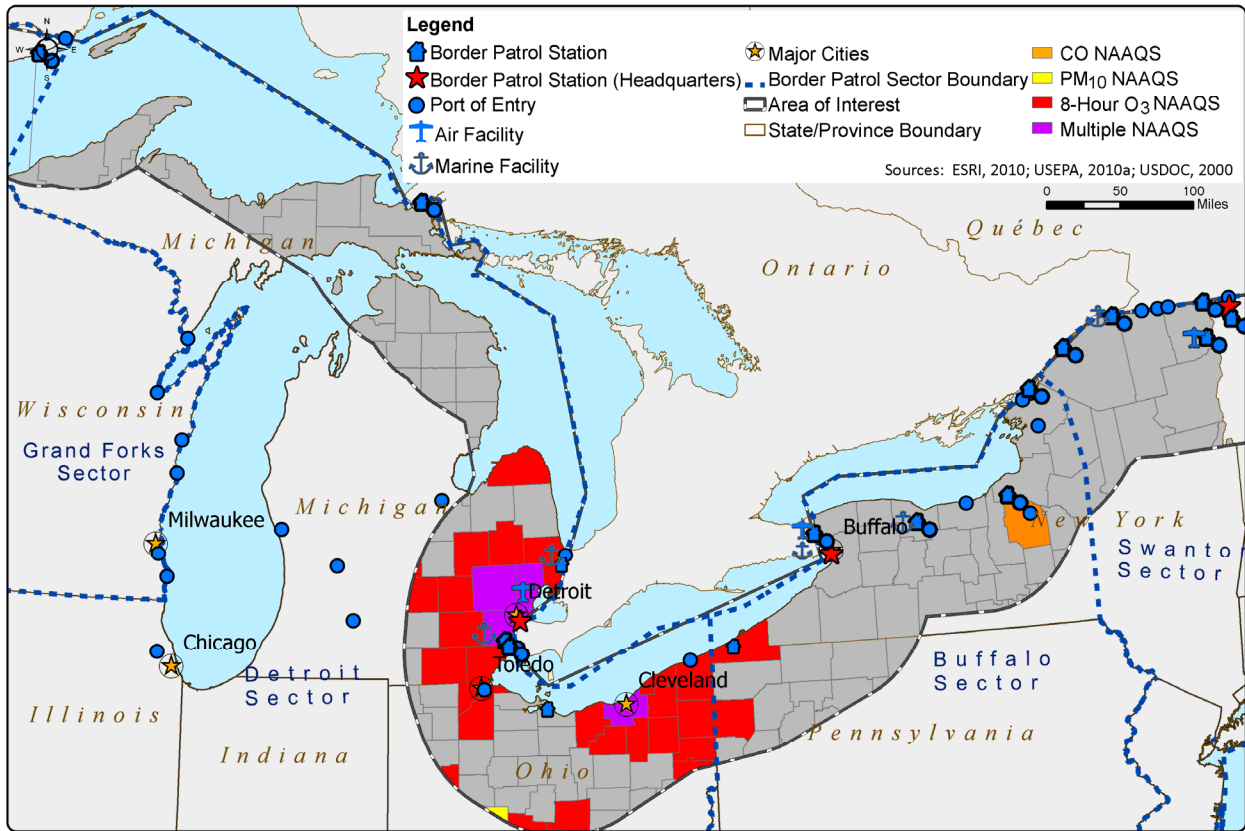


Notes:

NAAQS: National Ambient Air Quality Standards

PM₁₀: Particulate matter that is 10 micrometers in diameter and smaller

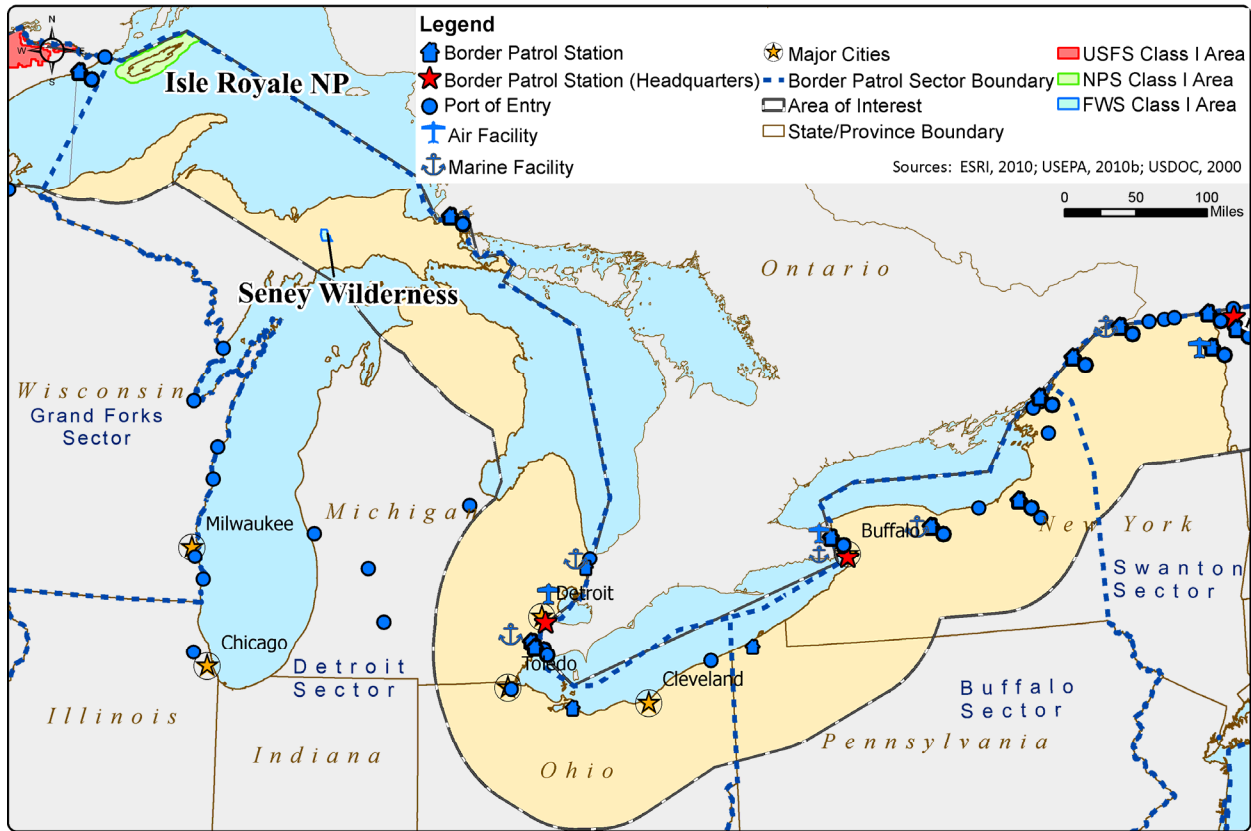
Figure 6.2-2. Maintenance Areas in the Great Lakes Region



6.2.2.2 Class I Areas

The CAA protects areas where air quality exceeds national standards established by the U.S. Environmental Protection Agency (USEPA) by measures to prevent significant deterioration (PSD) of air quality. The more stringent restrictions in effect in Class I areas are largely meant to maintain unimpaired visibility in areas such as “national parks, national wilderness areas, national monuments, national seashores, and other areas of special natural, recreational, scenic, or historic value.” In general, “clean air areas” are protected through ceilings on the additional amounts of certain air pollutants over a baseline level. The PSD increment amounts vary based on the area’s classification. Class I areas and major CBP facilities in the Great Lakes Region are shown on the map in Figure 6.2-3.

Figure 6.2-3. Class I Areas in the Great Lakes Region



Notes:

USFS: United States Forest Service

NPS: National Park Service

USFWS: U.S. Fish and Wildlife Service

6.3 BIOLOGICAL RESOURCES

6.3.1 INTRODUCTION

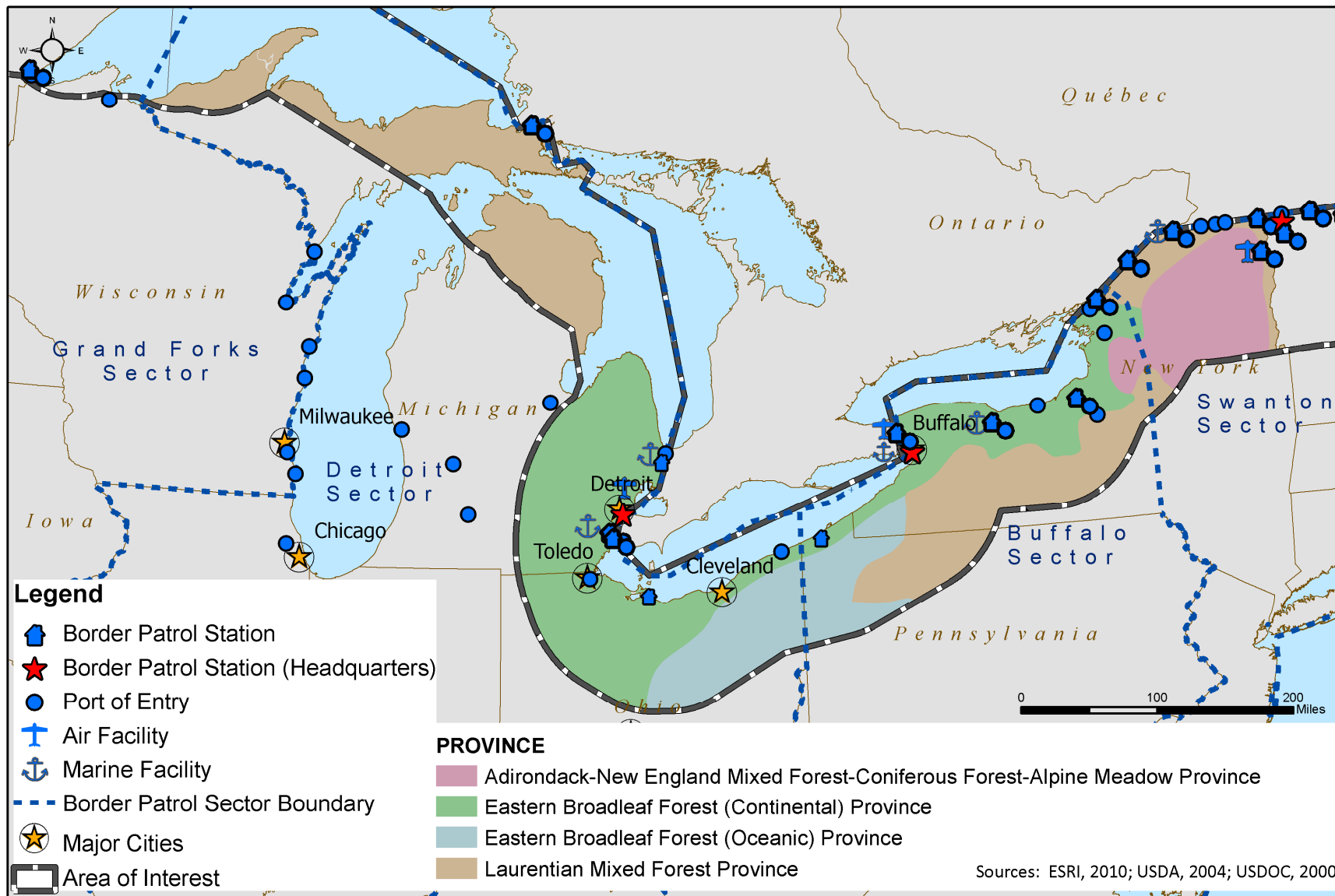
The Great Lakes Region encompasses portions of the following states: Wisconsin, Michigan, Ohio, Pennsylvania, and New York. Biologically, the region can be divided into four major ecoregions:

- Eastern Broadleaf Forest (Continental),
- Eastern Broadleaf Forest (Oceanic),
- Adirondack-New England Mixed-Forest Coniferous Forest-Alpine Meadow, and
- Laurentian Mixed Forest.

Generally, these ecoregions continue north of the U.S.–Canada border (Figure 6.3-1). For a complete description of each ecoregion, see Appendix L.

Map resources for the ecoregion map in this section are based on the U.S. Census Bureau (USCB), U.S. Geological Survey (USGS), and ESRI databases. Each ecoregion has a unique set of biological, climatic, and topographical characteristics along with unique challenges and opportunities for CBP. The description of the biological resources for the Great Lakes Region follows.

Figure 6.3-1. Ecoregions of the Great Lakes Region



6.3.2 AFFECTED ENVIRONMENT

6.3.2.1 Blocks of Regionally Significant Habitat

The blocks of regionally significant habitat listed below and shown in Figure 6.3-2 are relatively undeveloped and intact habitat protected as wilderness, state parks, and state and national forests. “Intact habitat” refers to areas of largely unfragmented habitat with few alterations or disturbances, such as improved roads or other development. Most areas listed are protected by law (wilderness areas, national parks), while others may occupy private lands and often cross state and country boundaries.

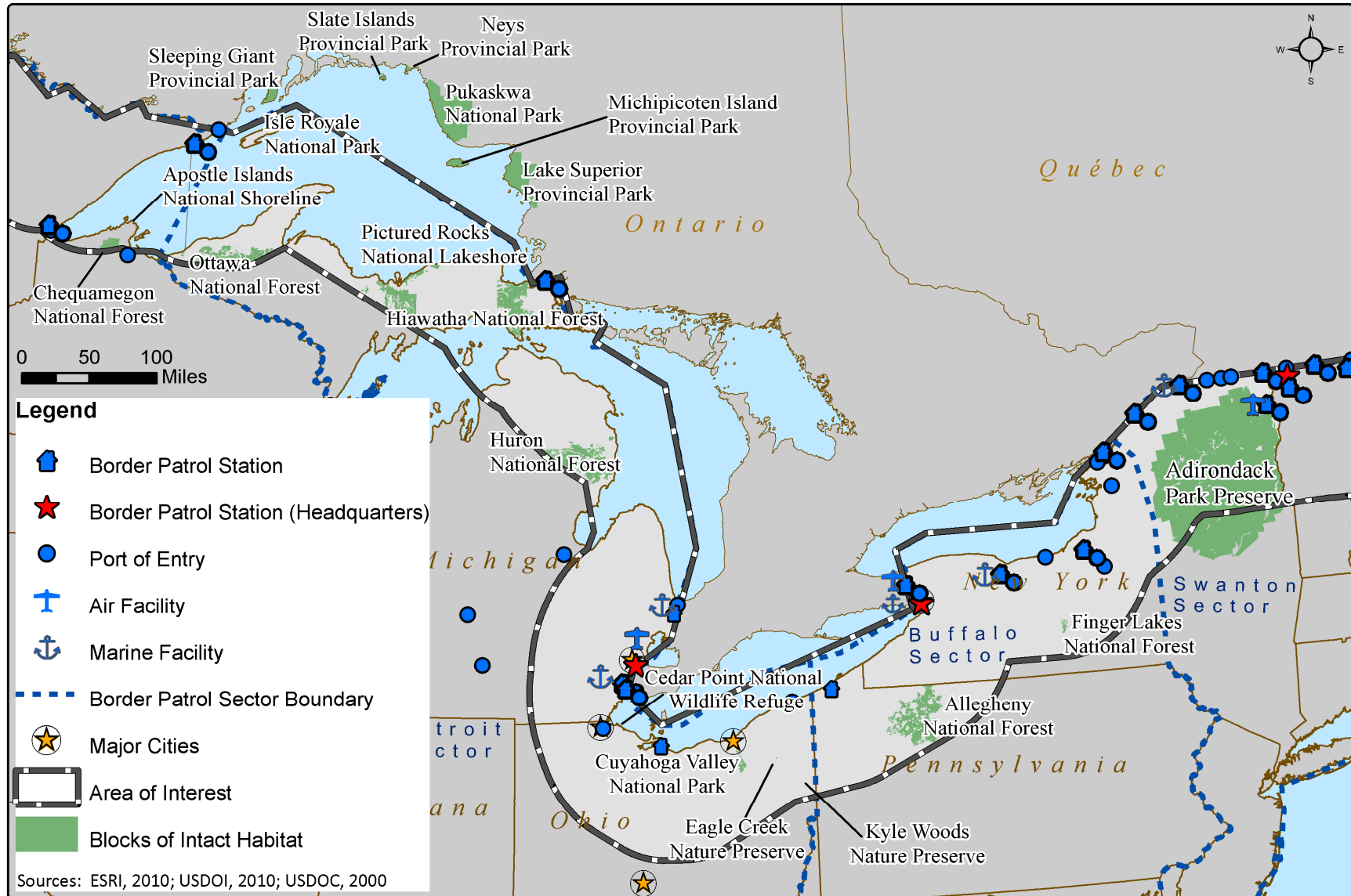
Selected regionally significant blocks that represent this region include:

- Adirondack Park Preserve (New York);
- Allegheny National Forest (Pennsylvania);
- Apostle Islands National Lakeshore (Wisconsin);
- Cedar Point National Wildlife Refuge (Ohio);
- Chequamegon National Forest (Wisconsin);
- Cuyahoga Valley National Park (Ohio);
- Eagle Creek State Nature Preserve (Ohio);
- Finger Lakes National Forest (New York);
- Great Lakes: Lake Superior, Lake Michigan, Lake Huron, Lake Erie, and Lake Ontario;
- Hiawatha National Forest (Michigan);
- Huron National Forest (Michigan);
- Isle Royale National Park (Michigan) ;
- Kyle (Arthur) Woods State Nature Preserve (Ohio);
- Lake Superior Provincial Park (Ontario, Canada);
- Michipicoten Island Provincial Park (Ontario, Canada);
- Mosquito Creek Wetland Area;
- NASA Plum Brook Station;
- Neys Provincial Park (Ontario, Canada);
- Ottawa National Forest (Michigan);
- Ottawa National Wildlife Refuge;
- Pickerel Creek Wildlife Area;
- Pictured Rocks National Lakeshore (Michigan);
- Porcupine Mountains State Park (Michigan);
- Pukaskwa National Park (Ontario, Canada);

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

- Ravenna Army Ammunition Plant;
- Rifle River Recreation Area (Michigan);
- Slate Islands Provincial Park (Ontario, Canada); and,
- Sleeping Giant Provincial Park (Ontario, Canada).

Figure 6.3-2. Blocks of Intact Habitat in the Great Lakes Region



6.3.2.2 Sensitive Habitats

Within a 100-mile zone adjacent to the U.S.–Canada border in this region are several ecological communities representing sensitive habitats. The sensitive habitats described here occur in many of the larger habitat areas listed in Section 6.3.2.1, and are home to many of the threatened and endangered species listed in the next section. For example, Isle Royale National Park is an island in Lake Superior occupied by boreal forests and houses many protected species, such as the American marten (*Martes americana*) and common trees such as balsam fir (*Abies balsamea*) and white cedar (*Thuja occidentalis*). Some descriptive habitats below, such as old growth/mature forest, span many regional boundaries and are more general in meaning. Others, such as Great Plains ponderosa pine woodlands (plant communities dominated by ponderosa pines), define more specific ecological associations.

Boreal Forests



Source: (NDL, No Date).

Many of these habitats are very fine in scale and form a patchwork of biologically sensitive and diverse areas. The list of sensitive habitats is based on those enumerated and described by the World Wildlife Fund (WWF, 2001), ecological system descriptions within the NatureServe.org database, and each state's respective natural resources agency (NatureServe, 2010).

- Alpine Meadow—alpine meadows are open areas on Adirondack ecoregion mountains, generally above 3,500 feet elevation, where cold temperatures and high winds favor a community of ground-layer plants that can tolerate such conditions;
- Black Swamp Forest—forest remnants remaining from extensive post-glacial lake plains southwest of Lake Erie;
- Bogs—wetland type that accumulates acidic peat with deposits of dead plant material;
- Boreal forests—predominately coniferous forest of the Northern Hemisphere;

- Calcareous fens—rarest wetland community in Wisconsin, with input of alkaline mineral-rich groundwater;
- Cedar/tamarack swamps—forested wetland characterized by one or both of these tree species;
- Cold-air talus woodland—talus areas with large, ice-cooled boulders where the microclimate supports black and red spruce, heaths, and evergreen shrubs;
- Flowages—series of connected lakes;
- Freshwater estuaries—ecological communities where lake and river waters mix;
- Great Lakes beaches and shorelines—Great Lakes beach community adjacent to margins of all five lakes, often with sparsely vegetated dunes;
- Hardwood swamps—deciduous forested wetland;
- Inland lake shorelines—beaches of inland lakes characterized by water-level fluctuations preventing development of stable shoreline plant communities, and supporting a more-specialized biota adapted to sandy or gravelly shorelines;
- Limestone bluff cedar-pine forests—forests of these species on limestone bedrock;
- Riverine marsh—riverside deep marsh wetland type;

Riverine Marsh



Source: (NDL, No Date)

- Sedge meadow—wetland dominated by sedges growing on saturated soils typically composed of peat or muck; and,
- Wet prairie—wet grassland habitat, dominated by sedges and rushes.

6.3.2.3 Threatened and Endangered Species

Federally listed threatened and endangered species are protected by the Endangered Species Act (ESA) of 1973. The purpose of the ESA is to protect and recover imperiled species and the ecosystems upon which they depend.

Appendix M lists the threatened or endangered species by county in the Great Lakes region. Species are listed as threatened or endangered at either the Federal or state level or both. Two animal species that have designated critical habitat in the region: the piping plover (*Charadrius melodus*) is listed as federally endangered in Wisconsin, Ohio, and Pennsylvania and threatened in Michigan and New York; and the Canada lynx (*Lynx canadensis*) is listed as federally threatened.

Some states differ in how they list and protect threatened and endangered species. The following list gives the specific agencies and listing differences (if applicable) in the Great Lakes Region.

- Michigan's endangered species act protects all state-listed species of plants and animals (NANFA, 2011). The Michigan Department of Natural Resources (MIDNR) maintains the list of endangered, threatened and extirpated species.
- New York has an endangered species law that protects wild animals. The New York State Department of Environmental Conservation (DEC) maintains this list of endangered, threatened, and special concern fish and wildlife species (NANFA, 2011).
- Ohio has endangered species laws to protect animals and plants (NANFA, 2011). The Ohio Department of Natural Resources (ODNR), Wildlife Division has legal authority over these species.
- Pennsylvania has separate laws protecting endangered species of animals, plants and fish (NANFA, 2011). The Pennsylvania Department of Conservation and Natural Resources (DCNR) has legal authority over these species.
- Wisconsin has an endangered species law that protects animals and plants. The law does not require recovery plans, although the Wisconsin Department of Natural Resources (WDNR) sometimes prepares them (NANFA, 2011).

Following are examples of some of the threatened and endangered species in the Great Lakes Region:

The Indiana bat (*Myotis sodalis*) is a forest-dwelling bat species that hibernates in caves in eastern and midwestern states, and has experienced a population decline of over 50 percent in recent decades. As with several other species of "tree bats" (species that breed in forests, but in some cases may spend part of their annual cycle in caves), many conservation issues are of current concern for the Indiana bat, including development.

Indiana bat



Source: (NDL, No Date).

The piping plover (*Charadrius melodus*), a federally listed bird species, occurs in this region along the shores of lakes Superior, Michigan, Huron, Erie, and Ontario. Since this species nests on wide, flat, and open sandy beaches, human activities that alter or disturb their habitat may affect populations nesting in the area or migrating through the area. Since the piping plover is a federally listed species, the U.S. Fish and Wildlife Service (USFWS) and the states have existing plans in place for monitoring or recovery of this species' populations. Wisconsin, Michigan, Ohio, and New York include the bird as endangered on their states' lists as well. The USFWS has designated critical habitat for this species within this region. Critical habitat for the region's breeding population was designated in May of 2001, and includes extensive stretches of shoreline in Wisconsin, Michigan, Ohio, Pennsylvania, and New York.

Piping Plover, *Charadrius melodus*



Source: (NDL, No Date).

The Hines emerald dragonfly (*Somatochlora hineana*) is a federally endangered species. This dragonfly requires a rare wetland environment characterized by dolomite bedrock, groundwater seeps, crayfish burrows, marginal flow, and seasonal drying (USDOI, 2001). The life span of the Hine's emerald dragonfly is approximately four to five years, developing from egg, to larvae, to adult. Most of this time is spent in wetlands during the larval stage. Adult flight takes place

during the summer months in wetlands and meadows near breeding habitat. Current populations live in isolated areas in Wisconsin, Illinois, Michigan, and Missouri. Within the 100-mile project area, critical habitat has been designated in Michigan at several sites near Lake Huron and Lake Michigan.

6.3.2.4 Wildlife Typically Found in the Region

In boreal and coniferous forest habitats in the northernmost portion of the Great Lakes Region in Wisconsin, Michigan, and New York, many passerine species typical of these habitats are found, including more than 25 species of warblers (family Parulidae), thrushes such as the hermit thrush (*Catharus guttatus*), rose-breasted grosbeak (*Pheucticus ludovicianus*), and birds especially typical of coniferous forest, such as black-backed woodpecker (*Picoides arcticus*), and gray jay (*Perisoreus canadensis*).

White-tailed deer, *Odocoileus virginianus*



Source: (NDL, No Date).

The woodlands of the northern border are characterized by long winters and a short growing season. Common mammal species include black bear (*Ursus americanus*), white-tailed deer (*Odocoileus virginianus*), moose (*Alce salces*), fisher (*Martes pennanti*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), fox (*Urocyon* spp. or *Vulpes* spp.), shrews (*Sorex* spp.), red squirrel (*Tamiasciurus hudsonicus*), and skunk (*Mephitis* spp. or *Spilogale* spp.). Amphibians include redbacked salamander (*Plethodon cinereus*), spotted salamander (*Ambystoma maculatum*), red-spotted newt (*Notophthalmus viridescens*), and American toad (*Bufo americanus*). Common garter snakes (*Thamnophis* spp.) and wood turtles (*Glyptemys* spp.) are also adapted to this northern climate (Bailey, 1995; EOE, 2009; NYDEC, 2011; OHDNR, 2010; PADCNR, 2010; MIDNR, no date; WIDNR, 2011).

Common Garter Snakes, *Thamnophis sirtalis*



Source: (NDL, No Date).

6.3.2.5 Vegetative Habitat Typically Found in the Region

Vegetative cover within the Laurentian Ecoregion province is dominated by forested habitats. Mixed forest stands are composed of several species of conifers, particularly white pine (*Pinus strobus*) in the Great Lakes Region, along with a mix of deciduous species. Typical vegetative cover consists of mixed pines (white, red, and jack pines) with aspen, sugar maple, and oak-hickory. Mixed forest stands are common, with the particular species in the assemblages highly dependent on soils. Deciduous trees typically favor nutrient-rich soils, while conifers thrive in poor soils. Pine trees are common in areas altered by fire. Shrub and herbaceous layers add to the vegetative diversity in each of these forests (Bailey, 1995; EOE, 2009).

Vegetative cover within the Eastern Broadleaf Forest (Continental) Province is also dominated by forested habitats. Typical vegetative cover consists mainly of oak-hickory forests with maple-beech forests along with elm (*Ulmus* spp.) in wetter areas. This province typically has a well-developed understory of flowering dogwood (*Cornus florida*), sassafras (*Sassafras albidum*), and hop hornbeam (*Ostrya virginiana*) as well as other shrubs, evergreens, and wildflowers. Existing wetland types include cattail marshes, wooded wetlands/swamps, and wet meadows (EOE, 2009).

The Adirondack-New England Mixed Forest Coniferous Forest-Alpine Meadow ecoregion is a mountainous region that transitions between true spruce-fir forest in the north to deciduous forests in the south. Growth form and species of this forested ecoregion are similar to those ecoregions further north, but red spruce (*Picea rubens*) occurs here instead of white spruce (*Picea glauca*). Vegetation zonation is present, with both elevation and latitudinal aspects. Mountain slopes at lower elevations are usually covered with mixed forest, typically composed of spruce, fir, maple (*Acer* spp.), and birch (*Betula* spp.).

Vegetative cover within the Eastern Broadleaf Forest (Oceanic) ecoregion includes forested and wetland habitats. Typical vegetative cover includes oak-hickory and maple-beech forests. Wetter forests often have a well-developed understory made up of flowering dogwood (*Cornus florida*), sassafras (*Sassafras albidum*), and hop hornbeam (*Ostrya virginiana*) along

with evergreens and wildflowers (Bailey, 1995; EOE, 2009; NYDEC, 2011; OHDNR, 2010; PADCNR, 2010; MIDNR, no date; WIDNR, no date).

6.3.2.6 Wetlands and Waterways

Wetland types within this region include:

- Beaches;
- Bogs;
- Emergent wetlands (marshes, fens, wet meadows, sedge meadows, wet prairies);
- Ephemeral/vernal ponds;
- Floodplain forests;
- Hardwood and coniferous swamps;
- Lacustrine wetlands (lakes);
- Palustrine emergent wetlands (marshes, fens, wet meadows, sedge meadows, wet prairies);
- Palustrine forested/scrub-shrub wetlands;
- Palustrine open water (ponds);
- Riverine habitat (rivers and streams); and,
- Shallow/open-water communities.

Wetland types are distributed widely throughout this region, but lake habitat is especially abundant because this province incorporates shoreline along all five of the Great Lakes. Wetland habitats in this region have been disturbed, largely due to agricultural practices and urbanization. These habitats are especially sensitive to disturbances such as channelization and ditching.

6.3.2.7 Aquatic Resources in the Region

Aquatic resources are highly regarded within this region, luring outdoor enthusiasts to the region for hunting and fishing. Abundant lakes, rivers, ponds, wetlands—the remnants of glacial recession—form dominant features on the landscape. All of the Great Lakes (Superior, Michigan, Huron, Erie and Ontario) border portions of this province.

These aquatic resources support a diverse fishery. Notable fish species include the lake sturgeon (*Acipenser fulvescens*), walleye (*Sander vitreus*), northern pike (*Esox lucius*), muskellunge (*E. masquinongy*), the non-native coho (*Oncorhynchus kisutch*, chinook salmon (*O. tshawytscha*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (also known as black bass, *M. salmoides*), brook trout (*Salvelinus fontinalis*), lake trout (*S. namaycush*), yellow perch (*Perca flavescens*), white sucker (*Catostomus commersonii*), and creek chub (*Semotilus atromaculatus*). Various native reptiles, amphibians, waterbirds, aquatic insects, mussels, and crustaceans also thrive in these waters (USDOC, 2010a).

Several major rivers run through the project area within the northeastern part of this ecoregion, including the Allegheny, St. Lawrence, Black, and Raquette rivers in New York, the Grand,

Cuyahoga, Sandusky, and Maumee rivers in Ohio, the Shiawassee, Ontonagon, and Au Sable rivers in Michigan, as well as numerous smaller rivers, streams, and tributaries. In addition to the Great Lakes, numerous smaller lakes and ponds also occur (Bailey, 1995; EOE, 2009).

Six Mile Lake in Michigan



Source: (NDL, No Date).

6.4 GEOLOGY AND SOILS

6.4.1 INTRODUCTION

The geology and soils in Great Lakes Region in the northern border study area vary widely throughout the region. Geology can be described as the study of the earth's history through rock formations. The topography of a given area on earth can be described as its surface, shape, or features.

This section addresses the geologic conditions in the Great Lakes Region and describes the potential impacts of CBP program alternatives on geologic resources. The study area contains significantly different topographic features ranging from the Great Lakes uplands to the Appalachian Mountains of New York. Geologic formations include glaciated landscapes, plateaus, moraines, and granitic mountain ranges.

6.4.2 AFFECTED ENVIRONMENT

6.4.2.1 Physiographic Provinces

Three physiographic divisions span the Great Lakes Region in the northern border area. These divisions are subdivided into provinces as well as some sections (Figure 6.4-1, Table 6.4-1).

The Laurentian Upland, Superior Upland (province) is the westernmost physiographic division in the Great Lakes Region along the northern border. To the east, the Interior Plains, Central Lowland is divided into two sections: the Eastern Lake and the Till Plains. The Appalachian Highlands physiographic division occupies the rest of the Great Lakes Region. Four provinces make up the Highlands: the Appalachian Plateaus, the Adirondacks, St. Lawrence Valley, and Valley and Ridge. Table 6.4-1 provides details on the geology of these areas and Appendix N features the geologic time scale showing the ages of the geologic time periods with which rock formations are dated. Appendix N features a geologic time scale showing the ages of the geologic time periods with which rock formations are dated.

6.4.2.2 Geologic Conditions

The geologic conditions within the Great Lakes Region are extremely complex, resulting from tectonic and related activities (e.g., faulting) and glacial activities along with erosive actions of wind and water. The Great Lakes Region contains consolidated geologic formations consisting of sedimentary, igneous, and metamorphic rocks. The Great Lakes Region also contains unconsolidated geologic formations consisting of alluvium, terrace deposits, glacial deposits, and other mixtures of sands, silts, and clays with various mixtures of rocks. The geologic formations are shown on Figure 6.4-2.

Figure 6.4-1. Physiographic Provinces, Divisions, and Sections of the Great Lakes Region

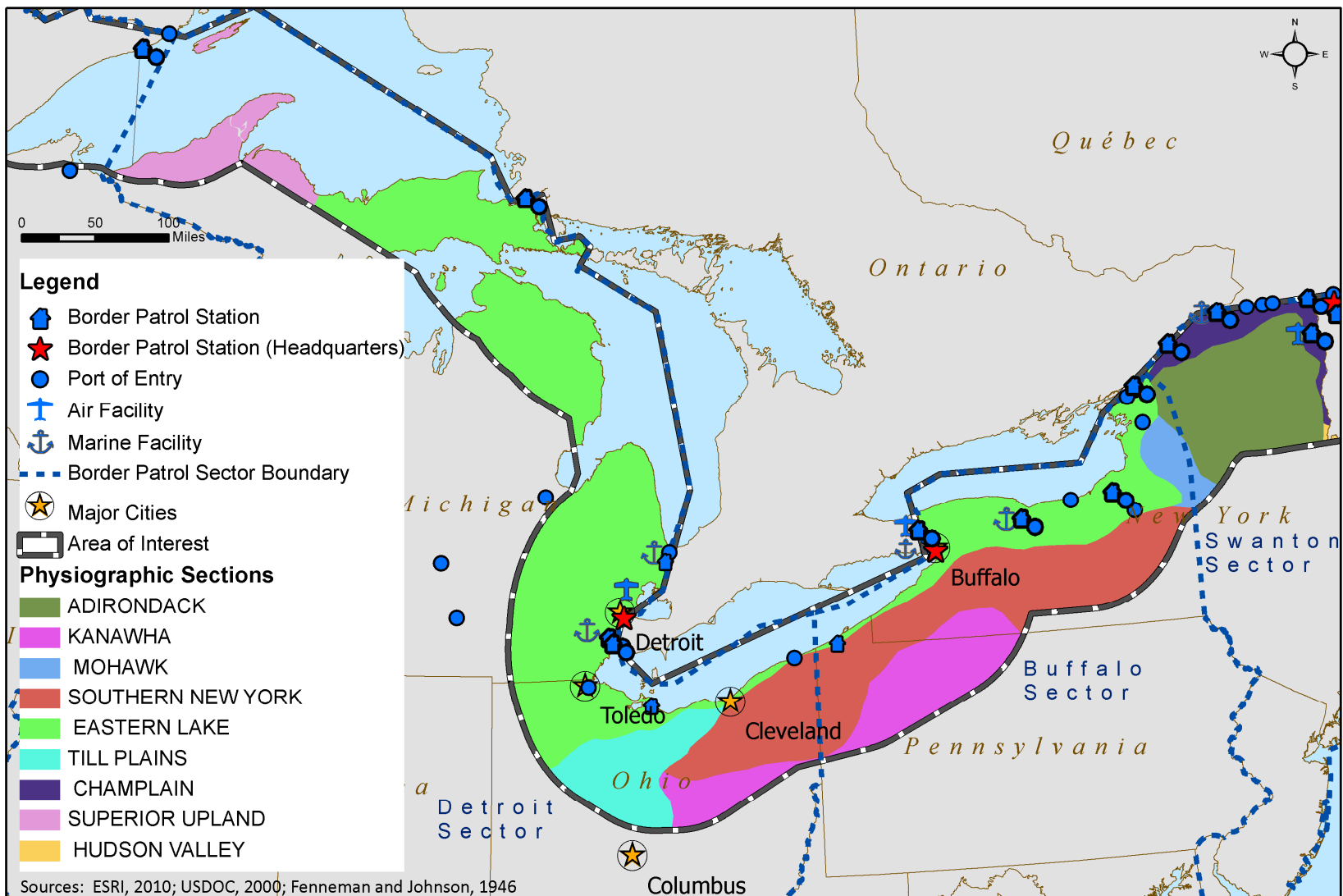


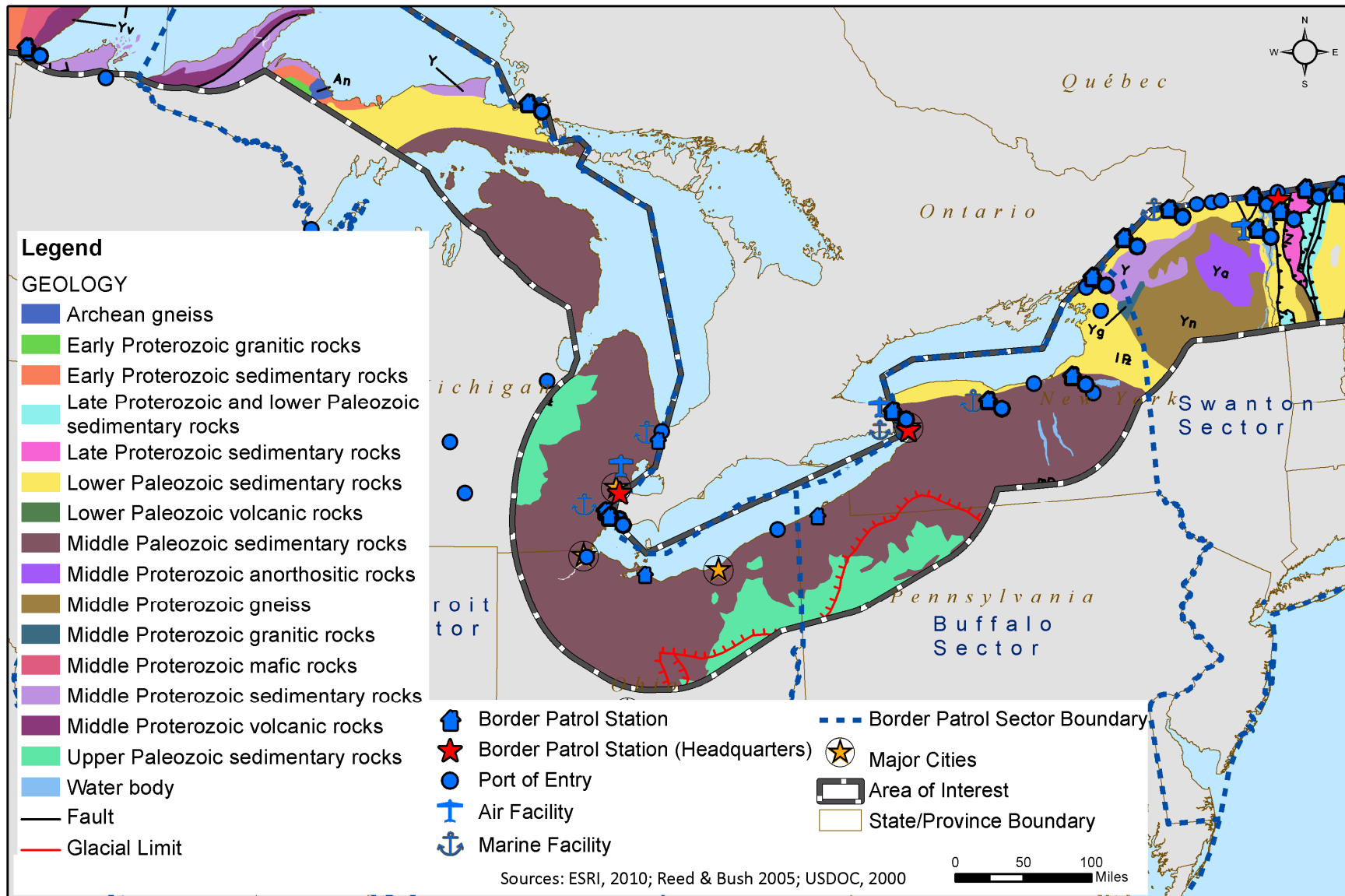
Table 6.4-1. Physiographic Provinces in the Great Lakes Region

Division	Province	Section	Terrain Texture including Topography	Geologic Structure and History	Generalized Rock Types
Laurentian Upland	Superior Upland	N/A	Elevation ranges from 600 to 2,280 ft. (183 to 695 m). Characterized by elevated linear features trending southwest-northeast along the Lake Superior shore and parallel ranges of Meabi and Vermillion to the north (USDOI, 1994).	Geologically known as the Canadian Shield, the Superior Upland is the largest American surface exposure of the ancient (2.6 to 1.6 billion years old) core of the North American continent (USDOI, 2000).	Mostly Precambrian metamorphic rocks and overlying Paleozoic rocks (Cambrian) covered by a thin veneer of glacial deposits from melting glaciers at the end of the Pleistocene (USDOI, 2004).
Interior Plains	Central Lowland	Eastern Lake	Level to rolling till plains, outwash plains, and lake plains. Areas of bedrock-controlled moraines, lake terraces, dunes, and swamps (WICCI, No Date).	Maturely dissected and glaciated cuestas and lowlands with moraines, morainic lakes, and lacustrine plains (Fenneman, 1928).	Glacial till over Cretaceous marine sediments (USDOI, No Date).
Interior Plains	Central Lowland	Till Plains	Young till plains without lakes and with some narrow and low moraines (Fenneman, 1928).	Glacial drift, not dissected by streams; two subsections: younger Wisconsin drift, older Illinoian drift (Fenneman, 1928).	Glacial till.
Appalachian Highlands	Appalachian Plateaus	Southern New York	A mature glaciated plateau of moderate relief (Fenneman, 1928).	Mature dissected part of Appalachian Plateaus once covered by continental ice (Fenneman, 1928).	Crystalline rocks and marble overlain by glacial till.
Appalachian Highlands	Appalachian Plateaus	Kanawha Plateau	A mature plateau of moderate to strong relief and fine texture (Fenneman, 1928).	Ancient unglaciated mountains with relatively high relief that developed over 480 million years ago.	Shales and sandstones, many vertically bedded.
Appalachian Highlands	Appalachian Plateaus	Mohawk Plateau	A maturely dissected glaciated plateau of diverse altitudes and varied relief, (Fenneman, 1928).	Ancient glaciated mountains with relatively high relief that developed over 480 million years ago.	Metamorphic and igneous rocks.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Division	Province	Section	Terrain Texture including Topography	Geologic Structure and History	Generalized Rock Types
Appalachian Highlands	Adirondack	N/A	Subdued mountains bordered by dissected peneplain (Fenneman, 1928).	Part of ancient Grenville continental province (USDOI, 2000).	Uplifted complex of Pre-cambrian metamorphic rock once covering them, Paleozoic sedimentary strata now flank these older rocks (USDOI, 2000).
Appalachian Highlands	St. Lawrence Valley	Champlain	Champlain has greater relief than average in St. Lawrence Valley province (Fenneman, 1928).	Rolling lowland, glaciated with partial cover of young marine plain.	Contact of Paleozoic and Precambrian rocks; metamorphic and igneous (Fenneman, 1928).
Appalachian Highlands	Valley and Ridge	Hudson Valley	Long ridges and valleys, some areas of high relief.	Created during formation of Appalachian Mountains; rivers eroded the valleys.	Mostly sedimentary rock, uplifted through mountain-building.

Figure 6.4-2. Geology of the Great Lakes Region

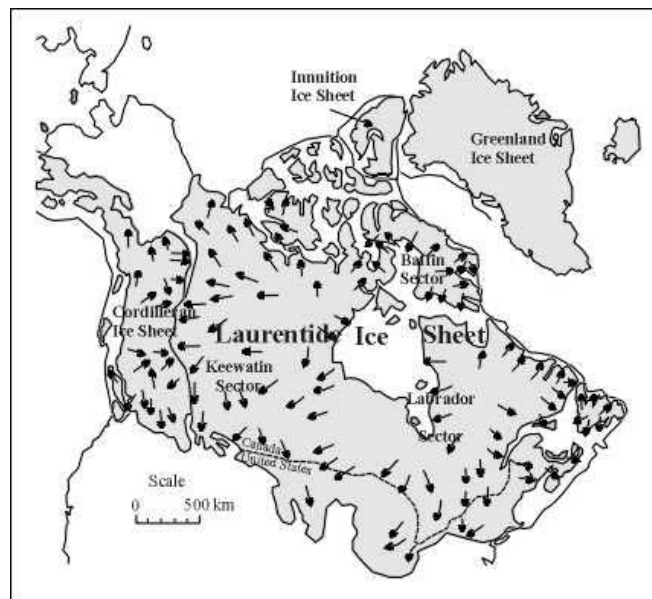


Regional Glaciation

During the Wisconsin glaciation, which ended around 10,000 years ago, the Laurentide Ice Sheet covered all of the Great Lakes Region. In addition to the ice sheet, mountain glaciers also expanded in high elevations.

The effects of glacial advances are readily apparent in the northern United States. Polished and striated outcroppings, rounded hills, moraines, valley fills of glacial till and outwash, and other typical glacial features are evidence of Pleistocene glaciation. All along the northern border, till deposits, erratics, and moraines are common (Nelson, 2003). Till, a sedimentary deposit derived from glacial erosion, was deposited throughout the northern United States as the ice sheets receded.

figure 6.4-3 Extent of the Laurentide Ice Sheet.



Seismicity and Tectonics

Seismic activity in the Great Lakes Region is rare (Figure 6.4-4). Seismic hazards are described in terms of minimum peak horizontal ground acceleration values. This value is defined by USGS as the fastest speed of horizontal particle movement at ground level because of an earthquake.

The cause of the seismic activity in northern New York is not completely understood since geologists have not been able to associate specific faults to earthquakes in the region. The types of earthquakes occurring here are intraplate quakes. The commonly accepted reason for this kind of earthquake is that ancient faults are releasing strain due to modern-day stresses. The ancient faults may date from the creation or separation of the supercontinent, Pangaea, although the activity occurring today is not due to plate boundary movement. The potential for damaging earthquakes in this region is low, but possible (Kafka, 2004).

Landslides

The Great Lakes Region has a very low incidence of landslides; most result from water action and human activities (Figure 6.4-5). Some locations are susceptible: the Great Lakes coastal areas, and the southernmost portion of the study area in Pennsylvania. Land cover in these areas decreases the incidence rate.

Figure 6.4-4. Seismicity in the Great Lakes Region

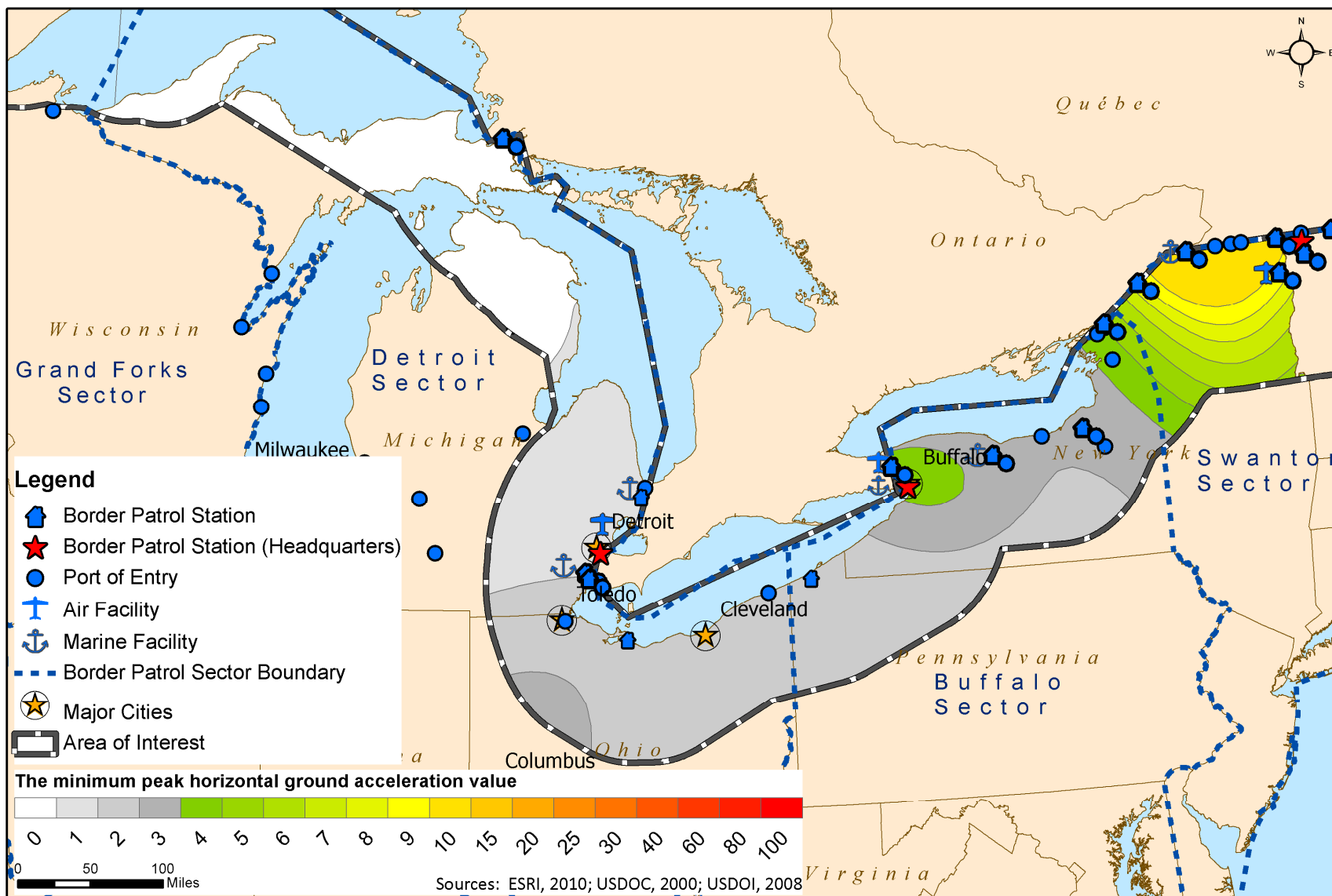
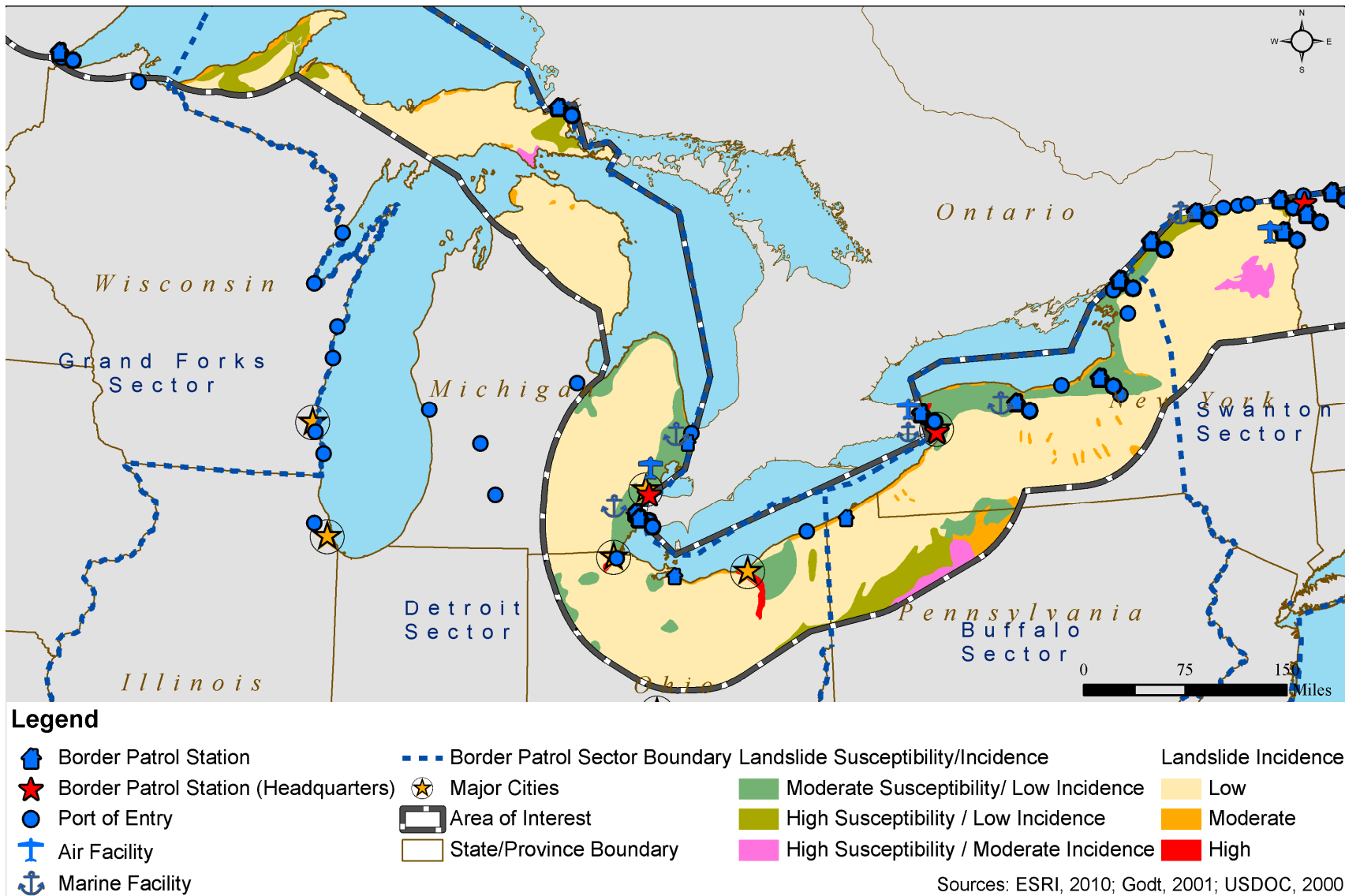


Figure 6.4-5. Landslide Incidence in the Great Lakes Region



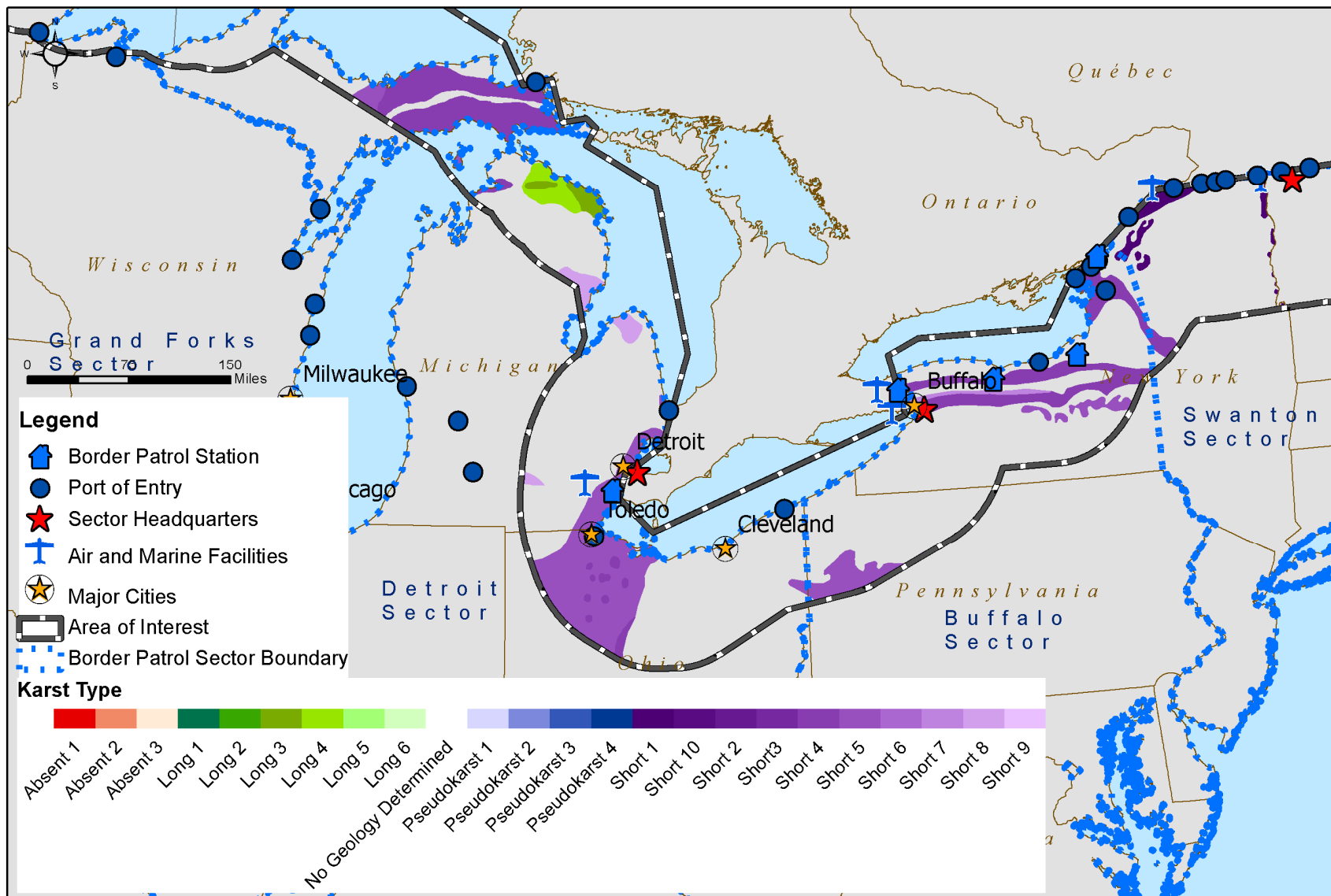
Karst Topography

In the Great Lakes Region, karst landscapes are spread throughout the Great Lakes Region (Figure 6.4-6 and Figure 6.4-7). These areas are mostly short (less than 1,000 ft. long) features in various types of carbonate rock. The northern section of the lower peninsula of Michigan contains karst features classified as long, which occur in areas of mixed carbonate rock. These areas have features that exceed 1,000 ft. in length and can range from 50 ft. to 250 ft. in depth.

Figure 6.4-6. An example of karst topography in the Great Lakes Region



Figure 6.4-7. Karst Topography in the Great Lakes Region



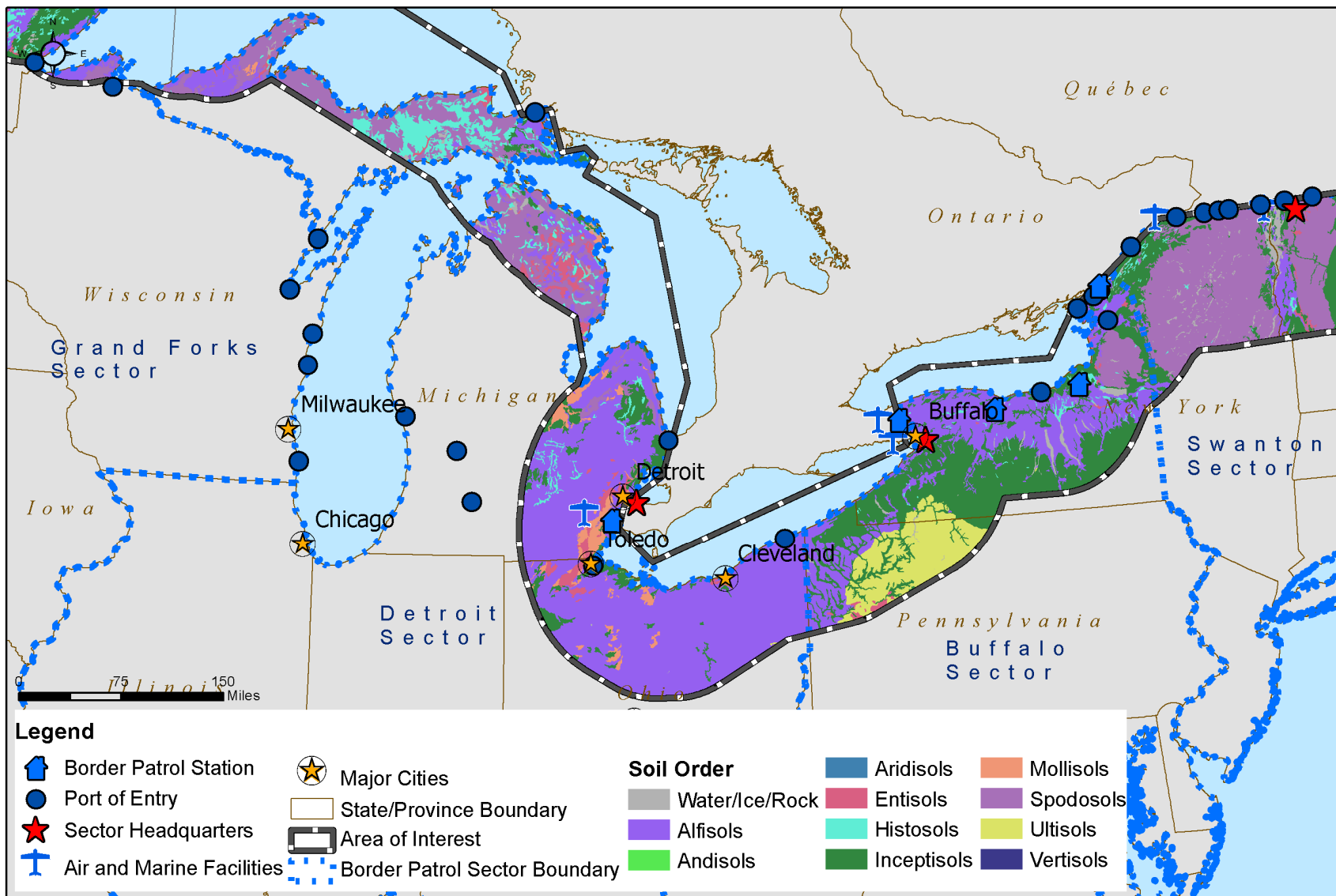
6.4.2.3 Soils

In the Great Lakes Region, seven major soil groups, or “orders,” occur (Figure 6.4-8). In this region, soils contain a wide range of particle sizes due to the expanse of the region and geological variation. In this region, alfisols, spodosols, and inceptisols dominate. Alfisols span portions of the entire region, especially in Michigan, Ohio, Pennsylvania, and New York. The primary component of this soil order is clay, which results from mineral weathering. Alfisols do not have a high erosion potential (University of Wisconsin, 1999). Small areas of northern Minnesota and Michigan also contain histosols and entisols. The histosols in the region are mainly found in areas of poor drainage. This water accumulation decomposes organic materials and creates peaty and mucky conditions. Histosols have a low weight-bearing capacity and, if drained of water, land subsidence may occur (University of Idaho, No Date). Entisols are soils that do not fit into any of the other 12 soil orders. These are young soils and have only an A horizon. Entisols are the most extensive soils in the world and can be very diverse based on the parent material from which they develop (University of Idaho, No Date). This soil order is often the transition layer between soils and non-soil parent rock.

Spodosols are found in northern Michigan and Wisconsin as well as New York and are acidic soils of forested areas. They are not agriculturally productive without management due to their high acidity, but have sub-layers of humus, or stable organic matter (University of Idaho, No Date). Spodosol textures are sandy to loamy and sometimes have clay (University of Wisconsin, 1999). Ultisols and inceptisols are mainly found in Pennsylvania and New York. Ultisols are soils with a high acid content, low fertility, and have been leached of minerals by the processes of weathering. Low soil fertility is due to a lack of nutrients in the soil resulting in the decreased ability to support plant life. While not productive as agricultural lands, ultisols are often found in highly productive forested areas (University of Idaho, No Date). They can be found in any climate that has periods of time when precipitation exceeds the evapotranspiration rate and the soil’s water storage capacity. A small organic layer followed by clays is typical of this soil order (University of Wisconsin, 1999). Inceptisols are the second most common soil type in the world. They are often found on steep slopes and typically do not have extensive development with regard to soil horizons (University of Idaho, No Date). These soils are found in almost all climates with the exception of arid climates. Mass movement (landslides and falls) and soil erosion are two processes that typically occur in this soil order (University of Wisconsin, 1999).

Mollisols are found at limited locations in the Great Lakes Region, mostly in Ohio and Michigan. These soils are common in grassland regions and are extremely agriculturally productive. In the United States, this is the most common soil order. The thick upper horizon (or layer) is a result of the decayed organic materials (University of Idaho, No Date). The development of this order is most often related to the weathering of sedimentary parent rock, and in some cases the weathering of glacial deposits. Mollisol soil texture can vary to a great degree from sandy to fine loams (See table 3.4.2-1). This soil order is prone to erosion, especially by water in cultivated areas (University of Wisconsin, 1999).

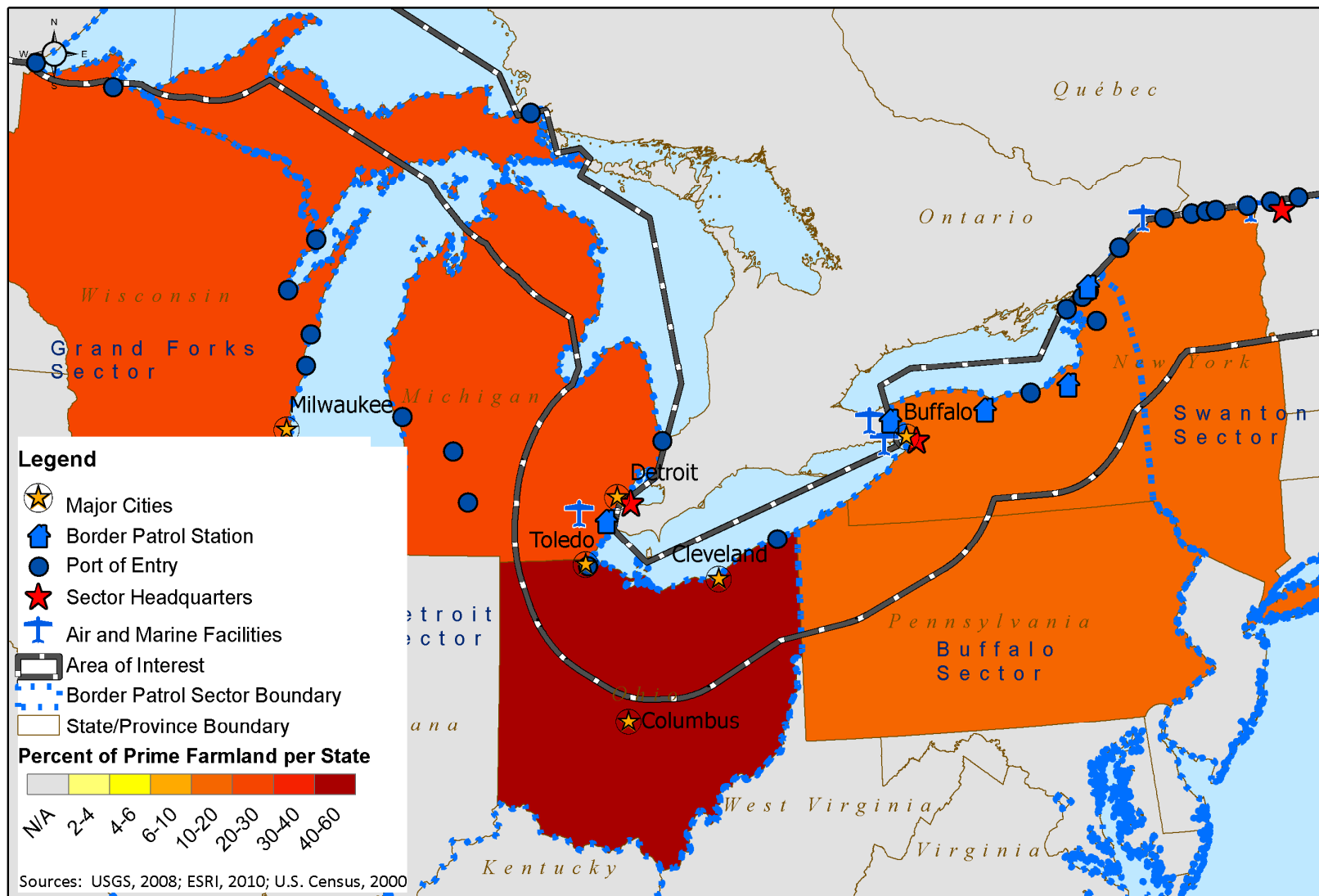
Figure 6.4-8. Soil Orders in the Great Lakes Region



6.4.2.4 Prime and Unique Farmland

In the Great Lakes Region, Prime and Unique Farmland is extensive (Figure 6.4-9). The highest percentage occurs in Ohio, with 40 to 60 percent of the land designated as Prime and Unique Farmland. Michigan and Wisconsin are second in the region with 20 to 30 percent of land designated as such. Pennsylvania and New York designate 10 to 20 percent of land as Prime and Unique Farmland.

Figure 6.4-9. Prime and Unique Farmland in the Great Lakes Region



6.5 WATER RESOURCES

6.5.1 INTRODUCTION

Water resources are distributed widely throughout the 100-mile PEIS study corridor in the states of Wisconsin, Michigan, Ohio, Pennsylvania, and New York. For the purposes of this study, this resource area consists of hydrologic and groundwater resources (aquifers, subterranean watercourses, and recharge areas), surface water and waters of the United States (lakes, ponds, rivers, streams, and channels), and floodplains. Water resources include several beneficial elements, such as water supply quantity and quality, habitat for aquatic organisms, recreation, and flood storage capacity, which are subject to effects from proposed activities.

6.5.2 AFFECTED ENVIRONMENT

6.5.2.1 Groundwater

Groundwater resources are sources of water that result from precipitation infiltrating the ground surface. Groundwater is contained in either confined reservoirs or unconfined aquifers. When the water table or piezometric surface reaches an elevation above the ground surface, groundwater will reappear above the ground surface as either streams, surface bodies of water, or wetlands. This exchange between surface water and groundwater is known as recharge and is an important feature of the hydrologic cycle.

Groundwater has a variety of beneficial uses. In the Great Lakes Region, as in the rest of the country, groundwater is a primary source for a wide variety of water uses including irrigation, domestic water supply, fish propagation, commercial water supply, industrial uses, and livestock. Table 6.5-1 shows the categories of groundwater use for states within the Great Lakes Region.

Table 6.5-1. Water Use in the Great Lakes Region in 2005

State	Irrigation Use (%)	Public Water Supply (%)	Industrial Use (%)	Rural Domestic, Livestock (%)
Wisconsin	4.7	6.4	86.1	2.8
Michigan	2.7	9.8	86.5	3.0
Ohio	0.4	12.5	85.4	1.7
Pennsylvania	0.3	15.0	76.9	7.8
New York	0.5	24.6	72.6	2.3

Source: (Kenny et al., 2009).

Groundwater occurs in porous geologic formation layers called aquifers, which may be large and regional, such as the Ogallala Aquifer, which underlies many states in the Great Plains. Aquifers may also be very small and localized.

Several principal aquifers are found in the Great Lakes Basin: the Cambrian-Ordovician Aquifer System, Silurian-Devonian Aquifers, Mississippian Aquifers, Pennsylvanian Aquifers, and

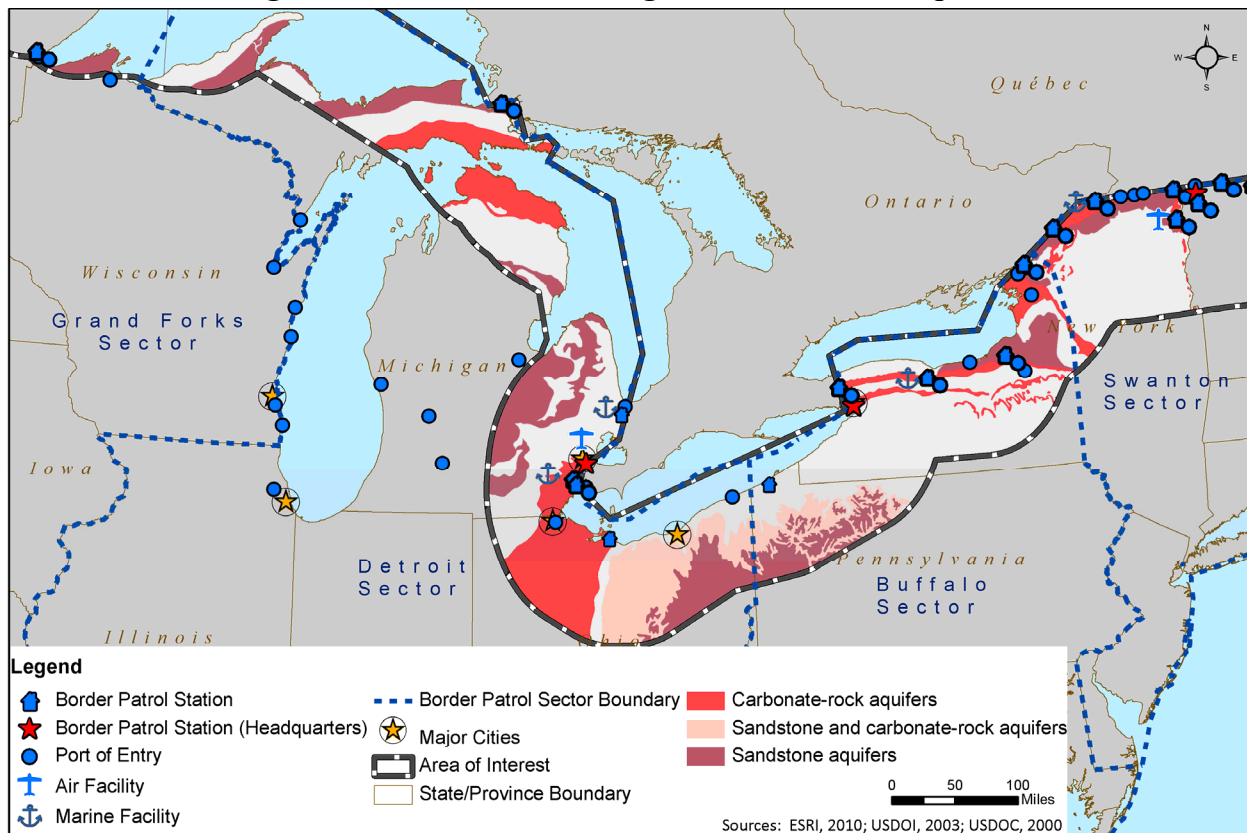
aquifers of alluvial and glacial origin (the “surficial aquifer system”). The surficial aquifer system overlies much of the area covered by Wisconsinan glaciations (USDOI, 2006).

Less regionally extensive aquifers or aquifer systems are also included in this group; the New York Sandstone Aquifers (Cambrian), the New York and New England carbonate rock aquifers (Silurian and Devonian), and the Marshall Aquifer in Michigan (Mississippian) (USDOI, 2006).

Geologic structural basins and arches control aquifer depth. As the depth to the top of the aquifers increases, water quality degrades, and water use from these aquifers declines.

Water demand is mostly met using surface water, including direct withdrawals from the Great Lakes. Total water use in the Great Lakes Basin for both Canada and the United States is approximately 850,000 Mgal/d, and total ground-water use in the Great Lakes Basin is about 1,500 Mgal/d (USDOI, 2006). In 1998, approximately 70 percent of the total groundwater withdrawal came from aquifers in the Lake Michigan and Lake Erie Basins. The areas of largest groundwater withdrawal are in the Chicago-Milwaukee area near the Great Lakes Basin boundary.

Figure 6.5-1. Great Lakes Region Groundwater Aquifers



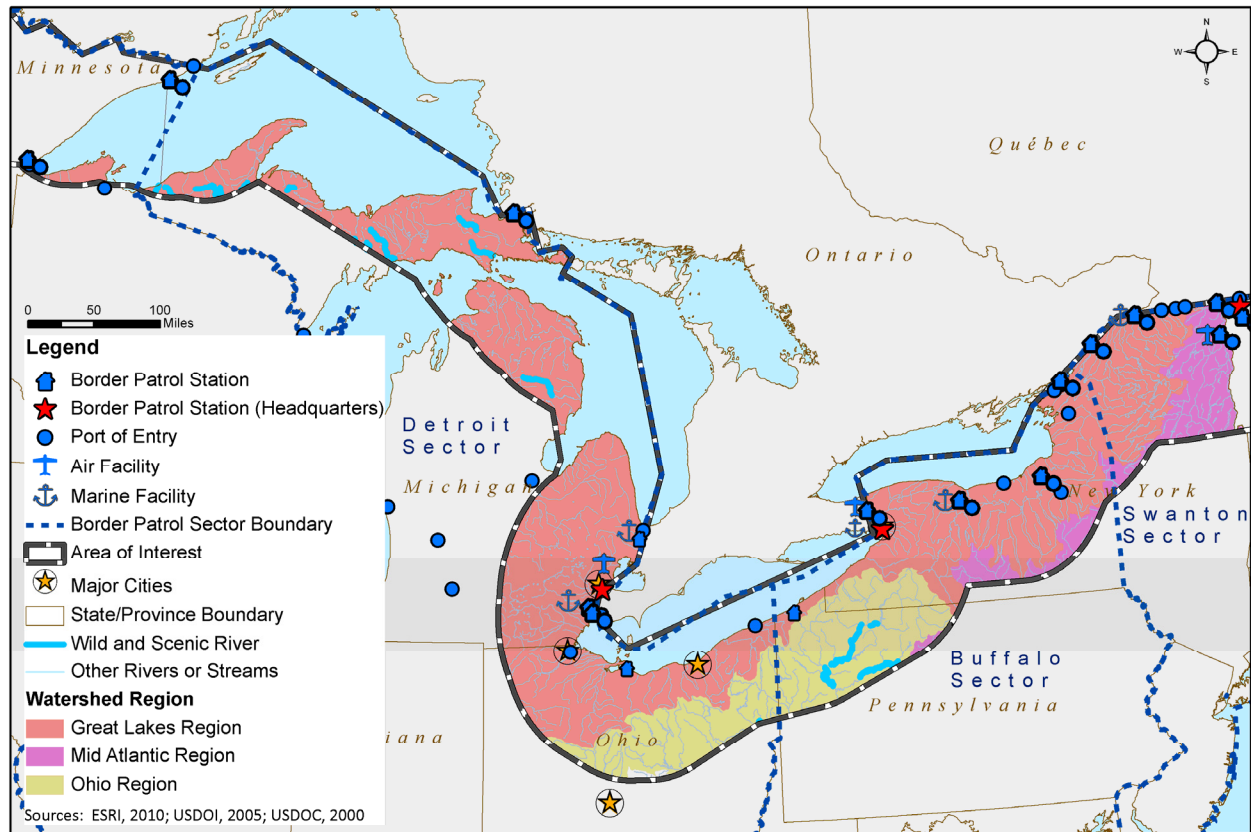
6.5.2.2 Surface Waters and Waters of the United States

Surface water is water found in lakes, rivers, ponds, wetlands, and oceans. It is the most abundant and visible form of water resource, with the greatest variety of uses. In addition to irrigation, domestic water supply, fish propagation, commercial water supply, industrial uses,

and livestock, surface water supports recreation, fish and wildlife habitat, hydropower, and transportation. Section 6.3.2.7 provides a discussion of the regional affected environment for aquatic resources. Surface water is often identified by the basin or watershed in which it is found. A watershed is simply the topographic area defined by the drainage of a single body of water.

There are nine designated Wild and Scenic Rivers within the 100-mile corridor of the Great Lakes Region; seven in Michigan and two in Pennsylvania. Figure 6.5-2 shows these Wild and Scenic Rivers as well as the other river basins found within the 100-mile corridor for the Great Lakes Region.

Figure 6.5-2. River Basins in the Great Lakes Region



Surface water resources in this region are dominated by the Great Lakes system. This system is the largest freshwater system on earth, covering 94,000 square miles, draining more than 200,000 square miles and storing an estimated six quadrillion gallons of surface water (GLIN, 2008). This is 21 percent of the world’s fresh water supply and 84 percent of the United States’ water supply. More than 30 million people live in the basin, about 10 percent of the American population and 30 percent of the Canadian population. Nearly 25 percent of the total Canadian agricultural production and seven percent of the U.S. agricultural production are located in the basin (USEPA, 2008).

Despite their large size, the Great Lakes are sensitive to pollution. The main sources of pollution are soil and farm chemical runoff from agricultural lands, city wastes, industrial discharges, and leachate from disposal sites. The large surface area of the lakes also makes them vulnerable to

direct atmospheric pollutants that fall with rain or snow and as dust on the lake surface (USEPA, 2008).

With early settlement, logging removed protective shade from streams and, together with sawdust from sawmills, clogged them with debris. Plowing left exposed soils, which washed away more easily, burying stream and river mouth habitats. Heavy fishing depleted the abundant fish stocks and populations of fish began to disappear (USEPA, 2008).

The untreated wastes of early industrialization degraded many rivers. Urbanization that accompanied industrial development added to degradation of water quality, creating nuisance conditions such as bacterial contamination, decay, and floating debris. Contaminated drinking water and polluted beaches contributed to human epidemics of waterborne diseases such as typhoid fever (USEPA, 2008).

**Figure 6.5-3. Industrial pollution site, Calumet River
US Environmental Protection Agency, Region V**



Source: (USEPA, 2008).

After the turn of the 20th century, new chemicals such as polychlorinated biphenyls (PCBs) and dichlorodiphenyltrichloroethane (DDT) were used on soils to enhance production. The combination of synthetic fertilizers, existing sources of nutrient-rich organic pollutants such as untreated human wastes from cities, and phosphate detergents caused an acceleration of biological production (eutrophication) in the lakes (USEPA, 2008).

Public concern about deterioration of water quality in the Great Lakes was formalized in the first Great Lakes Water Quality Agreement between Canada and the United States in 1972. Throughout the rest of the 1970s, nuisance conditions occurred less frequently as floating debris and oil slicks began to disappear. Dissolved oxygen levels improved, eliminating odor problems. Beaches reopened after improved sewage control and algal mats disappeared as nutrient levels declined (USEPA, 2008).

6.5.2.3 Floodplains

Floodplain management seeks to preserve the flood storage capacity for the river corridor. This may be achieved in several ways. Local communities often have floodplain management or zoning ordinances that restrict development within the floodplain. The Federal Emergency Management Agency (FEMA) manages the National Flood Insurance Program (NFIP). FEMA also provides floodplain management assistance, including mapping of 100-year floodplain

limits, to over 20,000 communities. The information provided by FEMA's flood management program is useful to CBP planners who seek to avoid effects from flooding. This is most relevant for CBP's border facilities, such as ports of entry (POEs) that are planned at locations where rivers define the northern border. The Detroit River, St. Mary's River, and St. Clair River in Michigan and the St. Lawrence River and Niagara River in New York are rivers of this type in the Great Lakes Region.

6.5.2.4 Transboundary Water Agreements

Boundary Waters Treaty

This treaty provides the basis for resolving disputes involving diverting or obstructing projects impacting water quantity and water across the boundary between Canada and the United States. It establishes an International Joint Commission with authority to approve projects on either side of the border that would alter transboundary water levels. The treaty was initiated between the United States and Great Britain in 1909 to settle issues of distribution of waters of the St. Mary and Milk Rivers for irrigation purposes between Canada and the United States.

Great Lakes Water Quality Agreement

The agreement, signed in 1972 and renewed in 1978, expresses the commitment of Canada and the United States to restore and maintain the chemical, physical, and biological integrity of the Great Lakes Basin Ecosystem and includes a number of objectives and guidelines to achieve these goals. It reaffirms the rights and obligation of Canada and the United States under the Boundary Waters Treaty.

6.6 NOISE

6.6.1 INTRODUCTION

The study area contains many soundscapes and noise-sensitive receptors that could experience impacts due to the alternatives that CBP is considering. However, the mere presence of a noise-sensitive area, such as a national park, residence, or school, does not guarantee that it would be significantly impacted by CBP’s activities or that the overall impacts would be major under the National Environmental Policy Act (NEPA). As with other topics in this PEIS, the programmatic approach to describing noise is driven by the planning objective of the document and the potential for actual impacts.

6.6.2 AFFECTED ENVIRONMENT

Sound is a physical phenomenon consisting of vibrations that travel through a medium like air and are sensed by the human ear. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise, distance between the noise source and the receptor, receptor sensitivity, and time of day. Noise is often generated by activities essential to a community’s quality of life, such as construction or vehicular traffic.

Sound varies by both intensity and frequency. Sound pressure level, in decibels (dB), is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Because the human ear responds differently to different frequencies, “A-weighting” was developed to approximate the frequency response of the human ear. The A-weighting curve has been widely adopted for environmental noise measurement and is standard in many sound level meters. The dBA levels of common sounds of daily life are provided in Table 6.6-1.

Table 6.6-1. Common Sound Levels

Outdoor	Sound level (dBA)	Indoor
Snowmobile	100	Subway train
Tractor	90	Garbage disposal
Downtown (large city)	80	Ringling telephone
Freeway traffic	70	TV audio
Normal conversation	60	Sewing machine
Rainfall	50	Refrigerator
Quiet residential area	40	Library

Notes: dBA = A-weighted decibel. Sound level provided is as generally perceived by an operator or a close observer of the equipment or situation listed.

Source: Harris, 1998.

The dBA noise metric describes steady noise levels, although very few noises are, in fact, constant. Therefore, the measurement day-night sound level (DNL) has been developed. DNL is defined as the average sound energy in a 24-hour period with a 10-dB penalty added to the nighttime levels (10 p.m. to 7 a.m.). DNL is a useful descriptor for noise because: (1) it averages ongoing yet intermittent noise, and (2) it measures total sound energy over a 24-hour period. In addition, Equivalent Sound Level (L_{eq}) is often used to describe the overall noise environment. L_{eq} is the average sound level in dB.

6.6.2.1 Regulatory Review

The Noise Control Act of 1972 (PL 92-574) directs Federal agencies to comply with applicable Federal, state, interstate, and local noise control regulations. In 1974, the USEPA provided information suggesting continuous and long-term noise levels in excess of DNL 65 dBA are normally unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals.

State and local governments have the opportunity to regulate noise in their jurisdictions. These regulations are typically guidelines for activities that generate noise and the hours that such activities may be performed. Noise is typically regulated at the local level. A municipal noise ordinance might address the hours that heavy equipment can be operated, the distance heavy equipment can be operated in proximity of noise-sensitive receptors (i.e., schools, hospitals, churches, and residences), and the duration of operation of a single noise source considered to be annoying to the public, such as a diesel-powered generator. Some set specific not-to-exceed noise levels, and others are simple nuisance noise ordinances.

A number of sources of noise may be addressed for rural areas, such as parades, vendors, social engagements with music, and animal noises. Construction noise is typically exempt from noise ordinances in rural areas. In addition, noise regulations in an urban setting take into account the constant noise sources of urban living, such as large heating, ventilation, and air conditioning (HVAC) units, public transportation (trains and buses), emergency vehicles, and heavy traffic. Because urban noise levels are already relatively high, adding a source for an extended period can be highly annoying to some people, hours of construction and operation of heavy equipment are often limited. A typical ordinance in a major city will restrict construction related noise sources between the hours of 10:00 p.m. and 7:00 a.m.

6.6.2.2 CBP Noise Sources

The CBP operates 24 hours a day and 7 days a week. The level of operation can be determined by the measures required to secure the border or necessary for normal facility activities. Table 6.6-2 lists CBP's operations and describes of the noise levels of these activities.

Table 6.6-2. CBP Noise Sources

Operation	Description
Use of mobile surveillance systems (MSS) and surveillance towers	Very little noise is generated by the motor. In remote areas, standby generators may be used to supplement electric power.
Firing ranges and armories	CBP conducts small-arms training at many of its POE and BPS. Small-arms weapon fire is clearly audible in areas surrounding these ranges during training activities. Usually these activities are limited to daytime hours.
Maritime patrols	Boating noise is typically audible during marine patrols near the shoreline. This noise is widespread and at most locations only sporadic. The watercraft used are generally selected for their noise-suppression features because of the nature of their mission.
Patrols by foot, horse, off-road vehicle (ORV), and snowmobile	Foot and horse patrols are typically quiet. Noise from ORVs and snowmobiles is audible for a mile or more in remote, quiet areas. This noise is widespread and at most locations only sporadic. Areas near POEs and BPSs may have more concentrated noise associated with these activities.
Added and expanded POEs and checkpoints	This action may require construction, which would end at the completion of the project.
Operation of expanded BPS	Additional personnel would be required for addition or expansion of newly constructed facilities. The possibility of canine facilities, firing ranges, and patrol vehicles may be required for operations at some new/expanded facilities.
Aircraft operations	Air operations at CBP are diverse: Helicopters, fixed-wing aircraft, and unmanned aerial systems (UAS) may be used regularly at some locations, although not all aircraft are used simultaneously. Along with regular operations, training exercises are also a source of aircraft noise at some facilities.
Construction activities	CBP conducts both large and small construction projects. Each has some level of heavy equipment and truck transport noise.
Maintenance activities	Maintenance operations at CBP are as diverse as the facilities themselves. The noise associated with these actions can involve training to maintain each category listed above. These noise sources may be one major repair using heavy equipment, monthly routine maintenance, or daily maintenance in the case of dogs, horses, and vehicles.

Source: USDHS, 2010.

6.6.2.3 Non-CBP Noise Sources

The sources of noise along the Great Lakes border vary greatly, although most of the region is rural or remote. Sounds dominating the rural areas are aircraft overflights, bird and animal vocalizations, and very light traffic. Farming is a major activity in some of the rural areas identified with the project area. Farming is seasonal in this region and may create major sources of noise during planting, and even more during harvest in August through October, when several large combines may operate concurrently. Although the majority of land is rural, this region has the most major cities, including

Chicago, Illinois; Detroit, Michigan; Cleveland, Ohio; and Buffalo, New York. Cities have significantly higher levels of noise than do more remote areas. A complete list of counties with their population and current background noise levels can be found in Appendix O. Notably, these levels are estimated average background levels based on population. Actual site-specific levels may vary base on location.

6.6.2.4 Background Noise Levels

Estimated background noise levels for areas within 100 miles of the border are shown in Figure 6.6-1 and described in Table 6.6-3. The majority of areas within 100 miles of the border would be classified as remote or rural residential and are isolated, far from major sources of sound.

Townships and small cities are scattered throughout the 100-mile buffer area; however, more remote land areas cover most of the project area. These smaller cities can be described as rural-residential and quiet-commercial.

Figure 6.6-1. Background Noise Levels in the Great Lakes Region

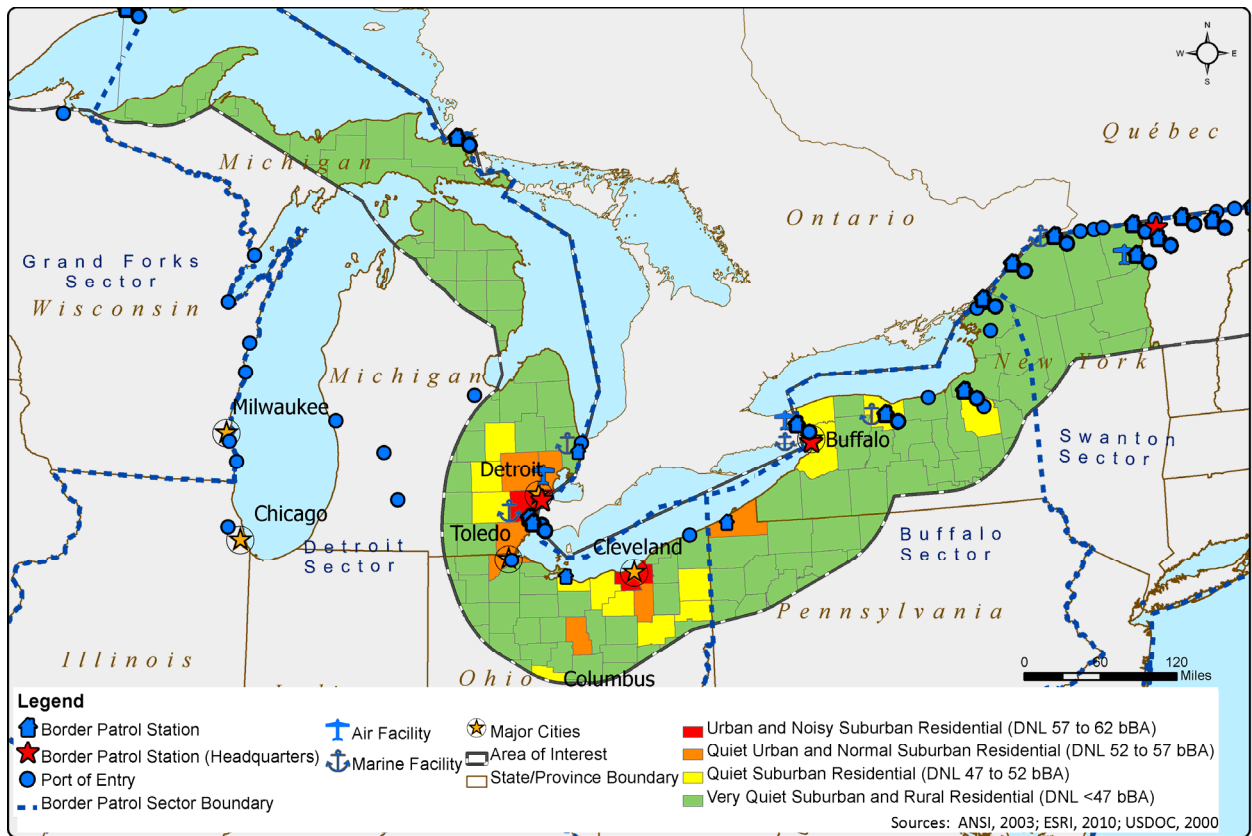


Table 6.6-3. Description of Background Noise Levels

Intensity Level	Example Land Use Category	Average Residential Intensity (people per acre)	Leq (dBA)		
			DNL	Daytime	Nighttime
Low	Quiet suburban residential	2	49	48	42
Medium-low		4	52	53	47
Medium	Quiet urban residential	9	55	56	50
Medium-high	Quiet commercial, industrial, and normal urban residential	16	58	58	52
High		20	59	60	54

Source: ANSI, 2003.

6.6.2.5 National Parks

The National Park Service (NPS) recognizes the natural soundscape of each national park unit as an inherent resource, and manages this resource in order to “restore degraded soundscapes to the natural conditions wherever possible, and protect natural soundscapes from degradation due to noise” (USDOJ, 2000). Non-impairment of natural soundscapes is mandated by the Organic Act of 1916 and is part of the NPS management goals and objectives. Each region of the project area has locations of special interest such as national parks. The two national parks within the Great Lakes Region are the Isle Royale National Park in Michigan (539,281 acres) (USEPA, 2010) and the Cuyahoga Valley National Park in Ohio (Cuyahoga 33,000 acres with approximately 2400 acres of it remaining in private ownership.) Other units of the national park system in the region include the Pictured Rocks National Lakeshore, the Keweenaw National Historical Park in Michigan; the Niagra Falls National Heritage Area and Women’s Rights National Heritage Area (Seneca Falls/Waterloo) in New York and the North County National Scenic in Michigan Trail running through Michigan, Ohio, and Pennsylvania portions of the Great Lakes Region.

6.7 CLIMATE CHANGE AND SUSTAINABILITY

6.7.1 INTRODUCTION

According to the 2009 U.S. Global Change Research Program (USGCRP) report, “Global Climate Change Impacts in the United States,” documented impacts to the Nation from climate change include increased average temperatures, more frequent heat waves, high-intensity precipitation events, sea-level rise, more prolonged droughts, and more acidic ocean waters, among others. Global and national temperature changes are not distributed evenly. Greater increases occur at high, northern latitudes (CEQ, 2010). In 2010, DHS identified global climate change as a long-term trend and global challenge that threatens America’s national-security interests (USDHS, 2010).

Sustainability and smart growth are approaches to human activity that aim to meet the needs of the present without compromising the ability of future generations to meet their own needs. For CBP, the concepts of sustainability and smart growth include the ability to adjust to changing geopolitical realities while preserving the environment and working to improve the quality of life for American residents and visitors.

To reduce environmental impacts and address the challenge of limited resources, DHS prepared a “Strategic Sustainability Performance Plan” to promote sustainable planning, design, development, and operations. The guidelines aim to decrease energy use, minimize reliance on traditional fossil fuels, protect and conserve water, and reduce the environmental impact of materials use and disposal. CBP’s overarching goal is to size, plan, and carry out proposed development in a manner that is sustainable and that works to preserve and protect limited resources.

6.7.2 AFFECTED ENVIRONMENT

6.7.2.1 Climate Regions of the Northern Border—Overview

The climate along the northern border is characterized by mild summers and very cold to extremely cold winters. January is the coldest month. July is the warmest month throughout the entire project area, and its temperature can fluctuate 20-30 degrees Fahrenheit between day and evening (Idcide, 2010). Precipitation is evenly distributed throughout the year. The average annual precipitation across the entire northern border is approximately 31 inches. There is one recognized climatic zone within the Great Lakes Region: Humid Continental Climate. A discussion of this zone is provided in the following subsection.

6.7.2.2 Climate in the Great Lakes Region

Humid Continental Climate

The Humid Continental Climate is found in the interior regions of continents within temperate regions of the midlatitudes. Regions with this climate experience variable weather conditions due to their location within the midlatitudes and year-round influence of the polar front. They are located between polar-type and tropical-type air masses where collisions of these air masses cause precipitation from the uplift of the moist and less dense tropical air mass.

These regions have great variability in seasonal temperatures because they are in the middle of the continent and are typically removed from the moderating influences of oceans. During the winter, Arctic air masses sweep into the northern portions of these regions, bringing extremely cold temperatures.

In North America, the Gulf of Mexico and the Caribbean Sea are sources of moisture for the maritime tropical air masses that carry humid air up into the eastern and central regions of the country, causing most of the humidity and precipitation that occur in these areas.

A diversity of ecosystems is found in the Humid Continental Climate. Mixed broadleaf deciduous forest is common in the southern and eastern portions. Grasslands may be found toward the West where the precipitation is less. The Humid Continental Climate has two subtypes, described below.

Humid Continental Climate (Warm Summer Subtype)

The Warm Summer Subtype can be found in the eastern and midwestern regions of the United States and is characterized by hot, humid summers and occasional cold waves in the winter.

Humid Continental Climate (Cool Summer Subtype)

The Cool Summer Subtype can be found in the New England, Great Lakes, and upper-Midwest regions of the United States and is characterized by cooler summers and very cold temperatures in the winter (Ritter, 2006).

6.7.2.3 Climate Change in the United States—Midwest Regional Assessment

In the twentieth century, the northern portion of the Midwest, including the upper Great Lakes, warmed by almost four degrees Fahrenheit (two degrees Celsius), while the southern portion, along the Ohio River valley, cooled by about one degree Fahrenheit (0.5 degree Celsius). Annual precipitation increased; in some areas, average precipitation increased as much as 20 percent. Much of the precipitation increase resulted from a rise in the number of days with heavy and very heavy precipitation events. Moderate to very large increases in the number of days with excessive moisture occurred in the eastern portion of the basin.

During the twenty-first century, models project that temperatures will increase throughout the Midwest and at a greater rate than was observed in the twentieth century. Even over the northern portion of the region, where the greatest level of warming has occurred, an accelerated warming trend is projected. Temperatures are expected to increase by five degrees Fahrenheit to ten degrees Fahrenheit (three degrees Celsius to six degrees Celsius). The average minimum temperature is likely to increase as much as two degrees Fahrenheit (one degree Celsius) more than the maximum temperature is expected to increase. Precipitation is likely to continue its upward trend at a slightly accelerated rate; 10 to 30 percent increases are projected across much of the region. Despite the increases in precipitation, increases in temperature and other meteorological factors are likely to lead to a substantial increase in evaporation, causing a soil moisture deficit, reduction in lake and river levels, and more drought-like conditions in much of the region. In addition, increases in the amount of precipitation produced by heavy and extreme precipitation are very likely (USGCRP, 2010).

6.8 LAND USE

6.8.1 INTRODUCTION

This section characterizes land uses in the Great Lakes Region and describes the potential impacts of CBP's program alternatives on these resources. Some categories of land use impacts are as likely to occur on the Canadian side of the border as the U.S. side. For example, impacts from construction projects that introduce noise and light pollution along the border could reduce the suitability of land to support its current or planned use on both sides of the border. Other actions, however, such as direct removal of land from existing uses for CBP-related infrastructure construction, would not affect the Canadian side. The study area for land use, therefore, includes areas in the United States within 100 miles of the border and within 2 miles of the border in Canada, indicating that only those land uses close to the border may be affected by CBP's activities in this analysis. The USGS and Natural Resources Canada (NRC) define land cover and land use classifications.

Land use classifications reflect either natural or human activities at a given location. Land uses based on human activities include residential, commercial, industrial, airfield, recreational, agriculture, and other types of developed areas. Natural uses include resource production, such as forestry, mining, or agriculture, and resource protection, such as conservation areas, wild lands, and parks. Management plans, policies, and regulations specify the type and extent of land use allowable in specific areas, as well as the protection designated for environmentally sensitive areas.

6.8.2 AFFECTED ENVIRONMENT

This section describes land use and cover for the Great Lakes Region. The summary tables characterize land use and cover according to the USGS Multi-Resolution Land Characteristics Consortium (MRLC) National Land Cover Database (NLCD) and USGS's Gap Analysis Program (USDOI, 2001; USDOI, 2010). The summary tables for Canada summarize land use and cover according to NRC's Advanced Very High Resolution Radiometer (AVHRR) land cover data and NRC's protected areas data on regions of 10 sq km or larger compiled by the Canadian Council on Ecological Areas (CCEA) (NRC, 2009; NRC, 2007).

6.8.2.1 Land Cover and Related Land Uses in the Great Lakes Region

The Great Lakes Region covers about 52.3 million acres, approximately 32.5 percent of the land area of the states in the region (Michigan, New York, Ohio, Pennsylvania, and Wisconsin). The most prevalent land cover type within the study area is forested (41.7 percent), which makes up the majority of the study area in New York (50.7 percent), Pennsylvania (65.1 percent), and Wisconsin (84.0 percent). Agricultural land (30.3 percent total with 19.9 percent cultivated crops and 10.4 percent pasture/hay) is the next most prevalent and covers more than half of the study area in Ohio (Table 6.8-1). Water/wetlands make up 13.2 percent and are most prevalent in Michigan, where they cover almost a quarter of the study area. Developed areas make up just over 10 percent of the study area. Herbaceous (2.3 percent) and snow/ice/barren (2.2 percent) areas are the least prevalent land cover types.

With the exception of Wisconsin, the land cover in the study area of each state is representative of land cover in each state as a whole. In Wisconsin, the study area has a substantially lower amount of cultivated crops and water/wetlands and a substantially higher amount of forested area when compared to the entire state.

The study area includes a high percentage of developed areas and herbaceous land relative to the entire country, though the relative presence of these land cover types is a similar proportion to the land cover in the states as a whole. The study area has a relatively low percentage of snow/ice/barren and water/wetlands land cover relative to the entire country.

Table 6.8-1. Land Cover in the Great Lakes Region*

Border State		Total Land Area (thousands of acres)	Developed (%)	Cultivated Crops (%)	Pasture/Hay (%)	Herbaceous (%)	Forest (%)	Water/Wetlands (%)	Snow/Ice/Barren Land** (%)
Michigan	Study area	17,646	11.9	17.5	7.0	4.3	35.8	22.4	1.1
	Statewide	37,344	10.6	19.2	6.7	4.9	35.6	21.6	1.4
New York	Study area	18,748	6.0	10.5	14.5	1.2	50.7	13.0	4.1
	Statewide	31,104	9.0	8.5	13.9	1.0	52.9	11.6	3.2
Ohio	Study area	10,273	17.3	47.6	8.5	1.6	21.4	3.2	0.4
	Statewide	26,505	14.1	39.4	11.1	1.6	31.2	2.0	0.5
Pennsylvania	Study area	5,161	6.9	8.7	11.3	1.4	65.1	3.4	3.1
	Statewide	29,707	11.0	9.3	15.3	0.5	60.1	2.4	1.4
Wisconsin	Study area	473	4.2	0.7	6.7	1.0	84.0	3.3	0.1
	Statewide	36,387	6.8	26.3	10.6	1.7	38.0	15.5	1.1
Great Lakes Region	Study area	52,301	10.3	19.9	10.4	2.3	41.7	13.2	2.2
	Selected states	161,047	10.1	20.2	11.3	2.1	43.3	11.5	1.5
Total United States***		2,053,000	5.0	21.9		14.1	31.2		27.7

*The Great Lakes includes all areas 100 miles south of the U.S.-Canada border in Michigan, New York, Ohio, Pennsylvania, and Wisconsin.

** “Barren Land” includes the NLCD land classification “Shrub/Scrub.”

*** Data for the United States as a whole are shown as calculated in USEPA, 2008. This report sums land cover categories for cultivated crops and pasture/hay to account for total agricultural cover, and sums snow/ice, barren, and wetlands land cover. This table aggregates the USEPA, 2008 calculation of water and shrub/scrub land cover with their category of snow/ice/barren/wetlands, though water alone covers 1.6 percent of the land area in the United States, while snow/ice/barren/wetlands cover 5.7, and shrub/scrub covers 20.4 percent.

Source: (USDOJ, 2001).

Figures 6.8.1 and 6.8.2 show maps of land cover and use in the Great Lakes Region.

Recreation also occurs on other land not specifically designated for the activity and land other than that profiled in Section 6.17 (Recreation), which focuses specifically on major Federal recreation sites. For example, wildlife viewing or hiking may be permitted on some conservation or natural areas in the study area. In addition, hunting and snowmobiling may occur on public or private forested land areas. Absent information on the specific distribution of recreational activities across the landscape, this analysis relies on the above categories of land as a low-end estimate of the area in which recreation is likely taking place.

Recreational land use in the Great Lakes Region accounts for 605,000 acres or 1.2 percent of total land area. This amount is substantially lower than the share of recreational land use for the country as a whole (10.1 percent) (Table 6.8-2). State parks and state recreation areas make up just over half of lands used for recreation. Of these, about half are in New York and half are in Michigan. The USFS and NPS also manage land with recreational uses in the Great Lakes Region. Recreational lands owned by cities and counties in New York and Ohio account for a substantial portion of the recreational land. Section 6.17 discusses the potential impacts of CBP activities on lands designated and otherwise used for recreational purposes. Appendix I provides the profiles of major Federal U.S. and Canadian protected and set-aside areas often used for recreational purposes in the study area.

Conservation areas in the Great Lakes Region account for about 2 million acres or 3.7 percent of total land area (Table 6.8-3), which is substantially lower than the proportion of conservation land nationwide (14.6 percent). State and private conservation easements in New York make up over 500,000 acres alone. State lands in Michigan account for a similar amount of conservation land. USFWS and the NPS each manage roughly 150,000 acres in wilderness areas, wildlife management areas, refuges and other similar conservation designations.

Table 6.8-2. Recreational Land Use* in the Great Lakes Region

Border State		Recreational Land Use (thousands of Acres)	Share of Recreational Land Use (%)
Michigan	Study area	214	1.2
	Statewide	3,001	8.0
New York	Study area	169	0.9
	Statewide	540	1.7
Ohio	Study area	125	1.2
	Statewide	523	2.0
Pennsylvania	Study area	94	1.8
	Statewide	930	3.1
Wisconsin	Study area	3	0.5
	Statewide	1,793	4.9
Great Lakes Region	Study area	605	1.2
	Selected states	6,787.4	4.2
Total United States		208,087.8	10.1

The Great Lakes includes all areas 100 miles south of the U.S.-Canada border in Michigan, New York, Ohio, Pennsylvania, and Wisconsin.

* Recreation lands are all lands clearly identified by USGS title of land type as intended for recreation (e.g., parks, scenic areas, or recreation areas).

Sources: (USDOJ, 2010).

Table 6.8-3. Conservation Land Use* in the Great Lakes Region

Border State		Conservation Land Use (thousands of Acres)	Share of Conservation Land Use (%)
Michigan	Study area	913	5.2
	Statewide	1,328	3.6
New York	Study area	882	4.7
	Statewide	1,013	3.3
Ohio	Study area	139	1.4
	Statewide	309	1.2
Pennsylvania	Study area	3	0.4
	Statewide	301	1.0
Wisconsin	Study area	2	0.4
	Statewide	839	2.3
Great Lakes Region	Study area	1,959	3.7
	Selected states	3,789	2.4
Total United States		300,149	14.6

The Great Lakes includes all areas 100 miles south of the U.S.-Canada border in Michigan, New York, Ohio, Pennsylvania, and Wisconsin.

* Conservation lands are all lands clearly identified by USGS title of land type as intended for conservation (e.g., reserves, preserves, conservation land, natural areas, etc.).

Source: (USDOJ, 2010).

6.8.2.2 Land Cover and Related Land Uses in the Areas North of the Great Lakes Region

This section considers resources north of the border from the Great Lakes Region extending two miles into Canada. This area covers about 1.6 million acres (Table 6.8-4). Over 70 percent of this area is water/wetlands, which is substantially greater than the proportion of water/wetlands in either the province or the country as a whole. The next most prevalent land cover type is forested (20.5 percent), which accounts for a significantly smaller fraction of total land cover than in the province or nation. Developed areas make up a greater proportion of land in the study area compared to the province and the country. While no identified snow/ice/barren land cover occurs in the area north of the Great Lakes Region, 38.2 percent of land in Canada is classified as snow/ice/barren due to tundra in the northern parts of the country.

Table 6.8-4. Land Cover in Canada North of the Great Lakes Region

Border Province		Total Land Area (thousands of acres)	Developed (%)	Cultivated Crops (%)	Pasture/ Hay (%)	Forested (%)	Water/ Wetlands (%)	Snow/Ice/ Barren (%)
Ontario	Study area	1,614	0.9	0.0	5.8	20.5	72.9	0.0
	Province	265,010	0.2	0.0	5.8	60.4	11.8	21.9
Total Canada		2,071,476	0.1	1.7	6.0	46.7	7.3	38.2

The areas north of the Great Lakes Region in Canada include the portions of the Province of Ontario extending 2 miles north of the U.S.-Canada border.

Source: (NRC, 2009).

Table 6.8-5 shows that recreational land use in the areas of Canada north of the border from the Great Lakes Region accounts for about 121,000 acres, or 7.5 percent of the total land area, which is comparable to the proportion of recreational land use in Canada as a whole (6.1 percent).

The recreational lands include La Verendrye River Provincial Park, Quentico Provincial Park, and the St. Lawrence Islands National Park.

Conservation land in the areas north of the border from the Great Lakes Region accounts for about 12,000 acres, or 0.8 percent, of the area. This percentage is substantially less than the proportion of conservation areas in the country as a whole (4.7 percent) (Table 6.8-6).

Table 6.8-5. Recreational Land Use in Canada North of the Great Lakes Region*

Border Province		Recreational Land Use (thousands of acres)	Share of Recreational Land Use (%)
Ontario	Study area	121	7.5
	Province	16,745	6.3
Total Canada		126,389	6.1

* Areas north of the Great Lakes Region in Canada include the portions of the Province of Ontario extending 2 miles north of the U.S.-Canada border.

Source: (NRC, 2007).

Note: Recreation lands are all lands clearly identified in the NRC dataset as intended for recreation; for example, described as parks or recreation areas.

Table 6.8-6. Conservation Land Use in Canada North of the Great Lakes Region*

Border Province		Conservation Land Use (thousands of acres)	Share of Conservation Land Use (%)
Ontario	Study area	12	0.8
	Province	7,603	2.9
Total Canada		98,234	4.7

* Areas north of the Great Lakes Region in Canada include the portions of the Province of Ontario extending 2 miles north of the U.S.-Canada border.

Source: (NRC, 2007).

Note: Conservation lands are all lands clearly identified in the NRC dataset as intended for conservation; for example, described as reserves, preserves, protected areas, and habitat areas.

Figure 6.8-1. Land Cover in the Great Lakes Region

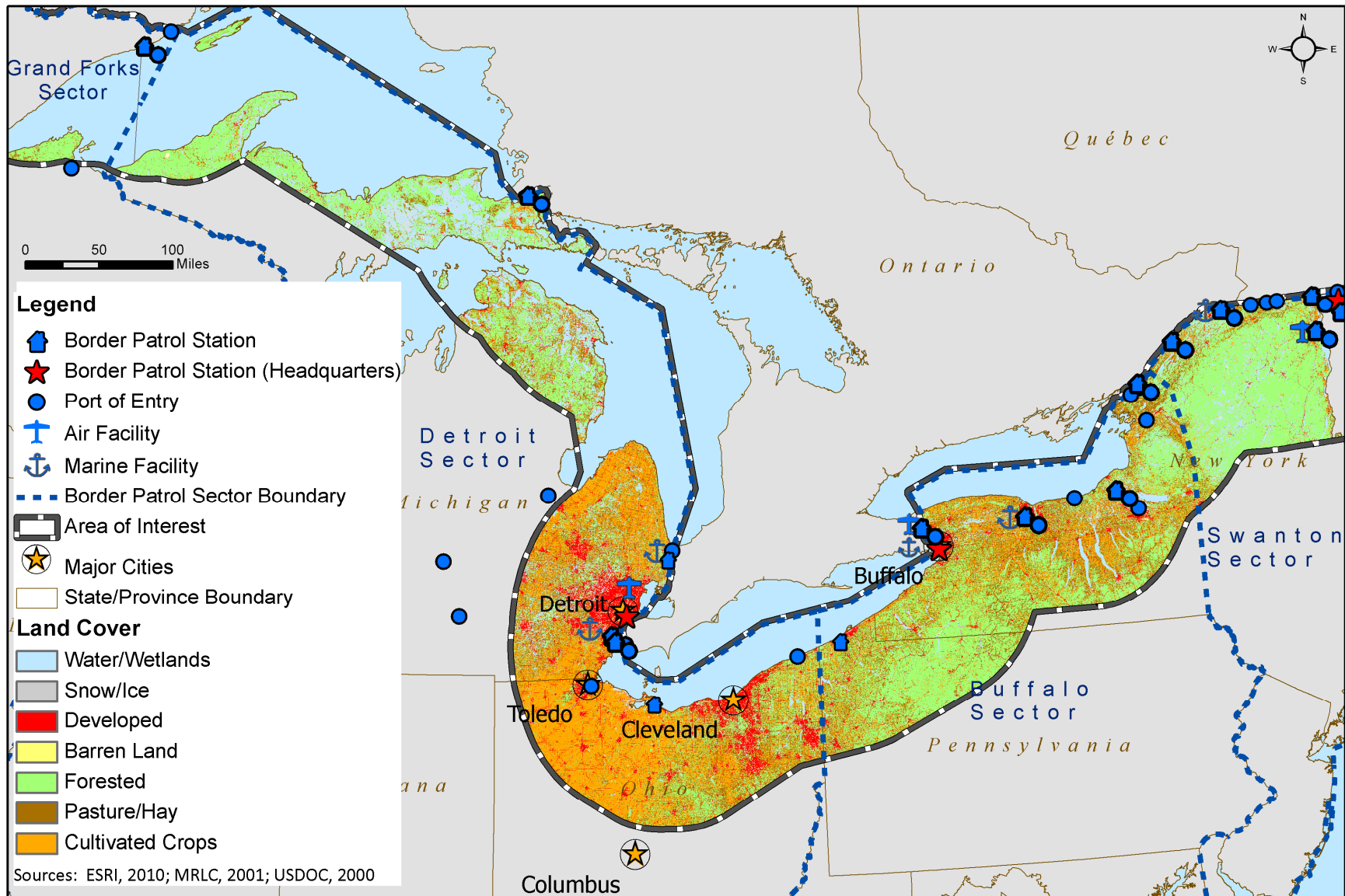
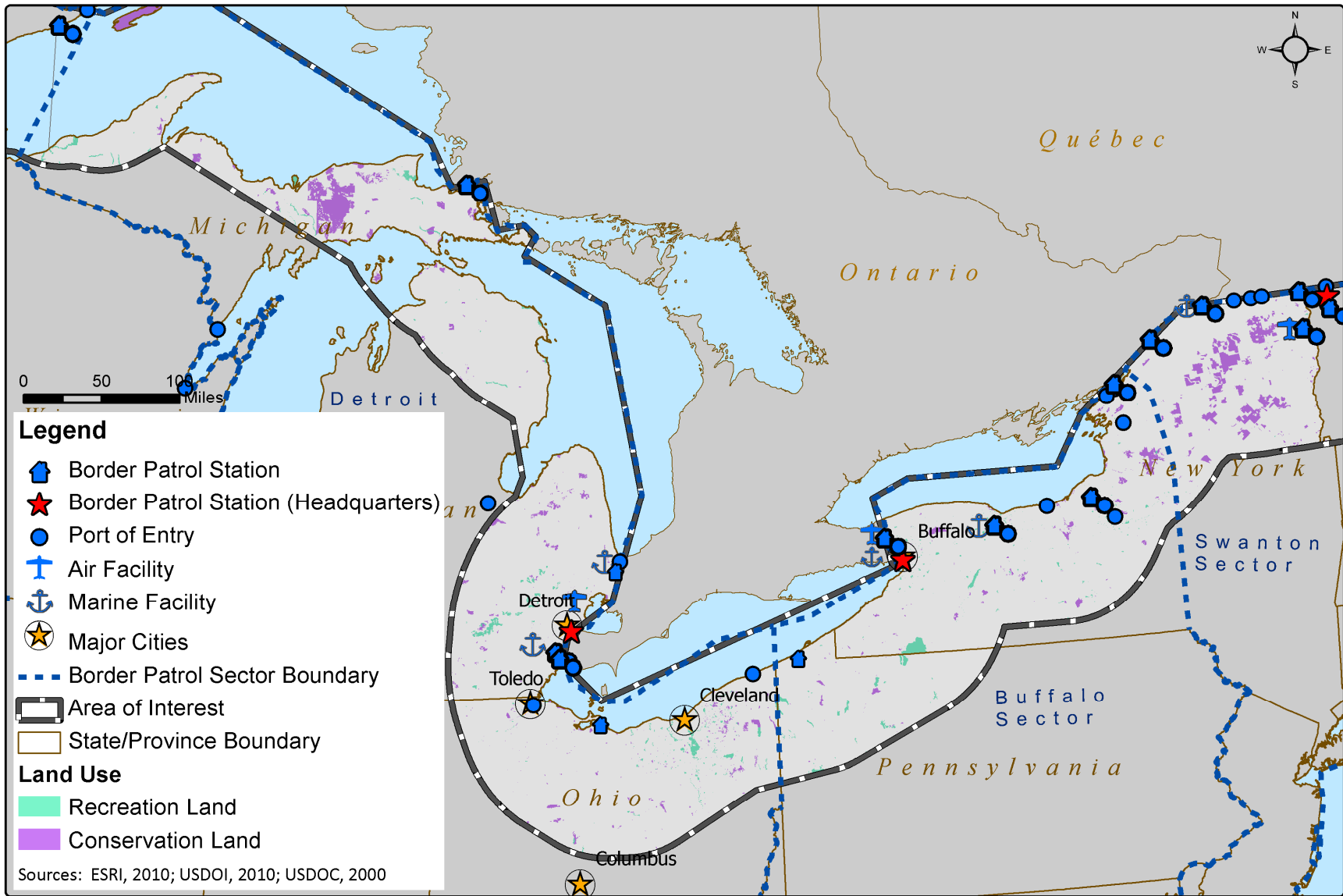


Figure 6.8-2. Land Use in the Great Lakes Region



6.8.2.3 Land Ownership in the Great Lakes Region in the United States

The major categories of land ownership identified in the Great Lakes Region in the United States are Federal (4.9 percent), state (11.1 percent), tribal (0.4 percent), and private (1.4 percent) (Table 6.8-7). Only about 17.5 percent of the Great Lakes Region is classified according to landowner, thus this discussion is subject to significant gaps in landowner information. Federal lands include national parks, national forests, conservation areas, and military lands, and are managed by the Bureau of Land Management (BLM), Bureau of Reclamation (BOR), Department of Defense (DOD), Department of Energy (DOE), USFWS, USFS, NPS, or are classified as “other Federal land.” State lands are properties owned by state departments of conservation, departments of land, departments of natural resources, departments of transportation, fish and wildlife, historical societies, state land boards, parks and recreation, or classified as “other state land.” Tribal land accounts for regions owned by Native American Tribes and are recognized by the Federal Government. Federal laws and the Constitution grant Tribal Nations greater sovereignty than that granted to state or local governments. Private lands are those owned by the Audubon Society, the Rocky Mountain Elk Foundation, The Nature Conservancy (TNC), private universities, other conservation groups, or private non-profits, or classified as “private conservation easement/conservation deed restriction,” “private conservation land,” or “private institution–managed for biodiversity.”

The Great Lakes Region includes about 2.5 million acres of Federal land, accounting for 4.9 percent of land ownership, which is substantially less than the proportion of federally owned land nationwide. The USFS manages the majority of these lands.

Approximately 5.8 million acres of state lands are located in the Great Lakes Region, accounting for 11.1 percent of total land ownership. The majority of these lands is classified as “other state land,” such as state parks and natural areas (2.4 million acres), or is owned by state fish and wildlife agencies (2.2 million acres). The share of state land ownership in the region is slightly higher than that of the country as a whole.

The Great Lakes Region includes about 130,000 acres of tribal lands in Michigan and New York. In New York, the St. Regis Mowhawk Indian Reservation (13,000 acres) sits on the border within a mile of the Massena POE. Fourteen reservations or other tribal lands occur within the study area: five in Michigan, and nine in New York. The proportion of tribal lands in the study area is far less than the proportion in the country as a whole, but representative of the amount in the region’s states. For a more complete discussion of Native American resources along the northern border, refer to Section 6.11 of this report.

The Great Lakes Region includes about 742,400 acres classified as private land. The majority of this private land occurs in New York (about 660,000 acres). The share of private land ownership in the study area is greater than the share for the country as a whole. Figure 6.8-3 maps the Great Lakes Region by landowner.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

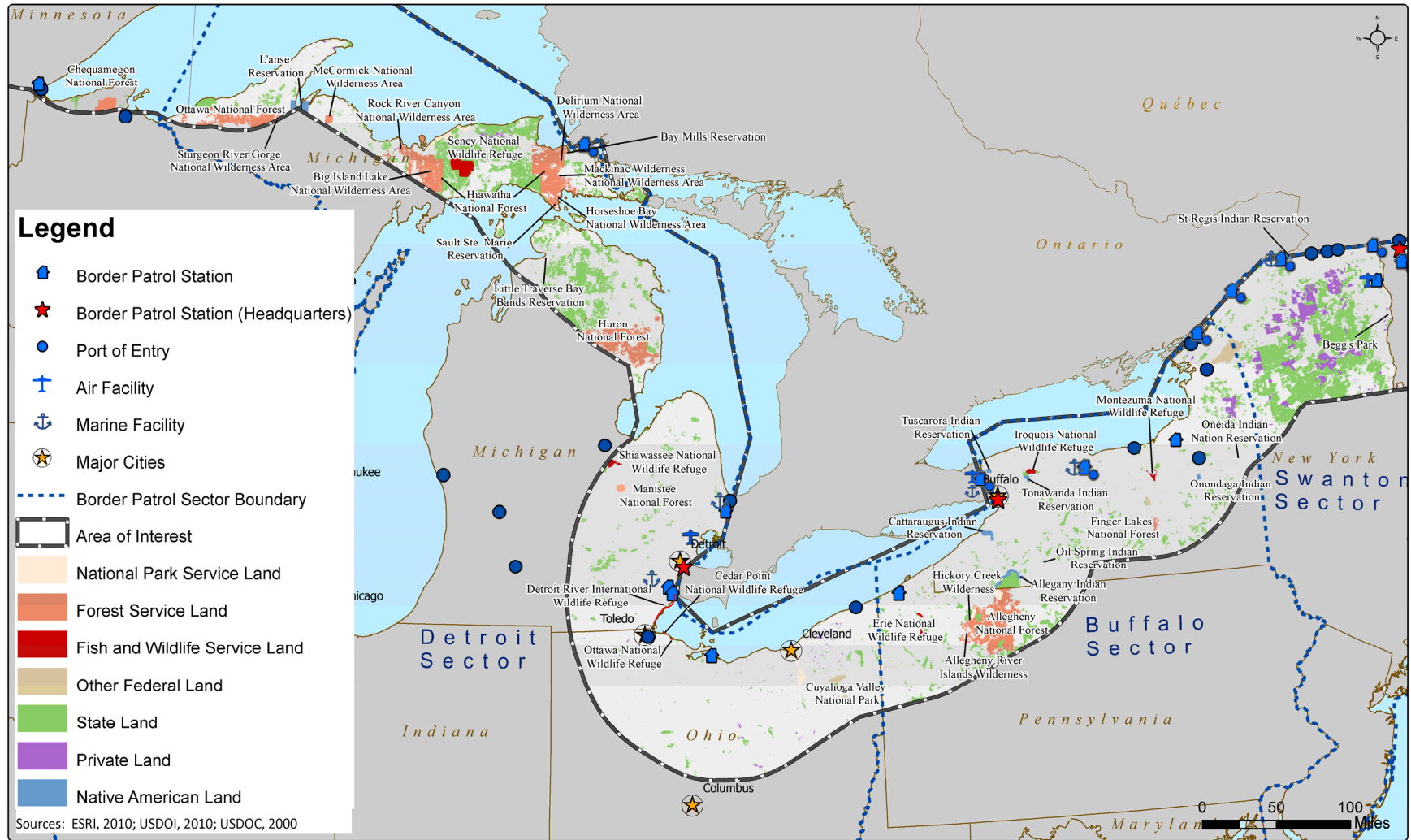
Table 6.8-7. Land Ownership in the Great Lakes Region*

Border State (Thousands of Acres)		Federal Land		State Land		Tribal Land		Privately Held Conservation Land		Total Conservation & Tribal Lands	
		Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area
Michigan	Study Area 17,656	1,695	9.6	2,395	13.6	72	0.4	46	0.3	4,208	23.9
	Statewide 36,185	3,247	9.0	4,717	13.0	202	0.6	47	0.1	8,213	22.7
New York	Study Area 18,333	165	0.9	2,825	15.4	116	0.6	658	3.6	3,764	20.5
	Statewide 30,161	258	0.9	4,156	13.8	116	0.4	735	2.4	5,265	17.5
Ohio	Study Area 10,167	61	0.6	132	1.3	0	0	33	0.3	226	2.2
	Statewide 26,151	300	1.1	576	2.2	0	0	76	0.3	952	3.6
Pennsylvania	Study Area 5,149	520	10.1	386	7.5	0	0	4	0.1	910	17.7
	Selected States 28,635	566	2.0	3,825	13.4	0	0	47	0.2	4,438	15.6
Wisconsin	Study Area 474	111	23.4	27	5.7	0	0	2	0.4	140	29.5
	Statewide 34,661	1,908	5.5	1,434	4.1	0	0	310	0.9	3,652	10.5
Great Lakes Region	Study Area 52,061	2,551	4.9	5,764	11.1	188	0.4	742	1.4	9,245	17.8
	Statewide 155,793	6,278	4.0	14,707	9.4	318	0.2	1,218	0.8	22,521	14.4
Total United States		657,885	32	189,314	9.2	100,574	4.9	15,918	0.8	963,691	47

* The Great Lakes Region includes all areas 100 miles south of the U.S.-Canada border in Michigan, New York, Ohio, Pennsylvania, and Wisconsin. Land ownership estimates do not add up to 100 percent for a given area due to gaps in information regarding land ownership within border states. Sources: (USDOI, 2010), (USDOC, 2012).

Note: For a complete discussion of Native American resources along the northern border, refer to section 6.11 of this report.

Figure 6.8-3. Land Ownership in the Great Lakes Region



6.8.2.4 Land Ownership in Canada North of the Great Lakes Region

Federal and provincial land ownership is characterized using the protected areas data compiled by NRC. As a result, ownership (excluding aboriginal lands) is only determined for about 10.8 percent of the entire land area of the country. The following discussion, therefore, reflects only the relatively small portion in Canada for which landowners are identified.

The share of Federal land ownership in the region in Canada is significantly less than that throughout the country (0.5 percent in the region versus 4.8 percent in the country) (Table 6.8-8). Provincial ownership in the region accounts for a greater percentage of land area than for Canada as a whole.

Aboriginal land is characterized using NRC data of Indian reserves, land claim settlement lands, and related aboriginal designations. Table 6.8-9 indicates that the share of aboriginal land north of the border from the Great Lakes Region (2.7 percent) is less than the share countrywide (7.4 percent).

Table 6.8-8. Land Ownership in Canada North of the Great Lakes Region*

Border Province		Federal Land		Provincial Land	
		Total Land Area	Share (%)	Total Land Area	Share (%)
Ontario	Study area	8	0.5	126	7.8
	Province	635	0.2	23,714	8.9
Total Canada		98,844	4.8	125,779	6.1

* Areas north of the Great Lakes Region in Canada include the portions of the Province of Ontario extending two miles north of the U.S.-Canada border.

Source: (NRC, 2007).

Notes: Federal lands are all lands with the designation national park, migratory bird sanctuary, national wildlife area, Prairie Farm Rehabilitation Administration, and marine protected area. Provincial lands are all lands designated under provincial administration, which often includes funding and support from Federal agencies.

Table 6.8-9. Aboriginal Land in Canada North of the Great Lakes Region*

Border Province		Aboriginal Lands (thousands of acres)	Share (%)
Ontario	Study area	43.7	2.7
	Province	1,996.3	0.8
Total Canada		152,964.7	7.4

* Areas north of the Great Lakes Region in Canada include the portions of the Province of Ontario extending two miles north of the U.S.-Canada border.

Source: (NRC, 2010).

6.8.2.5 Land Use Management

In the Great Lakes Region, access to remote roads on Federal lands remains an important factor in maintaining situational awareness throughout the border area. Access to these areas to secure lookouts or conduct surveillance is balanced with land management activities that ensure habitat protection for public trust species.

6.8.2.6 Consistency with Enforceable Policies of the Coastal Zone Management Act

In the Great Lakes Region, CBP's activities affect coastal zones and will have to comply with the appropriate state "enforceable policies" outlined below. Most CBP activities in the state coastal zones are anticipated to be in the negligible to moderate range, and are expected to comply with the Federal consistency requirements and procedures established by the individual states, which are identified below for the each of the states in this region.

Michigan

Michigan's northern border coastal zone generally extends a minimum of 1,000 feet from the ordinary high-water mark, but also extends further inland in some locations to encompass coastal lakes, river mouths, bays, floodplains, wetlands, dunes, urban areas, public parks, recreation areas, and natural areas (MDNR, 2010). The Administration Section in the Land and Water Management Division (LWMD) of the Michigan Department of Natural Resources (MDNR) administers the Michigan Coastal Management Program (MCMP). This program's enforceable policies are based on the regulatory statutes of the Natural Resources and Environmental Protection Act, which includes the following authorities (Antieau, 2010):

- Michigan Environmental Protection Act;
- Water resources protection;
- Soil erosion control and sedimentation control;
- Inland lakes and streams;
- Wetland protection;
- Natural rivers;
- Shorelands protection and management;
- Great Lakes submerged lands;
- Control of certain state lands;
- Wilderness and natural areas;
- Sand dune protection and management;
- Farmland and open space preservation;
- Endangered Species Act; and,
- Aboriginal records and antiquities.

The Great Lakes Shorelands Unit in the LWMD reviews Federal agency activities for consistency with Michigan's program. Upon issuance of all necessary permits, projects are considered consistent with MCMP. In certain circumstances, a consistency determination may

be made while a permit is pending. However, consistency determinations do not waive the need for permits required under other Federal, state, or local statutes (Antieau, 2010).

New York

New York's northern border coastal zone varies from region to region but has the following general conditions: the inland boundary is approximately 1,000 feet from the shoreline of the mainland; urbanized and developed coastal locations have a landward boundary that runs approximately 500 feet from the mainland's shoreline, or less than 500 feet if a roadway or railroad runs parallel to the shoreline at a distance of under 500 feet and defines the boundary; and the boundary extends inland to include major state-owned lands and facilities or electric power-generating facilities that abut the shoreline, (USDOC, 2010a). The New York Coastal Management Program (CMP) has 44 enforceable policies with which both Federal and state agencies must comply to the maximum extent practicable. These policies are divided into the following categories (NYS DOS, 2002):

- Development policies (Policies 1–6);
- Fish and wildlife policies (Policies 7–10);
- Flooding and erosion hazards policies (Policies 11–17);
- General policy (Policy 18);
- Public access policies (Policies 19–20);
- Recreation policies (Policies 21–22);
- Historic and scenic resources policies (Policies 23–25);
- Agricultural lands policy (Policy 26);
- Energy and ice management policies (Policies 27–29);
- Water and air resources policies (Policies 30–43); and,
- Wetlands policy (Policy 44).

The procedures for demonstrating consistency with the enforceable policies of the New York CMP are on the New York Coastal Resources online website (NYS DOS, 2010).

Ohio

Ohio's northern border coastal zone includes portions of nine counties bordering Lake Erie and its tributaries and varies depending on the biophysical characteristics of various coastal regions. In the western part of the coast, the boundary extends inland up to 15 miles along low-lying wetlands and floodplains. Most of the eastern part of the state is characterized by areas with high bluffs; consequently, the boundary extends inland for only about an eighth of a mile with the exception of the Mentor Marsh area (USDOC, 2010a). The Ohio Department of Natural Resources coastal management's responsibilities under the CMP come from Ohio Revised Code, Chapter 1506 and additional state statutory authorities that contain the state's enforceable authorities regarding Federal consistency (USDOC, 2007). The enforceable authorities are organized into nine areas:

- Coastal erosion and flooding;
- Water quality;
- Wetlands and other ecologically sensitive resources;
- Ports and shoreline development;
- Recreational and cultural resources;
- Fish and wildlife management;
- Environmental quality;
- Energy and mineral resources; and,
- Water quantity.

Chapter 7 of the “United States Department of Commerce Combined Coastal Management Program and Final EIS for the State of Ohio” (USDOC, 2007) contains the procedures for demonstrating consistency with the enforceable authorities of the Ohio CMP.

Pennsylvania

Pennsylvania’s northern border coastal zone runs along 63 miles of Lake Erie shoreline and varies from 900 feet in urban areas to over 3 miles in more rural areas. It encompasses the floodplains of Lake Erie and tributary streams, bluff hazards, recession areas, and coastal wetlands. The coastal zone also extends to the middle of the lake, to the boundary with Canada, and inland 900 feet within the City of Erie. The lake also contains Presque Isle State Park and is one of the state ports for international shipping (USDOC, 2010a).

Program enforceable policies are divided into the following areas, administered by the Department of Environmental Resources, Coastal Zone Management Office (PADEP, 2010):

- Coastal hazard areas;
- Dredging and spoil disposal;
- Fisheries management;
- Wetlands;
- Public access for recreation;
- Historic sites and structures;
- Port activities;
- Energy facilities siting;
- Intergovernmental coordination (includes air and water resource protection);
- Public involvement; and,
- Ocean resources (management of non-native, invasive aquatic or terrestrial plant and animal species).

The “Commonwealth of Pennsylvania Coastal Resources Management Program 394-0300-001 Technical Guidance Document” (PADEP, 2008) contains the procedures for demonstrating consistency with the enforceable policies of the Pennsylvania coastal zone management program.

Wisconsin

The 15 counties that front Lake Superior, Lake Michigan, or Green Bay make up Wisconsin’s northern border coastal zone (USDOC, 2010a). The Wisconsin CMP was implemented by the Wisconsin Department of Administration. Specific state coastal policies are organized into seven areas (WDA, 2007):

- Coastal water quality and quantity and coastal air quality;
- Coastal natural areas, wildlife habitat, and fisheries;
- Coastal erosion and flood hazard areas;
- Community development;
- Economic development;
- Governmental interrelationships; and,
- Public involvement.

The “Wisconsin Coastal Management Program, A Strategic Vision for the Great Lakes” contains the procedures for demonstrating consistency with the enforceable policies of the Wisconsin CMP (WDA, 2007).

6.9 AESTHETIC AND VISUAL RESOURCES

6.9.1 INTRODUCTION

Visual resources include those features that define the visual character of an area—natural features, vistas, or viewsheds, and even urban or community visual characteristics that include architecture, skylines, or other characteristics. Visual resources and aesthetics are important due to their unique qualities and the responses they inspire in humans. This section provides the analytical tools to conduct a precise visual impact assessment for future site-specific projects or activities; it also offers examples of the types of landscapes that exist along the border. It analyzes how, in which settings, to what extent, and with which viewer groups the various CBP activities might create visual impacts. It does not characterize every potential vista or visual landscape along the entire northern border, but does provide guidelines for minimizing, mitigating, or avoiding such impacts.

The Visual Resource Management (VRM) system developed by BLM defines the visual sensitivity of an area and the potential effect of a project on a visual resource. It assigns ratings of Classes I to IV based on combinations of scenic quality, sensitivity levels, and distance zones (for the Framework for Characterizing Resource Impacts on the northern border, see Chapter 3, Section 3.9).

6.9.2 AFFECTED ENVIRONMENT

6.9.2.1 Affected Landscapes

Four broadly defined landscapes occur within the potential settings of the proposed project. These four landscapes are: natural, rural, urban, and industrial (USDOT, 1999), and are briefly described below.

Natural Landscapes

Natural landscapes are those in which natural landforms and vegetation predominate, and signs of human activity are not apparent (USDOT, 1999). Coastlines, water bodies, mountains, and areas of varied relief are the most striking and tend to be the most conspicuous. Some natural landscapes are designated specifically for outdoor recreation. The BLM, USFS, USFWS, NPS, and state and local parks own most of these recreational lands. This area is typified by the Great Lakes. Wetlands are well represented in Michigan and New York, but some of the region's states have considerable forests, such as Wisconsin. Even where significant topographic relief occurs, heavily forested landforms are undistinguished and tend to confine a viewer's attention to the immediate foreground. Many of these landscapes would fall into the "A" category for scenic quality and thus be sensitive to visual modifications. Located in the northwestern portion of Lake Superior, the Isle Royal National Park preserves 132,018 acres of land federally designated as wilderness in 1976. The natural lightscape in an area like the Isle Royale National park is undisturbed and very valuable and provides a unique opportunity to view the northern lights.

Pictured Rocks National Lakeshore, Michigan



Source: (USDOl, 2011b).

Rural Landscapes

Rural landscapes include features such as croplands, orchards, fields, fences, and farm-related structures (USDOT, 1999). While border POEs and BPSs along the U.S.-Canadian border tend to be in rural, less densely populated areas well outside of major cities, the majority of the population in the study area lives in larger population centers. Agricultural areas are predominantly flat or gently rolling hills; these landscapes tend to be restricted to valleys and lowlands and are not typically found at higher elevations or in areas with complex topography. Native vegetation grows in confined areas where land is steep or soils are unproductive. Views may extend for some distance, with vertical elements typically consisting of relatively low farm buildings, silos, water towers, utility poles, and trees. Distinct geometric patterns, such as rectangular or circular fields and property boundaries divided by section lines, may characterize the landscape. Towns are small and have relatively low skylines. In general, the few structures in such areas can be of aesthetic interest. Agriculture greatly influences the landscape. Land-use groups can sometimes categorize different agriculture practices. Other rural areas include forests or desert, which are influenced by roadways, the presence of small towns, and land-clearing activities, such as timber harvesting, strip mining, ski areas, and large reservoirs.

Urban Landscapes

These landscapes represent only a fraction of the Nation's entire land area, but are the dominant visual environment of roughly three-quarters of the U.S. population (USDOT, 1999). Residential and suburban areas represent much of the urban landscape, with centralized primary commercial centers and business districts defining the most dominant visual characteristics. The scale of development in major urban areas is large and dominated by structures, highways, infrastructure, and trees. Urban landscapes can absorb a great degree of visual change because they already contain commanding visual features. Most urban landscapes are clustered around areas of usable natural resources, such as waterways and agriculture areas. The states with the highest proportion of developed land along the border are Ohio (17.3 percent) and Michigan (11.9 percent) and these areas represent the visual setting for the largest portion of the

population. Here, as well as along other parts of the border, the POEs and BPSs are more often found in rural areas. These landscapes already contain sizable amounts of infrastructure and would be able to absorb a greater amount of change and more additions to the visual environment than rural or natural landscapes. The largest concern in urban landscapes is the number and sensitivity of the visual user groups (see Section 6.9.2.3).

Industrial Landscapes

Heavy and light industrial landscapes tend to be scattered, situated in specific zones or districts such as along roads and waterfronts or near airports. Relatively few industrial landscapes exist along the northern border in the Great Lakes Region. Such landscapes can absorb the greatest degree of visual change, due to existing dominant visual features and their generally low scenic quality (“C” category). These landscapes are usually classified as Visual Resource Class IV in which major changes to the visual environment can occur without major impacts to the visual environment or viewer groups.

Industrial Plant on River



Source: (USDOI, 2008).

6.9.2.2 Areas with High Visual Sensitivity

Recreational users of public lands have expressed concern about visual impacts stemming from CBP’s activities (USDHS, 2010a). Unlike the western states, the Great Lakes Region does not have as large a proportion of public lands that are sensitive to visual impacts. These public lands are also mostly along the Great Lakes; thus, tall structures have less competing interested with the skyline facing the lakes.

Lake Superior in the Winter



Source: (USDOI, 2010b).

6.9.2.3 Affected User Groups

Specific viewer groups within the study area can gauge viewer sensitivity and assure the selection of appropriate representative viewpoints during the visual impact evaluation. While POEs and BPSs along the U.S.-Canadian border are generally in rural, less densely populated areas outside of major metropolitan areas, most of the population in the study area lives in larger population centers. The following four categories of viewer/user groups were identified within the study area.

Commuters and Through Travelers

These viewers pass through the study area on a regular basis in automobiles on their way to work or other destinations. On most roads within the study area, the views are from street level. Typically, drivers have limited views of CBP's infrastructure and activity, except at locations where CBP's actions cross the road. Commuters and through travelers are typically moving, have a relatively narrow visual field due to roadside vegetation or structures, and generally are preoccupied with traffic and navigating the roadways. For these reasons, commuters and through travelers' perception of (and sensitivity to) visual quality and changes in the visual environment are likely to remain relatively low. Passengers in moving vehicles, however, have greater opportunities for off-road views of a project than do drivers. The Great Lakes Region has substantial commuter and urban traffic. Six of the top ten busiest POE's are in this region, including the busiest, Buffalo/Niagara (see Traffic and Roadways, section 6.16.2).

Local Residents

These individuals may view the proposed actions from stationary locations, such as yards and homes, and while driving along local roads. The sensitivity of residents to visual quality varies and may be tempered by a viewer's exposure to existing CBP actions and infrastructure and other visually varied features already in existence. Presumably, most residents will be highly sensitive to changes in the landscape viewable from their homes and neighborhoods. CBP also considers visual impacts to Native American sacred sites or trust resources before carrying out a project.

Business Employees

These individuals work at local businesses, primarily in the commercial portions of the study area. Business employees will generally experience limited views of the alternative actions except at road crossings while driving to work or where CBP infrastructure and activity occurs near their place of employment. Most business employees work in one and two-story structures that may or may not have outside views. Those with views often look out on numerous, often varied, built features and the employees within are focused on their jobs. For these reasons, business employees are not likely to be sensitive to landscape changes

Recreational Users

The states with the greatest share of Federal land ownership are Idaho (54.9 percent), Washington (38.3 percent), and Montana (27.6 percent). Given the amount of public land (including recreational and conservation lands) in the Great Lakes Region, recreational users do not represent a large viewer group compared to the western states or the New England Region. Certain recreational users within the study area, however, already have clear views of current CBP infrastructure and activities. Proximity to existing infrastructure and activity may decrease their expectations of visual quality and their sensitivity to visual change.

6.10 SOCIOECONOMIC RESOURCES

6.10.1 INTRODUCTION

This section provides a socioeconomic profile of the Great Lakes Region and discusses potential impacts of the CBP's program alternatives on the region's resources. The study area includes areas in the United States and Canada within 100 miles of the border. Some categories of socioeconomic impacts, as discussed in the Environmental Consequences section, are as likely on the Canadian side of the border as on the U.S. side. For example, time delays at border crossings may affect populations and businesses on both sides of the border. In addition, much of the economic activity in U.S. border regions involves cross-border movement of people and goods; therefore, the impacts of CBP's activities on Canadian socioeconomic resources are considered along with the impacts on U.S. resources. The impacts of CBP's actions on communities and regional economies in Canada are most likely closest to the border. But since it is not possible to delineate precisely how far from the border impacts may extend, information is provided on the area 100 miles north of the border, mirroring the study area in the United States. This definition of the study area does not necessarily imply that impacts are equivalent in both countries.

Much of the economic data presented here for Canada is not available below the provincial level, so the provinces provide the best available representation of the border region. This limitation does not necessarily suggest the scope of economic impacts; it merely reflects the level at which demographic and economic data are available. All monetary values are expressed in 2009 U.S. dollars, unless otherwise indicated.

The socioeconomic environment includes people and their communities, accounting for such things as population movement, density and age distribution, as well as economic considerations; including income levels, opportunities for employment, and overall economic trends. Section 6.10.2 of this chapter first provides an overview of the socioeconomic resources across the Great Lakes Region and north of the Great Lakes Region in Canada. It then provides a more detailed characterization of the regional demography, including population levels and distribution, regional growth trends, income, employment levels, poverty statistics, and property values. This section also profiles the regional economy, indexing important economic sectors in terms of income and employment. It further provides regionally focused information on important economic sectors for nine POEs and BPSs. These sites include those POEs that are most active in terms of the annual number of crossings and the value of cargo transported.

6.10.2 AFFECTED ENVIRONMENT

6.10.2.1 Regional Demographics

To provide context for the potential impacts of CBP actions, some basic, descriptive, socioeconomic information is provided for the Great Lakes Region and the area north of this region in Canada and is compared to the broader states, provinces, and national economies, where possible. While the profiled region is defined as the area both 100 miles north and south of the U.S.-Canada border, the statistics in the various tables and text within this section include data for all U.S. counties and Canadian census divisions overlapping these 100-mile regions. These areas represent the finest geographic resolution available for these data and are used, therefore, to approximate values for populations and other demographic variables.

6.10.2.2 Population and Growth Trends

In the United States, approximately 19.3 million people live in the Great Lakes Region (Table 6.10-1). The segment of the population living in border communities accounts for 32.5 percent of those living in the Great Lakes Region states of Michigan, New York, Ohio, Pennsylvania, and Wisconsin. Michigan has the largest population in the region with approximately 7.0 million people. The border communities in Pennsylvania and Wisconsin are far less populated.

Between 2000 and 2009, while the population of the United States grew approximately 8.7 percent, border communities in all Great Lakes Region states experienced stagnant population growth or population declines ranging from 0.0 percent to -1.9 percent (Figure 6.10-1).

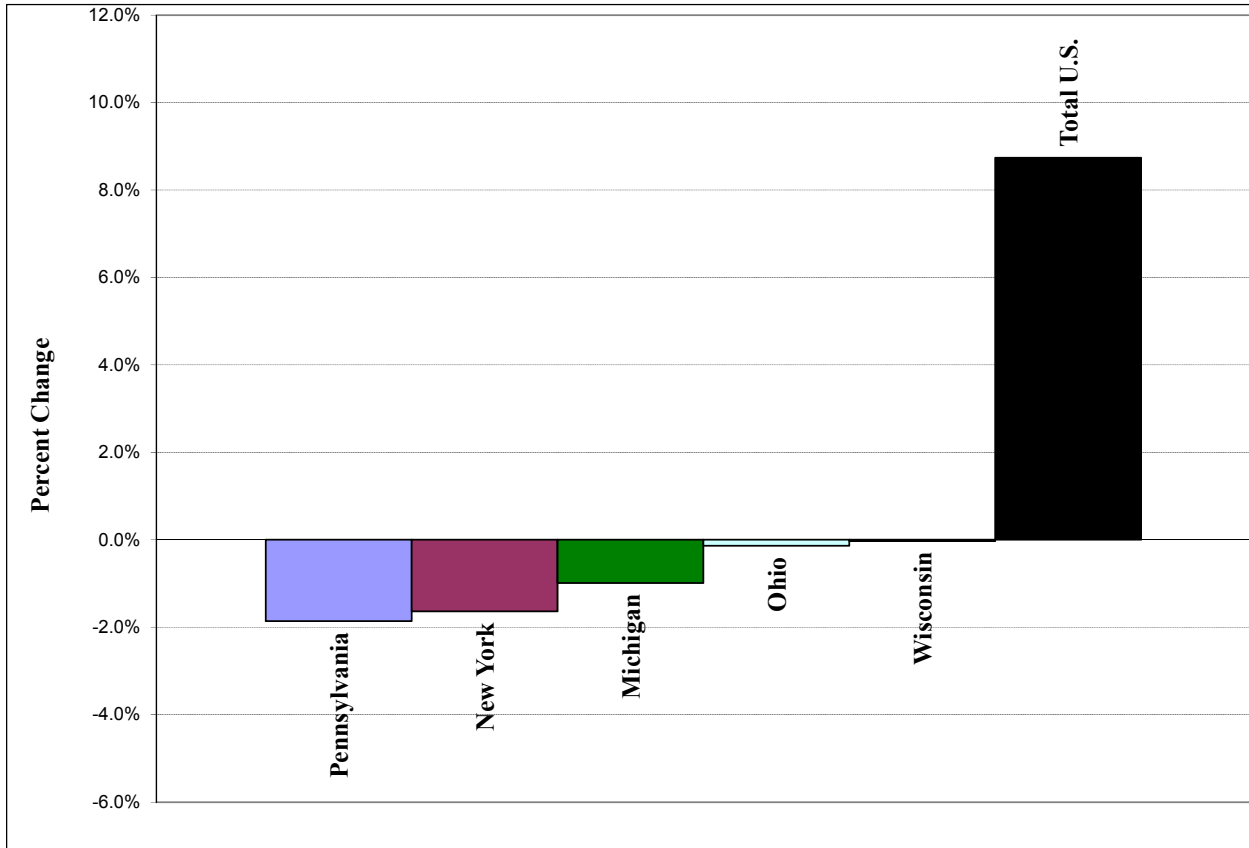
Table 6.10-1. Population of the Great Lakes Region*

Border State	Population within the Border Area**	Population Overall	Percent of Population within the Border Area
Michigan	7,015,171	9,969,727	70.4
New York	4,804,964	19,541,453	24.6
Ohio	6,259,768	11,542,645	54.2
Pennsylvania	1,110,381	12,604,767	8.8
Wisconsin	75,244	5,654,774	1.3
Great Lakes Region Total	19,265,528	59,313,366	32.5
Total United States	28,412,077	310,973,729	9.1

* The American Community Survey provides estimates of demographic, social, economic, and housing characteristics every year for all states, as well as for all cities, counties, metropolitan areas, and population groups of 65,000 people or more.

** Statistics in this column account only for those portions of the states within the Great Lakes Region. Total U.S. accounts only for the border area of all four regions.

Figure 6.10-1. Percent Change in Great Lakes Region Population, 2000–2009



Source: (USDOC, 2009a).

POEs and BPSs on the U.S.-Canada border tend to be in rural, less densely populated areas outside of major metropolitan areas, while the majority of the population in the region lives in larger population centers. Population centers in this report include all of the counties that overlap a metropolitan statistical area (MSA), defined by the Office of Management and Budget and used by the U.S. Census Bureau (USCB) to report demographic statistics. Overall, for the Great Lakes Region, approximately 78.9 percent of the population lives in population centers (Table 6.10-2). The Great Lakes Region in Michigan includes the Detroit-Warren-Livonia MSA, which accounts for the majority of the population in the Great Lakes Region.

Table 6.10-2. Population Centers in the Great Lakes Region*

Border State	Population Center	State's Great Lakes Population Living in Population Centers**	Total State Population in the Great Lakes Region	Percent of State's Great Lakes Population Living in Population Centers
Michigan	Ann Arbor	347,563	7,015,171	5.0
	Bay City	107,434		1.5
	Detroit-Warren-Livonia	4,403,437		62.8
	Flint	424,043		6.0
	Jackson	159,828		2.3
	Lansing-East Lansing	347,526		5.0
	Monroe	152,721		2.2
	Saginaw-Saginaw Township North	200,050		2.9
	Michigan State Total	6,142,602		87.6
New York	Buffalo-Niagara Falls	1,123,804	4,804,964	23.4
	Glens Falls	128,774		2.7
	Ithaca	101,779		2.1
	Rochester	1,035,566		21.6
	Syracuse	646,084		13.4
	Utica-Rome	293,280		6.1
	New York State Total	3,329,287		69.3
Ohio	Akron	699,935	6,259,768	11.2
	Canton-Massillon	408,005		6.5
	Cleveland-Elyria-Mentor	2,091,286		33.4
	Columbus	410,741		6.6
	Lima	104,357		1.7
	Mansfield	124,490		2.0
	Sandusky	76,963		1.2
	Toledo	672,220		10.7
	Youngstown-Warren-Boardman***	446,892		7.1
	Ohio State Total	5,034,889		80.4

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Pennsylvania	Erie	280,291	1,110,381	25.2
	Pittsburgh	252,545		22.7
	Youngstown-Warren-Boardman***	116,071		10.5
	Pennsylvania State Total	648,907		58.4
Wisconsin	Duluth***	44,274	75,244	58.8
Great Lakes Region total		15,199,959	19,265,528	78.9
Total United States****		261,110,826	310,973,729	84.0

* The American Community Survey provides estimates of demographic, social, economic and housing characteristics every year for all states, as well as for all cities, counties, metropolitan areas, and population groups of 65,000 people or more.

** Statistics in this column account only for those portions of the Great Lakes Region within each state.

*** The Great Lakes Region in Wisconsin includes only one population center. Thus, no state total column is presented.

**** Population statistics in this row represent the proportion of the total U.S. population that resides in population centers across the whole country.

In Canada, approximately 11.5 million people reside in the study area north of the Great Lakes Region (Table 6.10-3). Most major cities are located in the southern part of the country; therefore, Canada's population is more heavily concentrated along the border than the U.S. population. For example, in Ontario, approximately 95.6 percent of the population lives in border communities. Ontario has the largest population living in border communities in Canada. As some census divisions that overlap the 100-mile buffer area are large and extend well beyond 100 miles from the border, this analysis may overstate the Canadian population living in the study area north of the Great Lakes Region.

Between 1996 and 2006, the population of Canada grew 9.5 percent. More recently, according to Statistics Canada, about two-thirds of Canada's growth between 2009 and 2010 was attributable to net international migration. The number of immigrants to Canada increased from 245,300 between 2008 and 2009 to 270,500 between 2009 and 2010. However, during the economic recession in 2009 and 2010, the net flow of non-permanent residents decreased with more immigrants leaving the country, resulting in overall lower net international migration in 2010 than in the previous year. Population growth in Ontario (13.8 percent) outpaced growth for Canada as a whole (Figure 6.10-2).

Approximately 84.7 percent of the Canadian population in the study area north of the Great Lakes Region resides within population centers (Table 6.10-4).

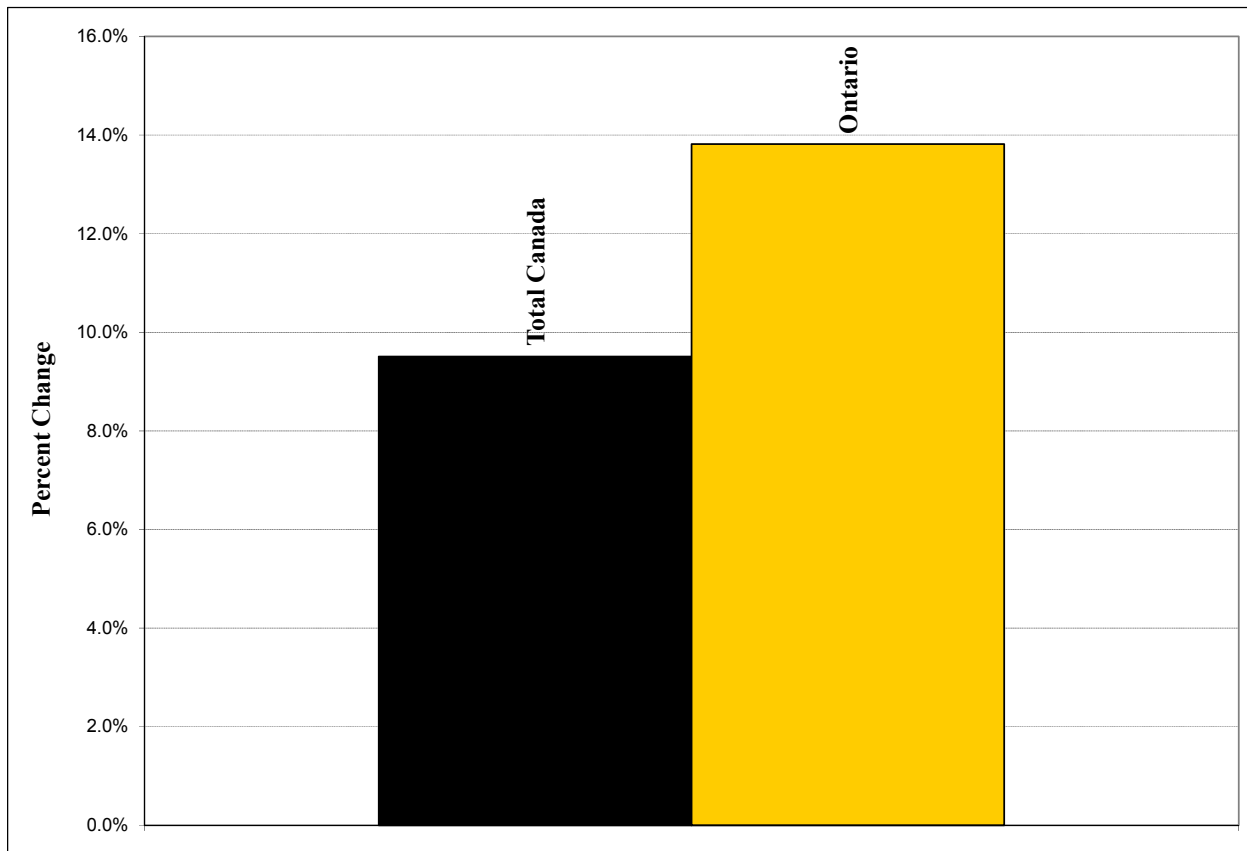
Table 6.10-3. Population North of the Great Lakes Region in Canada

Border Province	Study Area Population North of the Great Lakes Region*	Total Population in the Province	Percent of Total Province Population Residing in the Study Area North of the Great Lakes Region
Ontario	11,499,610	12,028,895	95.6
Total Canada	25,562,910	31,241,030	81.8

* Statistics in this column account only for those portions of the provinces within the study area. Total Canada accounts only for those portions of the provinces within the study area across all four regions.

Source: (StatCan, 2006a).

Figure 6.10-2. Percent Change in Canadian Population North of the Great Lakes Region, 1996–2006



Sources: (StatCan, 1996; StatCan, 2006a).

Table 6.10-4. Population in Central Metropolitan Areas in Study Area North of the Great Lakes Region in Canada

Border Province	Population Center	Study Area Population Living in Population Centers North of the Great Lakes Region*	Total Study Area Population North of the Great Lakes Region*	Percent of Total Study Area Population North of the Great Lakes Region Living in Population Centers
Ontario	Barries	175,335	11,499,610	1.5
	Brantford	122,825		1.1
	Greater Sudbury	156,395		1.4
	Guelph	126,080		1.1
	Hamilton	683,450		5.9
	Kingston	148,475		1.3
	Kitchener-Cambridge-Waterloo	446,495		3.9
	London	452,580		3.9
	Oshawa	328,070		2.9
	Ottawa-Gatineau **	812,135		7.1
	Peterborough	385,035		3.3
	St. Catharines-Niagara	385,035		3.3
	Thunder Bay	121,050		1.1
	Toronto	5,072,075		44.1
	Windsor	320,730		2.8
Ontario Province Total	9,735,765	84.7		
Total Canada***		21,508,575	31,241,030	68.8

* Population statistics in these columns account only for those portions of the CMAs and provinces within the study area.

** The population of Ottawa-Gatineau is split between the Provinces of Ontario and Quebec.

*** Population statistics in this row represent the proportion of the total Canadian population that resides in population centers across the whole country.

Sources: (USDOC, 2008a; USDOC, 2008b; USDOC, 2008c).

6.10.2.3 Income, Poverty, and Unemployment

The median household income of border communities within the Great Lakes Region (\$53,486) is slightly higher than the national average (\$53,051). The border communities in Michigan have one of the highest median incomes of all border communities across the U.S.-Canada border (Table 6.10-5). Border communities in New York, Pennsylvania, and Wisconsin are less wealthy than the state average (New York City, Philadelphia, Pittsburgh, and Milwaukee are outside of the study area).

The poverty rate is defined as the number of individuals included in the poverty count as a percentage of the population for whom the poverty status is determined. The poverty rates for the Great Lakes Region states are all lower than the 12.4 percent for the United States as a whole (Table 6.10-5). In Wisconsin, the poverty rate for border communities is notably higher than the state average. In New York, however, the poverty rate for border communities is notably lower than the state average.

The unemployment rate in the Great Lakes Region states ranged from 8.2 percent to 14.3 percent (Table 6.10-6). Border communities in Michigan and Ohio have the highest unemployment rates of all border communities across the U.S.-Canada border.

Table 6.10-5. Income and Poverty Statistics for the Great Lakes Region

Border State and Great Lakes Region*		Median Household Income** (\$)	Population Below the Poverty Line***	Percent of Population Below the Poverty Line
Michigan	Great Lakes Region	59,190	746,010	10.8
	Statewide	56,428	1,021,605	10.5
New York	Great Lakes Region	48,877	564,351	12.1
	Statewide	54,819	2,692,202	14.6
Ohio	Great Lakes Region	52,318	622,484	10.2
	Statewide	51,740	1,170,698	10.6
Pennsylvania	Great Lakes Region	44,878	125,742	11.5
	Statewide	50,666	1,304,117	11.0
Wisconsin	Great Lakes Region	43,018	8,386	11.5
	Statewide	55,322	451,538	8.7
Great Lakes Region total	Great Lakes Region	53,486	2,066,973	11.0
	Selected states	53,658	6,640,160	11.8
Total United States		53,051	33,899,812	12.4

* Statistics in the non-shaded rows account only for portions of the states within the Great Lakes Region.

** Median household income is reported in inflation-adjusted 2009 dollars.

***To determine the poverty rate in the United States, the Census Bureau references income thresholds that vary by family size and ages of family members. If a family's total income, not including noncash benefits (such as food stamps and housing subsidies), is below the family's threshold, every individual in the family is included in the poverty count.

Sources: (USDOC, 2000a; USDOC, 2000b).

Table 6.10-6. Unemployment Rates for the Great Lakes Region

Border State and Great Lakes Region*		Unemployment Rate (%)
Michigan	Great Lakes Region	14.3
	Statewide	13.6
New York	Great Lakes Region	8.2
	Statewide	8.4
Ohio	Great Lakes Region	10.6
	Statewide	10.2
Pennsylvania	Great Lakes Region	9.2
	Statewide	8.1
Wisconsin	Great Lakes Region	8.7
	Statewide	8.5
Great Lakes Region Total	Great Lakes Region	11.2
	Selected states	9.6
Total United States		9.3

* Statistics in the non-shaded rows account only for portions of the states within the Great Lakes Region.

Source: (USDOL, 2009a).

The median household income north of the Great Lakes Region in Ontario is approximately \$57,400 (in 2009 U.S. dollars) compared with \$49,400 for Canada as a whole (Table 6.10-7). Ontario has the second highest median household income among the border provinces.

The poverty rate in Canadian communities is defined as the percentage of low-income “economic families.” (See note in Table 6.10-7 for an explanation of “economic family.”) This threshold-based designation is comparable to the poverty statistics reported in the USCB. In the study area north of the Great Lakes Region, the poverty rate is approximately 11.8 percent compared with 11.6 percent for Canada as a whole (Table 6.10-7).

The unemployment rate in Ontario was 6.4 percent in 2006 compared with 6.6 percent for Canada as a whole (Table 6.10-8). Within Ontario, the unemployment rate in border communities is the same as the unemployment rate of the entire province.

Table 6.10-7. Income and Poverty Statistics North of the Great Lakes Region in Canada

Border Province and Study Area North of the Great Lakes Region*		Median Household Income** (\$US)	Number of Low-Income Economic Families***	Percent of Low-Income Economic Families***
Ontario	Study area north of Great Lakes Region	57,404	374,913	11.8
	Province	55,674	390,224	11.7
Total Canada		49,393	1,006,911	11.6

* Statistics in the non-shaded rows account only for portions of the provinces within the study area.

** Median household income is reported in inflation-adjusted 2009 U.S. dollars.

*** The Canadian Census reports statistics for “low-income” economic families. This threshold-based designation is comparable to the poverty statistics reported in the USCB. The term, “economic family,” refers to a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common-law, or adoption. A couple may be of opposite or same sex. Foster children are included.

Source: (StatCan, 2006d).

Table 6.10-8. Unemployment Rates North of the Great Lakes Region in Canada

Border Province and Study Area North of the Great Lakes Region*		Unemployment Rate (%)
Ontario	Study area north of Great Lakes Region	6.4
	Province	6.4
Total Canada		6.6

* Statistics in the non-shaded rows account only for portions of the provinces within the study area.

Source: (StatCan, 2006c).

6.10.2.4 Property Values

In the Great Lakes Region, the median property value between 2006 and 2008 was approximately \$136,400. This figure is lower than the median property value for the United States as a whole (\$192,400) during the same time period (Table 6.10-9). Except for Michigan, the median property value within the border region is lower than that of each state as a whole. This differential is most pronounced in New York where statewide property values are skewed by New York City. Moreover, border communities in New York and Pennsylvania have the lowest median property values of all border communities across the U.S.-Canada border.

Table 6.10-9. Median Property Value for the Great Lakes Region

Border State and the Great Lakes Region*		Median Home Value** (\$)
Michigan	Great Lakes Region	161,300
	Statewide	152,600
New York	Great Lakes Region	108,200
	Statewide	311,700
Ohio	Great Lakes Region	136,700
	Statewide	137,800
Pennsylvania	Great Lakes Region	103,400
	Statewide	155,400
Wisconsin	Great Lakes Region	125,400
	Statewide	168,500
Great Lakes Region total	Great Lakes Region	136,400
	Selected states	203,900
Total United States		192,400

* Statistics in the non-shaded rows account only for those portions of the states within the Great Lakes Region.

** The American Community Survey provides estimates of housing characteristics for all geographic areas with populations of 20,000 or more, including the Nation, all states and the District of Columbia, all congressional districts, and approximately 1,800 counties every 3 years. Due to the use of value categories rather than specific amounts collected for each individual housing unit in 2006 and 2007, property values cannot be inflation adjusted. Property values are reported in nominal dollar terms.

Source: (USDOC, 2008a).

Ontario has the second highest median property value in Canada. The median property value in the study area in 2006 was approximately \$273,800 (in 2009 U.S. dollars) compared with \$232,200 for Canada as a whole (Table 6.10-10). Border communities in Ontario have the third highest median property values among all border communities north of the U.S.-Canada border.

Table 6.10-10. Median Property Value North of the Great Lakes Region in Canada

Border Province and Study Area North of the Great Lakes Region*		Average Value of Dwelling** (SUS)
Ontario	Study area north of Great Lakes Region	273,800
	Province	262,300
Total Canada		232,200

* Statistics in the non-shaded rows account only for those portions of the provinces within the study area.

** A dwelling is defined as a set of living quarters designed for or converted for human habitation in which a person or group of persons reside or could reside. In addition, a private dwelling must have a source of heat or power and must be an enclosed space that provides shelter from the elements, as evidenced by complete and enclosed walls and roof and by doors and windows that protect from wind, rain, and snow. Property values are reported in 2006 U.S. dollars.

Source: (StatCan, 2006b).

6.10.2.5 Regional Economies

Tourism is a major component of economic activity along the northern border. Canada is the top country of origin for visitors to the United States. In 2008, the number of Canadian visitors staying one or more nights in the United States was nearly 19 million (USDOC, 2008d). In this context, “Canadian visitors” refers to Canadian residents visiting the United States. The Great Lakes Region includes significant tourist destinations. New York is the most popular tourist destination, accounting for more than 16 percent of Canadian visitors and more than 23 percent of Canadian visitors arriving by surface transportation. Michigan is the fourth most visited American state by Canadians, behind New York, Florida, and Washington state.

Trade with Canada

The flow of goods, services, and people across the border contributes significantly to economic activity in border communities. Canada is the largest trading partner of the United States. In 2009, the total value of merchandise trade with Canada was approximately \$429.6 billion—\$204.7 billion in exports and \$224.9 billion in imports. Shipments by surface modes of transportation, excluding pipelines, account for approximately 79 percent of total merchandise trade with Canada. The top exports to Canada by surface transportation are automobiles and automotive parts and accessories, and other machinery, appliances, and equipment. The top imports from Canada are automobiles and automotive parts and accessories, other machinery and appliances, and processed paper and pulp products. On average, approximately \$930 million in merchandise crosses the border by surface transportation every day (USDOT, 2009a). Appendix Q of this analysis describes regional income and employment by economic sector along the entire Northern Border.

Crossing the border using surface transportation is the principal means of entry for Canadians visiting the United States, accounting for two-thirds (12.6 million) of all Canadian visitor entries (USDOC, 2008e). While approximately 41 percent of Canadian visitors entering the United States by surface transportation visited the Great Lakes Region, spending in the region accounted for a relatively low percentage (16 percent) of these visitors’ total spending in the United States. Canadian visitors entering by surface transportation contributed approximately \$1.3 billion to the

Great Lakes Region in 2008 (Table 6.10-11). The average visitor spent approximately \$1,318 per visit. The most common stated purposes for visiting states in the Great Lakes Region were vacation (66 percent), visiting friends or relatives (24 percent), and business or employment (10 percent). The Great Lakes Region had the highest percentage of travel due to business or employment. While business travelers tend to spend more per trip, they rely more heavily on air travel and travel further from the border.

Table 6.10-11. Canadian Visitors Entering the Great Lakes Region by Surface Transportation*

Destination	Visitors		Spending			Purpose of Trip		
	Number of Visitors (000s)	Average Nights Per Visit	Visitor Spending (\$US millions)	Spending per Visitor (\$US)	Average Daily Spending per Visitor (\$US)	Business, Convention, or Employment (%)	Visiting Friends or Relatives (%)	Holiday, Vacation, or Other (%)
Michigan	1,375	2.5	293.8	214	85	8.5	29.5	62.0
New York	2,606	2.8	774.9	298	106	7.8	20.6	71.6
Ohio	516	2.6	118.4	230	89	19.2	24.1	56.5
Pennsylvania	686	2.5	131.1	191	77	12.3	25.7	62.0
Wisconsin	—**	—**	—**	—**	—**	—**	—**	—**
Border States in the Great Lakes Region	5,183	2.7	1,318	254	96	9.7	24.0	66.3

* Surface modes of transportation include autos, buses, and other non-air types of transportation. Average nights per visit and average daily spending per visitor are based on total visitors, including air travelers.

** The Office of Travel & Tourism Industries suppresses state data for which the sample size is fewer than 400,000.

Sources: (USDOC, 2008a; USDOC, 2008b; USDOC, 2008c).

6.10.2.6 Economic Profiles of POEs and BPSs in the Great Lakes Region

This section provides regional economic profiles for border communities in the United States and Canada that surround selected POEs in the EOR Region. The purpose of this section is to characterize socioeconomic resources of specific border communities in the region to provide context for the discussion of potential consequences of CBP's alternative actions, and to highlight the diversity in regional economies surrounding POEs and BPSs along the northern border. Appendix Q of this report provides data on trade, employment, and payroll statistics by economic sector for U.S. counties and Canadian provinces that contain profiled POEs and BPS in the four northern border regions. This section profiles nine sites in the Great Lakes Region that represent the most heavily used POEs along the U.S.-Canada border in the region in terms of total crossings and the total value of trade, along with some smaller, more rural POE sites. Additionally, sites were included based on their unique characteristics to reflect different socioeconomic conditions in border communities. For example, the sites profiled include BPSs-only in states that do not have a land border with Canada (Ohio and Pennsylvania). Table 6.10-12 lists the sites ranked by crossing volume and provides information on associated crossing activity.

Table 6.10-12. Port of Entry and Border Patrol Stations Profiled in the Great Lakes Region

Port	Annual Individual Crossings (% of Total)	Annual Vehicle Crossings (% of Total)	National Rank by Crossing Volume	Annual Trade Value (Surface Mode)	Rank by Trade Value	Two Largest Commodities (% of Port's Trade Value)	Important Features
NY: Buffalo-Niagara Falls	13,820,263 (22.4%)	6,168,583 (19.4%)	1	\$56,516,262,041 (16.7%)	2	<ul style="list-style-type: none"> • Vehicles and parts (22.8%) • Nuclear reactors, boilers, machinery and mechanical appliances (11%) 	<ul style="list-style-type: none"> • Largest by number of crossings
MI: Detroit	8,789,270 (14.3%)	5,311,848 (16.7%)	2	\$84,658,638,465 (25.1%)	1	<ul style="list-style-type: none"> • Vehicles and parts (34.7%) • Nuclear reactors, boilers, machinery and mechanical appliances (15.9%) 	<ul style="list-style-type: none"> • Largest by value of trade • Roughly colocated with Detroit BPS
MI: Port Huron	4,020,350 (6.5%)	2,201,531 (6.9%)	4	\$52,558,024,751 (15.6%)	3	<ul style="list-style-type: none"> • Vehicles and parts (20.2%) • Nuclear reactors, boilers, machinery and mechanical appliances (12.1%) 	

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Port	Annual Individual Crossings (% of Total)	Annual Vehicle Crossings (% of Total)	National Rank by Crossing Volume	Annual Trade Value (Surface Mode)	Rank by Trade Value	Two Largest Commodities (% of Port's Trade Value)	Important Features
NY: Champlain-Rouses Pt.	2,814,228 (4.6%)	1,344,983 (4.2%)	5	\$19,157,262,299 (5.7%)	4	<ul style="list-style-type: none"> Nuclear reactors, boilers, machinery and mechanical appliances (10.1%) Natural or cultured pearls, precious or semiprecious stones, precious metals (8.6%) 	
NY: Alexandria Bay/Cape Vincent	1,753,626 (2.8%)	826,464 (2.6%)	6	\$9,846,132,115 (2.9%)	8	<ul style="list-style-type: none"> Paper and paperboard (10.5%) Aluminum and articles thereof (9.9%) 	<ul style="list-style-type: none">
NY: Massena	1,610,163 (2.6%)	837,361 (2.6%)	7	\$428,879,812 (0.1%)	24	<ul style="list-style-type: none"> Copper and articles thereof (34.2%) Mineral fuels, mineral oils, bituminous substances (17.5%) 	<ul style="list-style-type: none">
MI: Sault Ste. Marie	1,515,683 (2.5%)	836,655 (2.6%)	9	\$1,901,340,785 (0.6%)	16	<ul style="list-style-type: none"> Iron and steel (20.6%) Paper and paperboard (13.7%) 	<ul style="list-style-type: none"> Roughly collocated with Sault Ste. Marie BPS
PA: Erie**						<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Only station in PA BPS station only

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

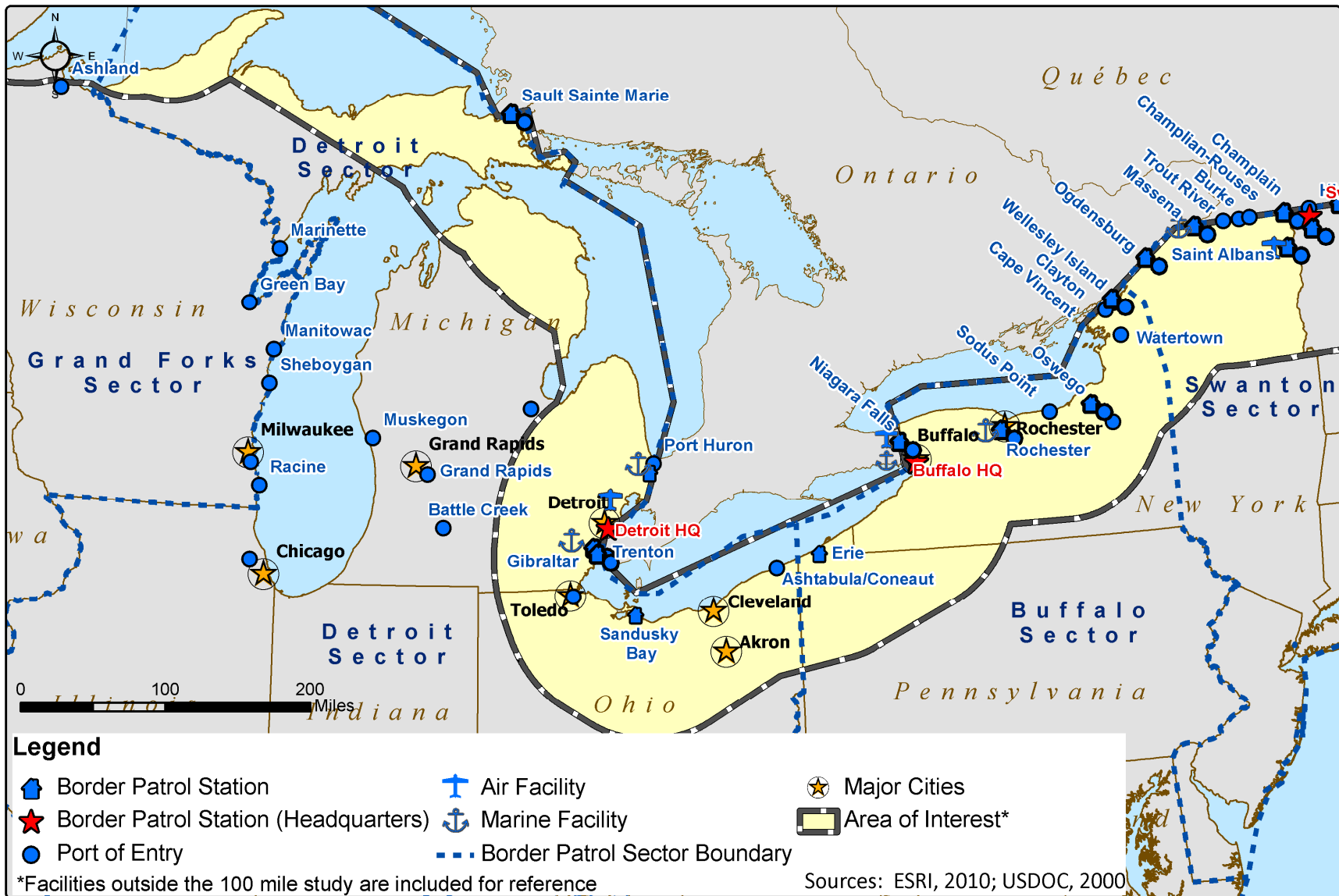
Port	Annual Individual Crossings (% of Total)	Annual Vehicle Crossings (% of Total)	National Rank by Crossing Volume	Annual Trade Value (Surface Mode)	Rank by Trade Value	Two Largest Commodities (% of Port's Trade Value)	Important Features
OH: Sandusky**						•	<ul style="list-style-type: none"> • Only station in OH • BPS station only

* Size based on number of individual border crossings.

** BTS does not provide data on commodities and crossings at BPS.

Sources: IEc analysis of Bureau of Transportation Statistics data: (USDOT, 2009a; USDOT, 2009b; USDOT, 2009c).

Figure 6.10-3. Locations of Points of Entry and Border Patrol Stations in Great Lakes Region



The remainder of this section characterizes the regional economies of the U.S. counties and Canadian provinces containing the Great Lakes Region sites identified in Table 6.10-12 and Figure 6.10-3.

Chippewa County, Michigan

Chippewa County, Michigan, located in the Upper Peninsula of the state, contains the Sault Ste. Marie POE and BPS. The county is a popular destination for outdoor recreational activities on the nearby Great Lakes and state and national parks. Trade, travel, and tourism are a major part of the regional economy. Accommodation and food services and retail trade together account for nearly half of all employment in Chippewa County. The major economic sectors in Chippewa County in terms of annual payroll are health care and social assistance (\$54.6 million), accommodation and food services (\$46.3 million), retail trade (\$36.8 million), and manufacturing (\$20.6 million).

- Sault Ste. Marie POE and BPS station: The International Bridge at Sault Ste. Marie is the only vehicular crossing between Ontario and Michigan for 300 miles (MDOT, 2010b). The bridge connects the twin cities of Sault Ste. Marie, Ontario and Sault Ste. Marie, Michigan. The communities served by the bridge have populations of 16,000 (Michigan) and 80,000 (Ontario). The bridge is also the site of the Soo Locks, which permit travel by water between Lake Superior and the lower Great Lakes. No pedestrian crossings exist at the site. A summer traffic survey found that nearly all International Bridge traffic carried Michigan or Ontario license plates. Ontario plates made up 75 percent of surveyed traffic on weekdays and 60 percent on weekends, likely due to the larger population on the Ontario side of the border. The percentage of low-frequency travel (once-per-year or once-only traveler) was higher than at other Michigan POEs, suggesting that this remote location is a throughway for infrequent, long-distance trips (OMOT, 2001).
- Sault Ste. Marie is the ninth largest POE in terms of individual border crossings, accounting for 1.5 million crossings in 2009 (2.5 percent of all U.S.-Canada crossings), but is smaller than the Detroit POE, which is also in Michigan. The value of commerce at the Sault Ste. Marie POE was \$1.9 billion in 2009. The major commodities at Sault Ste. Marie are iron and steel (20.6 percent), paper and paperboard (13.7 percent), and machinery and mechanical appliances (12.9 percent). The Sault Ste. Marie POE is one of the largest commercial crossings that accounts for more than 20 percent of all U.S.-Canada trade in metals and ores.

A Note on Data Sources

All statistics presented for private, nonfarm employment, unless otherwise noted, are from USCB County Business Patterns for 2008. All statistics on agricultural production employment, unless otherwise noted, are from the U.S. Department of Agriculture, Census of Agriculture for 2007. All Canadian statistics, unless otherwise noted, are from the Statistics Canada 2006 Census. All detail on border crossings and trade value, unless otherwise noted, are from the U.S. Department of Transportation Bureau of Transportation Statistics Transborder Freight Data for 2009. Monetary values are expressed in 2009 U.S. dollars.

Detroit-Warren-Livonia MSA, Michigan

The Port Huron and Detroit POEs in Michigan are located in the Detroit-Warren-Livonia MSA, which includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne Counties. The POEs are located along major interstates in a large metropolitan area. Accordingly, Detroit and Port Huron are the most active crossing points for commercial trucks along with Buffalo-Niagara Falls. The Detroit-Warren-Livonia MSA is a major manufacturing region and is home to the Big Three automobile manufacturers. In terms of annual payroll, the largest economic sectors for the region are manufacturing (\$12.1 billion), professional, scientific, and technical services (\$11.9 billion), health care and social assistance (\$10.7 billion), management of companies and enterprises (\$7.5 billion), and wholesale trade (\$5.3 billion). Across the border, Ontario is the largest automobile manufacturing region in North America.

- **Detroit POE and BPS:** The POE at Detroit consists of two crossing points: the Ambassador Bridge and the Detroit-Windsor Tunnel, both of which cross the Detroit River. The Ambassador Bridge is west of both downtown Detroit and downtown Windsor, Ontario. The Detroit-Windsor tunnel connects downtown Detroit to downtown Windsor. No pedestrian crossings occur at this POE, which is dominated by privately owned vehicles (POVs) and trucks. Peak traffic time on weekdays for this POE is 7 a.m. to 8 a.m. for U.S.-bound traffic, and 5 p.m. to 6 p.m. for Canada-bound traffic (OMOT, 2001). This pattern suggests that there is a large commuter population into the United States from Canada, a conclusion supported by survey data indicating that work trips are the most common reason for U.S.-bound travel on weekdays (21 to 25 percent of all weekday travel). In addition, more than 55 percent of travelers report that they make the trip daily or once a week. Weekend traffic tends to be heavy in both directions in the afternoon and early evenings, suggesting that shopping, recreation, and entertainment trips are popular at these times. The predominant reasons for weekend travel into Canada include visiting a casino (24.7 to 31.8 percent) and recreation/entertainment trips (20.3 to 21.4 percent), while travel into the United States is primarily to return home (over 60 percent). More than 60 percent of both weekday and weekend travel originates and terminates within a seven-county region of Michigan and the county of Essex in Canada.

In 2009, Detroit was the largest POE in terms of trade value between the United States and Canada, accounting for \$84.7 billion in commerce (approximately 25.1 percent of all U.S.-Canada trade), and the second largest POE in terms of individual crossings, representing 8.8 million crossings (approximately 14.3 percent of all U.S.-Canada crossings). Most significant, Detroit is the single largest POE for shipments of vehicles and parts crossing the U.S.-Canada border, accounting for \$29.4 billion in 2009 (nearly half of all U.S.-Canada trade). The other major traded commodities at Detroit are machinery and mechanical appliances (15.9 percent), electrical machinery and equipment (8.1 percent), plastics (4.0 percent), and iron and steel (2.4 percent).

- **Port Huron POE:** The Port Huron POE is on the Blue Water Bridge—consisting of two bridges—which connects Point Edward, Ontario and Port Huron, Michigan across the St. Clair River at the southern end of Lake Huron. The bridge connects Highway 402 in Ontario to Interstates 94 and 69 in Michigan. This crossing provides the most direct route from Toronto to Michigan and represents one of the four shortest land routes

between the American Midwest and northeastern United States (MDOT, 2010a). Toronto's proximity to Port Huron allows U.S. travelers to make multiple overnight trips easily in a year. Survey data indicate that about 10 percent of travelers make daily trips across this border. However, few travelers report work as the purpose of their travel—less than 10 percent of Canada-bound travelers and 13 percent of U.S.-bound travelers on weekdays. Conversely, nearly 25 percent of travelers report that they make infrequent trips across the border (onetime only or once per year). The most commonly reported purposes of Canada-bound trips are visiting casinos and shopping, while shopping is the most commonly reported purpose of U.S.-bound travel. Over 90 percent of surveyed vehicle plates come from Michigan and Ontario on both weekends and weekdays (OMOT, 2001).

Port Huron was the third largest POE in terms of trade value between the United States and Canada, accounting for \$52.6 billion in commerce (approximately 15.6 percent of all U.S.-Canada trade), and the fourth largest in terms of individual crossings, representing 4.0 million crossings (approximately 6.5 percent of all U.S.-Canada crossings) in 2009. The major commodities transported through Port Huron are vehicles and parts (20.2 percent), machinery and mechanical appliances (12.1 percent), plastics (6.6 percent), and electrical machinery and equipment (6.3 percent).

In addition, two U.S. states have no land border with Canada, but lie across the Great Lakes from Ontario. Sandusky and Erie are BPSs, not POEs, and thus do not include merchandise trade activity.

Erie County, Ohio

The Sandusky BPS is located in Erie County, Ohio. Erie County is part of the Sandusky MSA, which has a population of slightly fewer than 80,000. The major economic sector in Erie County is manufacturing, which accounts for nearly one-third of income (\$330.7 million in annual payroll) and 20.8 percent of jobs. The other dominant economic sectors by annual payroll are health care and social assistance (\$168.3 million), retail trade (\$104.6 million), and accommodation and food services (\$73.2 million).

- Sandusky BPS: The Owen Sound Transportation Company operates a ferry across Lake Erie between Pelee Island, Ontario and Sandusky, Ohio between April and mid-December (OSTC, 2010). The Sandusky Bay Station is currently operating out of a temporary facility in Sandusky, Ohio. A permanent location has not yet been chosen for the new station. However, it is tentatively scheduled to be located in the Ottawa County area and is tentatively planned to be a joint facility—housing U.S. Border Patrol, Office of Field Operations, and Office of Air and Marine offices. Sandusky will patrol the western and central portions of Lake Erie, along with five border counties along Lake Erie. The duties of agents will include marine patrol on Lake Erie, shoreline patrol, transportation checks, and land patrol of the area's routes of egress from the border, such as highways 80 and 90 (USDHS, 2010a).

Erie County, Pennsylvania

The Erie BPS is located in Erie County, Pennsylvania directly south of Lake Erie. Erie County is part of the Erie MSA and has a population of 280,000. Erie's economy is heavily based in

manufacturing, which accounts for nearly one-third of income (\$1.3 billion in annual payroll) and 21.4 percent of jobs, roughly double the national average for employment in the sector. The General Electric Company is one of the top employers. The other major economic sectors by annual payroll are health care and social assistance (\$825.1 million) and retail trade (\$330.8 million). The top three sectors account for approximately half the employment in the county.

- **Erie USBP Station:** The Erie BPS began operations during the summer of 2004. Operations consist of boat patrols, marina checks, transportation checks, and rapid response to requests of other agencies. Vessels crossing into the United States are routinely boarded and searched. Local and state law enforcement entities frequently rely on agents to assist with aliens of all nationalities and to serve as liaisons with local antiterrorism task forces. The station patrols 65 miles along the border in Pennsylvania and New York, from 8 to 20 miles offshore in waters up to 200feet deep (USDHS, 2010a).

Buffalo-Niagara Falls MSA, New York

Due to the location at Niagara Falls, one of the world's natural wonders, numerous hotels, casinos, cultural attractions, and other tourist venues sit on both the Canadian and U.S. sides of the border at Buffalo-Niagara Falls POE. The economy of the Buffalo-Niagara Falls MSA, which includes Erie and Niagara Counties in New York, while supported by tourism, is heavily industrialized, owing to the historical availability of inexpensive electricity from Niagara Falls and its strategic location as a water transportation hub (FRBNY, 2004). The largest economic sectors by annual payroll are health care and social assistance (\$3.0 billion), manufacturing (\$2.9 billion), finance and insurance (\$1.5 billion), retail trade (\$1.4 billion), and wholesale trade (\$1.3 billion).

- **Buffalo-Niagara Falls POE:** The POE at Buffalo-Niagara Falls has the highest volume of individual crossings, with 13.8 million or 22.4 percent of all U.S.-Canada border crossings in 2009. The Buffalo-Niagara Falls POE consists of six international bridges over the Niagara River and Niagara Falls: Rainbow, Whirlpool, Lewiston-Queenston, and Peace Bridges along with two railroad bridges (NFBC, 2010). The four bridges from Ontario into Buffalo have a combined 38 lanes for POVs, making it the highest capacity land POE entering the United States. The Rainbow Bridge connects the tourist districts of Niagara Falls, New York with Niagara Falls, Ontario and no commercial trucks are permitted on this bridge. The Whirlpool Bridge connects the commercial zones and downtown districts of Niagara Falls, New York with Niagara Falls, Ontario and is restricted to NEXUS card carriers. The Lewiston-Queenston Bridge connects two heritage communities: the Town and Village of Lewiston, New York, with the Village of Queenston in the Town of Niagara-on-the-Lake, Ontario. The Peace Bridge is near the center of downtown Buffalo, New York and Fort Erie, Ontario where it crosses the Niagara River. Heavy trucks can cross only at the Queenston-Lewiston Bridge and the Peace Bridge. Overall, border crossings into the United States at the Buffalo-Niagara Falls POE are predominantly POV and bus travel, with approximately half a million people entering as pedestrians in 2004.

According to a 2000 survey, 70 percent of bridge travelers were American; the majority came from New York (OMOT, 2001). Canadian travelers, primarily originating in

Ontario, made up the bulk of the remainder of bridge crossings. Of the New York residents surveyed, 80 percent characterized the purpose of their trip as tourism. Monthly crossing data show a seasonal surge in July and August each year, which demonstrates that this POE is frequently used by summer vacationers.

Buffalo-Niagara Falls is the second largest POE by trade value, accounting for \$56.5 billion (16.7 percent of all U.S.-Canada trade in 2009). It is the highest-value POE for the pharmaceutical industry, accounting for \$3.2 billion in shipments of pharmaceutical products (39.4 percent of all U.S.-Canada trade). After Detroit, Buffalo-Niagara Falls is the second-highest value POE for shipments of vehicles and parts between Ontario and the United States, which accounted for \$12.9 billion in trade (20.6 percent of all U.S.-Canada trade in 2009). The other major commodities crossing the border at Buffalo-Niagara Falls include machinery and mechanical appliances (11.0 percent), electrical machinery and equipment (6.0 percent), and plastics (5.4 percent).

Jefferson County, New York

Jefferson County, New York is nearly 250 miles northeast of Buffalo, 60 miles north of Syracuse, and 95 miles south of Ottawa and contains the Alexandria Bay/Cape Vincent POE. The county borders Lake Ontario to the west and the St. Lawrence River and the Thousand Islands Region, a popular tourist destination, to the north. Jefferson County has a population of approximately 120,000. Aside from its population centers, much of the land area is rural, comprised of open spaces, agriculture, and forests.

Fort Drum, a military training site in Jefferson County, is the largest employer in northern New York. In 2008, Fort Drum employed 18,681 soldiers and 4,396 civilians with payrolls (including contractors) totaling \$1.0 billion. Each year, approximately 80,000 active and reserve troops receive training and mobilization at Fort Drum (JCNY, 2010). Dairy and farm operations are an important component of industry in Jefferson County. The largest private, nonfarm economic sectors by annual payroll are health care and social assistance (\$204.7 million), retail trade (\$156.6 million), and manufacturing (\$111.0 million).

- Alexandria Bay/Cape Vincent POE: The Bureau of Trade Statistics aggregates crossing data for Alexandria Bay and Cape Vincent in New York. In 2006, BTS reported 51,000 ferry passengers traveled in either direction between Cape Vincent, New York, and Wolfe Island, Ontario, which is a small fraction of the 1.8 million individual crossings reported for the Alexandria Bay/Cape Vincent POE in 2009. The POE is the sixth largest POE in terms of crossing volume between the United States and Canada. A significant increase in POVs in the summer months suggests considerable tourist usage, with a large number returning from trips in Canada because inbound traffic is highest on Sunday and Monday and decreases throughout the week (NYDOT, 2005).

The Alexandria Bay POE, also known as the Thousand Islands Crossing, connects Wellesley Island, New York with Hill Island, Ontario. The Thousand Islands International Bridge consists of one U.S. span, three Canadian spans, and one International span. The International span across the border is 90 feet long and is the shortest international, vehicular bridge in the world (JCNY, 2010). There are no pedestrian or train crossings.

The Alexandria Bay/Cape Vincent POE is the eight largest in terms of trade value, accounting for \$9.8 billion (2.9 percent of all U.S.-Canada trade in 2009). The major commodities in terms of trade value are paper and paperboard (10.5 percent), aluminum (9.9 percent), machinery and mechanical appliances (9.1 percent), and natural or cultured pearls, precious or semiprecious stones, and precious metals (8.0 percent).

St. Lawrence County, New York

St. Lawrence County, New York, which contains the Massena POE, is a large, but fairly rural area comprised of small towns, farms, and forests. It has a population of nearly 110,000. Part of the county is in the Adirondack region, a patchwork of private and public lands, with several hamlets, paper and wood product industries, and recreational areas for fishing, hunting, hiking, canoeing, birding, cycling, snowmobiling, back-country skiing, or sightseeing (SLCG, 2010). The county has thousands of acres of state land, including wilderness areas that are open to public recreational use. A casino lies six miles inside the U.S. border on the St. Regis Mohawk Reservation (Seaman et al., 2004). The dominant economic sectors in terms of annual payroll are health care and social assistance (\$210 million), manufacturing (\$187.9 million), and retail trade (\$117.3 million).

- **Massena POE:** The Massena POE is a single crossing that connects the main street in Cornwall, Ontario with New York State Route 37 by way of two bridges across the St. Lawrence River. One bridge connects the U.S. mainland to Cornwall Island and the second connects the island to the Canadian mainland. The crossing is 65 miles southeast of Ottawa and 75 miles southwest of Montreal. Crossings at Massena are primarily by POV; there is no railway crossing the border. Massena has the seventh highest volume of individual crossings, approximately 1.6 million crossings in 2009 (2.6 percent of all U.S.-Canada crossings). Almost one-third of travelers surveyed in 1997 crossed the bridge daily, compared to less than 10 percent at other crossings (Seaman et al., 2004).

Massena is a smaller POE in terms of trade value, accounting for \$429.9 million (0.1 percent of all U.S.-Canada trade in 2009). The major commodities crossing the border at Massena in terms of trade value are copper (34.2 percent), mineral fuels and oils (17.5 percent), and special classification provisions (5.4 percent). The border is also a transportation thoroughway for the paper and wood product industries that operate in the region.

Clinton County, New York

Clinton County, New York, which contains the Champlain-Rouses Point POE, is the most northeastern county in the state. It borders Vermont across Lake Champlain to the east and Les Jardins-de-Napierville and Le Haut-Richelieu, Quebec to the north. Part of Clinton County is in the Adirondack region. The population is approximately 82,000. The dominant economic sectors in Clinton County in terms of annual payroll are health care and social assistance (\$186.6 million), manufacturing (\$150.1 million), retail trade (\$107.0 million), and transportation and warehousing (\$63.6 million). The top four sectors account for 60.5 percent of private, nonfarm jobs in the county.

- Champlain-Rouses Point POE: The Champlain-Rouses Point POE consists of four separate crossing points, one linking Champlain with Covey Hill, Quebec, and three linking Champlain with Lacolle, Quebec. The most heavily traveled crossing is between Interstate 87 in the United States and Highway 15 in Canada. The Champlain-Rouses Point POE is 30 miles north of Plattsburg, 175 miles north of Albany, and 45 miles south of Montreal. It is the only major land crossing between New York and Canada that does not have a river crossing (Seaman et al., 2004). The Champlain-Rouses Point POE has the fifth highest crossing volume, accounting for 2.8 million individual crossings or 4.6 percent of all U.S.-Canada crossings in 2009.

Champlain-Rouses Point is the fourth largest POE in terms of trade value, accounting for \$19.2 billion or 5.7 percent of all U.S.-Canada trade in 2009. It is one of the busiest truck crossing points between the United States and Canada. In the 1990s, cross-border truck shipments increased by 5.1 percent annually. The rapid growth of commercial trucking led to massive congestion and several fatalities involving truck drivers in the early 2000s. Champlain-Rouses Point is the single largest freight crossing for natural or cultured pearls, precious or semiprecious stones, and precious metals. In 2009, Champlain-Rouses Point accounted for \$1.7 billion or 45.1 percent of U.S.-Canada trade for these particular commodities. Natural or cultured pearls, precious or semiprecious stones, and precious metals accounted for 8.6 percent of total trade value by surface transportation at the Champlain-Rouses Point POE. The other major commodities by percentage of trade value crossing the border at the Champlain-Rouses Point POE are machinery and mechanical appliances (10.0 percent), vehicles and parts (7.1 percent), mineral fuels and oils (6.2 percent), and paper and paperboard (6.0 percent).

Ontario, Canada

Ontario lies to the north of the Sault Ste. Marie POE and BPS, Detroit POE and BPS, Port Huron POE, Sandusky BPS, Erie BPS, Buffalo-Niagara Falls POE, Alexandria Bay/Cape Vincent POE, and Massena POE sites. Ontario is Canada's largest province in terms of population. It is home to Canada's most populous city, Toronto, and the national capital, Ottawa. Ontario borders Minnesota, Michigan, and New York; Ohio and Pennsylvania lie across Lake Erie. Ontario is also home to the popular destination of Niagara Falls, which draws millions of tourists, providing upscale hotels, casinos, and cultural attractions in addition to the scenic views. Ontario accounts for more than half of the total value of all U.S.-Canada trade through the following POEs: Alexandria Bay/Cape Vincent, Buffalo-Niagara Falls, Detroit, International Falls, Port Huron, Massena, and Sault Ste. Marie.

Ontario contains Canada's largest manufacturing sector and is the largest North American automobile manufacturer, ahead of Michigan and all of Mexico (GOO, 2010). Ingersoll, Brampton, Windsor, Oakville, St. Thomas, Oshawa, Alliston, Cambridge, and Woodstock have major motor vehicle assembly plants (ICAN, 2010). Ontario is also the center of high tech, financial services, and other knowledge-intensive industries, accounting for roughly half of all Canadian employment in those industries. In terms of annual payroll, the largest economic sectors in Ontario are manufacturing (\$42.2 billion), professional, scientific, and technical services (\$24.1 billion), and health care and social assistance (\$21.5 billion). Retail trade accounts for the largest number of jobs after manufacturing.

Quebec, Canada

Quebec lies to the north of the Champlain-Rouses Point POE in eastern-central Canada and shares an international border with New York, Vermont, New Hampshire, and Maine. Quebec is the second largest Canadian province, accounting for 24 percent of the entire population. Most of the population lives on either shore of the St. Lawrence River between Montreal and Quebec City. Half of Quebec's population lives inside the Montreal metropolitan area. French is the native language for 80 percent of the population. Montreal is a major tourist destination due to its rich history, distinct heritage, and culture. The International Jazz Festival and the Montreal Casino attract many visitors. In the winter, tourists travel to Quebec to enjoy the numerous ski resorts. Mont-Tremblant, 150 kilometers (93.2 miles) north of Montreal, is one of the most popular resorts for U.S. tourists. Quebec City, the capital of Quebec, is the second largest urban center. During the international Winter Carnival, Quebec City also hosts great numbers of visitors.

Quebec is home to several high-tech industries, including aerospace companies and the Canadian Space Agency, and a large public sector. Montreal is a center of commerce, industry, technology, culture, and finance, while the economy of Quebec City is dominated by public administration and government services. The dominant economic sectors in Quebec by annual payroll are manufacturing (\$23.4 billion), health care and social assistance (\$14.0 billion), professional, scientific, and technical services (\$11.6 billion), and public administration (\$11.2 billion). Significant paper and pulp products industry exist outside of the major urban centers. The lumber industry is the economic cornerstone of close to 250 of Quebec's municipalities and generates approximately 40,500 direct jobs (QFIC, 2010). Quebec is also an important agricultural producer. It is the largest dairy producer in Canada and produces nearly 75 percent of the world's maple syrup.

6.11 CULTURAL AND PALEONTOLOGICAL RESOURCES

6.11.1 INTRODUCTION

This section provides an overview of cultural and paleontological resources located in the Great Lakes Region of the northern border and discusses potential impacts of CBP's program alternatives on those resources.

6.11.2 AFFECTED ENVIRONMENT

6.11.2.1 Archaeological Resources: Prehistoric/Precontact Context

Among the known cultural resources in the Great Lakes Region are archaeological sites from the prehistoric and pre-European contact periods. This section provides an overview of those periods. An expanded prehistoric and pre-European contact-period context and references can be found in Appendix H. In North America, the Prehistoric/Precontact era is generally divided into three broad periods: Paleo-Indian, Archaic, and Woodland/Ceramic/Late. During the Prehistoric era, North-American groups evolved from highly nomadic big-game hunters to politically sophisticated and sedentary Tribes and nations employing large-scale agriculture. There are thousands of known archaeological sites within the Great Lakes Region, which represent a fraction of the potential sites that may exist in the region. This record of known sites has been built up over the years as a result of reports by amateurs and vocational archaeologists as well as the result of formal archaeological surveys conducted by professionals and academics. In parallel with the evolution of prehistoric groups from nomadic hunting to sedentary agriculture and the resulting increases in population, sites from the earlier periods (ca. 12,000 to ca. 7,000 years before present [B.P.]) are rare. Sites from the later periods account for the bulk of the known sites in the region.

Paleo-Indian Period

The Paleo-Indian period (ca. 12,000 to ca. 10,000 B.P.) is similar in much of the study area and was characterized by people inhabiting the recently de-glaciated environment. Subsistence was dominated by big-game hunting of mastodon, mammoth, caribou, horse, bison, musk-ox, giant ground sloth, white-tailed deer, elk, moose, and wapiti, along with species of smaller mammals, birds, fish, reptiles, and shellfish. These early hunting groups generally had highly mobile lifeways. There are several types of Paleo-Indian sites including small camps; workshops/quarries; kill sites; rockshelters/cave camps; major, recurrently occupied camps; and possible cremation sites.

Archaic Period

During the Archaic period (ca. 10,000 to ca. 3,000 B.P.), the environment changed from unstable post-glacial conditions to an essentially modern state. In the context of this changing landscape came numerous cultural and technological changes. People gradually adopted less-mobile lifestyles. At the same time, they broadened the variety of resources on which they depended for food and shelter. Some groups began regularly interacting and trading with other people across large distances—sometimes over a thousand miles away. There are relatively few sites from the first 3,000 years of the Archaic known in the northern portion of the United States, a fact probably related to the continually changing climate and environment. Sites from the last 4,000 years of the period are more common and show people had developed a great variety of tool

types and styles, mostly made from stone, bone, and wood. In general, Archaic sites are found along water and on lake plains.

Woodland/Ceramic/Late Period

The Woodland/Ceramic/Late period lasted from 3,000 B.P. to the time when European trade goods reached Indian groups (450 to 250 B.P.). During this time, people invented several new technologies, including clay pots and the bow and arrow. Long-distance trade intensified. Groups adopted agriculture, developed even less-mobile lifeways than before, and started living in larger settlements, some with over 1,000 inhabitants. East of the Mississippi, some groups constructed large mounds that were used for burying their dead or other ceremonial purposes. In the millennium before contact with Europeans, many people in the eastern half of the United States came to rely heavily on maize, beans, and squash and started living in large villages that had defensive walls and were located in easily defendable locations, such as elevated terrain near rivers.

6.11.2.2 Prehistoric Archaeological Site Probability

Archaeologists use a variety of information and techniques to carry out *predictive modeling*, the process of assessing the probability of the existence of archaeological sites in a given location. This section provides an overview of the current understanding of archaeological site probability in the Great Lakes Region.

New York

For any given time period and geographic area, knowledge of the prehistoric past in New York State is minimal at best. The archaeological database indicates that Native American land-use patterns throughout the study area changed significantly in the approximately 12,000 years prior to contact with Europeans. While some landscape characteristics preferred by prehistoric groups for locating their occupations and activity sites are understood at a rudimentary level (such as proximity to water sources for consumption and transportation and a proclivity for sites to be on level terrain with relatively well-drained soils), our knowledge of these patterns is, in general, very scanty. For these reasons, the New York State Historic Preservation Office (SHPO) considers all previously uninvestigated, undisturbed areas to be potentially archaeologically sensitive and recommends Phase I archaeological field investigations of any project area that cannot be documented as having been disturbed to the point where it will not yield additional information concerning the prehistoric past, regardless of whether any other prehistoric archaeological resources have been identified nearby. However, some areas are considered to have greater archaeological sensitivity. For instance, in cases where known sites are in proximity to a project area, or for project areas located near sources of stone used for tool-making or close to water, including wetlands, rivers, lakes, the SHPO may recommend more intensive survey during the Phase I field investigation. The State of New York has no formal, standardized model for assessing prehistoric archaeological sensitivity. The identification of sensitive settings and the formulation of methods for investigating them are typically addressed during consultation with the SHPO on a project-specific basis.

Pennsylvania

For any given time period and geographic area, knowledge of the prehistoric past in Pennsylvania is minimal at best. Archaeological data indicates that Native American land-use

patterns throughout the study area changed significantly in the approximately 12,000 years prior to contact with Europeans. Although some landscape characteristics preferred by prehistoric groups for locating their occupations and activity sites are understood at a rudimentary level (such as proximity to water sources for consumption and transportation and a proclivity for sites to be on level terrain with relatively well-drained soils), our knowledge of these patterns is very scanty. For these reasons, the Pennsylvania Bureau of Historic Protection (BHP), which serves as SHPO, considers all previously uninvestigated, undisturbed areas to be potentially archaeologically sensitive and recommends Phase I archaeological field investigations of any project area that cannot be documented as having been disturbed to the point where it will not yield additional information concerning the prehistoric past, regardless of whether any other prehistoric archaeological resources have been identified nearby. However, some areas are considered to have greater archaeological sensitivity. For instance, in cases where known sites are in proximity to a project area, or for project areas located near sources of stone used for tool-making or close to water, including wetlands, rivers, lakes, the BHP may recommend more intensive survey during the Phase I field investigation. Pennsylvania has no formal, standardized model for assessing prehistoric archaeological sensitivity. The identification of sensitive settings and the formulation of methods for investigating them are typically addressed during consultation with the BHP on a project-specific basis.

Ohio

Knowledge of the prehistoric past in Ohio is minimal, at best, regardless of time period and geographic area. The archaeological database indicates that Native American land-use patterns throughout the study area changed significantly in the approximately 12,000 years prior to contact with Europeans. While some landscape characteristics preferred by prehistoric groups for locating their occupations and activity sites are understood at a rudimentary level (such as proximity to water sources for consumption and transportation and a proclivity for sites to be on level terrain with relatively well-drained soils), our knowledge of these patterns is, in general, very scanty. For these reasons, the Ohio Historic Preservation Office (OHPO), which acts as SHPO, considers all previously uninvestigated, undisturbed areas to be potentially archaeologically sensitive and recommends Phase I archaeological field investigations of any project area that cannot be documented as having been disturbed to the point where it will not yield additional information concerning the prehistoric past, regardless of whether any other prehistoric archaeological resources have been identified nearby. However, some areas are considered to have greater archaeological sensitivity. For instance, in cases where known sites are in proximity to a project area, or for project areas located near sources of stone used for tool-making or close to water, including wetlands, rivers, lakes, the OHPO may recommend more intensive survey during the Phase I field investigation. The State of Ohio has no formal, standardized model for assessing prehistoric archaeological sensitivity. The identification of sensitive settings and the formulation of methods for investigating them are typically addressed during consultation with the OHPO on a project-specific basis.

Michigan (Lower Peninsula)

An overarching understanding of the development and progression of prehistoric Native American land-use patterns across the eastern Lower Peninsula is uneven for some time periods. The distribution of sites and the environmental settings in which they occur was greatly influenced by changes in the natural environment and fluctuations in the levels of the Great

Lakes. Available information suggests that Paleo-Indian, Early Archaic, and Middle Archaic sites are associated with the morainal ridges and shores of Lake Algonquin and other relict beach ridges. The Saginaw River Valley, with its extensive tracts of wetland areas and river systems, was a major draw for prehistoric populations. With the variations in lake levels, the potential for deeply buried sites in the river valleys is greatly enhanced. Although more interior and upland settings were used for short-term resource extraction and winter hunting, many of the sites in these areas appear to be located close to water courses and wetland areas. Through the course of the Late Archaic period, use of major river valleys and upland areas intensified and a broader array of settings appear to have been used.

Early Woodland settlement patterns appear to have focused on the Saginaw River Valley and the uplands along other major river systems. During the Middle Woodland period, with its increased emphasis on the use of wetland and other aquatic resources, coastal and riverine settings continued to be emphasized. Other settings that probably figured prominently in the settlement systems were relict beach ridges, interior lakes and wetlands, smaller stream valleys, and headwater settings. These types of settings also played an important role in Late Woodland settlement patterns, although there appears to be an emphasis on placing larger settlements in riverine or near-coastal areas for access to Great Lakes fish in the north and easily tillable soils in the south.

Michigan (Upper Peninsula) and Wisconsin

Overarching understanding of the development and progression of prehistoric Native American settlement and land use in Michigan's Upper Peninsula and northern Wisconsin is uneven for some periods. The distribution of sites and understanding of their environmental settings is also greatly influenced by changes in the environment, both in terms of the distributions of natural resources and also in regards to fluctuations in the levels of the Great Lakes prior to modern lake levels. Although Paleo-Indian, Early Archaic, and Middle Archaic sites are uncommon, information at hand suggests that they focused on features such as the Lake Algonquin shoreline during the initial period, other proglacial lake features during later times, interior lake-side settings, and other contexts such as the uplands bordering the major river valleys and glacial moraines. Through the course of the Late Archaic period, use of these types of features intensified, particularly in areas of expanding population.

Early Woodland settlement patterns, though largely unknown, may be hypothesized to follow general patterns developed during the Late Archaic and earlier eras. Over the course of the Middle Woodland, with its increasing emphasis on aquatic resources, coastal and riverine environments continued to be emphasized. Within these zones, relict beach ridges and settings near the mouths of major rivers were particularly important. Other settings that figured importantly in the settlement systems include interior lakes, interior dunes, and the edges of interior wetlands. These types of settings continued to be used during the Late Woodland period with the addition of or increased emphasis on the use of coastal areas.

6.11.2.3 Historic Context

This section provides a brief historic context that describes the development of the Great Lakes Region after European contact. An expanded historic context and references can be found in Appendix H.

Contact between Indigenous people and Europeans began in the early 1600s along the eastern Great Lakes, extending throughout the Great Lakes by the 1640s. Visits by missionaries and fur traders increased in frequency after the 1650s. Beginning in central New York and eastern Michigan, French exploration spread from east to west. The earliest settlements were in Michigan and New York, as forts were established at lake points during the eighteenth century and extended into the northern Great Lakes. Prior to 1754, French forts were established at present-day locations such as Ogdensburg, Oswego, Youngstown (New York), Erie, Detroit, Mackinaw City, and Port Huron. Most of the PEIS area was sparsely settled until the middle of the nineteenth century. The French and Indian War (1754–1763) began in the Ohio valley and spread throughout the Great Lakes as prominent battles were fought on both sides of the border (Starbuck, 1994). The American Revolution (1775–1783) features several battles on the frontier in New York and Ohio but was a minor presence in the western lakes. Jay’s Treaty with Great Britain (1796) resolved several issues smoldering since the conclusion of the Revolution. As a result of the treaty, the British withdrew their soldiers from posts along the northern border between the United States and Canada, and a commission was established to settle outstanding border issues between the United States and Canada. Despite vacating their Great Lakes forts, Great Britain remained in control of the lakes until the conclusion of the War of 1812.

While New York and Pennsylvania were two of the original 13 states, Wisconsin, Ohio, and Michigan were part of the Northwest Territories established in the late 1780s. Eastern Minnesota was included as part of the Northwest Territories and western Minnesota was part of the Louisiana Purchase. Northern Ohio and eastern Michigan were the scenes of numerous battles between Indians and the new Federal Government in the period before the War of 1812. The Great Lakes and western New York were important theaters during that conflict.

Initial occupations in the region were fur trading, logging, and agriculture (with dairy farming developing during the nineteenth century). Timbering experienced resurgence in the late nineteenth century. Population of the Great Lakes area grew slowly until after the opening of the Erie Canal to Buffalo in 1825.

During the nineteenth century, development of transportation routes opened the region to settlement. New routes included a variety of highway types, canals, and later the railroads, which were heavily concentrated in the eastern United States. These new routes opened new locations and opportunities for conducting business. In the western lakes, copper and iron mining, manufacturing, and lake shipping were primary occupations. In the eastern lakes, Buffalo became a leading transshipment point for grain and coal coming east and people going west. This position was enhanced during the late-nineteenth century as railroads supplanted canals as primary carriers of coal.

Cities on the Great Lakes that became major manufacturing, heavy industry, and shipping centers after the Civil War and into the twentieth century included Duluth, Detroit, Cleveland, Sandusky, Youngstown (Ohio), Buffalo, and Rochester. Their exalted industrial position deteriorated during the last half of the twentieth century, as industrial plants closed and workers relocated.

6.11.2.4 Historic/Protohistoric Archaeological Site Probability

Among the known cultural resources in the Great Lakes Region are archeological sites from the historic and post-European contact periods. This section provides an overview of the current understanding of historic archaeological site probability in the Great Lakes Region. This includes the Protohistoric period (defined as the time between the initial arrival of European goods and diseases and actual contact between Native Americans and non-Natives), which began as early as the first half of the sixteenth century A.D. (450 to 400 B.P.). Items of European manufacture were quickly integrated into Native American lifeways during this time; examples include sheet brass; copper and iron kettles; items derived from sheet-metal kettles, such as tinkling cones, projectile points, and other tools and ornamental items; colorful glass trade beads; and iron axe blades.

Protohistoric and early historic developments throughout the Great Lakes area were dominated by the European-based fur trade and the participation in it by the Five-Nations Iroquois. Many groups throughout the area were either “dispersed” by the Iroquois (a process that began in the first half of the seventeenth century) or were impacted by Iroquois practices in other ways (such as adopting the remnants of dispersed groups). While the types of sites throughout the Great Lakes area remained largely consistent with those of earlier times, their numbers and distributions changed in ways that reflected the impacts of Iroquois fur-trade practices. In New York State, frequent Iroquois interaction with Europeans brought exposure to disease. Populations declined somewhat; settlements became smaller, but more numerous. In peripheral zones adjacent to the Iroquois Confederacy, populations largely disappeared for a time, such as in southwestern New York, northwestern Pennsylvania, and northern Ohio.

New York

In general, historical-period archaeological sites in the study area will be associated with mapped structures or documented historical events, such as battles. However, the precise locations of historical deposits are seldom known before archaeological investigations, and there is always the possibility that unmapped or unrecorded historical resources are present in the study area, particularly in its more remote locations. Thus, the New York SHPO considers all previously uninvestigated and undisturbed areas to be potentially sensitive for historical archaeological resources and recommends Phase I field investigations for project areas that cannot be documented as disturbed, regardless of whether any additional historical resources have been identified nearby. However, some areas are considered to have greater sensitivity for historical resources, such as those in proximity to mapped historical structures or events. In these cases, the SHPO may recommend a more intensive survey during the Phase I field investigation. The State of New York has no formal model for evaluating historical archaeological sensitivity. The identification of sensitive settings and the formulation of methods for investigating them are typically addressed during consultation with the SHPO on a project-specific basis.

Pennsylvania

In general, historical-period archaeological sites in the study area will be associated with mapped structures or documented historical events, such as battles. However, the precise locations of historical deposits are seldom known before archaeological investigations, and there is always the possibility that unmapped or unrecorded historical resources are present in the study area, particularly in its more remote locations. Thus, the Pennsylvania BHP considers all previously

uninvestigated and undisturbed areas to be potentially sensitive for historical archaeological resources and recommends Phase I field investigations for project areas that cannot be documented as disturbed, regardless of whether any additional historical resources have been identified nearby. However, some areas are considered to have greater sensitivity for historical resources, such as those in proximity to mapped historical structures or events. In these cases, the BHP may recommend a more intensive survey during the Phase I field investigation. The Commonwealth of Pennsylvania has no formal model for evaluating historical archaeological sensitivity. The identification of sensitive settings and the formulation of methods for investigating them are typically addressed during consultation with the BHP on a project-specific basis.

Ohio

In general, historical-period archaeological sites in the study area will be associated with mapped structures or documented historical events, such as battles. However, the precise locations of historical deposits are seldom known before archaeological investigations, and there is always the possibility that unmapped or unrecorded historical resources are present in the study area, particularly in its more remote locations. Thus, the OHPO considers all previously uninvestigated and undisturbed areas to be potentially sensitive for historical archaeological resources and recommends Phase I field investigations for project areas that cannot be documented as disturbed, regardless of whether any additional historical resources have been identified nearby. However, some areas are considered to have greater sensitivity for historical resources, such as those in proximity to mapped historical structures or events. In these cases, the OHPO may recommend a more intensive survey during the Phase I field investigation. The State of Ohio has no formal model for evaluating historical archaeological sensitivity. The identification of sensitive settings and the formulation of methods for investigating them are typically addressed during consultation with the OHPO on a project-specific basis.

State of Michigan (Lower Peninsula)

A variety of historic archaeological resources can be expected across the region. Early mission, fur-trading, and military posts have a limited distribution in the eastern Lower Peninsula, with most of this activity occurring in the Straits of Mackinac area, at Detroit, and in the extreme southeastern Lower Peninsula. After the area came under United States control, larger-scale settlement took place. In southern Michigan, much of this settlement was agrarian and occurred in proximity to roads and, eventually, railroads. Industrial development of the region, particularly by the lumber industry, had a significant impact on the landscape in the Saginaw River Valley and more northerly areas. Lumbering facilities were associated with harvested stands of trees, and lumber mills and other support facilities grew up along many of the river systems. The archaeological nature of other, more ephemeral, industrial and commercial developments remains unexplored and poorly understood.

Michigan (Upper Peninsula) and Wisconsin

A wide variety of historic archaeological resources can be expected across the region. These include early mission, fur-trade, and military posts from the era of early European contact, and a variety of sites associated with the historic development of the area after it came under American control. Among the latter site types are domestic and residential sites, transportation features, lumbering camps, and industrial facilities associated with the development of the mining

industry. Residential sites, including abandoned towns, are primarily associated with roadways, rail lines, and harbor settings that developed in conjunction with industry. The placement of lumbering and other industrial facilities was largely determined by the distribution of resources, although they had a close connection with the transportation system.

In general for the entire area, historic archaeological sites can occur in or near present-day municipalities and villages as well as along historic-period roads, particularly cross-roads. Sites may also be found along certain railway sections and waterways.

6.11.2.5 Above-Ground Historic Properties

There are numerous above-ground historic properties along the Great Lakes Region border area that are National Register listed, eligible, or potentially eligible for listing.

New York state has a rich and regionally distinct architectural heritage, which formed from the physical characteristics and relationships shaped by generations of human occupation and led to distinctive patterns of land use and development through history. Architectural and historic resources represented in the 100-mile-wide study area span a period of more than 400 years. The northern half of New York is associated with significant events and people vital to both the history of the state and the Nation. The completion of the Erie Canal in 1825 opened up westward expansion while providing critical commercial and transportation infrastructure for the state. New York's story of settlement, territorial struggle, invention, and expansion is physically and visually expressed in its artifacts, buildings, communities, waterways, and open spaces (NYOPRHP, 2009).

New York state possesses an impressive collection of domestic and commercial buildings associated with Erie Canal's period of significance. New York City's deep harbor and linkage to navigable waterways and corridors west and north promoted regional and international trade, which supported the development of the state's largest urban centers. In addition to an extensive canal system, valley floors supported railroads early in our nation's history and were used a century later in the development of modern highways.

Architectural styles of historic buildings and districts vary widely across the New York study area, which contains many National Register listed or eligible historic resources associated with the following historic and current uses: domestic, commerce/trade, social, government, education, religion, funerary, recreation and culture, agriculture/subsistence, industry/processing/extraction, health care, defense, landscape, and transportation. Some of these resources include examples of every popular architectural style spanning from Colonial through Modern. Significant examples of high-style, architect-designed buildings are found throughout the study area specifically in the major cities of Buffalo, Rochester, Syracuse, Watertown, Malone, and Plattsburgh. These include architectural works ranging from modest-vernacular to high-style examples of national, regional, and local significance.

New York state has a vast rural agricultural heritage, with farming vital to the development of each region in the study area (Western New York, Southern Tier, Finger Lakes, Central New York, and the North Country). Each of these regions features distinctive farm buildings and settings associated with particular farming practices and crops. For example, the traditional agricultural buildings common in the North-Country region such as enclosed barnyards, sugar

houses, hop kilns, ash houses, and smokehouses differ from those of the primarily dairy-farm heritage of Western and Central New York. Architectural styles and plans for farmhouses across the state include regional vernacular interpretations of popular domestic architectural styles to modest vernacular buildings lacking ornamental detail.

New York has an impressive collection of early-to-mid-nineteenth century cobblestone and stone masonry buildings. Beginning in the early nineteenth century, stone-masonry construction was common in the North-Country and Central regions of the state. In the western portion of the state within a 65-mile radius of Rochester, approximately 700 cobblestone structures were erected during a 35-year span in the middle of the nineteenth century. Types of cobblestone and stone buildings included homes, farmhouses, barns, stagecoach taverns, smokehouses, stores, churches, schools, and factories.

Other architectural resources unique to New York include modest- and large-scale summer homes, estates, and cottages located in the Thousand Islands, Adirondacks, Finger Lakes and the shores of Lakes Erie and Ontario. For example, from the late-nineteenth century until World War I, many of America's wealthiest and most prominent families purchased real estate in the Adirondacks and commissioned the construction of multi-building estates in a rustic, artistic style known as "Great Camps." During the same period, architect-designed summer estates also known as "castles" were built in the Thousand Islands.

The study area includes all of New York state's Seaway Trail, a state and national scenic byway, which follows 454 miles of the state's northern coastal region along the shores of Lake Erie, Lake Ontario, and the St. Lawrence River. The Great Lakes Seaway Trail is one of America's byways and is recognized for its unique landscape, scenic freshwater coastline, and historical significance. The Seaway Trail has some 25 historic lighthouses, sites associated with the French and Indian War and Revolutionary War, and 42 War of 1812 sites. The Seaway-Trail region was the vital transportation and communication link between France and its colonies.

Pennsylvania's rich architectural heritage reflects the state's broad patterns of settlement, growth, and change. Historic architectural resources in the state span from the 1700s through 1960 with the majority dating from the state's most intensive development in the late- and early twentieth century. . The Commonwealth's wide range of regional and national architectural styles is represented in an array of high-style, architect-designed, pure examples and vernacular adaptations of designs that integrate styles and cultural influences. . The historic buildings of Pennsylvania encompass many themes from government, education, agriculture, and industry, to religion, recreation, and commerce. Some architectural styles were modified for specific functions and some styles developed specifically for special uses.

Architectural styles of historic structures and districts vary widely across the large area encompassed by this study. Common historic building types in Pennsylvania include mills, agricultural and industrial complexes, railroad-related structures, schools, churches, novelty buildings, lake-transport and shipping facilities, forest and extraction industrial buildings, state-park structures, and a wide variety of vernacular domestic forms. These buildings may include details of established historic architectural styles, but their appearance is more dictated by necessity and the function they serve. Other historic resources include burial grounds and cemeteries.

Agriculture has played a critical role in the history and economy of Pennsylvania. The state has long been recognized for its rich historic farm landscape. Distinctive historic agricultural regions from ca. 1700–1960 in northwestern and north-central Pennsylvania include the following: Lake Erie Fruits and Vegetables; Northwestern Woodland, Grassland, and Specialized Farming; Allegheny Mountain Part-Time Farming; Northern Tier Grasslands; and North and West Branch Susquehanna Valleys.

Historic properties in Ohio include residences, commercial buildings, institutions (churches and schools), industrial buildings, farmsteads, and designed landscapes that reflect all aspects of the state's heritage. These historic resources illustrate life in Ohio ranging in date from approximately 1795 through 1960. Associated themes include agriculture, art and recreation commerce, finance, domestic architecture, education, government, social welfare, health, industry and manufacturing, military, planning and landscape architecture, religion, settlement, ethnic groups and migration, transportation, science, and communications. According to National Register data for Ohio, domestic architecture is the most prevalent category followed by settlement. Most domestic properties were constructed in the last half of the nineteenth century until the Depression, with the largest number of Ohio's domestic properties occurring in its twentieth-century neighborhoods. Numerous historic districts have been designated in the varied neighborhoods of Ohio's cities.

Northeast Ohio has a distinctive architecture and landscape due to the presence of numerous towns built by New Englanders. At the end of the 1700s, northeast Ohio was a Connecticut colony, the Western Reserve. General Moses Cleveland and a team of surveyors laid out five-mile-square townships from the Pennsylvania line west to the Cuyahoga River across the Lake Erie coast. Western-Reserve towns evoke New-England architectural and planning traditions, with central greens dominated by public buildings. New-England-trained carpenters incorporated into their building design patterns from builder's manuals (Ware, 2002). In addition to frontier buildings, northeastern Ohio's historic-building stock is also distinguished, through its late-nineteenth-century industrial prosperity, with an array of high-style, Victorian-era buildings (e.g., domestic, commercial, religious, transportation, and education). Settlement in Northwest Ohio occurred much later due to the vast uninhabitable Great Black Swamp, which included 1,500 square miles of dense, wet forest. The setting for the architecture in Northwest Ohio is distinguished by the region's flat terrain.

Ohio's agricultural properties are concentrated along major transportation routes and the peripheries of the state's major cities. In northeastern Ohio, agriculture focused on dairy and cheese farms while near Lake Erie viticulture was prominent. Northwestern Ohio did not become productive agriculturally until the late-nineteenth century when the Great Black Swamp was tilled and drained. Designated agricultural properties include barns, farmhouses, outbuildings, and agricultural fields. Most buildings date to 1850–1899, followed by the 1900–1924 period (OHPO, 2010).

Buildings of most styles and forms established across the country exist in Michigan's Lower Peninsula. Perhaps the earliest building style constructed in Michigan was Greek Revival. Cobblestone houses or commercial buildings, often in Greek-Revival style, are also present in the lower part of the Peninsula. In Michigan, some variations on building forms, such as the Hen-and-Chicks, are present, particularly in the southern part of the state where settlement

occurred earlier. The I-House is also present in the state. Mid-Century-Modern homes are present across the state, although more are present in urban areas than in rural areas. Rustic-style homes and commercial buildings are often associated with the resort areas of northern Michigan, as are large-scale, Victorian-era hotels and lodges.

The most common building type across the state is the single-family home. Blocks of houses occupy most of southeast Michigan; apartments and condominiums are present primarily in urban areas. In more rural areas, houses are surrounded by agricultural buildings, forming farmstead complexes. Scientific farming has resulted in the decline of family-owned farms, but many complexes still survive in areas where scientific farming is impractical. Because of the large number of recreational opportunities associated with lakes, waterways, and hundreds of miles of lakeshore, Michigan boasts a large number of cottages and retreats. These same shorelines also contain lighthouses, docks, piers, and harbors. Early industrial buildings line many of the waterways in the state, particularly near harbors and shipping ports. Over the last half century, some of these industrial areas have been converted into parkland or “parks” of industrial buildings in less desirable locations.

Commercial centers are situated in most downtown areas, from the smallest community with a single gas station to the largest cities. Historically, these commercial centers consisted of multi-story buildings packed side by side. In the mid-twentieth century, the nationwide trend of indoor shopping centers made its way to the state. Even in the smallest community, commercial development tends to mean the construction of strip malls, where success is driven by automobile access.

The most prevalent above-ground resource in northern Michigan and Wisconsin is the single-family house. These buildings are found in both urban areas and in rural portions of the region, with a greater trend toward higher-style buildings in urban areas. Houses tend to be smaller than in the southern portions of Michigan’s Lower Peninsula and southern Wisconsin. Apartments and condominiums may be present but tend to be found in urban areas rather than in small towns and rural areas. In rural areas, buildings may be part of a farmstead complex or a camp associated with logging or mining. Because of the large number of recreational opportunities associated with lakes, waterways, and hundreds of miles of lakeshore, the area boasts a large number of cottages and retreats, including housekeeping cabins in motel-like settings, first popularized in the 1930s with the advent of motor travel. Lighthouses, docks, piers, and harbors are situated along lakeshores. Other extant industrial buildings include modern and historic mining facilities.

While the earliest building style constructed in southern Michigan was Greek Revival, there are few buildings of this style present in the northern portion of Michigan’s Lower Peninsula and in the Upper Peninsula because settlement came much later to these areas. Although distinctly more rural than the southern part of the Lower Peninsula, this area does include historic wealth and communities of sufficient size to permit construction of high-style buildings; Second-Empire, Italianate, Gothic-Revival, Beaux-Arts, and Tudor-Revival styles all exist there. Richardson-Romanesque buildings constructed from local red sandstone are scattered across the Upper Peninsula and along Wisconsin’s southern Lake Superior shore.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

While examples of the Art-Deco and Art-Moderne styles are less frequent in Michigan’s Upper Peninsula and Wisconsin, the Craftsman Style Bungalow is found in virtually every community. Rustic-style homes and commercial buildings are often associated with the resort areas of northern Michigan. Large-scale, Victorian-era hotels and lodges constructed to serve those seeking pleasant summers away from allergens and city heat dot major tourist areas such as Mackinac Island, Michigan, and Bayfield, Wisconsin.

Tables 6.11-1, 6.11-3, and 6.11-4 identify historic properties that have been designated as historically important at the national, state, and local levels and briefly describe the historic environments in the vicinity of CBP facilities in the Great Lakes states. Table 6.11-2 lists the historic buildings that reside on CBP property in New York.

Table 6.11-1. Cultural Resources in the Vicinity of CBP Facilities in New York and Pennsylvania

Component*	Type**	Name	Address	National, State, and Local Historical Designations and Environment
NEW YORK				
OFO	POE	Alexandria Bay	46735 Interstate Route 81 Alexandria Bay, NY 13607	Village in the Town of Alexandria; located along the south bank of the St. Lawrence River; Thousand Island Bridge is border crossing; 6 National Register properties in the vicinity (does not include Wellesley Island)
OFO	POE	Buffalo	726 Exchange St, Suite 400 Buffalo, NY 14210	2nd most populous city in state; county seat; located on eastern shore of Lake Erie at head of Niagara River; 78 National Register properties in vicinity including 3 lighthouses, 3 boats (a destroyer, harbor tug, and fireboat), 5 districts, 4 parks or park systems and 1 cemetery
OFO	POE	Lewiston Bridge Complex	Interstate 190 at the Border Lewiston, NY 14092	Sits on banks of Niagara River; portion of town located on top of the Niagara Escarpment; historically significant in European development in North America; Village of Lewiston final stop on Underground Railroad before crossing into Canada; 4 National Register properties in the vicinity including 1 district, 1 archaeological district, and a prehistoric Hopewell mound
OFO	POE	Peace Bridge	Baird Drive at the Border Buffalo, NY 14210	See previous description for the Buffalo POE.
OFO	POE	Rainbow Bridge	Niagara Street at the Border Niagara Falls, NY	City is built along the Niagara Falls waterfalls (which it shares with Canada) and the Niagara Gorge; American Falls & Bridal Veil Falls located on American side; 18 National Register properties in the vicinity including 1 district

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Component*	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Whirlpool Bridge	Whirlpool Street at the Border Niagara Falls, NY	See previous description for the Niagara Falls POE
OFO	POE	Champlain	US Interstate 87 Champlain, NY 12919	Rural border town; important staging point for the military during the War of 1812; town contains 3 border crossings; Champlain POE is one of the most important commercial gateways into Canada; 2 National Register properties in town (See Rouses Point POE)
OFO	POE	Cannon Corners	Cannon Corners Rd at the Border Cannon Corners, NY 12959	Small rural hamlet in western portion of Town of Mooers; no National Register properties in vicinity
OFO	POE	Chateaugay	NY 374/County Rd 52 Chateaugay, NY 12920	Small rural town in North Country; Chateaugay River runs through middle of town; no National Register properties in vicinity
OFO	POE	Churubusco	US NY 189 Churubusco NY 12923	Small rural hamlet in the Town of Clinton near Quebec border; no National Register properties in vicinity
OFO	POE	Fort Covington	NY Route 132 Fort Covington, NY 12937	Small rural border town in the state's North Country; no National Register properties in the vicinity
OFO	POE	Jamieson Line	Country Rd 29/Jamieson Line Rd Burke, NY 12917	POE is located in the Town of Burke; boyhood home of Almanzo Wilder, husband of author Laura Ingalls Wilder; 1 National Register/State Register property which is the Almanzo Wilder Homestead
OFO	POE	Mooers	Hemmingford Road at the Border Mooers, NY 122958	Small border town in north-central Clinton County; formed from the Canada & Nova Scotia Refugee tract for those who took part in the Revolutionary War on the side of the colonies; no National Register properties in the vicinity
OFO	POE	Overton Corners	NY 276 at the Border Champlain, NY 12919	One of three border crossings in the Town of Champlain; see Champlain above; no National Register properties in the vicinity

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Component*	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Rouses Point	NY 9B Rouses Point, NY 12979	Small lakefront village in the Town of Champlain along the “Adirondack Coast;” formed from the Canada & Nova Scotia Refugee Tract; part of the Underground Railroad; one of 3 border crossings in the town; 2 National Register properties in the vicinity including Fort Montgomery
OFO	POE	Massena	30M Seaway International Bridge NY Hwy 37 Rooseveltown, NY 13683	POE is in Hamlet of Rooseveltown in Town of Massena; near Racquette River; 1 National Register property (Robinson Bay Archaeological District) is in the town
OFO	POE	Ogdensburg	Ogdensburg Bridge Plaza Ogdensburg, NY 13669	Border and seaport city in the state’s North Country; located along the St. Lawrence River; Ogdensburg-Prescott International Bridge is POE; 8 National Register properties in the vicinity including 1 district
OFO	POE	Rochester	1200 Brooks Avenue Rochester, NY 14624	City is the “northwestern gateway to NY’s Finger Lakes”; it boasts the 2nd largest regional economy in the state; is the county seat; 93 National Register properties including 3 bridges, 14 districts, 1 lighthouse, and the Municipal Park System of Rochester which is also a State Register property
OFO	POE	Trout River	17013 State Route 30 Constable NY 12926	Small border town in the state’s “North Country;” no National Register properties in the vicinity
USBP	BPS	Massena	135 Trippany Road Massena, NY 13662	Border town along Racquette River; nicknamed “Gateway to the Fourth Coast;” 1 National Register property in the vicinity (Robinson Bay Archaeological District)
OAM	Air Facility	Massena	135 Trippany Road Massena, NY 13662	See previous description for the Massena BPS.
USBP	BPS	Ogdensburg	127 North Water St. Ogdensburg, NY 13669	See previous description for the Ogdensburg POE.
USBP	Sector HQ	Buffalo	600 Colvin Woods Parkway Tonawanda, NY 14150	Town is a northern suburb of Buffalo; 3 National Register properties in the vicinity

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Component*	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OAM	Air Facility	Buffalo	600 Colvin Woods Parkway Tonawanda, NY 14150	See previous description for the Tonawanda Sector HQ.
USBP	BPS	Niagara Falls	1708 Lafayette Avenue Niagara Falls, NY 14305	See previous description for the Niagara Falls POE.
OAM	Air Facility	Niagara	1708 Lafayette Avenue Niagara Falls, NY 14305	See previous description for the Niagara Falls POE.
USBP	BPS	Oswego	19 East Schuyler Street Oswego, NY 13126	Located on Lake Ontario in north-central portion of state; known as the Port City of Central NY; 28 National Register properties in vicinity including Fort Oswego, 1 cemetery, 2 districts, 1 lighthouse, and the Harbor Tug Nash
USBP	BPS	Rochester	171 Pattonwood Drive Rochester, NY 14617	See previous description for the Rochester POE.
USBP	BPS	Wellesley Island	45864 Landon Road Wellesley Island, NY 13640	One of the largest islands of the Thousand Islands; partly in towns of Alexandria and Orleans; linked to Canada by the Thousand Island Bridge; 3 state parks on island; 2 National Register properties in the vicinity including 1 Historic District. A third property, Cragside Manor, is a summer home located on the Border Patrol property and has been determined eligible for National Register listing.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Component*	Type**	Name	Address	National, State, and Local Historical Designations and Environment
PENNSYLVANIA				
OFO	POE	Erie	4459 West 12th Street Erie, PA 16505	4th largest city in state; county seat for Erie County; only lake port city in state; Presque Isle State Park; 24 National Register properties and 3 National Register districts in the vicinity as well as the National Register Freighter the U.S.S Niagara and the National Register Erie Land Lighthouse
USBP	BPS	Erie	7851 Traut Drive Fairview, PA 16415	See previous description for the Erie POE.

*OFO = CBP Office of Field Operations, USBP = U.S. Border Patrol, OAM = CBP Office of Air and Marine

**POE = Port of Entry, BPS = Border Patrol station

Table 6.11-2. Historic Buildings on CBP Property in New York

Building Name	Type	City	Number	Year Finished	Rating Class
Peace Bridge	Bridge	Buffalo	NY-PBB-01*	1927	Eligible for National Register and State Register
Agri. Inspection Station	Other	Champlain	NY0579CB	1951	
Agricultural Processing Station/ Old Border Station	Border Station	Champlain	NY0576CB	1932	
Customs Residence	Residence	Chateaugay	NY0587CI** NY-CHT-02*	1933	5a*** Recommended National Register eligible
Immigration Residence	Residence	Chateaugay	NY0588CI** NY-CHT-03*	1933	5a*** Recommended National Register eligible
Inspection Center	Border Station	Chateaugay	NY0586CI** NY-CHT-01*	1933	4**** Recommended National Register eligible
U.S. Border Station	Border Station	Fort Covington	NY0059ZZ** NY-FTC-01*	1932	5a*** Recommended National Register eligible

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Building Name	Type	City	Number	Year Finished	Rating Class
Customs Residence	Residence	Mooers	NY0628MI** NY-MOO-02*	1932	Not rated Recommended National Register eligible
Immigration Residence	Residence	Mooers	NY0627MI** NY-MOO-03*	1932	Not rated Recommended National Register eligible
Inspection Building	Border Station	Mooers	NY0626MI** NY-MOO-01*	1932	4**** Recommended National Register eligible
Whirlpool Rapids Bridge	Bridge	Niagara Falls / Whirlpool	NY-WHL-01*	1897°	Eligible for National Register and State Register
Border Inspection Station	Border Station	Niagara Falls	NY-WHL-04*	Pre-1950°	Eligible for National Register and State Register
Border Inspection Station	Border Station	Overton Corners	NY-OVE-01*	1932	Recommended National Register eligible
U.S. Border Station	Border Station	Rouses Point	NY0196ZZ** NY-ROU-01*	1931	4**** Recommended National Register eligible
U.S. Border Station	Border Station	Rouses Point	NY0197ZZ	1931	
U.S. Border Station	Border Station	Trout River	NY0216ZZ** NY-TRO-01*	1931	4**** Recommended National Register eligible
Cragside Manor	Summer Home	Wellesley Island	NYSHPO USN# 04502.00076	1886	Determined National Register eligible by the New York State Historic Preservation Office (NYSHPO) but does not appear on National Register List

*Historic Resource Inventory Form Number from New York State Office of Parks, Recreation & Historic Preservation Inventory form.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

**Listed in General Services Administration (GSA) Public Buildings Service (PBS) publication “Held in Public Trust: PBS Strategy for Using Historic Buildings” (May, 1999): Appendix C, GSA Historic Buildings.

***GSA Historic Rating Class 5a: A building 50-yearsold or older that has not been evaluated for National Register eligibility but is likely eligible, such as a courthouse, custom house, or historic office building (“Held in Public Trust” Appendix C; for complete citation see footnote above).

****GSA Historic Rating Class 4: A building considered potentially eligible for the National Register based on historical documentation and/or informal consultation with the NYSHPO. Appears to meet the criteria, but has not been listed or evaluated (“Held in Public Trust” Appendix C; for complete citation see footnote above).

Table 6.11-3. Cultural Resources in the Vicinity of CBP Facilities in Michigan

Component	Type	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Battle Creek	4950 Dickman Road Battle Creek, MI 49037	1 National Register property
OFO	POE	Benton Harbor Seaport	Benton Harbor, MI	1 National Register property; 3 State Register properties
OFO	POE	St. Joseph Seaport	St. Joseph, MI	2 National Register properties (1 bridge, 1 lighthouse); 4 State Register properties; 1 State Register district
OFO	POE	Detroit	477 Michigan Avenue, Rm. 210 Detroit, MI 48226	35 National or State Register properties and 9 districts
OFO	POE	Detroit-Windsor Tunnel	Detroit, MI	See previous description for the Detroit POE.
OFO	POE	Monroe Seaport	Monroe, MI	10 National Register properties (including 2 districts, 1 monument, 1 battle site); 3 State Register properties (including 1 cemetery)
OFO	POE	Ambassador Bridge Passenger Facility	Detroit, MI	1 National Register property
OFO	POE	Port Huron	526 Water Street, Room 301 Port Huron, MI 48060	12 National Register properties (including 1 district, 2 lighthouses, 1 fort site, 2 bridge/tunnel); 12 State Register properties
OFO	POE	Sault Sainte Marie	900 International Bridge Plaza Sault Sainte Marie, MI 49783	12 National Register properties (including 1 ship); 7 State Register properties (including 1 cemetery)
OFO	POE	Alpena Seaport	Alpena, MI	11 State Register properties

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Component	Type	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Cheboygan Seaport	Cheboygan, MI	3 National Register properties (including 1 bridge); 4 State Register properties
OFO	POE	De Tour Seaport	De Tour, MI	1 National Register property
OFO	POE	Escanaba Seaport	Escanaba, MI	3 National Register properties (including 1 lighthouse); 3 State Register properties
OFO	POE	Houghton Seaport	Houghton, MI	9 National Register properties (including 1 historic district); 6 State Register properties (including 1 historic district)
OFO	POE	Marquette Seaport	Marquette, MI	10 National Register properties (including 1 historic district, 1 lighthouse); 10 State Register properties (including 1 cemetery)
OFO	POE	Munising Seaport	Munising, MI	3 National Register properties (including 1 lighthouse); 4 State Register properties
OFO	POE	Port Dolomite Seaport	Port Dolomite, MI	None
OFO	POE	Port Inland Seaport	Port Inland, MI	1 National Register property (lighthouse); 1 State Register property
OFO	POE	Rogers City Seaport (Port of Calcite)	Rogers City, MI	1 National Register property; 1 State Register property
USBP	Sector HQ	Detroit	1331 Atwater Street Detroit, MI 48232	19 National or State Register properties
OAM	Air Facility	Detroit	1331 Atwater Street Detroit, MI 48232	See previous description for the Detroit Sector HQ.
USBP	BPS	Sault Sainte Marie	208 Bingham Avenue Sault Sainte Marie, MI 49783	See previous description for the Sault Sainte Marie POE.

*OFO = CBP Office of Field Operations, USBP = U.S. Border Patrol, OAM = CBP Office of Air and Marine

**POE = Port of Entry, BPS = Border Patrol station

Table 6.11-4. Cultural Resources in the Vicinity of CBP Facilities in Wisconsin

Component	Type	Name	Address	National, State, Local Historical Designations, Historic Environment
OFO	POE	Racine	603 Main Street, Room 207 Racine, WI 53401	National Register and State Register property, US Post Office built 1925; approximately 20 other National Register properties located in downtown Racine
OFO	POE	Milwaukee	4915 South Howell Avenue Milwaukee, WI 53207	None within vicinity, located northwest of South Milwaukee, near airport, surrounded by suburban developments
OFO	POE	Green Bay	2077 Airport Drive Green Bay, WI 54313	None within vicinity, located southwest of city, near airport, near casinos

*OFO = CBP Office of Field Operations

**POE = Port of Entry

6.11.2.6 Native American Resources

This section provides information about the potential location of Native American cultural resources, sacred sites, and traditional cultural properties (TCPs) in the Great Lakes geographic region, based on the geographic location of Native Americans both historically and in the present. There are 33 tribal groups within the Great Lakes area (Table 6.11-5). Nineteen of these Tribes have reservations within the Great Lakes study area (Figure 6.11-1).

Table 6.11.-5. Native American Tribes that Have a Reservation, Judicially Established Interest, or Established Traditional Ties to Land within the 100-mile PEIS Corridor

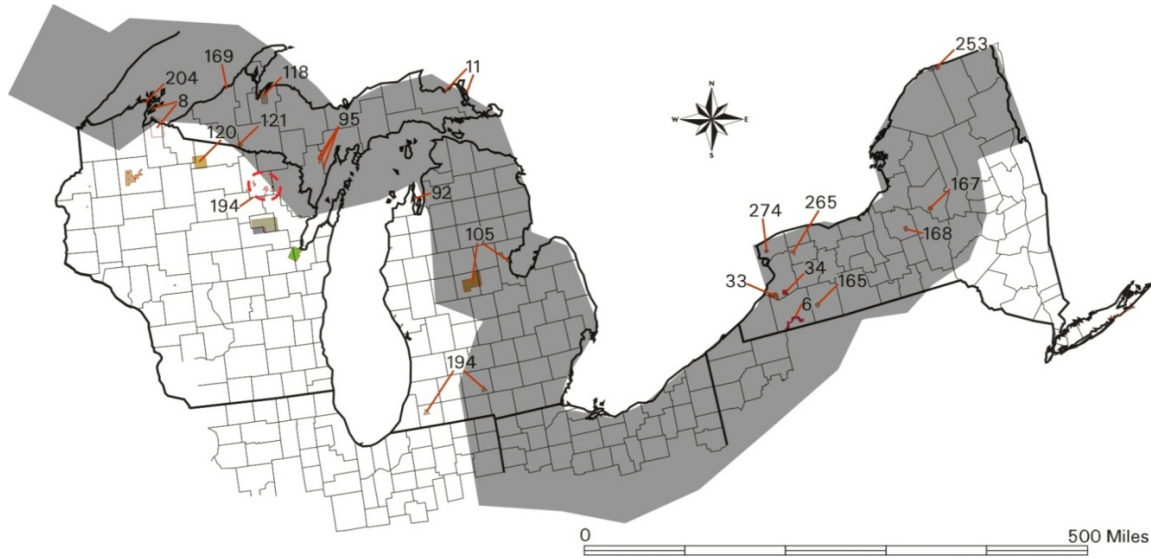
Bad River Band of the Lake Superior Tribe of Chippewa Indians	Menominee Indian Tribe of Wisconsin
Bay Mills Indian Community of the Ojibwe	Oneida Indian Nation of New York
Burt Lake Band of Ottawa & Chippewa Indians, Inc.	Oneida Tribe of Indians of Wisconsin
Cayuga Nation of New York	Onondaga Nation of New York
Delaware Tribe-Ohio	Pokagon Band of Potawatomi Indians (Michigan & Indiana)
Forest County Potawatomi Community	Red Cliff Band of Lake Superior Chippewa Indians of Wisconsin
Grand Traverse Band of Ottawa and Chippewa Indians	Saginaw Chippewa Indian Tribe of Michigan
Hannahville Indian Community	Saint Regis Mohawk Tribe
Ho-Chunk Nation of Wisconsin	St. Croix Chippewa Indians of Wisconsin
Huron Potawatomi, Inc. (Nottawaseppi Huron Band)	Sokaogon Chippewa Community
Keweenaw Bay Indian Community	Sault Ste. Marie Tribe of Chippewa Indians of Michigan
Lac Courte Oreilles Band of Lake Superior Chippewa Indians of Wisconsin	Seneca Nation of New York
Lac du Flambeau Band of Lake Superior Chippewa Indians	Stockbridge Munsee Community
Lac Vieux Desert Band of Lake Superior Chippewa Indians	Tonawanda Band of Seneca Indians of New York
Little River Band of Ottawa Indians	Tuscarora Nation of New York
Little Traverse Bay Bands of Odawa Indians	Wyandot Nation of Ohio
Match-e-be-nash-she-wish Band of Pottawatomi Indians	

The following maps indicate federally recognized Tribes that have a reservation within approximately 100 miles of the Canadian border, have a judicially established connection to land within the 100-mile corridor, or have established traditional ties that may involve traditional cultural properties or archaeological sites. The maps include:

1. A map of Indian reservations located within the 100-mile corridor (Figure 6.11-1);
2. A USGS map showing nineteenth-century cessions, reservations, and portages (Figure 6.11-2). This map was retrieved from ancestry.com; while the sourcing is unclear, the accuracy is corroborated by a 1992 map compiled by the Bureau of Indian Affairs and a 1998 GIS layer created by USGS (not included). The map shows Tribes that had a presence along the northern border 100 years ago and indicates cases where Indian lands were ceded prior to that period;

3. A USGS map showing judicially established Indian land areas as of 1978 (Figure 6.11-3).
. The map portrays the results of cases before the U.S. Indian Claims Commission or U.S. Court of Claims in which an American-Indian Tribe proved its original tribal occupancy of a tract within the continental United States; and,
4. A USGS map indicating early tribal, cultural, and linguistic areas (Figure 6.11-4). The information was derived from anthropological, archaeological, and linguistic studies. The map generally corroborates the other maps with regard to traditional tribal areas.

Figure 6.11-1. Native American Lands Within the 100-mile PEIS Corridor Crossing Wisconsin, Michigan, Ohio, Pennsylvania, and New York

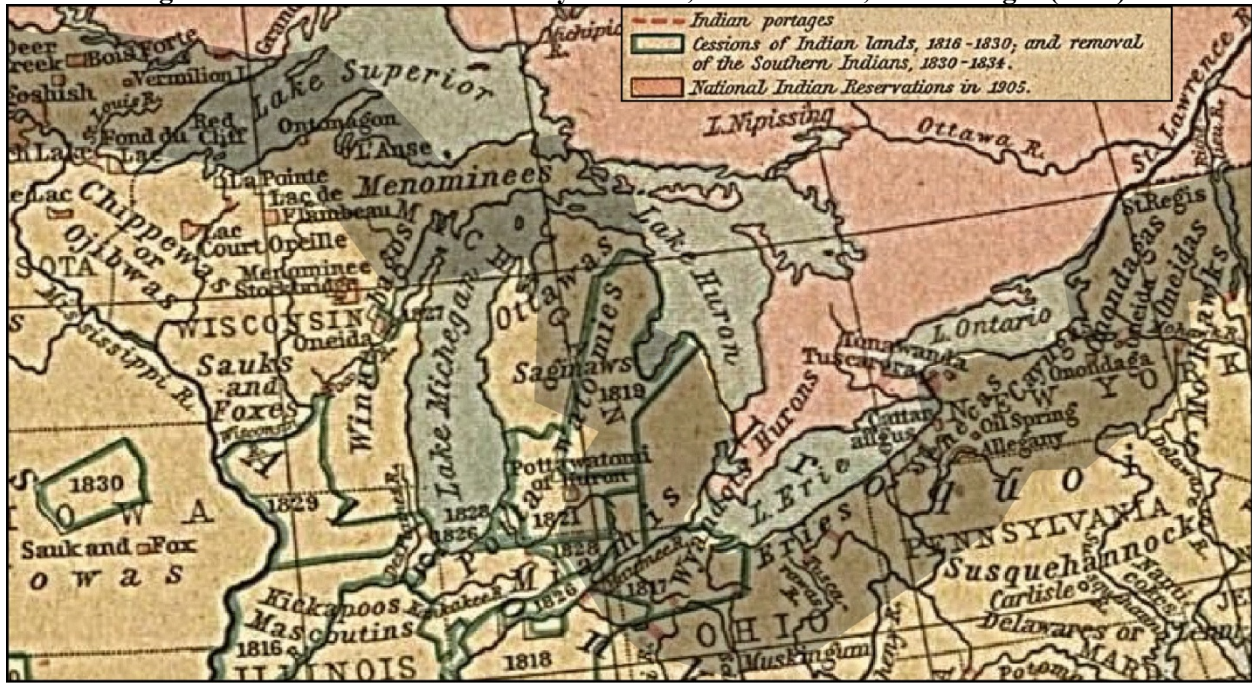


Key for Figure 6.11-1		167	Oneida Indian Nation of New York
8	Bad River band of the Lake Superior Tribe of Chippewa Indians	168	Onondaga Nation of New York
11	Bay Mills Indian Community of the Ojibwe	204	Red Cliff Band of Lake Superior Chippewa Indians of Wisconsin
34	Cayuga Nation of New York	105	Saginaw Chippewa Indian Tribe of Michigan
194	Forest County Potawatomi Community	253	Saint Regis Mohawk Tribe
92	Grand Traverse Band of Ottawa and Chippewa Indians	6	Seneca Nation of New York (Allegany)
118	Keweenaw Bay Indian Community (L'Anse)	33	Seneca Nation of New York (Cattaraugus)
169	Keweenaw Bay Indian Community (Ontonagon)	165	Seneca Nation of New York (Oil Springs)
120	Lac du Flambeau Band of Lake Superior Chippewa Indians	265	Tonawanda Band of Seneca Indians of New York
121	Lac Vieux Desert Band of Lake Superior Chippewa Indians	274	Tuscarora Nation of New York

Source:(USDOJ, 1999).

Note: A shaded 100-mile corridor has been added.

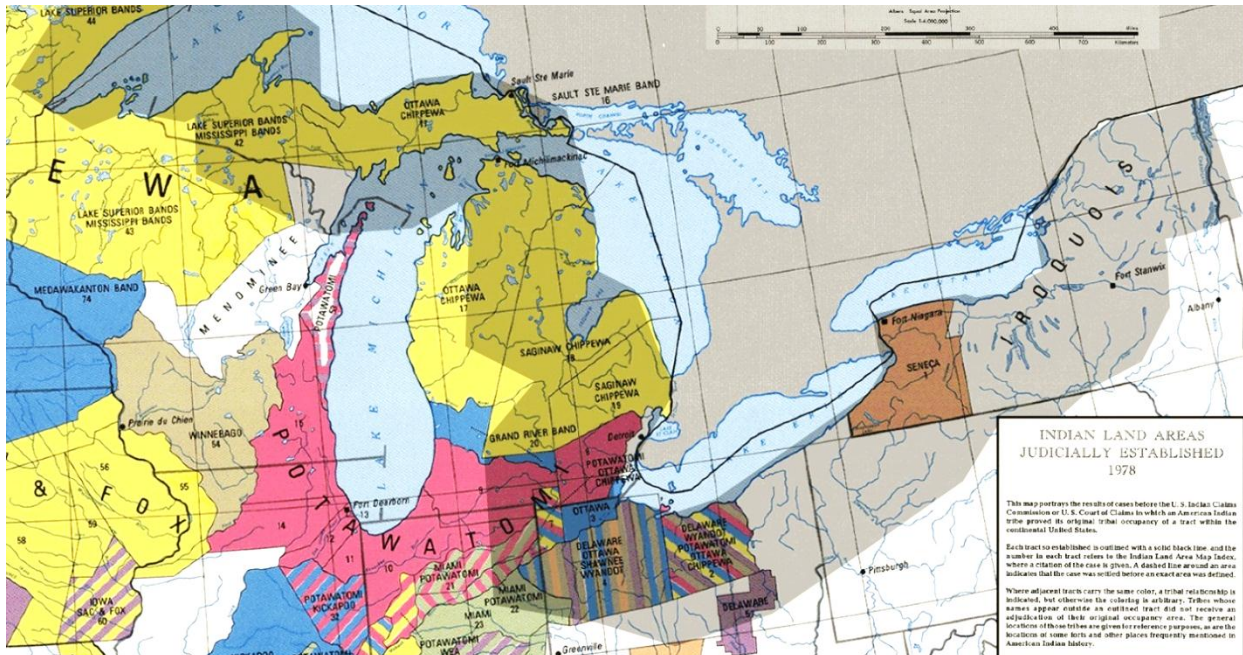
Figure 6.11-2. Nineteenth-Century Cessions, Reservations, and Portages (1907)



Source:(ancestry.com, No Date).

Note: A shaded 100-mile corridor has been added.

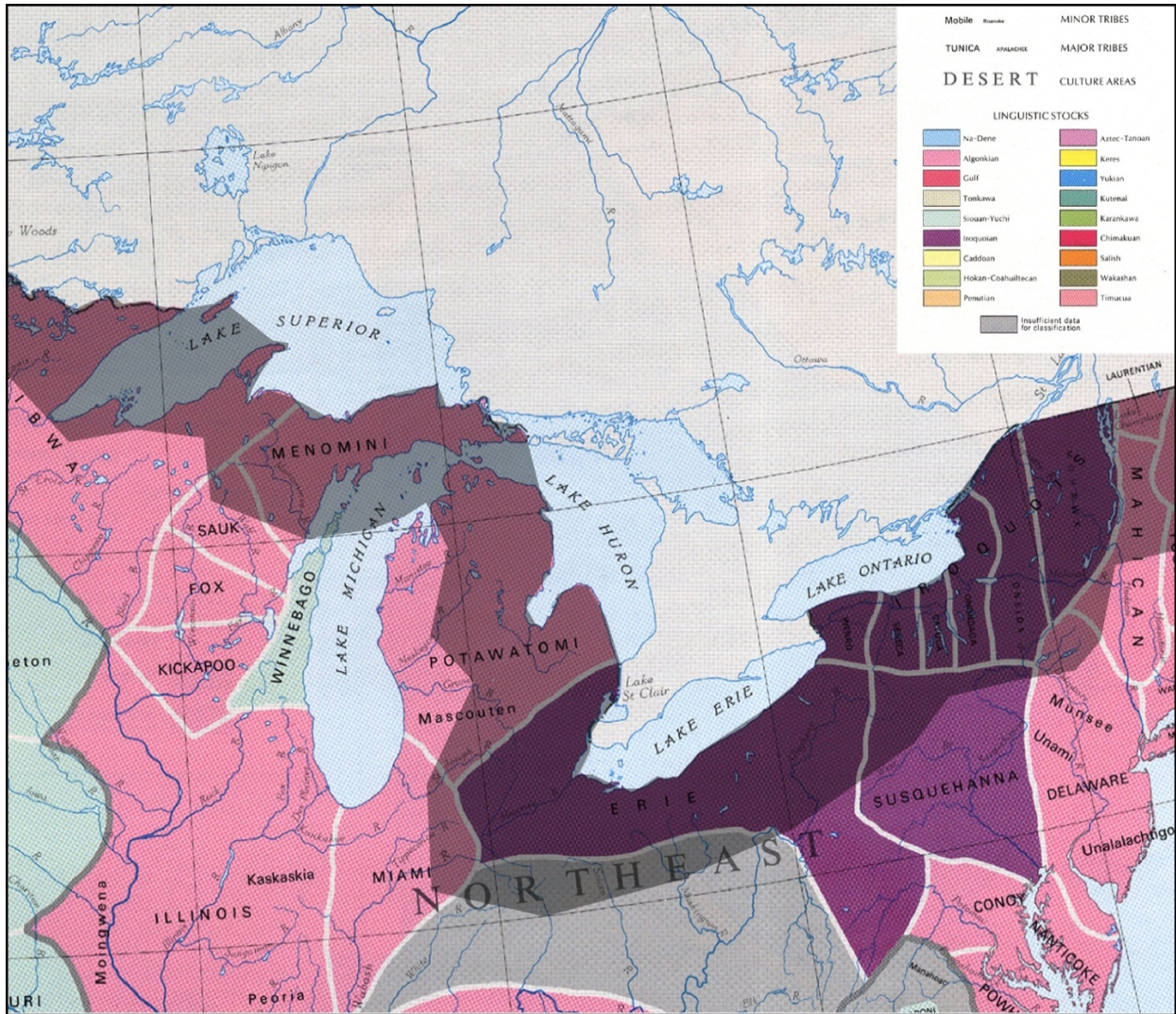
Figure 6.11-3. Judicially Established Indian Land Areas as of 1978



Source:(USDOI, 1978).

Note: A shaded 100-mile corridor has been added.

Figure 6.11-4. Early Tribal, Cultural, and Linguistic Areas



Source:(USDOI, 1991).

Note: A shaded 100-mile corridor has been added.

6.11.2.7 Paleontological Resources

As with archaeology, paleontologists use a variety of information and techniques to carry out *predictive modeling*, the process of assessing the probability of existence of paleontological sites in a given location. This section provides an overview of the current understanding of paleontological site probability in the Great Lakes Region. An expanded discussion of paleontological resources and references can be found in Appendix H.

Within the study area, four major geological groups were identified: sedimentary, volcanic, plutonic, and metamorphic. Of these rock groups, only sedimentary rocks have a high or moderate potential for containing paleontological materials. Both plutonic and volcanic rocks rarely contain fossils because igneous environments are not suitable for living things. Metamorphic rocks rarely contain fossils because the conditions of metamorphism tend to alter the texture of the rocks and destroy any fossils contained within.

New York

Paleontologically sensitive geological units in New York include predominantly Paleozoic and Cenozoic deposits. Paleozoic deposits represent a fast-rising and then eventually falling sea level. Fossils of trilobites, brachiopods, clams, and other marine organisms can be found in these rocks. Other geological units within the study area represent early deltas that contained small forests and other plants. Cenozoic deposits consist of Pleistocene glacial deposits, such as terminal and lateral moraines, containing large-vertebrate fossils.

Pennsylvania

Paleontological-sensitive geological units in Pennsylvania include predominantly Paleozoic and Cenozoic deposits. Paleozoic deposits range from shallow marine deposits that contain limestone and mudstones to terrestrial sandstone deposits. Inscribed in the Cenozoic deposits of the study area is also the continental collision of Gondwana. Fossils include many different marine forms such as trilobites and terrestrial deposits such as scale trees and ferns. Cenozoic deposits include glacial deposits containing large-vertebrate fossils.

Ohio

Paleontological-sensitive geological units in Ohio include only Paleozoic age and Cenozoic age sedimentary deposits. Paleozoic deposits reflect changing sea levels and include sandstone, siltstone, and mudstone. Other sedimentary deposits also include deltas and swamp deposits within the study area. Cenozoic deposits represent the massive glacial advances and retreats and contain many different large-vertebrate fossils.

Michigan

Paleontologically sensitive geological units in Michigan include some of the oldest known fossils from the Precambrian, including filamentous algae. Most parts of the study area are covered with Paleozoic-age rocks representing shallow, tropical seas as well as nearshore, coal-forming swamps. Other deposits consist of Cenozoic glacial deposits containing large-vertebrate fossils.

Wisconsin

Paleontological-sensitive geological units in Wisconsin include Paleozoic sandstone, siltstone, and mudstone representing shallow sea environments. A large range of marine life, from brachiopods to sharks as well as soft-bodied fossils, has been found. Other deposits are of Cenozoic age and represent glacial deposits containing woolly-mammoth and other large-vertebrate fossils.

6.12 ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

6.12.1 INTRODUCTION

Executive Order (EO) 12898 of February 11, 1994 (EO 12898, 1994), titled “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” requires that each Federal agency identify and address any disproportionately high and adverse effect of its programs, policies, and activities on minority and low-income populations. The U.S. Environmental Protection Agency (USEPA) defines *environmental justice* as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies” (USEPA, 2010).

EO 13045 of April 21, 1997 (EO 13045), titled “Protection of Children from Environmental Health Risks and Safety Risks,” places a high priority on the identification and assessment of environmental health and safety risks that may disproportionately affect children. The order requires that each agency “ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health or safety risks.” EO 13045 considers that physiological and social development of children makes them more sensitive than adults to adverse health and safety risks and recognizes that children in minority, low-income, and indigenous populations are more likely to be exposed to, and have increased health risks from, environmental contamination than the general population (USEPA, 2010).

6.12.2 AFFECTED ENVIRONMENT

This section describes the affected environment for the assessment of potential environmental-justice effects that could result from implementation of any of CBP’s program alternatives in the Great Lakes Region. The affected-environment section identifies and describes minority and low-income populations, as well as populations of children that may be present in the defined study area and that may be differentially affected by actions proposed under each of the alternatives considered in this PEIS.

The study area for the evaluation of environmental-justice effects is defined—in accordance with section 6.10, Socioeconomic Resources—as the border communities in both the United States and Canada within 100 miles of the U.S.-Canada border. The U.S. portion of this study area (Great Lakes Region) includes the border communities in the States of Michigan, New York, Ohio, Pennsylvania, and Wisconsin. The study area north of the Great Lakes Region in Canada includes the border communities in the Province of Ontario. For comparison purposes, the analysis also includes the population(s) of the respective border states and Canadian province as a whole. Border communities are defined geographically by the administrative boundaries of U.S. counties and Canadian census divisions contained within or overlapping the study area. A detailed demographic analysis of the study area is in section 6.10.

6.12.1.1 Minority Populations

The most recent USCB data for minority populations available for all counties and states in the United States are part of the Decennial Census for the year 2000 (USDOC, 2000a). Statistical data from this census have been used to characterize the minority populations within the Great

Lakes Region. Summary statistics for minority populations in the Great Lakes Region, their respective states, and the Nation are presented in Table 6.12-1.

In three of the states within the region—New York, Pennsylvania, and Wisconsin—the minority percentage of the population in the border communities is substantially lower than that found in the general population of the state. The population of the border communities in Michigan contains a somewhat higher minority percentage than the state of Michigan as a whole. Minority percentages for both the Ohio portion of the study area and the Ohio State population are relatively similar, with a difference of 0.1 percent. Within the Great Lakes Region, African-American populations constitute the largest single minority. These populations are present in proportions similar to that for the regional population, 11.9 percent, and for the national population, 12.4 percent. Populations of Hispanic origin, although making up 6.9 percent of the combined population of all five states in the region, represent only 2.6 percent of the study-area population.

**Table 6.12-1. Minority Statistics for the Great Lakes Region
(Percent of Population)**

Border State/Region*		White	Black or African American	American Indian and Alaska Native	Asian, Native Hawaiian, Pacific Islander, Other	More Than One Group	Hispanic Origin**
Michigan	Great Lakes Region	76.7	17.4	0.6	3.2	2.2	2.9
	Statewide	80.1	14.1	0.6	3.1	2.1	3.2
New York	Great Lakes Region	88.1	7.2	0.6	2.6	1.6	2.8
	Statewide	67.9	15.7	0.4	12.7	3.2	15.1
Ohio	Great Lakes Region	85.0	11.3	0.2	2.0	1.5	2.4
	Statewide	84.9	11.3	0.2	2.0	1.5	1.9
Pennsylvania	Great Lakes Region	95.3	2.8	0.1	0.8	0.9	1.0
	Statewide	85.4	9.9	0.2	3.3	1.3	3.2
Wisconsin	Great Lakes Region	92.3	0.3	5.1	0.8	1.5	0.8
	Statewide	89.0	5.6	0.9	3.1	1.3	3.6
Great Lakes Region Total	Great Lakes Region	83.4	11.9	0.5	2.5	1.7	2.6
	Selected States	79.0	12.4	0.4	6.1	2.1	6.9
Total United States		75.1	12.2	0.9	9.2	2.6	12.5

Source: (USDOC, 2000a).

*Statistics presented in the unshaded rows include only those portions of the states that lie within the study area; this includes all counties overlapping the area within 100 miles south of the border.

**Hispanic origin is an ethnicity that may include individuals who are also represented in other categories (such as White or Black). Therefore, Hispanic origin is a separate measure and is calculated separately from the other categories.

Data on minority populations north of the Great Lakes Region in Canada are taken from the 2006 Census of Canada (Table 6.12-2). For the border communities of the Province of Ontario, minority populations constitute 23.8 percent of the total population. This is 1 percent higher than the 22.8 percent minority population of the province as a whole and substantially higher than the 16.2 percent visible minority population of Canada as a whole.

The “Other Visible Minority” population (including multiple ethnicities) constitutes the largest single minority category in both the study area north of the Great Lakes Region and in the

Province of Ontario as a whole. This category consists primarily of the following groups: Chinese, South Asian, Arab, West Asian, Filipino, Southeast Asian, Latin American, Japanese, and Korean. However, populations identifying as Black constitute the largest single identifiable minority within this study area and the provincial population. The percentage of the population represented by Black populations exceeds the percentage of these populations in the national population.

Table 6.12-2. Visible Minority Statistics North of the Great Lakes Region in Canada (Percent of Population)

Border Province**		Not a Visible Minority	Black	Other Visible Minority* **	Two or More Visible Minorities	Aboriginal Peoples****
Ontario	North of the Great Lakes Region	76.2	4.1	19.0	0.7	1.8
	Province	77.2	3.9	18.2	0.6	2.0
Total Canada		83.8	2.5	13.3	0.4	3.8

Source: (StatCan, 2006a).

*Canada’s Employment Equity Act (2005) defines *visible minorities* as "persons, other than Aboriginal peoples, who are non-Caucasian in race or non-white in color."

**Statistics presented in the unshaded row account only for those portions of the province that lie within the study area; this includes all census divisions overlapping the area within 100 miles north of the border.

***The “Other Visible Minority” population consists mainly of the following groups: Chinese, South Asian, Black, Arab, West Asian, Filipino, Southeast Asian, Latin American, Japanese, and Korean.

****Self-identification by Aboriginal Peoples does not preclude self-identification inclusion in one of the other categories. The “Aboriginal Peoples” column of this table is, therefore, not additive with the other columns.

6.12.1.2 Low-Income Populations

Data from the most recently completed USCB (USDOC, 2000b; USDOC, 2000c) were used to characterize low-income minority populations for the Great Lakes Region. Median household income and poverty rates are in Table 6.12-3.

The median household income for the border communities in the Great Lakes Region, \$53,486, was slightly lower than the \$54,005 median for the total U.S. border region and \$435 higher than the national median of \$53,051. The study area in the State of Michigan had a higher median income than either the total Great Lakes Region study area or the national population as a whole. Median incomes for the border communities in the remaining four states were generally lower than the national level.

In 2000, the poverty rate for the Great Lakes Region was 1.4 percent lower than that for the Nation as a whole and comparable to the rate for the total U.S. border region of 10.8 percent. Border communities in the study areas in all five states considered individually had a generally lower poverty rate than the Nation as a whole. However, the border communities in the States of

Michigan, Pennsylvania, and Wisconsin had higher rates than was evident for their respective state populations.

Table 6.12-3. Income and Poverty Statistics for the Great Lakes Region

Border State/Region*		Median Household Income** (\$US)	Percent of Population Below the Poverty Line
Michigan	Great Lakes Region	59,190	10.8
	Statewide	56,428	10.5
New York	Great Lakes Region	48,877	12.1
	Statewide	54,819	14.6
Ohio	Great Lakes Region	52,318	10.2
	Statewide	51,740	10.6
Pennsylvania	Great Lakes Region	44,878	11.5
	Statewide	50,666	11.0
Wisconsin	Great Lakes Region	43,018	11.5
	Statewide	55,322	8.7
Great Lakes Region Total	Great Lakes Region	53,486	11.0
	Selected States	53,658	11.8
Total United States		53,051	12.4

Source: (USDOC, 2000b; USDOC, 2000c).

*Statistics presented in the unshaded rows include only those portions of the states that lie within the study area; this includes all counties overlapping the area within 100 miles south of the border.

**Median household income is reported from the 2000 USCB in inflation-adjusted 2009 U.S. dollars.

Data on median household income and populations living below the poverty level north of the Great Lakes Region in Canada were gathered from the 2006 Census of Canada. Statistics for Ontario Province are in Table 6.12-4.

The median income for the border communities of Ontario, \$57,404, was slightly higher than the median for the province as a whole and \$8,011 higher than the national median. Based on the percentage of low-income economic families, the poverty rate for border communities in Ontario is generally similar (within 0.2 percent) to that for the province as a whole and for the national population.

Table 6.12-4. Income and Poverty Statistics North of the Great Lakes Region in Canada

Border Province*		Median Household Income** (\$US)	Percent of Low-Income Economic Families***
Ontario	North of the Great Lakes Region	57,404	11.8
	Province	55,674	11.7
Total Canada		49,393	11.6

Source: (StatCan, 2006b).

*Statistics presented in the unshaded row include only those portions of the province that lie within the study area; this includes all census divisions overlapping the area within 100 miles north of the border.

**Median household income is reported from the 2006 Canadian Census in inflation-adjusted 2009 U.S. dollars.

***The Canadian Census reports statistics for “low-income” economic families. This threshold-based designation is comparable to the poverty statistics reported in the USCB. An *economic family* is a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common-law, or adoption. A couple may be of opposite or same sex. Foster children are included.

6.12.1.3 Population of Children under 18 Years of Age

The distribution of population by age for the Great Lakes Region is in Table 6.12-5. With the exception of the State of Michigan, which has a slightly higher percentage of children in both the border communities and the statewide population, the border communities of the remaining states and the individual states themselves do not have a higher percentage of children under the age of 18 in their populations than does the Nation as a whole.

**Table 6.12-5. Age Distribution in the Great Lakes Region
(Percent of Population)**

Border State/Region*		Under 18	18-24	25-34	35-44	45-54	55-64	65+
Michigan	Great Lakes Region	25.9	9.0	14.0	16.4	13.9	8.7	12.2
	Statewide	26.1	9.4	13.6	16.2	13.7	8.7	12.3
New York	Great Lakes Region	24.8	9.7	12.4	16.1	13.7	8.9	14.3
	Statewide	24.6	9.3	14.4	16.5	13.5	8.9	12.9
Ohio	Great Lakes Region	25.4	8.7	12.8	16.0	14.0	9.1	14.1
	Statewide	25.4	9.3	13.3	16.1	13.7	8.9	13.3
Pennsylvania	Great Lakes Region	24.1	9.0	11.9	15.5	13.9	9.4	16.1
	Statewide	23.8	8.9	12.6	16.0	13.9	9.2	15.6
Wisconsin	Great Lakes Region	24.2	9.5	11.1	15.7	14.5	9.7	15.2
	Statewide	25.5	9.7	13.1	16.5	13.6	8.5	13.1
Great Lakes Region Total	Great Lakes Region	25.4	9.1	13.1	16.1	13.9	8.9	13.6
	Selected States	24.9	9.3	13.6	16.3	13.7	8.9	13.5
Total United States		25.6	9.6	14.1	16.3	13.4	8.6	12.4

Source: (USDOC, 2000c).

*Statistics presented in the unshaded rows account only for those portions of the states that lie within the study area; this includes all counties overlapping the area within 100 miles south of the border.

The distribution of population by age north of the Great Lakes Region in Canada is in Table 6.12-6. For the Province of Ontario, children under 20 years of age represent 25.3 percent of the population of the border communities. This is comparable to the percentage for the province as a whole and slightly higher than the national percentage of 24.7 percent.

**Table 6.12-6. Age Distribution North of the Great Lakes Region in Canada
(Percent of Population)**

Border Province and Study Area*		Under 20	20-24	25-34	35-44	45-54	55-64	65+
Ontario	North of the Great Lakes Region	25.3	6.6	12.8	15.9	15.3	11.1	12.8
	Province	25.3	6.6	12.7	15.9	15.4	11.2	12.9
Total Canada		24.7	6.6	12.8	15.3	15.8	11.7	13.0

Source: (StatCan, 2006c).

*Statistics presented in the unshaded row account only for those portions of the province that lie within the study area; this includes all census divisions overlapping the area within 100 miles north of the border.

6.13 HUMAN HEALTH AND SAFETY

6.13.1 INTRODUCTION

Many of the routine activities conducted by CBP in the Great Lakes Region have the potential to affect human health and safety (HH&S). HH&S relates to the health and safety of the general public (including vehicle occupants), CBP and station employees, and maintenance personnel. Safety can also refer to safe operations of aircraft or other equipment. This section considers the potential adverse and beneficial impacts of CBP's alternative actions on HH&S.

6.13.2 AFFECTED ENVIRONMENT

Construction

HH&S concerns during construction and modernizing of facilities involve exposing workers to conditions that pose a health or safety risk. Construction site safety is largely a matter of adherence to regulatory requirements. These regulatory requirements are imposed for the benefit of employees and they implement operational practices that reduce risks of illness, injury, death, and property damage. The U.S. Occupational Safety and Health Administration (OSHA) issues standards that specify the amount and type of safety training and education required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits with respect to workplace stressors (29 CFR 1910). CBP applies and adheres to these standards in policy and practice.

Routine Operations

Trade and Travel Processing at POEs

The affected environment of agricultural inspections is the inspection location. Agricultural inspections are typically conducted onsite at POEs, but officers sometimes escort the shipment to the receiver site for inspection (USDHS, 2011). Inspections can also take place on the vessel or train transporting cargo into the United States. After inspection, many types of shipments are released to the appropriate agency.

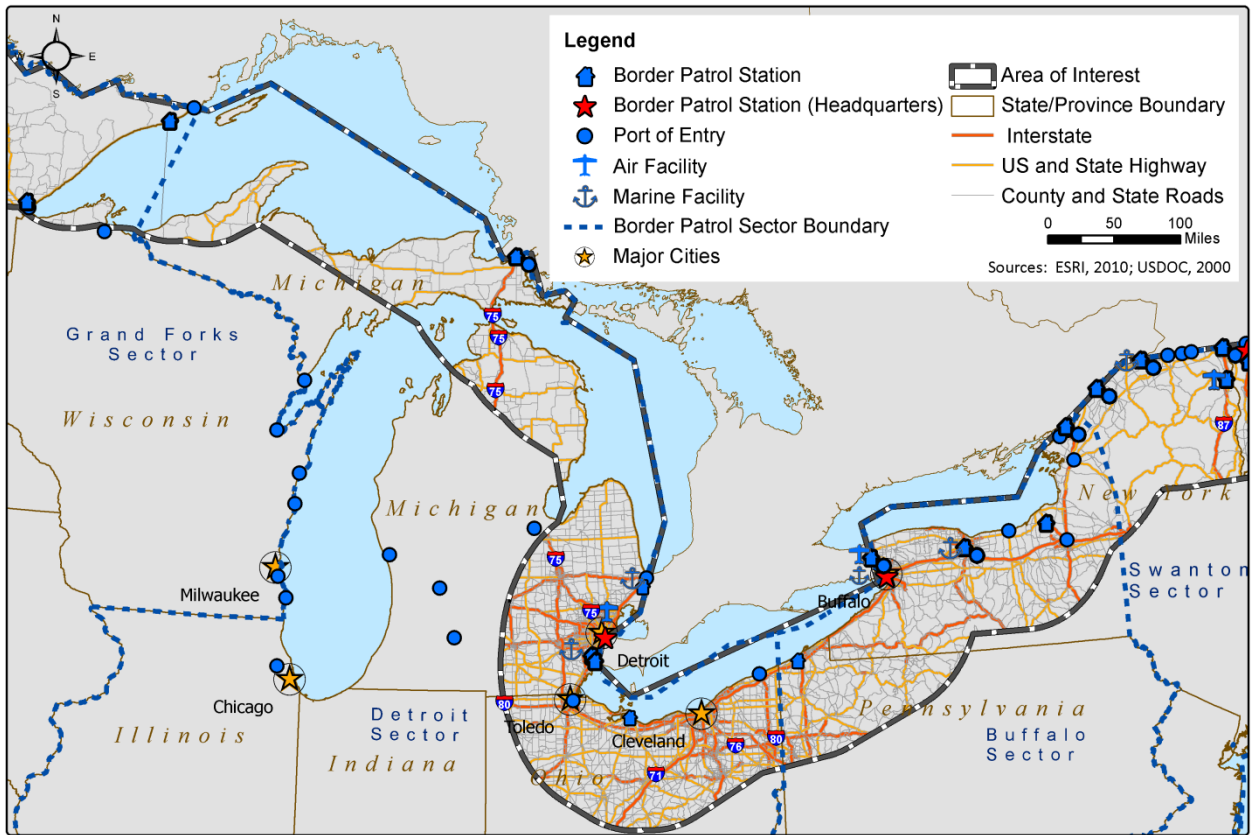
During these interceptions, HH&S effects are possible. Release of nonindigenous diseases into the United States would be harmful to HH&S. To prevent nonindigenous diseases from entering the United States, CBP places bans on certain animals, animal products, and other possible carriers of disease. In 2003, in Canada a positive case of bovine spongiform encephalopathy ("mad cow" disease) touched off an immediate ban on ruminant meat from Canada into the United States. That same year, there was an outbreak of monkeypox in the United States. This outbreak was linked to exotic animals being imported into the United States as pets. A ban was immediately imposed on certain live rodents from Africa, and agricultural specialists still enforce this ban (USDHS, 2004a). Preventing nonindigenous diseases from entering the United States has a beneficial effect on HH&S because it limits the outbreak of disease.

Ground Surveillance and Situational Response Activities

Motorized and Nonmotorized Patrols

Motorized patrols take place on U.S. national, state, county, and local municipalities' paved roads. Figure 6.13-1 shows U.S. national, state, and county roads that USBP agents can use for motorized patrolling in the Great Lakes Region. In rural areas along the border, USBP agents also use dirt roads for motorized and nonmotorized patrols. Dirt roads along the border region were built to be 24-feet wide, but due to vegetation growth the roads are now typically less than 10-feet wide (USDHS, 2011). USBP agents also use other Federal agencies' roads, including roads in national forests and on national parks. When possible, the USBP agents remain on existing roads to apprehend cross-border violators but when required they go off road. Off-road vehicles and nonmotorized patrols take place off-road and in remote areas along the border.

Figure 6.13-1. U.S., Interstate, State, and County Roads in the Great Lakes Region



Aircraft Operations

Manned aerial surveillance patrols are operated between 300 feet above ground level (AGL) and flight level (FL) 250. Aircraft patrols are operated at different heights based on different operational and environmental conditions including weather conditions and high-traffic environments.

Manned aerial surveillance patrols can occur along the Great Lakes border. The Buffalo and Swanton OAM possess different equipment and resources for aerial patrols. In order to fly for CBP, USBP agents must have a Federal Aviation Administration (FAA)-issued license (USDHS, 2010a). Accidents during manned aerial surveillance patrols could potentially injure CBP’s officers or members of the general public.

Unmanned Aircraft System (UAS) patrols can occur along the Great Lakes Region. The FAA sets the constraints for where a UAS may operate and how these operations may be conducted safely in the National Airspace System (NAS). Their main focus when evaluating UAS operations in the NAS is to make sure a UAS will not endanger other users of the NAS or compromise the safety of persons or property on the ground.

The FAA recognizes the great potential of UASs in homeland security and strives to accommodate the DHS's needs for UAS operations, without jeopardizing safety. Because airspace is a finite resource, the FAA sets aside Restricted or Prohibited Areas to help mitigate risks. These Restricted or Prohibited Areas are for an operator's exclusive use when needed.

For CBP's UASs to gain access to the civil airspace, CBP must go through the FAA's Certificate of Waiver or Authorization (COA) process. This is the avenue by which public users (Government agencies and Federal, state, and local law enforcement) that wish to fly a UAS can gain access to the NAS, provided that the risks of flying the unmanned aircraft in the civil airspace can be appropriately mitigated.

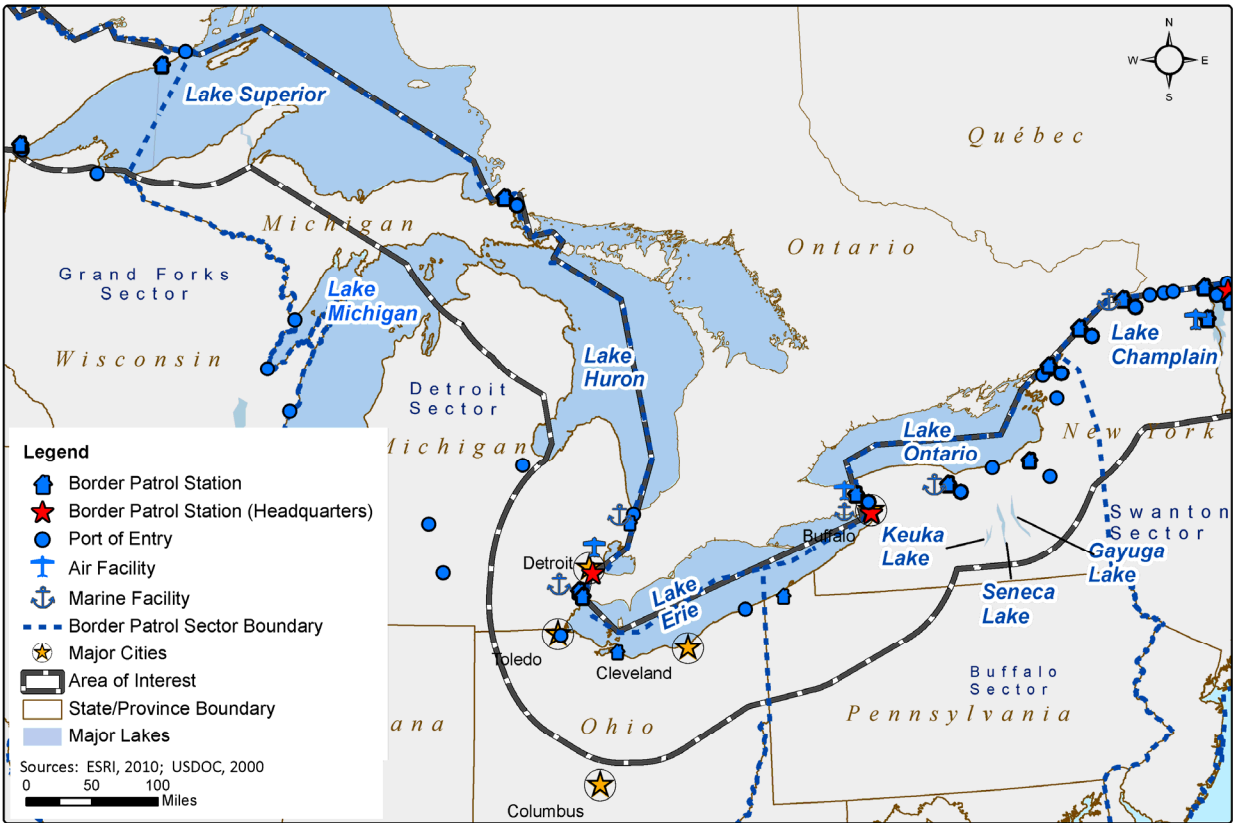
To minimize the risk of operating a UAS, the FAA frequently requires risk mitigations before granting a COA. These mitigations include special provisions unique to the requested type of operation. For example, the applicant may be restricted to operating only in a defined airspace or operating only during certain times of the day. The UAS may be required to have a transponder if it is to be flown in a certain type of airspace. Other safety enhancements may be required, depending on the nature of the proposed operation. To ensure safety, the COA application is reviewed for feasibility; airspace experts review and ensure that the operation will not severely impact the efficiency of the NAS. As of April, 2011, CBP has been issued 12 COAs.

Given that there are emergency and disaster situations where the use of UASs has saved lives and otherwise mitigated emergency situations, the FAA has issued three special disaster COAs, one of which was to CBP (Kalinowski & Allen, 2010).

Vessel Operations

The majority of waterways patrols along the Great Lakes Region occur on the Great Lakes. Figure 6.13-2 shows the navigable water in this region. To assist in river or lake patrols, OAM provides the USBP agents in this region with a range of watercrafts (USDHS, 2011). Accidents during patrols could take place between CBP, cross-border violators, and the general public.

Figure 6.13-2. Navigable Water in the Great Lakes Region



Radiation

CBP uses X-rays and gamma rays to inspect merchandise and conveyances, eliminating the need for an intrusive manual search. These detection systems provide images of material enclosed in cars, trucks, railcars, sea containers, personal luggage, packages, parcels, and mail (USDHS, 2009a). Increasing the efficiency and the number of searches can have a beneficial effect on HH&S. Beneficial effects could result if the number of interdictions increases and the occurrence of intentional destructive acts (IDAs) decreases as a result of using X-ray and gamma rays. The affected environment includes the location of equipment that produces X-rays and gamma rays, as well as the area immediately surrounding the equipment.

X-rays and gamma rays have the potential to expose people to ionizing radiation. The Nuclear Regulatory Commission (NRC) sets regulations and establishes standards for protection against radiation arising from activities conducted under licenses it issues. CBP has adopted the NRC standard because OSHA addresses only occupational dose exposure limits. These requirements are set forth in 10 CFR Part 20 (USDHS, 2004b).

In 10 CFR Part 20, the NRC identifies two classifications of radiation dose: occupational dose and exposure dose (USDHS, 2004b). Neither of these doses includes background radiation, radiation patients receive from medical practices, radiation received from participation in medical research programs, or radiation received as a member of the general public.

As set by the NRC in 10 CFR Part 20, the maximum permissible level of radiation dose to individual members of the general public in unrestricted areas (i.e., exposure dose) is 0.1 rem per year above the typical 0.360 rem per year dose provided by natural and man-made background radiation.

As part of its “as low as is reasonably achievable” (ALARA) program, CBP has determined that the radiation dose received by its personnel shall not exceed the public dose (USDHS, 2004b).

In 10 CFR 20.1003, NRC defines the philosophy of ALARA in relation to exposure:

ALARA (acronym for “as low as is reasonably achievable”) means making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

Exposure dose—is the dose received by a member of the public from exposure to radiation and to radioactive material released by a licensee, or to another source of radiation either within a licensee’s controlled area or in unrestricted areas (USDHS, 2004b).

Occupational dose—is the dose received by an individual in a restricted area or in the course of employment in which the individual’s assigned duties involve exposure to radiation and to radioactive material from licensed and unlicensed sources of radiation, whether in the possession of the licensee or other person. The individuals subject to the occupational dose classification must closely monitor their degree of radiation exposure using dosimeters (USDHS, 2004b).

Exposure to radiation can be harmful to HH&S. Because of the difficulties in determining if the health effects that are demonstrated at high radiation doses are also present at low doses, current radiation protection standards and practices are based on the premise that any radiation dose may result in detrimental health effects, such as cancer and hereditary genetic damage.

When discussing potential impacts caused by radiation exposure it is important to relate how much exposure is anticipated. In an August 2004, revised position statement on radiation risk, the Health Physics Society recommended against the quantitative estimation of health risks below an individual dose of 0.5 rem in 1 year or a lifetime dose of 10 rem above that received from natural sources. Doses from natural background radiation in the United States average about 0.360 rem per year (HPS, 2004).

Radio Frequency

The radio frequency (RF) environment refers to the presence of electromagnetic (EM) radiation emitted by radio waves and microwaves on the human and biological environment. RF waves have a frequency or of oscillation within the range of approximately 3 Hertz (Hz) to 300 gigahertz (GHz). This energy can interact with matter (USDHS, 2008a).

OSHA regulates RF and EM emissions for employees under 29 CFR 1910. The Federal Communications Commission (FCC) is responsible for licensing frequencies and ensuring that the approved use does not interfere with television or radio broadcasts, or substantially affect the natural or human environment (USDHS, 2008a). The FCC has adopted a modified version of the American National Standards Institute (ANSI) guidelines and Institute of Electrical and Electronics Engineers (IEEE) standards to evaluate exposure due to RF transmitters licensed and authorized by the FCC. The FCC’s guidelines also reflect the National Council of Radiation Protection and Measurements exposure guidelines.

Uncontrolled exposure—occurs when the general public is exposed or when persons employed are not made fully aware of the potential for exposure or cannot exercise control over their exposure (USDHS, 2008a).

Controlled exposure—occurs when a person is exposed to RF fields as part of their employment and the person has been made fully aware of the potential exposure and can exercise control over their exposure. (USDHS, 2008a).

rate

The National Council of Radiation Protection and Measurements and ANSI/IEEE exposure criteria identify the same threshold level at which harmful biological effects may occur. The whole-human-body absorption of RF energy varies with the frequency of the RF signal. The most restrictive limits on exposure are in the frequency range from 30 to 300 megahertz where the human body absorbs RF energy most efficiently when exposed in the fair field of an RF transmitting source (USDHS, 2008a).

There are two tiers of exposure limits: occupational or “controlled,” and general or “uncontrolled.” In order for a transmitting facility or operation to be out of compliance with the FCC’s RF guidelines in an area where levels exceed maximum permissible exposure (MPE) limits, it must first be accessible to the public. The MPE limits indicate levels above which people may not be safely exposed regardless of the location where those levels occur (USDHS, 2008a).

Adverse biological effects associated with RF energy are typically related to the heating of tissue by RF energy. This is typically referred to as a thermal effect, where the EM radiation emitted by an RF antenna passes through and rapidly heats biological tissue; similar to the way a microwave oven cooks food. According to the Health Physics Society, numerous studies have shown that

environmental levels of RF energy routinely encountered by the general public are typically far below levels necessary to produce significant heating and increased body temperature; RF energy that would produce harmful heating is generally associated only with workplace environments near high-powered RF sources, such as those used for molding plastics or processing food products. In such cases, exposure of human beings to RF energy could exceed MPE, and restrictive measures or actions would thus be required to ensure the public's safety (USDHS, 2008a).

There is also some concern that signals from some RF devices could interfere with pacemakers or other implanted medical devices; however, electromagnetic shielding has been incorporated into the design of modern pacemakers to prevent RF signals from interfering with the electronic circuitry in the pacemaker (USDHS, 2008a).

Because RF devices emit RF energy and EM radiation, adverse impacts could occur. The severity of these impacts depends on the equipment used and the elevation of the tower (USDHS, 2008a).

Beneficial impacts from RF devices could also occur. The use of RF could increase the frequency of interdictions along the northern border, improving the HH&S of the American population.

Firing Ranges

HH&S can be affected by noise levels and exposure to lead from firing ranges on both indoor and outdoor ranges in this region. Humans become exposed to lead associated with shooting ranges through lead-contaminated soil. Another potential pathway is through inhalation of lead dust by shooters during firing when airflow on the firing line is blocked. Range workers may also be exposed to lead dust while performing routine maintenance operations, such as raking or cleaning out bullet traps. Each of these pathways is site specific and may or may not occur at individual ranges (USDA, 2010).

OSHA sets regulations for protecting workers who handle or are exposed to lead, including airborne lead at indoor firing ranges (NSSF, 2001; 29 CFR 1910.1025). The OSHA standard for airborne lead exposure is 30 micrograms per cubic meter of air with an 8-hour time-weighted average (29 CFR 1910.1025).

Spent ammunition on ranges is not regulated as solid/hazardous waste unless it is discarded and left to accumulate for a long period of time. It is not regulated if it is recovered or reclaimed on a regular basis. If the range poses an imminent or substantial danger to human health or the environment, it can be addressed through the Resource Conservation and Recovery Act (RCRA).

USEPA regions also set guidelines and establish best management practices (BMPs) for building new ranges and for remediating outdoor ranges. These guidelines are in place to help minimize lead contamination in soil and water. HH&S would be adversely affected if USBP agents were exposed to lead on firing ranges or if the public's water supply was contaminated with lead (USEPA, 2003). The frequency and severity of response to lead exposure in humans depend on the amount of exposure. Symptoms include neurological, gastrointestinal, reproductive, and renal effects (NYDH, 2009).

Figure 6.13-3 CBP Officers Train at Firing Range



Source: (USDHS, No Date).

In addition to lead exposure, the noise generated on firing ranges may have an adverse effect on the health of CBP agents. Exposure to harmful levels of noise over a long time period can damage sensitive structures in the ear, resulting in noise-induced hearing loss (NIDCD, 2008). To protect employees from noises at harmful levels, OSHA sets noise standards and guidelines for the work environment. The OSHA noise exposure limit is set at a maximum permissible exposure limit of 90 decibels, A-weighted (dBA), averaged over an 8-hour time period (29 CFR 1910.95).

6.14 HAZARDOUS AND OTHERWISE REGULATED MATERIALS

6.14.1 INTRODUCTION

Hazardous materials are materials that are capable of posing an unreasonable risk to health, safety, and prosperity. Hazardous materials can be classified into roughly three categories:

- Hazardous or regulated substances;
- Hazardous or regulated waste; and,
- Special hazards.

6.14.1.1 Hazardous Substances

Any substances that are considered severely harmful to human health or the environment may be classified as “hazardous.” Hazardous substances take many forms. Many are commonly used substances that are harmless in their normal uses but are quite dangerous when released. They are defined in terms of those substances either specifically designated as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as the Superfund Law, or those substances identified under other laws (USEPA, 2011a). A great deal is known about hazardous substances and their effects. This information helps responders act quickly and safely to reduce the risks from emergency situations (USEPA, 2011b).

6.14.1.2 Hazardous Waste

A hazardous waste is defined by the Resource Conservation and Recovery Act (RCRA) as a solid waste, or combination of solid wastes, that, because of its quantity; concentration; or physical, chemical, or infectious characteristics may:

- Cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or,
- Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Hazardous wastes fall into two categories: characteristic wastes and listed wastes. *Characteristic hazardous wastes* are materials that are known or tested to exhibit a hazardous trait such as ignitability (i.e., flammability), reactivity, corrosiveness, and toxicity. *Listed hazardous wastes* are materials specifically listed by the USEPA or a state regulation as a hazardous waste.

Hazardous wastes listed by the USEPA fall into two categories:

- Process wastes from general activities (F-listed) and from specific industrial processes (K-listed); and,
- Unused or off-specification chemicals, container residues, and spill cleanup residues of acute hazardous-waste chemicals (P-listed) and other chemicals (U-listed).

These wastes may be found in different physical states as gases, liquids, or solids. Furthermore, a waste is deemed hazardous if it cannot be disposed of by common means like other byproducts of our everyday lives. Depending on the physical state of the waste, treatment and solidification

processes might be available. In other cases, however, there is not much that can be done to prevent harm (Leonard, 2009).

Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes; their associated regulatory requirements are specified in 40 CFR 273. Four types of waste are currently covered under the universal waste regulations: hazardous-waste batteries; hazardous-waste pesticides that are either recalled or collected in waste pesticide collection programs; hazardous-waste thermostats; and hazardous-waste lamps.

The RCRA regulates the management and disposal of hazardous waste. One common method of treatment is hazardous combustion, or incineration, which is used to destroy hazardous organic components and reduce the volume of waste (USEPA, 2009a).

6.14.1.3 Special Hazards and Otherwise Regulated Materials

Special hazards are those substances that might pose a risk to human health; they are addressed separately from other hazardous materials. Special hazards include asbestos-containing material, polychlorinated biphenyls (PCBs), and lead-based paint (LBP). The USEPA has the authority to regulate these special-hazard substances under the Toxic Substances Control Act 15 U.S.C. 53. The USEPA has established regulations regarding asbestos abatement and worker safety under 40 CFR 763, with additional regulation concerning emissions (40 CFR 61). Depending on the quantity or concentration, the disposal of LBP waste is potentially regulated by the RCRA at 40 CFR 260. The disposal of PCBs is addressed in 40 CFR Parts 750 and 761.

6.14.2 AFFECTED ENVIRONMENT

6.14.2.1 Hazardous Substances, Hazardous Wastes, Special Hazards, and Otherwise Regulated Materials

Due to the duplicative discussion of hazardous substances, hazardous wastes, special hazards, and otherwise regulated materials, complete descriptions of the range of hazards are found in section 3.14.

6.15 UTILITIES AND INFRASTRUCTURE

6.15.1 INTRODUCTION

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly man-made; generally, the more urban and developed an area, the more infrastructure it has (USDHS, 2008a). This section describes ranges of use for each utility resource based on recent CBP site-specific analyses of protection, relocation, construction, and operation of BPSs, and construction, modernization, and operation of POEs. This section then describes the utility resources of most CBP facilities: BPSs, POEs, forward operating bases (FOBs), traffic checkpoints, and communication towers.

6.15.2 AFFECTED ENVIRONMENT

6.15.2.1 Water Supply

Municipal water systems or rural lines, which supply facilities such as the Erie and Burke BPS in Pennsylvania and New York, respectively, pump a minimum of 35,000 gallons of water per day from 88 to 100-million-gallon-capacity reservoirs, lakes, or systems of groundwater wells (USDHS, 2009h; USDHS, 2009i). A substantial reserve capacity remains in these lakes or reservoirs. Such systems provide water to between 1,100 to 250,000 customers (USDHS, 2009i; USDHS, 2009h).

For those sites with wells present such as the Churubusco and Cannon Corners POEs in New York, a number of scenarios for water provisioning may be employed. Some utilize onsite wells by tapping a nearby water main. In more remote locations, where tapping a water main is not feasible, potable water is provided by an onsite well. Generally, wells are within 50 feet of the main building; water is pumped through an in-line water filter system and stored in multiple storage tanks (USDHS, 2009j). When necessary (and possible), water is filtered, softened, distilled, or treated as required for potable uses. If no usable onsite well exists for potable water, the water may come from a leased, off-site well located several hundred yards away. In a few locations, well water is run through a chlorination or reverse osmosis system for non-drinking usage.

When onsite wells are rendered obsolete or no well exists—as is often the case in this region due to high lead content—CBP supplies drinking water in commercial water bottles. At larger facilities, the delivered potable water is stored in 5-gallon jugs and is sometimes used for cooking. For those few facilities where bottled water is delivered, on average between 50 and 60 gallons are used per month.

6.15.2.2 Electrical and Communications Utilities

Electrical power is provided to most CBP facilities by a commercial grid system. These local or regional utility cooperatives and distribution companies serve from 872,000 to 4.5 million customers over a 36,100 square mile area throughout the Great Lakes Region (NYSEG, 2011; USDHS, 2009h). Service providers have a capacity of 14,000 MW (FEC, 2011). The electrical power is fed from the main service to an automatic transfer switch and electrical panels, then through the buildings. Primary electrical service is provided by overhead transmission lines to facilities, and secondary electrical service is provided from a pole-mounted transformer. Many

of these facilities have an onsite emergency electric generator with a 250-, 275-, 500-, or 1,000-gallon diesel fuel tank (USDHS, 2003d; USDHS, 2003e; USDHS, 2003f; USDHS, 2003g), which is required for periods when the primary power supply is not available. The Cannon Corners POE in New York, for example, loses power five to ten times a year due to storms (USDHS, 2010c).

Monopole communication towers do not utilize more than 3,650 kw-hours per month from commercial grid power (USDHS, 2008b). Primary power is provided to most monopole towers by the commercial power grid, but some in remote locations are powered by solar photovoltaic arrays with battery storage systems. Communication relay towers (CRTs) typically utilize a 17-kW generator. Remote video surveillance systems (RVSS) are connected to the commercial grid where available. If commercial power is not available, the towers are supplied by either a generator of up to 30-kW or a solar photovoltaic generator (USDHS, 2008b). If the commercial power grid is not immediately available when towers are deployed, primary power is supplied by a 30-kW generator with a propane-fueled motor supplied by a 2,000 gallon tank until the commercial power infrastructure is in place. Back-up power for each tower site is provided by a battery back-up system. All power lines are installed overhead from the main trunk power line to the tower site shelter and then on elevated cable trays to the tower, if the primary power source is the commercial grid.

At facilities lacking communication towers, antennas are mounted on posts attached to the main building.

Most POEs are provided telephone service by a nearby telephone substation. Existing telephone lines run underground or overhead (or some combination of the two) and, when possible, follow a highway right-of-way. Most telephone lines consist of one or two T-1 lines and one to six dial tone lines. Where T-1 or fiber-optic service is not available, Internet service is accessed through telephone modem.

6.15.2.3 Fuel Supply

Propane, or natural gas, supplies fuel for heating, ventilation, and air conditioning (HVAC) systems. Fuel for emergency power generators can be propane or diesel that is stored onsite tanks. A 5,000-gallon heating oil tank can provide for fuel storage, as is the case at the Massena POE (USDHS, 2003e). Some facilities have one or two additional 275-gallon fuel oil tanks (USDHS, 2003g). Others are serviced by interconnection with commercial natural gas suppliers through underground natural gas pipelines. Service providers transport natural gas to nearly 731,000 customers (USDHS, 2009h).

Each tower utilizes a 500-gallon propane tank to fuel a back-up generator in case of power outages (USDHS, 2008b). Each 500-gallon tank would be refueled every two months (USDHS, 2008b), assuming approximately two hours of run time monthly for a generator maintenance check and other operations as needed. When commercial grid power is not immediately available upon tower deployment, primary power would be supplied temporarily by a 30kW generator using a larger, 2,000-gallon propane tank. These larger propane tanks would be refueled every seven days (USDHS, 2008b).

6.15.2.4 Wastewater Management

Urban CBP facilities such as the Erie and Burke BPS are connected via municipal piping systems to wastewater treatment plants, which operate at up to a 68.8 million gallon capacity per day (mgd) (CoE, 2011). As an example, the Erie sanitary treatment plant in New York is permitted for 68.8 mgd for hydraulic flow and an organic loading of 124,000 pounds per day, and it had a 2001 average flow of 40.5 mgd and an organic loading of 73,344 pounds (CoE, 2011; USDHS, 2009i).

In more rural locations, like the Churubusco and Cannon Corners POEs in New York, sanitary waste is disposed to an onsite septic tank. Types of septic tanks vary; some have a grinder pump, a lift station, or two venting pipes, but all are connected to the appropriate drainage mound and field or leach field. Solid waste is removed from sites by a cleaning contractor or a private disposal company. Average septic tanks are pumped once every two years and treated twice a year, but those approaching capacity can be pumped as often as once every three months.

The state Department of Transportation or appropriate county-level department generally provides snow removal on state highways, and onsite snow removal service is contracted out to a janitor or maintenance company (USDHS, 2009j).

6.16 ROADWAYS AND TRAFFIC

6.16.1 INTRODUCTION

The United States relies heavily on a vast transportation network to expedite the flow of goods and people to and from Canada. CBP's mandate to enable efficient border crossing while providing the highest level of security and safety for all motorists is of utmost importance. Over the past decade, many land ports of entry (LPOEs) have been upgraded for highway safety, as well as technologically for ease of access. States and municipalities maintain the roadways leading to the borders to allow for tourism and trade in their areas. The following provides an overview of traffic and transportation regulations and describes the general traffic conditions for urban, suburban, rural, and remote areas.

6.16.2 AFFECTED ENVIRONMENT

6.16.2.1 Existing Roadway Network and Roadway Effectiveness

The majority of the roadways within 100 miles of the northern border within this region are primarily secondary and tertiary paved roads, although there are state highways throughout. The areas along the Great Lakes border range from remote to urban. Travel destinations can be as diverse as national parks, national forests, and wilderness areas to major tourist attractions like Niagara Falls and metropolitan destinations such as Buffalo, Detroit, and Chicago.

The number of motor vehicles in the United States has been steadily increasing, with more than 254 million vehicles registered in 2009 (BTS 2012). Annual travel on United States roadways reached an estimated 2.9 trillion vehicle-miles, over three times the level reported in 1960. Travel grew about 47 percent during the 1960s, another 38 percent in the 1970s, and another 41 percent in the 1980s. Travel in urban areas in 2009 accounted for over 1.9 trillion vehicle-miles, or 66 percent of the total, compared to 44 percent in 1960 (BTS 2012a). On the rural interstate system, automobiles, light trucks, and buses account for 77 percent of average daily traffic volumes, with heavy trucks representing the remainder. Percent distribution of traffic for commercial and noncommercial vehicles in both rural and urban areas is shown in Table 6.16-1.

Table 6.16-1. Percent Distribution of Traffic by Vehicle Class, Total United States

Type of Roadway	Vehicles (%)	
	Noncommercial	Commercial
Rural		
Interstate	81.6	18.4
Other principal arterials	87.2	12.8
Minor arterial, collector and local	88.5	11.5
Rural average	86.6	13.4
Urban		
Interstate	88.2	11.8
Other freeways and expressways	90.5	9.5
Other principal arterials	89.5	10.5
Minor arterials	90.4	9.6
Collectors	90.3	9.7
Local	91.0	9.0
Urban average	89.8	10.2

Source: (USDOT, 1996).

6.16.2.2 Level of Service

Level of service (LOS) is a qualitative measure of the operating conditions of an intersection or other transportation facility. There are six levels of service (A through F) defined: LOS A represents the best operating conditions with no congestion, and LOS F is the worst with heavy congestion. Roadways and intersections with LOS E or F are those with traffic conditions at or above capacity. Traffic patterns are congested, unstable, and normally unacceptable to individuals attempting to access and use roadways and intersections with LOS E or F (TRB, 2000). LOS has been used to facilitate a general discussion of traffic conditions in urban, suburban, rural, and remote areas. This discussion of typical patterns for different types of roadway networks is not meant to substitute for local studies and analyses that may be required.

6.16.2.3 Variability

Traffic varies by month of the year, day of the week, and hour of the day. Often the capacity of the roadway system can be exceeded by the volume of traffic using it. This can cause breakdown flow (i.e., LOS E or F) and initiate effects that extend far beyond the time during which the demand exceeded capacity, and may take several hours to dissipate. Seasonal peaks in traffic demand are also of importance, particularly for recreational facilities.

Seasonal fluctuations in traffic demand reflect the social and economic activity of the area being served by the highway. These seasonal fluctuations typically exhibit several relevant characteristics:

- Monthly variations are more severe on rural routes than on urban routes;

- Monthly variations are more severe on rural routes serving primarily recreational traffic than on rural routes serving primarily business traffic; and,
- Daily traffic patterns vary by month of year most severely for recreational routes.

Traffic variations by day of the week are related to roadway type. Normally, weekend volumes are lower than weekday volumes for highways serving predominantly business travel, such as urban freeways. In comparison, peak traffic occurs on weekends on main rural and recreational highways. Furthermore, the magnitude of daily variation is highest for recreational access routes and lowest for urban commuter routes.

Typical hourly variation in traffic is related to highway type and day of the week. The typical morning and evening peak hours are evident for urban commuter routes on weekdays. The evening peak is generally somewhat more intense than the morning peak. On weekends, urban routes show a peak travel period that is less intense and more spread out, occurring in early to mid afternoon. Recreational routes also have single daily peaks. Saturday peaks on such routes tend to occur in the late morning or early afternoon (as travelers go to their recreational destination) and in late afternoon or early evening on Sundays (as they return home).

Traffic analysis focuses on the peak hour of traffic volume because it represents the most critical period for operations and has the highest capacity requirements. If the highest hourly volumes for a given location were listed in descending order, a large variation in the data would be observed, depending on the type of roadway.

6.16.2.4 Urban and Suburban Transportation Networks

Delays and heavy traffic can be prevalent in all major cities. These delays are most frequent during rush hour times, 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m., Monday through Friday. Other reasons for congestion in urban areas are emergency vehicles, accidents, and vehicle breakdowns. Buffalo and Syracuse, NY; Erie, PA; Detroit, MI; Chicago, IL; and Cleveland, OH are urban areas within this region.

The ability of urban streets to function well is generally limited by the capacity of signalized intersections, with traffic normally uninterrupted on roadway segments between intersections. Signal timing plays a major role in the capacity of urban streets, limiting the portion of time available for movement between intersections. Traffic conditions may vary greatly, and such factors as curb parking, transit buses, lane widths, upstream intersections, and other factors may substantially affect roadway conditions. In urban areas, LOS at critical intersections would typically be E or F during peak periods, and characterized by very unstable or forced traffic flow.

Urban streets show less variation than other areas. Most users are daily commuters or frequent users, and special event traffic is less common. Furthermore, many urban routes are filled to capacity during each peak hour, and variation is therefore severely constrained.

Traffic in suburban areas is similar to that in urban areas; however, traffic delays are less of an issue unless traffic is being routed through residential areas. As with urban areas, there may be heavy traffic during rush hour, typically 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. Traffic congestion in suburban areas is normally confined to primary and secondary arterials, not residential areas. Public transportation is often provided, and traffic reports are available for updated roadway conditions.

6.16.2.5 Rural and Remote Transportation Networks

In rural and remote areas, traffic is mainly affected by roadway conditions. Heavy traffic volumes are rare and normally only occur due to road closure and construction activities. Rural highways in the United States and Canada rarely operate at volumes approaching capacity. In addition, rural and recreational routes often show a wide variation in peak-hour volumes. Extremely high volumes occur on a few weekends or in other peak periods, and traffic during the rest of the year is substantially less, even during the peak hour. For example, highways serving resorts and recreational areas may be virtually unused during much of the year, only to be subject to oversaturated conditions during peak summer periods.

Seasonal weather conditions are the primary cause of inefficient access on rural and remote roadways. Snow, flooding, and mudflows can make roads impassable; these events usually occur between October (when snow accumulations begin) and April (when melting snow and rains can cause flooding and mudslides). Local municipalities are prepared for maintenance of rural roadways, and residents often have alternate means of transportation, such as snowmobiles, ATVs, and horses. Remote areas, by definition, are sparsely populated, but the few residences within these areas normally have alternate transportation sources in case of emergencies. Television, radio, and NPS traffic reports are the primary sources of updates for rural and remote roadway conditions (USDOT, 2010).

6.16.2.6 Federal and State Transportation Regulations

LPOEs across the regions are accessed by a number of highways that are maintained by each state's department of transportation (DOT) or municipal highway authority. In remote areas where trails and gravel roadways are used, it is the maintaining agencies responsibility to inform the public of road and trail closures. In the United States, each state has its own regulations and governing agency, although most regulations are similar for the purpose of uniformity. In most states, the roadway design manual is based upon recommendations in the American Association of State Highway and Transportation Officials (AASHTO) Policy on Geometric Design of Highways and Streets, commonly referred to as the "Green Book." The Green Book is not a design manual but rather a series of recommended roadway design parameters (USDOT, 2010). In addition, many Federal departments have also adopted their own traffic code for enforcement on their respective reservations (e.g., national parks and military bases). A list of the state DOTs and regulatory agencies that plan and administer the roadway design regulations is provided in Appendix S.

6.16.2.7 CBP's Activities Affecting Roadways and Traffic

CBP's activities include enforcement of customs, immigration, and agriculture regulations at U.S. borders, and CBP has primary responsibility for preventing unlawful entry into the United States while ensuring the safe and efficient flow of goods and people. For the northern border within this region, these activities are focused around the LPOEs, but construction activities, the operation of other facilities, and patrol activities have some effects to transportation resources. A general description of these activities is provided in Chapter 2. This section outlines these activities from a transportation and traffic standpoint.

Land Ports of Entry

Many different roadways including interstates, U.S. highways, state highways, and rural roadways approach the LPOEs along the northern border within this region. These cross-border access points

Vacation travel and occasional same-day shopping trips are important travel purposes along most of the border. Several Canadian and U.S. near-border cities and towns are common consumer destinations. Vacation and same-day recreational travel are less frequent and more seasonal than consumer trips in the paired-cities model. In addition, these types of travel are highly discretionary, easily influenced by exchange rates and economic conditions (BPRI, 2010).

All LPOEs facilitate pedestrians and cyclists. However, pedestrian and bicycle circulation is infrequent at most rural LPOEs because of their remote locations and distance from residential areas. Some LPOEs have provisions for bike storage. Many LPOEs have boat and seaplane landing areas.

Transportation Checkpoints

Traffic checkpoints are conducted on roads leading from the border and consist of inspections of interior-bound conveyances, including passenger vehicles (cars, trucks, vans, and buses) and container vehicles and cargo trucks. These checkpoints provide an opportunity to detect and interdict cross-border violators that have thus far avoided apprehension. Vehicle checkpoints are generally traffic lanes temporarily controlled by CBP. Checkpoints may include support buildings to provide temporary office and holding space, as well as lights, signage, and other support equipment.

Checkpoints are established at airports for commercial aircraft and at locations along railroad lines for passenger and freight trains.

Nonroad and Off-road Activities

Traffic surveillance operations off-road can include agents stationed at specific observation points or driving predetermined routes (line watch); detection of any disturbances in natural terrain that could indicate the passage of people, animals, or vehicles (sign cutting); and road patrols. All sectors use a variety of vehicles, including four-wheel drive vehicles, sedans, scope trucks, ATVs, motorcycles, snowmobiles, and bike patrols in urban areas or over rough terrain.

BPSs vary in size and typically include any or all of the following components: administrative and support buildings, vehicle maintenance garages, equine and canine facilities, vehicle wash facilities, fuel tanks, small arms practice ranges, undocumented alien processing and temporary holding facilities, confiscated vehicle storage facilities, and agent and visitor parking. CBP's agents use a variety of off-road transportation modes to patrol border areas. These consist of four-wheel drive vehicles, ATVs, snowmobiles, horses, and, in some sensitive habitats, agents operating on foot. As outlined in Chapter 2, CBP's activities that may affect transportation resources include UAS activities, Manned Aerial Surveillance Patrols, and other patrols.

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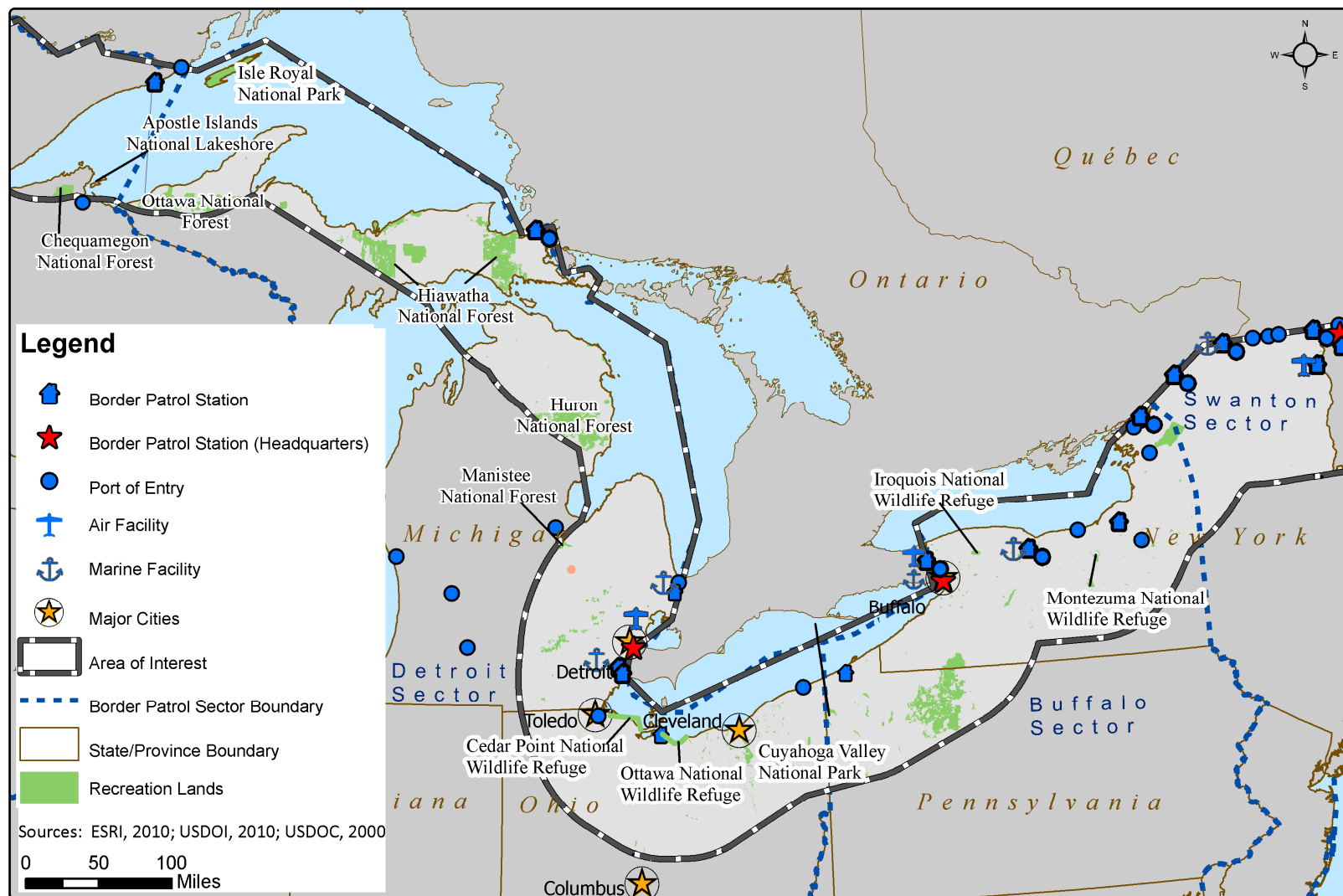
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6.17 RECREATION

6.17.1 INTRODUCTION

A wide variety of recreation areas exists along the northern border on both the U.S. and Canadian sides. On the U.S. side, these recreational areas include national parks (NP), national recreation areas (NRA), national forests (NF), lakesides, national wildlife refuges (NWR), and designated wilderness areas. On the Canadian side, recreational areas include national park reserves, provincial parks, protected areas, and natural areas. U.S. recreation categories are described briefly below, since the designation bears on the nature of activities permitted. Figure 6.17-1 shows a map of federally protected recreation areas in the Great Lakes Region. It also includes the Wildcat Brook Wild and Scenic River.

Figure 6.17-1. Federally Protected Recreation Areas, Including National Forests, Parks, Recreation Areas, and Wildlife Refuges in the Great Lakes Region



6.17.2 AFFECTED ENVIRONMENT

National parks, national forests, national wilderness areas, national wildlife refuges, and national recreation areas within the Great Lakes study area are profiled below by the impact category they most closely match. In addition to national protected areas, which are the primary focus of this analysis, many state and regional parks and protected areas along the northern border include recreation areas that could be impacted by activities along the border.

The Great Lakes Region contains varied types of recreation areas. The area contains high, medium, and low -impact use areas, with slightly more low and high-impact areas. Many recreation areas contain multiple types of use areas. National forests, national wildlife refuges, and national parks all occur within this study area. Water-related recreation resources, including Wild and Scenic Rivers, swimming beaches, and boating and canoeing areas predominate. Popular recreation activities include fishing, hiking, off-highway vehicle (OHV) riding, camping, motorized and nonmotorized boating, hunting, and swimming.

6.17.2.1 Michigan

Hiawatha National Forest

This 1 million acre national forest lies between Lake Superior and Lake Michigan, near Canadian marine boundaries. It has five National Wild and Scenic Rivers: the Carp, Indian, Sturgeon, Tahquamenon, and Whitefish. It also includes Grand Island National Recreation Area, Whitefish Scenic Byway, and five wilderness areas: Big Island Lake Wilderness, Delirium Wilderness, Horseshoe Bay Wilderness, Mackinac Wilderness, Rock River Canyon Wilderness, and Round Island Wilderness. Recreational activities include beachcombing, mountain biking, climbing, fishing, hiking, hunting, OHV riding, picnicking, and nature viewing. In addition, the forest has two rental cabins, 24 campground and group campsites, and 24 dispersed (primitive) campsites. Several boat launches and facilities for motorized boating also exist. Nonmotorized boating and swimming is allowed in many lakes and rivers. The annual visitation estimate is 490,700 visits. Much of this area can be categorized as a high-impact use area with some low- and medium-impact use areas (USDA, 2009j; USDA, 2010g).

Lighthouse in Hiawatha National Forest



Source: USDA, 2010j.

Huron-Manistee National Forest

The Huron-Manistee National Forest is in the upper northeast corner of Michigan, near the Canadian border that runs through Lake Huron. It approaches 1 million acres in size. Each year, the forest receives approximately 4 million recreation visits. The forest includes the 3,450-acre Nordhouse Dunes Wilderness Area, the Au Sable National Scenic River, and the Pere Marquette River National Wild and Scenic River. Approximately 10 miles of trails run within the wilderness and are accessible from two developed trailheads. Within the forest, recreation activities include hiking, bicycling, beachcombing, horse riding, fishing, hunting, OHV riding, and picnicking. Over 30 campsites and several sites for RV camping also exist. Non-campground camping is allowed almost everywhere in the forest. Many developed campgrounds have launches for motorized boats. In the winter, snowmobiling, cross-country skiing, and snowshoeing are also allowed. The annual visitation estimate for forest visits is 4,063,100. Much of this park can be categorized as a high-impact use area (USDA, 2010h; USDA, 2009k).

Ottawa National Forest

This forest approaches 1 million acres and is located in the western upper peninsula of Michigan. It borders Lake Superior, which includes the Canadian underwater border. The forest includes the Sylvania Wilderness and Sylvania Recreation Area; when combined, these two areas encompass 18,327 acres of wilderness. In addition, the forest includes the Sturgeon Wild and Scenic River, the Sturgeon River Gorge Wilderness (which includes few overgrown trails and one campground), the McCormick Wilderness (very rugged with a few unmaintained trails), the Lake Ottawa Recreation Area, and the Black River Harbor Campground Recreation area. Overall, 22 developed campgrounds exist in the Ottawa NF. All are accessible by road and most service both tent and trailer campers. One large group campground can accommodate 100 campers; dispersed camping is also allowed in the forest. In addition, more than 196 miles of

hiking and backpacking trails run through the forest along with paved day-hiking trails from the Ottawa Lake Recreation Area. Other recreation activities include bicycling, beachcombing, horse riding, fishing, hunting, OHV riding, and picnicking. There are 450 miles of groomed snowmobile trails and areas for cross-country skiing and snowshoeing. The national forest's annual visitation estimate is 507,000. Much of this park can be categorized as a high-impact use area (USDA, 2009l; USDA, 2010i).

Isle Royale National Park

Isle Royale National Park sits on Isle Royale in Lake Superior—less than 10 miles from the underwater Canadian border and a little over 20 miles from Canadian land. It is only accessible by boat or seaplane. The park has 132,018 acres of designated wilderness. In the wilderness, there are 36 established primitive campgrounds and 170 miles of trail and shorelines. Canoeing and kayaking on Isle Royale is very popular (some campgrounds are only accessible by canoe or kayak). There are several dock campgrounds. Motorized canoeing is only allowed in Lake Superior. Other recreational activities include fishing, day hiking, and scuba diving to explore shipwrecks. Between 2000 and 2009, the annual visitation ranged from 14,038 to 21,096 visitors per year. Most of this area can be categorized as a low-impact use area (USDO, 2006b; USDO, 2009m).

Ranger III is the largest ship owned and operated by the NPS and supports and provides transportation services to Isle Royale National Park



Source: USDO, 2009m.

6.17.2.2 New York

Iroquois National Wildlife Refuge

This refuge sits midway between Rochester and Buffalo, New York, near Lake Ontario and has three nature trails and four wetland overlooks. Nonmotorized canoeing and kayaking is allowed on Oak Orchard Creek. There is one skiing trail. Regulated hunting is also permitted, but camping is not allowed. The NWR has numerous interpretive activities and events. Most of this area can be categorized as a low-impact use area (USDO, 2010g).

Montezuma National Wildlife Refuge

Montezuma NWR lies between Rochester and Syracuse, approximately 20 miles from Lake Ontario. It is near Seneca Falls and the Finger Lakes. It contains 7,068 acres of land. There are six short trails (one mile or less) in the NWR. There is also a wildlife drive route, a visitor

center, and several observation and photography locations. Most of this area can be categorized as low-impact use area (USDOI, 2010h).

6.17.2.3 Ohio

Cuyahoga Valley National Park

The Cuyahoga Valley National Park is near Cleveland and Lake Erie. It has five primitive backcountry campsites at one campground along with an inn within park boundaries. Canoeing and kayaking are permitted, but discouraged due to potential water pollution. The park contains 125 miles of hiking trails. Other recreational activities include biking along designated bike paths, a scenic train ride, fishing, geocaching, golfing on one of four golf courses within the park, horseback riding, and picnicking. There is also a winter sports center that supports activities such as cross-country skiing, sledding, and ice fishing. Between 2000 and 2009, annual visitation ranged from 2,468,816 to 3,206,175. Much of this area can be categorized as a medium-impact use area (USDOI, 2010i; USDOI, 2009i).

Cedar Point National Wildlife Refuge

This small refuge is near Toledo, Ohio, on the shore of Lake Erie, approximately 20 miles from the underwater Canadian border. The refuge has 2,445 acres of marsh; most of it is closed to the public except for a fishing area that is open in the summer. Most of this area can be categorized as a low-impact use area (USDOI, 2009n).

Ottawa National Wildlife Refuge

This NWR sits slightly south of Cedar Point NWR on the shores of Lake Erie. The refuge is part of the Ottawa NWR Complex, which includes Cedar Point NWR, West Sister Island NWR, and Schoonover Waterfowl Production Area. In total, the complex includes over 9,000 acres. The refuge has ten miles of gravel/grass trails, monthly guided “hike the dikes” program in closed areas, and a shuttle service for disabled visitors. There is also a photo blind and monthly auto tours for wildlife observation. Camping and off-road vehicle use are not allowed. Controlled and regulated hunting and fishing are allowed in certain areas. Most of this area can be categorized as a low-impact use area (USDOI, 2010i).

6.17.2.4 Pennsylvania

Allegheny National Forest

Allegheny National Forest, in the northwest corner of Pennsylvania, features topography that varies a great deal in elevation. The park contains over 600 campsites and cabins, six boat launches, many miles of hiking, snowmobiling, and ATV trails. The park contains two designated wilderness areas—the Hickory Creek Wilderness and Allegheny Islands Wilderness—as well as two Wild and Scenic rivers—the Allegheny and Clarion rivers. Popular recreation activities include auto touring, fishing, hunting, horseback riding, skiing, hiking, camping, climbing, and ATV and snowmobile riding. This area can be categorized as a medium-impact use area (USDA, 2006).

6.17.2.5 Wisconsin

Chequamegon-Nicolet National Forest

The Chequamegon-Nicolet National Forest is in the upper northeast corner of Wisconsin, close to the Michigan border. It covers over 1.5 million acres and includes the Headwaters Wilderness (18,000 acres), Blackjack Springs Wilderness (5,800 acres), Porcupine Lake Wilderness (4,446 acre), Rainbow Lake Wilderness (6,583 acres), and Whisker Lake Wilderness (7,500 acres). It also includes the well-developed and maintained Anvil National Recreation Trail and the Morgan Falls St. Peter's Dome Trail. There are 800 miles of trails, 51 campgrounds, and eight rustic cabins. Many campgrounds offer space for RVs. Fishing and hunting are also very popular in this national forest. Certain trails are designated for mountain biking, horse riding, or OHV riding. Other activities include boating (motorized and nonmotorized), swimming, waterskiing, snowmobiling, cross-country skiing, and snowshoeing. The annual visitation estimate is 725,800. Much of this park can be categorized as a high-impact use area with some designated low-impact use areas (USDA, 2010j; USDA, 2009m).

Apostle Islands National Lakeshore

The Apostle Islands sit in Lake Superior offshore of Wisconsin. The park includes 21 islands and 12 miles of mainland. Established group and individual campsites, as well as backcountry camping zones, exist in the park. Other recreation activities include boating, fishing, hiking, hunting, kayaking, and scuba diving. The islands have 50 miles of maintained trails (including some boardwalks). According to a visitor survey in 2004, the most common activities that visitors participated in during their visit included sightseeing (80 percent), walking on beaches (66 percent), and photography (57 percent). Between 2000 and 2009, visitation ranged from 151,881 and 189,051 visitors per year. Much of this area can be categorized as a medium-impact use area (USDOI, 2009o; USDOI, 2010j).

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Final

Programmatic Environmental Impact Statement For Northern Border Activities

Section 7: New England Region



July 2012

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CONTENTS

7	New England Region	7-1
7.1	Introduction	7-1
7.2	Air Quality	7-4
7.2.1	Introduction	7-4
7.2.2	Affected Environment	7-4
7.2.2.1	National Ambient Air Quality Standards and Attainment Status	7-4
7.2.2.2	Class I Areas	7-6
7.3	Biological Resources	7-8
7.3.1	Introduction	7-8
7.3.2	Affected Environment	7-10
7.3.2.1	Blocks of Regionally Significant Habitat	7-10
7.3.2.2	Sensitive Habitats	7-12
7.3.2.3	Threatened and Endangered Species	7-13
7.3.2.4	Wildlife Typically Found in the Region	7-15
7.3.2.5	Vegetative Habitat Typically Found in the New England Region	7-16
7.3.2.6	Wetlands and Waterways	7-16
7.3.2.7	Aquatic Resources in the Region	7-17
7.4	Geology and Soils	7-18
7.4.1	Introduction	7-18
7.4.2	Affected Environment	7-18
7.4.2.1	Physiographic Provinces	7-18
7.4.2.2	Geologic Conditions	7-21
7.4.2.3	Soils	7-27
7.4.2.4	Prime and Unique Farmland	7-27
7.5	Water Resources	7-30
7.5.1	Introduction	7-30
7.5.2	Affected Environment	7-30
7.5.2.1	Groundwater	7-30
7.5.2.2	Surface Waters and Waters of the United States	7-32
7.5.2.3	Floodplains	7-35
7.5.2.4	Transboundary Water Agreements	7-35
7.6	Noise	7-36
7.6.1	Introduction	7-36
7.6.2	Affected Environment	7-36

7.6.2.1	Regulatory Review.....	7-37
7.6.2.2	CBP Noise Sources.....	7-37
7.6.2.3	Non-CBP Noise Sources.....	7-38
7.6.2.4	Background Noise Levels.....	7-38
7.6.2.5	National Parks.....	7-39
7.7	Climate Change and Sustainability.....	7-41
7.7.1	Introduction.....	7-41
7.7.2	Affected Environment.....	7-41
7.7.2.1	Climate Regions of the Northern Border—Overview.....	7-41
7.7.2.2	Climate in the New England Region.....	7-41
7.7.2.3	Climate Change in the United States—New England Regional Assessment.....	7-42
7.8	Land Use.....	7-43
7.8.1	Introduction.....	7-43
7.8.2	Affected Environment.....	7-43
7.8.2.1	Land Cover and Related Land Uses in the New England Region.....	7-43
7.8.2.2	Land Cover and Related Land Uses in the Areas North of the New England Region.....	7-47
7.8.2.3	Land Ownership in the New England Region.....	7-53
7.8.2.4	Land Ownership in Canada North of the New England Region.....	7-56
7.8.2.5	Land Use Management.....	7-58
7.8.2.6	Consistency with Enforceable Policies of the Coastal Zone Management Act.....	7-58
7.9	Aesthetic and Visual Resources.....	7-60
7.9.1	Introduction.....	7-60
7.9.2	Affected Environment.....	7-60
7.9.2.1	Affected Landscapes.....	7-60
7.9.2.2	Areas with High Visual Sensitivity.....	7-62
7.9.2.3	Affected User Groups.....	7-62
7.10	Socioeconomic Resources.....	7-65
7.10.1	Introduction.....	7-65
7.10.2	Affected Environment.....	7-65
7.10.2.1	Regional Demographics.....	7-65
7.10.2.2	Population and Growth Trends.....	7-66
7.10.2.3	Income, Poverty, and Unemployment.....	7-71
7.10.2.4	Property Values.....	7-74

7.10.2.5	Regional Economies	7-76
7.10.2.6	Economic Profiles of POEs and BPSs in the New England Region.....	7-79
7.11	Cultural and Paleontological Resources	7-85
7.11.1	Introduction.....	7-85
7.11.2	Affected Environment.....	7-85
7.11.2.1	Archaeological Resources: Prehistoric/Precontact Context.....	7-85
7.11.2.2	Prehistoric Archaeological Site Probability.....	7-86
7.11.2.3	Historic Context.....	7-87
7.11.2.4	Historic/Protohistoric Archaeological Site Probability	7-88
7.11.2.5	Above-Ground Historic Property Types	7-91
7.11.2.6	Native American Resources.....	7-101
7.11.2.7	Paleontological Resources	7-105
7.12	Environmental Justice and Protection of Children	7-107
7.12.1	Introduction.....	7-107
7.12.2	Affected Environment.....	7-107
7.12.2.1	Minority Populations	7-107
7.12.2.2	Low-Income Populations	7-110
7.12.2.3	Population of Children under 18 Years of Age	7-112
7.13	Human Health and Safety	7-114
7.13.1	Introduction.....	7-114
7.13.2	Affected Environment.....	7-114
7.14	Hazardous Materials	7-122
7.14.1	Introduction.....	7-122
7.14.1.1	Hazardous Substances.....	7-122
7.14.1.2	Hazardous Waste	7-122
7.14.1.3	Special Hazards.....	7-123
7.14.2	Affected Environment.....	7-123
7.14.2.1	Hazardous Substances, Hazardous Wastes, Special Hazards, and Otherwise Regulated Materials	7-123
7.15	Utilities and Infrastructure	7-124
7.15.1	Introduction.....	7-124
7.15.2	Affected Environment.....	7-124
7.15.2.1	Water Supply	7-124
7.15.2.2	Electrical and Communications Utilities	7-124
7.15.2.3	Fuel Supply	7-125

7.15.2.4 Wastewater Management..... 7-125

7.16 Roadways and Traffic 7-127

7.16.1 Introduction..... 7-127

7.16.2 Affected Environment..... 7-127

7.16.2.1 Existing Roadway Network and Roadway Effectiveness..... 7-127

7.16.2.1 Level of Service 7-128

7.16.2.2 Variability 7-128

7.16.2.3 Urban and Suburban Transportation Networks 7-129

7.16.2.4 Rural and Remote Transportation Networks 7-129

7.16.2.5 Federal and State Transportation Regulations 7-130

7.16.2.6 CBP’s Activities Affecting Roadways and Traffic..... 7-130

7.17 Recreation 7-133

7.17.1 Introduction..... 7-133

7.17.2 Affected Environment..... 7-135

7.17.2.1 Vermont/New Hampshire 7-135

7.17.2.2 Maine 7-136

FIGURES

Figure 7.1-1. The New England Region and CBP Facilities 7-1

Figure 7.2-1. Nonattainment Areas along the New England Region 7-5

Figure 7.2-2. Maintenance Areas along the New England Region..... 7-6

Figure 7.2-3. Class I Areas along the New England Region 7-7

Figure 7.3-1. Ecoregions of the New England Region 7-9

Figure 7.3-2. Blocks of Regionally Significant Habitat in the New England Regions 7-11

Figure 7.4-1. Physiographic Provinces, Division, and Sections of the New England Region . 7-19

Figure 7.4-2. Geologic Conditions of the New England Region 7-22

Figure 7.4-3. Extent of the Laurentide Ice Sheet 7-23

Figure 7.4-4. Seismicity in the New England Region 7-24

Figure 7.4-5. Landslide Incidence in the New England Region 7-25

Figure 7.4-6. Karst Topography in the New England Region 7-26

Figure 7.4-7. Soil Orders in the New England Region 7-28

Figure 7.4-8. Prime Farmland in the New England Region 7-29

Figure 7.5-1. New England Region Groundwater Aquifers 7-32

Figure 7.5-2. River Basins in New England Region..... 7-33

Figure 7.5-3. Middle Falls along the Androscoggin River 7-34

Figure 7.6-1. Background Noise Levels in the New England Region..... 7-39

Figure 7.8-1. Land Cover in the New England Region 7-51

Figure 7.8-2. Land Use in the New England Region 7-52

Figure 7.8-3. Land Ownership in the New England Region..... 7-55

Figure 7.10-1. Percent Change in the New England Region Population, 2000–2009 7-67

Figure 7.10-2. Percent Change in Canadian Population, North of New England Region, 1996–2006..... 7-70

Figure 7.10-3. Locations of POEs and BPSs in the New England Region..... 7-81

Figure 7.11-1. Native American Lands Within the 100-mile PEIS Corridor Crossing Maine, New Hampshire, and Vermont 7-103

Figure 7.11-2. Nineteenth-Century Cessions, Reservations, and Portages (1907) 7-104

Figure 7.11-3. Judicially Established Indian Land Areas as of 1978 7-104

Figure 7.11-4. Early Tribal, Cultural, and Linguistic Areas 7-105

Figure 7.13-1. U.S., State, and County Roads in the New England Region..... 7-115

Figure 7.13-2. Navigable Water in the New England Region 7-117

Figure 7.13-3. CBP Officers Train at Firing Range..... 7-120

Figure 7.17-1. Federally Protected Recreation Areas, Including National Forests, Parks, Recreation Areas, and Wildlife Refuges in the New England Region 7-134

TABLES

Table 7.4-1. Physiographic Provinces in the New England Region..... 7-20

Table 7.5-1. Water Use in the New England Region in 2005..... 7-30

Table 7.6-1. Common Sound Levels 7-36

Table 7.6-2. CBP Noise Sources..... 7-37

Table 7.6-3. Description of Background Noise Levels..... 7-39

Table 7.8-1. Land Cover in the New England Region..... 7-44

Table 7.8-2. Recreational Land Use in the New England Region 7-46

Table 7.8-3. Conservation Land Use* in the New England Region 7-46

Table 7.8-4. Land Cover in Canada North of the New England Region 7-48

Table 7.8-5. Recreational Land Use in Canada North of the New England Region 7-49

Table 7.8-6. Conservation Land Use in Canada North of the New England Region 7-50

Table 7.8-7. Land Ownership in the New England Region 7-54

Table 7.8-8. Land Ownership in Canada North of the New England Region 7-57

Table 7.8-9. Aboriginal Lands in Canada North of the New England Region 7-57

Table 7.10-1. Population of the New England Region* 7-66

Table 7.10-2. Population Centers in the New England Region* 7-68

Table 7.10-3. Population North of the New England Region in Canada..... 7-69

Table 7.10-4. Population in Census Metropolitan Areas in Study Area North of the New England Region in Canada..... 7-71

Table 7.10-5. Income and Poverty Statistics for the New England Region 7-72

Table 7.10-6. Unemployment Rates for the New England Region 7-72

Table 7.10-7. Income and Poverty Statistics North of the New England Region in Canada ... 7-73

Table 7.10-8. Unemployment Rates North of the New England Region in Canada 7-74

Table 7.10-9. Median Property Value for the New England Region..... 7-75

Table 7.10-10. Median Property Value North of New England Region in Canada 7-76

Table 7.10-11. Canadian Visitors Entering the New England Region by Surface Transportation* 7-78

Table 7.10-12. POE and BPS Sites Profiled in the New England Region..... 7-80

Table 7.11-1. Cultural Resources in the Vicinity of CBP Facilities in Maine..... 7-93

Table 7.11-2. Historic Buildings on CBP Property in Maine 7-97

Table 7.11-3. Cultural Resources in the Vicinity of CBP Facilities in New Hampshire and Vermont 7-98

Table 7.11-4. Historic Buildings on CBP Property in Vermont 7-101

Table 7.11-5. Native American Tribes that have a Reservation, Judicially Established Interest, or Established Traditional Ties to Land within the 100-mile PEIS Corridor..... 7-102

Table 7.12-1. Minority Statistics for the New England Region (Percent of Population) 7-108

Table 7.12-2. Visible Minority Statistics North of the New England Region in Canada* (Percent of Population)..... 7-109

Table 7.12-3. Income and Poverty Statistics for the New England Region 7-110

Table 7.12-4. Income and Poverty Statistics North of the New England Region in Canada . 7-111

Table 7.12-5. Age Distribution in the New England Region (Percent of Population) 7-112

Table 7.12-6. Age Distribution North of the New England Region in Canada (Percent of Population)..... 7-113

Table 7.16-1. Percent Distribution of Traffic by Vehicle Class, Total United States 7-127

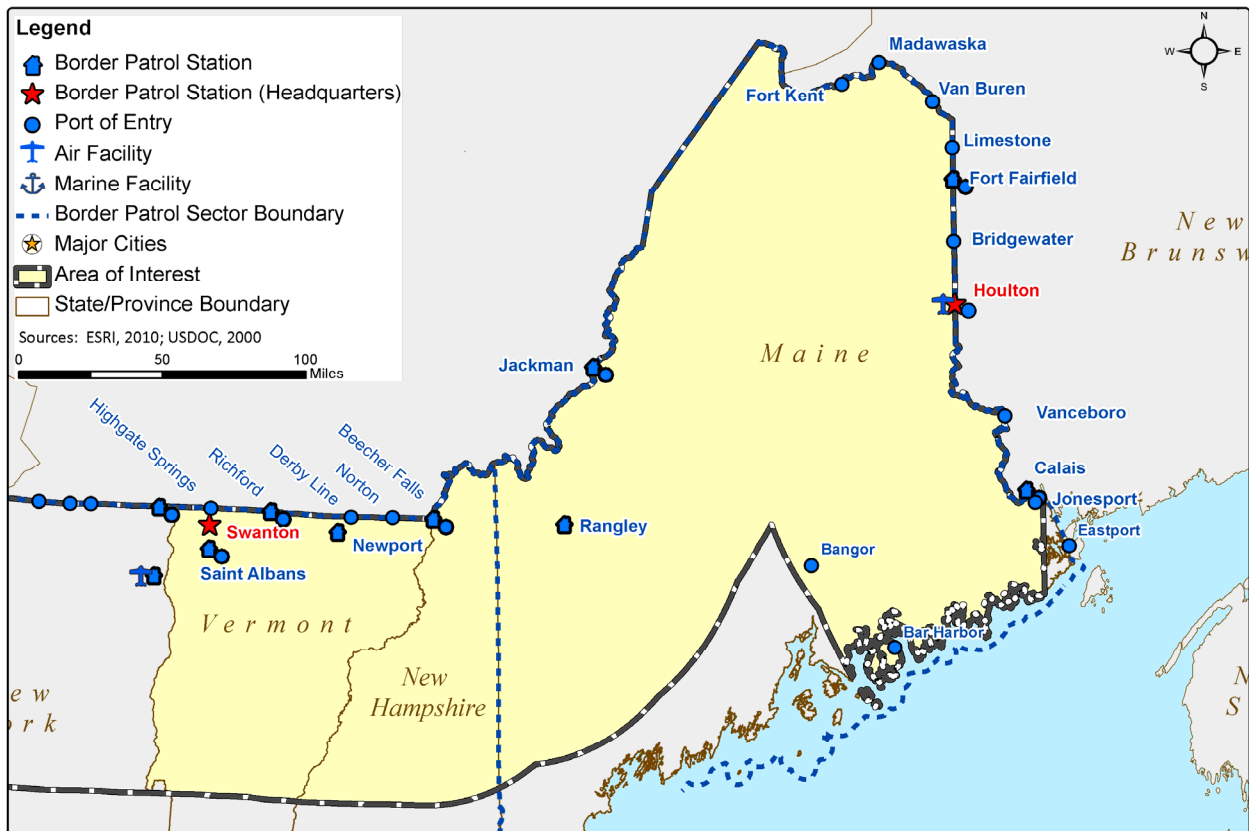
Table 7.16-2. Busiest LPOEs for Passenger Vehicles in the New England Region..... 7-131

7 NEW ENGLAND REGION

7.1 INTRODUCTION

This chapter analyzes potential environmental effects in the New England Region arising from U.S. Customs and Border Protection (CBP) actions related to its homeland-security mission. The chapter will address ongoing activities and long-range planning for security enhancement measures. The New England Region includes the areas of Maine, New Hampshire, and Vermont that fall within about 100 miles of the northern border. Figure 7.1-1 displays the territory and CBP facilities of the region.

Figure 7.1-1. The New England Region and CBP Facilities



The northern border environment in the New England Region has a wide variety of habitats and terrain types.

In Maine, these habitats include extensive areas of boreal coniferous forest, broad-leaved hardwood forests, mixed coniferous and deciduous stands, agricultural land, rolling hills, wetlands, glacial features, marine and estuarine deepwater habitats, marshes, beaches, intertidal flats, rocky coastal shorelines, and human developments of various densities. Major rivers that run through Maine include the Allagash, Aroostook, Narragaugus, St. Croix, and St. John Rivers. Important lakes include Mooselookmeguntic, Flagstaff, Brassua, and Moosehead Lakes.

Much of the habitat in New Hampshire is rugged, with coniferous forests, deciduous forests, mixed stands, mountains, alpine meadows near timberline, rolling hills, valleys, agricultural

land, forested and scrub-shrub wetlands, and human developments of various densities. Major rivers that run through New Hampshire include the Androscoggin, Connecticut, Pemigewasset, Saco, Merrimack, and Ammonoosuc Rivers. Important lakes include the Connecticut Lakes, Lake Winnepesaukee, Ossipee Lake, Sunapee Lake, Newfound Lake, and Lake Umbagog.

Habitats in Vermont include coniferous forests, deciduous forests, mixed stands, mountains, alpine meadows near timberline, rolling hills, valleys, agricultural land, forested wetlands, and human developments of various densities. Major rivers that run through Vermont include the Connecticut, Missisquoi, Passumpsic, White, and Winooski Rivers. Important lakes include Lake Champlain and Lake Memphremagog.

Most land in the New England Region is owned and managed privately, but there is also public land including state-owned land (Baxter State Park in Maine, many smaller state parks in New Hampshire and Vermont), national forests (White Mountain, Green Mountain), national parks (Acadia), national wildlife refuges (Lake Umbagog, Missisquoi), the Appalachian and Long Trails, and Native American lands (belonging to the Passamaquoddy, Penobscot, Maliseet, and Micmac Tribes).

U.S. Border Patrol in the New England Region

The U.S. Border Patrol (USBP) in the New England Region employs several hundred agents who operate from 10 stations spread over approximately 700 miles of the northern border (see Figure 7.2-1). The border in the New England Region is mainly rural and remote, consisting of pasture land, forest, and water. The International Boundary Commission maintains a clear cut to 60 feet on the U.S. side of the border (“the slash”), which defines the border wherever it passes through forest. In some areas, there are roads along the border, none of which is restricted. There are no vehicle barriers or fencing. Surveillance of the border employs diverse use of on- and off-road vehicles and snowmobiles as well as pedestrian, aerial, and waterborne patrols. CBP maintains partnerships with governmental agencies (Federal, state, and local law enforcement as well as Canadian authorities) and private entities (communities, landowners, interboundary groups) for both law enforcement and intelligence missions.

The region’s 10 Border Patrol stations (BPS) are divided into two sectors: Houlton in Maine and Swanton in New Hampshire and Vermont. All stations have canine teams. An average of 1,000-1,500 interdictions takes place per year. Most interdictions involve people who should not be in the United States (because of criminal history, failure to leave as required, or presence without admission from Canada); there is also a small amount of smuggling. About \$2 million in cash is seized every year, usually from narcotics trafficking. Occasionally weapons and drugs are seized.

USBP within the region deploy a combination of static permanent surveillance, ground radar, and acoustic sensors, with repeaters to provide extended line-of-sight coverage. Forward operating bases (FOBs) are deployed in parts of this region, as are mobile traffic checkpoints in coordination with state departments of transportation.

Office of Air and Marine in the New England Region

The CBP Office of Air and Marine (OAM) in Houlton, Maine deploys from Houlton International Airport. The Plattsburgh, New York OAM Center works with the Swanton USBP

and operates out of the Plattsburgh Air Force Base, now Plattsburgh International Airport. Agents conduct regular aerial patrols and mission-specific aerial surveillance of the border and surrounding areas. Agents respond to USBP requests and act independently as well. Agents also provide both fixed-wing and rotary aviation resources to specific criminal investigations that take place on the ground away from the border. They use night-vision goggles, forward-looking infrared, digital aerial video, airborne radar platforms, and video downlinks.

The USBP manages marine operations in the New England Region.

Office of Field Operations in the New England Region

Each CBP Office of Field Operations (OFO) region includes one or more large ports of entry (POEs) that may oversee smaller ports of varying sizes. Houlton, the largest POE in Maine, oversees 13 other POEs and processes about 10,000 trucks and 300,000 cars per month. It is capable of processing all cargo but focuses mostly on lumber, agricultural products, and seafood. There are three regions in Maine: Houlton, Calais, and Jackman. Each of these regions oversees ports of different sizes. The service port is in Portland, Maine, and the field office is in Boston. Service ports are OFO locations that have a full range of cargo processing functions, including inspections, entry, collections, and verification.

There are no POEs along the border in New Hampshire. Vermont has five small POEs and a service port in St. Albans.

7.2 AIR QUALITY

7.2.1 INTRODUCTION

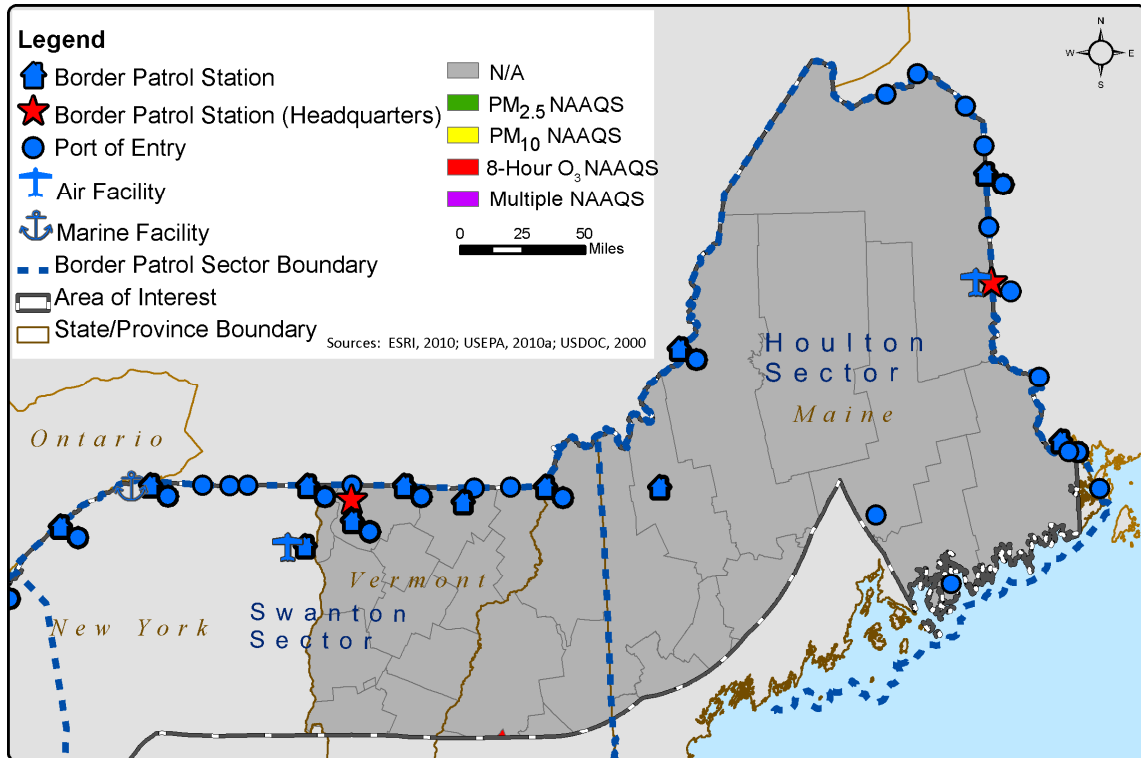
The New England study area contains many air quality control regions (AQCR) and Class I areas that could experience impacts due to the proposed action and alternatives in this Programmatic Environmental Impact Statement (PEIS). (Class I areas are Federal lands, designated by Congress as of August 7, 1977, that have air quality restrictions under Section 162(a) of the Clean Air Act (CAA) that are more stringent than the standards that apply elsewhere.) However, the mere presence of a sensitive area, such as a nonattainment, maintenance, or Class I areas, does not guarantee that that area would be impacted by CBP activities. Chapter 3, Section 3.2 provides more detailed information on national standards and requirements used to describe and determine effects to air quality resources.

7.2.2 AFFECTED ENVIRONMENT

7.2.2.1 National Ambient Air Quality Standards and Attainment Status

Nonattainment areas within 100 miles of the border are shown in Figure 7.2.2-1. There are no nonattainment areas in the New England Region (USEPA, 2010). Federal regulations designate AQCRs that were once classified as nonattainment but have lowered levels of pollutants through the use of regional controls, as maintenance areas. Figure 7.2-2 shows maintenance areas throughout Maine. The larger area of PM₁₀ (particulate matter that is 10 micrometers in diameter and smaller) in northern Maine is attributed to the use of a sand/salt mixture as a winter skid control measure, which has been changed in some locations to a calcium-chloride/salt mixture. This reduction in the use of sand promoted this area from nonattainment to maintenance area designation (USEPA, 1995). A complete list of nonattainment and maintenance areas organized by state and county is located in Appendix J.

Figure 7.2-1. Nonattainment Areas along the New England Region

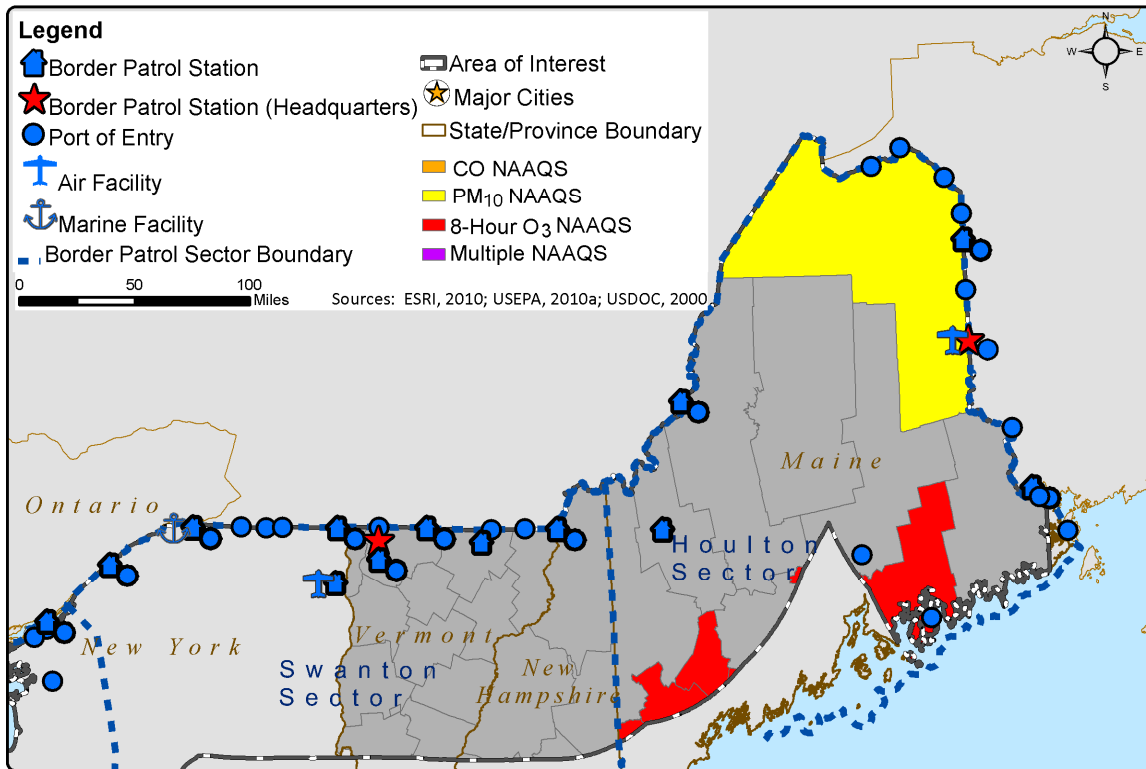


Notes:

NAAQS: National Ambient Air Quality Standards

PM_{2.5}: Particulate matter that is 2.5 micrometers in diameter and smaller

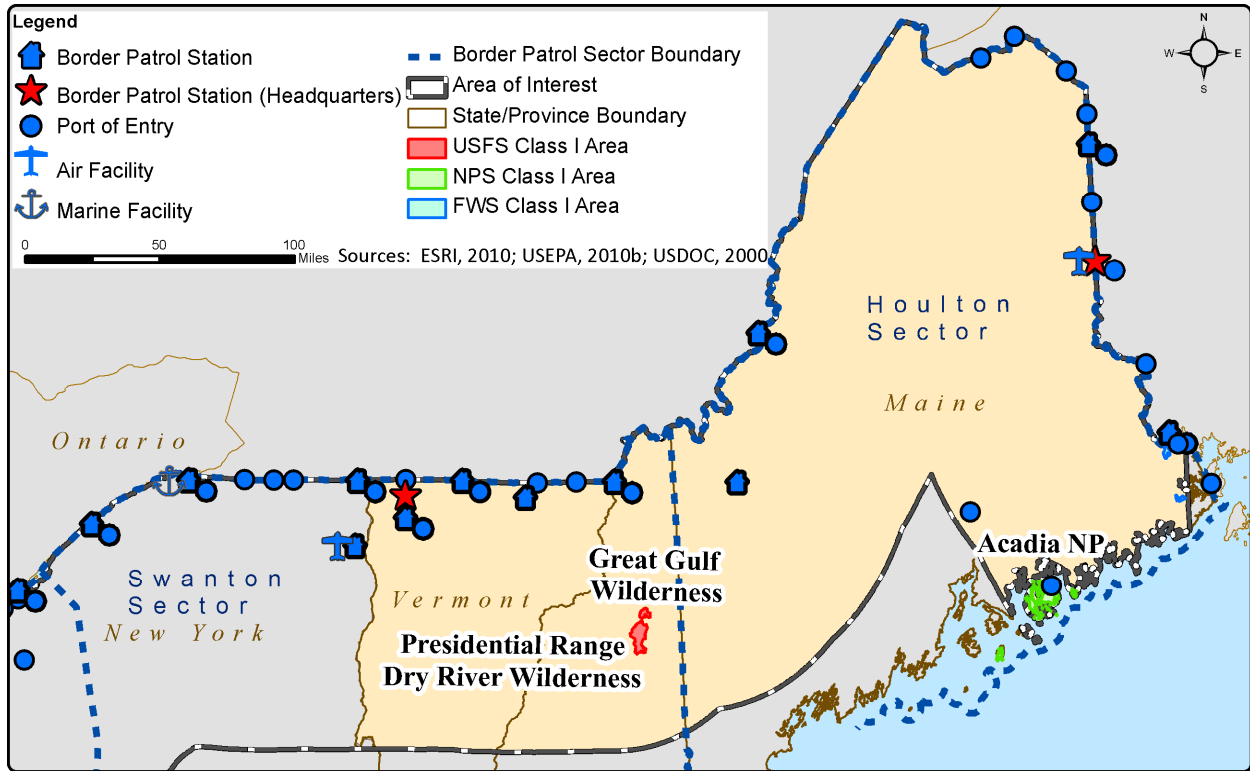
Figure 7.2-2. Maintenance Areas along the New England Region



7.2.2.2 Class I Areas

The CAA protects areas where air quality exceeds national standards established by the Environmental Protection Agency (USEPA) by measures to prevent significant deterioration (PSD) of air quality. The more stringent restrictions in effect in Class I areas are largely meant to maintain unimpaired visibility in areas such as “national parks, national wilderness areas, national monuments, national seashores, and other areas of special natural, recreational, scenic, or historic value.” In general, "clean air areas" are protected through ceilings on the additional amounts of certain air pollutants over a baseline level. The PSD increment amounts vary based on the area’s classification. Class I areas and major CBP facilities in the New England Region are shown on the map in Figure 7.2-3.

Figure 7.2-3. Class I Areas along the New England Region



Notes:

USFS: United States Forest Service

NPS: National Park Service

USFWS: U.S. Fish and Wildlife Service

7.3 BIOLOGICAL RESOURCES

7.3.1 INTRODUCTION

As with other topics in this PEIS, the programmatic approach for describing the existing biological resources is driven by the planning objective of the document and the potential for actual impacts. The description of the affected environment presented below focuses on the following areas:

The New England Region falls within portions of the following states: Vermont, New Hampshire, and Maine, and can be divided biologically into three ecoregions:

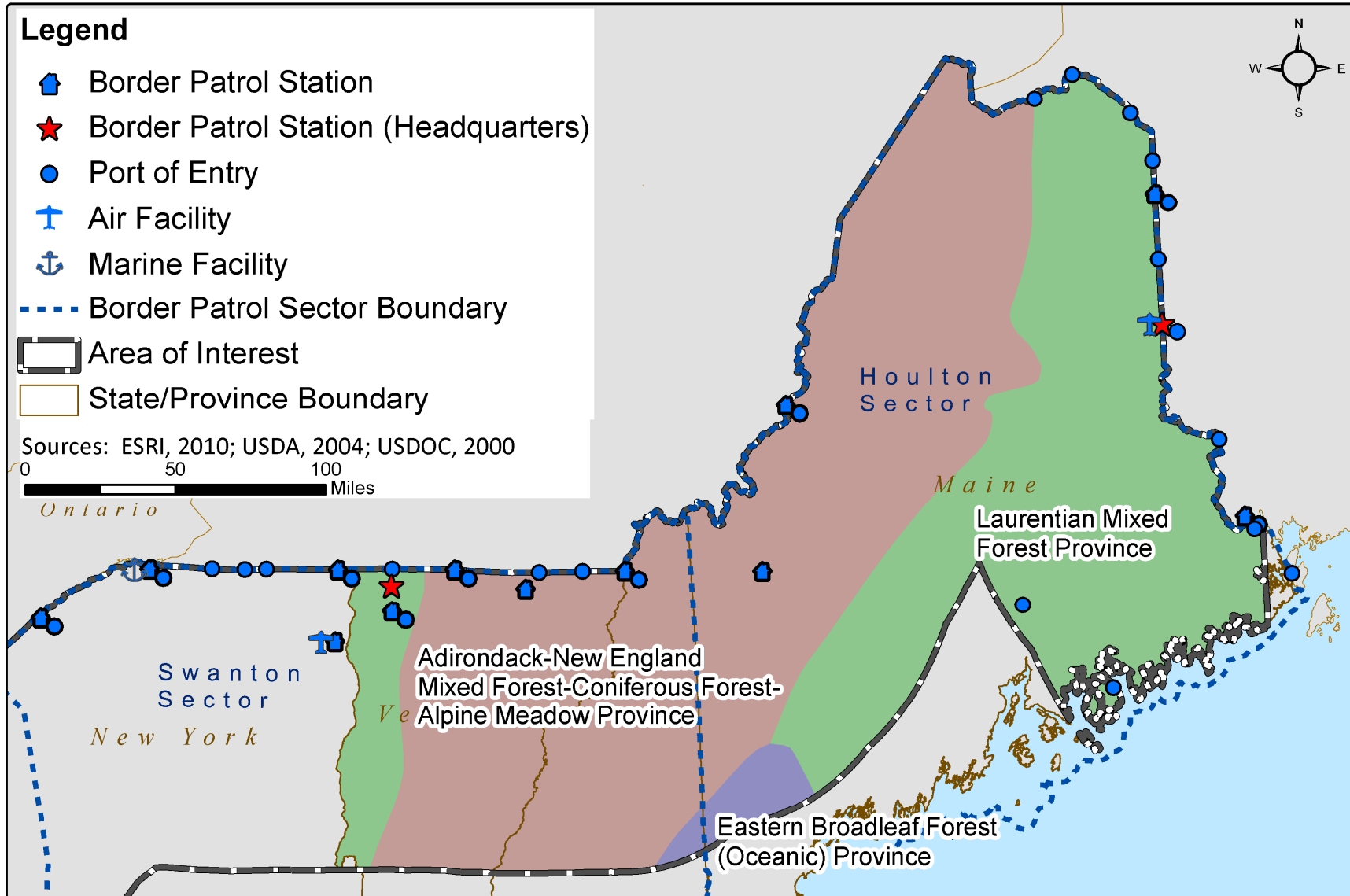
- Laurentian Mixed Forest;
- Adirondack-New England Mixed Forest Coniferous Forest-Alpine Meadow; and,
- Eastern Broadleaf Forest (Oceanic) ecoregions.

Figure 7.3-1 provides a map of these ecoregions. For a complete description of each ecoregion, refer to Appendix L.

Map resources for the ecoregion maps presented in this section were developed from the U.S. Census Bureau (USCB), U.S. Geological Survey (USGS), and ESRI databases.

Each ecoregion has a unique set of biological, climatic, and topographical characteristics along with unique challenges and opportunities for CBP.

Figure 7.3-1. Ecoregions of the New England Region



7.3.2 AFFECTED ENVIRONMENT

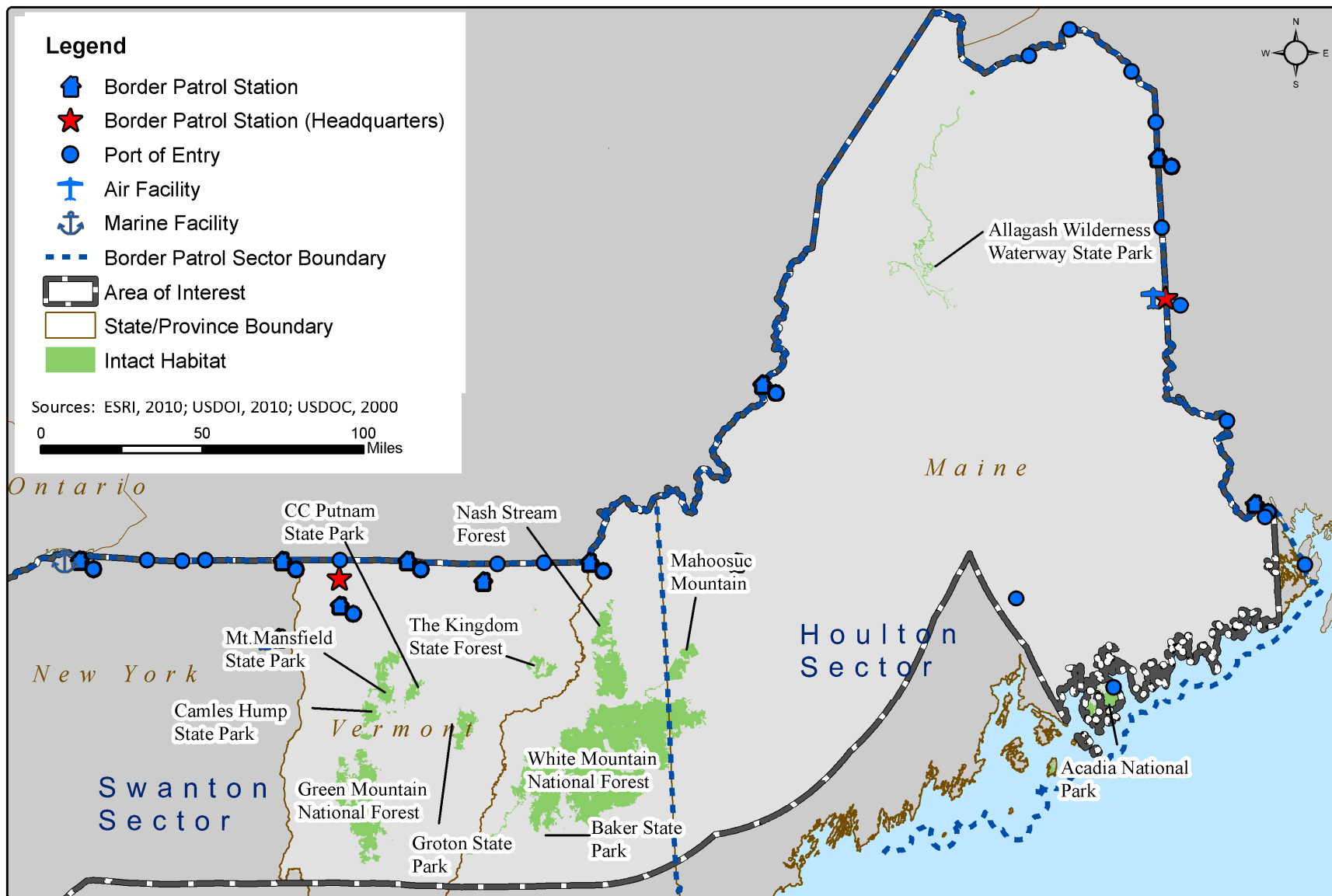
7.3.2.1 Blocks of Regionally Significant Habitat

The blocks of regionally significant habitat listed below and shown in Figure 7.3-2 are relatively undeveloped and intact habitat protected as wilderness, state parks, and state and national forests. Intact habitat refers to areas of largely unfragmented habitat with few alterations or disturbances, such as improved roads or other development. Most areas listed are protected by law (wilderness areas, national parks), while others may occupy private lands and often cross state and country boundaries.

Selected regionally significant blocks of intact habitat that represent this region include:

- Acadia National Park (Maine);
- Allagash Wilderness Waterway State Park (Maine);
- Baxter State Park (Maine);
- Big Reed Pond Forest Preserve (Maine);
- Camels Hump State Park (Vermont);
- C.C. Putnam State Forest (Vermont);
- Great Wass Island Preserve (Maine);
- Green Mountains (Vermont);
- Groton State Forest (Vermont);
- Mahoosuc Mountains – northern extension of the White Mountains (Maine);
- Missisquoi National Wildlife Refuge (Vermont);
- Mt. Mansfield State Forest (Vermont);
- Nash Stream Forest (New Hampshire);
- Roosevelt Campobello International Park (New Brunswick, Canada);
- Silvio O. Conte National Fish and Wildlife Refuge (Massachusetts);
- Spednic Lake (New Brunswick, Canada);
- The Kingdom State Forest (Vermont); and,
- White Mountain National Forest (New Hampshire).

Figure 7.3-2. Blocks of Regionally Significant Habitat in the New England Regions



7.3.2.2 Sensitive Habitats

Within a 100-mile zone adjacent to the U.S.-Canadian border in this region are several ecological communities representing sensitive habitats. The sensitive habitats described here occur in many of the larger habitat areas listed in Section 7.3.2.1, and are home to many of the threatened and endangered species in the next section. For example, the White Mountain fritillary (butterfly) (*Boloria titania montinus*), a subspecies of the purple fritillary (*B. titania*), is endemic to the alpine zone of the Presidential Range of New Hampshire (McFarland 2003). Some descriptive habitats below, such as flowages, span many regional boundaries and are more general in meaning. Others, such as northeastern interior pine barrens (dry forest communities dominated by pines), define much more specific ecological associations.

Many of these habitats are very fine in scale and form a patchwork of biologically sensitive and diverse areas. The list of sensitive habitats is based on those enumerated and described by the World Wildlife Fund (WWF, 2001), ecological system descriptions within the NatureServe.org database, and each state's respective natural resources agency (NatureServe, 2010).

- Alpine meadow—open areas on Adirondack Mountains, generally above 3,500 feet, where cold temperatures and high winds favor a community of ground-layer plants that can tolerate such conditions;
- Acadian-Appalachian alpine tundra—tundra vegetation above the timberline;
- Acadian-Appalachian montane spruce-fir forest—woods of spruce and fir on mountain slopes;
- Bogs—wetland that accumulates acidic peat with deposits of dead plant material;
- Boreal forests—predominately coniferous forest of the Northern Hemisphere;
- Calcareous fens—rarest wetland community with alkaline mineral-rich groundwater;
- Cedar/tamarack swamps—forested wetland characterized by one or both of these tree species;
- Cold-air talus woodland—areas with large, ice-cooled boulders where the microclimate supports black and red spruce, heaths, and evergreen shrubs;
- Flowages—series of connected lakes;
- Freshwater estuaries—ecological community where lake and river waters mix;
- Hardwood swamps—deciduous forested wetland;
- Inland lake shorelines—beaches of inland lakes characterized by water-level fluctuations preventing development of stable shoreline plant communities, instead supporting a more-specialized biota adapted to sandy or gravelly shorelines;
- Limestone bluff cedar-pine forests—forests of these species on limestone bedrock;
- Montane spruce-fir forest—spruce-fir forest on mountain slopes;
- Montane yellow birch-red spruce forest—birch-fir forests on mountain slopes;
- Northeastern interior pine barrens—dry pine forest on sandy, acidic, nutrient-poor soils;

- Pitch pine-oak-heath rocky summit—lower-elevation transition zone with pitch pine, oak, and associated shrub zone;
- Riverine marsh—riverside, deep-marsh wetland;
- Sedge meadow—wetland dominated by sedges growing on saturated soils typically composed of peat or muck; and,
- Subalpine krummholz—stunted wind-shaped coniferous forest below the timberline.

7.3.2.3 Threatened and Endangered Species

Federally listed threatened and endangered species are protected by the Endangered Species Act (ESA) of 1973. The purpose of the ESA is to protect and recover imperiled species and the ecosystems upon which they depend.

Appendix M lists the threatened or endangered species by county in the New England Region. Species are listed as threatened or endangered at either the Federal and/or state level. There is no designated critical habitat for threatened or endangered species in the region.

Some states differ in how they list and protect threatened and endangered species. The following list gives the specific agencies and listing differences (if applicable) in the New England Region.

- Vermont has an endangered species law that covers both animals and plants. The law does not require the development of recovery plans, although the state is preparing plans for some state-listed species. (NANFA, 2011).
- New Hampshire's Endangered Species Conservation Act protects non-domesticated species of wildlife indigenous to the state (NANFA, 2011).
- Maine passed an endangered species act (NANFA, 2011) in 1975.

Following are examples of some of the threatened and endangered species in the New England Region:

The Atlantic salmon (*Salmo salar*), is a federally listed endangered species with a range from the Androscoggin River northward along the Maine coast to the Dennys River. Impassable falls in the rivers limit the upstream extent of its freshwater range. The Atlantic salmon is an anadromous fish, typically spending two to three years in fresh water, migrating to the ocean where it spends an additional two to three years, and then returning to its natal river for spawning. Atlantic salmon in the Gulf of Maine represent the last wild populations of this fish in the United States. When listed under the ESA in 2000, at least eight rivers in the geographic range of the distinct population segment still supported wild Atlantic salmon populations (Fay et al. 2006).

Atlantic salmon



Source: (NDL, No Date).

The piping plover (*Charadrius melodus*) is a federally listed threatened species that occupies beaches, mudflats, sandflats, tidal ponds, and salt marshes in Maine. The roseate turn (*Sterna dougallii*) is a federally listed endangered species that occupies Salt marsh islands and beaches with sparse vegetation in Maine.

Least tern



Source: (NDL, No Date).

The Canada lynx (*Lynx canadensis*) is a federally threatened species listed in New Hampshire, Vermont, and Maine. This species occupies boreal/hardwood forests, preferring areas of higher altitude that receive deep snows and have high-density populations of snowshoe hares (*Lepus americanus*). Timber harvest, recreation, and other related activities are the predominant land uses affecting lynx habitat.

Additional federally listed endangered species in New England also include the roseate tern (*Sterna dougallii*) in Maine, the Karner blue butterfly (*Lycaeides melissa samuelis*) in New Hampshire, and the Indiana bat (*Myotis sodalis*) in Vermont.

Plant species include Furbish's lousewort (*Pedicularis furbishiae*) along the U.S-Canada border, the eastern prairie fringed orchid (*Plantanthera leucophaea*), which has populations in 6 states, including 1 population in Maine and the small whorled poponia (*Isotrea medeoloides*), which is widely but sparsely distributed in 17 eastern states, including Maine and New Hampshire, and Canada.

7.3.2.4 Wildlife Typically Found in the Region

Many birds, especially songbird species, such as the magnolia warbler (*Dendroica magnolia*) and the white-throated sparrow (*Zonotrichia albicollis*), migrate through this part of the northern border region twice each year. Many other bird, mammal, reptile, and amphibian species remain in the New England ecoregions year-round. Other common avian species include the broad-winged hawk (*Buteo platypterus*), ruffed grouse (*Bonasa umbellus*), hermit thrush (*Catharus guttatus*), and blue jay (*Cyanocitta cristata*). In boreal forest and coniferous forest habitats in the northernmost portion of the region, many passerine species typical of these forested habitats occur, including more than 25 warbler species (family Parulidae), rose-breasted grosbeak (*Pheucticus ludovicianus*), and coniferous forest birds, such as black-backed woodpecker (*Picoides arcticus*) and gray jay (*Perisoreus canadensis*).

The woodlands of this region are home many common animal species, including mammals such as the black bear (*Ursus americanus*), mule deer (*Odocoileus hemionus*), moose (*Alces alces*), fisher (*Martes pennant*), bobcat (*Lynx rufus*), fox (*Urocyon spp.* or *Vulpes spp.*), shrews (*Sorex spp.*), red squirrel (*Sciurus vulgaris*), and skunk (*Mephitis spp.*). Amphibians include red-backed salamander (*Plethodon cinereus*), spotted salamander (*Ambystoma maculatum*), red-spotted newt (*Notophthalmus viridescens*), and American toad (*Bufo americanus*). Common garter snakes (*Thamnophis spp.*) and wood turtles (*Glyptemys spp.*) are also adapted to this northern climate.

Red-backed Salamander, *Plethodon cinereus*



Source: (NDL, No Date).

Marine mammals common within the region's coastal areas include seals (harbor seal, *Phoca vitulina*; gray seal, *Halichoerus grypus*; harp seal, *Phoca groenlandica*), and whales (humpback whale, *Megaptera novaeangliae*, fin whale, *Balaenoptera physalus*). All marine mammals are protected under the Marine Mammal Protection Act (MMPA) of 1972. This act prohibits, with certain exceptions, the take of marine mammals in U.S. waters. The Department of Interior (DOI) oversees protection of the sea otter, walrus, polar bear, dugong, and manatee; and the Department of Commerce (DOC) oversees the protection of pinnipeds (other than walrus) and cetaceans (whales) (Bailey, 1995; EOE, 2009; VTDFG, 2011; NHFGD, 2011; MEDIFW, 2011).

7.3.2.5 Vegetative Habitat Typically Found in the New England Region

Forested habitats dominate the vegetative cover within the region. The Laurentian Ecoregion is primarily composed of coniferous and mixed forest with several species of conifers, particularly white pine (*Pinus strobus*), eastern hemlock (*Tsuga canadensis*), black spruce (*Picea mariana*) and white spruce (*Picea glauca*), balsam fir (*Abies balsamea*), and tamarack (*Larix laricina*). Deciduous species become increasingly common in the mixed forest. The species assemblages within the mixed forests are highly dependent on the soils; deciduous species typically favor nutrient-rich soils, while conifers thrive in poor ones. Pines are common in areas altered by fire. Shrub and herbaceous layers add to the vegetative diversity within each of these forests (Bailey, 1995; EOE, 2009).

The Adirondack-New England Mixed Forest Coniferous Forest-Alpine Meadow ecoregion is a mountainous region that transitions between true spruce-fir forest in the north to deciduous forest in the south. The growth form and species of this forested ecoregion are similar to those ecoregions further north, but red spruce (*Picea rubens*) grows here instead of white spruce (*Picea glauca*). Vegetational zonation is present, with both elevation and latitudinal aspects. Mountain slopes at lower elevations are usually covered with mixed forest, typically of spruce, fir, maple (*Acer* spp.), and birch (*Betula* spp.). The effect of latitude is noticeable from north to south.

Vegetative cover within the Eastern Broadleaf Forest (Oceanic) ecoregion includes forested and wetland habitats. Typical vegetative cover includes oak-hickory and maple-beech forests. Wetter forests often have a well-developed understory made up of flowering dogwood (*Cornus florida*), sassafras (*Sassafras albidum*), and hop hornbeam (*Ostrya virginiana*), along with evergreens and wildflowers (Bailey, 1995; EOE, 2009; VTDFG, 2011; NHFGD, 2011; eFloras, 2011).

7.3.2.6 Wetlands and Waterways

Wetland types within this region include:

- Beaches;
- Floodplain forests;
- Hardwood and coniferous swamps;
- Intertidal flats;
- Lacustrine wetlands (lakes);
- Marine and estuarine deepwater habitats;
- Marine and estuarine marshes;
- Palustrine emergent wetlands (marshes, fens, wet meadows, sedge meadows, wet prairies);
- Palustrine forested/scrub shrub wetlands;
- Palustrine open water (ponds);
- Riverine habitat (rivers and streams); and,

- Shallow/open-water communities.

Wetlands are those portions of the landscape where water saturation influences soil development, plant communities, and wildlife habitat. The U.S. Fish and Wildlife Service (USFWS) definition of wetlands encompasses areas that are periodically inundated or saturated with groundwater or surface water, and function as transition areas between uplands and aquatic habitats. Deepwater habitats, as defined by the USFWS (Cowardin et al., 1979), are permanently flooded lands below the wetland boundary in ponds, lakes, or oceans. Wetlands can be very sensitive to disturbance and have a greater likelihood of slow recovery compared to adjacent uplands. (Sheldon et al., 2003).

The marine and estuarine systems within the Laurentian Mixed Forest Province occur along the southeast coast of Maine, a portion of which sits in the northern border area. Notable wetlands include the Hurlbert (Atlantic white cedar) Swamp in New Hampshire (TNC, 2010) and the LaPlatte River Marsh and Gillette Swamp in Vermont.

7.3.2.7 Aquatic Resources in the Region

Aquatic resources are highly regarded in the New England Region, luring outdoor enthusiasts to the region for hunting and fishing. Abundant lakes, rivers, ponds, wetlands—the remnants of glacial recession—form dominant features on the landscape. The Atlantic Ocean borders portions of this region.

The aquatic resources within the region support a diverse fishery. Notable fish species include the lake sturgeon (*Acipenser fulvescens*), walleye (*Sander vitreus*), northern pike (*Esox lucius*), muskellunge (*E. masquinongy*), Atlantic salmon (*Salmo salar*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*M. salmoides*), brook trout (*Salvelinus fontinalis*), lake trout (*S. namaycush*), yellow perch (*Perca flavescens*), white sucker (*Catostomus commersonii*), sculpin (order – Scorpaeniformes), common shiner (*Luxilus cornutus*), and creek chub (*Semotilus atromaculatus*). Various native reptiles, amphibians, waterbirds, aquatic insects, mussels, and crustaceans also thrive in the region's waters (USDOC, 2010a). All native fish species in this region may be affected by water quality degradation due to human activity and also from the introduction of invasive species.

The Appalachian Plateau of the Eastern Broadleaf Forest (Oceanic) ecoregion has important aquatic resources as well, ranging from small natural lakes to wetlands. Major rivers in the New England Region include: the Androscoggin, Pemigewasset, Saco, Merrimack and Ammonoosuc rivers in New Hampshire, the Connecticut River between New Hampshire and Vermont, and the Missisquoi and Passumpsic rivers in Vermont. Important lakes include: Moosehead and Sebago in Maine, the Connecticut Lakes, Lake Winnepesaukee, Ossipee Lake, Sunapee Lake, Newfound Lake, and Lake Umbagog in New Hampshire; and lakes Champlain and Memphremagog in Vermont.

Aquatic resources are also highly regarded within the Eastern Broadleaf forest ecoregion, providing hunting and fishing for outdoor enthusiasts. The aquatic resources in this province are highly regarded due to the richly diverse fish populations. Large lakes, rivers, and streams constitute important habitat for freshwater fish in this ecoregion (Bailey, 1995; EOE, 2009).

7.4 GEOLOGY AND SOILS

7.4.1 INTRODUCTION

The geology, topography, and soils in the New England Region in the northern border study area vary widely throughout the region. Geology can be described as the study of the earth's history through rock formations. These rocks often serve as the parent rock for soils present at and below the surface. The topography of a given area on earth can be described as its surface, shape, or features

This section addresses the geologic conditions in the New England Region and describes the potential impacts of CBP's program alternatives on geologic resources. The study area contains significantly different topographic features ranging from glaciated lowlands to high relief in the Appalachian Highlands to the Atlantic seaboard. Geologic formations include crystalline mountain uplifts, magma intrusions, and depressed glacial lowlands.

7.4.2 AFFECTED ENVIRONMENT

7.4.2.1 Physiographic Provinces

Just one physiographic division covers the New England Region; this division is subdivided into provinces as well as some sections (Figure 7.4-1 and Table 7.4-1).

The Highlands encompass three provinces; these are further divided into sections. The St. Lawrence Province contains the Champlain section and the Valley and Ridge Province includes the Hudson Valley. The New England Province is divided into four sections: Taconic, Green Mountain, New England Upland, and White Mountains. Table 7.4-1 provides details on the geology of these areas and Appendix N features a geologic time scale showing the ages of the geologic time periods with which rock formations are dated.

Figure 7.4-1. Physiographic Provinces, Division, and Sections of the New England Region

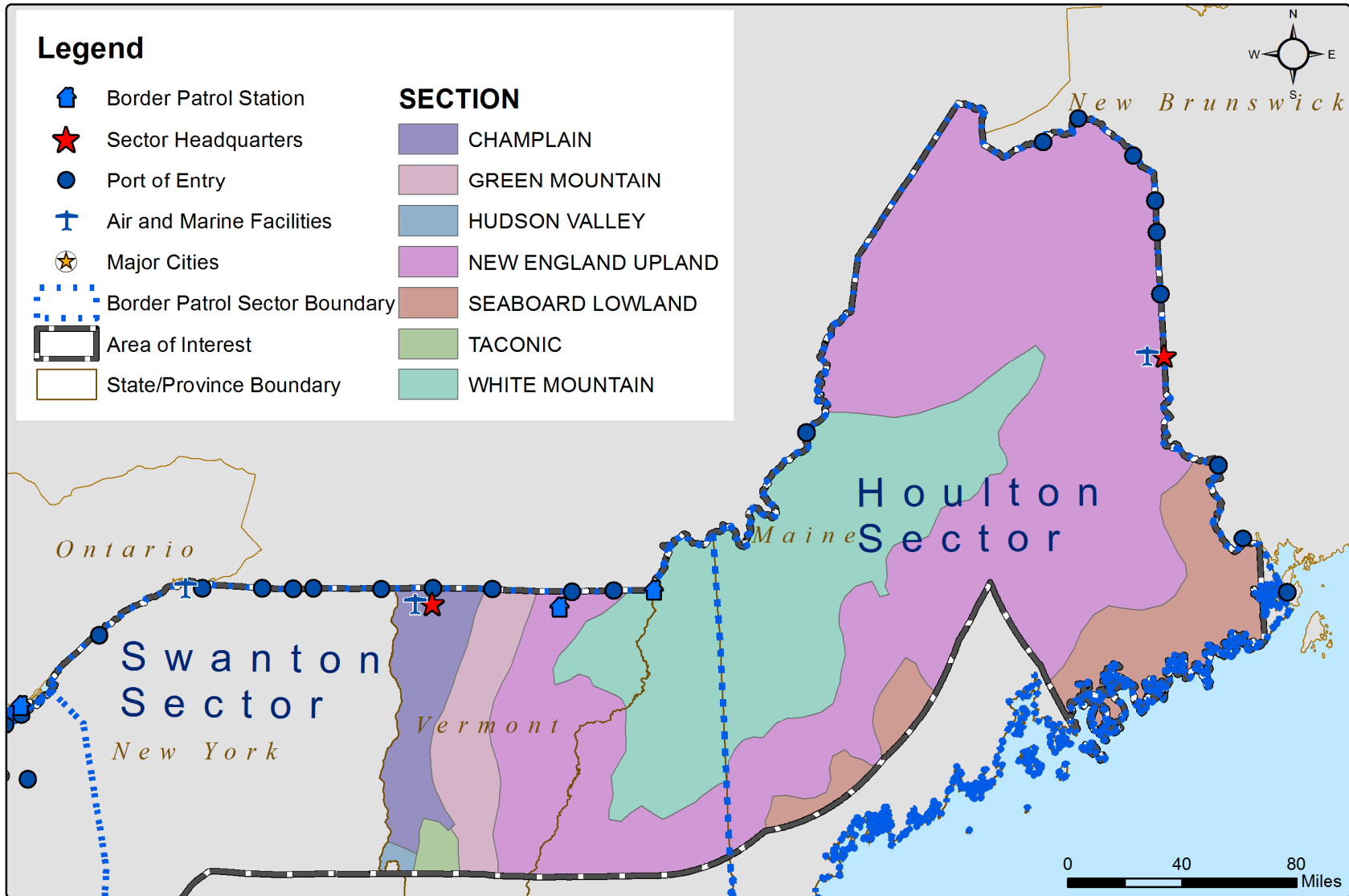


Table 7.4-1. Physiographic Provinces in the New England Region.

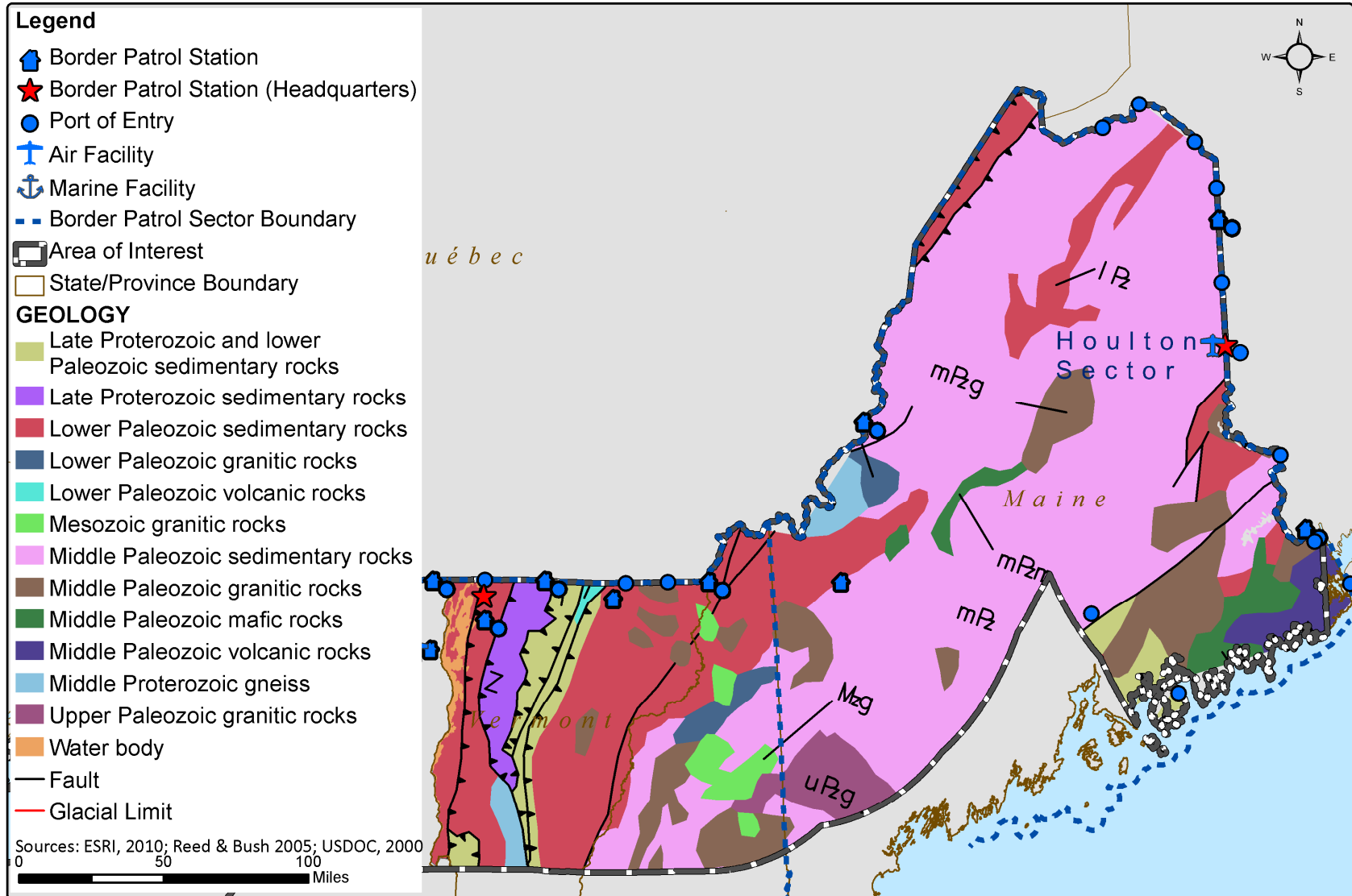
Division	Province	Section	Terrain Texture including Topography	Geologic Structure and History	Generalized Rock Types
Appalachian Highlands	St. Lawrence Valley	Champlain	Rolling lowland, glaciated; in part covered by young marine plain (Fenneman, 1928).	An area of high relief; glaciated with each North American glacial progression; greater relief than the average for the province (Fenneman, 1928).	Boundary marked by the contact of Paleozoic and Precambrian rocks. Large part of eastern boundary is at the foot of the Green Mts. This line agrees in the main, but not accurately, with contact of Paleozoic and Precambrian rocks (Fenneman, 1928).
Appalachian Highlands	Valley and Ridge	Huron Valley	Long ridges and valleys, some areas of high relief.	Formed during Appalachian Mts. development; rivers eroded the valleys.	Mostly sedimentary rock, uplifted through mountain-building.
Appalachian Highlands	New England	Taconic	200-mile-long mountain range surrounded by rolling hills to the west and river valleys to the east.	Formed in the late Ordovician.	Various sedimentary and metamorphic formations.
Appalachian Highlands	New England	Green Mountain	Linear ranges of subdued and glaciated mountains and residual plateaus (Fenneman, 1928).	Linear mountain ranges with granite axis. May have been eroded by rivers (Fenneman, 1928).	Precambrian granite; other rocks included (Fenneman, 1928).
Appalachian Highlands	New England	New England Upland	Non-mountainous; generally more than 500 feet high; characterized by sharp valleys. Ranges from 1,100 feet or more for mountains farthest from the sea to less than 600 feet at the boundary of the seaboard lowland (Fenneman, 1928).	Water-eroded plains, sharp and narrow valleys, giving surface a plateau aspect. Strong evidence of glaciation (Fenneman, 1928).	Various sedimentary, metamorphic, and igneous formations.

Division	Province	Section	Terrain Texture including Topography	Geologic Structure and History	Generalized Rock Types
Appalachian Highlands	New England	White Mountains	Extensive mountain range in NH reaching maximum height of 6,288 ft. on Mt. Washington.	Formed by magma intrusions about 100 million years ago over the ancient New England hotspot.	Glaciated mountain masses of crystalline rocks with abundant erosion-resistant outcroppings (Fenneman, 1928).
Appalachian Highlands	New England	Seaboard Lowland	Ranges from sea level to a maximum elevation of around 700 ft.	Depressed coastal lowland due to glaciation.	Pennsylvanian sedimentary rocks.

7.4.2.2 Geologic Conditions

The geologic conditions within the New England Region are complex, resulting from tectonic and related activities (e.g., faulting, volcanic activities, and seismic sea waves) and glacial activities along with erosive actions of wind and water. The New England Region contains consolidated geologic formations consisting of sedimentary, igneous, and metamorphic rocks. The New England Region also contains unconsolidated geologic formations consisting of alluvium, terrace deposits, glacial deposits, and other mixtures of sands, silts, and clays with various mixtures of rocks. The geologic formations are shown on Figure 7.4-2.

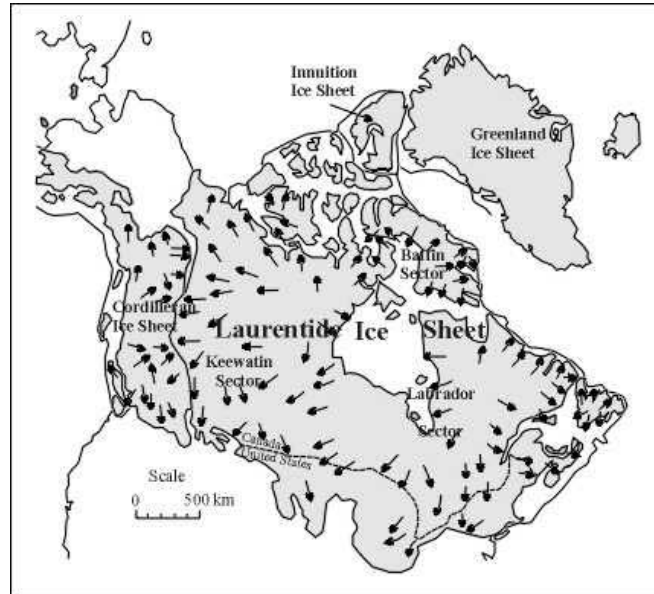
Figure 7.4-2. Geologic Conditions of the New England Region



Regional Glaciation

During the Wisconsin glaciation, which ended around 10,000 years ago, the Laurentide Ice Sheet covered all of the New England Region. In addition to the ice sheet, mountain glaciers also expanded in high elevations.

Figure 7.4-3. Extent of the Laurentide Ice Sheet



The effects of glacial advances are readily apparent in the northern United States. Polished and striated outcroppings, rounded hills, moraines, valley fills of glacial till and outwash, and other typical glacial features are evidence of Pleistocene glaciation. All along the northern border, till deposits, erratics, and moraines are common (Nelson, 2003). Till, a sedimentary deposit derived from glacial erosion, was deposited throughout the northern United States as the ice sheets receded.

Seismicity and Tectonics

Seismic activity in the New England Region is rare (Figure 7.4-4). Seismic hazards are described in terms of minimum peak horizontal ground acceleration values. USGS describes this value as the fastest speed of horizontal particle movement at ground level due to an earthquake.

Landslides

In New England, most landslides occur due to rainfall, snowmelt, and human activities occurring on the steep mountain slopes (Figure 7.4-5).

Karst Topography

In the New England Region, karst landscapes are found in small areas (Figure 7.4-6) scattered through Vermont and northeastern Maine. These areas have mostly short (less than 1,000 ft. long) features in various types of carbonate rock.

Figure 7.4-4. Seismicity in the New England Region

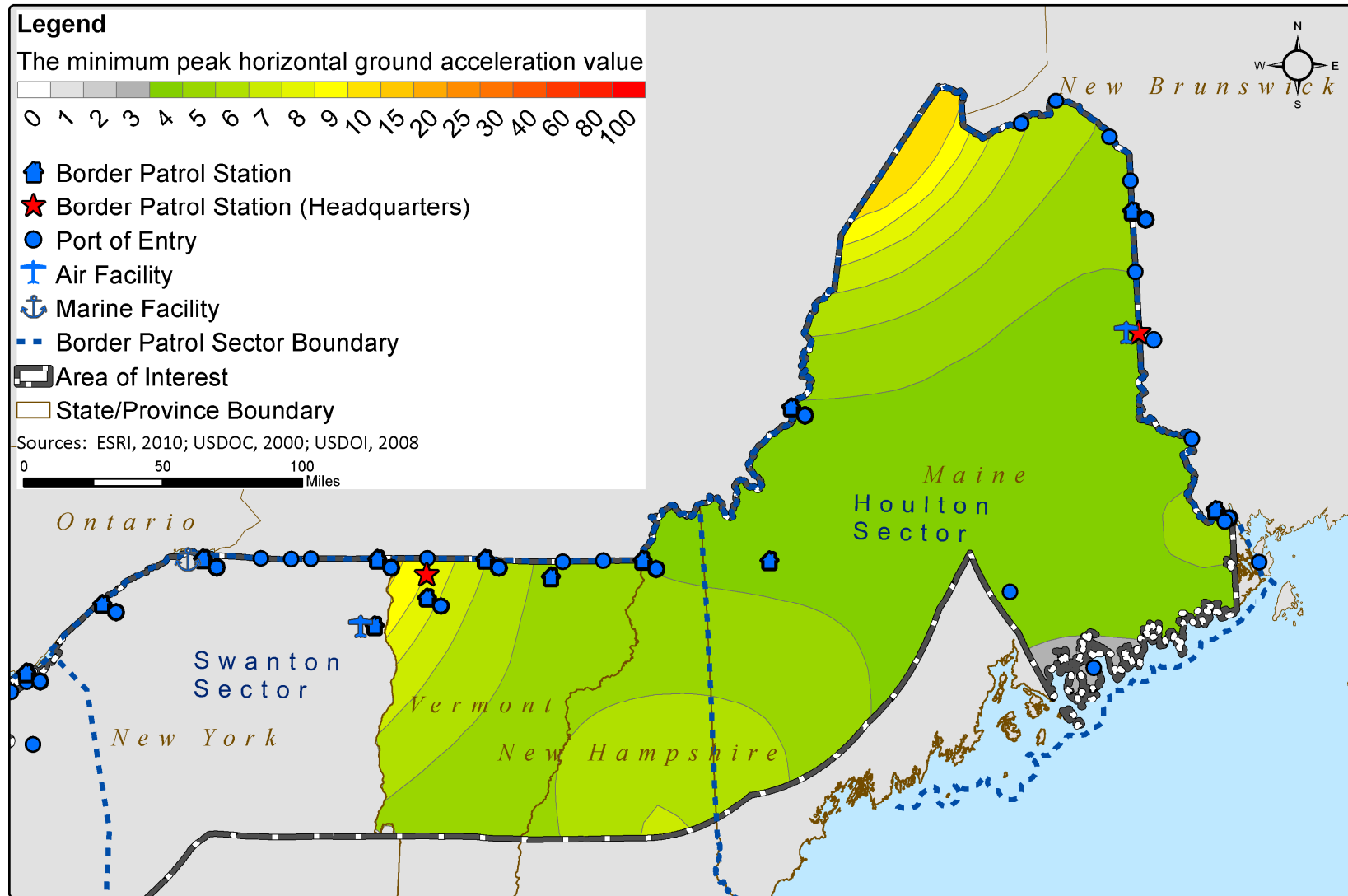


Figure 7.4-5. Landslide Incidence in the New England Region

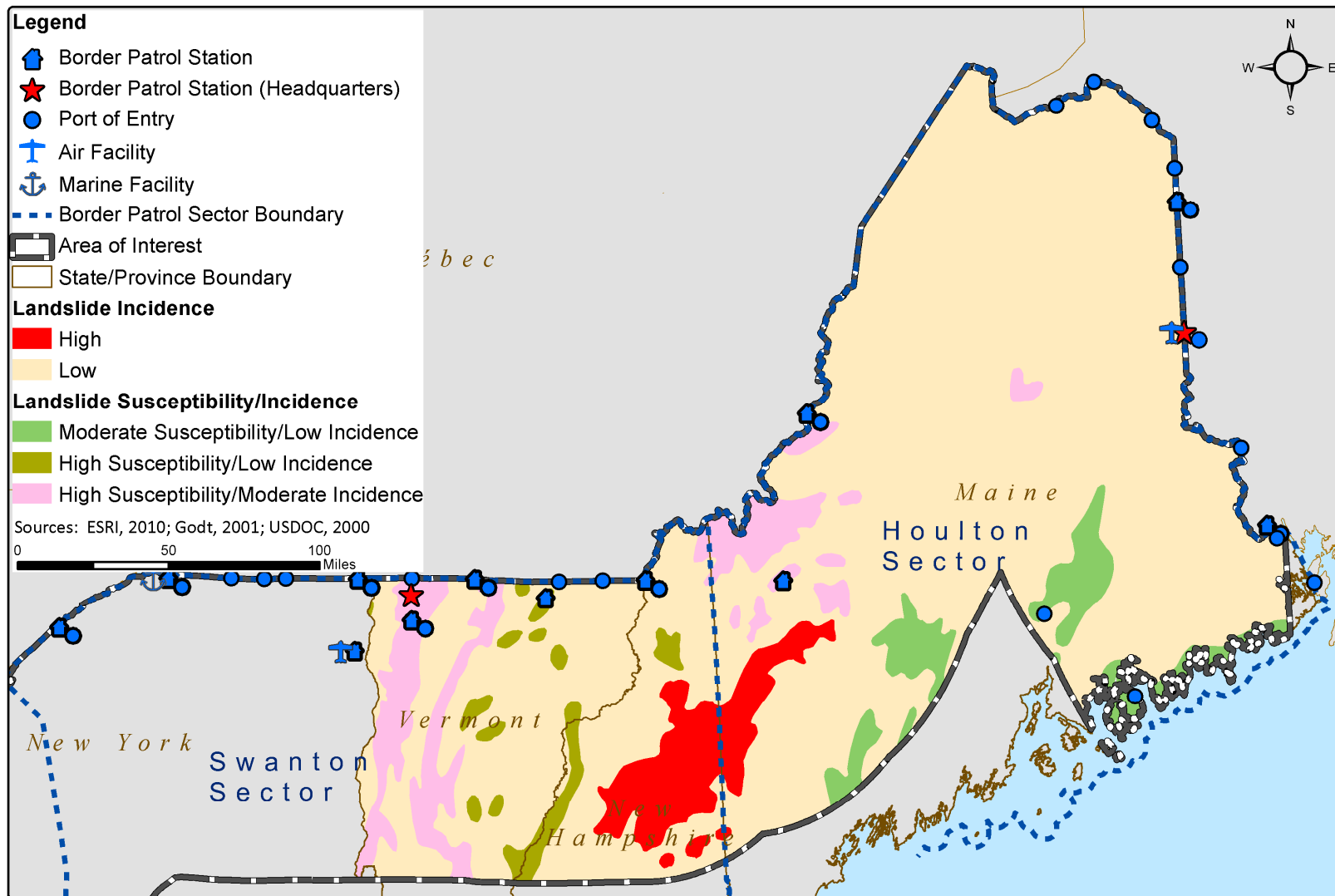
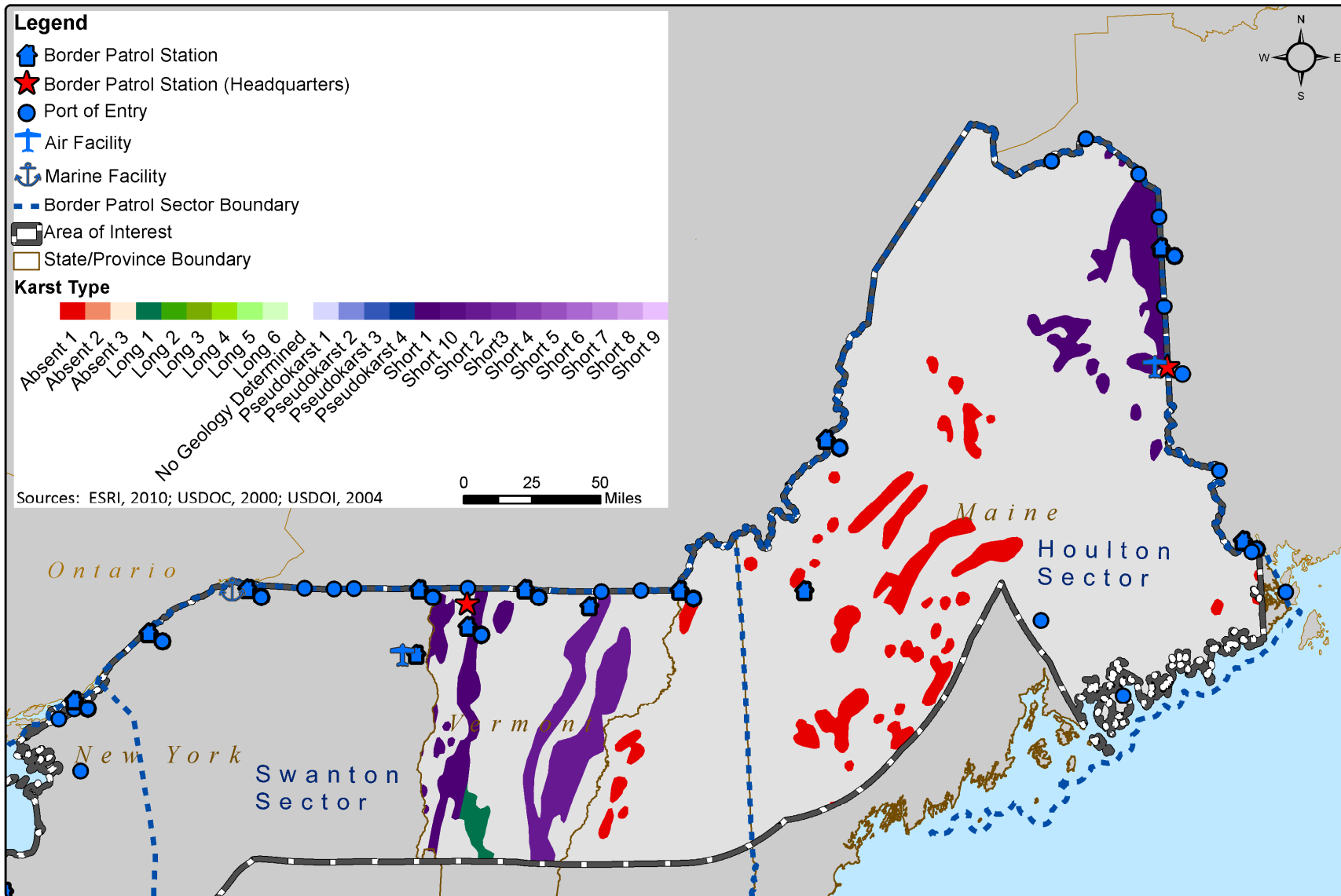


Figure 7.4-6. Karst Topography in the New England Region



7.4.2.3 Soils

In the New England Region, soils contain a range of particle sizes but are mainly sandy to loamy, sometimes with clay (Figure 7.4-7). Spodosols, one of the most dominant soil types, span Vermont and Maine and do not have a high erosion potential. They also are fairly acidic, and as a result are not productive without management (University of Idaho, No Date). Inceptisols are the second most common soil type in the region. This soil order occurs in Vermont and Maine and has a high erosion potential. Since inceptisols develop on surfaces that have not had adequate time to develop soil profiles, they do not have extensive soil horizons. Both the lack of horizon development and location on steep slopes contribute to the high erosion potential of inceptisols (University of Idaho, No Date). Alfisols also cover portions of the region, mainly along the Vermont/New York border. Since alfisols are primarily clay, their erosion potential is low (University of Wisconsin, 1999).

Histosols and entisols are the least prevalent soil orders in the New England Region. The histosols in the region are mainly found in areas of poor drainage. This water accumulation decomposes organic materials and creates peaty and mucky conditions. Histosols have a low weight-bearing capacity and, if they are drained of water, land subsidence may occur (University of Idaho, No Date). Entisols are soils that do not fit into any of the other 12 soil orders. These are young soils and have only an A horizon. Entisols are the most extensive soils in the world, and can be very diverse based on the parent material from which they develop (University of Idaho, No Date). This soil order is often the transition layer between soils and non-soil parent rock.

7.4.2.4 Prime and Unique Farmland

In the New England Region, Prime and Unique Farmland has a maximum of six percent of land cover (Figure 7.4-8). Compared to other regions in the United States, the New England Region has a low percentage of designated Prime and Unique Farmland.

Figure 7.4-7. Soil Orders in the New England Region

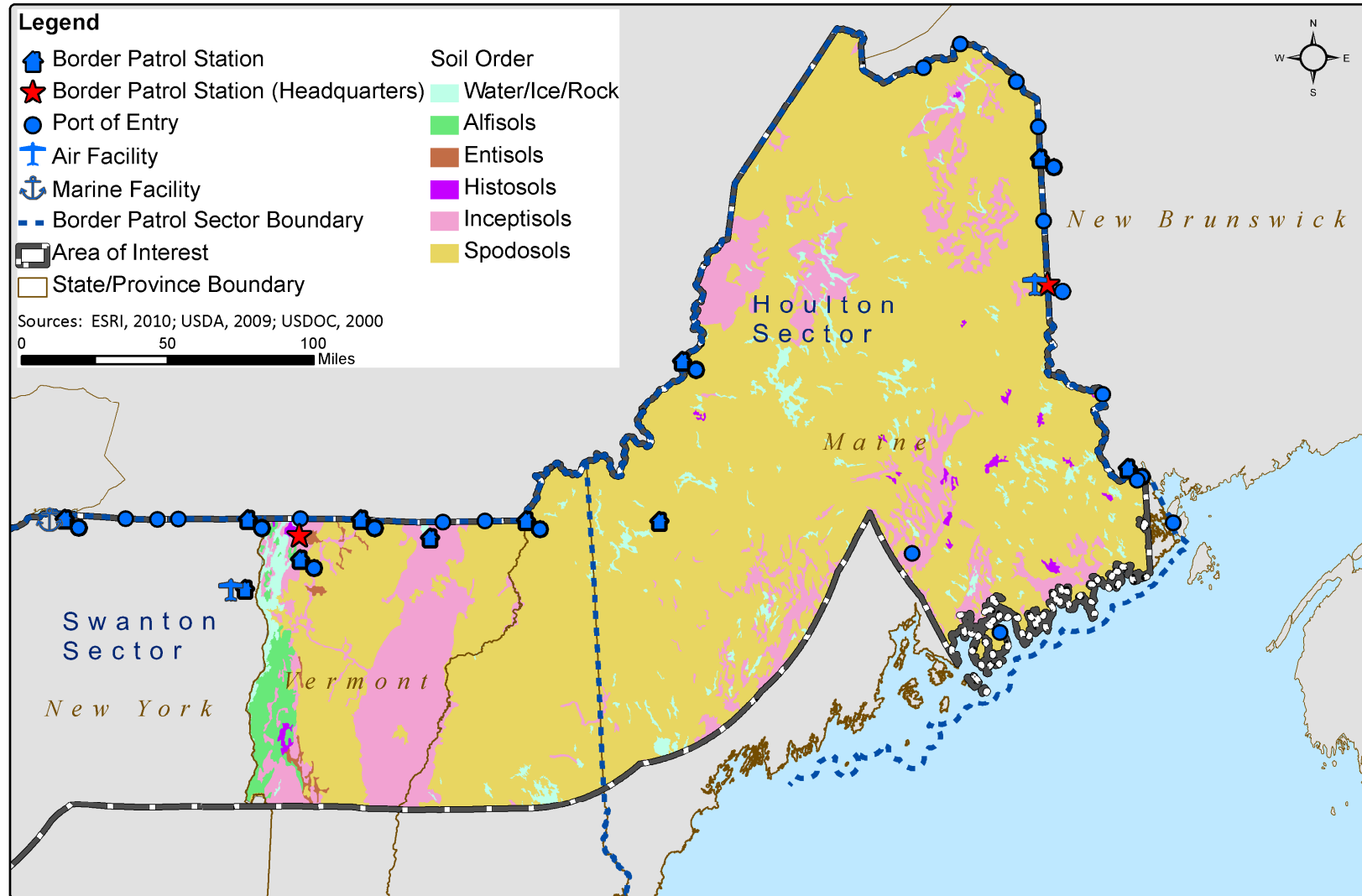
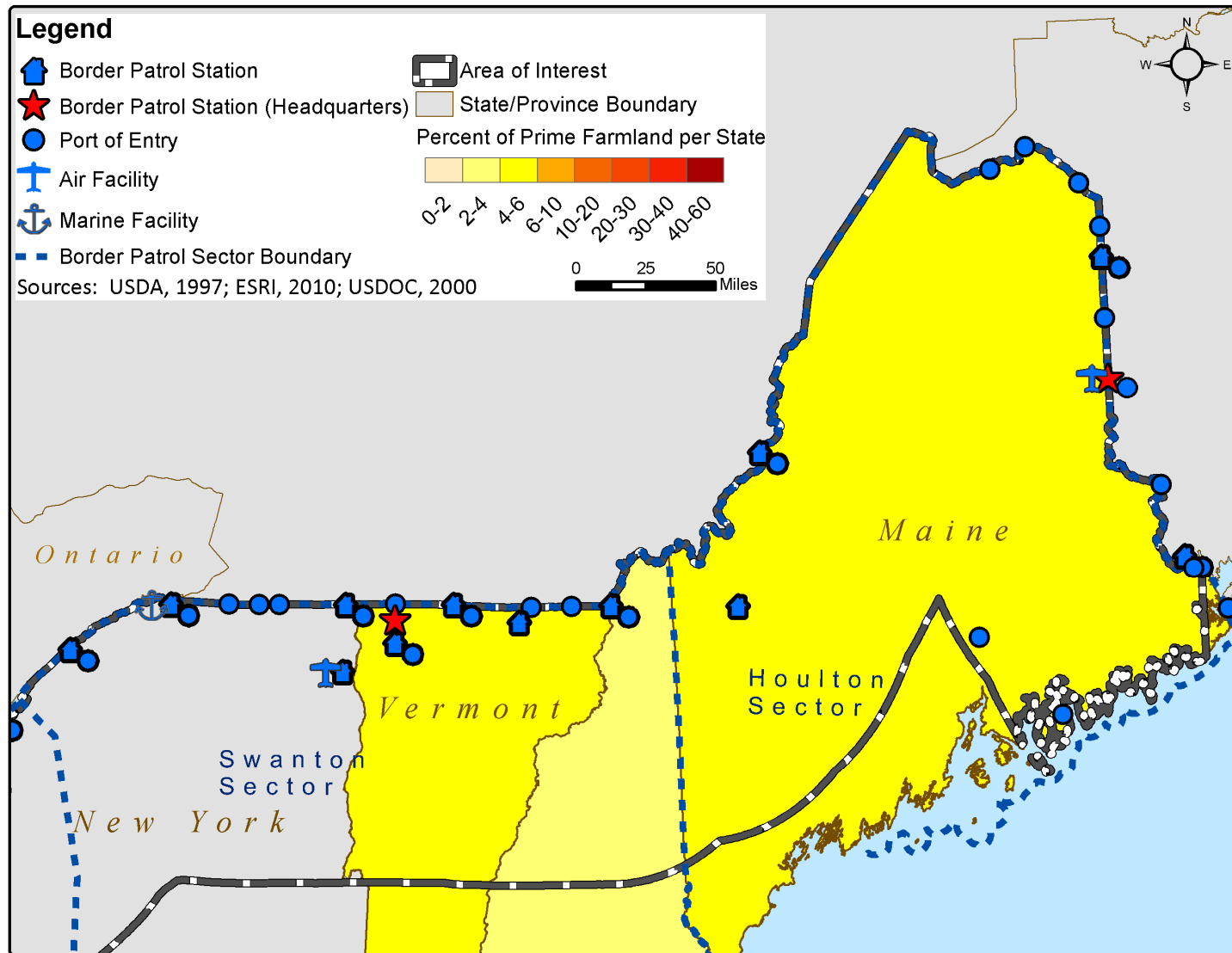


Figure 7.4-8. Prime Farmland in the New England Region



7.5 WATER RESOURCES

7.5.1 INTRODUCTION

Water resources are distributed widely throughout the 100-mile PEIS study corridor in the states of Vermont, New Hampshire, and Maine. For the purposes of this study, this resource area consists of hydrologic and groundwater resources (aquifers, subterranean watercourses, and recharge areas), surface water and waters of the United States (lakes, ponds, rivers, streams, and channels), and floodplains. Water resources include several beneficial elements, such as water supply quantity and quality, habitat for aquatic organisms, recreation, and flood storage capacity, which are subject to effects from proposed activities.

7.5.2 AFFECTED ENVIRONMENT

7.5.2.1 Groundwater

Groundwater resources are sources of water that result from precipitation infiltrating the ground surface. Groundwater is contained in either confined or unconfined aquifers. When the water table or piezometric surface reaches the ground surface, groundwater will reappear as either streams, surface bodies of water, or wetlands. This exchange between surface water and groundwater is an important feature of the hydrologic cycle.

Groundwater has a variety of beneficial uses. In the New England Region, as in the rest of the country, groundwater is a primary source for a wide variety of water uses including irrigation, domestic water supply, fish propagation, commercial water supply, industrial uses, and livestock. Table 7.5-1 shows the categories of groundwater use for states within the New England Region.

Table 7.5-1. Water Use in the New England Region in 2005

State	Irrigation Use (%)	Public Water Supply (%)	Industrial Use (%)	Rural Domestic, Livestock (%)
Vermont	0.6	8.9	82.8	7.7
New Hampshire	1.0	22.7	62.5	13.8
Maine	0.8	20.6	59.3	19.3

Source: (Kenny et al., 2009).

Groundwater occurs in porous rock layers called aquifers, which may be large and regional, such as the Ogallala Aquifer, which underlies many states in the Great Plains. Aquifers may also be very small and localized.

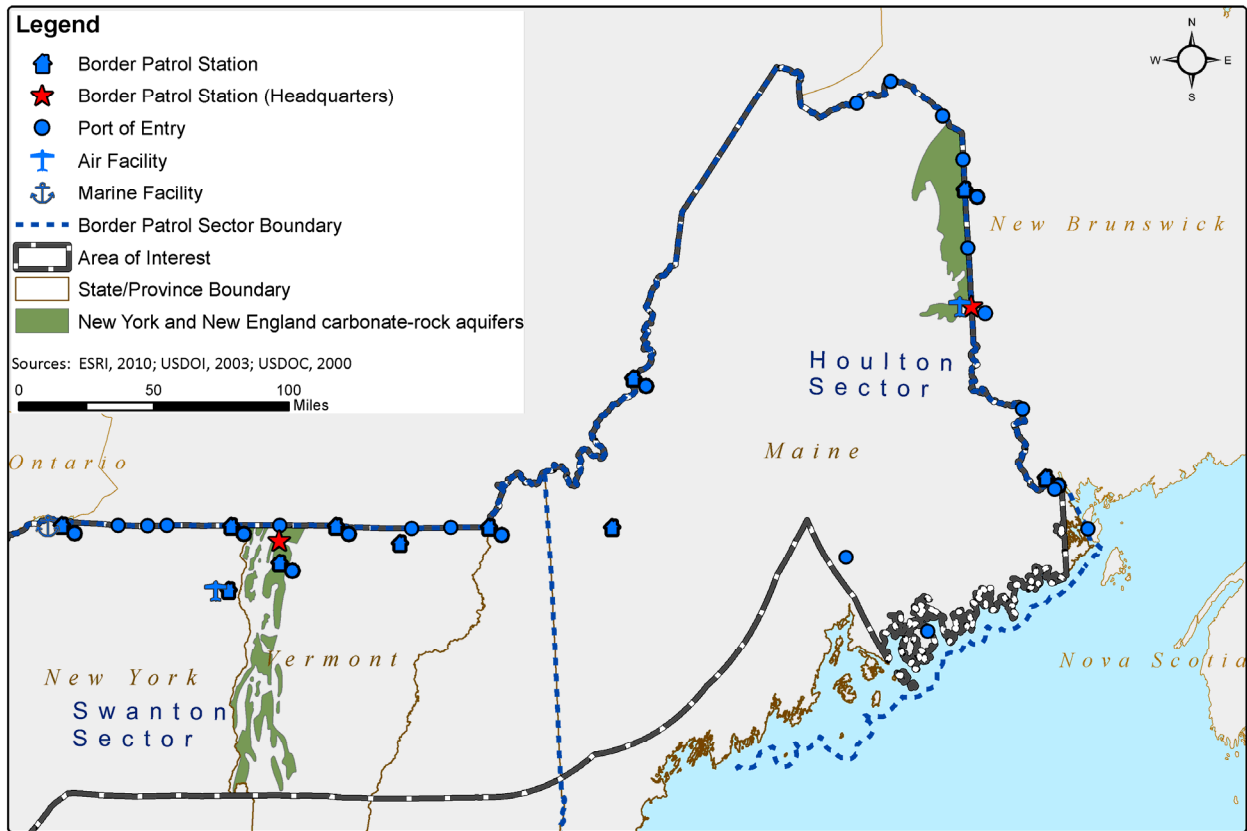
Groundwater in Maine occurs in two primary kinds of aquifers: (1) sand and gravel; and (2) bedrock. Sand and gravel aquifers are unconsolidated sand and gravel deposits, with excellent porosity and permeability that make them significant groundwater resources. They formed as water melted from glaciers, so they are only found in limited areas around the state. The entire state of Maine is underlain with bedrock composed of igneous and metamorphic rock. Almost

everywhere, this bedrock is fractured, which provides the open space through which groundwater flows (MGS, 2005).

Groundwater in New Hampshire is the most important source of drinking water. Approximately 60 percent of New Hampshire residents rely on groundwater for their drinking water. Community water systems serve an estimated 60 percent of the state's households; over a third of this water comes from groundwater. Of the 2,177 public water systems in New Hampshire, 98 percent rely on groundwater. Groundwater is also the source for the 40 percent of New Hampshire residents who rely on private water systems. Groundwater also provides an estimated 40 percent of the total flow in New Hampshire's rivers, which in turn feed the state's lakes, reservoirs, and estuaries. While 85 percent of private water supply wells tap bedrock aquifers, most high-yielding public water supply wells tap stratified-drift aquifers (NHDES, 2003).

Sixty-six percent of Vermont's population depends on groundwater for drinking water. Groundwater also has a key role in manufacturing, agriculture, and commercial operations. Groundwater recharges lakes, streams, and wetlands that in turn protect and support wildlife. Vermont's bedrock geology is tightly folded and broken as a result of the uplift of the Green Mountains. On top of the bedrock are sedimentary deposits—boulders, gravel, sand, and clay—that were laid down as the glaciers retreated. All of these layers define the aquifer that contains Vermont's groundwater (VDEC, 2003).

Figure 7.5-1. New England Region Groundwater Aquifers

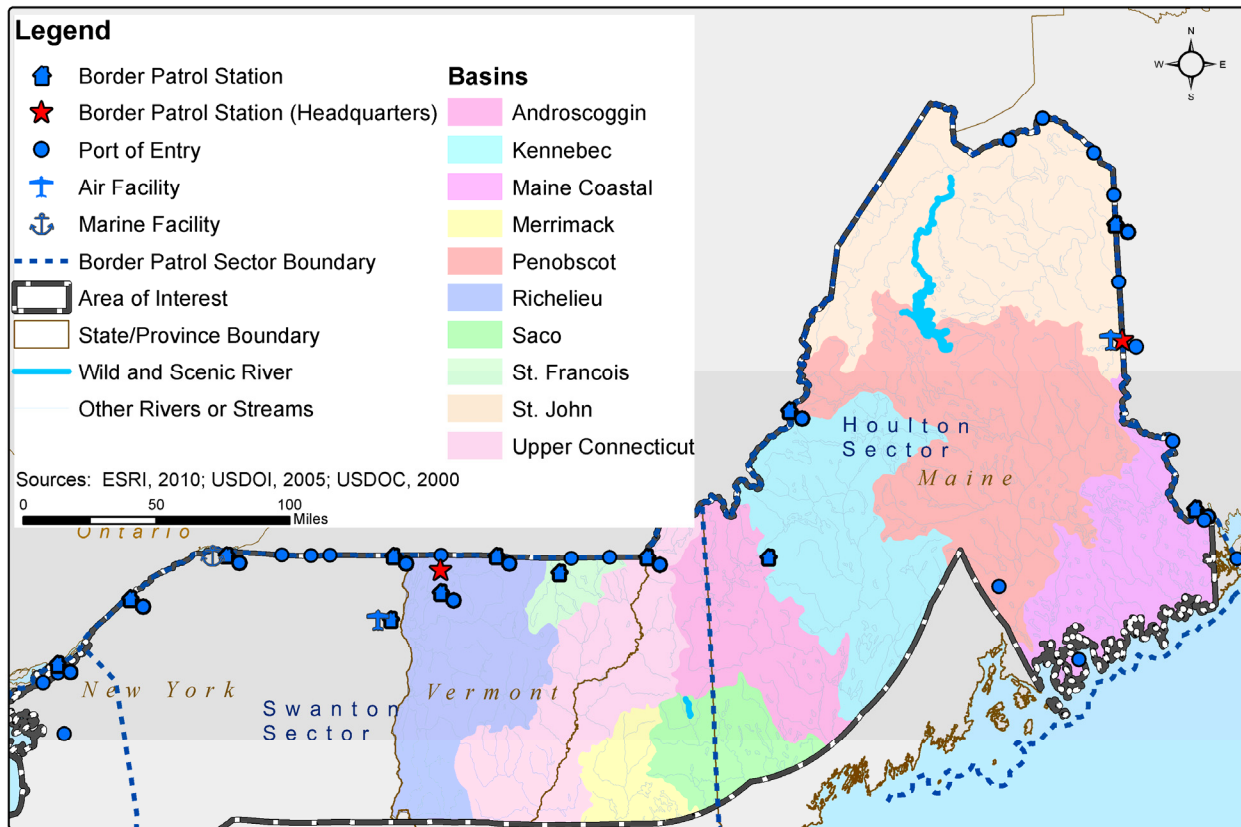


7.5.2.2 Surface Waters and Waters of the United States

Surface water is water found in lakes, rivers, ponds, wetlands, and oceans. It is the most abundant and visible form of water resource, with the greatest variety of uses. In addition to irrigation, domestic water supply, fish propagation, commercial water supply, industrial uses, and livestock, surface water supports recreation, fish and wildlife habitat, hydropower, and transportation. Section 7.3.2.7 provides a discussion of the regional affected environment for aquatic resources. Surface water is often identified by the basin or watershed in which it is found. A watershed is simply the topographic area defined by the drainage of a single body of water.

There are two designated Wild and Scenic Rivers within the 100-mile corridor of the New England Region; Wildcat River in New Hampshire and Allagash River in Maine. Figure 7.5-2 shows these Wild and Scenic Rivers as well as the other river basins found within the 100-mile corridor for the New England Region.

Figure 7.5-2. River Basins in New England Region



The St. John River Basin drains 21,400 square miles in northern Maine and Canada. It forms the U.S.-Canadian border between St. Francis, Maine and Grand Falls, New Brunswick, where the river crosses exclusively into Canadian territory. The river is approximately 420 miles long. The topography within the basin is mostly flat with rolling hills. The basin is largely undeveloped and much of the land is forested. Major communities within the St. John River Basin include Fort Kent, Fort Fairfield, Houlton, Caribou, St. Agatha, Presque Isle, Van Buren, and Frenchville (ENSR, 2007).

The Penobscot River Basin drains 8,570 square miles in central Maine. The Penobscot River flows for 105 miles from the confluence of its east and west Branches in Medway, south to its mouth in Penobscot Bay on the Maine coast. The basin is largely undeveloped; approximately 95 percent is forested. Major communities in this basin include Millinocket, Howland, Lincoln, Old Town, Orono, Veazie, Bangor, and Brewer (ENSR, 2007).

The Kennebec River Basin drains 5,900 square miles of west central Maine. The river originates in the Appalachian Mountains at the border with Canada. The upper two-thirds of the basin are hilly and mountainous, and the lower third of the basin has the gentle topography representative of a coastal drainage area. Major communities in this basin include Bingham, Anson, Madison, Norridgewock, Skowhegan, Waterville, Winslow, Augusta, Hallowell, and Gardiner (ENSR, 2007).

The Androscoggin River Basin drains 3,500 square miles in western Maine and northeastern New Hampshire. The river flows 169 miles from Umbagog Lake in Errol, New Hampshire to its mouth at Merrymeeting Bay. Below Rumsford, Maine the river basin becomes hilly and flat and is generally suitable for agriculture. Large communities in this basin include Bethel, Rumford, Mexico, Canton, Jay, Livermore, Lewiston, Auburn, and Brunswick/Topsham (ENSR, 2007).

Figure 7.5-3. Middle Falls along the Androscoggin River



The Saco River Basin drains 1,700 square miles of southwestern Maine. The river flows from the White Mountains of New Hampshire 75 miles to the mouth at Biddeford, Maine. The Saco River Basin is the largest river basin located within the Western Coastal Drainage Basin, which includes many smaller rivers draining directly to the Atlantic Ocean. Large communities within this basin include Fryeburg, Westbrook, and Kennebunk (ENSR, 2007).

The Presumpscot River Basin drains 1,270 square miles of southwestern Maine. The river originates at Sebago Lake and terminates in Portland, Maine, flowing through the towns of Windham, Gorham, and Westbrook before exiting to Casco Bay. The watershed is very hilly and is partially developed. Like the Saco River, this river basin is located within the Western Coastal Drainage Basin (ENSR, 2007).

The St. Croix River Basin drains 1,650 square miles of southeastern Maine. The St. Croix River forms the border between Maine and Canada with a major border crossing at Calais–St. Stephen. The St. Croix River Basin is the largest river basin located within the Eastern Coastal Drainage Basin, which includes many small rivers draining directly to the Atlantic Ocean (ENSR, 2007).

The Merrimack River is formed by the confluence of the Pemigewasset and Winnepesaukee Rivers in New Hampshire and flows 127 miles to the Atlantic Ocean. The lower 49 miles of the river are within Massachusetts. There are two impoundments on the river: the Essex Dam in Lawrence and the Pawtucket Dam in Lowell (ENSR, 2007).

The Connecticut River is the largest river in New England, flowing south from the Connecticut Lakes in northern New Hampshire into Long Island Sound at Old Saybrook, Connecticut. It has a total length of 407 miles and a drainage basin of over 11,250 square miles. The mean discharge is 19,600 cubic feet per second (cuffs). The headwaters of the Connecticut River are at the northern tip of New Hampshire, near the Canadian border. Much of the beginning of the

river's course in the town of Pittsburg is occupied by the Connecticut Lakes, a chain of deep, cold-water lakes (AWCOM, 2011).

The Saint-Francois basin extends from the south shore of the St. Lawrence River in Quebec to northern Vermont. The Saint-Francois River originates in Lake Aylmer north of the basin and flows into the St. Lawrence River at Lake Saint-Pierre. There are nine dikes and dams along the Saint-Francois River, including the Aylmer and Jules-Allard dams, which control the water levels of large lakes and regulate the flow of water upstream from the Saint-Francois River. The Saint-Francois drainage basin has an altitude ranging from 997 feet to 2,500 feet, with the higher altitudes located on the U.S. side in the Adirondack Mountains (Saint-Laurent et al, 2001).

The Richelieu River flows from Lake Champlain 106 miles north, ending in the St. Lawrence River at Sorel. It has a drainage basin of 9,035 square miles, of which 7,570 square miles are in the United States, and a mean discharge of 11,600 cufs. St. Jean, Chambly, and Sorel are important communities on its route. The Chambly Canal permits boats to bypass the rapids at St-Jean-sure-Richelieu and Chambly. The Champlain Canal and Lake Champlain form the U.S. portion of the Lakes to Locks Passage, linking with the Hudson River and allowing navigation using the Richelieu between the St. Lawrence River and New York City and the Erie Canal.

7.5.2.3 Floodplains

Floodplain management seeks to preserve the flood storage capacity for the river corridor. This may be achieved in several ways. Local communities often have floodplain management or zoning ordinances that restrict development within the floodplain. The Federal Emergency Management Agency (FEMA) manages the National Flood Insurance Program (NFIP). FEMA also provides floodplain management assistance, including mapping of 100-year floodplain limits, to over 20,000 communities. The information provided by FEMA's flood management program is useful to CBP planners who seek to avoid effects from flooding conditions. This is most relevant for CBP's border facilities, such as POEs that are planned at locations where rivers define the northern border. The St. John River, the St. Croix River, and Monument Creek in Maine and Halls Stream in New Hampshire are rivers of this type in the New England Region.

7.5.2.4 Transboundary Water Agreements

Boundary Waters Treaty

This treaty provides the basis for resolving disputes involving diverting or obstructing projects impacting water quantity and water across the boundary between Canada and the United States. It establishes an International Joint Commission with authority to approve projects on either side of the border that would alter transboundary water levels. The treaty was initiated between the United States and Great Britain to in 1909 to settle issues of distribution of waters of the St. Mary and Milk Rivers for irrigation purposes between Canada and the United States.

7.6 NOISE

7.6.1 INTRODUCTION

The study area contains many soundscapes and noise-sensitive receptors that could experience impacts due to the alternatives that CBP is considering. However, the mere presence of a noise-sensitive area, such as a national park, residence, or school, does not guarantee that it would be significantly impacted by CBP’s activities or that the overall impacts would be major under the National Environmental Policy Act (NEPA). As with other topics in this PEIS, the programmatic approach to describing noise is driven by the planning objective of the document and the potential for actual impacts.

7.6.2 AFFECTED ENVIRONMENT

Sound is a physical phenomenon consisting of vibrations that travel through a medium like air and are sensed by the human ear. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise, distance between the noise source and the receptor, receptor sensitivity, and time of day. Noise is often generated by activities essential to a community’s quality of life, such as construction or vehicular traffic.

Sound varies by both intensity and frequency. Sound pressure level, in decibels (dB), is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Because the human ear responds differently to different frequencies, “A-weighting” was developed to approximate the frequency response of the human ear. The A-weighting curve has been widely adopted for environmental noise measurement and is standard in many sound level meters. The dBA levels of common sounds of daily life are provided in Table 7.6-1.

Table 7.6-1. Common Sound Levels

Outdoor	Sound level (dBA)	Indoor
Snowmobile	100	Subway train
Tractor	90	Garbage disposal
Downtown (large city)	80	Ringling telephone
Freeway traffic	70	TV audio
Normal conversation	60	Sewing machine
Rainfall	50	Refrigerator
Quiet residential area	40	Library

Notes: dBA = A-weighted decibel. Sound level provided is as generally perceived by an operator or a close observer of the equipment or situation listed.

Source: Harris, 1998.

The dBA noise metric describes steady noise levels, although very few noises are, in fact, constant. Therefore, the measurement day-night sound level (DNL) has been developed. DNL is defined as the average sound energy in a 24-hour period with a 10-dB penalty added to the nighttime levels (10 p.m. to 7 a.m.). DNL is a useful descriptor for noise because: (1) it averages ongoing yet intermittent noise, and (2) it measures total sound energy over a 24-hour period. In addition, Equivalent Sound Level (L_{eq}) is often used to describe the overall noise environment. L_{eq} is the average sound level in dB.

7.6.2.1 Regulatory Review

The Noise Control Act of 1972 (PL 92-574) directs Federal agencies to comply with applicable Federal, state, interstate, and local noise control regulations. In 1974, the USEPA provided information suggesting continuous and long-term noise levels in excess of DNL 65 dBA are normally unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals.

State and local governments have the opportunity to regulate noise in their jurisdictions. These regulations are typically guidelines for activities that generate noise and the hours that such activities may be performed. Noise is typically regulated at the local level. A municipal noise ordinance might address the hours that heavy equipment can be operated, the distance heavy equipment can be operated in proximity of noise-sensitive receptors (i.e., schools, hospitals, churches, and residences), and the duration of operation of a single noise source considered to be annoying to the public, such as a diesel-powered generator. Some set specific not-to-exceed noise levels, and others are simple nuisance noise ordinances.

A number of sources of noise may be addressed for rural areas, such as parades, vendors, social engagements with music, and animal noises. Construction noise is typically exempt from noise ordinances in rural areas. In addition, noise regulations in an urban setting take into account the constant noise sources of urban living, such as large heating, ventilation, and air conditioning (HVAC) units, public transportation (trains and buses), emergency vehicles, and heavy traffic. Because urban noise levels are already relatively high, adding a source for an extended period can be highly annoying to some people, hours of construction and operation of heavy equipment are often limited. A typical ordinance in a major city will restrict construction related noise sources between the hours of 10:00 p.m. to 7:00 a.m.

7.6.2.2 CBP Noise Sources

The CBP operates 24 hours a day and 7 days a week. The level of operation can be determined by the measures required to secure the border or necessary for normal facility activities. Table 7.6-2 lists CBP’s operations and describes of the noise levels of these activities.

Table 7.6-2. CBP Noise Sources

Operation	Description
Use of mobile surveillance systems (MSS) and surveillance towers	Very little noise is generated by the motor. In remote areas, standby generators may be used to supplement electric power.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Operation	Description
Firing ranges and armories	CBP conducts small-arms training at many of its POEs and BPSs. Small-arms weapon fire is clearly audible in areas surrounding these ranges during training activities. Usually these activities are limited to daytime hours.
Maritime patrols	Boating noise is typically audible during marine patrols near the shoreline. This noise is widespread and at most locations only sporadic. The watercraft used are generally selected for their noise-suppression features because of the nature of their mission.
Patrols by foot, horse, off-road vehicle (ORV), and snowmobile	Foot and horse patrols are typically quiet. Noise from ORVs and snowmobiles is audible for a mile or more in remote, quiet areas. This noise is widespread and at most locations only sporadic. Areas near POEs and BPSs may have more concentrated noise associated with these activities.
Added and expanded POEs and checkpoints	This action may require construction, which would end at the completion of the project.
Operation of expanded BPS	Additional personnel would be required for addition or expansion of newly constructed facilities. The possibility of canine facilities, firing ranges, and patrol vehicles may be required for operations at some new/expanded facilities.
Aircraft operations	Air operations at CBP are diverse: Helicopters, fixed-wing aircraft, and unmanned aerial systems (UAS) may be used regularly at some locations, although not all aircraft are used simultaneously. Along with regular operations, training exercises are also a source of aircraft noise at some facilities.
Construction activities	CBP conducts both large and small construction projects. Each has some level of heavy equipment and truck transport noise.
Maintenance activities	Maintenance operations at CBP are as diverse as the facilities themselves. The noise associated with these actions can involve training to maintain each category listed above. These noise sources may be one major repair using heavy equipment, monthly routine maintenance, or daily maintenance in the case of dogs, horses, and vehicles.

Source: USDHS, 2010.

7.6.2.3 Non-CBP Noise Sources

The sources of noise along the border in the New England Region vary greatly, although most of the region is rural or remote. Sounds dominating the rural areas are aircraft overflights, bird and animal vocalizations, and very light traffic. Farming is a major activity in some of the rural areas identified with the project area. Farming is seasonal in this region and may create major sources of noise during planting, and even more during harvest in August through October, when several large combines may operate concurrently. There are no major cities in the New England Region. A complete list of counties with their population and current background noise levels can be found in Appendix O. Notably, these levels are estimated average background levels based on population. Actual site-specific levels may vary base on location.

7.6.2.4 Background Noise Levels

Estimated background noise levels for areas within 100 miles of the border are shown in Figure 7.6-1 and described in Table 7.6-3. The majority of areas within 100 miles of the border would be classified as remote or rural residential and are isolated, far from significant sources of sound.

Townships and small cities are scattered throughout the 100-mile buffer area; however, more remote land areas cover most of the project area. These smaller cities can be described as rural-residential and quiet-commercial.

Figure 7.6-1. Background Noise Levels in the New England Region

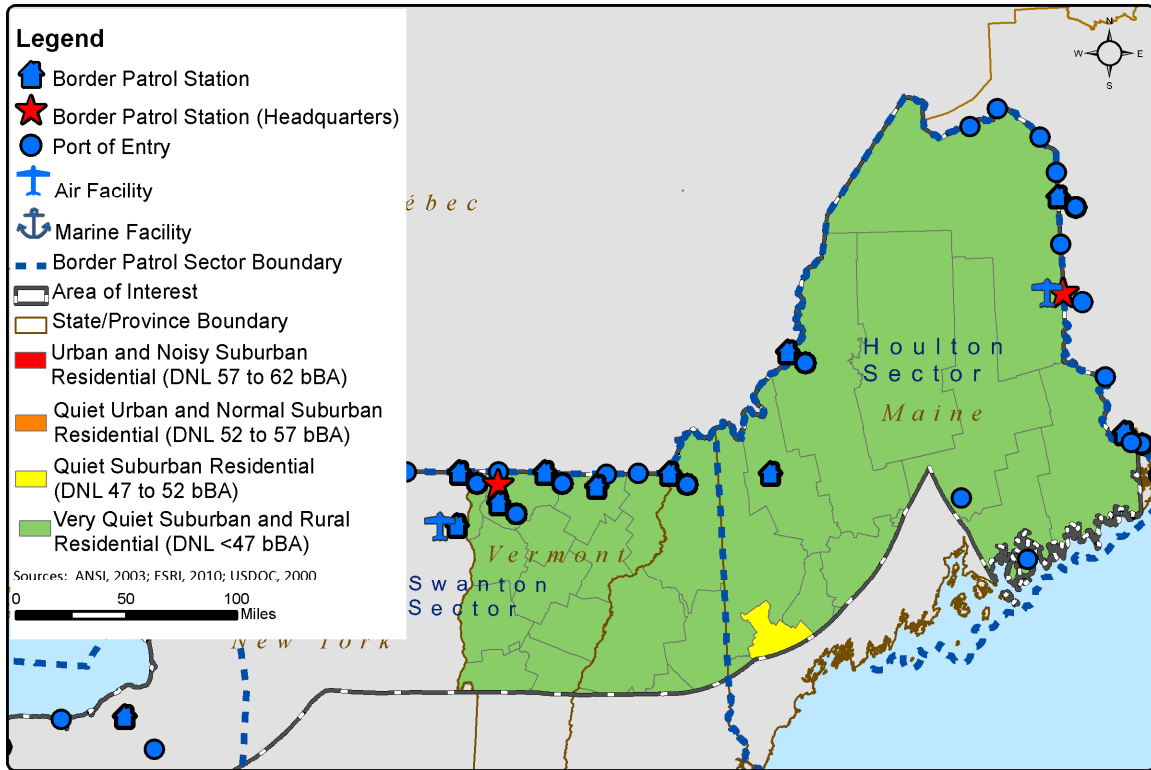


Table 7.6-3. Description of Background Noise Levels

Intensity Level	Example Land Use Category	Average Residential Intensity (people per acre)	Leq (dBA)		
			DNL	Daytime	Nighttime
Low	Quiet suburban residential	2	49	48	42
Medium-low		4	52	53	47
Medium	Quiet urban residential	9	55	56	50
Medium-high	Quiet commercial, industrial, and normal urban residential	16	58	58	52
High		20	59	60	54

Source: ANSI, 2003.

7.6.2.5 National Parks

The National Park Service (NPS) recognizes the natural soundscape of each national park unit as an inherent resource, and manages this resource in order to “restore degraded soundscapes to the natural conditions wherever possible, and protect natural soundscapes from degradation due to noise” (USDOJ, 2000). Non-impairment of natural soundscapes is mandated by the Organic Act

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

of 1916 and is part of the NPS management goals and objectives. Each region of the project area has locations of special interest such as units of the national park system. Major units within 100 miles of the border in the New England Region include Acadia National Park with total area of 48,600 acres (USEPA, 2010) and Saint Croix Island International Historic Site in Maine.

7.7 CLIMATE CHANGE AND SUSTAINABILITY

7.7.1 INTRODUCTION

According to the 2009 U.S. Global Change Research Program (USGCRP) report, “Global Climate Change Impacts in the United States,” documented impacts to the Nation from climate change include increased average temperatures, more frequent heat waves, high-intensity precipitation events, sea-level rise, more prolonged droughts, and more acidic ocean waters, among others. Global and national temperature changes are not distributed evenly. Greater increases occur at the high, northern latitudes (CEQ, 2010). In 2010, the Department of Homeland Security (DHS) identified global climate change as a long-term trend and global challenge that threatens America’s national-security interests (USDHS, 2010).

Sustainability and smart growth are approaches to human activity that aim to meet the needs of the present without compromising the ability of future generations to meet their own needs. For CBP, the concepts of sustainability and smart growth include the ability to adjust to changing geopolitical realities while preserving the environment and working to improve the quality of life for American residents and visitors.

To reduce environmental impacts and address the challenge of limited resources, DHS prepared a “Strategic Sustainability Performance Plan” to promote sustainable planning, design, development, and operations. The guidelines aim to decrease energy use, minimize reliance on traditional fossil fuels, protect and conserve water, and reduce the environmental impact of materials use and disposal. CBP’s overarching goal is to size, plan, and carry out proposed development in a manner that is sustainable and that works to preserve and protect limited resources.

7.7.2 AFFECTED ENVIRONMENT

7.7.2.1 Climate Regions of the Northern Border—Overview

The climate along the northern border is characterized by mild summers and very cold to extremely cold winters. January is the coldest month. July is the warmest month throughout the entire project area, and its temperature can fluctuate 20-30 degrees Fahrenheit between day and evening (Idcide, 2010). Precipitation is evenly distributed throughout the year but is considerably higher in the New England Region than in other northern border regions. The average annual precipitation across the entire northern border is approximately 31 inches. There is one recognized climatic zone within the New England Region: Humid Continental Climate. A discussion of this zone is provided in the following subsection.

7.7.2.2 Climate in the New England Region

Humid Continental Climate

The Humid Continental Climate is found in the interior regions of continents within temperate regions of the midlatitudes. Regions with this climate experience variable weather conditions due to their location within the midlatitudes and the year-round influence of the polar front. They are located between polar-type and tropical air masses where collisions of these air masses cause precipitation from the uplift of the moist and less dense tropical air mass.

These regions have great variability in seasonal temperatures because they are in the middle of the continent and are typically removed from the moderating influences of oceans. During the winter, Arctic air masses sweep into the northern portions of these regions, bringing extremely cold temperatures.

In North America, the Gulf of Mexico and the Caribbean Sea are sources of moisture for the maritime tropical air masses that carry humid air up into the eastern and central regions of the country, causing most of the humidity and precipitation that occur in these areas.

A diversity of ecosystems is found in the Humid Continental Climate. Mixed broadleaf deciduous forest is common in the southern and eastern portions of the climate in the United States. Grasslands may be found toward the West, where the precipitation is less. The Humid Continental Climate has two subtypes, described below.

Humid Continental Climate (Warm Summer Subtype)

The Warm Summer Subtype can be found in the eastern and midwestern regions of the United States and is characterized by hot, humid summers and occasional cold waves in the winter.

Humid Continental Climate (Cool Summer Subtype)

The Cool Summer Subtype can be found in the New England, Great Lakes, and upper-Midwest regions of the United States and is characterized by cooler summers and very cold temperatures in the winter (Ritter, 2006).

7.7.2.3 Climate Change in the United States—New England Regional Assessment

Historically, New England has experienced significant variability and extreme events related to weather and climate. Floods, droughts, heat waves, and severe storms are characteristic. For example, 7 major tropical storms have crossed the mid-Atlantic region since 1986, and 6 of the last 20 years have been characterized by significant drought. Average annual temperature increases of as much as 4 degrees Fahrenheit (2 degrees Celsius) over the last 100 years have occurred along the coastal margins from the Chesapeake Bay through Maine. Precipitation has generally increased, with increases greater than 20 percent over the last 100 years occurring in much of the region. Precipitation extremes appear to be increasing while the amount of land area experiencing drought appears to be decreasing. For the region as a whole, the period between the first and last dates with snow on the ground has decreased by seven days over the last 50 years.

New England has among the lowest rates of projected future warming among regions of the United States. Within these rates, winter minimum temperatures show the greatest change, with projected increases ranging from four degrees Fahrenheit to as much as nine degrees Fahrenheit (two degrees Celsius to five degrees Celsius) by 2100, with the largest increases in coastal regions. Maximum temperatures are likely to increase much less than minimums, again, with the largest changes in winter. The variability in precipitation in the coastal areas of New England is projected to increase (USGCRP, 2010).

7.8 LAND USE

7.8.1 INTRODUCTION

This section characterizes land uses in the New England Region and describes some land use on the Canadian side of the border that could be affected by some CBP activities. For example, construction projects that introduce noise and light pollution along the border could affect the suitability of land to support its current or planned use on both sides of the border. Other actions, however, such as direct removal of land from existing uses for CBP-related infrastructure construction, would not affect the Canadian side. The USGS and Natural Resources Canada (NRC) define land cover and land use classifications.

7.8.2 AFFECTED ENVIRONMENT

This section describes land use and cover for the New England Region. The summary tables characterize land use and cover according to the USGS Multi-Resolution Land Characteristics Consortium (MRLC) National Land Cover Database (NLCD) and USGS's Gap Analysis Program (USDOI, 2001; USDOI, 2010). The summary tables for Canada summarize land use and cover according to NRC's advanced very high resolution radiometer (AVHRR) land cover data and NRC's protected-areas data on regions of 10 sq km or larger compiled by the Canadian Council on Ecological Areas (CCEA) (NRC, 2009; NRC, 2007).

7.8.2.1 Land Cover and Related Land Uses in the New England Region

The New England Region covers about 26 million acres, approximately 78.7 percent of the land area of the states in the region (Maine, New Hampshire, and Vermont). The most prevalent land cover type within the study area is forested (72.0 percent). Forests cover the vast majority of the study area in each state, as well. Water/wetlands (12.4 percent) are the next most prevalent land cover type (Table 7.8-1). Generally, the land cover within the study area is representative of the land cover profile of each of the region's states.

Table 7.8-1. Land Cover in the New England Region

Border State		Total Land Area (Thousands of Acres)	Developed (%)	Cultivated Crops (%)	Pasture/Hay (%)	Herbaceous (%)	Forested (%)	Water/Wetlands (%)	Snow/Ice/Barren Land*
Maine	Study Area	18,252	2.6	2.1	1.3	0.8	70.8	14.5	7.9
	Statewide	20,798	3.5	2.1	1.8	0.8	70.0	14.5	7.3
New Hampshire	Study Area	2,975	3.7	1.3	1.3	0.3	85.0	6.0	2.4
	Statewide	5,928	7.5	1.2	3.3	0.3	78.1	7.3	2.2
Vermont	Study Area	4,650	5.4	5.3	10.6	0.2	68.4	8.3	1.8
	Statewide	6,150	5.3	4.3	9.9	0.2	71.7	7.0	1.6
New England Region	Study Area	25,877	3.2	2.6	3.0	0.7	72.0	12.4	6.2
	Selected States	32,876	4.5	2.4	3.6	0.6	71.8	11.8	5.3
TOTAL United States**		2,053,000	5.0	21.9		14.1	31.2	27.7	

The New England Region includes all areas 100 miles south of the U.S.-Canada border in Maine, New Hampshire, and Vermont.

* “Barren Land” includes the NLCD land classification “Shrub/Scrub.”

** Data for the United States as a whole are shown as calculated in USEPA, 2008. This report sums land cover categories for cultivated crops and pasture/hay to account for total agricultural cover, and sums snow/ice, barren, and wetlands land cover. This table aggregates the USEPA, 2008 calculation of water and shrub/scrub land cover with their category of snow/ice/barren/wetlands, though water alone covers 1.6 percent of the land area in the United States, while snow/ice/barren/wetlands cover 5.7, and shrub/scrub covers 20.4 percent.

Source: (USDOJ, 2001).

The study area includes a high percentage of forested area relative to the entire country; the levels of herbaceous land cover and agricultural land (cultivated crops and pasture/hay) in the study area are low compared to the Nation. The study area has a similar percentage of snow/ice/barren and water/wetlands relative to the country as a whole, and slightly less developed area than the country.

Figures 7.8.1 and 7.8.2 show maps of land cover and use in the New England region.

Recreation also occurs on other land not specifically designated for the activity and land other than that profiled in Section 7.17 (Recreation), which focuses specifically on major Federal recreation sites. For example, wildlife viewing or hiking may be permitted on some conservation or natural areas in the study area. In addition, hunting and snowmobiling may occur on public or private forested land areas. Absent information on the specific distribution of recreational activities across the landscape, this analysis relies on the above categories of land as a low-end estimate of the area in which recreation is likely taking place.

Recreational land use in the New England Region accounts for about 516,000 acres or 2.0 percent of total land area, which is less than the share of recreational land use for the country as a whole (10.1 percent) (Table 7.8-2). Parks and recreation departments of the various states manage just under half of the land with recreational uses in the region; Baxter State Park in Maine is the largest single area. NPS manages just less than 80,000 acres; another 75,000 have private conservation landowners. Cities are also significant recreation landowners in this region, constituting 30,000 acres of recreational land, much of which is in Maine. Section 4.17 discusses the potential impacts of CBP activities on lands designated and otherwise used for recreational purposes. Appendix I provides the profiles of major Federal U.S. and Canadian protected and set-aside areas often used for recreational purposes in the study area

Conservation areas in the New England Region account for about 2 million acres or 7.8 percent of total land area (Table 7.8-3). This percentage is significantly lower (about half) of the proportion of conservation land countrywide. State land management departments manage the greatest amount of conservation land in the New England Region where conserved areas are generally numerous and small.

Table 7.8-2. Recreational Land Use in the New England Region

Border State		Recreational Land Use* (Thousands of Acres)	Share of Recreational Land Use (%)
Maine	Study Area	370	2.0
	Statewide	444	2.1
New Hampshire	Study Area	100	3.4
	Statewide	794	13.4
Vermont	Study Area	46	1.0
	Statewide	491	8.0
New England Region	Study Area	516	2.0
	Selected States	1,729	5.3
TOTAL United States		208,088	10.1

The New England Region includes all areas 100 miles south of the U.S.-Canada border in Maine, New Hampshire, and Vermont.

* Recreation lands all lands clearly identified by USGS title of land type as intended for recreation (e.g., parks, scenic areas, or recreation areas).

Source: (USDOJ, 2010).

Table 7.8-3. Conservation Land Use* in the New England Region

Border State		Conservation Land Use (Thousands of Acres)	Share of Conservation Land Use (%)
Maine	Study Area	1,259	6.9
	Statewide	1,278	6.1
New Hampshire	Study Area	501	16.9
	Statewide	739	12.5
Vermont	Study Area	271	5.8
	Statewide	658	10.7
New England Region	Study Area	2,031	7.8
	Selected States	2,675	8.1
TOTAL United States		300,149	14.6

The New England Region includes all areas 100 miles south of the U.S.-Canada border in Maine, New Hampshire, and Vermont.

* Conservation lands are all lands clearly identified by USGS title of land type as intended for conservation (e.g., reserves, preserves, conservation land, and natural areas).

Source: (USDOJ, 2010).

7.8.2.2 Land Cover and Related Land Uses in the Areas North of the New England Region

This section considers resources north of the border from the New England Region extending two miles into Canada. This area covers about 1.85 million acres (Table 7.8-4). Over 90 percent of the area north of the New England Region is forested. Pasture/hay is the next most prevalent type, although it only constitutes 4.3 percent of the land area, followed by water/wetlands, which make up just over 3 percent. Much like each of the provinces in the study area, and the country as a whole, the study area has a large proportion of forested land, and low proportions of developed areas, agricultural lands (though greater amounts of pasture/hay than cultivated crops), and water/wetlands. The study area has a low proportion of snow/ice/barren land as compared to Canada as a whole.

Table 7.8-4. Land Cover in Canada North of the New England Region

Border Province		Total Land Area (Thousands of Acres)	Developed (%)	Cultivated Crops (%)	Pasture/Hay (%)	Forested (%)	Water/Wetlands (%)	Snow/Ice/Barren (%)
New Brunswick	Study Area	288	0.0	0.0	4.3	89.6	5.9	0.3
	Province	18,065	0.2	0.0	1.8	95.7	1.0	1.3
Nova Scotia	Study Area	1,068	0.0	0.0	0.0	97.9	2.1	0.0
	Province	13,816	0.4	0.0	5.0	89.7	1.6	3.2
Quebec	Study Area	495	0.0	0.0	13.6	83.1	3.4	0.0
	Province	301,185	0.1	0.0	2.6	56.2	5.8	35.2
Selected Provinces	Study Area	1,851	0.0	0.0	4.3	92.6	3.1	0.0
	Total for Selected Provinces	333,067	0.1	0.0	2.7	59.8	5.4	32.0
TOTAL CANADA		2,071,476	0.1	1.7	6.0	46.7	7.3	38.2

* The areas north of the New England Region in Canada include the portions of New Brunswick, Nova Scotia, and Quebec provinces extending two miles north of the U.S.-Canada border.

Source: (NRC, 2009).

Table 7.8-5 indicates that no areas are identified as recreational land in the areas north of the New England Region in contrast to the proportion of recreational land use in Canada as a whole (6.1 percent).

Table 7.8-6 shows that conservation areas in the areas north of the border from the New England Region make up about 129,000 acres, or about 6.9 percent of the total study area, which is greater than the proportion of conservation areas in the country as a whole (4.7 percent).

Table 7.8-5. Recreational Land Use in Canada North of the New England Region

Border Province		Recreational Land Use (Thousands of Acres)	Share of Recreational Land Use (%)
New Brunswick	Study Area	0	0.0
	Province	162	0.9
Nova Scotia	Study Area	0	0.0
	Province	353	2.6
Quebec	Study Area	0	0.0
	Province	2,166	0.7
Selected Provinces	Study Area	0	0.0
	Total for Selected Provinces	2,681	0.8
TOTAL CANADA		126,389	6.1

*Areas north of the New England Region in Canada include the portions of New Brunswick, Nova Scotia, and Quebec Provinces extending two miles north of the U.S.-Canada border.

Source: NRC, 2007.

Note: Recreation lands are all lands clearly identified in the NRC dataset as intended for recreation, for example, described as parks or recreation areas.

Table 7.8-6. Conservation Land Use in Canada North of the New England Region

Border Province		Conservation Land Use (Thousands of Acres)	Share of Conservation Land Use (%)
New Brunswick	Study Area	23	8.1
	Province	389	2.2
Nova Scotia	Study Area	87	8.1
	Province	1,361	9.9
Quebec	Study Area	19	3.8
	Province	17,325	5.8
Selected Provinces	Study Area	129	6.9
	Total for Selected Provinces	19,075	5.7
TOTAL CANADA		98,234	4.7

*Areas north of the New England Region in Canada include the portions of New Brunswick, Nova Scotia, and Quebec provinces extending two miles north of the U.S.-Canada border.

Source: (NRC, 2007).

Note: Conservation lands are all lands clearly identified in the NRC dataset as intended for conservation; for example, described as reserves, preserves, protected areas, habitat areas.

Figure 7.8-1. Land Cover in the New England Region

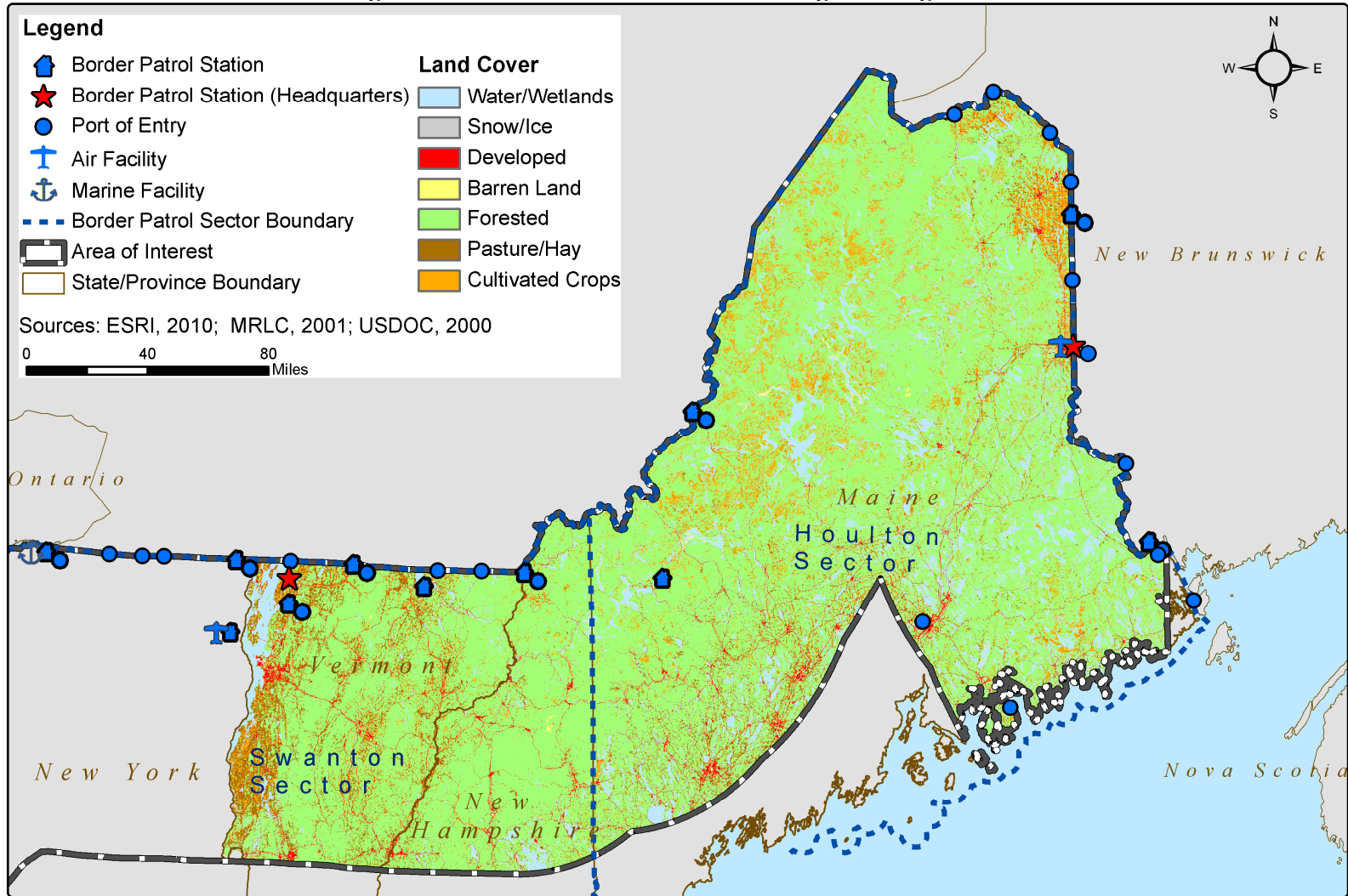
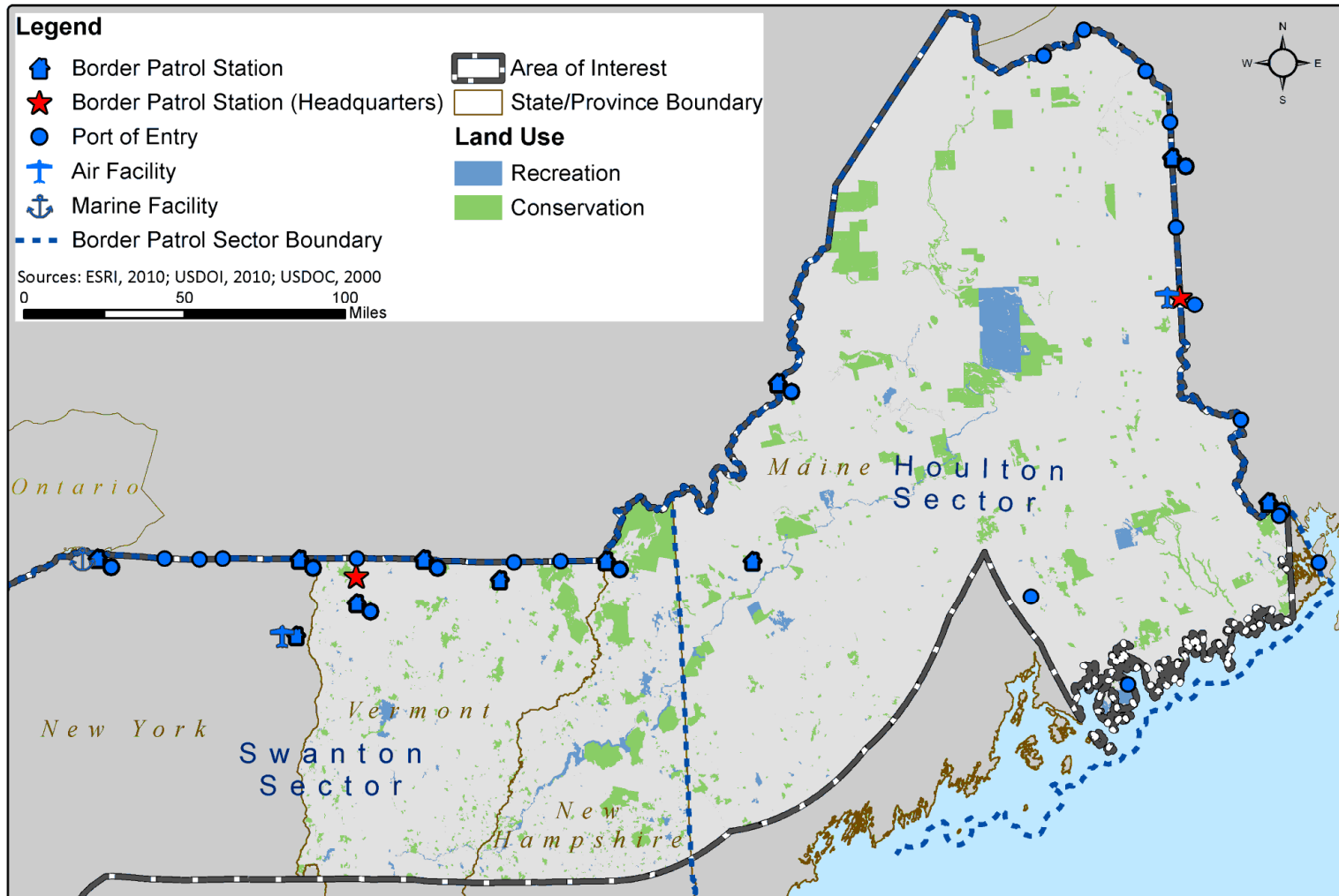


Figure 7.8-2. Land Use in the New England Region



7.8.2.3 Land Ownership in the New England Region

The major categories of land ownership in the New England Region in the United States are Federal (4.4 percent), state (5.2 percent), and private (11.0 percent) (Table 7.8-7). Tribal lands were not identified in this region. Only about 20.6 percent of the New England Region is classified according to landowner, thus this discussion is subject to significant gaps in landowner information. Federal lands include national parks, national forests, conservation areas, and military lands, and are managed by the Bureau of Land Management (BLM), Bureau of Reclamation (BOR), Department of Defense (DOD), Department of Energy (DOE), USFWS, U.S. Forest Service (USFS), NPS, or are classified as “other Federal land.” State lands are properties owned by state departments of conservation, departments of land, departments of natural resources, departments of transportation, fish and wildlife, historical societies, state land boards, parks and recreation, or classified as “other state land.” Tribal land accounts for regions owned by Native American Tribes and are recognized by the Federal Government. Federal laws and the Constitution grant Tribal Nations greater sovereignty than that granted to state or local governments. Private lands are those owned by the Audubon Society, the Rocky Mountain Elk Foundation, The Nature Conservancy (TNC), private universities, other conservation groups, or private non-profits, or classified as “private conservation easement/conservation deed restriction,” “private conservation land,” or “private institution–managed for biodiversity.”

The New England Region includes about 1.1 million acres of Federal land, accounting for 4.4 percent of land ownership. The USFS manages the majority of Federal land in this region, much of which sits within New Hampshire’s White Mountain National Forest. In addition, the USFWS and the NPS each manage slightly less than 100,000 acres.

Approximately 1.4 million acres of state land are in the New England Region, accounting for 5.2 percent of land ownership. The State Department of Conservation in Maine is the largest state landowner in the region, with about 640,000 acres, much of which is state trust land. The Maine and Vermont state parks and recreation agencies own another 400,000 acres. The share of state land ownership in the region is nearly half that of the United States as a whole.

Native American issues in this region are identified and discussed in Section 7.11 of this report.

The New England Region includes about 2.8 million acres classified as private land. The majority of this private land occurs in Maine (2.1 million acres) in over 50 private conservation refuges, easements, sanctuaries, forests, and preserves. The share of private land ownership in the study area is substantially greater than the share of private land ownership for the country as a whole. Figure 7.8-3 maps known landowner types across the New England Region.

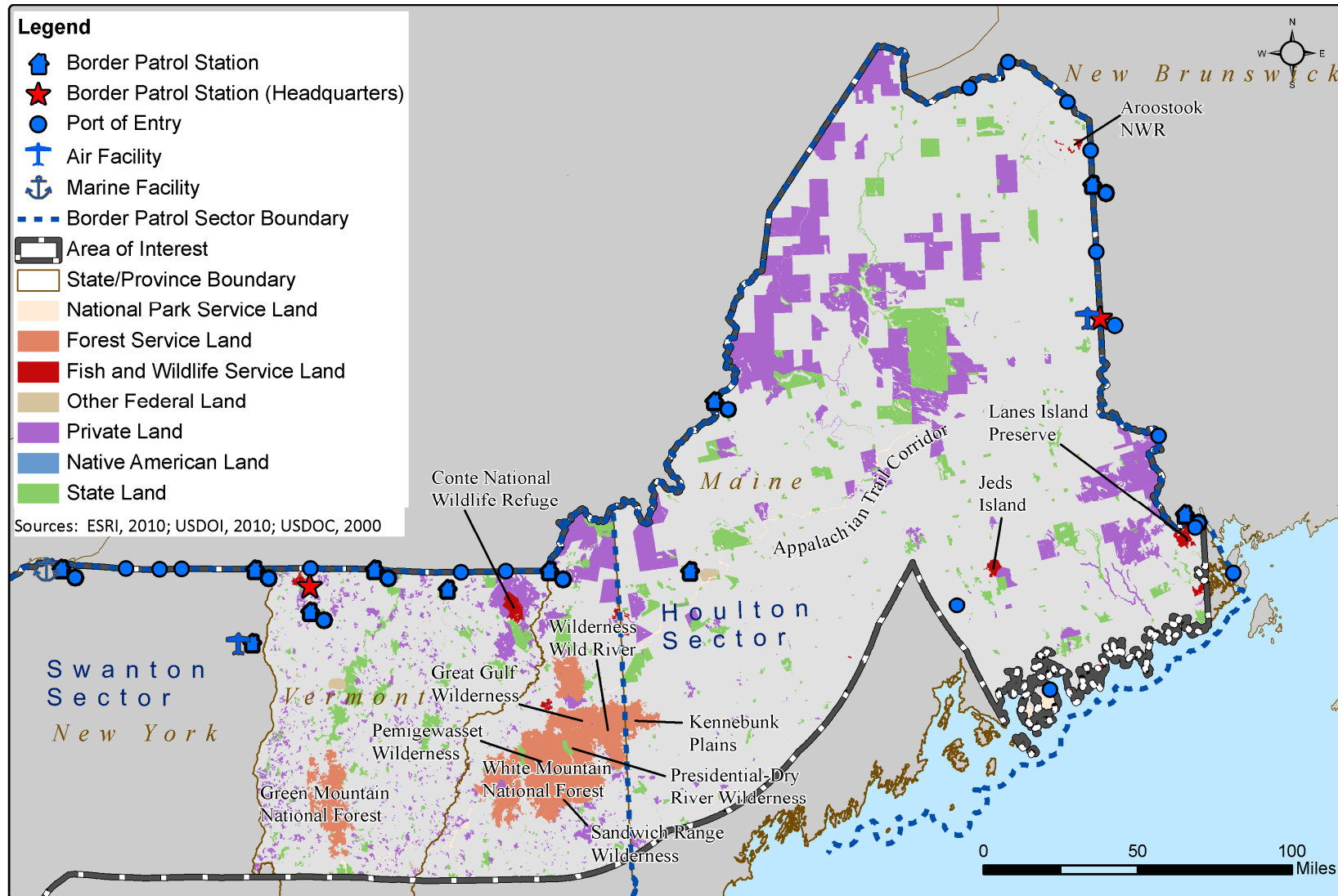
Table 7.8-7. Land Ownership in the New England Region

Border State (Thousands of Acres)		Federal Land		State Land		Tribal Land		Privately Held Conservation Land		Total Conservation & Tribal Lands	
		Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area
Maine	Study Area 18,000	180	1.0	923	5.1	0	0	2,135	11.9	3,238	18
	Statewide 19,470	194	1.0	972	5.0	0	0	2,159	11.1	3,325	17
New Hampshire	Study Area 2,969	757	25.5	129	4.3	0	0	302	10.2	1,188	40
	Statewide 5,730	781	13.6	22	0.4	0	0	501	8.7	1,304	23
Vermont	Study Area 4,674	201	4.3	303	6.5	0	0	415	8.9	919	20
	Statewide 9,217	446	4.8	355	3.9	0	0	507	5.5	1,308	14
New England Region	Study Area 25,886	1,139	4.4	1,356	5.2	0	0	2,852	11.0	5,347	21
	Selected States 34,417	1,421	4.1	1,552	4.5	0	0	3,167	9.2	6,140	18
Total United States		657,885	32	189,314	9.2	100,574	4.9	15,918	0.8	963,691	47

*The New England Region includes all areas 100 miles south of the U.S.-Canada border in Maine, New Hampshire, and Vermont.. Land ownership estimates do not add up to 100 percent for a given area due to gaps in information regarding land ownership within border states. Sources: (USDOJ, 2010), (USDOC, 2012).

Note: For a complete discussion of Native American resources along the northern border, refer to Section 7.11 of this report.

Figure 7.8-3. Land Ownership in the New England Region



7.8.2.4 Land Ownership in Canada North of the New England Region

Federal and provincial land ownership is characterized using the protected areas data compiled by NRC. As a result, ownership (excluding aboriginal lands) is only determined for about 10.8 percent of the entire land area of the country. The following discussion, therefore, reflects only the relatively small portion in Canada for which landowners are identified.

The share of Federal land ownership in Canada north of the New England Region is significantly less than that throughout the country, as highlighted in Table 7.8-8 (0.1 percent in the region versus 4.8 percent in the country). Proportionally, provincial ownership in the region is similar to that in Canada as a whole.

Aboriginal land is characterized using NRC data of Indian reserves, land claim settlement lands, and related aboriginal designations. As shown in Table 7.8-9, the share of aboriginal land in the areas in Canada north of the border from the New England Region (0.4 percent) is less than the share of aboriginal land countrywide (7.4 percent).

Table 7.8-8. Land Ownership in Canada North of the New England Region

Border Province		Federal Land		Provincial Land	
		Total Land Area	Share (%)	Total Land Area	Share (%)
New Brunswick	Study Area	0	0.0	23	8.1
	Province	128	0.7	423	2.3
Nova Scotia	Study Area	0	0.0	87	8.1
	Province	931	6.7	783	5.7
Quebec	Study Area	2	0.3	17	3.5
	Province	655	0.2	18,837	6.3
Selected Provinces	Study Area	2	0.1	127	6.9
	Total for Selected Provinces	1,714	0.5	20,043	6.0
TOTAL CANADA		98,844	4.8	125,779	6.1

*Areas north of the New England Region in Canada include the portions of New Brunswick, Nova Scotia, and Quebec provinces extending two miles north of the U.S.-Canada border.

Source: (NRC, 2007).

Notes: Federal lands are all lands with the designation national park, migratory bird sanctuary, national wildlife area, Prairie Farm Rehabilitation Administration, and marine protected area. Provincial lands are all lands designated under provincial administration, which often includes funding and support from Federal agencies.

Table 7.8-9. Aboriginal Lands in Canada North of the New England Region

Border Province		Aboriginal Lands (Thousands of Acres)	Share (%)
New Brunswick	Study Area	1	0.3
	Province	40	0.2
Nova Scotia	Study Area	2	0.2
	Province	29	0.2
Quebec	Study Area	5	1.1
	Province	1,015	0.3
Selected Provinces	Study Area	8	0.4
	Total for Selected Provinces	1,083	0.3
TOTAL CANADA		152,965	7.4

*Areas north of the New England Region in Canada include the portions of New Brunswick, Nova Scotia, and Quebec provinces extending two miles north of the U.S.-Canada border.

Source: (NRC, 2010).

7.8.2.5 Land Use Management

As noted in Chapter 3, for projects on non-Federal lands, CBP will comply with state and local land use regulations where applicable or where not specifically preempted from doing so, as long as such compliance does not impede execution of its congressionally mandated mission.

7.8.2.6 Consistency with Enforceable Policies of the Coastal Zone Management Act

In the New England Region, CBP's activities in Maine have coastal zones relevant to the northern border and will have to comply with the appropriate state "enforceable policies" outlined below. Most CBP activities in the state coastal zones are expected to fall in the negligible to moderate range and to comply with the Federal consistency requirements and procedures established by the individual states, identified below for Maine.

Maine

Maine's northern border coastal zone includes the inland line of coastal towns on tidewaters and all islands in the 100-mile zone of interest south of the border. The State Planning Office (SPO) administers the Maine Coastal Zone Management Program (CZMP) and enforcement of state laws that affect the coastal zone. CBP's activities that affect the coastal zone must be consistent with the following enforceable state policies that are part of the Maine Coastal Program (MSPO, 2006):

- Natural Resources Protection Act;
- Mandatory Shoreline Zoning Law;
- Site Location of Development Law;
- Erosion Control and Sedimentation Law;
- Storm Water Management Law;
- Subdivision Law;
- Marine Rivers Act;
- Maine Waterway Development and Conservation Act;
- Coastal Management Policies Act;
- Protection and Improvement of Air Law;
- Protection and Improvement of Waters Act;
- Nutrient Management Act Land Use Regulation Law;
- Maine Hazardous Waste, Septage and Solid Waste Management Act;
- Nuclear Facility Decommissioning Laws;
- Oil Discharge Prevention and Pollution Control Law;
- Marine Resources Law;
- Coastal Barrier Resources System Act;
- Marine Endangered Species Act; and,

- Fee schedule.

“The Maine Guide to Federal Consistency Review” contains the procedures for demonstrating consistency with the enforceable policies of the Maine CZMP (MSPO, 2006).

7.9 AESTHETIC AND VISUAL RESOURCES

7.9.1 INTRODUCTION

Visual resources include those features that define the visual character of an area—natural features, vistas, or viewsheds, and even urban or community visual characteristics that include architecture, skylines, or other characteristics. Visual resources and aesthetics are important due to their unique qualities and the responses they inspire in humans. This section provides the analytical tools to conduct a precise visual impact assessment for future site-specific projects or activities; it also offers examples of the types of landscapes that exist along the border. It analyzes how, in which settings, to what extent, and with which viewer groups the various CBP activities might create visual impacts. It does not characterize every potential vista or visual landscape along the entire northern border, but does provide guidelines for minimizing, mitigating, or avoiding such impacts.

The Visual Resource Management (VRM) system developed by BLM defines the visual sensitivity of an area and the potential effect of a project on a visual resource. It assigns ratings of Classes I to IV based on combinations of scenic quality, sensitivity levels, and distance zones (for the Framework for Characterizing Resource Impacts on the northern border, see Chapter 3, Section 3.9).

7.9.2 AFFECTED ENVIRONMENT

7.9.2.1 Affected Landscapes

Four broadly defined landscapes occur within the potential settings of the proposed project. These four landscapes are: natural, rural, urban, and industrial (USDOT, 1999), and are briefly described below.

Natural Landscapes

Natural landscapes are those in which natural landforms and vegetation predominate, and signs of human activity are not apparent (USDOT, 1999). Coastlines, water bodies, mountains, and areas of varied relief are the most striking and tend to be the most conspicuous. Some natural landscapes are designated specifically for outdoor recreation. BLM, USFS, USFWS, NPS, and state and local parks own most of these recreational lands. This region has a considerable amount of forested area; Maine, for instance, is 70.8 percent forested. As in the western United States, geological landforms, such as mountains, rock outcroppings, ridges, escarpments, and valleys, dominate the natural landscape. Even where significant topographic relief occurs, the heavily forested landforms are undistinguished and tend to confine a viewer's attention to the immediate foreground. Many of these landscapes would fall into the "A" category for scenic quality and thus be sensitive to visual modifications. Located in northern New Hampshire (making up 14% of the state) and extending into southwestern Maine, White Mountain National Forest has nine managed scenic areas within its 784,505 acres, managed to protect outstanding scenery making it an important natural landscape.

Saint John Valley, Maine



Source: (USDOJ, 2006).

Rural Landscapes

Rural landscapes include features such as croplands, orchards, fields, fences, and farm-related structures (USDOT, 1999). While border POEs and BPSs along the U.S.-Canadian border tend to be in rural, less densely populated areas well outside of major cities, the majority of the population in the study area lives in larger population centers. Agricultural areas are predominantly flat or gently rolling hills; these landscapes tend to be restricted to valleys and lowlands and are not typically found at higher elevations or in areas with complex topography. Native vegetation grows in confined areas where land is steep or soils are unproductive. Views may extend for some distance, with vertical elements typically consisting of relatively low farm buildings, silos, water towers, utility poles, and trees. Distinct geometric patterns, such as rectangular or circular fields and property boundaries divided by section lines, may characterize the landscape. Towns are small and have relatively low skylines. In general, the few structures in such areas can be of aesthetic interest. Agriculture greatly influences the landscape. Land-use groups can sometimes categorize different agriculture practices. Other rural areas include forests or desert, which are influenced by roadways, the presence of small towns, and land-clearing activities, such as timber harvesting, strip mining, ski areas, and large reservoirs.

Urban Landscapes

These landscapes represent only a fraction of the Nation's entire land area, but are the dominant visual environment of roughly three-quarters of the American population (USDOT, 1999). Residential and suburban areas represent much of the urban landscape, with centralized primary commercial centers and business districts defining the most dominant visual characteristics. The scale of development in major urban areas is large and dominated by structures, highways, infrastructure, and trees. Urban landscapes can absorb a great degree of visual change because they already contain commanding visual features. Most urban landscapes are clustered around

areas of usable natural resources, such as waterways. Most of the major cities cluster around ocean access. Although these large urban areas are not the most significant features in the New England Region, they still represent the visual setting for the largest portion of the population. Here, as well as along other parts of the border, the POEs and BPSs are more situated in rural areas. These landscapes already contain sizable amounts of infrastructure and would be able to absorb a greater amount of change and more additions to the visual environment than rural or natural landscapes. The largest concern in urban landscapes is the number and sensitivity of the visual user groups (see Section 7.9.2.3).

Industrial Landscapes

Heavy and light industrial landscapes tend to be scattered, situated in specific zones or districts, such as along roads and waterfronts or near airports. Unlike the Great Lakes Region, relatively few industrial landscapes exist along the northern border in the New England Region. Such landscapes can absorb the greatest degree of visual change, due to existing dominant visual features and their generally low scenic quality (“C” category). These landscapes are usually classified as Visual Resource Class IV in which major changes to the visual environment can occur without major impacts to the visual environment or viewer groups.

Industrial Plant on River



Source: (USDOl, 2008).

7.9.2.2 Areas with High Visual Sensitivity

Visual sensitivity refers to the level of viewer awareness and the value placed on a particular scene. Some areas have a high degree of visual sensitivity, usually due to their unique visual features or their use by recreational users. The BLM considers these areas as Visual Resource Class I in terms of scenic quality. Typically, highly sensitive areas are significant to the general public. In these areas, most modifications to the visual environment would result in a major adverse impact and any visual impact should be avoided or mitigated if possible. Natural areas with Federal or state protection often fall into this category. Unlike the western states, the New England Region does not have as large a proportion of public lands sensitive to visual impacts.

7.9.2.3 Affected User Groups

Specific viewer groups within the study area can gauge viewer sensitivity and assure the selection of appropriate representative viewpoints during the visual impact evaluation. While

POEs and BPSs along the U.S.-Canadian border are generally in rural, less densely populated areas outside of major metropolitan areas, most of the population in the study area lives in larger population centers. The following four categories of viewer/user groups were identified within the study area. In the United States, approximately 2.2 million people live in the New England Region (Table 7.10-1). The segment of the population living in border communities accounts for 67.5 percent of the population living in the New England Region states of Maine, New Hampshire, and Vermont. Maine has the largest population living in the region, about 1.2 million people. The border communities in New Hampshire and Vermont are less populated.

Commuters and Through Travelers

These viewers pass through the study area on a regular basis in automobiles on their way to work or other destinations. On most roads within the study area, the views are from street level. Typically, drivers have limited views of CBP's infrastructure and activity, except at locations where CBP's actions cross the road. Commuters and through travelers are typically moving, have a relatively narrow visual field due to roadside vegetation or structures, and generally are preoccupied with traffic and navigating the roadways. For these reasons, commuters and through travelers' perception of (and sensitivity to) visual quality and changes in the visual environment are likely to remain relatively low. Passengers in moving vehicles, however, have greater opportunities for off-road views of a project than do drivers. The New England Region has a relatively low amount of commuter and urban traffic although the Calais POE is one of the top ten busiest POEs on the northern border (see Traffic and Roadways, Section 7.16.2).

Local Residents

These individuals may view the proposed actions from stationary locations, such as yards and homes, and while driving along local roads. The sensitivity of residents to visual quality varies and may be tempered by a viewer's exposure to existing CBP actions and infrastructure and other visually varied features already in existence. Presumably, most residents will be highly sensitive to changes in the landscape viewable from their homes and neighborhoods. CBP also considers visual impacts to Native American sacred sites or trust resources before carrying out a project.

Business Employees

These individuals work at local businesses, primarily in the commercial portions of the study area. Business employees will generally experience limited views of the alternative actions except at road crossings while driving to work or where CBP's infrastructure and activity occurs near their place of employment. Most business employees work in one and two-story structures that may or may not have outside views. Those with views often look out on numerous (often varied) built features and the employees within are focused on their jobs. For these reasons, business employees are not likely to be sensitive to landscape changes.

Recreational Users

This group generally includes local residents and tourists involved in outdoor recreation at local parks, recreational facilities, and natural areas: hikers, bicyclists, joggers, and those involved in more passive activities (e.g., picnicking, walking, and nature observation). Scenery and visual quality may or may not be an important part of the recreational experience for these viewers. In general, recreational enjoyment is almost always enhanced by a setting that has not been visually

degraded. For some recreational users, scenery may constitute a very important part of their experience, and their activities may afford continuous views of landscape features over relatively long periods of time. Such viewers are likely to have a high appreciation for visual quality and high sensitivity to visual change.

Given the amount of public land (which includes recreational and conservation lands) in the New England Region, recreational users do not represent a large viewer group compared with western states. Certain recreational users within the study area, however, already have clear views of current CBP infrastructure and activities. Proximity to existing infrastructure and activity may decrease their expectations of visual quality and their sensitivity to visual change.

7.10 SOCIOECONOMIC RESOURCES

7.10.1 INTRODUCTION

This section provides a socioeconomic profile of the New England Region and discusses potential impacts of the CBP's program alternatives on the region's resources. The study area includes areas in the United States and Canada within 100 miles of the border. Some categories of socioeconomic impacts, as discussed in the environmental consequences section, are as likely to be experienced on the Canadian side of the border as on the U.S. side. For example, time delays at border crossings may affect populations and businesses on both sides of the border. In addition, much of the economic activity in U.S. border regions involves cross-border movement of people and goods; therefore, the impacts of CBP activities on Canadian socioeconomic resources are considered along with the impacts on U.S. resources. The impacts of CBP actions on communities and regional economies in Canada are most likely to be felt closest to the border. But since it is not possible to delineate precisely how far from the border impacts may extend, information on the area 100 miles north of the border is provided to mirror the study area in the United States. This definition of the study area does not imply that impacts are necessarily equivalent in the two countries.

Much of the economic data presented here for Canada is not available below the provincial level, so the provinces provide the best available representation of the border region. This limitation does not necessarily suggest the scope of economic impacts; it merely reflects the level at which demographic and economic data are available. All monetary values are expressed in 2009 U.S. dollars, unless otherwise indicated. The socioeconomic environment includes people and their communities, taking into account such things as population movement, density, and age distribution, as well as economic considerations including, income levels, opportunities for employment, and overall economic trends. Section 7.10.2 of this chapter first provides an overview of the socioeconomic resources across the New England Region and north of this region in Canada. It then provides a more detailed characterization of the regional demography, including population levels and distribution, regional growth trends, income, employment levels, poverty statistics, and property values. This section also profiles the regional economy, indexing important economic sectors in terms of income and employment. It further provides regionally focused information on important economic sectors for two POE sites. These sites include those POEs that are most active in terms of the annual number of crossings and the value of cargo transported.

7.10.2 AFFECTED ENVIRONMENT

7.10.2.1 Regional Demographics

To provide context for the potential impacts of CBP actions, some basic, descriptive, socioeconomic information is provided for the New England Region and the area north of this region in Canada and is compared to the broader states, provinces, and national economies, where possible. While the profiled region is defined as the area both 100 miles north and south of the U.S.-Canada border, the statistics in the various tables and text within this section include data for all U.S. counties and Canadian census divisions overlapping these 100-mile regions. These areas represent the finest geographic resolution available for these data and are used, therefore, to approximate values for populations and other demographic variables.

7.10.2.2 Population and Growth Trends

In the United States, approximately 2.2 million people reside in the New England Region (Table 7.10-1). The segment of the population living in border communities accounts for 67.5 percent of the population in the New England Region states of Maine, New Hampshire, and Vermont. Maine has the largest population in the region with about 1.2 million people. The border communities in New Hampshire and Vermont are less populated.

Between 2000 and 2009, border communities in Maine (3.2 percent growth), New Hampshire (6.7 percent), and Vermont (2.5 percent) experienced population growth at a slower pace than the United States as a whole (8.7 percent) (Figure 7.10-1).

Table 7.10-1. Population of the New England Region*

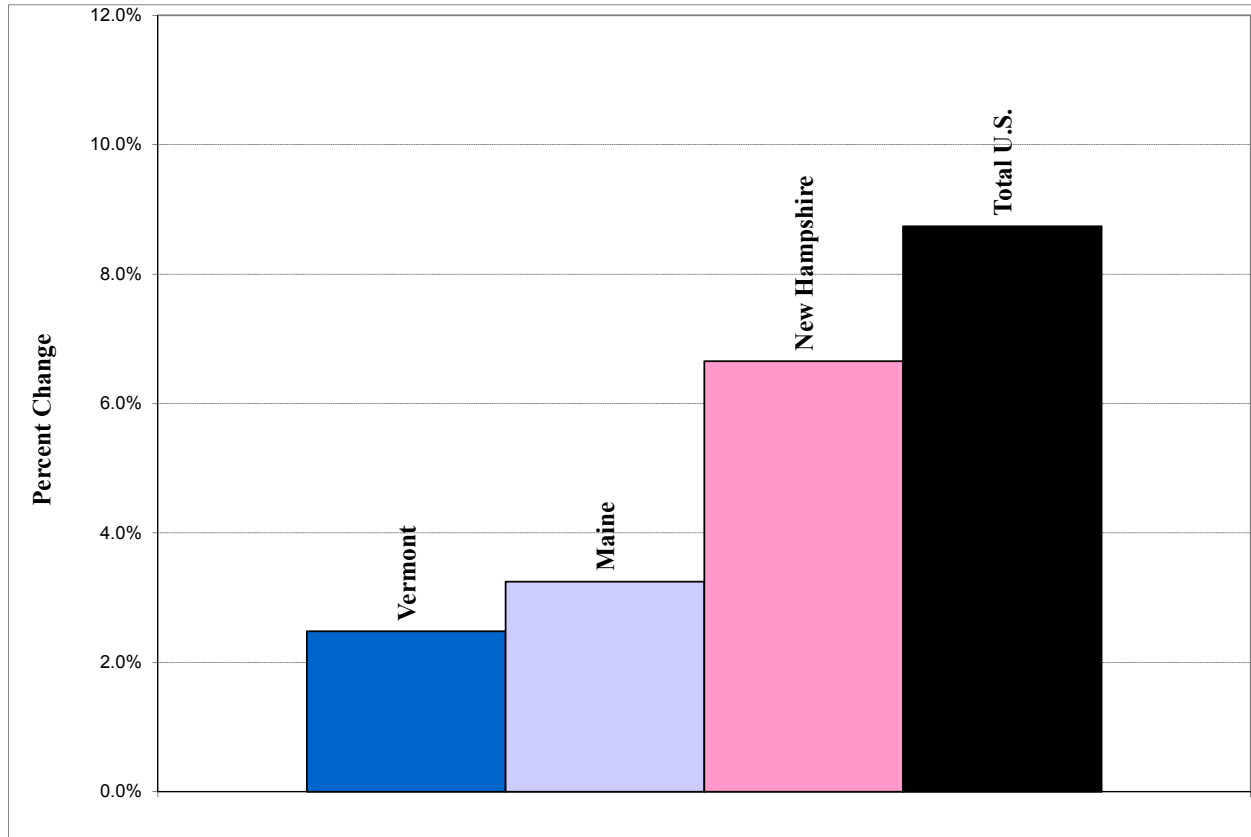
Border State	Population within the Border Area**	Population Overall	Percent of Population within the Border Area
Maine	1,242,924	1,318,301	94.3
New Hampshire	418,759	1,324,575	31.6
Vermont	541,878	621,760	87.2
New England Region Total	2,203,561	3,264,636	67.5
Total United States	28,412,077	310,973,729	9.1

* The American Community Survey provides estimates of demographic, social, economic, and housing characteristics every year for all states, as well as for all cities, counties, metropolitan areas, and population groups of 65,000 people or more (USDOC, 2000).

** Statistics in this column account only for those portions of the states within the New England Region. Total United States accounts only for the border area of all four regions.

While border POEs and BPS along the northern border tend to be in rural, less densely populated areas outside of major metropolitan areas, the majority of the population in the region lives in larger population centers. Population centers in this report include all of the counties that overlap a metropolitan statistical area (MSA), defined by the Office of Management and Budget and used by the USCB to report demographic statistics. Overall, for the New England Region in the United States, approximately 55.1 percent of the population lives in population centers (Table 7.10-2).

Figure 7.10-1. Percent Change in the New England Region Population, 2000–2009



Source: (USDOC, 2009a).

Table 7.10-2. Population Centers in the New England Region*

Border State	Population Center	State's New England Population Living in Population Centers**	Total State Population in the New England Region	Percent of State's New England Population Living in Population Centers
Maine	Bangor	241,153	1,242,924	19.4
	Lewiston-Auburn	106,539		8.6
	Portland-South Portland	536,679		43.2
	Maine State Total	884,371		71.2
New Hampshire***	New Hampshire State Total	0	418,759	0.0
Vermont***	Burlington-South Burlington	329,469	541,878	60.8
New England Region Total		1,213,840	2,203,561	55.1
Total United States****		261,110,826	310,973,729	84.0

* The American Community Survey provides estimates of demographic, social, economic, and housing characteristics every year for all states, as well as for all cities, counties, metropolitan areas, and population groups of 65,000 people or more.

** Statistics in this column account only for those portions of the New England Region within each state.

*** The New England Region in Vermont includes only one population center; thus, no state total row is presented. The New England Region in New Hampshire does not include any population centers.

**** Population statistics in this row represent the proportion of the total American population that resides in population centers across the whole country.

In Canada, approximately 7.4 million people reside in the study area north of the New England Region (Table 7.10-3). Most of Canada's major cities are in the southern part of the country; therefore, the country's population is more heavily concentrated along the border than the U.S. population. For example, in Quebec, approximately 92.7 percent of the population lives in border communities. Quebec has the second largest population living in border communities in Canada. As some census divisions overlapping the 100-mile buffer area are large and extend well beyond 100 miles from the border, this analysis may overstate the Canadian population residing in the study area north of the New England Region.

Between 1996 and 2006, the population of Canada grew 9.5 percent. More recently, according to Statistics Canada, about two-thirds of Canada's growth between 2009 and 2010 was attributable to net international migration. The number of immigrants to Canada rose from 245,300 between 2008 and 2009 to 270,500 between 2009 and 2010. During the economic recession in 2009 and 2010, however, the net flow of non-permanent residents decreased, with more immigrants leaving the country, resulting in lower net international migration in 2010 compared to the previous year. Overall, the area north of the New England Region experienced population growth. Unlike Nova Scotia (-5.1 percent) and New Brunswick (-2.8 percent),

Quebec (6.6 percent) experienced positive population growth, but at a pace slower than Canada as a whole (Figure 7.10-2).

Approximately 71.7 percent of the Canadian population in the study area north of the New England Region resides within population centers (Table 7.10-4). While more than 73 percent of the study area population in Quebec lives in population centers, none of the study area population in Nova Scotia does.

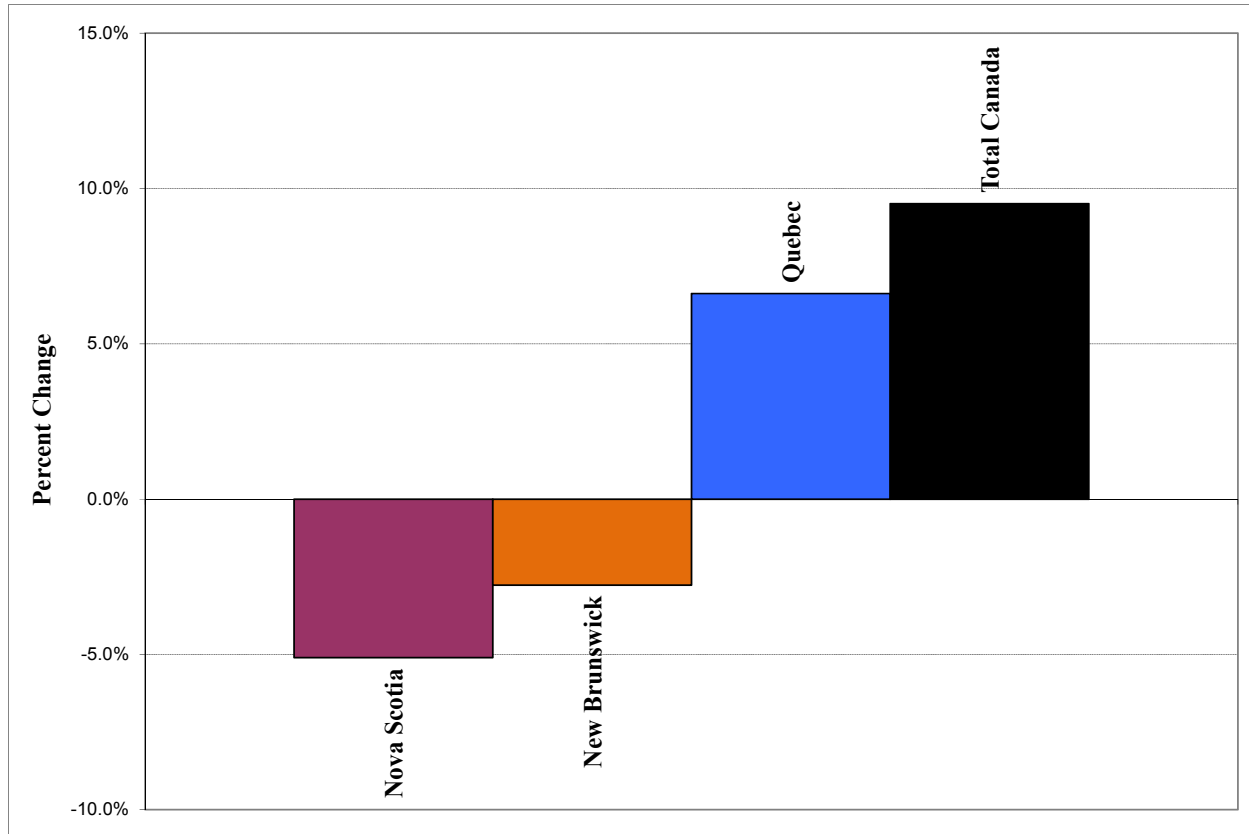
Table 7.10-3. Population North of the New England Region in Canada

Border Province	Study Area Population North of the New England Region*	Total Population in the Province	Percent of Total Province Population Residing in the Study Area North of the New England Region
New Brunswick	453,605	719,650	63.0
Nova Scotia	65,725	903,090	7.3
Quebec	6,895,455	7,435,900	92.7
New England Region Total	7,414,785	9,058,640	81.9
Total Canada	25,562,910	31,241,030	81.8

* Statistics in this column account only for those portions of the provinces within the study area. Total Canada accounts only for those portions of the border provinces within the study area across all four regions.

Source: (StatCan, 2006a).

Figure 7.10-2. Percent Change in Canadian Population, North of New England Region, 1996–2006



Sources: (StatCan, 1996; StatCan, 2006a).

Table 7.10-4. Population in Census Metropolitan Areas in Study Area North of the New England Region in Canada

Border Province	Population Center	Study Area Population Living in Population Centers North of the New England Region*	Total Study Area Population North of the New England Region*	Percent of Total Study Area Population North of the New England Region Living in Population Centers
New Brunswick	Moncton	124,055	453,605	27.3
	Saint John	120,875		26.6
	New Brunswick Province Total	244,930		54.0
Nova Scotia	Nova Scotia Province Total	0	65,725	0.0
Quebec	Montreal	3,588,520	6,895,455	52.0
	Ottawa-Gatineau **	304,985		4.4
	Quebec	704,185		10.2
	Saguenay	149,600		2.2
	Sherbrooke	183,635		2.7
	Trois-Rivières	138,560		2.0
	Quebec Province Total	5,069,485		73.5
	New England Region Total	5,314,415		7,414,785
Total Canada**		21,508,575	31,241,030	68.8

* Population statistics in these columns account only for those portions of the CMAs and provinces within the study area.

** Population statistics in this row represent the proportion of the total Canadian population that resides in population centers across the whole country.

Source: (StatCan, 2006a).

7.10.2.3 Income, Poverty, and Unemployment

The median household income of border communities within the New England Region (\$50,069) is lower than the national average (\$53,051). Border communities in New Hampshire are less wealthy than the state average (Manchester and Concord are outside of the study area).

The poverty rate is defined as the number of individuals included in the poverty count as a percentage of the population for whom the poverty status is determined. The poverty rates for the New England states are all lower than the 12.4 percent for the entire United States (Table 7.10-5). Border communities in New Hampshire and Vermont have the lowest poverty rates of all border communities across the U.S.-Canada border.

The unemployment rates in the New England states in 2009 were all significantly lower than the 9.3 percent for the country (Table 7.10-6). The unemployment rate for border communities in New Hampshire was much lower than the national average.

Table 7.10-5. Income and Poverty Statistics for the New England Region

Border State/ New England Region*		Median Household Income** (\$)	Population Below the Poverty Line***	Percent of Population Below the Poverty Line
Maine	New England Region	47,503	128,261	11.0
	Statewide	47,046	135,501	10.9
New Hampshire	New England Region	54,887	27,542	7.3
	Statewide	62,492	78,530	6.5
Vermont	New England Region	52,338	47,880	9.4
	Statewide	51,614	55,506	9.4
New England Region Total	New England Region	50,069	203,683	9.9
	Selected States	54,056	269,537	8.9
Total United States		53,051	33,899,812	12.4

* Statistics in the non-shaded rows account only for portions of the states within the New England Region.

** Median household income is reported in inflation-adjusted 2009 dollars.

***To determine the poverty rate in the United States, the Census Bureau references income thresholds that vary by family size and ages of family members. If a family’s total income, not including noncash benefits (such as food stamps and housing subsidies), is below the family’s threshold, every individual in the family is included in the poverty count.

Source: (USDOC, 2000a; USDOC, 2000b).

Table 7.10-6. Unemployment Rates for the New England Region

Border State/ New England Region*		Unemployment Rate (%)
Maine	New England Region	8.1
	Statewide	8.0
New Hampshire	New England Region	5.9
	Statewide	6.3
Vermont	New England Region	6.9
	Statewide	6.9

Border State/ New England Region*		Unemployment Rate (%)
New England Region Total	New England Region	7.3
	Selected States	7.1
Total United States		9.3

* Statistics in the non-shaded rows account only for portions of the states within the New England Region.

Source: (USDOL, 2009a).

The median household income in the study area north of the New England Region is approximately \$43,700 (in 2009 U.S. dollars) compared with \$49,400 for Canada as a whole (Table 7.10-7). Border communities in New Brunswick and Nova Scotia have the lowest poverty rates among all border communities north of the U.S.-Canada border.

The poverty rate in Canadian communities is defined as the percentage of low-income “economic families.” (See note in Table 7.10-7 for an explanation of “economic family.”) This threshold-based designation is comparable to the poverty statistics reported in the USCB. In the study area north of the New England Region, the poverty rate is approximately 12.5 percent compared with 11.6 percent for Canada as a whole (Table 7.10-7). Border communities in Quebec have the second highest poverty rates among all border communities north of the U.S.-Canada border.

In the study area north of the New England Region, the unemployment rate was 6.9 percent in 2006 compared with 6.6 percent for Canada (Table 7.10-8). In Nova Scotia, the unemployment rate was significantly higher in the border communities than for the entire province. Border communities in New Brunswick and Nova Scotia have the highest unemployment rates among all border communities north of the U.S.-Canada border.

Table 7.10-7. Income and Poverty Statistics North of the New England Region in Canada

Border Province/Study Area North of New England Region*		Median Household Income** (\$US)	Number of Low-Income Economic Families***	Percent of Low-Income Economic Families***
New Brunswick	Study area north of New England Region	42,435	14,293	10.7
	Province	41,620	22,252	10.4
Nova Scotia	Study area north of New England Region	36,138	2,063	10.3
	Province	42,920	27,192	10.3
Quebec	Study area north of New England Region	43,846	248,722	12.6
	Province	42,748	260,440	12.3
New England Region	Study area north of New	43,692	265,078	12.5

Border Province/Study Area North of New England Region*		Median Household Income** (\$US)	Number of Low-Income Economic Families***	Percent of Low-Income Economic Families***
Total	England Region			
	Selected provinces	42,676	309,884	11.9
Total Canada		49,393	1,006,911	11.6

* Statistics in the non-shaded rows account only for portions of the provinces within the study area.

** Median household income is reported in inflation-adjusted 2009 US dollars.

*** The Canadian Census reports statistics for “low-income” economic families. This threshold-based designation is comparable to the poverty statistics reported in the USCB. The term “economic family” refers to a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common-law, or adoption. A couple may be of opposite or same sex. Foster children are included.

Source: (StatCan, 2006d).

Table 7.10-8. Unemployment Rates North of the New England Region in Canada

Border Province/Study Area North of the New England Region*		Unemployment Rate (%)
New Brunswick	Study area north of New England Region	10.1
	Province	10.0
Nova Scotia	Study area north of New England Region	11.8
	Province	9.1
Quebec	Study area north of New England Region	6.6
	Province	7.0
New England Region Total	Study area north of New England Region	6.9
	Selected provinces	7.4
Total Canada		6.6

* Statistics in the non-shaded rows account only for portions of the provinces within the study area.

Source: (StatCan, 2006c).

7.10.2.4 Property Values

In the New England Region, the median property value between 2006 and 2008 was approximately \$192,400—the same median property value for the United States as a whole (\$192,400) (Table 7.10-9). Except for New Hampshire, the median property value within the border region is higher than the median property value for each respective state.

Table 7.10-9. Median Property Value for the New England Region

Border State/ New England Region*		Median Home Value** (\$)
Maine	New England Region	177,700
	Statewide	175,200
New Hampshire	New England Region	220,100
	Statewide	260,300
Vermont	New England Region	205,300
	Statewide	203,800
New England Region Total	New England Region	192,400
	Selected states	214,500
Total United States		192,400

* Statistics in the non-shaded rows account only for those portions of the states within the New England Region.

** The American Community Survey provides estimates of housing characteristics for all geographic areas with populations of 20,000 or more, including the Nation, all states and the District of Columbia, all congressional districts, and approximately 1,800 counties every 3 years. Due to the use of value categories rather than specific amounts collected for each individual housing unit in 2006 and 2007, property values cannot be inflation adjusted. Property values are reported in nominal dollar terms.

Source: (USDOC, 2008a).

In the study area north of the New England Region, the median property value in 2006 was approximately \$173,800 (in 2009 U.S. dollars) compared with \$232,200 for Canada as a whole (Table 7.10-10). Border communities in New Brunswick have the lowest median property values among all border communities north of the border. The median property value for border communities in Nova Scotia is significantly less than for the province as a whole.

Table 7.10-10. Median Property Value North of New England Region in Canada

Border Province/Study Area North of New England Region*		Average Value of Dwelling** (US\$)
New Brunswick	Study area north of New England Region	107,900
	Province	105,400
Nova Scotia	Study area north of New England Region	116,500
	Province	139,300
Quebec	Study area north of New England Region	178,700
	Province	160,800
New England Region Total	Study area north of New England Region	173,800
	Selected provinces	154,300
Total Canada		232,200

* Statistics in the non-shaded rows account only for those portions of the provinces within the study area.

** A dwelling is defined as a set of living quarters designed for or converted for human habitation in which a person or group of persons reside or could reside. In addition, a private dwelling must have a source of heat or power and must be an enclosed space that provides shelter from the elements, as evidenced by complete and enclosed walls and roof and by doors and windows that protect from wind, rain, and snow. Property values are reported in 2006 U.S. dollars.

Source: (StatCan, 2006b).

7.10.2.5 Regional Economies

Tourism is a major component of economic activity along the northern border. Canada is the top country of origin for visitors to the United States. In 2008, the number of Canadian visitors staying one or more nights in the United States was nearly 19 million (USDOC, 2008d). In this context, “Canadian visitors” refers to Canadian residents visiting the United States.

Crossing the northern border using surface modes of transportation is the principal means of entry for Canadians

Trade with Canada
<p>The flow of goods, services, and people across the border contributes significantly to economic activity in border communities. Canada is the largest trading partner of the United States. In 2009, the total value of merchandise trade with Canada was approximately \$429.6 billion—\$204.7 billion in exports and \$224.9 billion in imports. Shipments by surface modes of transportation, excluding pipelines, account for approximately 79 percent of total merchandise trade with Canada. The top exports to Canada by surface transportation are automobiles and automotive parts and accessories, and other machinery, appliances, and equipment. The top imports from Canada are automobiles and automotive parts and accessories, other machinery and appliances, and processed paper and pulp products. On average, approximately \$930 million in merchandise crosses the northern border by surface transportation every day (USDOT, 2009a). Appendix Q of this analysis provides trade statistics for surface transportation between the United States and Canada.</p>

visiting the United States, accounting for two-thirds (12.6 million) of all Canadian visitor entries (USDOC, 2008b). While approximately 16 percent of Canadian visitors entering the United States by surface transportation visited the New England Region, spending in this region accounted for a relatively low percentage (less than 7 percent) of these visitors' total spending in the United States. Canadian visitors entering by surface transportation contributed approximately \$535 million to the New England Region in 2008 (Table 7.10-11). The average visitor spent approximately \$262 per visit. The most common stated purposes for visiting states in the region were vacation (82 percent), visiting friends or relatives (15 percent), and business or employment (3 percent). The New England Region had the lowest percentage of travel due to business or employment. While business travelers tend to spend more per trip, they rely more heavily on air travel and travel further from the border.

Table 7.10-11. Canadian Visitors Entering the New England Region by Surface Transportation*

Destination	Visitors		Spending			Purpose of Trip		
	Number of Visitors (000s)	Average Nights Per Visit	Visitor Spending (\$US millions)	Spending per Visitor (\$US)	Average Daily Spending per Visitor (\$US)	Business, Convention, or Employment (%)	Visiting Friends or Relatives (%)	Holiday, Vacation, or Other (%)
Maine	857	3.4	261.2	305	91	2.8	13.2	84.0
New Hampshire	443	2.9	110.5	249	87	3.0	15.6	81.6
Vermont	741	3.1	163.7	221	72	2.9	15.7	81.5
Border States in New England Region	2,041	3.2	535.0	262	82	2.9	14.6	82.6

* Surface modes of transportation include autos, buses, and other non-air modes of transportation. Average nights per visit and average daily spending per visitor are based on total visitors, including air travelers.

Sources: (USDOC, 2008a; USDOC, 2008b; USDOC, 2008c).

7.10.2.6 Economic Profiles of POEs and BPSs in the New England Region

This section provides regional economic profiles for border communities in the United States and Canada that surround selected POEs in the New England Region. This section characterizes socioeconomic resources of specific border communities in the region to provide context for the discussion of potential consequences of CBP's alternative actions, and to highlight the diversity in regional economies surrounding POEs and BPSs along the northern border. Appendix Q of this report provides data on trade, employment, and payroll statistics by economic sector for U.S. counties and Canadian provinces that contain profiled POEs and BPSs in the four northern border regions.

This section profiles two sites in the New England Region representing the most heavily used POEs along the U.S.-Canada border in the region in terms of total crossings and the total value of trade. Table 7.10-12 lists the sites ranked by crossing volume and provides information on associated crossing activity.

Table 7.10-12. POE and BPS Sites Profiled in the New England Region

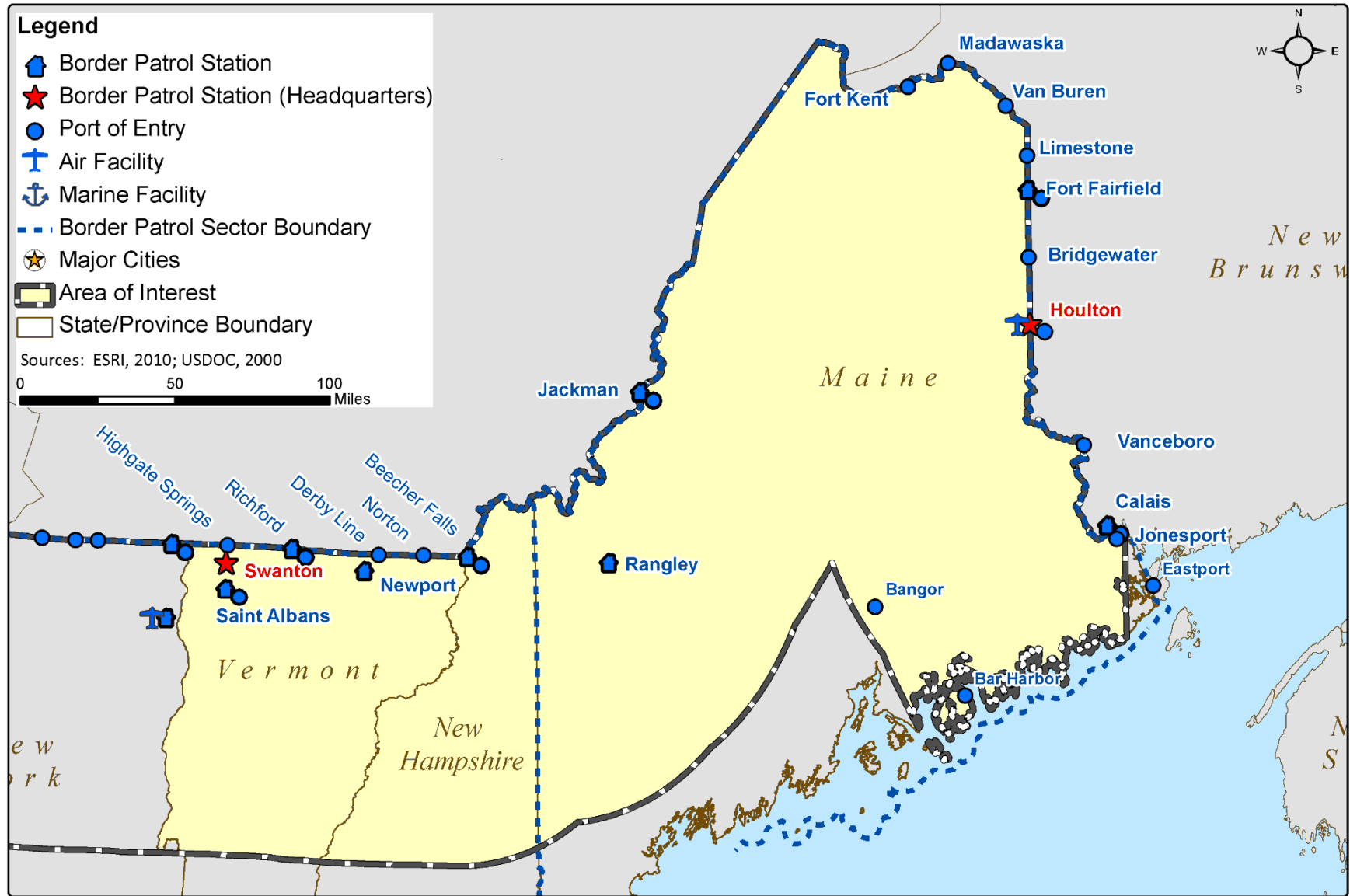
Port	Annual Individual Crossings (% of Total)	Annual Vehicle Crossings (% of Total)	National Rank by Crossing Volume	Annual Trade Value (Surface Mode)	Rank by Trade Value	Two Largest Commodities (% of Port's Trade Value)	Important Features
ME: Calais	1,414,000 (2.3%)	963,530 (3.0%)	10	\$2,360,785,936 (0.7%)	14	<ul style="list-style-type: none"> Fish and crustaceans, mollusks (30.9%) Nuclear reactors, boilers, machinery, and mechanical appliances (7.9%) 	<ul style="list-style-type: none"> Close community ties between Calais, ME and St. Stephen, New Brunswick
VT: Derby Line	1,355,812 (2.2%)	650,320 (2.0%)	11	\$1,707,808,810 (0.5%)	17	<ul style="list-style-type: none"> Paper and paperboard (16.5%) Wood and articles thereof (14.4%) 	<ul style="list-style-type: none"> Heavy summer travel use

* Size based on number of individual border crossings.

** BTS does not provide data on commodities and crossings at BPSs.

Sources: IEc analysis of Bureau of Transportation Statistics data: (USDOT, 2009a; USDOT, 2009b; USDOT, 2009c).

Figure 7.10-3. Locations of POEs and BPSs in the New England Region



The remainder of this section characterizes the regional economies of the U.S. counties and Canadian provinces containing the New England Region sites identified in Table 7.10-12 and Figure 7.10-3.

Orleans County, Vermont

Orleans County, Vermont lies between the eastern and western ranges of the Green Mountains and is bordered by Quebec to the north. This county is largely rural and has a population of approximately 28,000. The border splits the towns of Derby Line, Vermont, and Stanstead, Quebec, but the two towns function as a single community, sharing resources such as a sewer system, emergency services, snowplows, and the Haskell Free Library and Opera House (NYT, 2009). The Jay Peak Resort and surrounding area is a popular ski destination just five miles south of the border. Outdoor winter recreational activities, including skiing, snowboarding, cross-country skiing, snowshoeing, snowmobiling, and hiking are popular in the area. The major economic sectors by annual payroll are health care and social assistance (\$56.2 million), retail trade (\$33.0 million), construction (\$23.3 million), and accommodation and food services (\$13.4 million). The poverty rate for Orleans County is the second highest in Vermont and the median household income is the second lowest in the state.

- **Derby Line POE:** The Derby Line POE has two crossing points leading to either Route 55 or Route 143 in Quebec. Derby Line is approximately 220 miles north of Boston on Interstate 91 and approximately 100 miles southeast of Montreal. Two popular winter destinations for Canadians are the Jay Peak Resort and the White Mountain National Forest in New Hampshire. Monthly crossing data show an annual surge in privately owned vehicle crossings in July and August, suggesting that tourists use this POE heavily for summer travel (USDOT, 2009c). Derby Line has the eleventh highest volume of individual border crossings, accounting for 1.4 million or 2.2 percent of all U.S.-Canada crossings in 2009. The value of border commerce at the Derby Line POE in 2009 was \$1.7 billion (approximately 0.5 percent of all U.S.-Canada trade). Derby Line is a significant freight crossing for the paper and wood product industries. The major commodities transported across Derby Line by trade value are paper and paperboard (16.5 percent), wood and wood articles (14.4 percent), vehicles and parts (8.0 percent), and articles of iron or steel (7.4 percent).

Washington County, Maine

Washington County, Maine is the easternmost county in the United States. This county is largely rural and has a population of approximately 32,000. It has many fishing-based, seaside communities; it also has an agricultural economy for which a key component is wild blueberry production. Maine is the single largest producer of wild blueberries in the world. According to the U.S. Department of Agriculture, Maine produced 89.95 million pounds of wild blueberries in 2008 (USDA, 2009). The major economic sectors in Washington County by annual payroll are health care and social assistance (\$62.9 million), manufacturing (\$39.4 million), and retail trade (\$23.9 million).

Many Canadians travel through Washington County to reach Bangor International Airport or shop at Bangor Mall. Bangor, the state's third largest city, is the economic center for central, northern, and Down East Maine and serves as northern New England's economic link to the Canadian maritime, eastern Quebec, and beyond (CBME, 2010). However, Washington County

is relatively less affluent. According to the USCB, it has the lowest median household income and the highest poverty rate in the state.

The border between Washington County and New Brunswick splits some communities. Residents of Calais in Maine and St. Stephen in New Brunswick have close ties; it is common to have family that lives across the border (USDHS, 2008). Calais and St. Stephen frequently function as a single community, fostering cooperation between the fire departments and on other projects. Calais does not have a football field, so its high school team plays its games in St. Stephen. This unique relationship is celebrated yearly during the International Homecoming Festival. In November 2009, a new border crossing opened between the two towns (Mack, 2009).

- Calais POE: The Calais POE is separated from St. Stephen, New Brunswick by the St. Croix River. The POE is approximately 100 miles northeast of Bangor. There are two distinct border-crossing points at the Calais POE: the Ferry Point Bridge and the Milltown Bridge. The close ties among communities split by the border are reflected in the substantial number of pedestrian crossings. Calais ranks third among all U.S.-Canada POEs in the number of pedestrian crossings with 16,665 pedestrian crossings in 2009, behind Sumas and Buffalo-Niagara Falls. The number of pedestrian crossings may be underestimated because at the Ferry Point Bridge, privately owned vehicles can obscure the view of guards so that pedestrians remain uncounted (USDOT, 2001). Calais has the tenth highest volume of individual crossings overall, accounting for 1.4 million or 2.3 percent of all U.S.-Canada crossings in 2009. A relatively small number of buses use the Calais POE and there are no passenger trains. Calais accounts for the fourteenth highest value of trade with \$2.4 billion or 0.7 percent of all U.S.-Canada trade in 2009. As the largest land POE along the Eastern seaboard, it is the single largest POE for shipment of fish, crustaceans, mollusks, and other aquatic invertebrates, which accounted for \$730.3 million or 30.9 percent of U.S.-Canada trade in seafood. The other major commodities transported through Calais include machinery and mechanical appliances (7.9 percent), paper and paperboard (7.6 percent), and rubber and articles thereof (7.0 percent).

Quebec, Canada

Quebec lies to the north of the Derby Line POE. Quebec sits in eastern central Canada and shares an international border with the states of New York, Vermont, New Hampshire, and Maine. Quebec is the second largest Canadian province, accounting for 24 percent of the entire population. Most of the population lives on either shore of the St. Lawrence River between Montreal and Quebec City. Half of Quebec's population lives inside the Montreal metropolitan area. French is the native language for 80 percent of the population. Montreal is a major tourist destination due to its rich history, distinct heritage, and culture. The International Jazz Festival and the Montreal Casino attract many visitors. In the winter, tourists travel to Quebec to enjoy the numerous ski resorts. Mont-Tremblant, 150 km north of Montreal, is one of the most popular resorts for American tourists. Quebec City, the capital of Quebec, is the second largest urban center. During the international Winter Carnival, Quebec City also hosts a great number of visitors.

Quebec is home to a number of high-tech industries, including aerospace companies and the Canadian Space Agency, and a large public sector. Montreal is a center of commerce, industry,

technology, culture, and finance, while the economy of Quebec City is dominated by public administration and government services. The dominant economic sectors in Quebec by annual payroll are manufacturing (\$23.4 billion), health care and social assistance (\$14.0 billion), professional, scientific, and technical services (\$11.6 billion), and public administration (\$11.2 billion). A significant paper and pulp products industry exists outside the major urban centers. The lumber industry is the economic cornerstone for nearly 250 of Quebec's municipalities and generates approximately 40,500 direct jobs (QFIC, 2010). Quebec is also an important agricultural producer. It is the largest dairy producer in Canada and produces nearly 75 percent of the world's maple syrup.

New Brunswick, Canada

New Brunswick lies to the north of the Calais POE. New Brunswick is one of three Canadian Maritimes Provinces and has the smallest land area and population in the Canadian study area. New Brunswick's three major cities are Moncton, St. John, and Fredericton. Moncton is the most populous city in New Brunswick and is the commercial and retail center of the province. The city of St. John, along the north shore of the Bay of Fundy, is the second largest city and the major industrial center of the province. The Irving Group, which has interests in oil, forestry, shipbuilding, and transportation, is headquartered in St. John and is the largest employer in the province (JDI, 2010). The Port of St. John, the largest seaport in New Brunswick, handles an average of 27 million metric tons of cargo annually and is one of Canada's key ports recognized for its strategic importance to Canada's trade and economy (SJPA, 2010). It is also a major port for cruise ships traveling between Canada and New England. Fredericton, the capital of New Brunswick, is the center of government services and higher education.

The major economic sectors in New Brunswick by regional income are manufacturing (\$1.6 billion), health care and social assistance (\$1.4 billion), public administration (\$1.3 billion), retail trade (\$940.7 million), and educational services (\$936.5 million). Outside of the urban centers, the economy centers on farming, forestry, and fishing. The tourism industry is supported by cruise ships entering the Port of St. John and by Fundy National Park, a major tourist attraction.

7.11 CULTURAL AND PALEONTOLOGICAL RESOURCES

7.11.1 INTRODUCTION

This section provides an overview of cultural and paleontological resources located in the New England Region of the northern border and discusses potential impacts of CBP's program alternatives on those resources.

7.11.2 AFFECTED ENVIRONMENT

7.11.2.1 Archaeological Resources: Prehistoric/Precontact Context

Among the known cultural resources in the New England Region are archaeological sites from the prehistoric and pre-European contact periods. This section provides an overview of those periods. An expanded prehistoric and pre-European contact-period context and references can be found in Appendix H. In North America, the Prehistoric/Precontact era is generally divided into three broad periods: Paleo-Indian, Archaic, and Ceramic/Woodland/Late. During the Prehistoric era, North-American groups evolved from highly nomadic big-game hunters to politically sophisticated and sedentary Tribes and nations employing large-scale agriculture. There are thousands of known archaeological sites within the New England Region, which represent a fraction of the potential sites that may exist in the region. This record of known sites has been built up over the years as a result of reports by amateurs and vocational archaeologists as well as the result of formal archaeological surveys conducted by professionals and academics. In parallel with the evolution of prehistoric groups from nomadic hunting to sedentary agriculture/aquaculture and the resulting increases in population, sites from the earlier periods (ca. 12,000 to ca. 7,000 years before present [B.P.]) are rare. Sites from the later periods account for the bulk of the known sites in the region.

Paleo-Indian Period

The Paleo-Indian period (ca. 12,000 to ca. 10,000 B.P.) is similar in much of the study area and was characterized by people inhabiting the recently deglaciated environment. Subsistence was dominated by big-game hunting of mastodon, mammoth, caribou, horse, bison, musk-ox, giant ground sloth, white-tailed deer, elk, moose, and wapiti, along with species of smaller mammals, birds, fish, reptiles, and shellfish. These early hunting groups generally had highly mobile lifeways. There are several types of Paleo-Indian sites including small camps; workshops/quarries; kill sites; rockshelters/cave camps; major, recurrently occupied camps; and possible cremation sites.

Archaic Period

During the Archaic period (ca. 10,000 to ca. 3,000 B.P.), the environment changed from unstable post-glacial conditions to an essentially modern state. In the context of this changing landscape, came numerous cultural and technological changes. People gradually adopted less-mobile lifestyles. At the same time, they broadened the variety of resources on which they depended for food and shelter. Some groups began regularly interacting and trading with other people across large distances—sometimes over a thousand miles away. There are relatively few sites from the first 3,000 years of the Archaic known in the northern portion of the United States, a fact probably related to the continually changing climate and environment. Sites from the last 4,000 years of the period are more common and show people had developed a great variety of tool

types and styles, mostly made from stone, bone, and wood. In general, Archaic sites are found along water and on lake plains.

Woodland/Ceramic/Late Period

The Woodland/Ceramic/Late period lasted from 3,000 B.P. to the time when European trade goods reached Indian groups (450 to 250 B.P.). During this time, people invented several new technologies, including clay pots and the bow and arrow. Long-distance trade intensified. Groups adopted agriculture, developed even less-mobile lifeways than before, and started living in larger settlements, some with over 1,000 inhabitants. In the millennium before contact with Europeans, many people in the eastern half of the United States came to rely heavily on maize, beans, and squash and started living in large villages that had defensive walls and were located in easily-defendable locations, such as elevated terrain near rivers.

7.11.2.2 Prehistoric Archaeological Site Probability

Archaeologists use a variety of information and techniques to carry out *predictive modeling*, the process of assessing the probability of the existence of archaeological sites in a given location. This section provides an overview of the current understanding of archaeological site probability in the New England Region.

Maine

The Maine Historic Preservation Commission (MHPC) identifies five types of Precontact archaeological sites: (1) habitation (camp or village) and workshop sites; (2) lithic quarries; (3) cemeteries; (4) rock art; and (5) waterlogged sites preserving wood or other perishables. There are about 6,000 sites in the Maine prehistoric archaeological survey inventory. Habitation and workshop sites comprise the vast majority (over 95 percent) of the known archaeological locations in Maine. They exhibit evidence of a range of activities from food procurement and processing to tool manufacture and maintenance. More than 95 percent of these sites are located adjacent to canoe-navigable waters, whether coast, lake, river, stream, swamp, or relict shorelines. The majority of sites is shallowly buried on till, sand, gravel, or silt soils within 1.5 feet of the surface. In alluvial settings along rivers and streams, sites can be buried more deeply—to depths of 10 feet.

Predictive site-location models are also based partly on culture periods as well as bedrock and surficial geology, proximity to water, aspect, and slope. Elevated sandy bluffs are considered sensitive for the presence of Paleo-Indian and Late Ceramic period sites. Relatively level terraces bordering rivers and streams are sensitive for Late Paleo-Indian, Archaic, and Ceramic period sites. This sensitivity is enhanced by the presence of rapids or confluences. Landforms at the start or end of rapids at stream confluences and with a southern or eastern exposure are particularly likely locations for Native American archaeological sites. The original shores of lakes, particularly at inlets and outlets, are also sensitive for Late Paleo-Indian, Archaic, and Ceramic period sites. Landforms in areas with a high density of known archaeological sites are considered more sensitive than landforms in areas where sites are rare.

New Hampshire and Vermont

Developing a single, scientifically valid, objective, highly operationalized, deductively derived model for locating Precontact period, Native American archaeological sites across Vermont or

New Hampshire would not be feasible because most of the area lacks representative data (Sloma and Callum, 2002). The Vermont State Historic Preservation Office (SHPO) uses one broad predictive model approved by the Vermont Advisory Council on Historic Preservation. The Vermont SHPO's predictive model is intended to identify areas with a high potential for containing significant Precontact Native American residential sites. The model may offer some guidance in locating non-Native early settlement sites and some types of historic-period Native American sites since these types of sites had similar environmental requirements to Precontact settlements. The locations of individual Native American burials, cemeteries, and special-use areas during any time period are not readily predictable and the model is unlikely to help in their identification.

The present information on Precontact period, Native American archaeological sites, such as lithic procurement, caves, ritual, subsistence, and habitation sites, would suggest a diverse variety of Native American sites within the northern border study area from the Paleo-Indian to the present time. These sites have been documented in a wide variety of environmental settings ranging from bedrock, to upland, to small streams, to broad floodplains. Native Americans apparently continuously occupied and utilized this region. New Hampshire sites with the largest area, highest artifact density, and greatest number of occupations are apt to be located in distinctive settings such as major river channels, particularly at falls, river confluences, or rich alluvial bottomlands; the interface of tidal estuaries and fresh water; or the outlets of lakes. In Vermont, sites with the largest area, highest artifact density, and greatest number of occupations are apt to be located in the Champlain Valley bordering Lake Champlain, the Connecticut River Valley, and other major river channels, particularly at falls, river confluences, or rich alluvial bottomlands. Smaller, but no less important, Native American sites may be present beside interior lakes, ponds, wetlands, and springs, as well as near important resource areas such as lithic sources, rock shelters, and mountain passes.

7.11.2.3 Historic Context

This section provides a brief historic context that describes the development of the New England Region after European contact. An expanded historic context and references can be found in Appendix H.

Contact between Indigenous people and Europeans in northern New England began in the mid-to-late sixteenth century from French outposts along the Atlantic coast of Canada. The earliest settlement of Maine was the French colony at St. Croix Island in 1604. While the early French occupations were focused on the fur trade and missionary work, the English settlements in Massachusetts and southern New Hampshire were permanent occupations. Northern Maine remained part of the French cultural sphere until after the Revolutionary War, while southern coastal Maine, New Hampshire, and Vermont were in the English sphere of influence from the beginning of their settlement.

The colonial period, especially before 1700, is characterized by intensive and brutal conflicts between the colonists and the Indians (e.g., King Philip's War [1675-1676]). Later, conflicts pitted the French and English and their Native allies in a series of conflicts for supremacy of the New World—King William's War (1690-1700), Queen Anne's War (1702-1713), the French and Indian War (1754-1763)—and gave rise to military traffic and conflict along Lake Champlain and its waterways in areas of northern Vermont and New York.

Initial occupations in this rugged, heavily timbered region comprised fur trading, logging, and small-scale agriculture. Timbering experienced resurgence in the late-nineteenth century, especially in northern and interior Maine.

During the nineteenth century, development of transportation routes opened the region to settlement. While poor roads kept settlement low until the 1850s, new routes included a variety of highway types, canals, and later railroads, which were heavily concentrated in the southern part of the region. These new routes opened new locations for settlement and provided new opportunities for business. Agriculture in this region was generally poor, but commerce was quick to use the abundant water power for operating a variety of mills. Small-scale textile mills took root in the 1820s and soon spread over the region, expanding into a variety of small, water-powered factories. These factories were complemented by small-scale agriculture, maple-syrup collecting, hop farming, and dairying during the later-nineteenth century through the twentieth century.

These small factories attracted numerous waves of immigrants during their operation but by the mid-twentieth century were dying out. The introduction of the automobile revolutionized settlement patterns and enhanced transportation capabilities. Tourism and recreation are important components of the economy in this region.

7.11.2.4 Historic/Protohistoric Archaeological Site Probability

Among the known cultural resources in the New England Region are archaeological sites from the historic and post-European contact periods. This section provides an overview of the current understanding of historic archaeological site probability in the New England Region. This section includes the Protohistoric Period (defined as the time between the initial arrival of European goods and diseases and actual contact between Native Americans and non-Natives) which extended from about A.D. 1500 to A.D. 1650. Items including guns, ceramics, and other elements of material culture were quickly integrated into indigenous economic and subsistence systems.

The earliest direct contact between Native Americans and Europeans in the Northeast were interactions between groups of coastal Indians and Basque, Portuguese, and Breton fishing parties in the early 1500s. Later, after the arrival of French settlers at what is now Nova Scotia in 1604 and the Pilgrims at Plymouth in what is now Massachusetts in 1620, European involvement in the area intensified. The first fifty years of the contact period in the area primarily involved interaction between Native American groups and non-Native settlers, fur traders, and Christian missionaries.

Maine

Historic non-Native site-sensitivity assessments in Maine are based on an evolving set of guidelines established by the MHPC in which early colonial period sites along the coast are generally given higher priority than sites of later times and contexts. However, the provision for the careful assessment of the first fifty years of settlement in any given township, regardless of time period and the state's recognition of the significance of the region's historic industries, add considerably to the inventory of historic-period archaeological sites in Maine. A working draft of the state's agricultural context and the development of various other contexts, from logging

and lumbering to sporting camps, together with guidelines established by the NPS provide additional means by which historic non-Native sensitivity in Maine is assessed.

The predictive site-location model for historic non-Native sites is in part also based on a set of environmental variables similar to those favorable for Native American site selection, some of which are directly borrowed from Precontact cultural settings, such as the utilization of travel corridors, agricultural fields, and village sites. Use of a wide range of natural resources during the historic period resulted in a large number of known and expected archaeological resources related to rural industries, patterns of town development, and other historic contexts. The archival record aids in the assessment of individual sites and landscapes within the region. Maps and a variety of other documents aid in site identification and interpretation, potentially answering questions concerning function, duration, and significance.

New Hampshire and Vermont

In Vermont, the Division for Historic Preservation (VDHP) highlights significant types of sites in “Keeping Vermont A Special World: The Vermont Historic Preservation Plan.” This ten-year plan summarizes historic contexts that describe what we know about our past according to important themes, types of cultural resources, quantity, and quality. Archaeologists further define significance as a site’s potential to yield important information about the past, despite site size, artifact number, or site notoriety. The NPS maintains a summary website of state historic preservation plans, including those for Vermont and New Hampshire.¹ Both plans are currently under revision.

The State of Vermont promotes the use of its *predictive model*. Draft archaeological guidelines for Vermont (VDHP, 2002) describe the application of the state’s predictive model:

The predictive model is an initial desk-review tool; it is only a coarse filter that may highlight potential site areas. A project area that indicates a high potential for containing a significant site on the predictive model may trigger a site visit. The site visit results in a recommendation for further archaeological investigation, or, results in a “sign off.”

The Vermont SHPO applies the predictive model during desk review of development projects subject to state laws, although developers and state agencies may choose to hire archaeological consultants to apply the predictive model which will then be reviewed by the SHPO. The SHPO usually conducts site visits triggered by the predictive model for Act 250 and state reviews.

Historic-period archaeological sites are likely to vary in location, function, and age between different physiographic regions, watersheds, and the landforms or settings where they were established. In some contexts, there appears to be a correlation between Precontact period Native American sites overlapped by later early historic-period sites (e.g., Doherty et al., 1995; Doherty et al., 1997); these occurrences have yet to be fully explored. Shaffer (1998) discussed this same point in regard to Pennsylvania archaeology.

¹See <http://www.nps.gov/history/hps/pad/stateplans/planlist.html>.

Interest in historic-period archaeological sites is fairly recent in comparison to Precontact period sites. The earliest excavation of a historic-period site in New Hampshire was in Wolfeboro in 1934–1935 when the Civilian Conservation Corps excavated inside the plantation-mansion cellar hole of New Hampshire’s last colonial governor, John Wentworth (Starbuck, 1989). Since that time, cultural resource-management work and academic research in Vermont and New Hampshire has added to our knowledge of this later era of human occupation in this region. The information is far from complete, and many sites remain to be identified and investigated.

The general pattern of historic settlement in New Hampshire and Vermont developed largely around river channels and lakes, with floodplain areas often being the easiest areas to develop, and later spreading into upland areas. Settlement pattern studies of historic-period non-Native archaeological sites grew predominately from the field of geography (Glassie, 1968; Hubka, 1984; Meeks, 1986a; Meeks, 1986b; McHenry, 1979; McHenry 1986), local or regional history (e.g., Russell, 1976), or anthropology (e.g., Elliott, 1977).

Today, historic archeologists may examine where settlers located upon the landscape and how they arranged their farmsteads. For example, a constricted, linear (mostly north-south) farmstead layout exists upon Connecticut River Valley terraces and Champlain lowland bedrock ridges settled largely in the late-eighteenth and early nineteenth century by settlers of largely English ancestry. Farmstead layout is likely to be different on deltas, lake bottoms, and perhaps hill farms. Unfortunately, farmstead layout is poorly studied in all but the Connecticut River Valley (Hubka, 1984; McHenry, 1986). McHenry (1986) has shown that eighteenth-century Vermont field patterns even reflect differences among English settlers from Connecticut, Massachusetts, and New Hampshire. Different patterns for “hill farms” have also been found (Melnick et al., 1984). Little archaeological work has been conducted in Vermont and New Hampshire to investigate the historic-period settlement pattern of other ethnic groups including Native Americans, African Americans, Dutch, French, and others.

In a review of New Hampshire’s historic-period archeology, Starbuck (1994) pointed to gaps in historic site data. He observed (1) that no archaeological study existed of any minority group in the state; (2) women’s activities were poorly represented in archaeological studies; (3) there were almost no comparisons of “coastal” versus “interior” settlement patterns; (4) there had been few efforts to locate early posthole houses and other forms of poorly known architecture, which were holdovers from English medieval styles; and (5) very little was done with the sites of farms and early industries. Since that time, most of these deficiencies have been addressed to some degree, but much work remains to be done.

Known historic-period sites and structures provide some general information as to where one might expect to find archaeological sites of the same age, but not all of these properties are documented. Developing a single, scientifically valid, objective, highly operationalized, deductively derived model for locating historic-period archaeological sites across Vermont and New Hampshire would not be feasible because most of the area lacks representative data (Sloma and Callum, 2002). The ability to model for historic-period site locations and settlement patterns has been demonstrated in several studies (Klein, 1973; Langhorne, 1976; Moran, 1978; Monroe et al., 1980; Paynter, 1982; Mires, 1983; Lewis, 1984; O’Brien, 1984; Hasenstab and Resnick, 1990; Lukezic, 1990; Zubrow, 1990; Linebaugh and Robinson, 1994).

In some instances, a historic-period site may provide the only information when records are non-existent. While most researchers are aware of maps as a “snapshot” in time, map review with a null finding is often deemed sufficient to exclude the possibility of historic-period archaeological sites. cursory review and premature findings can lead to costly, inadvertent discoveries that should have been avoided. Archaeological investigations in Vermont have increasingly identified late-eighteenth-century through nineteenth-century residential sites that are not depicted on nineteenth-century maps.

In general for the entire area, historic archaeological sites can occur in or near present-day municipalities and villages as well as along historic-period roads, particularly cross-roads. Sites may also be found along certain railway sections and waterways.

Archaeological sites consist of remains and locations exhibiting evidence (usually artifacts) of past human activity. These sites can be associated with both the prehistoric and historic periods and can be visible on the ground surface or buried. In general, prehistoric sites consist of villages, camps, rock shelters, workshops, quarries, and a variety of specialized activity areas such as fishing and resource processing camps. Historic archaeological sites generally consist of farmsteads, refuse dumps, privies, and residential sites as well as buried infrastructure sites such as roads and canals. Historic-period archaeological deposits are also common in urban settings.

7.11.2.5 Above-Ground Historic Property Types

There are numerous above-ground historic properties along the New England border area that are National Register listed, eligible, or potentially eligible for listing. This is particularly true for Maine and parts of Vermont.

As a primarily rural, agricultural state, historic buildings in Maine tend overwhelmingly to be residential and small-scale commercial (i.e., smaller downtown business districts). While the earliest houses in the state, from the late-seventeenth century and early-eighteenth century, tend to be along the coast, several eighteenth-century houses exist in the southern portions of the study area. Most of the counties in the central and northern parts of the state, however, show few if any eighteenth-century buildings. Houses from the early eighteenth century generally are one- or one-and-one-half-story buildings, often constructed of logs, while houses from the middle and later parts of the eighteenth century are one, one and one-half, or two stories in height, constructed around a timber frame, and generally with a central brick chimney and unadorned wood siding.

The northern portion of Maine, principally Aroostook County, was in flux through the early nineteenth century as a result of the uncertainty over the border with Canada. Border tensions led to the creation of a blockhouse fort (now located in Fort Kent) along the St. John River. The early architectural traditions in northern Aroostook County along the border remained influenced by the Acadian settlers, whose building technology differed from that of their English counterparts in the lower part of the state. The Acadian vernacular architectural traditions in the eighteenth century included log houses that used tenons at the corners rather than notches.

Further from the new and establishing towns of the central and southern portions of the state, in the St. John River Valley along Maine’s northern border with Canada, residential architecture tended to be more conservative in style and continued to reflect the Acadian origins. Greek-

Revival influences remained longer in these rural areas and can be seen in the variations of vernacular Acadian house types, including the one-and-one-half-story, front-gable, half-cape house that is scattered throughout the central and northern portions of the state. By the early and mid-twentieth century, however, examples of high-style residential architecture including variations on the Colonial-Revival and Mediterranean styles can be found throughout the state.

One of Maine's principal agricultural crops led to the establishment of a particular form of agricultural building: the potato barn. Set partially below grade with only the roof extending above the ground, examples of nineteenth-century potato barns can be seen throughout the northern parts of the state, especially in northeastern Aroostook County. In addition to residences, Maine's industrial heritage continues to be represented in historic architecture. Some small-scale industrial buildings remain in the southern portion of the study area: small mill buildings that made use of the limited fall of the rivers and their tidal movement as they approached the coast. More common, though, are the large-scale factory buildings relating to the state's industries, principally paper and textiles. By the late-nineteenth century and early twentieth century, these buildings tended overwhelmingly to be built of brick, two- to four-stories high, with rows of multi-paned, metal-framed windows. Like the sporting camps, many of these older factory buildings tended to be located along the state's rivers, to take advantage of the available hydropower. These buildings are found most often in the smaller and mid-sized Piedmont cities such as Waterville, Auburn, Madison, and Skowhegan. Maine also has a long history of the use of hydroelectric power. Dating from the 1890s into the mid-twentieth century, many hydroelectric powerhouses remain and generally are considered historically significant.

One type of monument likely to be found in the extreme northern parts of Maine is the border monument. These monuments are small obelisks, approximately three-feet high, and are made of either concrete or metal.

The study area in New Hampshire and Vermont consists of sparsely populated rural agricultural and forested lands. Historic buildings in the northern and central regions of these two states mostly reflect vernacular interpretations of popular architectural styles that may feature some elements found in a particular style. One of the oldest log cabins in the nation, Hyde Log Cabin (ca. 1783), is located in Grand Isle, Vermont. The region's vernacular architecture incorporates an individual builder's ideas into the overall design as well as influences from architectural traditions and customs adapted from European settlers. The mixture of the vernacular and high-style examples in New Hampshire and Vermont enhance the overall character of each state's historic architecture.

New Hampshire and Vermont are also recognized for their rich agricultural history, which is reflected in the existing farmsteads and agricultural landscape found across the North Country regions of these two states. The Connecticut River, which serves as the boundary between the two states, is a national scenic byway. This natural and historic-river corridor has been referred to as "the heart" of New England because of the vital role it has played in the 250-year development of the region. The Connecticut River Valley contains many riverside villages as well as rural farming villages. The two states are further distinguished for their collection of covered bridges. With a total of 106 bridges, Vermont possesses the most covered bridges in the Nation.

The northern portions of New Hampshire and Vermont contain numerous state parks and several historic sites such as the following in Vermont: the President Chester A. Arthur State Historic Site, Chimney Point Historic Site in Addison on Lake Champlain, and Senator Justin S. Morrill Homestead. Chimney Point on Lake Champlain in Vermont is one of the earliest, most intensely settled, and most strategic sites in the Champlain Valley, with human habitation going back as far as 7,500 years. The Champlain Lake and the Upper Hudson River valleys in Vermont and New York contain the largest number of eighteenth-century forts and battlefields associated with key struggles in the French and Indian War and the Revolutionary War.

A small fraction of the New England Region has been previously inventoried and evaluated for historic structures. Actual numbers of recorded, above-ground historic properties and previous project-survey boundaries exist in SHPO databases and files, but exact numbers of cultural resources are not readily available for this overview. As is the case with other site types in the study area, there is a high probability of discovering previously unrecorded and significant above-ground historic properties that will meet the criteria for listing in the National Register.

Tables 7.11-1 and 7.11-3 identify historic properties that have been designated as historically important at the national, state, and local levels and briefly describe the historic environments in the vicinity of CBP facilities in the New England Region. Table 7.11-2 lists the historic buildings located on CBP properties in Maine.

Table 7.11-1. Cultural Resources in the Vicinity of CBP Facilities in Maine

Component *	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Eastport (Ferry)	100 Water Street Eastport, ME 04631	Island community; county-wide (partial) intensive survey in 1980; Eastport intensive survey in 1998; Six National Register properties in the vicinity including two National Register districts and Fort Sullivan
OFO	POE	Lubec (Land)	Maine State Route 189 Eastport, ME 04631	Three miles from Eastport; FDR Memorial Bridge; National Register properties in vicinity including two light stations and one lifesaving Station
USBP	BPS	Calais	180 International Ave. Calais, ME 04619	Historically known as commerce center; Three National Register districts and nine National Register properties in the vicinity including one light station. Saint Croix Island International Historic Site is located approximately 9 miles southeast.
OFO	POE	International Avenue	Route 1-Maine State Route 9 Calais, ME 04619	See description for Calais BPS above.
OFO	POE	Milltown Point	North Street at the Border Calais, ME 04619	See description for Calais BPS above.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Component *	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Ferry Point	Main Street at the Border Calais, ME 04619	See description for Calais BPS above.
OFO	POE	Vanceboro	Maine State Route 6 Vanceboro, ME 04491	Town located at eastern terminus of Maine State Route 6; part of intensive survey in 1987; no National Register properties listed in the vicinity
USBP	Sector HQ	Houlton	27 Customs Loop Houlton, ME 04730	Town located at northern terminus of Interstate 95; county seat for Aroostook County; part of intensive survey in 1987; 1 National Register district; 11 National Register properties in the vicinity
USBP	BPS	Houlton	27 Customs Loop Houlton, ME 04730	See description for Houlton Sector HQ above.
OFO	POE	Houlton	US Interstate 95 Houlton, ME 04730	See description for Houlton Sector HQ above.
OAM	Air Facility	Houlton	27 Customs Loop Houlton, ME 04730	See description for Houlton Sector HQ above.
OFO	POE	Forest City	Forest City Road at the Border Forest City, ME 04413	Extremely small rural community; no National Register properties in the vicinity
OFO	POE	Monticello	Fletcher Road at the Border Monticello, ME 04760	Small rural community; no National Register properties in the vicinity
OFO	POE	Orient	Boundary Road at the Border Orient, ME 04471	Small rural community; no National Register properties in the vicinity
USBP	BPS	Fort Fairfield	Maine State Route 167 Fort Fairfield, ME 04742	Small rural town; Two National Register properties in the vicinity
OFO	POE	Fort Fairfield	4 Boundary Line Road Fort Fairfield, ME 04742	Small rural community; no National Register properties in the vicinity
OFO	POE	Easton	Ladner Road at the Border Easton, ME 04704	Small rural community; no National Register properties in the vicinity

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Component *	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Limestone	410 Grand Falls Road Limestone, ME 04750	Small rural town; One National Register property in the vicinity
USBP	BPS	Van Buren	137 Bridge St. Van Buren, ME 04785	Small rural town; Five National Register properties in the vicinity
OFO	POE	Van Buren	137 Bridge St. Van Buren, ME 04785	Small rural community; no National Register properties in the vicinity
OFO	POE	Hamlin	Boundary Road at the Border Hamlin, ME 04785	Small rural community; One National Register property in the vicinity
OFO	POE	Madawaska	63 Bridge Avenue Madawaska, ME 04756	Rural town; northernmost town in New England; Two National Register properties in the vicinity
USBP	BPS	Fort Kent	401 West Main Street Fort Kent, ME 04743	Small rural town; northern terminus of U.S. Route 1; Two National Register properties in the vicinity
OFO	POE	Fort Kent	401 West Main Street Fort Kent, ME 04743	See description for Fort Kent BPS above.
OFO	POE	Estcourt Station	Frontier Road at the Border Estcourt Station, ME 04741	Rural village in Big Twenty Township; northernmost point in Maine; no National Register properties in the vicinity
USBP	BPS	Jackman	2614 Main Street Sandy Bay Township, ME 04945	Small rural town; One National Register property in the vicinity
OFO	POE	Jackman	US 201 Sandy Bay Township, ME 04945	See description for Jackman BPS above.
OFO	POE	Coburn Gore	State Route 27 at the Border, Coburn Gore, ME 04936	Small rural community; One National Register property in the vicinity

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Component *	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	St. Aurelie	Baker Lake Road at the Border Seboomook Lake, ME 04478	Timberlands; no National Register properties in the vicinity
OFO	POE	St. Juste	Realty Rd Seboomook Lake, ME 04478	Remote border station; no National Register properties in the vicinity
OFO	POE	St. Pamphile	Blanchette Road at the Border Northwest Aroostook, ME 00125	Small settlement; remote border station; no National Register properties in the vicinity
OFO	POE	St. Zacharie	Golden Road at the Border Seboomook Lake, ME 04478	Remote border station; no National Register properties in the vicinity
USBP	BPS	Rangeley	96 Main St. Rangeley, ME 04970	Small rural town; center of Rangeley Lakes Region; Four National Register properties in the vicinity

*OFO = CBP Office of Field Operations, USBP = U.S. Border Patrol, OAM = CBP Office of Air and Marine

**POE = Port of Entry, BPS = Border Patrol station

Table 7.11-2. Historic Buildings on CBP Property in Maine

Building Name	Type	City	Number	Year Finished	Rating Class*
U.S. Border Station	Border Station	Calais	ME0009ZZ	1938	5a
U.S. Border Station	Border Station	Calais	ME0501BC	1936	5a
U.S. Border Station Garage	Border Station	Calais	ME0503BC	1936	Not rated
U.S. Border Station	Border Station	Coburn Gore	ME0551BE	1932	5a
U.S. Border Station & Customs Residence	Residence	Coburn Gore	ME0552BE	1936	5a
U.S. Border Station & Immigration Residence	Residence	Coburn Gore	ME0553BE	1936	5a
U.S. Border Station	Border Station	Fort Fairfield	ME0601BF	1934	5a
U.S. Border Station & Immigration Residence	Residence	Fort Fairfield	ME0603BF	1934	Not rated
U.S. Border Station	Limestone	Limestone	ME0701BL	1934	
U.S. Border Station	Border Station	Orient	ME0751BT	1937	5a
U.S. Border Station	Garage	Orient	ME0752BT	1937	5a

Source: USGSA, 1999.

*GSA Historic Rating Class 5a: A building 50-years old or older that has not been evaluated for National Register eligibility but is likely eligible, such as a courthouse, custom house, or historic office building (“Held in Public Trust” Appendix C; see footnote above).

Table 7.11-3. Cultural Resources in the Vicinity of CBP Facilities in New Hampshire and Vermont

Component*	Type*	Name	Address	National, State, and Local Historical Designations and Environment
NEW HAMPSHIRE				
OFO	POE	Pittsburg Station	Route 3 at the Border, (Daniel Webster Hwy) Pittsburg, NH 03592	Located in Great North Woods Region; largest town by area in state; sparsely populated; wilderness conditions; One State Register property and no National Register properties in the vicinity
VERMONT				
OFO	POE	Beecher Falls	1429 Vermont Route 253 Beecher Falls, VT 05902	Rural village in Town of Canaan; no National Register properties in vicinity
OBP	BPS	Beecher Falls	1429 Vermont Route 253 Beecher Falls, VT 05902	See description for Beecher Falls POE above.
OFO	POE	Derby Line	Interstate 91 Derby Line, VT 05830	Rural village in Town of Derby; One of two villages where U.S.-Canadian border runs through community; One National Register property in village; Two National Register properties in town
OFO	POE	Beebe Plain Station	Beebe Road at the Border Beebe Plain, VT 05823	Very small rural village in Town of Derby; One of two villages where U.S.-Canadian border runs through community; no National Register properties in village; Two National Register properties in town
OFO	POE	Derby Line (Route 5)	US Route 5 at the Border, Derby Line, VT 05830	Rural village in Town of Derby; One of two villages where U.S.-Canadian border runs through community; One National Register property in village; Two National Register properties in town
OFO	POE	North Troy Station	VT 243 at the border, North Troy, VT 05859	Small rural village in Town of Troy; no National Register properties in the vicinity
OFO	POE	Highgate Springs	Interstate 89 at the Border, Highgate Springs, VT 05460	Small rural village in Town of Highgate; no National Register properties in the vicinity

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Component*	Type*	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Alburg Springs Station	Alburg Springs Road at the Border, Alburg, VT 05440	Small rural village in Town of Alburg; no National Register properties in the vicinity
OFO	POE	Alburg Station	VT 225 at the Border, Alburg, VT 05440	Rural town with lakeside community; U.S.-Canadian border officials share same building; One National Register property in the vicinity
OFO	POE	Morses Line Station	VT Route 235 at the Border/Morses Line Rd Franklin, VT 05457	Small unincorporated village on U.S.-Canadian border; no National Register properties in the vicinity
OFO	POE	Norton	Vermont Route 147, Norton, VT 05907	Rural town; no National Register properties in the vicinity
OFO	POE	Canaan Station	VT 141 at the Border, Canaan, VT 05903	Small rural town; One National Register property in the vicinity
OFO	POE	Richford	Vermont Route 139 Richford, VT 05476	Rural town; farmlands; Five National Register properties and one National Register district in the vicinity
OFO	POE	East Richford Station	VT 105/Glen Sutton Rd, Richford, VT 05476	See description for Richford POE above.
OFO	POE	Pinnacle Road Station	Pinnacle Road at the Border, Richford, VT 05476	See description for Richford POE above.
OFO	POE	West Berkshire Station	VT 108 at the Border, Richford, VT 05476	Rural village in Town of Berkshire; no National Register properties in Village; One National Register property in town
OFO	POE	St. Albans	50 S. Main St, Suite 100R St. Albans, VT 05478	Rural town; Nine National Register properties and one National Register district in the vicinity

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Component*	Type*	Name	Address	National, State, and Local Historical Designations and Environment
OBP	BPS	Richford Station	80 Main St Richford, VT 05476	Rural town; farmlands; Five National Register properties and one National Register district in the vicinity
OBP	Air Facility	Swanton Station	62 Airport Rd, Swanton, VT 05488	Rural town; center of Abenaki activity and culture; Six National Register properties in the vicinity
OBP	Sector HQ	Swanton Station	62 Airport Rd, Swanton, VT 05488	See description for Swanton Station Air Facility above.
OAM	BPS	Swanton	62 Airport Rd, Swanton, VT 05488	See description for Swanton Station Air Facility above.

*OFO = CBP Office of Field Operations, USBP = U.S. Border Patrol, OAM = CBP Office of Air and Marine

**POE = Port of Entry, BPS = Border Patrol station

Table 7.11-4. Historic Buildings on CBP Property in Vermont

Building Name	Type	City	Number	Year Finished	Rating Class*
Border Station Immigration Residence	Residence	West Berkshire	VT0852BW	1935	
U.S. Border Station	Border Station	Beebe Plain	VT0601BP	1937	
U.S. Border Station	Border Station	West Berkshire	VT0851BW	1935	
U.S. Border Station	Border Station	North Troy	VT0751BT	1937	
U.S. Border Station	Border Station	Norton	VT0801BN	1934	
U.S. Border Station	Border Station	Alburg Springs	VT0551BS	1937	
U.S. Border Station	Border Station	Beecher Falls	VT0002ZZ	1932	
U.S. Border Station	Border Station	Derby Line	VT0651PD	1932	
U.S. Border Station	Border Station	Canaan	VT0007ZZ	1935	
U.S. Border Station Cattle Inspection	Other	Derby Line	VT0653PD	1932	
U.S. Border Station East Richford	Border Station	East Richford	VT0008ZZ	1931	
U.S. Border Station Garage	Garage	Derby Line	VT0652PD	1931	
U.S. Border Station Garage	Garage	Beebe Plains	VT0602BP	1937	
U.S. Border Station Garage	Garage	Alburg Springs	VT0552BS	1937	
U.S. Border Station	Border Station	Richford	VT0014ZZ	1934	

7.11.2.6 Native American Resources

This section provides information about the potential location of Native American cultural resources, sacred sites, and traditional cultural properties (TCPs) in the New England Region, based on the geographic location of Native Americans both historically and in the present. There are five tribal groups within the New England area (Table 7.11-4). Three of these Tribes have

reservations within the New England Region study area, all of which are in the State of Maine (Figure 7.11-1). No federally recognized Tribes are located in New Hampshire or Vermont

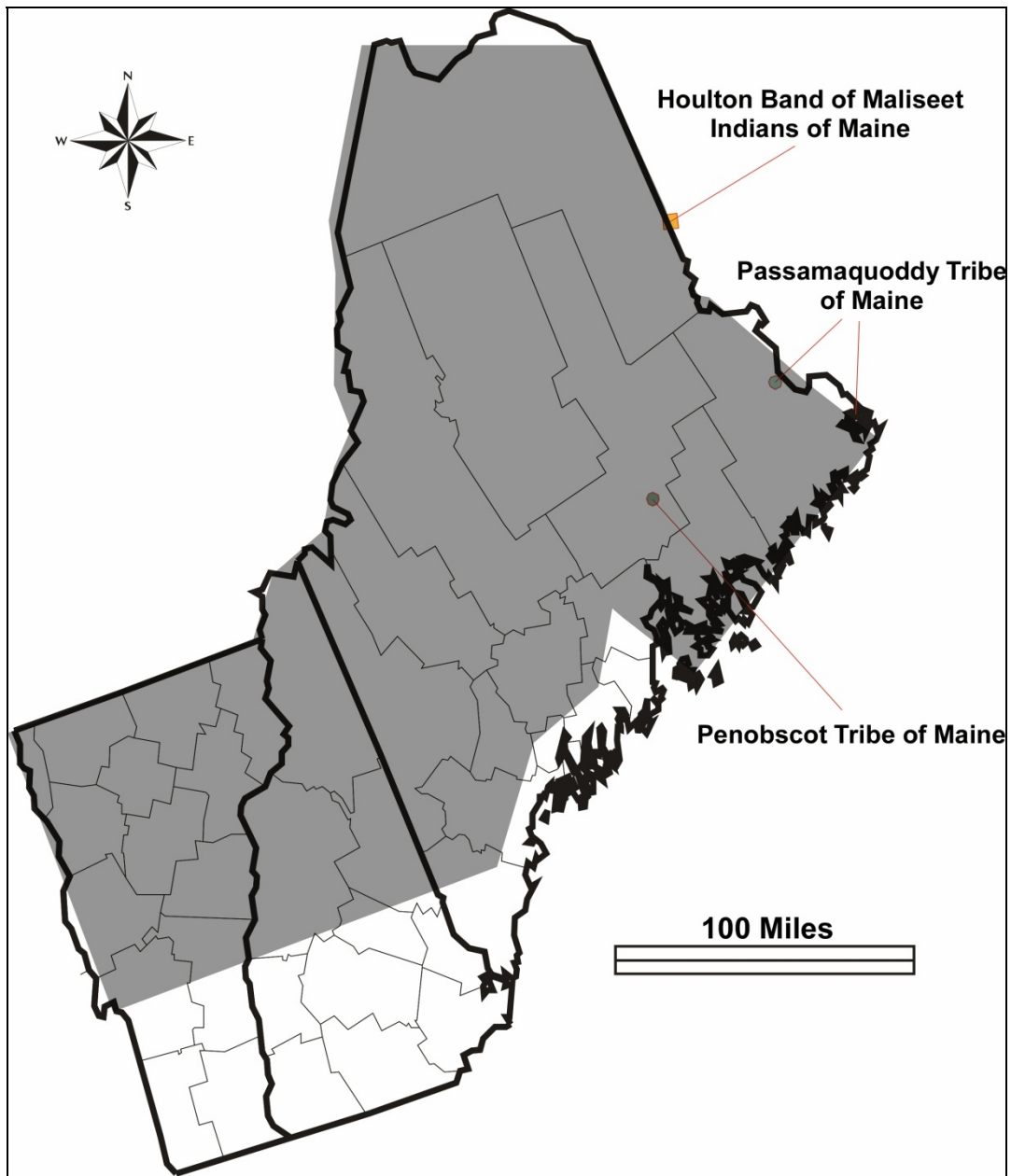
Table 7.11-5. Native American Tribes that have a Reservation, Judicially Established Interest, or Established Traditional Ties to Land within the 100-mile PEIS Corridor

Aroostook Band of Micmac Indians
Houlton Band of Maliseet Indians of Maine
Passamaquoddy Tribe of Maine
Penobscot Tribe of Maine
Wabanaki Nation

The following maps indicate federally recognized Tribes that have a reservation within approximately 100 miles of the Canadian border, have a judicially established connection to land within the 100-mile corridor, or have established traditional ties that may involve traditional cultural properties or archaeological sites. The maps include:

1. A map of Indian reservations located within the 100-mile corridor (Figure 7.11-1);
2. A USGS map showing nineteenth-century cessions, reservations, and portages (Figure 7.11-2). This map was retrieved from ancestry.com; while the sourcing is unclear, the accuracy is corroborated by a 1992 map compiled by the Bureau of Indian Affairs and a 1998 GIS layer created by USGS (not included). The map shows Tribes that had a presence along the northern border 100 years ago and indicates cases where Indian lands were ceded prior to that period;
3. A USGS map showing judicially established Indian land areas as of 1978 (Figure 7.11-3). The map portrays the results of cases before the U.S. Indian Claims Commission or U.S. Court of Claims in which an American-Indian Tribe proved its original tribal occupancy of a tract within the continental United States; and,
4. A USGS map indicating early tribal, cultural, and linguistic areas (Figure 7.11-4). The information was derived from anthropological, archaeological, and linguistic studies. The map generally corroborates the other maps with regard to traditional tribal areas.

Figure 7.11-1. Native American Lands Within the 100-mile PEIS Corridor Crossing Maine, New Hampshire, and Vermont



Source: USDOJ, 1991.

Note: A shaded 100-mile corridor has been added.

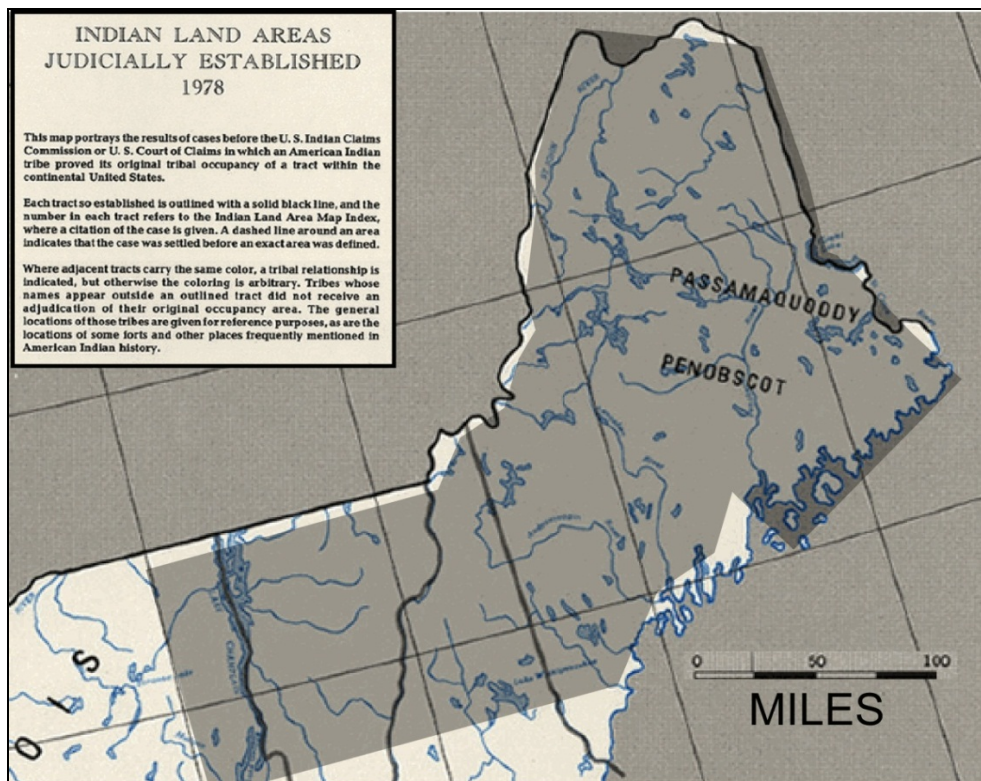
Figure 7.11-2. Nineteenth-Century Cessions, Reservations, and Portages (1907)



Source: (ancestry.com, No Date).

Note: A shaded 100-mile corridor has been added.

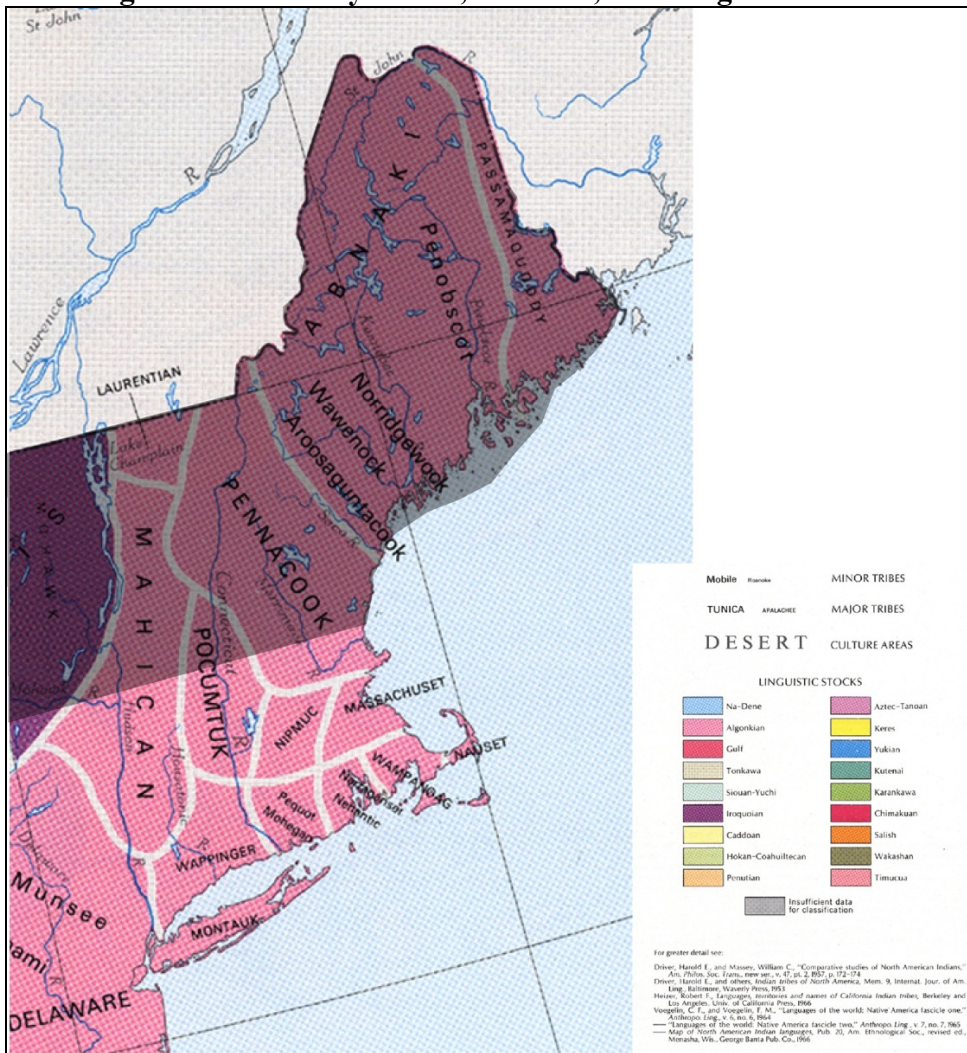
Figure 7.11-3. Judicially Established Indian Land Areas as of 1978



Source: USDOJ, 1978.

Note: A shaded 100-mile corridor has been added.

Figure 7.11-4. Early Tribal, Cultural, and Linguistic Areas



Source:(USDOI, 1991).
 Note: A shaded 100-mile corridor has been added.

7.11.2.7 Paleontological Resources

As with archaeology, paleontologists use a variety of information and techniques to carry out *predictive modeling*, the process of assessing the probability of existence of paleontological sites in a given location. This section provides an overview of the current understanding of paleontological site probability in the New England Region. An expanded discussion of paleontological resources and references can be found in Appendix H.

Within the study area, four major geological groups were identified: sedimentary, volcanic, plutonic, and metamorphic. Of these rock groups, only sedimentary rocks have a high or moderate potential for containing paleontological materials. Both plutonic and volcanic rocks rarely contain fossils because igneous environments are not suitable for living things. Metamorphic rocks rarely contain fossils because the conditions of metamorphism tend to alter the texture of the rocks and destroy any fossils contained within.

Maine

Paleontological-sensitive geological units in Maine include Paleozoic and Cenozoic deposits. Paleozoic deposits containing fossils have been destroyed by metamorphism associated with orogenies (mountain-building events) within the southern portion of the study area only. In all other areas, the Paleozoic deposits are intact. Paleozoic deposits represent sea-level fluctuations and include habitats ranging from nearshore to deepwater. Fossils from these geological units include numerous invertebrates. Cenozoic deposits consist of retreating glacial deposits containing many different plant and large-vertebrate fossils.

New Hampshire

Paleontologically sensitive geological units in New Hampshire include only a very small area in the north of the state. These units are only of Cenozoic age because metamorphism associated with the orogenies destroyed or altered any sediments formed during Paleozoic times. Cenozoic deposits consist of retreating glacial deposits containing many different plant and large-vertebrate fossils.

Vermont

Paleontologically sensitive geological units in Vermont include Paleozoic and Cenozoic deposits. Paleozoic deposits containing fossils are sparse in Vermont, and metamorphism associated with the orogenies destroyed or altered any sediments formed at this time. Paleozoic sediments include sandstone, siltstone, and mudstone and contain bryozoans, brachiopods, cephalopods, gastropods, sponges, and trilobites. Cenozoic deposits consist of Pleistocene glacial deposits containing large-vertebrate fossils.

7.12 ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

7.12.1 INTRODUCTION

Executive Order (EO) 12898 of February 11, 1994 (EO 12898, 1994), titled “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” requires that each Federal agency identify and address any disproportionately high and adverse effect of its programs, policies, and activities on minority and low-income populations. The USEPA defines *environmental justice* as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies” (USEPA, 2010).

EO 13045 of April 21, 1997 (EO 13045), titled “Protection of Children from Environmental Health Risks and Safety Risks,” places a high priority on the identification and assessment of environmental health and safety risks that may disproportionately affect children. The order requires that each agency “ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health or safety risks.” EO 13045 considers that physiological and social development of children makes them more sensitive than adults to adverse health and safety risks and recognizes that children in minority, low-income, and indigenous populations are more likely to be exposed to, and have increased health risks from, environmental contamination than the general population (USEPA, 2010).

7.12.2 AFFECTED ENVIRONMENT

This section describes the affected environment for the assessment of potential environmental-justice effects that could result from implementation of any of CBP’s program alternatives in the New England Region. The affected environment identifies and describes minority and low-income populations, as well as populations of children that may be present in the defined study area and that may be differentially affected by actions proposed under each of the alternatives considered in this PEIS.

The study area for the evaluation of environmental-justice effects is defined—in accordance with Section 7.10, Socioeconomic Resources—as the border communities in both the United States and Canada within 100 miles of the U.S.-Canada border. The U.S. portion of this study area (New England Region) includes the border communities in the States of Maine, New Hampshire, and Vermont. The study area north of the New England Region in Canada includes the border communities in the Provinces of Quebec, New Brunswick, and Nova Scotia. For comparison purposes, the analysis also includes the populations of the respective border states and Canadian provinces as a whole. Border communities are defined geographically by the administrative boundaries of U.S. counties and Canadian census divisions contained within or overlapping the study area. A detailed demographic analysis of the study area is in Section 7.10.

7.12.2.1 Minority Populations

The most recent USCB data (USDOC, 2000a) for minority populations available for all counties and states in the United States are part of the Decennial Census for the year 2000. Statistical data from this census have been used to characterize the minority populations within the New

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

England Region. Summary statistics for minority populations in the New England Region, their respective states, and the Nation are presented in Table 7.12.-1.

In general, minority populations are not present in the New England Region at higher levels than in either the respective states or the national population as a whole. Minority populations do not exceed four percent of the population in the border communities of any of the three states in the region or in the combined New England Region as whole.

The individual states of the New England Region are relatively homogeneous by population. Minority percentages for the border communities in each of the individual states and for the larger state populations are relatively consistent, differing by less than one percentage point across all jurisdictions and for the combined New England regional total. Populations of Asian, Native Hawaiian, Pacific Islander, and Others constitute the largest single minority identification in the New England Region, with one percent of the total population. Persons of Hispanic origin represent the second largest group, with 0.8 percent of the population.

**Table 7.12-1. Minority Statistics for the New England Region
(Percent of Population)**

Border State/Region*		White	Black or African American	American Indian and Alaska Native	Asian, Native Hawaiian, Pacific Islander, Other	More Than One Group	Hispanic Origin**
Maine	New England Region	96.9	0.5	0.6	0.9	1.1	0.7
	Statewide	97.0	0.5	0.6	0.9	1.1	0.7
New Hampshire	New England Region	97.1	0.4	0.3	1.0	1.2	0.8
	Statewide	96.0	0.7	0.2	1.9	1.2	1.6
Vermont	New England Region	96.6	0.5	0.5	1.1	1.3	0.8
	Statewide	96.7	0.5	0.4	1.0	1.3	0.9
New England Region Total	New England Region	96.9	0.5	0.5	1.0	1.2	0.8
	Selected States	96.5	0.6	0.4	1.3	1.2	1.1
Total United States		75.1	12.2	0.9	9.2	2.6	12.5

Source:(USDOC, 2000a).

*Statistics presented in the unshaded rows include only those portions of the states that lie within the study area; this includes all counties overlapping the area within 100 miles south of the border.

**Hispanic origin is an ethnicity that may include individuals who are also represented in other categories (such as White or Black). Therefore, Hispanic origin is a separate measure and is calculated separately from the other categories.

The minority populations north of the New England Region in Canada are represented by data from the 2006 Census of Canada (Table 7.12-2). Similar to the U.S. portion of the study area, border communities in the three provinces are relatively homogeneous. The minority segment of the border communities represents 9.2 percent of the total population, approximately 7 percent smaller than the minority component of the national population. There are no segments of the study area north of the New England Region, or of the three provinces containing the study area, in which the minority component of the population exceeds ten percent.

The “Other Visible Minority” classification (including multiple ethnicities) constitutes the largest single minority category in the study area north of the New England Region in Canada. This category consists primarily of the following groups: Chinese, South Asian, Arab, West Asian, Filipino, Southeast Asian, Latin American, Japanese, and Korean. However, with the exception of Quebec, Aboriginal Peoples constitute the largest single identifiable minority within the study area. The percentage of the population represented by Aboriginal Peoples in the study area does not exceed 7 percent in any jurisdiction.

Table 7.12-2. Visible Minority Statistics North of the New England Region in Canada* (Percent of Population)

Border Province/Region**		Not a Visible Minority	Black	Other Visible Minority	Two or More Visible Minorities	Aboriginal Peoples***
New Brunswick	North of New England Region	97.8	0.7	1.4	0.1	2.6
	Province	98.1	0.6	1.2	0.1	2.5
Nova Scotia	North of New England Region	97.6	1.7	0.6	0.1	7.0
	Province	95.8	2.1	1.9	0.1	2.7
Quebec	North of New England Region	90.3	2.7	6.6	0.2	0.8
	Province	91.2	2.5	6.1	0.2	1.5
North of New England Region Total	North of New England Region	90.8	2.6	6.2	0.2	1.0
	Selected Provinces	92.2	2.3	5.3	0.1	1.7
Total Canada		83.8	2.5	13.3	0.4	3.8

Source:(StatCan, 2006a).

*Canada’s Employment Equity Act (2005) defines *visible minorities* as "persons, other than Aboriginal peoples, who are non-Caucasian in race or non-white in color."

**Statistics presented in the unshaded rows account only for those portions of the provinces that lie within the study area; this includes all census divisions overlapping the area within 100 miles north of the border.

***The “Other Visible Minority” population consists mainly of the following groups: Chinese, South Asian, Black, Arab, West Asian, Filipino, Southeast Asian, Latin American, Japanese, and Korean.

****Self-identification by Aboriginal Peoples does not preclude self-identification inclusion in one of the other categories. The “Aboriginal Peoples” column of this table is, therefore, not additive with the other columns.

7.12.2.2 Low-Income Populations

Data from the most recently completed USCB (USDOC, 2000b; USDOC, 2000c) were used to characterize low-income minority populations in the New England Region border-community study area. Median household income and poverty rates are in Table 7.12-3.

The median household income for the combined population of the border communities in the New England Region in 2000 is \$50,069. This is \$3,987 lower than the combined median for the three individual states that make up the New England Region and \$2,982 lower than the national median household income. For the individual states of Maine and Vermont, median income for the border communities is slightly higher than for the entire state population as a whole. In New Hampshire, the median household income of the border communities is substantially lower, by \$7,605, than the median for the state population as a whole.

Within the individual states of the region, the border communities of Maine and Vermont have poverty rates substantially the same as that for their respective state as a whole; however, poverty levels among the border communities of Maine were 0.1 percent higher than that for the state as a whole. In the State of New Hampshire, poverty levels for the border communities exceed the level for the state by 0.8 percent.

Table 7.12-3. Income and Poverty Statistics for the New England Region

Border State/Region*		Median Household Income** (\$US)	Percent of Population Below the Poverty Line
Maine	New England Region	47,503	11.0
	Statewide	47,046	10.9
New Hampshire	New England Region	54,887	7.3
	Statewide	62,492	6.5
Vermont	New England Region	52,338	9.4
	Statewide	51,614	9.4
New England Region Total	New England Region	50,069	9.9
	Selected States	54,056	8.9
Total United States		53,051	12.4

Source: (USDOC, 2000b; USDOC, 2000c).

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

*Statistics presented in the unshaded rows include only those portions of the states that lie within the study area; this includes all counties overlapping the area within 100 miles south of the border.

**Median household income is reported from the 2000 USCB in inflation-adjusted 2009 U.S. dollars.

Median household income and poverty levels for the border communities north of the New England Region in Canada are represented by data from the 2006 Census of Canada. Statistics for these communities and their respective provinces are in Table 7.12-4.

The median income for the combined population of the border communities in the three provinces is \$43,692. This is \$1,016 higher than the median for the total population of the three provinces as a whole, but \$5,701 lower than the national median. Within the individual provinces, the border communities of New Brunswick and Quebec have a higher median household income than their respective provincial populations. The median income for the border communities of Nova Scotia, \$36,138, is substantially lower than the median for the province as a whole.

Poverty levels for the border communities of Nova Scotia are equivalent to that for the provincial population as a whole. For border communities in New Brunswick and Quebec, the percent of low-income families is 0.3 percent higher than that for the population of their respective province.

Table 7.12-4. Income and Poverty Statistics North of the New England Region in Canada

Border Province/Region*		Median Household Income** (\$US)	Percent of Low-Income Economic Families***
New Brunswick	North of New England Region	42,435	10.7
	Province	41,620	10.4
Nova Scotia	North of New England Region	36,138	10.3
	Province	42,920	10.3
Quebec	North of New England Region	43,846	12.6
	Province	42,748	12.3
North of New England Region Total	North of New England Region	43,692	12.5
	Selected Provinces	42,676	11.9
Total Canada		49,393	11.6

Source:(StatCan, 2006b).

*Statistics presented in the unshaded rows include only those portions of the provinces that lie within the study area; this includes all census divisions overlapping the area within 100 miles north of the border.

**Median household income is reported from the 2006 Canadian Census in inflation-adjusted 2009 U.S. dollars.

***The Canadian Census reports statistics for “low-income” economic families. This threshold-based designation is comparable to the poverty statistics reported in the USCB. An *economic family* is a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common-law, or adoption. A couple may be of opposite or same sex. Foster children are included.

7.12.2.3 Population of Children under 18 Years of Age

The distribution of population by age for the U.S. border communities of the New England Region is in Table 7.12-5. For the border communities within individual states and for the states that make up the New England Region, the percentage of children under the age of 18 does not exceed the percentage in the national population.

**Table 7.12-5. Age Distribution in the New England Region
(Percent of Population)**

Border State/Region*		Under 18	18-24	25-34	35-44	45-54	55-64	65+
Maine	New England Region	23.7	8.3	12.4	16.8	15.1	9.6	14.2
	Statewide	23.6	8.2	12.3	16.8	15.1	9.7	14.4
New Hampshire	New England Region	23.5	8.4	11.6	16.8	15.4	9.8	14.5
	Statewide	25.0	8.3	12.9	18.0	14.9	8.9	12.0
Vermont	New England Region	24.3	9.7	12.4	16.8	15.3	9.2	12.3
	Statewide	24.2	9.4	12.2	16.8	15.4	9.3	12.7
New England Region Total	New England Region	23.8	8.6	12.2	16.8	15.2	9.5	13.8
	Selected States	24.3	8.5	12.5	17.2	15.1	9.3	13.1
Total United States		25.6	9.6	14.1	16.3	13.4	8.6	12.4

Source:(USDOC, 2000c).

*Statistics presented in the unshaded rows account only for those portions of the states that lie within the study area; this includes all counties overlapping the area within 100 miles south of the border.

The distribution of population by age for the border communities north of the New England Region in Canada is in Table 7.12-6. For the border communities in all three provinces of the region, children under 20 years of age represent 23.1 percent of the total population of the study area. This is comparable to the percentage of children in the combined population of the three provinces but slightly lower than the national percentage. For border communities in each of the individual provinces and for the population of the individual provinces as a whole, the percentage of children in the population does not exceed the national percentage.

**Table 7.12-6. Age Distribution North of the New England Region in Canada
(Percent of Population)**

Border Province/Region*		Under 20	20-24	25-34	35-44	45-54	55-64	65+
New Brunswick	North of New England Region	23.8	6.1	11.9	15.0	16.4	12.7	14.0
	Province	23.1	6.2	12.1	15.1	16.5	13.0	14.1
Nova Scotia	North of New England Region	22.2	5.0	9.7	14.6	16.1	14.8	17.6
	Province	23.0	6.2	11.6	15.1	16.4	13.2	14.5
Quebec	North of New England Region	23.1	6.4	13.0	15.1	16.4	12.6	13.4
	Province	23.2	6.3	12.9	15.0	16.5	12.7	13.5
North of New England Region Total	North of New England Region	23.1	6.3	12.9	15.0	16.4	12.7	13.5
	Selected Provinces	23.2	6.3	12.7	15.0	16.5	12.8	13.6
Total Canada		24.7	6.6	12.8	15.3	15.8	11.7	13.0

Source:(StatCan, 2006c).

*Statistics presented in the unshaded row account only for those portions of the province that lie within the study area; this includes all census divisions overlapping the area within 100 miles north of the border.

7.13 HUMAN HEALTH AND SAFETY

7.13.1 INTRODUCTION

Many of the routine activities conducted by CBP in the New England Region have the potential to affect human health and safety (HH&S). HH&S relates to the health and safety of the general public (including vehicle occupants), CBP and station employees, and maintenance personnel. Safety can also refer to safe operations of aircraft or other equipment. This section considers the potential adverse and beneficial impacts of CBP's alternative actions on HH&S.

7.13.2 AFFECTED ENVIRONMENT

Construction

HH&S concerns during construction and modernizing of facilities involve exposing workers to conditions that pose a health or safety risk. Construction site safety is largely a matter of adherence to regulatory requirements. These regulatory requirements are imposed for the benefit of employees and they implement operational practices that reduce risks of illness, injury, death, and property damage. The U.S. Occupational Safety and Health Administration (OSHA) issues standards that specify the amount and type of safety training and education required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits with respect to workplace stressors (29 CFR 1910). CBP applies and adheres to these standards in policy and practice.

Routine Operations

Trade and Travel Processing at POEs

The affected environment of agricultural inspections is the inspection location. Agricultural inspections are typically conducted onsite at POEs, but officers sometimes escort the shipment to the receiver site for inspection (USDHS, 2011). Inspections can also take place on the vessel or train transporting cargo into the United States. After inspection, many types of shipments are released to the appropriate agency.

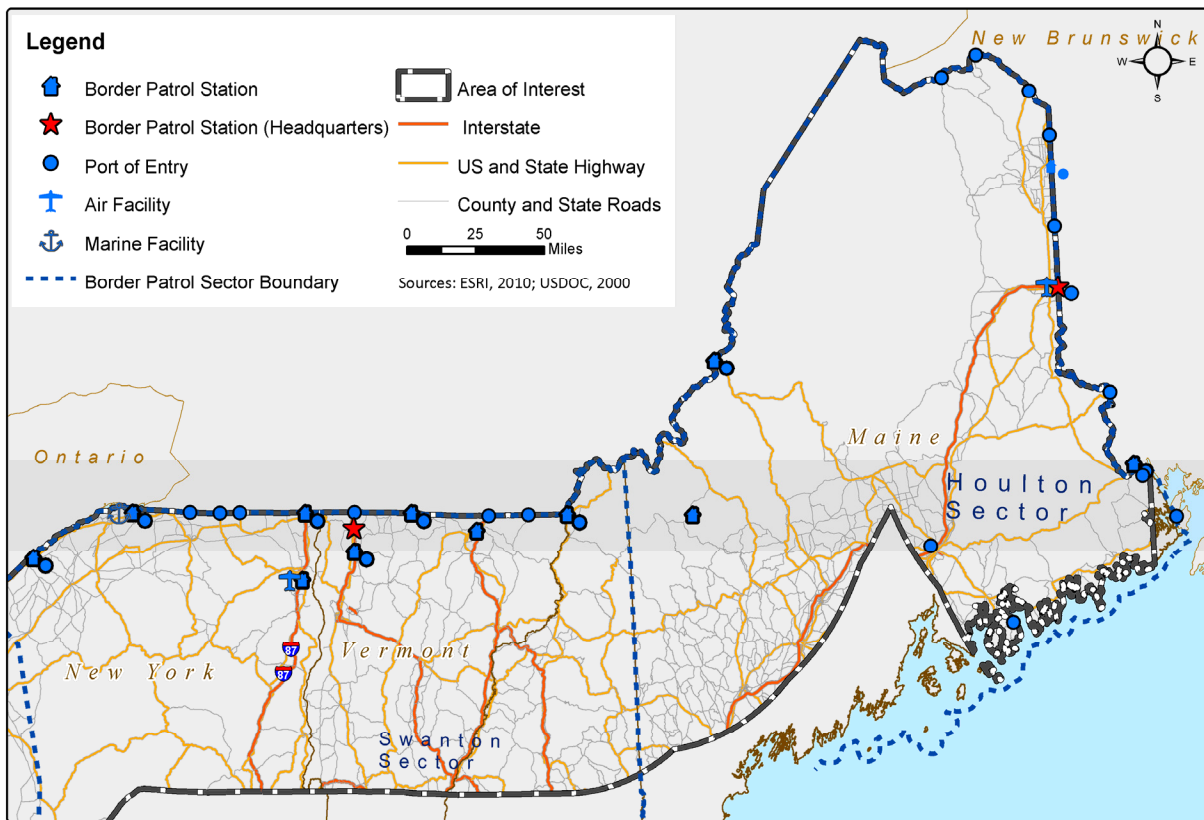
During these interceptions, HH&S effects are possible. Release of nonindigenous diseases into the United States would be harmful to HH&S. To prevent nonindigenous diseases from entering the United States, CBP places bans on certain animals, animal products, and other possible carriers of disease. In 2003, in Canada a positive case of bovine spongiform encephalopathy ("mad cow" disease) touched off an immediate ban on ruminant meat from Canada into the United States. That same year, there was an outbreak of monkey pox in the United States. This outbreak was linked to exotic animals being imported into the United States as pets. A ban was immediately imposed on certain live rodents from Africa, and agricultural specialists still enforce this ban (USDHS, 2004a). Preventing nonindigenous diseases from entering the United States has a beneficial effect on HH&S because it limits the outbreak of disease

Ground Surveillance and Situational Response Activities

Motorized and Nonmotorized Patrols

Motorized patrols take place on Federal, state, county, and local municipalities’ paved roads. Figure 7.13-1 shows U.S. national, state, and county roads that USBP agents can use for motorized patrolling in the New England Region. In rural areas along the border, USBP agents also use dirt roads for motorized and nonmotorized patrols. Dirt roads along the border region were built to be 24-feet wide, but due to vegetation growth the roads are now typically less than 10-feet wide (USDHS, 2011). USBP agents also use other Federal agencies’ roads, including roads in national forests and national parks. When possible, the USBP agents remain on existing roads to apprehend cross-border violators but when required they go off road. Off-road vehicles and nonmotorized patrols take place off-road and in remote areas along the border.

Figure 7.13-1. U.S., State, and County Roads in the New England Region



Aircraft Operations

Manned aerial surveillance patrols are operated between 300 feet above ground level (AGL) and flight level (FL) 250. Aircraft patrols are operated at different heights based on different operational and environmental conditions including weather conditions and high traffic environments.

Manned aerial surveillance patrols are conducted along the New England border. The Swanton and Houlton Air and Marine branches possess different equipment and resources for aerial patrols. In order to fly for CBP, OAM agents must have a Federal Aviation Administration

(FAA)-issued license (USDHS, 2010a). Accidents during manned aerial surveillance patrols could potentially injure OAM officers or members of the general public.

Unmanned Aircraft Systems (UAS) are remotely piloted aircrafts, and patrols can occur along the New England Region. UASs are operated at 18,000 feet AGL or higher.

The FAA sets the constraints for where a UAS may operate and how these operations may be conducted safely in the National Airspace System (NAS). Their main focus when evaluating UAS operations in the NAS is to make sure a UAS will not endanger other users of the NAS or compromise the safety of persons or property on the ground.

The FAA recognizes the great potential of UASs in homeland security and strives to accommodate the DHS's needs for UAS operations, without jeopardizing safety. Because airspace is a finite resource, the FAA sets aside Restricted or Prohibited Areas to help mitigate risks. These Restricted or Prohibited Areas are for an operator's exclusive use when needed.

For CBP's UASs to gain access to the civil airspace, CBP must go through the FAA's Certificate of Waiver or Authorization (COA) process. This is the avenue by which public users (Government agencies and Federal, state, and local law enforcement) that wish to fly a UAS can gain access to the NAS, provided that the risks of flying the UAS in the civil airspace can be appropriately mitigated.

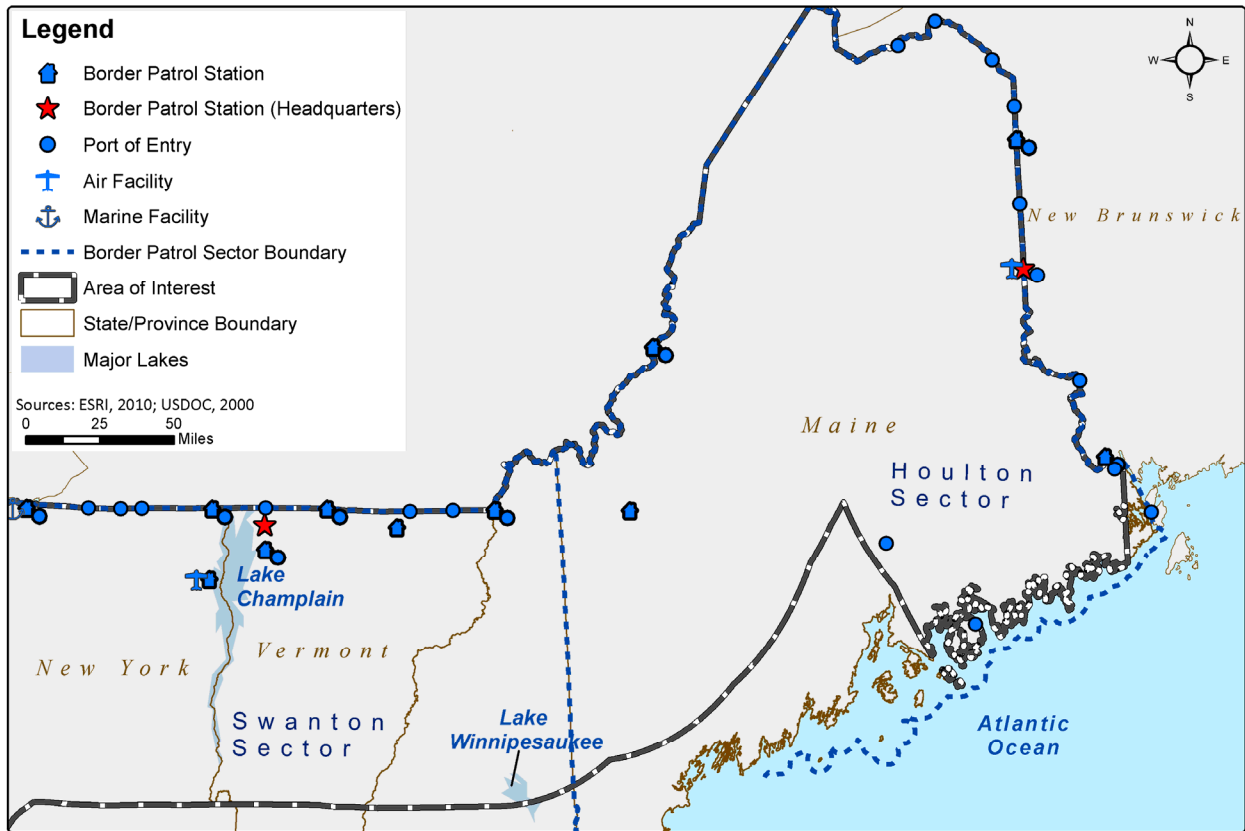
To minimize the risk of operating a UAS, the FAA frequently requires risk mitigations before granting a COA. These mitigations include special provisions unique to the requested type of operation. For example, the applicant may be restricted to operating only in a defined airspace or operating only during certain times of the day. The UAS may be required to have a transponder if it is to be flown in a certain type of airspace. Other safety enhancements may be required, depending on the nature of the proposed operation. To ensure safety, the COA application is reviewed for feasibility; airspace experts review and ensure that the operation will not severely impact the efficiency of the NAS. As of April, 2011, CBP has been issued 12 COAs.

Given that there are emergency and disaster situations where the use of UASs has saved lives and otherwise mitigated emergency situations, the FAA has issued three special disaster COAs, one of which was to CBP (Kalinowski & Allen, 2010).

Vessel Operations

There are approximately 563 square miles of navigable waterways in this region (ESRI, 2010), with patrolling occurring mainly on Lake Champlain. Figure 7.13-2 shows the navigable water in this region. To assist in river or lake patrols, OAM provides the USBP agents in this region with a range of watercrafts (USDHS, 2011). Accidents during patrols could take place between CBP, cross-border violators, and the general public.

Figure 7.13-2. Navigable Water in the New England Region



Radiation

CBP uses X-rays and gamma rays to inspect merchandise and conveyances, eliminating the need for an intrusive manual search. These detection systems provide images of material enclosed in cars, trucks, railcars, sea containers, personal luggage, packages, parcels, and mail (USDHS, 2009a). Increasing the efficiency and the number of searches can have a beneficial effect on HH&S. Beneficial effects could result if the number of interdictions increases and the occurrence of intentional destructive acts (IDAs) decreases as a result of using X-ray and gamma rays. The affected environment includes the location of equipment that produces X-rays and gamma rays, as well as the area immediately surrounding the equipment.

X-rays and gamma rays have the potential to expose people to ionizing radiation. The Nuclear Regulatory Commission (NRC) sets regulations and establishes standards for protection against radiation arising from activities conducted under licenses it issues. CBP has adopted the NRC standard because OSHA addresses only

Exposure dose is the dose received by a member of the public from exposure to radiation and to radioactive material released by a licensee, or to another source of radiation either within a licensee’s controlled area or in unrestricted areas (USDHS, 2004b).

Occupational dose is the dose received by an individual in a restricted area or in the course of employment in which the individual’s assigned duties involve exposure to radiation and to radioactive material from licensed and unlicensed sources of radiation, whether in the possession of the licensee or other person. The individuals subject to the occupational dose classification must closely monitor their degree of radiation exposure using dosimeters (USDHS, 2004b).

occupational dose exposure limits. These requirements are set forth in 10 CFR Part 20 (USDHS, 2004b).

In 10 CFR Part 20, the NRC identifies two classifications of radiation dose: occupational dose and exposure dose (USDHS, 2004b). Neither of these doses includes background radiation, radiation patients receive from medical practices, radiation received from participation in medical research programs, or radiation received as a member of the general public.

As set by the NRC in 10 CFR Part 20, the maximum permissible level of radiation dose to individual members of the general public in unrestricted areas (i.e., exposure dose) is 0.1 rem per year above the typical 0.360 rem per year dose provided by natural and man-made background radiation.

As part of its “as low as is reasonably achievable” (ALARA) program, CBP has determined that the radiation dose received by its personnel shall not exceed the public dose (USDHS, 2004b).

In 10 CFR 20.1003, NRC defines the philosophy of ALARA in relation to exposure:

ALARA (acronym for “as low as is reasonably achievable”) means making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

Exposure to radiation can be harmful to HH&S. Because of the difficulties in determining if the health effects that are demonstrated at high radiation doses are also present at low doses, current radiation protection standards and practices are based on the premise that any radiation dose may result in detrimental health effects, such as cancer and hereditary genetic damage.

When discussing potential impacts caused by radiation exposure, it is important to relate how much exposure is anticipated. In an August 2004 revised position statement on radiation risk, the Health Physics Society recommended against the quantitative estimation of health risks below an individual dose of 0.5 rem in one year or a lifetime dose of 10 rem above that received from natural sources. Doses from natural background radiation in the United States average about 0.360 rem per year (HPS, 2004).

Radio Frequency

The radio frequency (RF) environment refers to the presence of electromagnetic (EM) radiation emitted by radio waves and microwaves on the human and biological environment. RF waves have a frequency or rate of oscillation within the range of approximately 3 Hertz (Hz) to 300 gigahertz (GHz). This energy can interact with matter (USDHS, 2008a).

Uncontrolled exposure occurs when the general public is exposed or when persons employed are not made fully aware of the potential for exposure or cannot exercise control over their exposure (USDHS, 2008a).

Controlled exposure occurs when a person is exposed to RF fields as part of their employment and the person has been made fully aware of the potential exposure and can exercise control over their exposure. (USDHS, 2008a).

OSHA regulates RF and EM emissions for employees under 29 CFR 1910. The Federal Communications Commission (FCC) is responsible for licensing frequencies and ensuring that the approved use does not interfere with television or radio broadcasts, or substantially affect the natural or human environment (USDHS, 2008a). The FCC has adopted a modified version of the American National Standards Institute (ANSI) guidelines and Institute of Electrical and Electronics Engineers (IEEE) standards to evaluate exposure due to RF transmitters licensed and authorized by the FCC. The FCC's guidelines also reflect the National Council of Radiation Protection and Measurements exposure guidelines.

The National Council of Radiation Protection and Measurements and ANSI/IEEE exposure criteria identify the same threshold level at which harmful biological effects may occur. The whole-human-body absorption of RF energy varies with the frequency of the RF signal. The most restrictive limits on exposure are in the frequency range from 30 to 300 megahertz where the human body absorbs RF energy most (USDHS, 2008a).

There are two tiers of exposure limits: occupational or "controlled," and general or "uncontrolled." In order for a transmitting facility or operation to be out of compliance with the FCC's RF guidelines in an area where levels exceed maximum permissible exposure (MPE) limits, it must first be accessible to the public. The MPE limits indicate levels above which people may not be safely exposed regardless of the location where those levels occur (USDHS, 2008a).

Adverse biological effects associated with RF energy are typically related to the heating of tissue by RF energy. This is typically referred to as a thermal effect, where the EM radiation emitted by an RF antenna passes through and rapidly heats biological tissue; similar to the way a microwave oven cooks food. According to the Health Physics Society, numerous studies have shown that environmental levels of RF energy routinely encountered by the general public are typically far below levels necessary to produce significant heating and increased body temperature; RF energy that would produce harmful heating is generally associated only with workplace environments near high-powered RF sources, such as those used for molding plastics or processing food products. In such cases, exposure of human beings to RF energy could exceed MPE and restrictive measures or actions would thus be required to ensure the public's safety (USDHS, 2008a).

There is also some concern that signals from some RF devices could interfere with pacemakers or other implanted medical devices; however, electromagnetic shielding has been incorporated into the design of modern pacemakers to prevent RF signals from interfering with the electronic circuitry in the pacemaker (USDHS, 2008a).

Because RF devices emit RF energy and EM radiation, adverse impacts could occur. The severity of these impacts depends on the equipment used and the elevation of the tower (USDHS, 2008a).

Beneficial impacts from RF devices could also occur. The use of RF could increase the frequency of interdictions along the northern border, improving the HH&S of the United States population.

Firing Ranges

HH&S can be affected by noise levels and exposure to lead from firing ranges on both indoor and outdoor ranges in this region. Humans become exposed to lead associated with shooting ranges through lead-contaminated soil. Another potential pathway is through inhalation of lead dust by shooters during firing when airflow on the firing line is blocked. Range workers may also be exposed to lead dust while performing routine maintenance operations, such as raking or cleaning out bullet traps. Each of these pathways is site specific and may or may not occur at individual ranges (USDA, 2010).

Figure 7.13-3. CBP Officers Train at Firing Range



Source: (USDHS, No Date).

OSHA sets regulations for protecting workers who handle or are exposed to lead, including airborne lead at indoor firing ranges (NSSF, 2001; 29 CFR 1910.1025). The OSHA standard for airborne lead exposure is 30 micrograms per cubic meter of air with an 8-hour time-weighted average (29 CFR 1910.1025).

Spent ammunition on ranges is not regulated as solid/hazardous waste unless it is discarded and left to accumulate for a long period of time. It is not regulated if it is recovered or reclaimed on a regular basis. If the range poses an imminent or substantial danger to human health or the environment, it can be addressed through the Resource Conservation and Recovery Act (RCRA).

USEPA regions also set guidelines and establish best management practices (BMPs) for building new ranges and for remediating outdoor ranges. These guidelines are in place to help minimize lead contamination in soil and water. HH&S would be adversely affected if CBP agents were exposed to lead on firing ranges or if the public's water supply was contaminated with lead (USEPA, 2003). The frequency and severity of response to lead exposure in humans depend on the amount of exposure. Symptoms include neurological, gastrointestinal, reproductive, and renal effects (NYDH, 2009).

In addition to lead exposure, the noise generated on firing ranges may have an adverse effect on the health of CBP agents. Exposure to harmful levels of noise over a long time period can damage sensitive structures in the ear, resulting in noise-induced hearing loss (NIDCD, 2008).

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

To protect employees from noises at harmful levels, OSHA sets noise standards and guidelines for the work environment. The OSHA noise exposure limit is set at a maximum permissible exposure limit of 90 decibels, A-weighted (dBA), averaged over an 8-hour time period (29 CFR 1910.95).

7.14 HAZARDOUS MATERIALS

7.14.1 INTRODUCTION

Hazardous or regulated materials (HRM) are materials that are capable of posing an unreasonable risk to health, safety, and prosperity. This definition is in accordance to that given in Department of Transportation (DOT) regulations. HRM can be classified into roughly three categories:

- Hazardous or regulated substances;
- Hazardous or regulated waste); and,
- Special hazards.

7.14.1.1 Hazardous Substances

Any substances that are considered severely harmful to human health or the environment may be classified as “hazardous.” Hazardous substances take many forms. Many are commonly used substances that are harmless in their normal uses but are quite dangerous when released. They are defined in terms of those substances either specifically designated as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as the Superfund Law, or those substances identified under other laws (USEPA, 2011a). A great deal is known about hazardous substances and their effects. This information helps responders act quickly and safely to reduce the risks from emergency situations (USEPA, 2011b).

7.14.1.2 Hazardous Waste

A hazardous waste is defined by the Resource Conservation and Recovery Act (RCRA) as a solid waste, or combination of solid wastes, that, because of its quantity; concentration; or physical, chemical, or infectious characteristics may:

- Cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or,
- Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Hazardous wastes fall into two categories: characteristic wastes and listed wastes. *Characteristic hazardous wastes* are materials that are known or tested to exhibit a hazardous trait such as ignitability (i.e., flammability), reactivity, corrosiveness, and toxicity. *Listed hazardous wastes* are materials specifically listed by USEPA or a state regulation as a hazardous waste. Hazardous wastes listed by the USEPA fall into two categories:

- Process wastes from general activities (F-listed) and from specific industrial processes (K-listed); and,
- Unused or off-specification chemicals, container residues, and spill cleanup residues of acute hazardous-waste chemicals (P-listed) and other chemicals (U-listed).

These wastes may be found in different physical states as gases, liquids, or solids. Furthermore, a waste is deemed hazardous if it cannot be disposed of by common means like other byproducts of our everyday lives. Depending on the physical state of the waste, treatment and solidification processes might be available. In other cases, however, there is not much that can be done to prevent harm (Leonard, 2009).

Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes; their associated regulatory requirements are specified in 40 CFR 273. Four types of waste are currently covered under the universal waste regulations: hazardous-waste batteries; hazardous-waste pesticides that are either recalled or collected in waste pesticide collection programs; hazardous-waste thermostats; and hazardous-waste lamps.

The RCRA regulates the management and disposal of hazardous waste. One common method of treatment is hazardous combustion, or incineration, which is used to destroy hazardous organic components and reduce the volume of waste (USEPA, 2009a).

7.14.1.3 Special Hazards and Otherwise Regulated Materials

Special hazards are those substances that might pose a risk to human health; they are addressed separately from other hazardous materials. Special hazards include asbestos-containing material, polychlorinated biphenyls (PCBs), and lead-based paint (LBP). The USEPA has the authority to regulate these special-hazard substances under the Toxic Substances Control Act 15 U.S.C. 53. The USEPA has established regulations regarding asbestos abatement and worker safety under 40 CFR 763, with additional regulation concerning emissions (40 CFR 61). Depending on the quantity or concentration, the disposal of LBP waste is potentially regulated by the RCRA at 40 CFR 260. The disposal of PCBs is addressed in 40 CFR Parts 750 and 761.

7.14.2 AFFECTED ENVIRONMENT

7.14.2.1 Hazardous Substances, Hazardous Wastes, Special Hazards, and Otherwise Regulated Materials

Due to the duplicative discussion of hazardous substances, hazardous wastes, special hazards and otherwise regulated materials, complete descriptions of the range of hazards are found in Section 3.14.

7.15 UTILITIES AND INFRASTRUCTURE

7.15.1 INTRODUCTION

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly man-made; generally, the more urban and developed an area, the more infrastructure it has (USDHS, 2008a). This section describes ranges of use for each utility resource based on recent CBP site-specific analyses of protection, relocation, construction, and operation of BPSs, and construction, modernization, and operation of POEs. This section then describes the utility resources of most CBP facilities: BPSs, POEs, forward operating bases (FOBs), traffic checkpoints, and communication towers.

7.15.2 AFFECTED ENVIRONMENT

7.15.2.1 Water Supply

Municipal water systems or rural lines, which supply CBP facilities such as the Rangeley, Maine BPS, have the capacity to pump up to 74,000 gallons of water per day from 500,000-gallon-capacity reservoirs, lakes, or systems of groundwater wells (USDHS, 2009k). A substantial reserve capacity remains in these lakes or reservoirs.

For sites with wells present, there are several ways in which water may be provided. Some sites utilize onsite wells by tapping a nearby water main. In more remote locations (where tapping a water main is not feasible), potable water is provided by an onsite well. Generally, wells are within 90 feet of the main building; water is pumped through an inline water filter system and stored in multiple storage tanks. When necessary (and possible), water is filtered, softened, distilled, or treated as required for potable uses. If there is no usable onsite well for potable water, the water may come from a leased, offsite well located several hundred yards away. In a few locations, well water is run through a chlorination or reverse osmosis system for non-drinking usage.

When onsite wells are rendered obsolete, as was the case at the Pittsburg, Morses Line, Pinnacle, and Easton POEs, CBP supplies drinking water in commercial water bottles. At large facilities the delivered potable water is stored in 5-gallon jugs and is sometimes used for cooking. For those few facilities where bottled water is delivered, on average between 50 and 60 gallons are used per month.

7.15.2.2 Electrical and Communications Utilities

Electrical power is provided to most CBP facilities by a commercial grid system. These local or regional utility cooperatives and distribution companies serve from 33,000 to 596,000 customers over a 3,000- to 11,000-square-mile area throughout the New England Region (USDHS, 2009l; USDHS, 2009k; EMEC, 2011). The Maine Public Service Company, the service provider for the Fort Fairfield POE, has a capacity of 154.3 MW (USDHS, 2009l). Central Maine Power, the service provider for the Rangeley POE, had a system peak demand of 1,619 MW in 2010 (CMP, 2011). Primary electrical service is provided by overhead transmission lines to the facilities, and secondary electrical service is provided from a pole-mounted transformer. Many of these facilities have an onsite emergency electric generator with a 275-, 500-, 1,000-, 2,000-, or 6,000-gallon diesel fuel tank (USDHS, 2003h; USDHS, 2003i; USDHS, 2003j).

At seasonal facilities in rural areas, electricity is provided by one or two smaller generators connected to the automatic transfer switches and building power system.

Monopole communication towers do not utilize more than 3,650 kilowatt (kW)-hours per month from commercial grid power (USDHS, 2008b). Primary power is provided to most monopole towers by the commercial power grid, but some in remote locations are powered by solar photovoltaic arrays with battery storage systems. Communication relay towers (CRTs) typically utilize a 17-kW generator. Remote video surveillance systems (RVSS) are connected to the commercial grid where available. If commercial power is not available, the towers are supplied by either a generator of up to 30-kW or a solar photovoltaic generator (USDHS, 2008b). If a commercial power grid is not immediately available when towers are deployed, primary power is supplied by a 30-kW generator with a propane-fueled motor supplied by a 2,000-gallon tank until the commercial power infrastructure is in place. Back-up power for each tower site is provided by a battery back-up system. All power lines are installed overhead from the main trunk power line to the tower site shelter and then on elevated cable trays to the tower if the primary power source is the commercial grid.

At facilities lacking communication towers, antennas are mounted on posts attached to the main building.

Most POEs are provided telephone service by a nearby telephone substation. Existing telephone lines run underground or overhead (or some combination of the two) and, when possible, follow a highway right-of-way. Most telephone lines consist of one or two T-1 lines and one to six dial tone lines. Where T-1 or fiber-optic service is not available, Internet service is accessed through telephone modems.

7.15.2.3 Fuel Supply

Propane, or natural gas, supplies fuel for heating, ventilation, and air conditioning (HVAC) systems. Fuel for emergency power generators can be propane or diesel that is stored in up to three 125-, 150-, 250-, or 500-gallon onsite tanks (USDHS, 2009m; USDHS, 2010a; USDHS, 2010d; USDHS, 2009n). Some, as is the case at the Morses Line POE in Vermont, have additional 330 gallon and 75-gallon fuel oil tanks associated with the boiler (USDHS, 2010d). Heat is generated by solar panels at the Pinnacle Road POE in Vermont, with fuel oil as a back-up. Some facilities are serviced by interconnections with commercial natural gas suppliers through underground natural gas pipelines.

Each tower that normally receives electric power from the commercial grid has a 500-gallon propane tank to fuel a back-up generator in case of power outages (USDHS, 2008b). Each 500-gallon fuel tank would be refueled every two months (USDHS, 2008b), assuming two hours of run time monthly for a generator maintenance check and other operations as needed. When commercial grid power is not immediately available upon tower deployment, primary power would be supplied temporarily by a 30-kW generator using a larger, 2,000-gallon propane tank. These larger propane tanks would be refueled approximately every seven days (USDHS, 2008b).

7.15.2.4 Wastewater Management

Urban CBP facilities such as the Rangeley and Fort Fairfield BPS are connected via municipal piping systems to wastewater treatment plants. The Fort Fairfield Wastewater Treatment Plant,

for example, treats an average of 400,000 gallons per day and serves approximately 800 accounts. It is a secondary system licensed for 600,000 gallons per day of average flow. From June to September, the plant has a monthly average biochemical oxygen demand and total suspended solids of 750 pounds per day; from September to June this average is 1,383 pounds per day (FF, 2010).

In rural locations like the Hamlin and Easton POEs in Maine, sanitary waste is disposed to onsite septic tanks. Types of septic tanks vary; some have a grinder pump, a lift station, or two venting pipes, but all are connected to the appropriate drainage mound and field or leach field. Solid waste is removed from sites by a cleaning contractor or a private disposal company. On average, septic tanks are pumped once every two years and are treated twice a year. However, those approaching capacity may need to be pumped as often as once every three months.

The state department of transportation or appropriate county-level department generally removes snow from state highways, and onsite snow removal service is contracted out to a janitor or maintenance company (USDHS, 2009d). At some POEs, facility staff uses a snow blower or tractor for snow removal (USDHS, 2009n).

7.16 ROADWAYS AND TRAFFIC

7.16.1 INTRODUCTION

The United States relies heavily on a vast transportation network to expedite the flow of goods and people to and from Canada. Providing efficient border crossing, while providing the highest level of security and safety for all motorists, is of utmost importance. Over the past decade, many land ports of entry (LPOEs) have been upgraded for highway safety, as well as technologically for ease of access. States and municipalities maintain the roadways leading to the borders to allow for tourism and trade in their areas. The following provides an overview of traffic and transportation regulations and describes the general traffic conditions for urban, suburban, rural, and remote areas.

7.16.2 AFFECTED ENVIRONMENT

7.16.2.1 Existing Roadway Network and Roadway Effectiveness

The majority of the roadways within 100 miles of the northern border within this region are secondary and tertiary paved roads, although there are some state highways throughout. Many of the areas in the New England Region are rural and remote, and some include travel destinations ranging from national parks and wilderness areas to major tourist attractions like the Maine coast.

The number of motor vehicles in the United States has been steadily increasing, with more than 254 million vehicles registered in 2009 (BTS 2012). Annual travel on U.S. roadways reached an over 2.9 trillion vehicle-miles, over three times the level reported in 1960. Travel grew about 47 percent during the 1960s, another 38 percent in the 1970s, and another 41 percent in the 1980s. Travel in urban areas in 2009 accounted for over 1.9 trillion vehicle-miles in 1996, or 66 percent of the total, compared to 44 percent in 1960 (BTS 2012a). On the rural interstate system, automobiles, light trucks, and buses account for 77 percent of average daily traffic volumes, with heavy trucks representing the remainder. Percent distribution of traffic for commercial and noncommercial vehicles in both rural and urban areas is shown in Table 7.16-1.

Table 7.16-1. Percent Distribution of Traffic by Vehicle Class, Total United States

Type of Roadway	Vehicles (%)	
	Noncommercial	Commercial
Rural		
Interstate	81.6	18.4
Other principal arterials	87.2	12.8
Minor arterial, collector and local	88.5	11.5
Rural average	86.6	13.4
Urban		
Interstate	88.2	11.8
Other freeways and expressways	90.5	9.5

Type of Roadway	Vehicles (%)	
	Noncommercial	Commercial
Other principal arterials	89.5	10.5
Minor arterials	90.4	9.6
Collectors	90.3	9.7
Local	91.0	9.0
Urban average	89.8	10.2

Source: USDOT, 1996.

7.16.2.1 Level of Service

Level of service (LOS) is a qualitative measure of the operating conditions of an intersection or other transportation facility. There are six levels of service (A through F) defined: LOS A represents the best operating conditions with no congestion, and LOS F is the worst with heavy congestion. Roadways and intersections with LOS E or F are those with traffic conditions at or above capacity. Traffic patterns are congested, unstable, and normally unacceptable to individuals attempting to access and use roadways and intersections with LOS E or F (TRB, 2000). LOS has been used to facilitate a general discussion of traffic conditions in urban, suburban, rural, and remote areas. This discussion of typical patterns for different types of roadway networks is not meant to substitute for local studies and analyses that may be required.

7.16.2.2 Variability

Traffic varies by month of the year, day of the week, and hour of the day. Often the capacity of the roadway system can be exceeded by the volume of traffic using it. This can cause breakdown flow (i.e., LOS E or F) and initiate effects that extend far beyond the time during which the demand exceeded capacity, and may take several hours to dissipate. Seasonal peaks in traffic demand are also of importance, particularly for recreational facilities.

Seasonal fluctuations in traffic demand reflect the social and economic activity of the area being served by the highway. These seasonal fluctuations typically exhibit several relevant characteristics:

- Monthly variations are more severe on rural routes than on urban routes;
- Monthly variations are more severe on rural routes serving primarily recreational traffic than on rural routes serving primarily business traffic; and,
- Daily traffic patterns vary by month of year most severely for recreational routes.

Traffic variations by day of the week are related to roadway type. Normally, weekend volumes are lower than weekday volumes for highways serving predominantly business travel, such as urban freeways. In comparison, peak traffic occurs on weekends on main rural and recreational highways. Furthermore, the magnitude of daily variation is highest for recreational access routes and lowest for urban commuter routes.

Typical hourly variation in traffic is related to highway type and day of the week. The typical morning and evening peak hours are evident for urban commuter routes on weekdays. The evening peak is generally somewhat more intense than the morning peak. On weekends, urban routes show a peak travel period that is less intense and more spread out, occurring in early to mid afternoon. Recreational routes also have single daily peaks. Saturday peaks on such routes tend to occur in the late morning or early afternoon (as travelers go to their recreational destination) and in late afternoon or early evening on Sundays (as they return home).

Traffic analysis focuses on the peak hour of traffic volume because it represents the most critical period for operations and has the highest capacity requirements. If the highest hourly volumes for a given location were listed in descending order, a large variation in the data would be observed, depending on the type of roadway.

7.16.2.3 Urban and Suburban Transportation Networks

Traffic in suburban areas is similar to that in urban areas; however, traffic delays are less of an issue unless traffic is being routed through residential areas. As with urban areas, there may be heavy traffic during rush hour, typically 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. Traffic congestion in suburban areas is normally confined to primary and secondary arterials, not residential areas. Public transportation is often provided, and traffic reports are available for updated roadway conditions.

The ability of urban streets to function well is generally limited by the capacity of signalized intersections, with traffic normally uninterrupted on roadway segments between intersections. Signal timing plays a major role in the capacity of urban streets, limiting the portion of time available for movement between intersections. Traffic conditions may vary greatly, and such factors as curb parking, transit buses, lane widths, upstream intersections, and other factors may substantially affect roadway conditions. In urban areas, LOS at critical intersections would typically be E or F during peak periods, and characterized by very unstable or forced traffic flow.

Urban streets show less variation than other areas. Most users are daily commuters or frequent users, and special event traffic is less common. Furthermore, many urban routes are filled to capacity during each peak hour, and variation is therefore severely constrained.

Traffic in suburban areas is similar to that in urban areas; however, traffic delays are less of an issue unless traffic is being routed through residential areas. As with urban areas, there may be heavy traffic during rush hour, typically 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. Traffic congestion in suburban areas is normally confined to primary and secondary arterials, not residential areas. Public transportation is often provided, and traffic reports are available for updated roadway conditions.

7.16.2.4 Rural and Remote Transportation Networks

In rural and remote areas, traffic is mainly affected by roadway conditions. Heavy traffic volumes are rare and normally only occur due to road closure and construction activities. Rural highways in the United States and Canada rarely operate at volumes approaching capacity. In addition, rural and recreational routes often show a wide variation in peak-hour volumes. Extremely high volumes occur on a few weekends or in other peak periods, and traffic during the rest of the year is substantially less, even during the peak hour. For example, highways serving

resorts and recreational areas may be virtually unused during much of the year, only to be subject to oversaturated conditions during peak summer periods.

Seasonal weather conditions are the primary cause of inefficient access on rural and remote roadways. Snow, flooding, and mudflows can make roads impassable; these events usually occur between October (when snow accumulations begin) and April (when melting snow and rains can cause flooding and mudslides). Local municipalities are prepared for maintenance of rural roadways, and residents often have alternate means of transportation, such as snowmobiles, ATVs, and horses. Remote areas, by definition, are sparsely populated, but the few residences within these areas normally have alternate transportation sources in case of emergencies. Television, radio, and NPS traffic reports are the primary sources of updates for rural and remote roadway conditions (USDOJ, 2010).

7.16.2.5 Federal and State Transportation Regulations

LPOEs across the regions are accessed by a number of highways that are maintained by each state's DOT or municipal highway authority. In remote areas where trails and gravel roadways are used, it is the maintaining agencies responsibility to inform the public of road and trail closures. In the United States, each state has its own regulations and governing agency, although most regulations are similar for the purpose of uniformity. In most states, the roadway design manual is based upon recommendations in the American Association of State Highway and Transportation Officials (AASHTO) Policy on Geometric Design of Highways and Streets, commonly referred to as the "Green Book." The Green Book is not a design manual but rather a series of recommended roadway design parameters (USDOT, 2010). In addition, many Federal departments have also adopted their own traffic code for enforcement on their respective reservations (e.g., national parks and military bases). A list of the state DOTs and regulatory agencies that plan and administer the roadway design regulations is provided in Appendix S.

7.16.2.6 CBP's Activities Affecting Roadways and Traffic

CBP's activities include enforcement of customs, immigration, and agriculture regulations at U.S. borders, and CBP has primary responsibility for preventing unlawful entry into the United States while ensuring the safe and efficient flow of goods and people. For the northern border within this region, these activities are focused around the LPOEs, but construction activities, the operation of other facilities, and patrol activities have some effects to transportation resources. A general description of these activities is provided in Chapter 2. This section outlines these activities from a transportation and traffic standpoint.

Land Ports of Entry

Many different roadways including interstates, U.S. highways, state highways, and rural roadways approach the LPOEs along the northern border within this region. These cross-border access points are often colocated with towns and cities adjacent to the border, and roadways facilitate traffic approaching and departing from the LPOEs.

Vehicles entering LPOEs from Canada proceed across the border and then separate into inspection lanes. Often inspections of commercial vehicles and passenger vehicles are conducted in separate areas. These are normally parking areas for vehicles that are selected for secondary inspection, with dedicated truck lanes to help facilitate flow of larger vehicles. At some of the

larger facilities, there are committed areas for secondary truck inspections that may involve offloading and detailed examination.

As with any other roadway, cross-border traffic varies by month, day of the week, and hour of the day. Seasonal fluctuations in traffic demand reflect the social and economic activity of the area being served by the facility. Canadian traffic reaches a peak in either July or August and ebbs to a low-point in February. Summer peaks are consistently 65 to 75 percent higher than winter lows (BPRI, 2010). Normally, weekend volumes are lower than weekday volumes for LPOEs serving predominantly business travel. Monthly variations are more severe on rural LPOEs than on urban entry points. Vehicle queues are common particularly at urban LPOEs and can last for several minutes to several hours in rare cases. In general, queue length, and wait times determine the overall LOS of a LPOE from a transportation and traffic standpoint. The busiest LPOEs in the New England Region are in Table 7.16-2. A complete list of LPOEs and their level of use by transportation mode is provided in Appendix S.

**Table 7.16-2. Busiest LPOEs for Passenger Vehicles
in the New England Region**

Rank	Port Name	Annual Personal Vehicles	Annual Personal Vehicle Passengers
6	ME: Calais	890,247	1,308,679
12	ME: Madawaska	570,182	912,286
13	VT: Derby Line	552,942	1,201,768
16	VT: Highgate Springs	477,134	1,083,739
19	ME: Houlton	295,055	666,488
22	ME: Van Buren	238,319	362,246
25	ME: Fort Kent	186,552	279,543
28	ME: Eastport	150,307	238,057
29	ME: Fort Fairfield	141,495	227,781
30	ME: Jackman	125,365	325,762
34	VT: Richford	95,909	211,868
37	VT: Beecher Falls	67,181	115,575

Source: USDOT, 2009.

At LPOEs in urban areas, special lanes are used for frequent travelers and commercial vehicles with Nexpress radio frequency units for fewer delays, buses are provided for public transportation, and pedestrian walkways provided for tourists. CBP and other non-government organizations provide real-time traffic information via the internet, twitter and mobile applications (USDHS, 2010). Other technologies used to improve the functionality of LPOE are described in Chapter 2.

Vacation travel and occasional same-day shopping trips are important travel purposes along most of the border. Several Canadian and U.S. near-border cities and towns are common consumer

destinations. Vacation and same-day recreational travel are less frequent and more seasonal than consumer trips in the paired-cities model. In addition, these types of travel are highly discretionary, easily influenced by exchange rates and economic conditions (BPRI, 2010).

All LPOEs facilitate pedestrians and cyclists. However, pedestrian and bicycle circulation is infrequent at most rural LPOEs because of their remote locations and distance from residential areas. Some LPOEs have provisions for bike storage. Many LPOEs have boat and seaplane landing areas.

Transportation Checkpoints

Traffic checkpoints are conducted on roads leading from the border and consist of inspections of interior-bound conveyances, including passenger vehicles (cars, trucks, vans, and buses) and container vehicles and cargo trucks. These checkpoints provide an opportunity to detect and interdict cross-border violators that have thus far avoided apprehension. Vehicle checkpoints are generally traffic lanes temporarily controlled by CBP. Checkpoints may include support buildings to provide temporary office and holding space, as well as lights, signage, and other support equipment.

Checkpoints are established at airports for commercial aircraft and at locations along railroad lines for passenger and freight trains.

Nonroad/Offroad Activities

Traffic surveillance operations offroad can include agents stationed at specific observation points or driving predetermined routes (line watch); detection of any disturbances in natural terrain that could indicate the passage of people, animals, or vehicles (sign cutting); and road patrols. All sectors use a variety of vehicles, including four-wheel drive vehicles, sedans, scope trucks, ATVs, motorcycles, snowmobiles, and bike patrols in urban areas or over rough terrain.

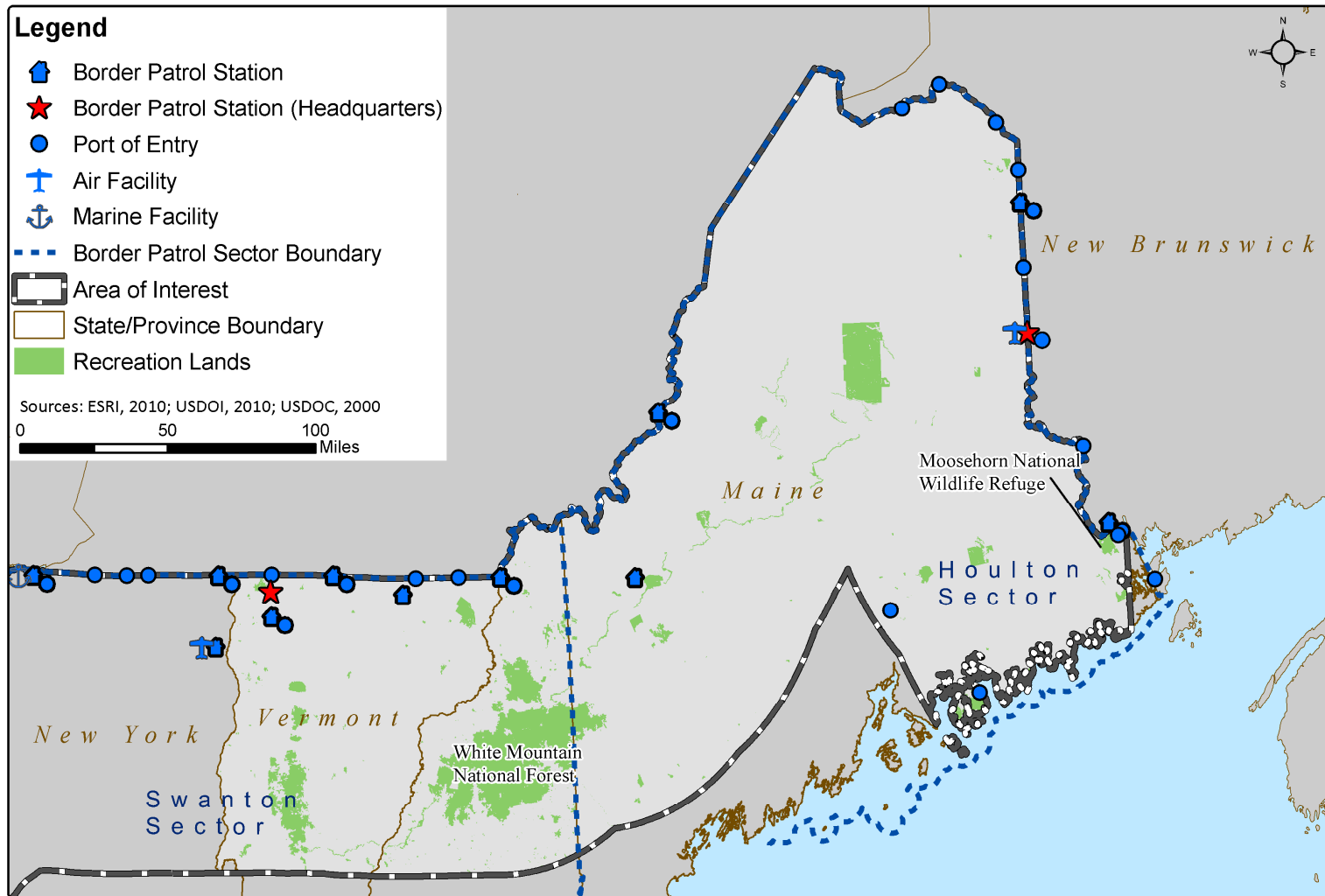
BPSs vary in size and typically include any or all of the following components: administrative and support buildings, vehicle maintenance garages, equine and canine facilities, vehicle wash facilities, fuel tanks, small arms practice ranges, undocumented alien processing and temporary holding facilities, confiscated vehicle storage facilities, and agent and visitor parking. CBP's agents use a variety of offroad transportation modes to patrol border areas. These consist of four-wheel drive vehicles, ATVs, snowmobiles, horses, and, in some sensitive habitats, agents operating on foot. As outlined in Chapter 2, CBP's activities that may affect transportation resources include UAS activities, Manned Aerial Surveillance Patrols, and other patrols.

7.17 RECREATION

7.17.1 INTRODUCTION

A wide variety of recreation areas exist along the northern border on both the U.S. and Canadian sides. On the U.S. side, recreational areas include national parks (NP), national recreation areas (NRA), national forests (NF), lakesides, national wildlife refuges (NWR), and designated wilderness areas. On the Canadian side, recreational areas include national park reserves, provincial parks, protected areas, and natural areas. U.S. recreation categories are described briefly below, since the designation bears on the nature of activities permitted. Figure 7.17-1 shows a map of federally protected recreation areas in the New England Region.

Figure 7.17-1. Federally Protected Recreation Areas, Including National Forests, Parks, Recreation Areas, and Wildlife Refuges in the New England Region



7.17.2 AFFECTED ENVIRONMENT

NPs, NFs, NWAs, NWR, and national recreation areas within the New England Region are profiled below by the impact category they most closely match. In addition to national protected areas, which are the primary focus of this analysis, many state and regional parks and protected areas along the northern border have recreation areas that could be impacted by activities along the border.

The New England Region has the fewest number of national recreation areas. One national forest sits in this area, the White Mountain National Forest, which is a medium-impact use area. The Moosehorn National Wildlife Refuge, a low-impact use area, is also in the region. Popular recreation activities include biking, hiking, skiing, hunting, fishing, and camping.

The following sections provide recreation profiles of U.S. national parks, national recreation areas, national forests, and national wildlife refuges. Appendix I contains profiles of Canadian protected areas.

7.17.2.1 Vermont/New Hampshire

Green Mountain National Forest

The Green Mountain National Forest (GMNF) is more than 400,000 acres in southwestern and central Vermont. Its setting combines rugged mountain peaks with quintessential Vermont villages and offers a variety of recreation choices for visitors. The Forest includes three nationally designated trails as well as 900 miles of multiple-use trails permitting hiking, cross country skiing, snowmobiling, horseback riding, and bicycling. The annual visitation estimate for forest visits is 2,656,000. Much of this area can be categorized as a medium-impact use area (USDA, 2009o).

White Mountain National Forest

The White Mountain NF sits in northern New Hampshire with a small amount of forest extending east into Maine. This national forest includes six Federal wilderness areas: Great Gulf Wilderness (approximately 5,552 acres), Presidential Range-Dry River (29,000 acres), Pemigewasset Wilderness (45,000 acres), Sandwich Range and Sandwich Range Extension Wilderness (25,000 and 10,800 acres), Caribou Speckled Mountain Wilderness (14,000 acres), and the Wild River Wilderness (23,700 acres). It also includes the Wildcat Brook Wild and Scenic River. Three cabins are available for rent, along with 23 developed campgrounds and three group campsites, accessible by car. Backcountry camping is also permitted. Several facilities (campgrounds, trails, etc.) are accessible for people in wheelchairs. Other recreational activities include biking, bird watching, hiking, climbing, fishing, hunting and trapping, geocaching, boating, swimming, skiing, and mountaineering. The annual visitation estimate for forest visits is 1,704,400. Much of this area can be categorized as a medium-impact use area (USDA, 2010k; USDA, 2009n).

Winter in the White Mountain National Forest



Source: USDA, 2010k.

7.17.2.2 Maine

Moosehorn National Wildlife Refuge

The Moosehorn NWR is on the upper northeast corner of Maine, on the Canadian border. The NWR covers 24,400 acres. In the park, over 50 miles of dirt roads and trails allow walking, biking, and skiing. There are also two observation decks. Regulated hunting and fishing are allowed in certain locations at certain times, but no camping or overnight parking, bicycling, or motorized vehicle use is permitted. Most of this area can be categorized as a low-impact use area(USDOJ, 2010k).

Moosehorn National Wildlife Refuge contains many scenic views



Source: USDOJ, 2010k.

Acadia National Park

Acadia NP is approximately 70 miles from the northern border in the lower eastern half of Maine. Visitors can access mountains, lakes and streams, wetlands, forests, meadows, and beaches along ocean within its 46,800 acres and sea level to 1530 feet range of elevations.

Animal and plant wildlife in the park inhabit a variety of ecosystems and zones ranging from sub-alpine to intertidal. Recreation opportunities include walking and hiking through forests and up mountains on 125 miles of historic trails (with or without rangers), ranger-led boat cruises, bike or horse-drawn carriage tours, and visiting historic features such as the Bass Harbor Head Lighthouse. (USDOl, 2012)

Saint Croix International Historic Site

The historic site looks onto Saint Croix Island which is the location of one of the earliest European settlements in North America. It promotes a quiet and reflective atmosphere of respect for the heroism and suffering of the French colonists in 1604–05. The interpretive trail at the mainland site features bronze figures of the French settlers and Passamaquoddy people, as well as wayside exhibits that discuss historical events and the interaction of the two cultures. A model of the 1604 French settlement sits under a shelter overlooking the island. From mid-June through mid-September, there are participatory talks about the history of the settlement led by park rangers. (USDOl, 2012)

Final

Programmatic Environmental Impact Statement For Northern Border Activities

Section 8: Environmental Consequences



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CONTENTS

8 Environmental Consequences 1

8.1 Introduction 1

8.2 Environmental Consequences to Air Quality 4

8.2.1 No Action Alternative 5

8.2.2 Facilities Development and Improvement Alternative 7

8.2.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative 11

8.2.4 Tactical Security Infrastructure Deployment Alternative 15

8.2.5 Flexible Direction Alternative 16

8.2.6 Best Management, Minimization, and Mitigation 19

8.2.7 Summary of Potential Impacts 20

8.3 Environmental Consequences to Biological Resources 22

8.3.1 No Action Alternative 24

8.3.2 Facilities Development and Improvement Alternative 33

8.3.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative 37

8.3.4 Tactical Security Infrastructure Deployment Alternative 38

8.3.5 Flexible Direction Alternative 42

8.3.6 Best Management, Minimization, and Mitigation 42

8.3.7 Summary of Potential Biological Resources Impacts 48

8.4 Environmental Consequences to Geology and Soils 51

8.4.1 No Action Alternative 51

8.4.2 Facilities Development and Improvement Alternative 55

8.4.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative 56

8.4.4 Tactical Security Infrastructure Deployment Alternative 57

8.4.5 Flexible Direction Alternative 58

8.4.6 Best Management, Minimization, and Mitigation 58

8.4.7 Summary of Potential Geology, Topography, and Soils Impacts 59

8.5 Environmental Consequences to Water Resources 62

8.5.1 No Action Alternative 63

8.5.2 Facilities Development and Improvement Alternative 68

8.5.3 Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative 70

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

8.5.4	Tactical Security Infrastructure Deployment Alternative.....	71
8.5.5	Flexible Direction Alternative	72
8.5.6	Best Management, Minimization, and Mitigation	74
8.5.7	Summary of Potential Water Resources Impacts.....	76
8.6	Environmental Consequences of Noise.....	79
8.6.1	No Action Alternative.....	79
8.6.2	Facilities Development and Improvement Alternative.....	79
8.6.3	Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative.....	83
8.6.4	Tactical Security Infrastructure Deployment Alternative.....	91
8.6.5	Flexible Direction Alternative	91
8.6.6	Best Management, Minimization, and Mitigation	93
8.6.7	Summary of Potential Noise Impacts	93
8.7	Environmental Consequences for Climate and Resource Sustainability	96
8.7.1	No Action Alternative.....	96
8.7.2	Facilities Development and Improvement Alternative.....	99
8.7.3	Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative.....	101
8.7.4	Tactical Security Infrastructure Deployment Alternative.....	102
8.7.5	Flexible Direction Alternative	102
8.7.6	Best Management, Minimization, and Mitigation	103
8.7.7	Summary of Potential Impacts.....	106
8.8	Environmental Consequences to Land Use.....	108
8.8.1	No Action Alternative.....	109
8.8.2	Facilities Development and Improvement Alternative.....	114
8.8.3	Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative.....	114
8.8.4	Tactical Security Infrastructure Expansion Alternative.....	115
8.8.5	Flexible Direction Alternative	116
8.8.6	Best Management, Minimization, and Mitigation	116
8.8.7	Summary of Potential Impacts.....	117
8.9	Environmental Consequences to Aesthetic and Visual Resources	120
8.9.1	No Action Alternative.....	123
8.9.2	Facilities Development and Improvement Alternative.....	133

8.9.3	Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative.....	134
8.9.4	Tactical Security Infrastructure Deployment Alternative.....	135
8.9.5	Flexible Direction Alternative	135
8.9.6	Best Management, Minimization, and Mitigation	136
8.9.7	Summary of Potential Impacts.....	138
8.10	Environmental Consequences to Socioeconomic Resources	140
8.10.1	No Action Alternative.....	153
8.10.2	Facilities Development and Improvement Alternative.....	158
8.10.3	Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative.....	159
8.10.4	Tactical Security Infrastructure Deployment Alternative.....	159
8.10.5	Flexible Direction Alternative	160
8.10.6	Best Management, minimization, and Mitigation.....	161
8.10.7	Summary of Potential Socioeconomic Impacts	162
8.11	Environmental Consequences To Cultural and Paleontological Resources.....	165
8.11.1	No Action Alternative.....	166
8.11.2	Facilities Development and Improvement Alternative.....	166
8.11.3	Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative.....	167
8.11.4	Tactical Security InfrastructureDeployment Alternative.....	167
8.11.5	Flexible Direction Alternative	168
8.11.6	Best Management, Minimization, and Mitigation	168
8.11.7	Summary of Potential Impacts on Cultural and Paleontological Resources.....	168
8.12	Environmental Consequences to Environmental Justice and the Protection of Children 173	
8.12.1	No Action Alternative.....	176
8.12.2	Facilities Development and Improvement Alternative.....	178
8.12.3	Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative.....	180
8.12.4	Tactical Security Infrastructure Deployment Alternative.....	181
8.12.5	Flexible Direction Alternative	182
8.12.6	Best Management, Minimization, and Mitigation	184
8.12.7	Summary of Potential Impacts.....	185
8.13	Environmental Consequences to Human Health and Safety	188
8.13.1	No Action Alternative.....	189

8.13.2	Facilities Development and Improvement Alternative.....	205
8.13.3	Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative.....	206
8.13.4	Tactical Security Infrastructure Deployment Alternative.....	207
8.13.5	Flexible Direction Alternative	208
8.13.6	Best Management, Minimization, and Mitigation	210
8.13.7	Summary of Potential Impacts.....	211
8.14	Environmental Consequences of Hazardous Materials.....	214
8.14.1	No Action Alternative.....	214
8.14.2	Facilities Development and Improvement Alternative.....	220
8.14.3	Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative.....	222
8.14.4	Tactical Security Infrastructure Deployment Alternative.....	223
8.14.5	Flexible Direction Alternative	224
8.14.6	Best Management, Minimization, and Mitigation	224
8.14.7	Summary of Potential Impacts.....	225
8.15	Environmental Consequences to Utilities and Infrastructure.....	229
8.15.1	No Action Alternative.....	230
8.15.2	Facilities Development and Improvement Alternative.....	234
8.15.3	Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative.....	236
8.15.4	Tactical Security Infrastructure Deployment Alternative.....	237
8.15.5	Flexible Direction Alternative	237
8.15.6	Best Management, Minimization, and Mitigation	238
8.15.7	Summary of Potential Impacts.....	239
8.16	Environmental Consequences to Roadways and Traffic Resources	241
8.16.1	No Action Alternative.....	242
8.16.2	Facilities Development and Improvement Alternative.....	242
8.16.3	Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative.....	243
8.16.4	Tactical Security Infrastructure Deployment Alternative.....	246
8.16.5	Flexible Direction Alternative	246
8.16.6	Best Management, Minimization, and Mitigation	247
8.16.7	Summary of Potential Impacts.....	247
8.17	Environmental Consequences to Recreation Resources.....	250

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

8.17.1 No Action Alternative..... 251

8.17.2 Facilities Development and Improvement Alternative..... 261

8.17.3 Detection, Inspection, Surveillance, and Communications Technology Expansion
Alternative..... 262

8.17.4 Tactical Security Infrastructure Deployment Alternative..... 263

8.17.5 Flexible Direction Alternative 264

8.17.6 Best Management, Minimization, and Mitigation 265

8.17.7 Summary of Potential Impacts..... 265

8.18 Cumulative Impacts..... 269

8.18.1 Introduction..... 269

8.18.2 Air Quality 269

8.18.3 Biological Resources 270

8.18.4 Geology and Soils..... 271

8.18.5 Water Resources 272

8.18.6 Noise..... 273

8.18.7 Climate and Resource Sustainability 274

8.18.8 Land Use 275

8.18.9 Aesthetics..... 276

8.18.10 Socioeconomics 277

8.18.11 Cultural and Paleontological Resources 278

8.18.12 Environmental Justice and the Protection of Children 279

8.18.13 Human Health and Safety 280

8.18.14 Hazardous Materials 283

8.18.15 Utilities and Infrastructure 283

8.18.16 Roadways and Traffic 287

8.18.17 Recreation 288

TABLES

Table 8.1-1. Summary of Potential Environmental Impacts across the Northern Border as a Whole by Alternative.....	2
Table 8.2-1. Applicability Thresholds for Nonattainment Areas (NAAs).....	5
Table 8.2-2. Baseline Emissions from CBP Activities.....	6
Table 8.2-3. Net Emissions from the Facilities Development and Improvement Alternative.....	9
Table 8.2-4. Air Permitting Review for a Constructed or Modified Facility.....	10
Table 8.2-5. Net Emissions from the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative.....	12
Table 8.2-6. Net Emissions from the Tactical Security Infrastructure Deployment Alternative.....	15
Table 8.2-7. Net Emissions from the Flexible Direction Alternative.....	17
Table 8.2-8. Summary of Potential Air Quality Impacts.....	20
Table 8.3-1. Summary of Potential Biological Resources Impacts.....	48
Table 8.4-1. Summary of Potential Geology, Topography, and Soils Impacts.....	59
Table 8.5-1. Registered ATVs by State.....	65
Table 8.5-2. Registered Snowmobiles by State.....	67
Table 8.5-3. Summary of Potential Water Resources Impacts.....	76
Table 8.6-1. Noise Levels Associated with Outdoor Construction.....	80
Table 8.6-2. Estimated Noise Levels for CBP Helicopters.....	81
Table 8.6-3. Noise Levels for Patrol Activities under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative.....	85
Table 8.6-4. Noise Levels Directly Below Flight Track of Cessna Citation.....	87
Table 8.6-5. Noise Levels Directly Below Flight Track of a UH-60 Helicopter.....	87
Table 8.6-6. Maximum Noise Levels of the Predator UAS Compared to Other Noise Sources.....	88
Table 8.6-7. Noise Levels for Vessel Activities for Each Alternative.....	89
Table 8.6-8. Summary of Potential Noise Impacts.....	93
Table 8.7-1. Summary of Potential Climate and Resource Sustainability Impacts.....	106
Table 8.8-1. Summary of Potential Land Use Impacts.....	117
Table 8.9-1. Summary of Potential Visual and Aesthetic Resources Impacts.....	138
Table 8.10-1. Major Categories of Socioeconomic Impact Associated with CBP’s Activities.....	141
Table 8.10-2. Estimated Value of Wait Time per Person-Hour in 2009 dollars.....	148
Table 8.10-3. Summary of Potential Socioeconomic Impacts.....	162
Table 8.11-1. Summary of Potential Impacts on Cultural and Paleontological Resources.....	169
Table 8.12-1. Summary of Potential Environmental-Justice Impacts from All CBP Alternatives.....	185
Table 8.13-1. Body Dose Threshold Data.....	202
Table 8.13-2. Summary of Potential Human Health & Safety Impacts.....	211
Table 8.14-1. Summary of Potential Impacts of Hazardous and Otherwise Regulated Materials.....	225
Table 8.15-1. Summary of Potential Utility Impacts.....	239
Table 8.16-1. Summary of Potential Impacts to Transportation Resources.....	248
Table 8.17-1. Registered All-Terrain Vehicles by State, 2009.....	255
Table 8.17-2. Registered Snowmobiles per State, 2009.....	256
Table 8.17-3. Recreational Vessel Registration by State (2009).....	259

Table 8.17-4. Summary of Potential Recreation Impacts 266

8 ENVIRONMENTAL CONSEQUENCES

8.1 INTRODUCTION

U.S. Customs and Border Protection (CBP) prepared this Programmatic Environmental Impact Statement (PEIS) to address the potential impacts from proposed enhancements to the combination of security resources it employs to respond to existing and evolving cross-border threats. CBP would seek to modify its deployment of facilities, technologies, and land-based security infrastructure as necessary to enable its agents, officers, specialists, and supporting personnel to pursue effective control of air, land, and sea borders between the United States and Canada. The time span considered for the proposed action and program alternatives is the next five to seven years.

The discussion of affected environment within this PEIS is organized by four regions in four previous chapters: West of the Rockies (WOR) (Chapter 4); East of the Rockies (EOR) (Chapter 5); Great Lakes (Chapter 6); and New England (Chapter 7). This structure was intended to allow impact analysis to focus on important issues within more ecologically similar border environments. For example, maritime issues are important in portions of the WOR and New England Regions, preeminent in the Great Lakes Region, and virtually absent in the EOR Region. Similarly, issues relating to forest ecosystems are of great importance in the New England, Great Lakes, and WOR Regions, while issues relating to grassland ecosystems predominate in the EOR Region.

However, in another respect the northern border and the 100-mile study area south of the northern border are one contiguous entity with a number of common elements. CBP's proposed program alternatives largely standardize the type and intensity of activities across the four regions of the northern border. The operating presumption is that threats could emerge anywhere along the border. Therefore, standardizing the number and type of activities proposed within each region provides flexibility to respond to future threats with the optimal mix of resources wherever needed along the border. The development, maintenance, and operation of ports of entry (POEs), Border Patrol stations (BPSs), forward operating bases (FOBs), and other supporting facilities and roads would largely be planned and executed in accordance with similar design standards and best management practices regardless of the region. Many of the actions and operational activities analyzed in this PEIS would occur in previously disturbed or developed lands, including urbanizing areas. None of the activities currently in place or projected in the listed alternatives are anticipated to result in excess development of previously undisturbed properties or building activity in excess of 50 acres. However, site-specific considerations would dictate particular distinctions and impacts that cannot be effectively detailed in this document due to the large variety of site-specific conditions and the lack of current knowledge of where CBP will need to execute specific future projects.

This chapter presents a program-level discussion of environmental impacts likely to occur if CBP implemented any of its proposed program alternatives. Chapter 3 provides the context for making impact determinations and Chapters 4 through 7 discuss the affected environment for the four regions covered by this PEIS. This chapter addresses area-wide consequences and individual activity impact considerations to provide context for future project and site-specific analysis. The discussion of impacts includes direct, indirect, and cumulative effects associated

with CBP activities. In many cases, the description and determination of the level of impacts to resource areas is the same regardless of region. However, where CBP’s decisions at the programmatic level are better informed about potential or ongoing impacts to a particular region or resource, the environmental effects discussion will provide greater detail.

The following sections present an analysis of the environmental and socioeconomic impacts that would likely result if any of the proposed program alternatives were implemented. The analysis is divided into the sixteen resource areas outlined in Chapter 3. For each of the resource areas, the analysis discusses general impacts that would occur anywhere along the entire northern border. Where appropriate, this chapter provides region-specific environmental impacts based on discussion of affected environments found in Chapters 4 through 7. These overall impact determinations are further summarized by alternative in Table 8.1-1.

Table 8.1-1. Summary of Potential Environmental Impacts across the Northern Border as a Whole by Alternative

Resource Area	Alternatives				
	No Action	Facilities Development and Improvement	Detection, Inspection, Surveillance, and Communications Technology Expansion	Tactical Security Infrastructure Deployment	Flexible Direction
Air quality	Minor	Minor	Minor	Minor	Minor
Biological resources	Minor, Moderate	Minor, Moderate	Minor, Moderate	Minor, Moderate	Minor, Moderate
Geology, topography, and soils	Negligible, Minor, Moderate	Minor, Moderate	Minor, Moderate	Minor, Moderate	Minor, Moderate
Water resources	Minor	Minor	Minor	Minor	Minor
Noise	Minor	Minor, Moderate	Minor	Minor	Minor, Moderate
Climate change	Beneficial, Negligible, Minor	Beneficial, Minor	Beneficial, Minor	Beneficial, Minor	Beneficial, Minor
Land use	Moderate	Moderate	Moderate	Moderate	Moderate
Aesthetic and visual resources	Minor	Minor, Moderate	Minor, Moderate	Minor, Moderate	Minor, Moderate
Socioeconomic resources	Moderate	Moderate	Moderate	Moderate	Moderate
Cultural, historic, archaeological, and paleontological resources	Beneficial, Minor, Moderate, Major	Beneficial, Minor, Moderate, Major	Beneficial, Minor, Moderate, Major	Beneficial, Minor, Moderate, Major	Beneficial, Minor, Moderate, Major

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Resource Area	Alternatives				
	No Action	Facilities Development and Improvement	Detection, Inspection, Surveillance, and Communications Technology Expansion	Tactical Security Infrastructure Deployment	Flexible Direction
Environmental justice and protection of children	Negligible, Minor	Negligible, Minor	Minor	Negligible, Minor	Minor
Human health and safety	Beneficial, Minor, Moderate	Beneficial, Minor, Moderate	Beneficial, Minor, Moderate	Beneficial, Minor, Moderate	Beneficial, Minor, Moderate
Hazardous materials	Beneficial, Minor	Negligible, Minor	Negligible, Minor	Negligible, Minor	Negligible, Minor
Utilities and infrastructure	Negligible	Negligible	Negligible	Negligible	Negligible
Roadways and traffic	Minor, Major	Minor, Major	Minor, Major	Minor, Major	Minor, Major
Recreation	Negligible, Minor	Minor, Moderate	Minor, Moderate	Minor, Moderate	Moderate

8.2 ENVIRONMENTAL CONSEQUENCES TO AIR QUALITY

This section considers the potential adverse and beneficial impacts of CBP's alternative actions on air quality. Effects would be considered minor unless the activity would exceed the applicability threshold for a nonattainment area or contribute to a violation of any Federal, state, or local air regulation.

The entire northern border study area contains many air quality control regions (AQCR) and Class I areas that could experience impacts due to implementation of any of the proposed alternatives. For descriptions of the regional affected environments for air quality see Sections 4.2.2 (WOR Region), 5.2.2 (EOR Region), 6.2.2 (Great Lakes Region), and 7.2.2 (New England Region). All of the alternatives would have short- and long-term, minor, adverse effects to air quality. These effects would be primarily due to emissions from construction activities; the routine operation of POEs, BPSs, and FOBs; and U.S. Border Patrol (USBP) activities using marine vessels, all-terrain vehicles (ATVs), and snowmobiles. All new sources of air emissions would be located within 100 miles of the northern border and, in general, would not generate emissions above de minimis thresholds or contribute to a violation of any Federal, state, or local air regulation.

The mere presence of a sensitive area such as a nonattainment, maintenance, or Class I area does not guarantee that it would be impacted by CBP's activities. Effects would be considered minor unless they exceeded the applicability threshold for a Clean Air Act (CAA) nonattainment area or contributed to a violation of any Federal, state, or local air regulation. While there are scattered areas of air quality nonattainment in Montana, Idaho, and in urban areas of the Great Lakes and New England Regions, air quality over the majority of the northern border is in attainment with the relevant air quality standards. All CBP actions would conform to each State Implementation Plan (SIP). Several CBP activities that do not generate any direct or indirect emissions for which CBP maintains an ongoing program of control would have either no effect or a beneficial effect on air quality, and have not been carried forward for detailed analysis. These activities include nonmotorized ground operations, operation of nonintrusive inspection (NII) systems, and operation of sensor and other technologies. In addition, some of the activities analyzed may have minor beneficial effects in addition to those outlined in the section. For example, constructing new CBP facilities closer to the border would reduce travel time for employees and associated air emissions.

General Conformity

Two independent legal requirements address air quality management in the preplanning stages: (1) National Environmental Policy Act (NEPA) and (2) the general conformity provision of CAA §176(c). Under the CAA section, Federal agencies are prohibited from engaging in, supporting, providing assistance for, or approving activities (e.g., issuing a license or permit) that are inconsistent with SIP requirements. This section is known as the General Conformity Rule (GCR). Depending on the action and the attainment status of the county, a CBP activity might have to complete a separate conformity analysis in addition to the NEPA analysis. Exemption from one requirement does not automatically exempt the action from the other requirement, nor does fulfillment of one requirement constitute fulfillment of the other. The GCR, however, was written with NEPA in mind, and CBP integrates the two requirements to save time and resources.

According to CAA §176(c), activities must conform to an implementation plan’s purpose of “eliminating or reducing the severity and number of violations” of the National Ambient Air Quality Standards (NAAQS) and achieving “expeditious attainment” of such standards. Such activities must not cause or contribute to a new violation; increase the frequency or severity of an existing violation; or delay timely attainment of any standard, required interim emission reduction, or other milestone. Pursuant to that rule, conformity determinations are required to ensure that state air quality standards would not be exceeded and that an action would comply fully with the SIP.

The GCR divides the air conformity process into two distinct areas: applicability analysis and conformity determination. The GCR requires Federal agencies to determine whether their actions would increase emissions of criteria pollutants above preset threshold levels (40 CFR 93.153(b)). These de minimis rates vary depending on the severity of the nonattainment and geographic location. De minimis emissions are total direct and indirect emissions of a criteria pollutant caused by a Federal action in a nonattainment or maintenance area at rates less than the specified applicability thresholds. These rates vary by the type of pollutant and the level of nonattainment (Table 4.2-2).

Table 8.2-1. Applicability Thresholds for Nonattainment Areas (NAAs)

Criteria Pollutants (tons per year)	Threshold
O ₃ (VOCs or NO _x)	
Serious NAAs	50
Severe NAAs	25
Extreme NAAs	10
Other O ₃ NAAs outside an O ₃ transport region	100
Marginal and moderate NAAs inside an O ₃ transport region	
VOC	50
NO _x	100
CO	
All NAAs	100
SO ₂ or NO _x	
PM ₁₀	
Moderate NAAs	100
Serious NAAs	70
Pb	
All NAAs	25

Source: 40 CFR 93.153.

8.2.1 NO ACTION ALTERNATIVE

The No Action Alternative would have short- and long-term, minor, adverse effects on air quality. These effects would be primarily due to emissions from planned construction projects,

and motorized ground, aircraft, and vessel patrols. All new sources of air emissions would be located within 100 miles of the northern border and, in general, would not contribute to a violation of any Federal, state, or local air regulation. CBP would (1) continue the current level of operations, and (2) continue maintaining and repairing existing facilities, technology, and infrastructure. Both maintenance activities and ongoing operations are specifically exempt from the general conformity regulations (40 CFR 93.153(b)). General conformity regulations for all currently planned construction projects have already been addressed or are being addressed in other NEPA documents. Estimated emissions from current activities are outlined below as a comparative baseline for the other alternatives in this PEIS (Table 8.2-2). Air emissions for each region were calculated based on the operational levels outlined in Chapter 2 under the No Action Alternative. A detailed breakdown of emissions is located in Appendix J.

Table 8.2-2. Baseline Emissions from CBP Activities

CBP Activity	WOR Region Total Emissions (tons per year)					
	CO	NO _x	PM ₁₀	PM _{2.5}	SO _x	VOC
Small construction projects ¹ - construction emissions	3.4	7.0	0.4	0.4	< 0.1	1.0
Small construction projects ¹ - operational emissions	1.6	1.5	0.1	0.1	0.4	0.2
Large construction projects ¹ - construction emissions	6.0	11.8	0.7	0.7	< 0.1	1.8
Large construction projects ¹ - operational emissions	2.8	1.7	0.1	0.1	0.4	0.3
Ground operations—motorized ²	48.5	5.1	0.4	0.2	< 0.1	5.0
Aircraft operations ²	10.4	0.5	0.1	0.1	0.2	5.8
Vessel operations ²	7.1	0.2	< 0.1	< 0.1	< 0.1	0.3
CBP Activity	EOR Region Total Emissions (tons per year)					
	CO	NO _x	PM ₁₀	PM _{2.5}	SO _x	VOC
Small construction projects ¹ - construction emissions	3.4	7.0	0.4	0.4	< 0.1	1.0
Small construction projects ¹ - operational emissions	1.6	1.5	0.1	0.1	0.4	0.2
Large construction projects ¹ - construction emissions	6.0	11.8	0.7	0.7	< 0.1	1.8
Large construction projects ¹ - operational emissions	2.8	1.7	0.1	0.1	0.4	0.3
Ground operations—motorized ²	48.5	5.1	0.4	0.2	< 0.1	5.0
Aircraft operations ²	10.4	0.5	0.1	0.1	0.2	5.8
Vessel operations ²	2.5	0.1	< 0.1	< 0.1	< 0.1	0.1

CBP Activity	Great Lakes Region Total Emissions (tons per year)					
	CO	NO _x	PM ₁₀	PM _{2.5}	SO _x	VOC
Small construction projects ¹ - construction emissions	3.4	7.0	0.4	0.4	< 0.1	1.0
Small construction projects ¹ - operational emissions	1.6	1.5	0.1	0.1	0.4	0.2
Large construction projects ¹ - construction emissions	6.0	11.8	0.7	0.7	< 0.1	1.8
Large construction projects ¹ - operational emissions	2.8	1.7	0.1	0.1	0.4	0.3
Small construction projects ¹	3.4	7.0	0.4	0.4	< 0.1	1.0
Ground operations—motorized ²	48.5	5.1	0.4	0.2	< 0.1	5.0
Aircraft operations ²	7.8	0.4	0.1	0.1	0.1	4.4
Vessel operations ²	12.2	0.4	< 0.1	< 0.1	< 0.1	0.5
CBP Activity	New England Region Total Emissions (tons per year)					
	CO	NO _x	PM ₁₀	PM _{2.5}	SO _x	VOC
Small construction projects ¹ - construction emissions	3.4	7.0	0.4	0.4	< 0.1	1.0
Small construction projects ¹ - operational emissions	1.6	1.5	0.1	0.1	0.4	0.2
Large construction projects ¹ - construction emissions	6.0	11.8	0.7	0.7	< 0.1	1.8
Large construction projects ¹ - operational emissions	2.8	1.7	0.1	0.1	0.4	0.3
Ground operations—motorized ²	48.5	5.1	0.4	0.2	< 0.1	5.0
Aircraft operations ²	7.8	0.4	0.1	0.1	0.1	7.8
Vessel operations ²	8.1	0.3	<0.1	< 0.1	< 0.1	0.3

¹ Outlines emissions for a single construction project and assumes that the projects either (1) are technologically and economically independent of each other, or (2) do not occur concurrently in the same nonattainment region.

² Accounts for all operations within the entire region as a reasonable upper bound of emissions.

8.2.2 FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE

The Facilities Development and Improvement Alternative would have short- and long-term, minor, adverse effects on air quality. In addition to activities outlined in the No Action Alternative, these effects would be primarily due to emissions from both small and large construction projects. All new sources of air emissions would be located within 100 miles of the northern border and, in general, would not generate emissions above the de minimis thresholds or contribute to a violation of any Federal, state, or local air regulation. All sites require a

conformity analysis when working in a non-attainment area under the CAA. Discussion of impacts analysis for this alternative follows.

Construction Projects

Both small and large construction projects would have short-term, minor, adverse effects to air quality. Increases in emissions would not exceed de minimis thresholds nor contribute to a violation of any Federal, state, or local air regulation.

The exact locations of construction projects are unknown at this time; such projects could take place anywhere within 100 miles of the northern border. For purposes of analysis, all direct and indirect emissions of criteria pollutants were estimated and compared to the most restrictive applicability threshold levels to determine whether the GCR may apply. Table 8.2-3 shows the net emissions from the Facilities Development and Improvement Alternative for a single region and for all four regions combined. The total annual emissions were estimated for heavy construction equipment, construction worker commutes, paving, architectural coatings, and fugitive dust for both large and small construction projects. The GCR does not apply to any of the activities because either (1) the activity would be located in an attainment area, or (2) the projected emission would be below the applicability thresholds for any nonattainment area. This is true regardless of the type of CBP activity, location of activity, pollutants of interest, or the severity of nonattainment. It is understood that activities this small and of this type are too small or too widespread to interfere with a region's ability to attain the NAAQS. Any additional support activities other than those described herein would require site-specific analysis under NEPA and the GCR. This may require additional emissions estimations to ensure that the total direct and indirect emissions from the action would not exceed the applicability thresholds, and that the GCR still would not apply. Air emissions for each region were calculated based on the operational levels outlined in Chapter 2 under the Facilities Development and Improvement Alternative. Detailed emissions calculations are located in Appendix J.

Table 8.2-3. Net Emissions from the Facilities Development and Improvement Alternative

U.S. Customs and Border Protection Activity	Net Emissions per Northern Border Region (tons per year)					
	CO	NO _x	PM ₁₀	PM _{2.5}	SO _x	VOC
Small construction projects ¹ -construction emissions	3.4	7.0	0.4	0.4	< 0.1	1.0
Small construction projects ¹ -operational emissions	1.6	1.5	0.1	0.1	0.4	0.2
Large construction projects ¹ -construction emissions	6.0	11.8	0.7	0.7	< 0.1	1.8
Large construction projects ¹ -operational emissions	2.8	1.7	0.1	0.1	0.4	0.3
De minimis thresholds (tons per year) ³	100	25	100	100	100	25
Would emissions exceed de minimis thresholds?	No	No	No	No	No	No

¹ Outlines emissions for a single project and assumes that the projects are either (1) technologically and economically independent of each other or (2) do not occur concurrently in the same nonattainment region.

² Accounts for all operations within the entire region as a reasonable upper bound of emissions.

³ There are no areas within 100 miles of the northern border designated extreme nonattainment for the 8-hour ozone or nonattainment for the lead.

For analysis purposes, it was assumed that for large projects, all construction would be compressed into a single 12-month period, and for small projects, all construction would be compressed into a single 6-month period. Therefore, regardless of the ultimate implementation schedule, these effects would be considered a reasonable worst case. It was also assumed that the projects would be approximately 25,000 square feet and a 750-kW back-up generator would be used either initially or in the future. Moderate changes in the size of the facility or the type of equipment ultimately selected would not substantially change the total direct or indirect emissions, the applicability of the GCR, or the level of effects under NEPA.

The determined effects of air quality from construction activities can normally be referenced in subsequent or tiered NEPA documents on a case-by-case basis. Additional analysis would be performed in the specific situations where site-specific information is required to make a more detailed analysis of an activity and to determine the level of its effect under NEPA. This would be necessary for actions that include new buildings with a total gross square footage greater than 100,000.

Establishing both small and large facilities would have long-term, minor, adverse effects to air quality. Increases in emissions would not exceed de minimis thresholds nor contribute to a violation of any Federal, state, or local air regulation.

Facilities may be located at any existing border crossing along the northern border. For purposes of analysis, all direct and indirect emissions of criteria pollutants were estimated and compared to the most restrictive applicability threshold levels to determine whether the GCR may apply (Table 3.2-2). The total annual emissions were estimated for heating the facilities, worker commutes, and use of emergency generators. It was assumed that a large facility would be approximately 25,000 square feet and a small facility would be approximately 10,000 square feet, and a 750-kW back-up generator would be used either initially or in the future. The GCR

does not apply to any of the activities because either (1) the activity would be located in an attainment area, or (2) the projected emission would be below the applicability thresholds for any nonattainment area. This is true regardless of the location of CBP activity, pollutants of interest, or the severity of nonattainment. It is understood that activities this small and of this type are too small or too widespread to interfere with a region’s ability to attain the NAAQS. Any additional support activities other than those described herein would require site-specific analysis under NEPA and the GCR. This may require additional emissions estimations to ensure the total direct and indirect emissions from the action would not exceed the applicability thresholds, and that the GCR still would not apply. Detailed emissions calculations are located in Appendix J.

Air permits to construct or operate any new stationary sources of air emissions, such as boilers or generators, may be required before construction could begin. Similarly, air permits may be required for the construction of a new facility. This issue is outlined in Table 8.2-4. All new stationary sources of air emissions would be subject to Federal, state, and local air permitting regulations, including prevention of significant deterioration (PSD), new source review (NSR), New Source Performance Standards (NSPS), and National Emission Standards for Hazardous Air Pollutants (NESHAP). Permitting requirements for individual activities are outlined below.

Table 8.2-4. Air Permitting Review for a Constructed or Modified Facility

Regulation	Applicability
NSR	The potential to emit (PTE) would not exceed NSR threshold and would be exempt from NSR permitting requirements. It is possible that a state operating permit would be required for boilers, emergency back-up generators, and any other stationary source of air emissions.
PSD	Potential emissions would not exceed the 250-ton per year PSD threshold; therefore, the project would not be subject to PSD review. Depending on location, new stationary sources would have to meet PSD requirements for Class I areas.
Title V permitting requirements	The facilities PTE would be below the Title V major source threshold and would not require a Title V permit.
NESHAP	Potential hazardous air pollutant (HAP) emissions would not exceed NESHAP thresholds. Therefore, the use of Maximum Available Control Technology (MACT) would not be required.
NSPS	Both emergency generators and boilers would be subject to NSPS.

Other non-permitting requirements may be required through the use of compliant practices or products. These requirements appear in each individual state’s air quality regulations. Regulations usually include restrictions to open burning, incineration, fugitive-particle emissions, use of architectural coatings, and the storage of fuel. Non-permitting requirements that may apply to construction for individual states are outlined in Appendix J. In addition to these non-permitting requirements, CBP and its contractors would not handle, transport, or store any material in a manner that may allow unnecessary amounts of air contaminants to become airborne.

Precautions may include:

- Using water for control of dust during construction operations;

- Paving roadways and maintaining them in a clean condition;
- Covering open equipment for conveying or transporting material likely to create objectionable air pollution when airborne; and,
- Promptly removing spilled or tracked dirt or other materials from paved streets.

The determined effects on air quality from operating new facilities can normally be referenced in subsequent or tiered NEPA documents on a case-by-case basis. Additional analysis would be performed in the specific situations where site-specific information is required to make a more detailed analysis of an activity and to determine the level of its effect under NEPA. This would be necessary for actions that include:

- Any new stationary source of air emissions that would exceed the PSD major source thresholds in an attainment area or the nonattainment new source review (NNSR) major source threshold in a nonattainment area;
- Proposed stationary sources that failed to meet the PSD requirements for Class I areas; or,
- Any activities that included stationary sources of air emissions that would exceed the Title V major source thresholds.

8.2.3 DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE

The Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative would have short- and long-term, minor, adverse effects on air quality. In addition to activities outlined in the No Action Alternative, these effects would be primarily due to emissions from small construction projects and from additional aircraft and vessel operations. All new sources of air emissions would be located within 100 miles of the northern border and, in general, would not generate emissions above the de minimis thresholds or contribute to a violation of any Federal, state, or local air regulation. Discussion of impacts analysis for this alternative follows. Air emissions for each region were calculated based on the operational levels outlined in Chapter 2 under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative. Detailed emissions calculations are located in Appendix J.

Construction Projects

Similar to the Facilities Development and Improvement Alternative and for the same reasons, both small and large construction projects under this alternative would have short-term, minor, adverse effects. Even with an increase in the total number of projects, under this alternative, the increases in emissions (Table 8.2-5) would not exceed de minimis thresholds nor contribute to a violation of any Federal, state, or local air regulation. The GCR would not apply because either (1) the activity would be located in an attainment area, or (2) the projected emissions would be below the applicability thresholds for any nonattainment area.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Subsequent NEPA analysis would be conducted, where necessary, to determine the specific impacts if:

- The infrastructure being constructed had a footprint with a total gross square footage greater than 100,000;
- The activity proposed any stationary source of air emissions that would exceed the PSD major source thresholds in an attainment area or the NNSR major source threshold in a nonattainment area; or,
- Proposed stationary sources failed to meet the PSD requirements for Class I areas.

Table 8.2-5. Net Emissions from the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative

CBP Activity	WOR Region Total Emissions (tons per year)					
	CO	NO _x	PM ₁₀	PM _{2.5}	SO _x	VOC
Small construction projects ¹ - construction emissions	3.4	7.0	0.4	0.4	< 0.1	1.0
Small construction projects ¹ - operational emissions	1.6	1.5	0.1	0.1	0.4	0.2
Ground operations—motorized ²	30.3	3.2	0.2	0.2	< 0.1	3.1
Aircraft operation ²	12.0	0.6	0.1	0.1	0.2	6.6
Vessel operations ²	10.7	0.4	< 0.1	< 0.1	< 0.1	1.0
De minimis thresholds (tons per year) ³	100	25	100	100	100	25
Would emissions exceed de minimis thresholds?	No	No	No	No	No	No
CBP Activity	EOR Region Total Emissions (tons per year)					
	CO	NO _x	PM ₁₀	PM _{2.5}	SO _x	VOC
Small construction projects ¹ - construction emissions	3.4	7.0	0.4	0.4	< 0.1	1.0
Small construction projects ¹ - operational emissions	1.6	1.5	0.1	0.1	0.4	0.2
Ground operations—motorized ²	30.3	3.2	0.2	0.2	< 0.1	3.1
Aircraft operation ²	15.6	0.7	0.2	0.2	0.3	8.5
Vessel operations ²	5.1	0.2	< 0.1	< 0.1	< 0.1	0.2
De minimis thresholds (tons per year) ³	100	25	100	100	100	25
Would emissions exceed de minimis thresholds?	No	No	No	No	No	No

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

CBP Activity	Great Lakes Region Total Emissions (tons per year)					
	CO	NO _x	PM ₁₀	PM _{2.5}	SO _x	VOC
Small construction projects ¹ - construction emissions	3.4	7.0	0.4	0.4	< 0.1	1.0
Small construction projects ¹ - operational emissions	1.6	1.5	0.1	0.1	0.4	0.2
Ground operations—motorized ²	30.3	3.2	0.2	0.2	< 0.1	3.1
Aircraft operation ²	12.0	0.6	0.1	0.1	0.2	6.5
Vessel operations ²	12.2	0.4	< 0.1	< 0.1	< 0.1	0.5
De minimis thresholds (tons per year) ³	100	25	100	100	100	25
Would emissions exceed de minimis thresholds?	No	No	No	No	No	No
CBP Activity	New England Region Total Emissions (tons per year)					
	CO	NO _x	PM ₁₀	PM _{2.5}	SO _x	VOC
Small construction projects ¹ - construction emissions	3.4	7.0	0.4	0.4	< 0.1	1.0
Small construction projects ¹ - operational emissions	1.6	1.5	0.1	0.1	0.4	0.2
Ground Operations—Motorized ²	30.3	3.2	0.2	0.2	< 0.1	3.1
Aircraft operation ²	12.0	0.6	0.1	0.1	0.2	12.0
Vessel operations ²	25.4	0.9	< 0.1	< 0.1	< 0.1	0.5
De minimis thresholds (tons per year) ³	100	25	100	100	100	25
Would emissions exceed de minimis thresholds?	No	No	No	No	No	No

¹ These numbers outline emissions for a single construction project and assume that the projects either (1) are technologically and economically independent of each other or (2) do not occur concurrently in the same nonattainment region.

² These numbers account for all operations within the entire region as a reasonable upper bound of emissions.

³ There are no areas within 100 miles of the northern border designated extreme nonattainment for the 8-hour ozone standard or nonattainment for the lead standard.

Ground Operations—Motorized

Conducting motorized ground operations would have long-term, minor, adverse effects to air quality. Increases in emissions would not exceed de minimis thresholds or contribute to a violation of any Federal, state, or local air regulation. Notably, conducting motorized ground patrols would not include any new stationary sources of air emissions, and no air permitting would be required.

The total annual emissions were estimated for motorized ground patrols. The total direct and indirect emissions associated with this activity would not exceed applicability threshold levels (Table 8.2-5). The GCR does not apply because either (1) the activity would be located in an attainment area or (2) the projected emissions would be below the applicability thresholds for any nonattainment area. This is true regardless of the location of the activity, pollutants of interest, or severity of nonattainment. Therefore, to operate all such activities within a single AQCR was considered a reasonable upper bound for effects. Moderate changes in the number of operations would not substantially change the total direct or indirect emissions, the applicability of the GCR, or the level of effects under NEPA. A detailed breakdown of emissions is located in Appendix J.

Aircraft Operations

Conducting aircraft patrols along the northern border would have long-term, minor, adverse effects to air quality. Increases in emissions would not exceed de minimis thresholds or contribute to a violation of any Federal, state, or local air regulation. Notably, conducting aircraft operations would not include any new stationary sources of air emissions, and no air permitting would be required.

The total annual emissions were estimated for aerial surveillance patrols. The total additional direct and indirect emissions associated with this activity (Table 8.2-5) would not exceed applicability threshold levels. The GCR does not apply because either (1) the activity would be located in an attainment area, or (2) the projected emissions would be below the applicability thresholds for any nonattainment area. This is true regardless of the location of the activity, pollutants of interest, or the severity of nonattainment. For analysis purposes, it was assumed that an air fleet consisting of 92 percent Cessna Citations and 8 percent UH-60 helicopters would be used. This was considered a reasonable upper bound for effects. Moderate changes in number of operations or aircraft used would not substantially change the total direct or indirect emissions, the applicability of the GCR, or the level of effects under NEPA. A detailed breakdown of emissions is located in Appendix J.

Vessel Operations

Conducting waterborne patrols would have long-term, minor, adverse effects to air quality. Increases in emissions would not exceed de minimis thresholds or contribute to a violation of any Federal, state, or local air regulation. Notably, conducting waterborne patrols would not include any new stationary sources of air emissions, and no air permitting would be required.

The total annual emissions were estimated for waterborne patrols. The total direct and indirect emissions associated with this activity would not exceed applicability threshold levels (Table 8.2-5). The GCR does not apply because either (1) the activity would be located in an attainment area, or (2) the projected emissions would be below the applicability thresholds for any nonattainment area. This is true regardless of the location of the activity, pollutants of interest, or the severity of nonattainment. Moderate changes in number of operations would not substantially change the total direct or indirect emissions, the applicability of the GCR or the level of effects under NEPA. A detailed breakdown of emissions is located in Appendix J.

8.2.4 TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE

The Tactical Security Infrastructure Deployment Alternative would have short- and long-term, minor, adverse effects on air quality. In addition to activities outlined in the No Action Alternative, these effects would be primarily due to emissions from both small and large construction projects. All new sources of air emissions would be located within 100 miles of the northern border and, in general, would not generate emissions above the de minimis thresholds or contribute to a violation of any Federal, state, or local air regulation. Discussion of impacts analysis for this alternative follows.

Construction Projects

For reasons outlined under the Facilities Development and Improvement Alternative, both small and large construction projects would have short-term, minor, adverse effects to air quality. Even with an increase in the total number of operations over the current program, under this alternative the increases in emissions would not exceed de minimis thresholds or contribute to a violation of any Federal, state, or local air regulation (Table 8.2-5). The GCR would not apply because either (1) the activity would be located in an attainment area, or (2) the projected emissions would be below the applicability thresholds for any nonattainment area. The applicability of both permitting and non-permitting regulations would be the same as outlined for the Facilities Development and Improvement Alternative. Notably, under this alternative, the construction of roadways, trails, fencing, barriers, and trench cuts is unlikely to have any ongoing operational sources of air emissions. No additional generators or boilers are anticipated.

Table 8.2-6. Net Emissions from the Tactical Security Infrastructure Deployment Alternative

CBP Activity	Net Emissions (tons per year)					
	CO	NO _x	PM ₁₀	PM _{2.5}	SO _x	VOC
Small construction projects ¹ -construction emissions	3.4	7.0	0.4	0.4	< 0.1	1.0
Small construction projects ¹ -operational emissions	1.6	1.5	0.1	0.1	0.4	0.2
Large construction projects ¹ -construction emissions	6.0	11.8	0.7	0.7	< 0.1	1.8
Large construction projects ¹ -operational emissions	2.8	1.7	0.1	0.1	0.4	0.3
De minimis thresholds (tons per year) ³	100	25	100	100	100	25
Would emissions exceed de minimis thresholds?	No	No	No	No	No	No

¹ These numbers outline emissions for a single construction project and assumes that the projects are either (1) technologically and economically independent of each other or (2) do not occur concurrently in the same nonattainment region.

² These numbers account for all operations within the entire region as a reasonable upper bound of emissions.

³ There are no areas within 100 miles of the northern border designated extreme nonattainment for the 8-hour ozone or nonattainment for the lead.

Subsequent NEPA analysis would be conducted, where necessary, to determine the specific impacts if the infrastructure being constructed had a footprint with a total gross square footage greater than 100,000.

8.2.5 FLEXIBLE DIRECTION ALTERNATIVE

The Flexible Direction Alternative would have short- and long-term, minor, adverse effects on air quality. In addition to activities outlined in the No Action Alternative, these effects would be primarily due to emissions from both small and large construction projects, and from additional ground, air, and vessel operations. All new sources of air emissions would be located within 100 miles of the northern border and, in general, would not generate emissions above the de minimis thresholds or contribute to a violation of any Federal, state, or local air regulation. Discussion of impacts analysis for this alternative follows.

Construction Projects

Similar to the Facilities Development and Improvement Alternative and for the same reasons, both small and large construction projects under this alternative would have short-term, minor, adverse effects. Even with an increase in the total number of projects, under this alternative, the increases in emissions would not exceed de minimis thresholds nor contribute to a violation of any Federal, state, or local air regulation (Table 8.2-7). The GCR would not apply because either (1) the activity would be located in an attainment area, or (2) the projected emissions would be below the applicability thresholds for any nonattainment area. Air emissions for each region were calculated based on the operational levels outlined in Chapter 2 under the Flexible Direction Alternative. Detailed emissions calculations are located in Appendix J.

Subsequent NEPA analysis would be conducted, where necessary, to determine the specific impacts of POE upgrade construction if:

- The buildings associated with the new facilities had a total gross square footage greater than 100,000;
- The activity proposed any stationary source of air emissions that would exceed the PSD major source thresholds in an attainment area or the NNSR major source threshold in a nonattainment area; or,
- Proposed stationary sources failed to meet the PSD requirements for Class I areas.

Table 8.2-7. Net Emissions from the Flexible Direction Alternative

CBP Activity	WOR Region Net Emissions (tons per year)					
	CO	NO _x	PM ₁₀	PM _{2.5}	SO _x	VOC
Small construction projects ¹ - construction emissions	3.4	7	0.4	0.4	< 0.1	1
Small construction projects ¹ -operational emissions	1.6	1.5	0.1	0.1	0.4	0.2
Large construction projects ¹ -construction emissions	6	11.8	0.7	0.7	< 0.1	1.8
Large construction projects ¹ -operational emissions	2.8	1.7	0.1	0.1	0.4	0.3
Small construction projects ¹	3.4	7	0.4	0.4	< 0.1	1
Small construction projects ¹	6	11.8	0.7	0.7	< 0.1	1.8
Ground operations—motorized ²	30.3	3.2	0.2	0.2	< 0.1	3.1
Aircraft operation ²	36.4	1.6	0.4	0.3	0.7	4.3
Vessel operations ²	10.7	0.4	< 0.1	< 0.1	< 0.1	0.4
De minimis thresholds (tons per year) ³	100	25	100	100	100	25
Would emissions exceed de minimis thresholds?	No	No	No	No	No	No
CBP Activity	EOR Region Net Emissions (tons per year)					
	CO	NO _x	PM ₁₀	PM _{2.5}	SO _x	VOC
Small construction projects ¹ - construction emissions	3.4	7	0.4	0.4	< 0.1	1
Small construction projects ¹ -operational emissions	1.6	1.5	0.1	0.1	0.4	0.2
Large construction projects ¹ -construction emissions	6	11.8	0.7	0.7	< 0.1	1.8
Large construction projects ¹ -operational emissions	2.8	1.7	0.1	0.1	0.4	0.3
Small construction projects ¹	3.4	7	0.4	0.4	< 0.1	1
Small construction projects ¹	6	11.8	0.7	0.7	< 0.1	1.8
Ground operations—motorized ²	30.3	3.2	0.2	0.2	< 0.1	3.1
Aircraft operation ²	15.6	0.7	0.2	0.2	0.3	8.5
Vessel operations ²	5.1	0.2	< 0.1	< 0.1	< 0.1	0.2
De minimis thresholds (tons per year) ³	100	25	100	100	100	25
Would emissions exceed de minimis thresholds?	No	No	No	No	No	No

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

CBP Activity	Great Lakes Region Net Emissions (tons per year)					
	CO	NO _x	PM ₁₀	PM _{2.5}	SO _x	VOC
Small construction projects ¹ - construction emissions	7	0.4	0.4	< 0.1	1	1
Small construction projects ¹ -operational emissions	1.5	0.1	0.1	0.4	0.2	0.2
Large construction projects ¹ -construction emissions	11.8	0.7	0.7	< 0.1	1.8	1.8
Large construction projects ¹ -operational emissions	1.7	0.1	0.1	0.4	0.3	0.3
Small construction projects ¹		7	0.4	0.4	< 0.1	1
Small construction projects ¹	6	11.8	0.7	0.7	< 0.1	1.8
Ground operations—motorized ²	30.3	3.2	0.2	0.2	< 0.1	3.1
Aircraft operation ²	36.4	1.6	0.4	0.3	0.7	4.3
Vessel operations ²	25.4	0.9	< 0.1	< 0.1	< 0.1	0.5
De minimis thresholds (tons per year) ³	100	25	100	100	100	25
Would emissions exceed de minimis thresholds?	No	No	No	No	No	No
CBP Activity	New England Region Net Emissions (tons per year)					
	CO	NO _x	PM ₁₀	PM _{2.5}	SO _x	VOC
Small construction projects ¹ - construction emissions	7	0.4	0.4	< 0.1	1	1
Small construction projects ¹ -operational emissions	1.5	0.1	0.1	0.4	0.2	0.2
Large construction projects ¹ -construction emissions	11.8	0.7	0.7	< 0.1	1.8	1.8
Large construction projects ¹ -operational emissions	1.7	0.1	0.1	0.4	0.3	0.3
Small construction projects ¹	3.4	7	0.4	0.4	< 0.1	1
Small construction projects ¹	6	11.8	0.7	0.7	< 0.1	1.8
Ground operations—motorized ²	30.3	3.2	0.2	0.2	< 0.1	3.1
Aircraft operation ²	12	0.6	0.1	0.1	0.2	12
Vessel operations ²	25.4	0.9	< 0.1	< 0.1	< 0.1	0.5
De minimis thresholds (tons per year) ³	100	25	100	100	100	25
Would emissions exceed de minimis thresholds?	No	No	No	No	No	No

¹ Outlines emissions for a single project and assumes that the projects are either (1) technologically and economically independent of each other or (2) do not occur concurrently in the same nonattainment region.

² Accounts for all operations within the entire region as a reasonable upper bound of emissions.

³ There are no areas within 100 miles of the northern border designated extreme nonattainment for the 8-hour ozone or nonattainment for the lead.

Ground Operations—Motorized

For reasons outlined under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, conducting motorized ground operations would have long-term, minor, adverse effects to air quality. Even with an increase in the total number of patrols, under this alternative the increases in emissions would not exceed de minimis thresholds or contribute to a violation of any Federal, state, or local air regulation. Therefore, to operate all such activities within a single AQCR was considered a reasonable upper bound for effects. Moderate changes in number of operations would not substantially change the total direct or indirect emissions, the applicability of the GCR or the level of effects under NEPA. A detailed breakdown of emissions is located in Appendix J.

Aircraft Operations

For reasons outlined under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, conducting aerial surveillance patrols along the northern border would have long-term, minor, adverse effects to air quality. Even with an increase in the total number of operations, under this alternative, when compared to the No Action Alternative, increases in emissions would not exceed de minimis thresholds or contribute to a violation of any Federal, state, or local air regulation. For analysis purposes, it was assumed that an air fleet consisting of 92 percent Cessna Citations and 8 percent UH-60 helicopters would be used. Notably, conducting aircraft operations would not include any new stationary sources of air emissions, and no air permitting would be required.

Vessel Operations

For reasons outlined under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, conducting waterborne patrols along the northern border would have long-term, minor, adverse effects to air quality. Even with an increase in the total number of operations, under this alternative the increases in emissions would not exceed de minimis thresholds or contribute to a violation of any Federal, state, or local air regulation. Notably, conducting vessel operations would not include any new stationary sources of air emissions, and no air permitting would be required.

8.2.6 BEST MANAGEMENT, MINIMIZATION, AND MITIGATION

No mitigation measures would be required for air quality. CBP would comply fully with all Federal, state, and local air regulations where applicable.

Minor, short- and long-term, cumulative effects would be expected. Impacts on air quality would be primarily due to the construction and operation of CBP's facilities, as well as field activities. A wide range of other activities along the northern border that produce some amounts of air pollutants would, of course, occur within each region across the northern border as a whole. Every state takes into account the effects of all past, present, and reasonably foreseeable projects, activities, and associated emissions during the development of its SIP under the CAA. As noted above, estimated emissions generated by CBP's activities for all alternatives would be de minimis—so limited that they would not interfere with timely attainment of the NAAQS. Therefore, implementation of any of the proposed alternatives would not contribute appreciably to any adverse, cumulative air quality impacts. Thus, impacts across the northern border as a

whole would not be significant, and no air quality mitigation measures would be required (see Section 9.2).

8.2.7 SUMMARY OF POTENTIAL IMPACTS

Table 8.2-8 summarizes the comparison of impacts to air quality stemming from the various alternatives.

Table 8.2-8. Summary of Potential Air Quality Impacts

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor adverse	Moderate Adverse	Major Adverse	Beneficial
NO ACTION ALTERNATIVE					
Small construction projects (< 1 acre and < 1/4 mile: e.g., minor repairs to facilities, parking lot repairs, access road repairs)		⊗			
Large construction projects (> 1 acre and > 1/4 mile: e.g., repairs to facilities, parking lot repairs, access road repairs)		⊗			
Checkpoint operations	⊗				
Ground operations—motorized		⊗			
Ground operations—nonmotorized	⊗				
Aircraft operations		⊗			
Vessel operations		⊗			
Operation of NII systems	⊗				
Operation of sensor and other technologies	⊗				
OVERALL IMPACT		⊗			
FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE					
Small construction projects		⊗			
Large construction		⊗			
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE					
Small construction projects (e.g., towers and other infrastructure to mount antennas)		⊗			
Ground operations—motorized		⊗			
Ground operations—nonmotorized	⊗				

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor adverse	Moderate Adverse	Major Adverse	Beneficial
Aircraft operations		⊗			
Vessel operations		⊗			
Operation of NII systems	⊗				
Operation of Sensor and other technologies	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE					
Small construction projects (trench cuts, towers, minor access roads and fences)		⊗			
Large construction projects (access roads and fences)		⊗			
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
FLEXIBLE DIRECTION ALTERNATIVE					
Small construction projects		⊗			
Large construction projects		⊗			
Checkpoint operations	⊗				
Ground operations—motorized		⊗			
Ground operations—no motorized	⊗				
Aircraft operations		⊗			
Vessel operations		⊗			
Operation of NII systems	⊗				
Operation of sensor and other technologies	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			

8.3 ENVIRONMENTAL CONSEQUENCES TO BIOLOGICAL RESOURCES

This section of the PEIS broadly identifies potential impacts to biological resources that would result from CBP implementing any of the program alternatives within the northern border area of study. Descriptions of the biological resources within the regional affected environments are provided in sections 4.3.2 (WOR Region), 5.3.2 (EOR Region), 6.3.2 (Great Lakes Region), and 7.3.2 (New England Region). Within the 12 ecoregions identified for the northern border, there are substantial blocks of relatively intact habitat and sensitive environmental areas that are under jurisdictional management by Federal, state, or local authorities.

All of the alternatives have the potential for adverse impacts to terrestrial and aquatic resources. In accordance with the taxonomies of threats to biodiversity from local to regional scales¹, CBP's stressors to the ecologies supporting biological resources fall primarily into the category of "human intrusions and disturbance" with additional concerns related to "invasive and other problematic species" and maintenance and use of smaller versions of "transportation and service corridors." The determination of the level of impacts to biological resources in this PEIS is very coarse because the proposed alternatives do not propose specific projects with locations and rates of activity that can be evaluated at this time. These determinations are based upon knowledge of impacts of CBP activities derived from previous NEPA analysis on CBP activities and from general information on resource impact considerations.

Overall direct and indirect biological impacts in the 12 ecoregions that comprise the northern border study area would be minor to moderately adverse regardless of the alternative chosen (see Table 8.3-1). Some of the activities within the proposed alternatives could cause minor to moderate adverse direct or indirect impacts in undisturbed sensitive habitats. The construction and modification of facilities and infrastructure as well as their use can promote temporary or intermittent behavioral changes to species as well as diminishment of habitat depending on the location of activities. The continued presence (and maintenance) of built structures and ongoing operations such as patrols can have longer term impacts both to behavior and the physical conditions of biological resources. The biological resource impacts of the listed alternatives would be expected to have minimal to moderate direct effect on threatened and endangered species, wildlife, vegetative habitat, and aquatic resources. Also, the potential exists for some habitat fragmentation, breeding interruption to sensitive species, and increased opportunity for the spread of invasive species depending on the execution of individual projects. However, CBP would necessarily coordinate and consult with land and resource managers prior to undertaking new activities identified in this PEIS. Such cooperative efforts would likely result in modifications to projects to avoid impacts that would cause serious detriment to sensitive habitats and sensitive species.

¹ Organizations such as the International Union for Conservation of Nature (IUCN) and the Conservation Measures Partnership (CMP) have developed taxonomies of the threats faced by biodiversity around the world, from local to landscape and regional scales. The IUCN-CMP classification can be found at http://www.iucn.org/about/work/programmes/species/red_list/resources/technical_documents/new_classification_schemes/index.cfm.

CBP's Air Unit Citation Jet Patrol



Source: (Tourtellotte, 2010).

If CBP would seek to implement portions of the proposed action, decisions regarding the actual location and pace of any modifications to CBP activities would be deferred until individual or groups of projects were ripe for proposal. Each project and connected actions would then be subject to appropriate levels of environmental review including NEPA analysis based on site-level anticipated impacts. Planning for any CBP projects proposed for undisturbed or otherwise sensitive wildlife areas will need to connect analysis of the patchwork of direct environmental impacts illustrated within this section to address potential impacts to the integrity of ecological systems. As appropriate, CBP will develop conceptual site models for project areas to guide analysis of ecological and other environmental sustainment considerations particularly on units of land regulated by the agencies of the Department of Interior and the U.S. Department of Agriculture-Forest Service. The conceptual site models would facilitate identification of ecological attributes of terrestrial resource systems so that more specific and measurable indicators of impacts could be used to rate significance of adverse effects. These models would frame assessment of impacts to ecological systems with regard for historic rates of decline and any particular conservation goals assigned to areas such as national parks, conservation reserves, forests, wilderness area, and other protected and recognized sensitive systems. In particular, CBP site-specific analysis would focus on improving qualification and quantification of the acceptable range of variation in ecological systems to clarify the context and intensity of impacts falling below the significant threshold. The management objectives for protected areas would be a major factor dictating the context for analysis of impacts.

Ongoing, planned, and activities within the proposed alternatives identified in this PEIS are subject to Federal laws and regulations, as well as state and local requirements. CBP's adherence to these requirements and the proper use of biological monitoring and restoration initiatives to meet these requirements would minimize or avoid major adverse impacts for the great majority of planned actions. Augmented environmental education and agent training protocols (as identified in Chapter 1 of this PEIS) ensure that ongoing law enforcement activities are carried out effectively, but with deliberate avoidance of unnecessary adverse environmental impacts. The possibility exists for impacts from future projects to combine with other ongoing CBP activities and past, present and future activities from other non-CBP sources. Small actions

can produce additive effects on biological resources when combined with the historical, current and imminent effects of similar actions.

Mitigation actions could reduce these real and potential impacts. CBP's policy is to reduce impacts to biological resources by planning and consulting with resources and land managers to implement avoidance and impact minimization measures where feasible and appropriate given law enforcement and agent and officer safety imperatives. When necessary, CBP will plan for, coordinate, and execute mitigation and compensation measures to protect, recover, or replace adversely impacted biological resources. Many standard mitigation measures have been incorporated as standard operating procedures by CBP on past projects. In some cases, particularly in the previously mentioned areas of relatively intact habitat and various sensitive environments, mitigation solutions would be required by law. These measures would be negotiated and coordinated with applicable Federal, state, and local agencies. However, the regional analyses conclude that CBP's contributions to cumulative impacts across the northern border as a whole would be negligible.

Conceptual site modeling to plan for any future CBP proposal for facility or infrastructure construction and modification projects would need to consider impacts to attributes of terrestrial ecosystems including: local air quality; connectivity to adjacent or otherwise complimentary terrestrial and aquatic resources and systems; surface water and groundwater exchange; and soil erosion, deposition, and drainage factors; and native key or rare species habitat and food supply including competition with invasives. Considerations for impacts to aquatic ecosystems include: sedimentation and channel erosion; drainage and flow-path connectivity; and native key or rare species habitat and food supply including competition with invasives. The management objectives for protected areas would be a major factor dictating the context for analysis of impacts. (Unnasch, et al, 2008)

Actions with no impact on biological resources under any of the alternatives may include: operation of radio frequency identification devices (RFID), Trusted Traveler programs, and intelligence coordination.

8.3.1 NO ACTION ALTERNATIVE

The No Action Alternative scenario, or "status quo," calls for continued use of facilities, technology, infrastructure, and approximate numbers of personnel in use, deployed, or currently planned by CBP.

Marine Patrol with a CBP Midnight Express



Source: (USDHS, No Date[a]).

8.3.1.1 Construction Projects

Planned and current small construction projects include pedestrian or vehicle fences and other physical barriers, roads, bridges, culverts and low water crossings. Large construction projects include the construction or modernization of existing buildings (such as FOBs, land ports of entry [LPOEs], and BPSs), permanent traffic checkpoints, and monopole towers. Currently there are about 15 large construction projects planned or occurring along the northern border in the WOR Region.

Impacts to Terrestrial Resources

Impacts to terrestrial resources from construction projects currently underway are expected to be minor to moderate depending on the location and size of the construction activities. There are a number of techniques available to assist in mitigating/reducing impacts; these are discussed more fully in Section 8.3.6—Best Management, Minimization, and Mitigation.

Excessive noise levels caused by construction (Table 8.1-1), especially in previously undisturbed areas, can have short-term and long-term impacts on wildlife. Impacts would generally be localized to the general vicinity of the project site, but, as discussed in Sections 3.6 and 8.6, the spatial extent of noise impacts would depend on the level of background noise and the amount of physical structure around the construction site that could dampen sound. Forest areas would restrict sound from traveling as far as it would in grassland or open areas. Excessive noise can lead to stress-related physiological impacts, altered behavior, or injuries that could lead to mortality. Excessive noise can disrupt natural dispersal of some animal species, reducing local population size by reducing survivorship and reproductive productivity (Ouren et al., 2007). As an example, grizzly bears are a threatened species that require a large, undisturbed range. Construction noise in an area utilized by grizzly bears could lead to avoidance of that localized area during the construction period. This avoidance behavior can result in decreased or fragmented home ranges and migration, which can impact the population by isolating individuals. Most planned and occurring construction projects are located on or near existing roads and developed areas. The major exception is FOBs. In areas already adjacent to roads and developed areas, many species would be accustomed to noise related to human activity. Those species that are sensitive to noise, such as the grizzly bear, would have already vacated, or would be currently avoiding, that area. Noise would be minimized, as discussed in Section 8.6. Best

management practices (described in Section 8.3.6) would be applied as appropriate to minimize impacts.

No new direct adverse impacts from light pollution are anticipated in urbanized areas. Indirect impacts depend upon the quantity and strength of the lights, the size of the area illuminated, and the habitat types surrounding the lights. As with noise, lights in a heavily forested habitat would affect a much smaller area than those in grasslands or on a ridge top. Most nocturnal wildlife will avoid artificially lit areas. However, these areas may attract insects, potentially providing a new congregation of food for certain wildlife. Construction activities would be conducted during daylight hours to the greatest extent possible, and if nighttime construction would be required, lights would be kept to the minimum wattage necessary for safety, down shielded, and directed into the construction workspace. Best management practices are described in Section 8.3.6.

Increased repair and construction activity and human presence could potentially displace or disturb certain wildlife species, forcing them into adjacent habitats either temporarily or permanently. Minor, adverse impacts could occur to some medium-sized and large mammals, such as elk (*Cervus canadensis*) and mule deer (*Odocoileus hemionus*) due to fencing or other barriers, which would restrict movement onto the land for foraging or other activities. In forested habitats within the Great Lakes Region, the Merlin, Kirtland's warbler (federally listed only in Michigan and Wisconsin), spruce grouse (*Falcapennis canadensis*), northern goshawk (*Accipiter gentilis*), great gray owl (*Strix nebulosa*), and black-backed woodpecker (*Picoides arcticus*) are some of the sensitive species that could be affected by construction or other human disturbance, especially during the breeding season (generally from March through July) (Borkowski et al., 2006; Wisdom et al., 2004; Wisdom, 2007).

Construction of linear facilities (e.g. fencing and roads) could alter migration patterns and thus impact species dispersal. Less-mobile species, such as small mammals, reptiles, and amphibians, could experience individual mortalities caused by clearing, grading, compaction, and other construction activities. Injury or mortality of wildlife may also result from collisions with construction vehicles, buildings, windows, towers, and guy wires. These impacts would remain localized and limited to the immediate vicinity of the project site and are not expected to impact the population as a whole.

Without proper controls and monitoring, CBP maintenance of roads or facilities can inadvertently lead to habitat degradation through changes in local drainage patterns or the introduction of invasive plant species. Further introduction or dispersion of scotch broom (*Cytisus scogvarius*) in the WOR Region could hasten the decline of intact oak forests representing a greater concern for major regional losses due to the already diminished state from historical levels. Similar concerns exist in the NE Region where serious long-term impacts to forests are already occurring from invasive plant species such as garlic mustard (*Alliaria petiolata*) and buckthorn (*Rhamnus* spp.). In the EOR Region, the North Dakota Century Code lists at least seven noxious weeds in northern North Dakota counties (including Canada thistle, leafy spurge, Russian knapweed, and spotted knapweed) that have a serious long-term impact to native landscapes.

In the EOR Region, the North Dakota Century Code lists at least seven noxious weeds in northern North Dakota counties (including Canada thistle, leafy spurge, Russian knapweed, and spotted knapweed) that have a serious long-term impact to native landscapes. In the New England Region, serious, long-term impacts to forests are already occurring from invasive plant species such as garlic mustard (*Alliaria petiolata*) and buckthorn (*Rhamnus* spp.).

The footprints of anticipated CBP construction projects would be small relative to the habitat available across the northern border. Suitability of the existing land use would be considered in selecting sites for new construction, and designs would incorporate features to reduce injury and mortality, such as use of monopole towers without guy wires, so impacts would be minimized to the greatest extent possible. Most impacts could be avoided with proper use of best management practices (BMP) and once construction is complete impacted species are expected to recover completely. Therefore, depending on the size and location of the construction project, the impacts (in most cases) would be minor and short-term. Additionally, any proposed construction that may impact threatened and endangered species would have specific permitting or monitoring protocols for these types of impacts (Section 8.3.6.3 describes mitigation measures for threatened and endangered species).

Impacts to Aquatic Resources

CBP related construction projects can result in minor impacts to aquatic resources. Damage to fish, such as the Atlantic salmon (*Salmo salar*) and other aquatic species can potentially occur if sediments, fuel, or product spills enter a waterway via runoff, potentially carrying material off-site and contaminating larger areas.

Much of the Puget Sound, the Strait of Juan de Fuca, Georgia Basin, and associated streams and rivers in Washington are critical habitat for the Chinook salmon (USDOC, 2007). Avoiding or minimizing habitat disturbance from construction or road building during the spawning season would reduce short-term, adverse impacts. In addition, construction projects that exceed one acre of disturbance would require that storm water pollution preventions plans and erosion and sedimentation control plans be prepared to minimize the potential for contamination of surface or groundwater resources.

Short-term impacts can potentially occur when material is temporarily placed within wetlands and surface waters to create access and storage areas for construction activities. Vegetation clearing within or adjacent to wetlands, bordering streams, and water bodies can also have temporary to permanent impacts on habitat quality. Waterfowl, herons, and shorebirds are among the important bird species groups inhabiting wetland areas of the Great Plains (EOR Region). These species are frequently associated with open marshes and “prairie pothole” wetlands, and may be declining due to wetland destruction and degradation (Igl and Johnson, 1998). Impacts to wetlands or waters of the United States would be controlled by a wetland permit issued by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act. More mitigation measures for impacts related to wetlands and aquatic resources can be found in Section 8.3.6.2.

Construction at or near aquatic areas have the potential to impact species far from the construction site due to the physical characteristics of sound in water. Marine mammals such as

sperm whales and pilot whales will change their behavior (such as decreasing vocalizations and avoidance) as a result of certain sounds.

Lights near water may attract fish, disrupting their natural behavior. Artificial lighting could also displace nocturnal wildlife (some are especially sensitive to light) or cause increased exposure to predation. Nocturnal lighting can disturb some marine organisms, particularly sea turtles (e.g., the leatherback turtle [*Dermochelys coriacea*]), which navigate primarily by moonlight when close to shore. Construction activities would be conducted during daylight hours to the greatest extent possible, and if nighttime construction would be required, lights would be kept to the minimum wattage necessary for safety, down shielded, and directed into the construction workspace. Attention would be given to minimizing any light in aquatic areas.

Impacts to aquatic ecosystems as a result of CBP activities are expected to be localized, minor, and short term. Once construction is complete, any lights, noise, or human activity related to construction would cease, and any displaced aquatic species would be able to recolonize the area.

8.3.1.2 Operation of Trade/Travel Processing and Large and Small POEs

This section discusses impacts of onsite trade and travel processing operations, large POEs with over 10,000 crossings per day, and small POEs with under 10,000 crossings per day.

Impacts to Terrestrial and Aquatic Resources

Trade and travel processing operations can result in minor impacts. Injury or direct mortality of wildlife (especially birds and bats) may result from collisions with vehicles, buildings, windows, towers, and guy wires. Collisions of wildlife with vehicles on roads can injure or kill animals. If traffic increases over time, wildlife collisions with vehicles may rise. Noise from traffic passing could have long-term, negative effects on wildlife as it would disturb and displace individual animals (more so in quieter, rural locations than in urban locations where ambient noise is greater.) In rural areas, limited hours of operation would result in fewer hours of noise. Also, urban areas are less likely to harbor wildlife that are sensitive to noise and other human activity.

General human activity, such as those associated with continued CBP operations may disrupt normal behaviors and movements during migration or breeding periods. Upland game birds and cavity nesters are more often influenced by habitat disturbance. Outside of the breeding season, human disturbance may force birds to change their feeding habits, thereby reducing normal food intake (USDA, 2009).

The piping plover (*Charadrius melodus*), along northern Great Lakes shorelines, is at risk whenever previously undeveloped northern border Great Lakes beaches are impacted by development, vehicular traffic on beaches, or unmonitored or unplanned human presence.

The piping plover may also be negatively impacted by habitat disturbance in this region, especially along the shores of lakes Michigan, Erie, and Ontario. Since this species nests on wide, flat, open, sandy beaches, human activities that alter or create disturbance in their habitat may affect populations nesting in the area or migrating through the area. Alterations to landscapes may also increase mortality of their young. Also vulnerable are breeding colonies of Caspian terns (*Sterna caspia*), locally established on rocky Great Lakes islands, and common

terns (*S. hirundo*), which breed and nest in sand beach zones similar to those used by the piping plover.

Several carnivorous species seek secluded areas for reproduction and rearing of young and have abandoned their dens when disturbed (USDA, 2009). In the WOR, EOR, and Great Lakes Regions, these include wolves (*Canis lupus*), wolverines (*Gulo gulo*), fishers (*Martes pennanti*), and lynx (*Lynx canadensis*). In New England Region, coyotes, (*C. latrans*), fishers (*Martes pennanti*), and lynx (*Lynx canadensis*) have been known to demonstrate the same behavior.

Noisy activities or visible human activities at sensitive locations (e.g., nest trees) have the potential to disrupt normal behavior patterns. Intrusion-induced behaviors, such as nest abandonment and decreased nest attentiveness, have led to reduced reproduction and survival in species intolerant of intrusion (USDA, 2010). In the EOR Region, the long-eared myotis (*Myotis evotis*), long-legged myotis (*Myotis volans*), northern prairie skink, silver chub (*Macrhybopsis storeriana*), pearl dace (*Margariscus margarita*), northern redbelly snake (*Storeria occipitomaculata occipitomaculata*), peregrine falcon, yellow rail (*Coturnicops noveboracensis*), black-billed cuckoo (*Coccyzus erythrophthalmus*), and red-headed woodpecker (*Melanerpes erythrocephalus*) are some of the sensitive species that could be affected by human disturbance, especially during the breeding season (generally March through July for these bird species) in this region. Some mussels, invertebrates, and plant species may also be affected (Foreman and Alexander, 1998; Bury, 1980; Appendix M).

No new, direct, adverse impacts from light pollution are anticipated in urbanized areas. Indirect impacts depend upon the quantity and strength of the lights, the size of the area they illuminate, and the habitat types surrounding them. Lights in a heavily forested habitat would affect a much smaller area than those in grasslands or on a ridge top. Most nocturnal wildlife will avoid artificially lighted areas. However, these areas may attract insects, potentially providing a larger food source for certain wildlife.

8.3.1.3 Air and Marine Operations

Impacts to Terrestrial Resources

Impacts to terrestrial resources from air and marine operations are expected to be minor to moderate and short-term in duration. In the WOR and EOR Regions, low-level flights (helicopter or fixed-wing) may displace some wildlife or disrupt their normal behavior, including elk (*Cervus canadensis*) and bighorn sheep (*Ovis canadensis*). In the Great Lakes and New England Regions, white-tailed deer (*Odocoileus virginianus*) and moose (*Alces alces*) may similarly be disturbed, as well as the bobcat (*Lynx rufus*) in the New England Region.

Monitoring flights, generally at or above 800 feet, are infrequent and create temporary, negligible to minor impacts on wildlife (USDOJ, 2005). Bird impacts with aircraft can pose a problem. The Federal Aviation Administration (FAA) wildlife strike database contains over 108,000 records of strikes between 1990 and 2008 (USDOT, 2010). Pilots report over 5,000 bird strikes every year. The economic damage from bird strikes has been reported to be at least \$400 million from impacts with commercial and military aircrafts (Scott, 2009). However, the number of flights conducted by CBP is minimal compared to total number of commercial and private

aircraft flights in the area; therefore, impacts related to CBP aircraft would be expected to be a small fraction of any annual total.

Blackhawk flying over Northern Border



Source: (USDHS, No Date[b]).

Impacts to Aquatic Resources

Impacts to aquatic resources are expected to be minor based on the small fraction of water-based patrols conducted compared to general public and commercial boating activity. Potential short- and long-term impacts from the use of marine patrols and vessels along the northern border may include aquatic vegetation disturbance; generalized habitat disturbances; propeller strikes; heightened turbulence and waves eroding aquatic habitat and leading to long-term habitat alteration; exposure to pollutants that degrade water quality (affecting fish reproductive success and decreasing populations); and watercraft activity that may disturb normal nesting, spawning, or feeding behaviors of aquatic species (Asplund, 2000).

For example, in the WOR Region, leatherback turtles frequently swim or feed at the surface, and they are particularly vulnerable to vessel collisions, which frequently prove fatal (USDOC, 2010b). Threats to leatherback turtles relevant to CBP activity include vessel collisions, ingestion of marina and vessel debris (e.g., plastic bags, tar balls, and plastic pellets), dock construction, underwater noise, and fueling. While the potential impacts noted above are the possible result of the operation and maintenance of marine vessels, the number of watercraft operated by Office of Air and Marine (OAM) is a small fraction of the number of similar commercial and private vessels operated in the waters along the U.S. and Canadian border.

Introduction of aquatic invasive species, such as caulerpa seaweed (*Caulerpa taxifolia*) and parrotfeather (*Myriophyllum aquaticum*) (WOR Region); curly leaf pond weed, (*Potamogeton crispus*) and parrotfeather, (EOR Region); quagga mussel (*Dreissena rostriformis bugensis*), Eurasian watermilfoil (*M. spicatum*), and spiny waterflea (*Bythotrephes longimanus*) (Great Lakes Region); curly pondweed (*Potamogeton crispus*), flowering rush (*Butomus umbellatus*), Asian clam (*Corbicula fluminea*), and northern snakehead (*Channa argus*) (New England Region), can adversely impact native aquatic resources (Asplund, 2000). Zebra mussels (*D. polymorpha*), another aquatic invasive species in the New England Region, can quickly infest lakes and out-compete native mussels, altering water quality and habitat.

Lights near or on water at marinas may have an economically beneficial impact for fishermen due to light attraction by fish and shellfish; however, they could also displace and disorient nocturnal wildlife species that are sensitive to light or are exposed to predation by the light.

8.3.1.4 Motorized Ground Operations

Impacts to Terrestrial Resources

Impacts to terrestrial resources from motorized ground operations are expected to be minor to moderate. Off-road vehicles (ORV) and ATVs affect the natural habitats and behaviors of native plants and animals (with emphasis on endangered and threatened species) primarily through habitat degradation and disturbance. Injury or mortality of wildlife may result from direct collisions with vehicles. Tires of these vehicles may erode or compact the soil with each individual trail use. These types of activities could modify the landscape, resulting in a reduced litter layer, decreased soil microbial activity, reduced plant biomass and cover of native species, decreased reproductive success of native plants, changes to the genetic structure of plant populations, altered wildlife habitats, and increased exposure and spread of nonnative species.

The operation of ATVs can allow the transport of non-native plant species into a natural area. Nonnative species can negatively impact natural areas, agriculture, and horticulture (Simberloff, 1996). Indirect effects of noxious weed spread include the degradation of wildlife habitat, as well as declines in natural diversity, water quality, the palatability or abundance of wildlife forage, native plant diversity, and aesthetic value of the landscape. Nonnative species may also encroach on rare plant populations and their habitats, potentially reduce soil stability and subsequently increase erosion, and cause overall decline of ecosystem health (USDOJ, 2007).

Large animals are potentially at risk from short- and long-term impacts from motorized ground operations (and equipment) along the northern border. Mechanized patrols can cause higher levels of disturbance than foot or horse patrols (Canfield et al., 1999; Cassirer et al., 1992). Regional examples of such animals include the following:

- Mule deer (*Odocoileus hemionus*), moose (*Alces alces*), elk (*Cervus canadensis*), and mountain lion (*Puma concolor*) in the WOR and EOR Regions; and,
- Black bear (*Ursus americanus*), moose, and white-tailed deer (*Odocoileus virginianus*) in the Great Lakes and New England Regions.

Large mammals may use these trails for travel, increasing their possibility of encountering an ORV and being disturbed, injured, or killed (USDOJ, 2010b). ORVs are noisy and are likely to disturb large game species in some situations. Changes in behavior can include avoidance, attraction, or habituation (when animals get used to the presence of people). Big game can also experience physiological changes, such as stress due to repeated disturbance interrupting feeding or breeding behavior, reducing vigor, and reducing productivity, potentially leading to mortality (USDA, 2009).

Wildlife populations can be adversely affected by excessive noise levels, especially in previously undisturbed areas. Noise from motorized vehicles can be detrimental to wildlife in several ways. Certain species may be unable to successfully communicate with each other and use their own auditory senses; these limitations may have an impact on the long-term survival or behavior of a

species (Radle, 2007). Excessive noise can also lead to stress-related, physiological impacts and altered behavior, or injuries potentially leading to mortality. Excessive noise may also disrupt natural dispersal of some animal species. These effects can reduce local population size or cause reduced survivorship and reproductive productivity (Ouren et al., 2007).

Impacts to Aquatic Resources

Impacts to aquatic resources are expected to be minor to moderate. ORV use in wetlands has the potential to destroy vegetation, alter wetland functions, increase sediment loads, reduce plant growth or vigor, alter biodiversity and community composition, reduce vegetative cover, and increase the potential for increased exotic species invasion. Most wetlands are highly sensitive to ORV disturbances (especially in spring and summer), and even limited use in most wetlands can cause substantial and permanent impacts (Ouren et al., 2007). Stream crossings by ORVs or ATVs can increase turbidity, likely resulting in short- and long-term, minor, adverse effects on aquatic vegetation and invertebrates, and affecting waterfowl foraging and nesting habitat. Stream crossings in areas with salmon would also have short-term, minor, adverse effects by disturbing and displacing mammalian carnivores that forage on spawned-out adults, as well as exposing wildlife to hunting and trapping (USDOJ, 2010b).

Lights from conducting motorized ground operations near water may attract fish, and could displace nocturnal wildlife sensitive to light or exposed to predation by it.

8.3.1.5 Nonmotorized Ground Operations

Impacts to Terrestrial Resources

Impacts to terrestrial resources are expected to be minor to moderate. Foot or non-mechanized patrols pose a low risk of disturbance to sensitive, wildlife species.

Canine and horse patrols may affect wildlife in adjacent habitats. These operations are not expected to affect wildlife beyond a minor level. Indirect impacts may include introduction of pathogens and parasites, such as parvovirus and worms. Kennels create noise on a regular basis, and may displace some wildlife species from the immediate area. Wolves and coyotes would investigate feces from CBP dogs in remote areas, making them potentially susceptible to disease and parasite transmission. Canine and/or horse patrols also have a greater possibility to disturb natural areas through the introduction of invasive plant species through seed attached to hooves or fur. This can negatively impact natural areas, agriculture, and horticulture (Simberloff, 1996). Indirect effects of noxious weed spread include degradation of wildlife habitat, declines in natural diversity, decreased water quality, reduced aesthetic value of the landscape, encroachment upon rare plant populations and their habitats, potential reductions in soil stability and subsequent increases in erosion, and overall decline of ecosystem health (USDOJ, 2007).

8.3.1.6 Operation of Sensors and Other Technologies

This section describes the impacts of the operation of sensors and other technologies (including surveillance/communication towers and short-range radar).

Impacts to Terrestrial Resources

Impacts to terrestrial resources would be minor from the operation of sensors and other technology. Adverse impacts from regular maintenance of ground sensors are expected to be

short term and range from negligible to minor. CBP activities and deployment of sensors and other technologies in rural areas may have a greater potential to affect species adversely than do activities in urban regions.

Access roads to towers potentially provide hunters, poachers, mineral hunters, and other resource users access to previously unreachable areas. This access and associated increase in human activity can increase erosion and invasion of noxious weeds, affecting sensitive plant habitats. Habitat fragmentation can increase intrusion of nonnative species, introduce disease, or provide predators with access to once-sheltered prey species.

Impacts to threatened and endangered species include effects ranging from mortality to negative impacts on reproduction. Determining potential impacts to the mountain lion (*Puma concolor*), a listed species in New York and Vermont is important when contemplating CBP construction or surveillance activities in habitat frequented by cougars. A recovery plan for the cougar was developed in 1982; currently a 5-year review is underway, with an open-comment period for this species' planning process (USDOJ, 1982; USDOJ, 2011f). Section 8.3.6.3 discusses mitigation measures for threatened and endangered species.

The presence and operation of communication towers can cause long-term impacts to avian habitat, mortality, and behavior from tower collisions and/or tower avoidance. Lights on towers and other infrastructure may, under intermittent circumstances, attract avian species near electromagnetic or radio frequency emitting sources.

8.3.1.7 Site-Level Consideration of Ecological Impacts

Conceptual site modeling for CBP facility and infrastructure construction and modification projects would need to consider impacts to attributes of terrestrial ecosystems including: local air quality; connectivity to adjacent or otherwise complimentary terrestrial and aquatic resources and systems; surface water and groundwater exchange; and soil erosion, deposition, and drainage factors; and native key or rare species habitat and food supply including competition with invasives. Considerations for impacts to aquatic ecosystems include: sedimentation and channel erosion; drainage and flow-path connectivity; and native key or rare species habitat and food supply including competition with invasives. The management objectives for protected areas would be a major factor dictating the context for analysis of impacts. (Unnasch, et al, 2008)

8.3.2 FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE

Adverse impacts from this alternative are expected to be minor to moderate and adverse. There are a number of techniques available to assist in mitigating/reducing impacts; these are discussed more fully in Section 8.3.6—Best Management, Minimization, and Mitigation. The Facilities Development and Improvement Alternative would focus on providing new permanent facilities, such as BPSs, POEs, housing, and other facilities to allow CBP agents and officers to operate more efficiently and respond to situations more quickly. USBP agents in some locations are currently operating out of leased space—Federal, state, or county government buildings or other law enforcement agency buildings—or out of spaces that are over capacity. Many of the POE inspection facilities along the northern border operate in high traffic volume, 24 hours per day, 365 days per year, in extreme climates, and they undergo considerable wear and tear. These facilities, built for a different era of operations, are poorly configured to support CBP's evolving

trade facilitation and antiterrorism mission. A number of POEs need to be replaced or extensively upgraded, involving major construction. At this time, no new POE operations are planned (i.e., no new ports are planned on roads crossing the border that have not previously had a POE). If the need for a totally new trade and travel processing operation arises, CBP would complete a separate analysis to meet the NEPA requirements of that project.

Also included in this alternative is the construction of semi-permanent and temporary facilities, such as FOBs, temporary housing (where local housing stock may not be readily available), checkpoints, and other facilities necessary to support CBP law enforcement agents and officers as they carry out operational duties.

The list of activities noted below is a generalization of CBP activities that could be undertaken if CBP chose to follow this alternative:

- Modernize/upgrade existing POEs;
- Construct BPSs;
- Construct small facilities or modify facilities that support OAM operations;
- Construct communications towers;
- Set up permanent traffic checkpoints; and,
- Construct new FOBs.

8.3.2.1 Construction and Maintenance

Construction of any of the fixed-point facilities above could incur ecological consequences, especially in rural and relatively undisturbed habitat. Habitat disturbance can be a catalyst of ecological change (Turner, 2010). The potential for impact would depend on the location and footprint of the proposed construction; however, appropriate siting and implementation of construction mitigation practices would minimize impacts.

Impacts to Terrestrial Resources

Impacts to terrestrial resources from implementation of the Facilities Development and Improvement Alternative are expected to be minor to moderate. Land-use alteration for new facilities, and associated human activities, may disrupt wildlife movement or behavior, especially during important migration or breeding periods.

Construction activities may cause soil erosion or compaction, leading to a reduction in the litter layer, decreased soil microbial activity, reduced plant biomass and cover of native species, decreased reproductive success of native plants, changes in the genetic structure of plant populations, and alteration of wildlife habitats.

Habitat modification of relatively undisturbed areas could have a number of effects on wildlife, especially threatened and endangered species. Such activities could reduce cover, foraging, and nesting habitat for some species in the immediate area of the facility. Newly constructed road and trail networks could fragment the landscape, increasing isolation and decreasing patch sizes of suitable habitat potentially causing loss and fragmentation of habitat, increased competition, and movement barriers. The sandhill crane (*Grus canadensis*), for example, is a species that

inhabits the EOR Region. Sandhill cranes inhabit open marshes and wetlands during the breeding season, as well as grain fields, shallow lakes, and meadows during the winter and on migration routes. Sandhill cranes feed on mollusks, crustaceans, small vertebrates, and waste grain. Building new facilities in fallow fields or cropland causes a loss of breeding or migratory stopover habitat and directly impacts the crane population in the local area. The whooping crane (*G. americanus*) is an example of an endangered and highly monitored species in Montana and North Dakota. It inhabits open marshes and wetlands during breeding season as well as grain fields, shallow lakes, and meadows during the winter and on migration routes, feeding on mollusks, crustaceans, small vertebrates, and waste grain. Any disturbance that causes a loss of breeding or migratory stopover habitat can directly impact the populations of this species.

An example of a state threatened or endangered species within the Great Lakes Region that may be disturbed by human activity is the peregrine falcon (*Falco peregrinus*), which is listed as state-endangered in Minnesota and Ohio, and as threatened in Michigan and New York. These falcons prefer open habitats around water, with tall cliffs where they nest on ledges on bare, steep, rock walls. Since young are completely dependent on their parents, any disturbance during their breeding season may cause a decrease in nesting sites and local populations.

Land alterations have greatly affected oak trees in the East Coast. Changes due to climate, land use, and natural area disturbance have all contributed to the decline of white oak trees (Abrams, 2003). Red and chestnut oaks have been replacing white oaks in these areas; however, red oaks are more susceptible to a pathogen known as sudden oak death (*Phytophthora ramorum*) (McShea et al., 2007). Any construction activities may further the decline of oak species in this region.

Many species are associated with large contiguous habitats; for example, the northern spotted owl (*Strix occidentalis*) (WOR Region), the American marten (*Martes americana*) (WOR and EOR Regions), and the Northern Goshawk (*Accipiter gentilis*) (Great Lakes and New England Regions) depend upon large old growth forests (USDA, 2010). Creation of permanent structures in these old growth forests and increased development would convert the area in the immediate vicinity (USDOJ, 2010c) and eliminate the impacted area as suitable habitat for these endangered species. Clearing for trails or temporary structures also impacts old growth forests as the vegetation in the cleared area would be converted to early successional stages, reducing the overall coverage of old growth and potentially fragmenting the forest.

Disturbance of natural areas caused by construction or maintenance activities may lead to the introduction of invasive plant species that could be brought in (e.g. seed in the tire treads of construction vehicles). This can negatively impact natural areas, agriculture, and horticulture (Simberloff, 1996). Indirect effects of noxious weed spread include degradation of wildlife habitat, declines in natural diversity, decreased water quality, reduced aesthetic value of the landscape, encroachment upon rare plant populations and their habitats, potential reductions in soil stability and subsequent increases in erosion, and overall decline of ecosystem health (USDOJ, 2007).

Increased construction activity and human presence could potentially displace and disturb certain wildlife species, forcing them into adjacent habitats either temporarily or permanently. Within a construction zone, less-mobile species, such as small mammals, reptiles, and amphibians, could

be destroyed by clearing, grading, compaction, and other construction activities. These impacts would remain localized and limited to the immediate vicinity of the project site. Threatened and endangered species may have specific permitting or monitoring protocols when addressing these types of impacts.

Minor and temporary adverse impacts could occur to some medium and large mammals (such as elk [*Cervus canadensis*] or mule deer [*Odocoileus hemionus*]) with extensive home ranges due to fencing, which would restrict their movement onto the land for foraging or other activities.

The presence and operation of communication towers can cause long-term impacts to avian habitat through mortality due to tower collisions and avoidance behaviors.

Wildlife populations can be adversely impacted by excessive noise levels caused by construction or maintenance activities, especially in previously undisturbed areas. Noise can be detrimental to wildlife in several ways. Certain species may be unable to successfully communicate with each other or to use their own auditory senses (Radle, 2007). Excessive noise can also lead to stress-related physiological impacts and altered behavior, or injuries potentially leading to mortality. Excessive noise may also disrupt natural dispersal of some animal species. These effects can reduce local population size or cause reduced survivorship and reproductive productivity (Ouren et al., 2007). Generally, those species that are sensitive to noise as described above would avoid the area.

No new direct adverse impacts from light pollution are anticipated in urbanized areas. Indirect impacts depend upon the quantity and strength of the lights, the size of the area they illuminate, and the habitat types surrounding them. Lights in a heavily forested habitat would affect a much smaller area than those in grasslands or on a ridge top. Most nocturnal wildlife will avoid artificially lighted areas. However, these areas may attract insects, potentially providing a larger food source for certain wildlife.

Impacts to Aquatic Resources

Land-use alteration for new facilities and associated human activities may impact aquatic wildlife and resources to a minor degree. Alpine lakes, streams, and rivers of the northwestern Rocky Mountains are especially susceptible to disturbance from construction. Sedimentation and impaired water quality can affect the abundance of invertebrates, and can reduce fish and other aquatic populations. Carrying capacities (the maximum population that an area will support without undergoing deterioration) for juvenile salmon and trout declined when road construction without adequate protections caused low dissolved-oxygen concentrations and adverse sedimentation (Eaglin and Hubert, 1993).

Piers and boat ramps can indirectly lead to pollution of waters due to spills, intentional littering or waste disposal, fuel leaks, anti-fouling treatments of piles, or introduction of nonnative organisms (on boat hulls or discharged from boats). Damage to fish and other aquatic species can potentially occur if sediments, fuel, or product spills enter a waterway. Near-surface water and runoff can carry material off-site, contaminating larger areas. Siltation and runoff can degrade or modify aquatic habitat, adversely affecting aquatic animals and fish species.

Construction can have indirect, permanent or temporary effects on wetlands. Permanent wetland loss can occur when wetlands or surface waters are permanently filled, drained, or otherwise converted for placement of structure or impervious surfaces. Temporary impacts occur when material is placed in wetlands and surface waters to create access and storage for construction, and is removed when construction is complete. Vegetation clearing within or adjacent to wetlands, bordering streams, and water bodies can also have temporary or permanent impacts.

Indirect effects to wetlands and surface waters include increased sedimentation and erosion from construction and nonpoint-source runoff, reducing the quality of aquatic habitats. Increased potential for introduction of non-native species and increased artificial lighting can adversely affect use of the wetlands by wildlife (e.g., amphibian breeding). Installation of barrier or silt fencing for construction can restrict wildlife movement in and out of the wetland. Shoreline construction may also interfere with wetlands or estuaries that provide habitat.

8.3.2.2 Site-Level Consideration of Ecological Integrity

Conceptual site modeling to plan for any future CBP proposal for facility construction and modification projects would need to consider impacts to attributes of terrestrial ecosystems including: local air quality; connectivity to adjacent or otherwise complimentary terrestrial and aquatic resources and systems; surface water and groundwater exchange; and soil erosion, deposition, and drainage factors; and native key or rare species habitat and food supply including competition with invasives. Considerations for impacts to aquatic ecosystems include: sedimentation and channel erosion; drainage and flow-path connectivity; and native key or rare species habitat and food supply including competition with invasives. The management objectives for protected areas would be a major factor dictating the context for analysis of impacts. (Unnasch, et al, 2008)

8.3.3 DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE

The Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative focuses on deploying more effective detection, inspection, surveillance, and communications technology, and on making improvements and upgrades to current technology. About 100 small construction projects are planned under this alternative, such as towers and other infrastructure to mount antennas. This alternative also includes increasing aircraft operations to no more than 125 flights per day and increasing marine vessel operations to no more than 175 operations per day. About 200 non-motorized and 1,300 motorized ground patrols would occur each day. Use of systems including remote sensors, short-range radar, remote video surveillance systems (RVSS) and mobile surveillance systems (MSS), new camera systems, and stationary communications systems would increase to about 2,500 hours per day. The use, deployment, and upgrades of these technologies would be similar to those in the No Action Alternative.

Impacts from additional activities under this alternative are expected to be minor and adverse and the overall potential impact to biological resources from implementing this alternative would be moderate and adverse. There are a number of techniques available to assist in mitigating and reducing impacts; these are discussed more fully in Section 8.3.6—Best Management, Minimization, and Mitigation. The Detection, Inspection, Surveillance, and Communications

Technology Expansion Alternative would deploy more effective surveillance and communication technologies in support of CBP activities. It would include improvements to the identification and inspection technologies used by the Office of Field Operations (OFO), as well as continuing Office of Technology Innovation and Acquisition (OTIA) and Office of Information Technology (OIT) technological developments and plans.

Cargo Inspection at Seaport



Source: (USDHS, No Date[c]).

8.3.3.1 Operation of Sensors and Other Technologies (including surveillance and communication towers)

Impacts to Terrestrial and Aquatic Resources

Fielding the upgrades under this alternative would have impacts similar to those in the No Action Alternative and therefore would be moderate and adverse.

8.3.3.2 Site-Level Consideration of Ecological Integrity

Conceptual site modeling to plan for any future CBP proposal for projects deploying more effective detection, inspection, surveillance, and communications technology would need to consider impacts from supporting infrastructure to attributes of terrestrial ecosystems including: connectivity to adjacent or otherwise complimentary terrestrial and aquatic resources and systems; surface water and groundwater exchange; and soil erosion, deposition, and drainage factors; and native key or rare species habitat and food supply including competition with invasives. Considerations for impacts to aquatic ecosystems include: sedimentation and channel erosion; and native key or rare species habitat and food supply including competition with invasives. Greater consideration of increased intrusions from ground, aerial, and water-based patrols would need to be factored into conceptual models for project are impacts. (Unnasch, et al, 2008)

8.3.4 TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE

The Tactical Security Infrastructure Deployment Alternative would focus on constructing additional barriers (e.g. selective fencing, vehicle barriers, etc.) at select points along the northern border to deter and delay cross-border violators (CBVs). It would also include construction of access roads and related facilities to increase the mobility of USBP agents for surveillance and response to international border violations. About 30 small projects (< ¼ mile

in length) and about 5 large projects (> ¼ mile in length) would take place under this alternative. As discussed in the No Action Alternative, the construction of roads and barriers reduces the amount of natural habitat, creates barriers to the migration and movement of species, and fragments habitat and home ranges.

Impacts from this alternative are expected to be minor to moderate, adverse impacts. There are a number of techniques available to assist in mitigating/reducing impacts; these are discussed more fully in Section 8.3.6— Best Management, Minimization, and Mitigation. The Tactical Security Infrastructure Deployment Alternative would construct additional barriers (selective fencing, vehicle barriers, etc.) at selected points along the border to deter and delay CBVs. It would also construct additional access roads and related facilities to increase the mobility of USBP agents for surveillance and response to various international border violations.

Below is a list of construction activities that CBP has undertaken or will undertake in the future. This list is not all-inclusive, but illustrates possible construction of linear facilities. The potential impact to biological resources from such activities would be similar to, but in some cases distinct from, the potential impact from construction of fixed-point facilities (described in the Facilities Development and Improvement Alternative).

- Construction of pedestrian or vehicle fences or other physical barriers; and,
- Construction of access roads, drag roads, bridges, culverts, and low-water crossings.

Construction of any of the linear facilities above could have ecological consequences, especially in rural areas and relatively undisturbed habitat. Disturbance of habitat can be a catalyst of ecological change (Turner, 2010). The potential for impact would depend on the location and footprint of the proposed construction.

8.3.4.1 Construction and Maintenance of Linear Facilities

Impacts to Terrestrial Resources

Disturbance may occur during construction of fences and barriers, and it may result in site-specific effects to biological resources. Negative direct or indirect effects during construction, operation, and maintenance could affect threatened and endangered resources, wildlife, and vegetative habitat unless avoidance and minimization measures are used. Long stretches of barrier fencing can prove deleterious to ecological systems. Such fencing could severely fragment habitat, or could disrupt migratory or post-breeding movement of animals. It could also introduce non-native species or disease into new or sensitive areas, or provide predators with access to otherwise sheltered prey species. Disturbance of forested habitats by road or trail construction would likely result in more impact on wildlife than similar construction in croplands or grasslands. Direct environmental impacts due to erection of barriers or fencing may include collision, entrapment, or mortality for wildlife coming in contact with the fence. Indirect impacts include habitat fragmentation and inaccessibility to resources, such as water and food.

Unintended environmental impacts could occur between border crossing stations and along barrier corridors. Access and patrol roads along barriers or fences could provide hunters, poachers, mineral hunters, and others access to previously inaccessible areas. Increased potential for poaching, illegal shooting, and incidental trapping can substantially harm species with low

numbers, affecting population stability (Foreman and Alexander, 1998; Simmons et al., 2010; Wisdom, 2007; Rowland et al., 2005). Major highways create movement barriers for many wildlife species, particularly wide-ranging carnivores and hoofed animals, and are suspected of being a major factor in the decline of some forest carnivores, such as the fisher (*Martes pennanti*) and the American marten (*M. Americana*) in the WOR and New England Regions, and the Black Bear (*Ursus americanus*) in the Great Lakes Region (USDA, 2010).

New construction of roads, culverts, and bridges has ecological consequences. One problem is habitat fragmentation, in which the amount of large, contiguous habitat for a species is reduced by human activity. Habitat fragmentation due to road construction can isolate wildlife populations and is considered a growing and substantial threat to species persistence (Reed, 2004). Rare or declining amphibian populations and some grassland bird species may be negatively affected by increasing road density. Some grassland bird species will no longer breed in areas where habitat patch size is below an area threshold. Examples of such bird species include the sharp-tailed grouse (*Tympanuchus phasianellus*) in the WOR Region, the Greater Prairie Chicken (*T. cupido*) and Greater Sage Grouse (*Centrocercus urophasianus*) in the EOR Region, the Sharp-tailed Grouse in the Great Lakes Region, and the Henslow's Sparrow (*Ammodramus henslowii*) in the New England Region.

“Roadway barriers can reduce access to resources and disrupt population dynamics” (Simmons et al., 2010), possibly leading to extirpation of a species in the affected area. Reduction of habitat connectivity may limit movement and dispersal, affecting population dynamics and causing eventual elimination of a species from a geographic area. Long-term habitat impacts would result from permanent changes to vegetation structure, primarily where vegetation is prevented from reoccupying areas of development. Creation of permanent structures and growth of non-natural ground cover would convert many habitats to early successional vegetation stages (USDOI, 2010c).

Construction of roads, trails, and fences may lead to the introduction and spread of invasive species. Disturbance of natural areas caused by construction or maintenance activities may lead to the introduction of invasive plant species. This can negatively impact natural areas, agriculture, and horticulture (Simberloff, 1996). Indirect effects of noxious weed spread include degradation of wildlife habitat, declines in natural diversity, reduced aesthetic value of the landscape, encroachment upon rare plant populations and their habitats, potential reductions in soil stability and subsequent increases in erosion, and overall decline of ecosystem health (USDOI, 2007).

Fill soils for road construction could introduce the seeds of weed and invasive species into the seed bank of a previously undisturbed area. Soil compaction could alter hydrology in or near wetlands or waterways.

In general, wildlife road mortality increases with traffic volume and speed. Small mammals, reptiles, and amphibians are more vulnerable because individuals are inconspicuous and slow-moving. Amphibians may be especially vulnerable to road mortality because their life histories often involve migration between wetland and upland habitats. Raptors are also vulnerable to collisions on forest roads due to their foraging behaviors (USDA, 2010).

Construction of additional access roads would allow more patrols by standard ORV, and ATVs. Developing new and more-accessible trails for this region could produce impacts on wildlife and protected landscapes. The scope and extent of these impacts are likely to increase if an extensive motorized transport is involved, especially with increased public use.

Increased human activity can cause changes in wildlife behavior. Studies have documented shifts in animals' home range and foraging patterns, and disturbance of nesting or breeding behaviors from motorized road or trail use and associated increased human activity. Many species avoid areas close to roads or trails, or exhibit flight behavior within a certain distance of route use. Black bears (*Ursus americanus*), for example, cross roads with low traffic volume more frequently than those with high volume. They almost never cross interstate highways (Baruch-Mordo et al., 2008; Kasworm and Manley, 1990) (EOR, Great Lakes, and New England Regions).

Noisy activities or visible human activities at sensitive locations (e.g., nest trees) have the potential to disrupt normal behavior patterns. Intrusion-induced behaviors, such as nest abandonment and decreased nest attentiveness, have led to reduced reproduction and survival in species intolerant of intrusion (Korschgen and Dahlgren, 1992).

Impacts to Aquatic Resources

Direct, adverse impacts to wetland habitats and plant communities could result from soil erosion, sedimentation, and hydrologic alterations due to road, culvert, or bridge construction projects. Roads near riparian corridors pose a risk to aquatic habitat quality and population structure. Roads can route sediment into water bodies, fragment aquatic habitat creating barriers to migration, and provide vectors for aquatic nuisance species and hazardous materials. Additionally, roads can allow access to riparian areas for livestock, leading to widespread degradation of stream banks, in-channel aquatic habitat, and riparian vegetation (USDA, 2008).

Long-term effects from access roads may come from the runoff and associated erosion of road materials into riparian areas associated with heavy rainfall, snowmelt, and maintenance activities. Runoff from access roads could contribute additional sediment to streambeds, clog fish gills, reduce dissolved oxygen levels, form additional sandbars, and fill in coarse substrate (USDOI, 2010c). Salmon and trout (including steelhead) are at risk from sedimentation due to construction and road building activities in the vicinity of streams or rivers. Applying best management practices will reduce the potential severity of the impact. Much of Puget Sound, the Strait of Juan de Fuca, Georgia Basin, and associated streams and rivers in Washington are critical habitat for the Chinook salmon (USDOC, 2007). Avoiding or minimizing habitat disturbance from construction or road building during the spawning season will reduce short-term impacts.

8.3.4.2 Site-Level Consideration of Ecological Integrity

Conceptual site modeling considerations to plan for any future CBP proposal for tactical security infrastructure fielding would be similar to that for the Facility Development Alternative. However, due to the potential for a greater extent of projects in sensitive ecological systems conceptual site models would need to incorporate greater consideration of the additive impacts of multiple CBP projects in ecosystems and protected land management units. As is the case for

facility construction projects, CBP would need to consider impacts to attributes of terrestrial ecosystems including: local air quality; connectivity to adjacent or otherwise complimentary terrestrial and aquatic resources and systems; surface water and groundwater exchange; and soil erosion, deposition, and drainage factors; and native key or rare species habitat and food supply including competition with invasives. Considerations for impacts to aquatic ecosystems include: sedimentation and channel erosion; drainage and flow-path connectivity; and native key or rare species habitat and food supply including competition with invasives. The management objectives for protected areas would be a major factor dictating the context for analysis of impacts. (Unnasch, et al, 2008)

8.3.5 FLEXIBLE DIRECTION ALTERNATIVE

The Flexible Direction Alternative allows CBP to use a mix of any of the actions described in the previous four alternatives on an as-needed basis to respond to evolving threats along the border. Adverse impacts from this alternative are expected to be minor to moderate and adverse. There are a number of techniques available to assist in mitigating/reducing impacts; these are discussed more fully in Section 8.3.6—Best Management, Minimization, and Mitigation. This alternative would allow CBP to follow a mix of any of the above directions based on CBP’s programmatic needs along the northern border. The required mix of mitigation measures could change as a result of changes in CBP programmatic need activities along the Northern Border. This alternative could be expected to cause the maximum impact that may result from full implementation of the other alternatives described above. However, as discussed above, the impacts related to each alternative would be minor to moderate. For each proposed action the applicable BMPs would be applied to minimize the potential impacts. Therefore, the impacts of the Flexible Direction Alternative are expected to be minor to moderate.

8.3.5.1 Site-Level Consideration of Ecological Integrity

Conceptual site modeling for CBP facility and infrastructure construction and modification projects would need to consider impacts to attributes of terrestrial ecosystems including: local air quality; connectivity to adjacent or otherwise complimentary terrestrial and aquatic resources and systems; surface water and groundwater exchange; and soil erosion, deposition, and drainage factors; and native key or rare species habitat and food supply including competition with invasives. Considerations for impacts to aquatic ecosystems include: sedimentation and channel erosion; drainage and flow-path connectivity; and native key or rare species habitat and food supply including competition with invasives. The management objectives for protected areas would be a major factor dictating the context for analysis of impacts. (Unnasch, et al, 2008)

8.3.6 BEST MANAGEMENT, MINIMIZATION, AND MITIGATION

CBP seeks to avoid, reduce, minimize, and, when necessary, repair the impacts of its actions on the human environment. It does so with a combination of best management practices, siting plans, design strategies, mitigation measures, and monitoring plans best suited to reduce the severity of an impact given the scale and the location of the particular action. In some cases, the law requires mitigation solutions for certain direct impacts. These measures would be negotiated and coordinated with applicable Federal, state, and local agencies.

In general, CBP would ensure that applicable construction activities follow the U.S. Department of Homeland Security (DHS) Environmental Planning Management Directive 025-01,

Sustainable Practices for Environmental, Energy and Transportation Management. CBP will avoid or minimize habitat loss, disturbance, and fragmentation through appropriate site design. A construction stormwater general permit would be obtained prior to construction requiring a notice of intent (NOI) to implement an action. CBP would incorporate appropriate BMPs for project construction to minimize area disturbance. CBP sustainable practices include measures to manage highly erodible soils, wastewater, runoff, noise, light, and discharge of hazardous substances. As required by Federal and state law, CBP implements erosion-control measures and appropriate BMPs before, during, and after soil-disturbing activities. Depending on project needs and requirements, CBP would implement other protective measures to prevent or limit the spread of invasive plants or animals into native habitats.

CBP implements protective and mitigation measures for threatened and endangered species and for other specially protected species. For example, if a construction activity would likely harm certain migratory birds or their habitat, the Migratory Bird Treaty Act requires surveys to locate and avoid active nest sites. Applicable permits would be sought if construction would likely affect migratory birds. To avoid and minimize impacts to biological resources, CBP will strive to site new buildings or structures outside of wetlands, sensitive wildlife habitats, migratory flyways, or habitat of threatened or endangered species. While minimal to moderate potential adverse impacts for the listed alternatives exist when combined with other similar activities and actions related to the project, direct and cumulative effects could be reduced to acceptable levels through in-house BMPs, environmental regulatory compliance, and interagency consultation.

There are three broad categories of potential impacts to biological resources from CBP activities for which this PEIS identifies mitigating actions:

- Impacts to general wildlife and habitat (8.3.6.1);
- Impacts to wetlands and aquatic resources (8.3.6.2); and,
- Impacts to threatened and endangered species (8.3.6.3).

8.3.6.1 Mitigation for Impacts to General Wildlife and Habitat

Site-specific NEPA review would be required if impact to wildlife is a concern at a particular construction site. Planning activities will take the species into consideration within site-specific NEPA review.

Black bear



Source: (NDL, No Date).

Ground-disturbing construction activities should not take place during wildlife migration or breeding periods without consultation with the U.S. Fish and Wildlife Service (USFWS) and applicable Federal, state, local, Tribal, or private land managers and owners. If construction or demolition is scheduled to start during these periods, steps should be taken to prevent species from using areas of potential impact. Possible steps include: covering equipment and structures; surveying specific sites for nesting migratory birds prior to clearing them; and establishing buffers around known breeding and high-use areas (USDOD, 2008). CBP would implement BMPs to prevent soil erosion and sedimentation during construction.

Reducing vehicular use in sensitive areas helps to protect wildlife habitat. Vehicle barriers would also discourage activity in sensitive areas. Routinely washing and inspecting vehicles for vegetation, seeds, insects, and animals would also reduce the risk of transporting non-native or invasive species into off-road environments.

The USFWS has provided recommendations to communications companies and the Federal Communications Commission (FCC) on tower height, lighting regimes, and placement (USDOJ, 2000). Redesigned lighting on communications towers can limit avian mortality from collisions, which frequently occur on nights with bad weather (fog or low cloud ceiling). Use of strobe or white lights and removal of non-flashing and steady-burning red lights can substantially reduce avian mortality (Gehring et al., 2009).

Increased activity along roads may contribute to weed seeds in grassland and prairie soils. Due to the longevity of the seed banks of weed species, any grassland excessively disturbed by patrols could experience a future increase of invasive weeds, which may ultimately result in a loss of native grassland species (Renne and Tracy, 2007). Habitats are highly susceptible to invasive plant infestations once disturbed. Non-native invasive plant species can negatively impact natural areas, forestry, agriculture, and horticulture (Simberloff, 1996). Those CBP activities that may accidentally introduce invasive species should be monitored, and introductions of harmful plants prevented, when possible.

Disturbance could occur during construction of roads, bridges, culverts, and low-water crossings. Soil disturbance during construction may result in site-specific effects to biological resources. CBP would implement BMPs to prevent soil erosion and sedimentation during construction. Negative direct or indirect effects during construction, operation, and maintenance activities may affect threatened and endangered resources, wildlife, vegetative habitat, and aquatic resources without use of avoidance and minimization measures.

Use of native vegetation as part of site landscaping could benefit some birds, small mammals, and insects by providing food and cover. These negligible indirect benefits would be limited to small mammal, insect, and avian species not restricted by the fence surrounding a facility.

8.3.6.2 Mitigation for Impacts to Wetlands and Aquatic Resources

Construction of new POEs (at this time, no new POEs are planned) would require an assessment of those wetlands and surface waters potentially affected under existing Federal and state regulations in compliance with NEPA. Section 404 of the Clean Water Act requires that projects affecting wetlands follow the sequential process of avoiding adverse wetland and surface-water

effects, then minimizing impacts not practicably avoided, and then compensating for impacts that cannot be further minimized through wetland mitigation and restoration.

Secondary impacts to wetlands would be mitigated through use of BMPs that reduce erosion and sedimentation during POE construction. These practices include minimizing the length of time that bare soil remains exposed, including timely reseeded and mulching. Construction and maintenance of potable water and long-term sediment and surface-water retention features could further reduce erosion and sedimentation. CBP may provide and implement an erosion and sediment control plan to protect wetlands and other waterways from additional storm water runoff. Landscaping near wetlands would include native species to avoid introducing invasive species. Invasive plant species management includes the cleaning of construction equipment prior to site entry.

CBP would take measures to keep unavoidable wetland and surface-water impacts within the threshold of USACE and state-issued, nationwide and general permits (0.5 to 3 acres of wetland impact, depending on construction location). Mitigation would be required to compensate for unavoidable wetland loss. Depending on the state, mitigation could include purchase of credits from a wetland mitigation bank, monetary compensation for wetland loss, or wetland restoration or preservation. Impacts to wetlands would normally be no more than moderate, and are likely to become minor with mitigation requirements. Any new POE facility will be evaluated through the NEPA process as well as through Federal and state permit processes, ensuring reduction of individual and cumulative impacts of the authorized activities.

CBP would provide and implement a long-term erosion and sediment control plan for storm water treatment structures. Secondary impacts from new lighting structures would be reviewed during the permitting process based on potentially affected wildlife (e.g., breeding amphibians). Landscaping near wetlands could include planting native species to avoid introducing invasive species. Invasive plant species management would also include cleaning construction equipment prior to site entry.

All disturbed areas should be mulched and revegetated with native woody and herbaceous species (USDOJ, 2011c).

Consultation with USFWS will be needed if endangered or threatened species are found in affected wetlands.

To protect fish spawning, no in-water work should occur during seasons designated by appropriate resource agencies for the potentially affected protected species, and similar time constraints may affect work scheduling if aquatic endangered species' breeding, nesting, or egg-laying activities take place (USDOJ, 2011c).

Also routinely washing and inspecting watercraft for vegetation, seeds, and marine animals would reduce the risk of transporting non-native or invasive species into surface waters.

8.3.6.3 Mitigation for Impacts to Protected Species

Under the implementing Federal regulations (50 CFR 402), Federal agencies must review proposed actions and determine whether an action may affect federally listed and proposed

species, or proposed or designated critical habitat. To accomplish this, a request is made to the USFWS for a list of species and critical habitat that may be in the project area (USDOJ, 2010d).

Once a species list is obtained or verified as accurate, Federal agencies must determine whether their actions may affect any listed species or their critical habitat. If no species or their critical habitats are affected, no further consultation is required. If species may be affected, the agency must consult with the USFWS (USDOJ, 2010d).

Marbled Murrelet



Source: (NDL, No Date).

Implementing avoidance and minimization efforts may reduce potential impacts to listed species. The potential effects by region are as follows. Species locations by county can be found in Appendix M.

- In the WOR Region, for example, the woodland caribou (*Rangifer tarandus caribou*), the spotted owl (*Strix occidentalis*), and the marbled murrelet (*Brachyramphus marmoratus*) have specific habitat requirements. Construction and disturbance in high-quality, intact habitat where these species occur should be avoided to the greatest extent practicable. In addition to avoiding construction disturbance in areas of intact grizzly bear (*Ursus arctos horribilis*) habitat, minimization of new road construction and limiting road access by means including closing unneeded roads on Federal land can create roadless habitat for grizzlies and other threatened and endangered species. Such measures should be balanced to avoid creating national security vulnerabilities. CBP can minimize impacts to the leatherback turtle (*Dermochelys scoriacea*) by reducing use of nocturnal lighting around marine and coastal sites, which can disturb navigation, in areas of known turtle activity.
- In the EOR Region, the same considerations as in the WOR Region apply for reducing impacts to grizzly bears. The black-footed ferret (*Mustela nigripes*) requires extensive grassland habitat, particularly in North Dakota. Construction and disturbance activities in high quality, intact habitat that this species inhabits should be avoided, as this is one of the most endangered mammals in the United States (USDOJ, 2008b). Impacts to migrating whooping cranes (*Grusa mericanus*) may be minimized by avoiding marshes and prairie potholes in the summer and known migratory pathways in the spring and fall.
- In the Great Lakes Region, the piping plover (*Charadrius melodus*) nests along the shoreline of lakes Superior, Michigan, Huron, Erie, and Ontario. Activities that disturb

nest sites should be avoided to the greatest extent practicable. The Hine's emerald dragonfly (*Somatochlora hineana*) requires specific wetland habitat. Construction and disturbance activities in or near documented critical habitat should be avoided.

- In the New England Region, the roseate tern (*S. dougallii*) is a beach-nesting species with populations along the Atlantic Coast. Activities that disturb nest sites should be avoided to the greatest extent practicable. Atlantic salmon (*Salmo salar*) populations are in decline, so construction and disturbance activities in or near designated critical habitat should be avoided.

Surveys are recommended to determine the presence or probable absence of species near the proposed site if the proposed projects directly or indirectly affect any of the habitat types for federally listed species in the region. Any survey should be designed and conducted in coordination with the endangered species coordinator at the nearest USFWS office. Surveyors must also have valid Federal and state permits to take stock of federally listed species (USDO, 2011b).

Surveys for protected species should be conducted prior to construction in areas where expected impacts to protected species are a concern. If protected plant species are growing in a proposed construction area, populations would be flagged for avoidance prior to construction.

Threatened and endangered species are protected from "take," which includes harassment or killing of these rare species. If impacts to protected species cannot be avoided, CBP must enter into formal consultation with USFWS by submitting a biological assessment in accordance with Section 7(c) of the Endangered Species Act (ESA); except when USFWS concurs, in writing, that a proposed action "is not likely to adversely affect" listed species or designated critical habitat (50 CFR §402.14). USFWS will then provide a biological opinion and incidental take statement. The statement will specify the amount or extent of anticipated impact of any incidental taking of endangered or threatened species and also provide reasonable and prudent measures that are necessary to minimize impacts and set forth terms and conditions with which CBP must comply in order to implement the reasonable and prudent measures.

Construction, maintenance, or surveillance activities during the breeding season, migration, or winter can affect bald eagles throughout a project area. USFWS offers guidance for activities near nesting eagles (USDO, 2010f). To avoid disturbing nesting bald eagles, USFWS recommends maintaining natural forested (or vegetative) buffers around nest trees and avoiding certain activities during the nesting season. Buffer areas reduce the visual and auditory impacts of human activities near nest sites. In other seasons, disturbance may still occur, and USFWS guidance provides methods to limit disturbance and other potentially deleterious impacts.

If any active eagle nests are within 0.5 miles of a CBP project site in Ohio, the Ohio Department of Natural Resources recommends work restriction from mid-January through July to allow pre-nesting activities, incubation, and raising of the young (USDO, 2011c).

Site-specific and surrounding area effects to threatened and endangered resources, wildlife, vegetative habitat, and aquatic resources may occur. Site-specific evaluations have been or would be conducted prior to POE modernization and upgrading activities. CBP maintains an

ongoing operational and environmental education initiative to avoid and minimize impacts to biological resources to the greatest extent practicable.

While some minor to moderate adverse impacts to biological resources will occur regardless of the alternative chosen, mitigation actions can reduce both real and potential impacts. A comparison of CBP activities to similar activities by the general public may prove helpful in determining overall impact. For example, while CBP may have many marine vessels in use within the WOR Region, over 1,000,000 marine vessels are registered in this area for public and commercial usage. CBP conducts numerous motorized ground operations in a typical day, compared with millions of vehicles in use by the public.

Although the above comparison is instructive, it is still possible for the improper or compromised use of one vehicle on a single occasion to harm sensitive habitat. Therefore, the training and mitigation plans above, as well as interagency coordination in determining locations of sensitive habitat, remain critically important in carrying out the CBP mission while maintaining a healthy ecosystem.

8.3.7 SUMMARY OF POTENTIAL BIOLOGICAL RESOURCES IMPACTS

Table 8.3-1 summarizes the biological resource impacts of the four alternatives.

Table 8.3-1. Summary of Potential Biological Resources Impacts

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor adverse	Moderate Adverse	Major Adverse	Beneficial
NO ACTION ALTERNATIVE					
Small construction projects (< 1 acre and < 1/4 mile: e.g., minor repairs to facilities, parking lot repairs, access road repairs)	⊗				
Large construction projects (> 1 acre and > 1/4 mile: e.g., repairs to facilities, parking lot repairs, access road repairs)			⊗		
Checkpoint operations	⊗				
Ground operations—motorized		⊗			
Ground operations—nonmotorized		⊗			
Aircraft operations			⊗		
Vessel operations		⊗			
Operation of NII systems	⊗				
Operation of sensor and other technologies	⊗				
OVERALL IMPACT		⊗	⊗		
FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE					

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor adverse	Moderate Adverse	Major Adverse	Beneficial
Small construction projects		⊗			
Large construction			⊗		
OVERALL IMPACT (INCLUDING NO ACTION)		⊗	⊗		
DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE					
Small construction projects (e.g., towers and other infrastructure to mount antennas)		⊗			
Ground operations—motorized		⊗			
Ground operations—nonmotorized		⊗			
Aircraft operations		⊗			
Vessel operations		⊗			
Operation of NII systems	⊗				
Operation of Sensor and other technologies	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE					
Small construction projects (trench cuts, towers, minor access roads and fences)		⊗			
Large construction projects (access roads and fences)			⊗		
OVERALL IMPACT (INCLUDING NO ACTION)		⊗	⊗		
FLEXIBLE DIRECTION ALTERNATIVE					
Small construction projects		⊗			
Large construction projects			⊗		
Checkpoint operations		⊗			
Ground operations—motorized			⊗		
Ground operations—nonmotorized					⊗
Aircraft operations	⊗				
Vessel operations	⊗				
Operation of NII systems					⊗
Operation of sensor and other technologies					⊗

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor adverse	Moderate Adverse	Major Adverse	Beneficial
OVERALL IMPACT (INCLUDING NO ACTION)		⊗	⊗		

8.4 ENVIRONMENTAL CONSEQUENCES TO GEOLOGY AND SOILS

Impacts on geology and soils may be caused by: (1) activities causing substantial changes in soil stability, permeability, or productivity, such as the removal of surface vegetative cover; (2) increases in impermeable surfaces resulting in increased erosion of soil by wind and storm runoff; or (3) changes in the physical character of natural landforms and surface features, or actual removal of earth, such as for road building or construction of facilities. For descriptions of the regional affected environments for geology, topography, and soils see Sections 4.4.2 (WOR Region), 5.4.2 (EOR Region), 6.4.2 (Great Lakes Region), and 7.4.2 (New England Region).

Impacts to geology and soils vary greatly with each CBP activity described in the regional analyses. On-the-ground conditions such as terrain, soil type, and regional geology would determine the specific level of impact. Generally speaking, however, direct and indirect impacts from all of the alternatives across the northern border would be moderate and adverse (see Sections 4.4.3, 5.4.3, 6.4.3, 7.4.3, and Table 8.4-1). Moreover, BMPs, such as design for seismic hazards, unstable slope avoidance, erosion and sediment control requirements, and soil management plans, would be implemented to maintain state and Federal compliance (see Section 9.4). As a result, CBP's incremental contributions to cumulative impacts across the northern border as a whole would be negligible.

8.4.1 NO ACTION ALTERNATIVE

Construction Projects

Impacts to Geology

Construction projects currently underway may affect the surficial geologic and related topographic conditions in specific localized areas. These impacts are contingent upon the specific characteristics of the location.

Currently, about 20 small construction projects in each region are underway or in the planning process. About 15 large construction projects are planned or in progress in each region. Grading requirements for all construction projects generally come in the form of excavation of surficial earth materials and replacement of those materials as compacted fill. Excavation activities would have localized, permanent impacts at construction site locations. Grading requirements for projects also change the various topographic conditions for site drainage purposes. Typical construction activities would have negligible effects on regional geology since grading and excavation for small facilities and utilities (e.g., on-site septic systems) generally only requires fairly shallow (generally less than ten feet in depth) excavation activities.

Depending upon site conditions and the size of larger projects, grading and excavation requirements could be on the order of tens of feet in depth. In hilly to mountainous terrain, removal of slopes may require the creation of retaining walls depending upon engineering requirements. Impacts are expected to be minor to moderate and adverse, contingent upon the specific characteristics of the location.

In areas such as the Cascade region, where seismic hazards exist, facilities would adhere to seismic building codes. In areas prone to land subsidence, landslides, or potential adverse

geologic conditions, a geologic and engineering evaluation of the subsurface geologic condition would minimize risks. The WOR and EOR Regions do not have a great deal of karst topography, while the Great Lakes and New England Regions do. Areas where karst topography occurs would mandate special consideration for any construction projects. Construction projects on or near karst topography would be at risk for subsidence if groundwater withdrawal would continuously exceed replenishment or if groundwater were to become acidic. Risks would also be considerable in areas of slope instability or adverse geologic conditions. Bedrock geology would be analyzed prior to construction to determine gross and surficial stability to minimize such risks.

The installation of underground utilities infrastructure would likely have minor, adverse impacts to geology resulting from localized trenching for utility placement. A detailed report on the geologic conditions and engineering characteristics of the selected location would be necessary to determine the appropriate methods of installing underground utilities. The actual impacts to the geology would depend on site construction requirements.

Impacts to Soils

Soil characteristics depend upon two factors: the region in which they develop and the underlying substrate. The specific soil type at a project site will largely determine soil impacts. While 20 small and 15 large construction projects are currently in progress or planned in each region, the specific soil type at the site of the action will largely determine soil impacts. Construction related to the creation, maintenance, and repair of roads, checkpoints, and support facilities would have localized adverse impacts to soils. The WOR and EOR Regions have a large amount of erodible soil. The Great Lakes Region has clay-rich soils that are usually not highly susceptible to erosion. Some areas have a higher susceptibility (e.g., inceptisols in New York). The New England Region has some erodible soil (inceptisols), particularly in Vermont and Maine. The potential for soil erosion is highest during construction. The temporary period required for construction or improvement of checkpoints and supporting facilities would have moderate, adverse impacts to soils. The expansion of impermeable surfaces related to the projects has the potential to increase soil erosion by storm water runoff. Erosion would be particularly likely in drier portions of the region where large rain events occur. Removal of soil and then replacement of soil as engineered fill during any site development will permanently alter the soil characteristics. However, based on the amount of soil in any given region the overall impacts from CBP actions are expected to be minor to moderate and adverse.

Compaction of soil to create engineered fill would result from construction or site improvements. Vehicular traffic on access roads generally decreases soil porosity, which decreases the transfer of air and water through the soil and lessens vegetative productivity due to root restriction. BMPs would be implemented to reduce access roads and prevent soil erosion. BMPs would be used to reduce soil erosion include revegetation, installation of windbreaks, and contouring. If the project area is situated on designated Prime Farmland, form AD-1006 would be completed to assign a farmland conversion impact rating. Impacts from access road use are expected to be moderate and adverse.

With underground installation of utility infrastructure, impacts to soils would be permanent, would vary according to the size of the installation, and would be minor to moderate and adverse. The effects of excavation and installation can be minimized using BMPs.

On-site Trade and Travel Processing Operations

Impacts to Geology

Since proposed operations do not include construction of any type, there would not be any impacts to geology.

Impacts to Soils

Routine activities at POEs, BPSs or FOBs have the potential to produce localized soil impacts. An average of 20 small (WOR and New England Regions), 30 small (EOR Region), and 10 small and 3 large (Great Lakes Region) onsite trade and travel processing operations occur. Only one large onsite trade and travel processing operation takes place in the WOR region. There are no onsite trade and travel processing operations in the EOR or New England Regions.

As the areas have been previously disturbed by construction, most permanent soil impacts would be caused by soil erosion due to wind action and runoff of water from impermeable road surfaces. Impacts from the operational use of paved roadways would be minor and adverse. Soil erosion prevention plans would be developed based on local, state, and regional regulations. These impacts are expected to be long-term, minor to moderate, and adverse, although most impacts would likely be minor.

Motorized Ground Operations

Impacts to Geology

Since proposed operations do not include construction of any type, there would be no impacts to regional geology.

Impacts to Soils

Each BPS uses a variety of vehicles to monitor and patrol border areas. Surveillance operations use four-wheel-drive trucks, sedans, ATVs, snowmobiles, and motorcycles. In each of the four regions, motorized ground operations take place an average of 800 times per day. If these operations became concentrated in areas with vulnerable soils, moderate impacts would result from the raising of dust, which could potentially causing erosion by creating rutting. Specific effects would be based on the character of the local soil, which varies throughout the regions. Impacts to soils from motorized ground operations are expected to be minor to moderate and adverse.

Two-tracks are previously disturbed pathways or ruts, created by the passage of two- and four-wheel drive vehicles. USBP agents follow established two-track pathways when using four-wheel drive vehicles for patrols. Because agents would use the same tracks created during initial area surveillance, soils impacts would be minimized. At times, interdiction may demand that a vehicle leave the established track. In this case, soil impacts would be minor and adverse as long as agents do not repeatedly leave the previously established tracks.

The soils in two-tracks become compacted by regular use and loss of topsoil, making them prone to erosion from rain and wind. Revegetation becomes more difficult due to the increased soil density. In addition to soil compaction, stress from vehicles can cause gullies to develop, which increases erosion potential (Stokowski and LaPointe, 2000). In areas with sensitive soil

conditions, some impacts could be heightened. Impacts could be minimized by identifying and avoiding sensitive areas and by using BMPs, such as maintaining native vegetation and repairing ruts from patrols. Overall impacts of four-wheel drive vehicle surveillance would range from minor to moderate and adverse.

Two-wheel drive vehicles such as motorcycles can also affect soils. The speed of a motorcycle is a factor in the extent of impact. Higher speeds produce more damaging effects; repeated passes over the same area increase compaction and rutting (Stokowski and LaPointe, 2000). Depending on the terrain, soil character, rainfall, and surrounding vegetation, impacts to soils from two-wheel drive vehicles are expected to be minor and adverse based on the use of BMPs (rut repair, etc.) and the small scale of patrols.

Impacts caused by ATVs would be similar to impacts caused by two- and four-wheel drive vehicles. Soil impacts such as compaction, rutting, and erosion can occur from high-volume use of ATVs (Stokowski and LaPointe, 2000). Soil impacts from ATV use are expected to be minor and adverse, given the low frequency and volume of ATV patrols. CBP would adhere to specific regulations in protected areas, such as national parks.

Snowmobiles can also have adverse impacts on soils when used at times of low snowpack or on steep slopes if the vehicle treads encounter the underlying soil. Snowmobiles can cause erosion in exposed areas due to repeated passes if the vehicle treads encounter soil. Compaction may also occur, making revegetation more difficult (Baker and Buthmann, 2005). Impacts from snowmobiles are expected to be minor and adverse.

Nonmotorized Ground Operations

Impacts to Geology

Since proposed operations do not include construction of any type, there would be no impacts to regional geology.

Impacts to Soils

Mounted patrols on horseback for border surveillance can have some of the same effects on soils as other surveillance methods, although to a lesser degree. Horses compact soils as they travel along paths, and their hooves can also displace topsoil. These factors increase the potential for soil erosion. Impacts from mounted patrols are expected to be short-term, minor, and adverse, because this method of surveillance is used infrequently. In all of the four regions, nonmotorized operations average about 150 per day, per region. Given the vast amount of land in each region, impacts from nonmotorized ground operations are not expected to affect soils beyond a minor and adverse level.

In protected and preserved areas such as national parks and natural wildlife reserves, border surveillance sometimes takes place on foot. Although soil compaction and trampling would occur, the extent would be minimal. Impacts resulting from foot patrols are anticipated to be minor and adverse.

Border Patrol agents use canine patrols mainly for narcotic and firearms detection. Some canine teams are trained for search and rescue operations. Soil impacts that may occur during search

and rescue operations include compaction and trampling. Given the likely brief exposure of soils to canine operations, impacts are expected to be negligible.

Operation of Sensors and Other Technologies

Impacts to Geology

Since proposed operations do not include construction of any type, there would not be any impacts to regional geology.

Impacts to Soils

Unattended ground sensors (UGS) are small electronic devices that monitor movement through seismic and magnetic transmitters. Sensors are typically placed along roads or trails known to be used as illegal travel corridors. Impacts to soils caused by the sensors themselves would be negligible. Maintenance and replacement of the UGSs may affect soil integrity due to trampling and compaction. Impacts from regular maintenance of the UGSs are expected to range from negligible to minor, short-term, and adverse; local soil characteristics would determine the severity of impact. The operation of MSSs would cause impacts similar to those caused by single passes of motorized patrols, as the systems would be driven to remote locations and would remain in place for between one week and one month. The low frequency of their mobility would make the adverse impacts short-term and minor, with rapid recovery of topsoil when the system was moved. In general, each region has about 1,500 UGSs and remote surveillance platforms in operation; fewer than 50 of these are remote surveillance systems. Given the amount of total land in each region and the dispersion of UGSs required to provide adequate coverage, impacts caused by sensors and MSS operations would be negligible. Impacts to soils caused by operation of these technologies would be minor and adverse.

In conclusion, impacts to geology and soil from the No Action Alternative would generally be minor to moderate and adverse. Specific impacts would be determined upon closer study of localized project areas.

8.4.2 FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE

The Facilities Development and Improvement Alternative would provide new and permanent facilities to allow USBP agents and CBP officers to operate more efficiently and respond to situations more quickly. Included in this alternative is the proposed construction of semi-permanent and temporary facilities, such as FOBs, checkpoints, and other facilities that support the operational duties of CBP law-enforcement agents and officers. Much of the proposed construction would occur at facilities that are outdated or that do not operate efficiently due to space constraints. This alternative would also allow an increase of large and small on-site trade and travel processing operations.

In each of the four regions, about 30 small and 20 large construction projects would occur under this alternative.

Large construction projects can take approximately seven years to design, execute, and bring to full functionality. Considered in this time frame is the time needed for project planning, financing, approval, and construction. Impacts to soils from construction activities would be similar to those already occurring at existing facilities. If the selected project location is a

previously undisturbed area, soil impacts would likely be moderate and adverse with implementation of construction mitigation practices. Soil disruption, compaction, and erosion are all likely effects of BPS construction. Additional impermeable surfaces would intensify storm water erosion, exacerbating soil loss. In these areas, soils would be permanently altered by the new surface. A soil erosion plan would help to control the impact of impermeable surfaces. Construction projects that disturb one or more acres require National Pollutant Discharge Elimination System (NPDES) permits to reduce stormwater runoff.² Impact intensity would depend on regional soil characteristics and physical properties.

Access roads would also be created for new BPSs or POE upgrades. This would increase impermeable surface and could potentially accelerate soil erosion due to clearing. Roadside revegetation and drainage would decrease this effect. Soil impacts from new roads would be short-term, moderate, and adverse with the use of mitigation techniques.

Impacts to regional geology from construction of a new CBP facility would be long-term, minor, and adverse. While recovery in the geological strata would not occur after excavation, the impacts would be minor unless the project occupies an area of karst terrain or high relief. Grading and excavation would prove necessary in most cases, which could expose soils and cause erosion. A geological evaluation of bedrock would help determine a suitable location for the building and related infrastructure.

In general, impacts from this alternative to regional geology and soils would be expected to be minor to moderate and adverse. Specific impacts would be determined through closer study of local project areas.

8.4.3 DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE

The Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative would deploy more effective force by increasing technologies used to support CBP activities. This alternative would include improvements of the identification and inspection technologies used by the Office of Field Operations (OFO). This alternative would also allow an increase in the numbers of motorized and nonmotorized ground operations.

This alternative would include an increase of approximately 100 small construction projects in each of the four regions. Motorized ground operations may increase to about 1,300 per day, per region. Nonmotorized ground operations may increase to about 200 per day, per region. Installation of UGSs and use of MSSs would increase to approximately 2,500 devices, where needed. Installation of sensors generally consists of excavating several one-foot diameter holes to a depth of 1-2 feet. One to several rows of UGSs is installed in a given area. Short-term, minor, and adverse impacts would occur due to the disturbance of surface and subsurface soil during the lifetime of UGS installation and operation.

² As of the date of publication of this PEIS, New Hampshire is the only state within the area of study that does not have any NPDES permitting authority. All other states have some NPDES permitting authority under the construction general permit program. [Source: http://www.epa.gov/npdes/pubs/cgp2012_appendixb.pdf]

Additional and upgraded detection, inspection, surveillance, and telecommunications systems would be implemented under this alternative, including:

- Vehicle and cargo inspection systems;
- High-energy X-ray imaging scanners;
- Innovative wireless technologies;
- Acoustic air surveillance systems
- OmniSense sensor systems;
- Stationary surveillance systems and MSSs; and,
- Low-flying aircraft passive acoustic detection systems.

These upgrades would enable CBP law enforcement components to focus on identified threat areas, to improve agent and officer communications systems, and to deploy personnel to resolve incidents with maximum efficiency. These upgrades would have similar impacts to those in the No Action Alternative. Due to the relatively small footprint of tactical infrastructure and surveillance systems, impacts to geology and soils are expected to be minor and adverse. Construction of supporting infrastructure such as poles, towers, and access roads would disrupt soils, but only temporarily outside the immediate footprint of the support structure. Permeable materials would be used in the creation of access roads so infiltration would remain similar to the level it was prior to construction. Impacts to geology and soils from this alternative are expected to be minor and adverse. Specific impacts would be determined upon closer study of localized project areas.

In conclusion, impacts to geology and soils from the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative would be minor to moderate and adverse. Specific impacts would be determined through closer study of local project areas.

8.4.4 TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE

Implementation of this alternative would allow CBP to construct small areas of ground-based vehicle barriers (such as gates and fencing near existing roads and rights-of-way, trenches, and other deterrents) in locations where CBVs operate. Access roads would be improved or constructed to reach the tactical infrastructure. Patrol and access road improvements and vehicle barriers would require ground disturbance during construction. Impacts to soil and local geology would range from minor to moderate, depending on the properties of the earth materials encountered during excavation and the level of construction activities at the project location. Implementation of this alternative would increase the amount of construction projects to about 30 small and 5 large per region. All of the regions have many areas with erodible soils. Geotechnical studies would be completed prior to construction. These impacts would be expected to be minor and adverse based on the anticipated depth of proposed excavations (generally less than 10 feet).

For areas that have become impassible, infrastructure improvements would include construction of new bridges, repair of existing bridges, and emplacement of culverts, low-water crossings, gabions, and water bars. These structures could impact soils and geologic conditions by shifting

water flow and potentially increasing bank and channel erosion. CBP would take special caution in each of the four regions due to the high relief and erodible soils. Specific impacts would be determined with closer study of the localized project area. Impacts to geology and soils from this alternative are expected to be long-term, minor to moderate, and adverse.

In conclusion, impacts to geology and soils from the Tactical Security Infrastructure Deployment Alternative would tend to be minor to moderate and adverse. Specific impacts would be determined with closer study of localized project areas.

8.4.5 FLEXIBLE DIRECTION ALTERNATIVE

This alternative includes all of the elements of the three other action alternatives. The maximum possible impact of the full implementation of all three action alternatives is analyzed under the Flexible Direction Alternative.

Anticipated changes under this alternative include an increase in small construction projects by 160 and large construction projects by approximately 25 per region. Small on-site trade and travel processing operations would increase to about 10 for the Great Lakes Region, 20 for the WOR Region, and 30 each for the EOR and New England Regions. Large onsite trade and travel processing operations would increase by five operations for each region. Motorized ground operations would increase to around 1,300 per day and nonmotorized ground operations would increase to about 200 per day. Sensors and other technology use may rise to approximately 2,500.

Similar to the other action alternatives, impacts to regional geology from this alternative would be minor and adverse. Impacts to soils from this alternative would range from minor to moderate and adverse, depending on soil type and anticipated level of grading for site development. Even at their highest levels of impact, actions under this alternative would not be more than moderate, due to the relatively small amount of land affected compared to the size of each region and the overall northern border study area.

In conclusion, impacts to geology and soil from the Flexible Direction Alternative would be minor to moderate and adverse. Specific impacts would be determined upon closer study of localized project areas due to the variation of soils and geology in the regions.

8.4.6 BEST MANAGEMENT, MINIMIZATION, AND MITIGATION

CBP seeks to avoid, minimize, repair, and reduce the impacts of its actions in the human environment. The agency does so with a combination of BMPs, siting plans, design strategies, minimization measures, and monitoring plans best suited to the scale and the location of the particular action. Mitigations available to CBP may not necessarily be mandatory. In implementing its proposed action CBP could choose from among the following actions to minimize impacts to geology and soils:

- Address potential impacts resulting from regional seismic hazards during the design phase, using reinforced concrete and masonry in construction if necessary;
- Negate potential mass-movement (landslide) hazards by avoiding areas prone to slope instability and using protective barriers to reinforce areas of potential risk; and/or

- Address potential impacts related to highly erodible soils and susceptible geologic formations on a case-by-case basis. Those earth materials which are subject to erosion should be addressed in sediment control plans based on local regulations and engineering analysis. A Federal NPDES permit may also be required dependent on the proximity of the action to water bodies of concern. Dust control plans would also reduce impacts. Uncontrolled soil compaction can be controlled by re-using established access roads and trails rather than creating new pathways. Drainage along impermeable surfaces should reflect the specific hydrologic requirements in the area that they serve. Revegetation would also improve soil conditions and reduce erosion potential. Spill prevention control and countermeasure plans may be a requirement for actions that potentially contribute hazardous materials to the soil.

8.4.7 SUMMARY OF POTENTIAL GEOLOGY, TOPOGRAPHY, AND SOILS IMPACTS

Table 8.4-1 summarizes the impacts of the alternatives on geology, topography, and soils.

Table 8.4-1. Summary of Potential Geology, Topography, and Soils Impacts

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
NO ACTION ALTERNATIVE					
Small Construction Projects (<1 acre and <1/4 mile: e.g., minor repairs to facilities, parking lot repairs, access road repairs, etc.)		G/S	S		
Large Construction Projects (>1 acre and >1/4 mile: e.g., repairs to facilities, parking lot repairs, access road repairs, etc.)		G/S	S		
Small On-site Trade and Travel Processing Operations	G	S	S		
Large On-site Trade and Travel Processing Operations	G	S	S		
Ground Operations–Motorized	G	S	S		
Ground Operations–Nonmotorized	On-Road	G	S		
	Off-Road	G	S		
Operation of Sensors and Other Technologies	G	S	S		
OVERALL IMPACT	G	S	S		
FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE					

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
Small Construction Projects	G	G/S	S		
Large Construction Projects	G	G/S	S		
OVERALL IMPACT (INCLUDING NO ACTION)	G	S	S		
DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE					
Small Construction Projects (towers and other infrastructure to mount antennas, etc.)	G	G/S			
Operation of Sensors and Other Technologies	G	S			
Ground Operations–Motorized	G	S	S		
Ground Operations–Nonmotorized	On-Road	G	S		
	Off-Road	G	S		
OVERALL IMPACT (INCLUDING NO ACTION)	G	S	S		
TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE					
Small Construction Projects (trench cuts, towers, minor access roads and fences)	G	S	S		
Large Construction Projects (access roads and fences)	G	S	S		
OVERALL IMPACT (INCLUDING NO ACTION)	G	S	S		
FLEXIBLE DIRECTION ALTERNATIVE					
Small Construction Projects	G	S	S		
Large Construction Projects		G/S	S		
Small On-site Trade and Travel Processing Operations	G	S	S		
Large On-site Trade and Travel Processing Operations	G	S	S		
Ground Operations–Motorized	G	S	S		
Ground Operations–Nonmotorized	G	S			
Operation of Sensors and Other	G	S	S		

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
Technologies					
OVERALL IMPACT (INCLUDING NO ACTION)	G	S	S		

Note: G=Geology and topography; S= Soils.

8.5 ENVIRONMENTAL CONSEQUENCES TO WATER RESOURCES

The following section evaluates the effects of activities identified for each alternative developed in Chapter 2, Proposed Action. Activities that do not have an effect on water resources are not evaluated in this section. Activities that do not affect water resources include checkpoint operations, aircraft operations, operation of NII systems, and operation of sensor and other technologies. This section considers the potential adverse and beneficial impacts of CBP alternative actions on water resources.

Water resources are distributed widely throughout the 4,000- by 100-mile northern border study area and consist of hydrologic and groundwater resources (aquifers, subterranean watercourses, and recharge areas), surface water and waters of the United States (lakes, ponds, rivers, streams, and channels), and floodplains. Water resources include several beneficial elements, such as water supply quantity and quality, habitat for aquatic organisms, recreation, and flood storage capacity, which are subject to effects from proposed CBP activities. For descriptions of the regional affected environments for Water Resources see Sections 4.5.2 (WOR Region), 5.5.2 (WOR Region), 6.5.2 (Great Lakes Region), and 7.5.2 (New England Region).

The presence of a water resource within the 100-mile buffer of the northern border does not guarantee that it would be impacted by CBP's activities. For construction activities, there are potential effects on receiving waters related to removal, replacement, and disturbance of soil where protective vegetation has been removed. It is common practice in the civil construction industry (and is often specified in the issuance of construction permits) to implement BMPs such as silt fences, silt dams, and mulching, for sediment and erosion control. These BMPs substantially reduce the amount of sediment leaving construction sites and entering receiving waters. The small amount of sediment that cannot be effectively removed using BMPs would be minor in magnitude and of a short duration while any project was under construction.

Routine operational activities that require a water supply and sewer collection affect water resources. Whether the activity is located in an urban area with access to municipal water and sewer systems, or in a rural or remote location where water supply and waste treatment are provided onsite, systems would be designed to provide a site utilities solution that meets the water and sewage requirements adequately, in accordance with applicable regulations, and that protects water resource quantity and quality.

It was concluded that the overall direct and indirect impacts of all the alternatives across the northern border as a whole would be minor and adverse (see Table 8.5-3). This conclusion was reached by considering all of the CBP activities having a potential impact on water resources in all alternatives across the northern border, combined with the understanding that BMPs would be implemented, and considering the dispersed nature of the non-CBP projects and their resulting impacts. As a result of CBP's overall small, incremental contributions to water quality and supply issues, cumulative impacts to water resources across the northern border as a whole would be negligible as well.

8.5.1 NO ACTION ALTERNATIVE

With implementation of identified mitigation measures, effects to water resources under the No Action Alternative would be minor and adverse. Discussion of impacts analysis for this alternative follows.

Large and Small Construction Projects

For purposes of evaluating the effects of CBP activities on water resources, it is not necessary to separate the consideration of large and small construction projects. Under the No Action Alternative, construction primarily consists of repair and maintenance of existing facilities, technology, and infrastructure, or is limited to infrastructure that needs replacement to preserve current functionality of CBP missions. CBP estimates completing approximately 35 projects of this type over the next 5 to 7 years. A wide spectrum of potential CBP construction programs will be evaluated in this alternative, though these construction programs are limited by current funding.

Each construction activity related to removal, replacement, and disturbance of soil where protective vegetation has been removed has some potential effect on surface receiving waters. It is common practice in the civil construction industry, and is often specified in the issuance of construction permits, to implement mitigations for sediment and erosion control, such as silt fences, silt dams, and mulching. These mitigation measures substantially reduce the amount of sediment leaving a construction site and entering receiving waters. The size of the construction project determines the extent of these mitigations. The small amount of sediment that cannot be removed using mitigations is minor in magnitude and of a short duration (while the project is in construction). A list of mitigations that will be implemented for CBP's construction activities is provided in Section 8.5.6. With implementation of mitigations, the impact of these activities would be minor and adverse.

Construction projects also typically use water to inhibit dust. The amount of water used for this purpose will vary depending upon the local climate and upon the levels of humidity and precipitation. Restrictions on water use for this purpose are uncommon along the northern border, and any such restrictions that may be imposed through the construction permitting process would be accommodated as required.

Any construction that occurs within a floodplain reduces the capacity of the floodplain to store floodwaters. For this reason, construction of any infrastructure within a floodplain should be avoided. Most floodplains are highly regulated by local communities' floodplain regulations with cooperation and support from FEMA. Compelling reasons may arise for building infrastructure within a floodplain, and, if construction must occur, a permit or variance can be created that addresses the restrictions imposed by Federal and local regulation. The small number of construction projects that cannot avoid siting in a floodplain would be of minor magnitude and long-term duration. With implementation of mitigation, this effect would be minor.

Overall, the level of impact for large and small construction projects would be minor and adverse.

Large and Small On-Site Trade and Travel Processing Operations

For purposes of evaluating the effects of CBP activities on water resources, it is not necessary to separate consideration of large and small on-site trade and travel processing operations.

Operations that have an effect on water resources are those that generate water supply and sewage collection requirements. Whether the facility is located in an urban area with access to municipal water and sewer systems, or in a rural or remote location where water supply and waste treatment are provided on-site, systems can be designed that provide an adequate site utilities solution. The site utilities solution must meet the requirement in accordance with applicable regulations, and protect water resources from a perspective of both resources quantity and quality. CBP plans to continue operating 20± small and large operations in the New England and WOR regions. In the Great Lakes Region, CBP plans to continue operating 10± small and large operations. The EOR Region plans to continue operating 30± small and large operations under this alternative.

A small to medium-sized POE may employ officers, agents and various support personnel. These facilities require adequate water supply and wastewater treatment. A list of mitigations for maintenance of routine operations at a POE is provided in Section 8.5.6. With implementation of mitigation, the effect of POE operation on water resources would be minor and adverse.

The operation of BPSs has an effect on water resources because these activities generate water supply and sewage collection requirements. Though BPSs are often located in or near developed areas where municipal services are available, requirements for responsible design and installation of properly sized and functional water distribution and sewage collection systems remains a primary consideration. Each station accommodates 25 to 50 agents, most of whom spend a large portion of the day out on patrol away from the station. These stations are small- to medium-sized office facilities; multiple sites possess an adequate water supply from which the facility can be served and wastewater treated sufficiently before disposal. A list of mitigations that would be implemented for continuing operations at BPSs is provided in Section 8.5.6. With implementation of mitigation, this effect would be minor and adverse.

The primary effect to water resources resulting from the use of canine teams at POEs arises from the management of animal wastes in the kennels. USBP canine handlers manage animal waste by washing it into septic systems. Wherever they are available, CBP uses municipal sewer systems. The effect of management and disposal of animal waste from canine patrol programs on water resources is minor in magnitude with a localized extent and short-term duration for a single event of mismanaged animal waste. A list of mitigations for operation of canine patrols is provided in Section 8.5.6. With implementation of mitigation, this effect would be minor and adverse.

The use of FOBs requires providing potable water, which must be transported to the remote facility from another location. Similarly, wastewater is collected in portable containers at FOBs and transported to another location for treatment. The off-site sources of water supply and wastewater treatment are selected such that these services have only minor effects on the water resources at those locations. With off-site sources for water supply and wastewater treatment, the effect of routine activities at a FOB is minor in magnitude, localized in extent, and of short duration while the FOB is in operation. A list of mitigations that would be implemented for

maintaining routine activities at a FOB is provided in Section 8.5.6. With implementation of mitigation, this effect would be minor and adverse.

Ground Operations–Motorized

Motorized operations occur with the use of trucks on highway surfaces, as well as snowmobiles and ATVs on off-road surfaces. CBP estimates performing approximately 800 motorized ground operations per day in each region over the next 5 to 7 years. Motorized patrols may pass over the same spot on any route twice per day. The use of trucks on highway surfaces is not expected to produce water resources effects and will not be evaluated further.

Conduct ATV Patrols

ATV patrols can impact water quality by rutting the areas over which they travel, leading to erosion and runoff, and producing sedimentation and water quality degradation. Operation of approximately 100 ATVs on approximately 40 off-road trails in each region occurs almost exclusively on established paths or trails. Much ATV use occurs in areas and under conditions designed to prevent rutting. However, rutting may occur in rough and steep terrain or under adverse weather conditions. USBP agents receive extensive training in rider technique that allows them to minimize rutting during patrol operations, but some rutting is inevitable. The number of rutting events that occur is very low in relation to the overall number of ATVs registered in northern border states, shown below in Table 8.5-1.

Table 8.5-1. Registered ATVs by State

WOR State	Number of Registered ATVs
Idaho	98,283 (2009)
Montana (West)	n/a
Washington	n/a
EOR States	Number of Registered ATVs
Minnesota	350,000 (2005)
Montana (East)	65,000 (2011) MT DOT
North Dakota	22,737 (2007)
Great Lakes States	Number of Registered ATVs
Michigan	181,659 (2008)
New York	12,747 (2009)
Ohio	N/A
Pennsylvania	N/A
Wisconsin	275,400 (2009)

New England States	Number of Registered ATVs
Maine	63,467 (2007)
New Hampshire	N/A
Vermont	N/A

Sources: (Iverson, 2010; Nelson and Stynes, 2010; ATV Minnesota, 2005; NYDMV, 2010; NDPRD, 2007; WIDNR, 2009; MDIFW, 2008).

The twice-daily frequency and extent of rutting in relation to all recreational trails travelled is very small. The magnitude of rutting events is minor and the duration is moderate unless repairs are made. A list of mitigations that would be implemented for operation of ATV patrols is provided in Section 8.5.6. With implementation of mitigation, this effect would be minor and adverse. If responsive repair and maintenance of rutted travel surfaces cannot be arranged through partnerships, the effect would be moderate and adverse.

Conduct Snowmobile Patrols

Effects caused by snowmobile patrols are similar to the effects of ATV patrols and occur in similar locations. Snowmobiles are utilized when travel surfaces become unstable due to the presence of snow on the travel surface. As with ATV patrol operations, snowmobile patrols can cause sedimentation and water quality degradation that result from erosion and runoff in areas rutted by use of snowmobiles. This occurs in areas that are not repaired as a part of the snowmobile patrol program.

Operations of approximately 40 snowmobiles in each region are almost exclusively on established paths or trails. Much of the activity occurs in areas and in snow-covered conditions such that rutting does not occur. However, rutting may occur in areas where the traveled surface transitions from snow-covered ground to ground without snow.

USBP agents receive extensive training in rider technique that allows them to minimize rutting during snowmobile patrol operations, but some rutting is inevitable. The number of rutting events from patrol operations in relation to overall recreational snowmobile travel in the region is very small, as shown below in Table 8.5-2.

Table 8.5-2. Registered Snowmobiles by State

WOR States	Number of Registered Snowmobiles
Idaho	50,000
Montana	23,440
Washington	31,532
EOR States	Number of Registered Snowmobiles
Minnesota	277,290
Montana	23,440
North Dakota	21,000
Great Lakes States	Number of Registered Snowmobiles
Michigan	301,805
New York	146,662
Ohio	19,500
Pennsylvania	45,270
Wisconsin	232,320
New England States	Number of Registered Snowmobiles
Maine	96,600
New Hampshire	73,625
Vermont	41,000

Source: (ACSA, 2010).

The National Park Service (NPS) prepared an Environmental Impact Statement (EIS) for Winter Use in Yellowstone and Grand Teton National Parks in 2007 (USDOJ, 2007). The preferred alternative identified in this EIS allowed for the use of 540 snowmobiles and 83 snow coaches per day within the parks and dismissed the consideration of water resource effects resulting from operations of snow vehicles and other winter activities at the parks.

The twice-daily frequency and extent of rutting in relation to all recreational snowmobile trails traveled is very small because a very high percentage of the travel is performed on snow where no rutting will occur. The magnitude and duration of a rutting event is negligible; therefore, this effect would be negligible.

Ground Operations—Nonmotorized

Nonmotorized CBP operations include foot patrols and horse patrols. CBP estimates that approximately 150 operations of this type would occur per day over the next 5 to 7 years. The

infrequency and benign character of foot patrols are not expected to produce water resources effects and are not evaluated further.

Effects on water resources can be caused by buildup of animal wastes from horse patrols and loss of vegetative cover from horse stables and pastures. The nutrients and sediment released from these facilities during periods of precipitation is a nonpoint source pollution that can degrade water quality in nearby receiving waters. Excessive nutrients in receiving waters can reduce oxygen availability and promote algae growth. This effect can be mitigated if horse boarding facilities are properly managed.

With proper management of horse boarding facilities, the effect of horse stable operations on water resources is minor in magnitude, localized in extent, and of moderate duration during warmer seasons when algae growth occurs. A list of mitigations that would be implemented for the operation of horse patrols is provided in Section 8.5.6. With implementation of mitigation, this effect would be minor and adverse.

Vessel Operations

Waterborne patrols place watercraft that contain fuels, oils, and seized materials in direct contact with surface water resources. Approximately 77 of these operations are performed per day across the northern border area: 15 in the WOR Region, 20 in the EOR Region, 42 in the Great Lakes Region, and 16 in the New England Region. A spill or leak in this context could involve direct introduction of contaminants into a water resource with little opportunity for recovery. The probability and frequency of such an event are very low. For virtually all substances that may be spilled, the volume of the potential spill in relation to the larger body of water is very small. The magnitude of such a spill would be minor; the extent of the spill would be localized, and the duration would be temporary.

Watercraft operators receive training in the safe operation of watercraft, including fueling operations and storage of potential contaminants. A list of mitigations that would be implemented for continued operation of waterborne patrols is provided in Section 8.5.6. With implementation of mitigation, this effect would be minor and adverse.

With implementation of identified mitigation measures, overall effects to water resources under the No Action Alternative would be minor and adverse.

8.5.2 FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE

Under this alternative, CBP would focus on construction of new facilities and major modernization of existing facilities. With implementation of identified mitigation measures, the effects to water resources evaluated under the Facilities Development and Improvement Alternative would be minor and adverse.

Activities that would be increased with implementation of the Facilities Development and Improvement Alternative include:

Large and Small Construction Projects

Construction of larger facilities such as BPSs may involve re-grading, which has the potential to alter natural drainage patterns. Site design mitigations commonly used by local jurisdictions as

regulatory conditions for land development may be implemented. These mitigations may include provision of on-site detention basins that limit the rate of runoff or drainageways that collect runoff and redirect it to natural receiving waters. The small amount of runoff that cannot be returned to its natural drainage course at historic rates would be minor in magnitude and of a short duration (while the project is in construction). With implementation of mitigation, this effect would be minor.

Constructing Roads, Bridges, Culverts, and Low-water Crossings

CBP constructs roads, bridges, and culverts to meet security requirements. If roads, bridges, and culverts placed in or adjacent to waterways are not properly designed, the water surrounding this infrastructure may behave in an unplanned and generally undesirable manner. State and local jurisdictions typically adhere to design standards for this infrastructure, including conveyance of storm water within road rights-of-way. The capacity of a structure to effectively pass storm water is dependent upon the size of the cross-section through which the water passes and the hydraulic gradient of the water as it passes through the structure. These design standards reflect accepted engineering practices and assure a reduction in impacts resulting from placement of these structures in or across a waterway. The deviation of water flow from the natural conditions of an established waterway to the hydraulic passage through a well-designed, manmade, drainage structure would be minor in magnitude and long-term in duration. With implementation of mitigation, the effect of road and bridge construction on water quality would be minor and adverse.

CBP constructs low-water crossings to allow vehicles to pass through waterways that have predominately shallow depth at the crossing. A rock or concrete paved bottom section is developed to protect the physical integrity of the waterway. Any foreign matter clinging to a vehicle as it passes through the shallow water at the crossing could be washed into the water as a contaminant. The vehicles are typically washed at shift change, so the likelihood of contaminants is low. With routine vehicle washing, waterway contamination caused by the passage of vehicles through a low-water crossing would be of minor magnitude and of temporary and infrequent duration. The effect of low-water crossings on water quality would be minor and adverse.

The primary concern for protection of Wild and Scenic Rivers (designated and candidate) is the preservation of these resources in a free-flowing state. The placement of a bridge, culvert, or low-water crossing within the free-flowing section of a designated river is restricted. Though it is unlikely that CBP activities would require placement of such a structure in Wild and Scenic Rivers, future project planners must be aware of this restriction and avoid placement of these structures on designated rivers in this region.

Since the Facilities Development and Improvement Alternative would result in a greater number of BPS than the No Action Alternative, the construction activities associated with these facilities would result in a greater number of effects across the northern border. In each of the regions, there would be approximately 50 additional construction projects anticipated over the 5 to 7 year period under this alternative.

Construction of more POEs and BPSs is associated with a greater aggregate amount of soil disturbed and vegetation removed during the construction period for these facilities. Therefore,

under this alternative, there would be more sites with the potential to alter and redirect natural drainage patterns. More facilities may be considered for siting near watercourses with floodplain resources.

Facility construction projects would contribute to a gross increase in potential impacts to water resources. However, these projects are dispersed across each of the regions. Mitigations would be implemented that would reduce these adverse impacts to negligible or minor levels. The increased facility construction associated with this alternative would not cause effects that exceed the minor and adverse effects of the No Action Alternative.

8.5.3 DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE

With implementation of identified mitigation measures, overall effects to water resources under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative would be minor and adverse.

In this alternative, CBP would focus on increased use of surveillance and communication tools such as the RVSS, short-range radars, ground sensors, unmanned aircraft systems (UAS), various types of scanning technologies for vehicle and cargo inspections, fixed and mobile video, surveillance cameras, surveillance aircraft, and underground sensor resources.

Activities that would be increased with implementation of the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative include:

Small Construction Projects

Approximately 100 additional minor actions per region related to non-facility construction and installation are proposed under this alternative over the next 5 to 7 years at POEs, BPSs, and other locations, some of them remote, not collocated with facilities. Water resources could be impacted by construction activities associated with RVSS, short-range radar, and ground sensors. Improvements associated with UASs, various types of scanning technologies for vehicle and cargo inspections, fixed and mobile video, surveillance cameras, and surveillance aircraft would not affect water resources.

An expanded use of detection, inspection, surveillance, and communications technology would be associated with greater soil disturbance and vegetation removal during the construction period for improvements. Work on certain sites could have the potential to alter and redirect natural drainage patterns. Expansion improvements may be considered near watercourses that have floodplain resources.

The addition of detection, inspection, surveillance and communications technology expansion projects would have slightly greater effects than the No Action Alternative, but projects and associated effects would be dispersed across each of the regions. Mitigation measures would be implemented that would reduce the adverse effects of these facility improvements to negligible or minor levels. These conditions make it unlikely that the increased construction activity associated with this alternative would cause effects greater than those associated with the No Action Alternative, which would be minor and adverse.

Construct Roads, Bridges, Culverts, and Low-water Crossings

Activity associated with site work such as access roads and site development for new detection, inspection, surveillance, and communications improvements may be slightly increased under this alternative, but work of this type would have the same level of effect as the No Action Alternative, which would be minor and adverse after implementation of mitigation.

Ground Operations–Motorized

This alternative is associated with an increase in the numbers of motorized patrols. The number of daily motorized ground operations would increase to approximately 1,300 per region. An increased number of operations to patrol the same length of border would mean that each individual operation would cover the same ground more thoroughly, passing by the same spot on a route perhaps three to five times rather than twice, as in the No Action Alternative. This is not a substantial increase in frequency, so the effects would be the same. With implementation of mitigation, the effects would be minor and adverse. If responsive repair and maintenance of rutted travel surfaces cannot be arranged through partnerships, the effect would be moderate and adverse.

Ground Operations–Nonmotorized

Nonmotorized ground operations would increase under this alternative in the same manner that motorized ground operations would increase. The number of daily nonmotorized ground operations would increase to approximately 200 per region. The frequency for passing by the same spot on a given route would also increase. More horses would be boarded in facilities, and pasture acreage would need to increase to accommodate additional horses in a sustainable manner. With implementation of mitigation, this effect would be minor and adverse.

Vessel Operations

Vessel operations under this alternative would increase by 41 to a total of 118 per day across the northern border: 21 in the WOR Region, 10 in the EOR Region, 63 in the Great Lakes Region, and 24 in the New England Region. With implementation of mitigation, the effect would be minor and adverse, as it is under the No Action Alternative.

8.5.4 TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE

In this alternative, CBP levels would focus on increased use of tactical security infrastructure deployment tools. With implementation of identified mitigation measures, the effects to water resources evaluated under the Tactical Security Infrastructure Deployment Alternative would be minor and adverse.

Activities that would be increased with implementation of the Tactical Security Infrastructure Deployment Alternative include:

Large and Small Construction Projects

This alternative would involve an increase in non-facility construction and installation actions at POEs and in other locations, some of them remote, not collocated with facilities. Although the overall number of 35 large and small construction projects per region is approximately the same as under the No Action Alternative, the construction activities would focus on fences, other barriers, roadways, trails, and new construction or repair of existing bridges, culverts, low-water

crossings, gabions, and water bars, and would involve some new actions in this category of activities. The numbers of large facility-type projects would be reduced.

The overall number of construction projects would be roughly the same under this alternative as under the No Action Alternative, which means that roughly the same amount of soil would be disturbed and roughly the same amount of vegetation would be removed during the construction period, compared to the No Action Alternative. Work at some sites may have the potential to alter and redirect natural drainage patterns. Tactical infrastructure improvements may be considered near watercourses with floodplain resources.

The completion of these construction projects would have little or no increase in the effects of the No Action Alternative, and they are widely dispersed across the northern border. Mitigation would be implemented that would reduce the adverse effects of these facility improvements to negligible or minor levels. There is no evidence to support the conclusion that effects caused under this alternative would exceed the level of effects of the No Action Alternative, which would be minor and adverse.

Construct Roads, Bridges, Culverts, and Low-water Crossings

This alternative would involve an increased level of activity associated with construction of roadways, trails, and new construction or repair of bridges, culverts, low-water crossings, gabions, and water bars. An increase in roads, bridges, culverts, and low-water crossings projects would be associated with a greater level of soil disturbance and vegetation removal than would occur under the No Action Alternative. Work at some sites may have the potential to alter and redirect natural drainage patterns and tactical infrastructure improvements may be considered near watercourses with floodplain resources.

The primary concern for protection of Wild and Scenic Rivers (designated and candidate) is the preservation of these resources in a free-flowing state. The placement of a bridge, culvert, or low-water crossing within the free-flowing section of Wild and Scenic Rivers is restricted. Though it is unlikely that CBP activities would require placement of such a structure in a designated river, future project planners must be aware of this restriction and avoid placement of these structures on designated rivers in this region.

The addition of roads, bridges, culverts, and low-water crossing projects would have slightly greater effects than the No Action Alternative, but they are widely dispersed across the northern border. Mitigation would be implemented that would reduce the adverse effects of these facility improvements to negligible or minor levels. There is no evidence to support the conclusion that the increased construction activity associated with this alternative would cause effects that exceed those that would occur under the No Action Alternative, which would be minor and adverse.

8.5.5 FLEXIBLE DIRECTION ALTERNATIVE

In this alternative, CBP would simultaneously increase levels of activity for each category of actions described by the previous alternatives. The simultaneous increase may not occur to the full extent in each category, but this alternative will offer CBP the flexibility to adjust levels of activity within each category as the mission demands it. With implementation of identified

mitigation measures, effects to water resources under the Flexible Direction Alternative would be minor and adverse.

Activities that would be increased with implementation of the Flexible Direction Alternative include:

Large and Small Construction Projects

The proposed level of construction activity for this alternative is approximately 185 large and small construction projects per region. These projects would be the same type analyzed and discussed in Sections 8.5.2 to 8.5.4. An increased number of these facilities would be associated with a greater level of soil disturbance and vegetation removal than would occur under the No Action Alternative. Work at some sites may have the potential to alter and redirect natural drainage patterns and tactical infrastructure improvements may be considered near watercourses with floodplain resources.

These facility construction projects would contribute to a gross increase in impacts to water resources, but they would be dispersed across each of the regions. Most of their impacts, including those that are cumulative, have been previously assessed. Mitigations would be implemented that would reduce the adverse effects of facility improvements to negligible or minor levels. There is no evidence to support the conclusion that the increased facility construction activity associated with this alternative would have effects that exceed those of the No Action Alternative, which would be minor and adverse.

Ground Operations—Motorized

Approximately 1,300 motorized operations would occur per day across each region under this alternative, which is the same level previously analyzed under the No Action Alternative. With implementation of mitigation, this effect would be minor and adverse, as it is under the No Action Alternative.

Ground Operations—Nonmotorized

There would be approximately 200 nonmotorized operations per day across the regions under this alternative, which is the same level previously analyzed under the No Action Alternative. With implementation of mitigation, this effect would be minor and adverse, as it is under the No Action Alternative.

Vessel Operations

Under this alternative, there would be approximately 41 additional vessel operations, for a total of 118 per day across the northern border: 21 in the WOR Region, 10 in the EOR Region, 63 in the Great Lakes Region, and 24 in the New England Region. With implementation of mitigation, this effect would be minor and adverse, as it is under the No Action Alternative.

With implementation of identified mitigation measures, overall effects to water resources under the Flexible Direction Alternative would be minor and adverse.

8.5.6 BEST MANAGEMENT, MINIMIZATION, AND MITIGATION

CBP seeks to avoid, minimize, repair, and reduce the impacts of its actions on the human environment. It does so with a combination of BMPs, siting plans, design strategies, mitigation measures, and monitoring plans best suited to the scale and the location of the particular action. Towards that end, in implementing its proposed action, CBP could choose from among the following actions to avoid or minimize impacts to water resources:

8.5.6.1 Construction Activities

- Silt fences would be used for new construction;
- Diversion ditches would be used for new construction;
- Vegetation on bare soil would be reseeded and reestablished as soon as possible following construction (using native vegetation where appropriate);
- Highly compacted areas left after construction would be scarified and aerated to offset potential impacts from soil compaction. Other mitigations may also be implemented that are suitable to the terrain;
- Mulching, straw berms, and temporary cover crops would be applied as appropriate;
- Portable and long-term sediment and surface water retention features would be constructed, operated, and maintained;
- Appropriate erosion and sediment control would be in place and functional before earth-moving operations begin and would remain intact throughout the project. Disturbed areas would be planted as quickly as possible to prevent erosion;
- Design and construction measures would include development of surface water control features to ensure that post-development runoff from construction sites does not exceed pre-development runoff; and,
- Construction of roads in waterways or riparian areas will be avoided if possible.

8.5.6.2 Operation of Facilities

- Areas around buildings and parking lots would be well-vegetated to minimize soil erosion. In addition, catch basins, diversion ditches, and pipe conveyances may be created to handle additional storm water runoff;
- Design elements such as grass swales and landscaped features would be designed to help minimize runoff and soil erosion;
- Storm gutters and other storm drainage system improvements would be installed in conjunction with construction of new facilities;
- On-site detention or retention basins would be provided for developed sites to reduce the rate of runoff;
- Drainage improvements would be provided, including storm water channels that intercept runoff directed toward areas that had not previously accepted runoff and that divert it to natural receiving waters;

- New infrastructure would not be built in 100-year floodplains. Local regulations that govern development of floodplains would be followed;
- Accepted engineering design practices and/or established state or local standards would be used to design the capacity of road drainageways, bridges, culverts, and low-water crossings in a manner that minimizes erosion and creation of sediment at the structure;
- Accepted engineering practice would be used to design water and waste systems that are properly sized for facility occupancy;
- Canine wastes would be removed from kennel areas and properly disposed of in waste systems such as municipal sewers or septic systems; and,
- Temporary or permanent water supply and waste disposal systems would be in place and operational when FOBs are manned.

8.5.6.3 Waterborne Patrols

- Training would be provided to watercraft operators in the safe operation of boats, including handling, storage, disposal, and use of fuels and lubricants. Training would include safe interim storage of intercepted materials to prevent spillage or leakage.

8.5.6.4 Motorized Patrols

- A 2-week (80 hour) rider safety course designed to educate riders in eliminating ATV- or snowmobile-related accidents and agent injuries would be provided to develop driving skills that minimize effects on the environment;
- Under conditions of unstable travel surfaces, ATVs would be driven at speeds that avoid rutting, if possible; and,
- Partnerships would be maintained or initiated to identify and make provisions for repair or maintenance of easily rutted roads or trails.

8.5.6.5 Horse Patrols

- Horse stables would not be sited in drainage swales or areas with poor soil drainage; areas around stables would be graded to divert runoff away from structure (LSU, 2009);
- Horse stables would not be placed near ponds, streams, or wetlands (LSU, 2009);
- Gutters, down spouts, and splash blocks would be installed on all horse-related structures. A significant amount of roof runoff can be diverted away from paddocks, exercise lots, and stall areas through the use of a properly designed and maintained drainage system (LSU, 2009); and,
- A properly maintained and managed pasture is essential to reducing mud and soil erosion to maintain water quality. Pasture vegetation species would be selected that create healthy and vigorous pastures to ensure good soil cover and reduce runoff. Closely grazed areas promote runoff and soil erosion. Larger pastures would be considered for division into several smaller units for rotational grazing. Horses would be removed from a pasture area when the forage is consumed to two to three inches. When horses are removed, personnel would clip pasture vegetation, fertilize soil, and spread manure to enable the pasture to recover (LSU, 2009).

8.5.7 SUMMARY OF POTENTIAL WATER RESOURCES IMPACTS

Table 8.5-3 summarizes the comparison of potential impacts to water resources from the various alternatives.

Table 8.5-3. Summary of Potential Water Resources Impacts

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
NO ACTION ALTERNATIVE					
Small construction projects (< 1 acre and < 1/4 mile: e.g., minor repairs to facilities, parking lot repairs, access road repairs)		⊗			
Large construction projects (> 1 acre and > 1/4 mile: e.g., repairs to facilities, parking lot repairs, access road repairs)		⊗			
Small on-site trade and travel processing operations		⊗			
Large on-site trade and travel processing operations		⊗			
Checkpoint operations	⊗				
Ground operations—motorized		⊗			
Ground operations—nonmotorized	On-road		⊗		
	Off road		⊗		
Aircraft operations	⊗				
Vessel operations		⊗			
Operation of NII systems	⊗				
Operation of sensor and other technologies	⊗				
OVERALL IMPACT		⊗			

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE					
Small construction project (< 1 acre and < 1/4 mile: reconstruction/ or construction of USBP structures, parking lot repairs, access road repairs)		⊗			
Large construction projects (> 1 acre and > 1/4 mile: reconstruction/or construction of USBP structures, parking lot repairs, access road repairs)		⊗			
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE					
Small construction projects (towers and other infrastructure to mount antennas, etc.)		⊗			
Ground operations–motorized		⊗			
Ground operations–nonmotorized	On-road	⊗			
	Off road	⊗			
Aircraft operations	⊗				
Vessel operations		⊗			
Operation of NII systems	⊗				
Operation of sensor and other technologies	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE					
Small construction projects (trench cuts, towers, minor access roads and fences)		⊗			
Large construction projects (access roads and fences)		⊗			
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
FLEXIBLE DIRECTION ALTERNATIVE					
Small construction projects		⊗			
Large construction projects		⊗			
Checkpoint operations	⊗				
Ground operations—motorized		⊗			
Ground operations—nonmotorized		⊗			
Aircraft operations	⊗				
Vessel operations		⊗			
Operation of NII systems	⊗				
Operation of sensor and other technologies	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			

8.6 ENVIRONMENTAL CONSEQUENCES OF NOISE

This section considers the potential adverse and beneficial impacts of CBP alternative actions on noise. Effects would be considered minor or negligible unless the activity would create areas of incompatible land use or would violate any Federal, state, or local noise ordinance.

The northern border study area contains many soundscapes and noise-sensitive receptors (such as national parks, residences, and schools) that could experience impacts due to implementation of any of the proposed alternatives. For descriptions of the regional affected environments for noise see Sections 4.6.2 (WOR Region), 5.6.2 (EOR Region), 6.6.2 (Great Lakes Region), and 7.6.2 (New England Region).

However, across the northern border all of the alternatives would have only short- and long-term, minor, adverse, direct and indirect noise impacts. These impacts would be primarily due to noise from construction activities and from the routine operation of POEs, BPSs, FOBs, and border patrol activities using motorized equipment such as aircraft, marine vessels, ATVs, and snowmobiles. All new sources of noise would be located within 100 miles of the northern border and, in general, increases in this noise would not create areas of incompatible land use or violate any Federal, state, or local noise ordinance.

In addition to CBP's activities, a wide range of other activities along the northern border produce noise. Noise generated by CBP's activities for all alternatives across the northern border as a whole would be minor and not concentrated, except as noted at POEs and BPSs. These activities would constitute small, incremental increases in the overall noise environment, and thus are not expected to contribute appreciably to adverse cumulative noise impacts. As a result, across the northern border as a whole, no noise impacts would be significant enough to require mitigation measures (see Section 9.6).

Several CBP activities create either no noise whatsoever or negligible amounts of noise. These activities include nonmotorized ground operations, operation of nonintrusive inspection (NII) systems, and operation of sensor and other technologies. These activities would have either no effect or a beneficial effect on the noise environment; therefore, they have not been carried forward for additional analysis.

8.6.1 NO ACTION ALTERNATIVE

The No Action Alternative would have short- and long-term, minor, adverse effects to noise. These effects would be primarily due to planned construction projects and motorized ground, aircraft, and vessel patrols. An overview of these noise sources can be found in Section 7.6.2.2. Under this alternative, CBP would (1) continue the current level of operations, and (2) continue maintaining and repairing existing facilities, technology, and infrastructure. In general, increases in noise are not likely to create areas of incompatible land use or violate any Federal, state, or local noise ordinance.

8.6.2 FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE

The Facilities Development and Improvement Alternative would have short-term minor and long-term, moderate, adverse effects on the noise environment. In addition to activities outlined in the No Action Alternative, these effects would be primarily due to both small and large

construction projects, and to the establishment of helipads and small arms ranges at upgraded POEs and new and upgraded BPSs. In general, increases in noise would not create areas of incompatible land use or violate any Federal, state, or local noise ordinance. A detailed analysis is provided below.

Construction Projects

Both large and small construction projects would have short-term, minor, adverse effects. Individual pieces of heavy equipment typically generate noise levels of 80 to 90 A-weighted decibels (dBA) at a distance of 50 feet (Table 8.6-1). With multiple items of equipment operating concurrently, noise levels can be relatively high during daytime periods at locations within several hundred feet of active construction sites. In addition, trucks transporting materials to and from construction sites would have some negligible impact to the noise environment. The zone of relatively high construction noise levels typically extends to distances of 400 to 800 feet from the site of major equipment operations. It would be possible for residences and other noise-sensitive receptors, such as schools, churches, and hospitals, closer than 800 feet to experience appreciable amounts of construction noise. Given the temporary nature of construction activities, this impact would be minor. If regulatory limits were exceeded during construction, sound reduction measures, such as limiting hours of construction or utilizing sound barriers, would be implemented.

Table 8.6-1. Noise Levels Associated with Outdoor Construction

Construction Phase	dBA Leq at 50 Feet from Source
Ground clearing	84
Excavation, grading	89
Foundations	78
Structural	85
Finishing	89

Source: USEPA, 1971.

Although construction-related noise impacts would be minor, the following best management practices would be performed to reduce the already-limited noise effects:

- Construction would primarily occur during normal weekday business hours; and,
- Construction equipment mufflers would be maintained properly and in good working order.

Construction noise would dominate the soundscape for all on-site personnel. Construction personnel, particularly equipment operators, would don adequate personal hearing protection to limit exposure and ensure compliance with Federal health and safety regulations.

Due to their temporary nature, individual construction projects would have only a minor effect on the noise environment.

Operation of upgraded POEs could have long-term, moderate, adverse effects on the noise environment. These effects may be due to changes in traffic patterns, new permanent stationary sources of noise such as stand-by generators, the use of helicopters, the establishment of small arms firing ranges, and the operation of dog kennels.

Changes in local traffic patterns and associated noise would be expected. Areas near new and modified POEs would experience changes in traffic noise due to the rerouting of traffic crossing the border. These effects would be offset on a one-to-one basis by decreases in activities at other POEs or at entrances and exits within the modified POE. Background noise was estimated using the American National Standards Institute (ANSI) Procedures for Description and Measurement of Environmental Sound. These procedures are based on population density and are strongly correlated to the level of traffic activities in an area. Notably, a doubling in traffic would be required to induce even a barely perceptible (3 dBA) change in the noise environment. Long-term noise levels associated with modified POEs would likely be consistent with the current noise environment regardless of the ultimate locations chosen or the types of modifications made. These effects would be minor for most operating scenarios. However, if new access-controlled highways or new secondary roadways within urban areas were necessary, site-specific information would be required to make a more detailed analysis at this activity and to determine the level of effect under NEPA.

Standby generators at modified POEs would be completely enclosed by buildings or other enclosures. Standby generators would operate for limited periods for maintenance and testing and during power outages. Due to their limited use, effects to the noise environment from standby generators would be minor.

For POEs with helicopter pads, helicopter operations would increase noise levels at nearby noise-sensitive areas. For ease of analysis, the Sikorsky UH-60A Blackhawk was used as a reasonable worst case CBP rotorcraft. Notably, the UH-60A would be louder than the Eurocopter AS-350B A-Star and other helicopters in CBP's fleet, since it has more horsepower and a greater gross weight. If a helicopter were to fly over a nearby noise-sensitive area at an airspeed of 140 knots and an altitude of 200 feet, the sound exposure level (SEL) would be 97.8 dBA (Table 8.6-2). If a single helicopter per day flew over the same noise-sensitive area, the annual day-night sound level (DNL) would be approximately 48.4 dBA. This would be well below the U.S. Environmental Protection Agency (USEPA) 65 dBA threshold and would be fully compatible with adjacent land uses. It would take an estimated 46 helicopter operations per day (16,790 per year) at 200 ft. above ground level (AGL) over a single receptor to drive the DNL above 65 dBA. The helicopter operations are spread throughout the sector rather than concentrated in any one location, and if a CBP helicopter were to go to a POE, it would not travel at 140 knots at 200 feet; therefore this is not an accurate representation of CBP activities. For the purposes of analysis, however, this level of activity was carried forward as the reasonable upper bound of possible activities to facilitate a discussion of effects under NEPA.

Table 8.6-2. Estimated Noise Levels for CBP Helicopters

Phase of Flight/Airspeed	Distance from Aircraft to Receptor (feet)				
	200	300	500	1,000	2,000

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Phase of Flight/Airspeed	Distance from Aircraft to Receptor (feet)				
	200	300	500	1,000	2,000
Landing or takeoff					
SEL	96.7	93.9	90.5	85.4	79.5
DNL (one overflight per day)	47.3	44.5	41.1	36	30.1
In flight/70 knots					
SEL	93.5	90.9	87.4	82.5	77.0
DNL (one overflight per day)	44.1	41.5	38	33.1	27.6
In flight/120 knots					
SEL	96.5	94.0	90.5	85.6	80.2
DNL (one overflight per day)	47.1	44.6	41.1	36.2	30.8
In flight/140 knots					
SEL	97.8	95.2	91.8	87.0	81.6
DNL (one overflight per day)	48.4	45.8	42.4	37.6	32.2

Source: USDoD, 2002.

Use of helicopter pads would be on an as needed basis, and operations normally would be limited to the occasional transport of essential personnel to and from the site. On rare occasions, noise may be annoying to residents directly under the approach and departure flight tracks. Individual flights would be loud enough to interfere with communications or wake up sleepers; however, the overall DNL would be comparable to daytime background levels given the long periods of quiet in between overflights. It is unlikely that remote POEs would have helicopter pads with noise-sensitive areas nearby. In the final design stage care would be taken to not locate helicopter pads adjacent to noise-sensitive areas. These effects would be minor.

In addition, small indoor firing ranges could be established at modified POEs and BPSs. Normally, there would be no outdoor live-fire small arms activities. All firing would occur indoors, and controls would be put in place to ensure the noise would be inaudible outside the perimeter of the POE. Noise generated during indoor training at the firing ranges is not expected to generate disruptive noise levels outside of POEs and BPSs. In the final design stage, the facility would be designed and located such that noise from training activities would be inaudible to nearby residences and the effects would be minor. However, if firing ranges were to be sited outdoors or if the small arms noise could not be completely contained within the POE, site-specific information would be required to make a more detailed analysis of this activity and to determine the level of effect under NEPA.

The optional canine facilities (kennels, dog runs, and storage areas) could add to the noise levels at new and upgraded POEs. Kennel facilities would be operated in accordance with all Federal, state, and local noise ordinances. These effects would be minor.

Additional analysis would be performed in situations where site-specific information is necessary to make a more detailed analysis of an activity and to determine the level of its effect under NEPA. This would be necessary for actions that include:

- New access-controlled highways or the establishment of a new secondary roadway within an urban area;
- More than 46 helicopter operations per day; or,
- Outdoor firing ranges or small arms noise that could not be completely contained within the POE.

8.6.3 DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE

The Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative would have short- and long-term, minor, adverse effects on the noise environment. In addition to activities outlined in the No Action Alternative, these effects would be primarily from small construction projects and additional motorized ground patrols, aircraft, and vessel operations. In general, increases in noise would not create areas of incompatible land use or violate any Federal, state, or local noise ordinance.

Construction Projects

As with the Facilities Development Alternative, and for similar reasons, both small and large construction projects would have short-term, minor, adverse effects. It would be possible for residences and other noise-sensitive receptors, such as schools, churches, and hospitals, closer than 800 feet to experience appreciable amounts of construction noise. Due to the limited amount of noise and the activities' temporary nature, these activities would have a less than major effect on the noise environment.

Ground Operations—Motorized

Conducting additional motorized ground operations along the northern border would have long-term, minor, adverse effects on the noise environment. For ease of discussion, these activities have been separated into three distinct categories: (1) onroad vehicle patrols, (2) ATV patrols, and (3) snowmobile patrols.

Onroad Vehicle Patrols

Conducting additional onroad vehicle patrols would have long-term, negligible, adverse effects on the noise environment. Background noise was estimated using the ANSI Procedures for Description and Measurement of Environmental Sound. These procedures are based on population density and strongly correlated to the level of traffic activities in an area. Notably, a doubling in traffic would be required to induce even a barely perceptible (3 dBA) change in the noise environment. Due to the limited number of onroad vehicle patrols outlined under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, long-term noise levels would be consistent with the current noise environment regardless of the ultimate location of the patrols.

ATV Patrols

Conducting additional ATV patrols would have long-term, minor, adverse effects on the noise environment. In general, ATV activities have the potential to be incompatible with certain noise-sensitive land uses. As a result, this PEIS assesses the effects of the potential for additional CBP ATV patrols to increase noise near sensitive receptors. Because ATV activity changes throughout the year and throughout any given day, DNL was chosen to evaluate the noise environment for ATVs' effects. Although the exact nature and locations of patrols have not been specifically inventoried, this analysis provides a bounded approach to determine at what operational level major effects may be possible.

Throughout the year, ATVs would be audible from locations near tracks or trails, more so in the summer than in the winter due to recreational activities. Although ATVs can be noisy, the effect on noise-sensitive areas is not of primary concern, because the activity is normally widespread and sporadic. In general, the number of ATVs passing a single location would not be sufficient to generate areas of incompatible land use or significantly affect noise-sensitive areas.

CBP ATVs with two-stroke engines are louder than those with four-stroke engines. Noise levels can vary based on operation, but average 90-100 dBA at a distance of 20 inches from the exhaust.

In a reasonable worst case, it was assumed that a single noise-sensitive area would have the potential to be passed 7,800 times per month during ATVs' months of operation. Because the ATVs are spread throughout the sector and not concentrated in any one location, this is not an accurate representation of CBP's activities. For the purposes of analysis, however, this level of activity was carried forward as the reasonable upper bound to facilitate a discussion of effects under NEPA. Under these conditions, ATVs generate a DNL of 53.7 dBA (Table 8.6-3). Due to the limited number of onroad vehicle patrols outlined under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, these levels would be well below the 65-dBA DNL threshold. Because of their widespread nature, actual CBP ATV activities at any location would be much less than those described herein. If CBP's ATV activities were to increase dramatically within a national park or an area known to have threatened or endangered species present, site-specific information would be required to make a more detailed analysis of this activity and to determine the level of effect under NEPA. Noise levels were calculated based on the operational levels outlined in Chapter 2 under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative.

Table 8.6-3. Noise Levels for Patrol Activities under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative

CBP Activity	Vehicle Type		
	ATVs	Snowmobiles	Units
Individual Pass-By			
Measured sound level of single unit	95.0	76.0	dBA
Distance of measurement	0.5	15.2	meters
Calculated sound level at 25 m	78.1	73.8	dBA
Speed of vehicle	40	30	mph
Audible distance	2	2	miles
Audible time	3	4	minutes
Annual Activity			
Trips per day	260	260	
Total monthly pass-bys	7,800	7,800	trips
Percent time audible	1.35%	2.41%	
Distance to receptor	60	60	meters
DNL from Activity	53.7	52.0	dBA

Snowmobile Patrols

Conducting snowmobile patrols would have long-term minor adverse effects on the noise environment. In general, snowmobile activities have the potential to be incompatible with certain noise-sensitive land uses. As a result, this PEIS assesses the effects of the potential for additional CBP snowmobile patrols to increase noise near sensitive receptors. Because snowmobile activity changes throughout the year and throughout any given day, DNL was chosen to evaluate the noise environment for its effects. Although the exact nature and locations of patrols have not been specifically inventoried, this analysis provides a bounded approach to determine at what operational level major effects may be possible.

Snowmobiles are operable only on snow and have limited seasonal use; therefore, these machines would be audible from locations near tracks or trails where snow is present. Although snowmobiles can be noisy, the effects on noise-sensitive areas are not of primary concern because the activity is normally widespread and sporadic. In general, the number of snowmobiles passing a single location would not be sufficient to generate areas of incompatible land use or to significantly affect noise-sensitive areas.

CBP snowmobiles with two-stroke engines are louder than those with four-stroke engines. Noise levels can vary based on operation, but average 76 dBA at a distance of 50 feet while traveling 40 miles per hour (mph). For purposes of analysis, it was assumed the snowcats were quieter than the snowmobiles in all modes.

In a reasonable worst case it was assumed that a single noise-sensitive area would have the potential to be passed 7,800 times per month. Because the snowmobiles throughout the sector are not concentrated in any one location, this is not an accurate representation of CBP's activities. For the purposes of analysis, however, this level of activity was carried forward as the reasonable upper bound to facilitate a discussion of effects under NEPA. Under these conditions, snowmobiles would generate a DNL of 52.0 dBA. These levels would be well below the 65-dBA DNL threshold. Because of snowmobiles' widespread nature, actual CBP snowmobile activities at any location would be much less than those described herein. If CBP's snowmobile activities were to increase dramatically within a national park or an area known to have threatened or endangered species present, site-specific information would be required to make a more detailed analysis of this activity and to determine the level of effect under NEPA.

Aircraft Operations

Conducting additional aircraft patrols along the northern border would have long-term, minor, adverse effects to noise. These activities have been separated into two distinct areas: manned aerial surveillance patrols and UAS missions.

Manned Aerial Surveillance Patrols

Conducting additional manned aerial surveillance patrols would have long-term, minor, adverse effects on the noise environment. In general, aircraft noise from an airport or air installation may exceed levels that make certain noise-sensitive land uses (e.g., residences, schools, churches, and hospitals) incompatible with air operations. Therefore, this PEIS assesses the effects of the potential for additional CBP aircraft operations to increase aircraft noise outside an airport's boundaries and under the paths of individual overflights.

Detailed noise analysis is not required or meaningful for airport activities whose DNL 65 dB contour lies within airport boundaries. It is expected that the increases in areas of DNL 65 dB would be minor and predominately confined to any airport or air installation with operational levels below 90,000 annual propeller operations or 700 annual adjusted jet operations (USDOT, 2007; USDOT, 1985). Based on the latest modeling technology, these levels of piston-powered or jet-powered general aviation operations have been shown to produce DNL 60 dB over an area less than 1.1 square miles, extending no more than 12,500 feet from the start of takeoff roll. The resulting maximum DNL 65 dB contour would be 0.5 square miles and would not extend more than 10,000 feet from the start of takeoff roll. These effects would be minor. Due to the limited amount of noise, CBP's manned aerial surveillance patrols would have a less than major effect on the noise environment at air installations with operational levels below 90,000 annual adjusted propeller operations or 700 annual adjusted jet operations.

Notably, a doubling of air operations would be required to increase noise near an airport or installation by 3 dBA. Since CBP's manned aerial surveillance patrols make up a very small amount of air operations at any airport or air installations, their contribution to the overall noise environment is, and would continue to be, negligible.

Individual aircraft overflights may generate distinct but distant acoustical events that have minor effects. The SEL represents the sound energy normalized to one second, and it is simple to calculate DNL from SEL. If there is one flight per day, the DNL can be calculated by subtracting from the SEL a constant representing 10 times the base 10 logarithm of the 86,400

seconds in a 24-hour day, which is 49.4. For example, if 49.4 were subtracted from 92.1 dBA (i.e., sound level of a Cessna Citation cruising at 500 ft AGL) the DNL would be 42.7 dB. Notably, the Cessna Citation and UH-60 are the loudest aircraft in CBP’s existing fleet (Table 8.6-4 and 8.6-5).

Table 8.6-4. Noise Levels Directly Below Flight Track of Cessna Citation

Feet AGL	Single Overflight		Number of Overflights Required to Generate 65 dBA DNL	
	SEL	DNL	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
	500	92.1	42.7	>170
700	89.6	40.2	>300	>30
1,000	87.0	37.6	>550	>55
1,500	83.8	34.4	>1,150	>115

Note: Assumed level flight at 160 knots.

Source: (USDoD), 2002.

Table 8.6-5. Noise Levels Directly Below Flight Track of a UH-60 Helicopter

Feet AGL	Single Overflight		Number of Overflights Required to Generate 65 dBA DNL	
	SEL	DNL	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
	500	91.8	42.4	>180
700	89.5	40.1	>300	>30
1,000	87.0	37.6	>550	>55
1,500	83.9	34.5	>1,125	>125

Note: Assumed level flight at 160 knots.

Source: (USDoD, 2002).

It is expected that it would take a minimum of 170 operations per day (62,000 annually), or 17 operations per night (6,205 annually), of either the Cessna Citation or the UH-60 helicopter at 500 ft. AGL over a single receptor to drive the DNL above 65 dBA; current operations are much less than that for CBP’s air operations along the entire northern border. Individual overflights would be loud enough to interfere with communications or to awaken sleepers; however, the overall DNL would be comparable to daytime background DNL levels, given the long periods of quiet in between overflights. Therefore, the effects of noise from this activity over noise-sensitive areas away from the air installations would be minor.

Subsequent NEPA analysis would be conducted where necessary to determine the specific impacts of manned aerial surveillance patrols if CBP’s manned aerial surveillance patrols were to increase to more than 10 percent of the total air operations at an individual airport or air

installations with operational levels above 90,000 annual adjusted propeller operations or 700 annual adjusted jet operations. These effects would be minor.

UAS Missions

Conducting UAS missions would have long-term, minor, adverse effects on the noise environment. These effects would be due to individual UAS overflights that may generate distinct but distant acoustical events.

Individual UAS overflights may generate distinct but distant acoustical events that have minor effects. The loudest part of a UAS landing and takeoff cycle is the runup before takeoff. The Predator UAS used for tactical reconnaissance and border surveillance has a noise level of approximately 86 dBA at 192 feet during its runup operations; this level was used as a reasonable worst case for in-flight operations during the takeoff and landing cycle (Table 8.6-6). UASs operate at an altitude of 18,000 feet except for takeoff and landing. Once a UAS reaches approximately 3,000 feet AGL, it will no longer be heard on the ground (Roop, 2004). Because of the airspace restrictions and their limited levels of noise, no residences, communities, or sensitive noise receptors would experience any notable change to the overall noise environment due to changes in UAS activities.

Table 8.6-6. Maximum Noise Levels of the Predator UAS Compared to Other Noise Sources

Noise Source	Distance (ft.)	Maximum Noise Level (dBA)
Predator (UAS)	192	86
Predator (UAS)	24	104
Passenger car (65 mph)	25	77
Motorcycle	25	90
Air conditioner	60	60

Source: (USDoD, 1998).

Overall, increases in the use of Predator UAS would translate into negligible (not distinguishable from existing) changes in the overall noise environment. In general, UASs are quieter, normally operate at much higher altitudes, and are used less frequently than helicopters. Because of their relatively low noise levels, they are not commonly accounted for in determining the effects of air operational noise on communities and individuals living adjacent to airports and military air installations. As with helicopters, no changes to existing areas of incompatible land use would be generated due to changes in UAS operations at airports and air installations used by CBP. Specifically, the noise generated by a UAS during runup and takeoff is not sufficient to change the 65-dBA DNL incompatible noise contour at airports and air installations.

Due to the limited amount of noise, these activities would have a less than major effect on the noise environment.

Vessel Operations

Conducting waterborne patrols would have long-term minor, adverse, effects on the noise environment. In general, boating activities have the potential to be incompatible with certain noise-sensitive land uses, such as residences, schools, churches, and hospitals. As a result, this PEIS assesses the potential effects of additional CBP waterborne patrols that may increase noise near sensitive receptors. Because boating activity changes throughout the year and throughout any given day, DNL was chosen to evaluate the noise environment for the effects of waterborne patrols. Although the exact nature and locations of marine-based CBP patrols have not been specifically inventoried, this analysis provides a bounded approach to determine at what operational level major effects may be possible.

Throughout the year, boats would be audible from locations along a shoreline or waterway, more so in the summer than in the winter due to recreational activities. Although watercraft can be noisy, the effect of watercraft noise on noise-sensitive areas is not of primary concern because the activity is widespread and sporadic. In general, the number of boats passing a single location would not be sufficient to generate areas of incompatible land use or significantly affect noise-sensitive areas (Table 8.6-7). For example, a common midsized watercraft would have an overall sound level of 68–71 dBA at a distance of 82 feet (25 meters) (PWIA, 2008). Noise levels for each region were calculated based on the operational levels outlined in Chapter 2 under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative.

Table 8.6-7. Noise Levels for Vessel Activities for Each Alternative

CBP Activity	No Action Alternative	Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	Flexible Direction Alternative	Units
Individual Pass-By				
Sound level	71	71	71	dBA
Distance of measurement	25	25	25	meters
Sound level at 25 m	71	71	71	dBA
Speed	30	30	30	mph
Audible distance	2	2	2	miles
Audible time	4	4	4	minutes
Annual Activity (WOR Region)				
Trips per day	14	21	21	trips
Total monthly pass-bys	840	1,260	1,260	pass-bys
Percent time audible (equivalent)	0.26%	0.39%	0.39%	percent

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

CBP Activity	No Action Alternative	Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative	Flexible Direction Alternative	Units
Distance to receptor	60	60	60	meters
DNL from Activity	39.4	41.2	41	dBA
Annual Activity (Great Lakes Region)				
Trips per day	42	63	63	trips
Total monthly passbys	2,520	3,780	3,780	passes
Percent time audible (equivalent)	0.78%	1.17%	1.17%	percent
Distance to receptor	60	60	60	meters
DNL from activity	44.2	46	46	dBA
Annual Activity (New England Region)				
Trips per day	16	24	24	trips
Total monthly pass-bys	960	1,440	1,440	pass-bys
Percent time audible (equivalent)	0.30%	0.44%	0.44%	percent
Distance to receptor	60	60	60	meters
DNL from activity	40	41.8	41.8	dBA
Annual Activity (EOR Region)				
Trips per day	5	10	10	trips
Total monthly passbys	300	600	600	passes
Percent time audible (equivalent)	0.09%	0.19%	0.19%	percent
Distance to receptor	60	60	60	meters
DNL from activity	35	38	38	dBA

Assumptions based on historic operational levels were made for the worst case for each region. In a reasonable worst case, it was assumed that a single noise-sensitive area would have the potential to be passed 1,260 times per month in the WOR Region, 600 times per month in the EOR Region, 3,780 times per month in the Great Lakes Region, and 1,440 times per month in the New England Region. The boats are spread throughout the regions rather than concentrated in any one location; therefore, this is not an accurate representation of CBP's boating activities. For the purposes of analysis, however, this level of activity was carried forward as the reasonable upper bound of possible activities to facilitate a discussion of effects under NEPA. Under these conditions, boats would generate DNLs ranging from 41.2 dBA to approximately 46 dBA. These levels would be well below the 65-dBA DNL threshold. Because of their widespread

nature, actual CBP boating activities at any location would be much less than those described herein. Effects of noise from these activities would be minor.

Additional analysis would be performed in situations where site-specific information is necessary to make a more detailed analysis of an activity and to determine the level of its effect under NEPA. This would be necessary for actions that include:

- Helicopter operations expected to exceed 46 operations per day at a POE or a BPS; or,
- Manned aerial surveillance patrol increases that make up more than 10 percent of the total air operations at an individual airport or at air installations with operational levels above 90,000 annual adjusted propeller operations or 700 annual adjusted jet operations.

8.6.4 TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE

The Tactical Security Infrastructure Deployment Alternative would have short-term minor adverse effects on the noise environment. In addition to activities outlined in the No Action Alternative, these effects would be primarily due to both small and large construction projects. In general, increases in noise would not create areas of incompatible land use or violate any Federal, state, or local noise ordinance.

Construction Projects

As with the Facilities Development Alternative, and for similar reasons, both small and large construction projects would have short- and long-term minor adverse effects. It would be possible for residences and other noise-sensitive receptors closer than 800 feet, such as schools, churches, and hospitals, to experience appreciable amounts of construction noise. Due to the limited amount of noise and the activities' temporary nature, these activities would have a less than major effect on the noise environment. Notably, under this alternative, the construction of roadways, trails, fencing, barriers, and trench cuts is unlikely to have any ongoing operational sources of noise. No additional generators, dog kennels, small arms ranges, or helipads are anticipated under this alternative.

8.6.5 FLEXIBLE DIRECTION ALTERNATIVE

The Flexible Direction Alternative would have short-term, minor and long-term, moderate, adverse effects on the noise environment. In addition to activities outlined in the No Action Alternative, these effects would be primarily due to both small and large construction projects, the establishment of helipads and small arms ranges at upgraded POEs and new and upgraded BPSs, and additional air, ground, and water patrols throughout the region. In general, increases in noise would not create areas of incompatible land use or violate any Federal, state, or local noise ordinance.

Construction Projects

As with the Facilities Development Alternative, and for similar reasons, both small and large construction projects would have short-term, minor and long-term, moderate, adverse effects. It would be possible for residences and other noise-sensitive receptors closer than 800 feet, such as schools, churches, and hospitals, to experience appreciable amounts of construction noise. Due to the limited amount of noise and the activities' temporary nature, these activities would have a less than major effect on the noise environment.

As with the Facilities Development Alternative, and for similar reasons, operation of an upgraded POE could have long-term, moderate, adverse effects on the noise environment. These effects may be due to changes in traffic patterns or new permanent sources of noise, such as stand-by generators, the use of helicopters, the establishment of small arms firing ranges, and operation of dog kennels.

Ground Operations—Motorized

As with the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, and for similar reasons, conducting additional motorized ground patrols along the northern border would have long-term, minor, adverse effects to noise.

Aircraft Operations

As with the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, and for similar reasons, conducting additional aircraft patrols along the northern border would have long-term, minor, adverse effects to noise.

Conducting additional manned aerial surveillance patrols would have long-term, minor, adverse effects on the noise environment. Subsequent NEPA analysis would be conducted where necessary to determine the specific impacts of manned aerial surveillance patrols if CBP's manned aerial surveillance patrols were to increase to more than 10 percent of the total air operations at an individual airport or air installations with operational levels above 90,000 annual adjusted propeller operations or 700 annual adjusted jet operations. These effects would be minor.

Conducting UAS missions would have long-term, minor, adverse effects on the noise environment. These effects would be due to individual UAS overflights that may generate distinct but distant acoustical events. Due to the limited amount of noise, these activities would have a less than major effect on the noise environment.

Vessel Operations

As with the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, and for similar reasons, conducting waterborne patrols would have long-term, minor, adverse effects on the noise environment. In general, boating activities have the potential to be incompatible with certain noise-sensitive land uses, such as residences, schools, churches, and hospitals.

In a reasonable worst case, it was assumed that a single noise-sensitive area would have the potential to be passed 1,260 times per month in the WOR Region, 600 times per month in the EOR Region, 3,780 times per month in the Great Lakes Region, and 1,440 times per month in the New England Region. The boats are spread throughout the regions rather than concentrated in any one location; therefore this is not an accurate representation of CBP's boating activities. For the purposes of analysis, however, this level of activity was carried forward as the reasonable upper bound of possible activities to facilitate a discussion of effects under NEPA. Under these conditions, boats would generate DNLs ranging from of 41.2 dBA to approximately 46 dBA. These levels would be well below the 65-dBA DNL threshold. Because of their widespread nature, actual CBP boating activities at any location would be much less than those described herein. Effects of noise from these activities would be minor.

Additional analysis would be performed in situations where site-specific information is necessary to make a more detailed analysis of an activity and to determine the level of its effect under NEPA. This would be necessary for actions that include:

- The establishment of new access-controlled highways or a new secondary roadway within an urban area;
- Helicopter operations expected to exceed 46 operations per day at a POE or a BPS;
- Outdoor firing ranges or indoor ranges where the noise could not be completely contained within CBP’s properties;
- Manned aerial surveillance patrol increases that make up more than 10 percent of the total air operations at an individual airport or air installations with operational levels above 90,000 annual adjusted propeller operations, or 700 annual adjusted jet operations; or,
- Substantial increases in ATV or snowmobile activities within a national park or an area known to have threatened or endangered species present.

8.6.6 BEST MANAGEMENT, MINIMIZATION, AND MITIGATION

No additional operational management, minimization or mitigation measures would be required for noise.

8.6.7 SUMMARY OF POTENTIAL NOISE IMPACTS

Table 8.6-9 summarizes the comparison of impacts to noise stemming from the various alternatives.

Table 8.6-8. Summary of Potential Noise Impacts

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor adverse	Moderate Adverse	Major Adverse	Beneficial
NO ACTION ALTERNATIVE					
Small construction projects (< 1 acre and < 1/4 mile, e.g., minor repairs to facilities, parking lot repairs, access road repairs)		⊗			
Large construction projects (> 1 acre and > 1/4 mile, e.g., repairs to facilities, parking lot repairs, access road repairs)		⊗			
Checkpoint operations	⊗				
Ground operations—motorized		⊗			
Ground operations—nonmotorized	⊗				
Aircraft operations		⊗			
Vessel operations		⊗			

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor adverse	Moderate Adverse	Major Adverse	Beneficial
Operation of NII systems	⊗				
Operation of sensor and other technologies	⊗				
OVERALL IMPACT		⊗			
FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE					
Small construction projects		⊗			
Large construction			⊗		
OVERALL IMPACT (INCLUDING NO ACTION)		⊗	⊗		
DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE					
Small construction projects		⊗			
Ground operations—motorized		⊗			
Ground operations—nonmotorized	⊗				
Aircraft operations		⊗			
Vessel operations		⊗			
Operation of NII systems	⊗				
Operation of sensor and other technologies	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE					
Small construction projects		⊗			
Large construction projects		⊗			
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor adverse	Moderate Adverse	Major Adverse	Beneficial
FLEXIBLE DIRECTION ALTERNATIVE					
Small construction projects		⊗			
Large construction projects		⊗			
Checkpoint operations	⊗				
Ground operations—motorized		⊗			
Ground operations—nonmotorized	⊗				
Aircraft operations		⊗			
Vessel operations		⊗			
Operation of NII systems	⊗				
Operation of sensor and other technologies	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)		⊗	⊗		

8.7 ENVIRONMENTAL CONSEQUENCES FOR CLIMATE AND RESOURCE SUSTAINABILITY

This section describes the potential adverse and beneficial impacts to climate and resource sustainability associated with CBP's ongoing and proposed activities.

Climate change is defined as any significant change in climate metrics, including precipitation, temperature, and wind patterns, over a period of time. Sustainable development is defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs. For descriptions of the regional affected environments for climate and resource sustainability, see Sections 4.7.2 (WOR Region), 5.7.2 (EOR Region), 6.7.2 (Great Lakes Region), and 7.7.2 (New England Region).

The effects of climate change most people refer to today stem from "global warming," a relatively recent phenomenon of rising average temperatures across the globe. The temperature increase is thought to be due in large part to the human-induced increase in greenhouse gas emissions (GHGs) released into the atmosphere as a result of fuel combustion. Common GHGs, such as carbon dioxide, methane, and nitrous oxide, trap radiant heat coming from the Earth causing the average temperature to rise.

Climate change is a complex homeland security challenge with strategic implications for the Department of Homeland Security (DHS) and CBP. In a globalized and interconnected world, the risks posed or exacerbated by a changing climate—such as intensifying extreme weather events and sea ice changes in the Arctic—transcend national borders and affect core homeland security missions. Understanding how climate change may change the strategic landscape is at the heart of effectively managing risks to the Nation's security. The DHS Climate Change Adaptation Task Force (DHS Task Force) notes in the Deputy Secretary's August 30, 2011 *DHS Policy for Climate Change Adaptation* memo that the projected impacts of climate change pose direct and indirect security and resiliency risks to core homeland security missions and DHS infrastructure and operations.

Across the northern border as a whole, impacts from all of the alternatives would range from negligible-to-minor, adverse impacts. Beneficial impacts would also occur. A substantial array of mitigation measures relating to improved energy efficiency, emission reduction, and sustainable -technology implementation could be utilized on a site-specific basis to further reduce any of these potentially adverse impacts. As a result of CBP's proposed small, incremental construction and operational activities, and mitigation efforts, cumulative impacts to climate and sustainability across the northern border as a whole would be negligible.

8.7.1 NO ACTION ALTERNATIVE

The No Action Alternative would entail the continuation of the status quo, or the current level of CBP operations, with generally the same level of manpower that is operating now. This alternative would include routine maintenance and repairs of facilities, equipment, and technology (including commercial upgrades as these become available). Nonmotorized ground operations are not expected to have any impacts on climate or resource sustainability because their footprint is so small. The overall impacts to climate and resource sustainability under the No Action Alternative are expected to be negligible to minor and adverse. BMPs and mitigation

measures would be employed to the greatest extent possible, as described detail in Section 8.7.6, Best Management, Minimization, and Mitigation.

Small Construction Projects

There are approximately 20 small construction projects underway or in planning in each of the regions. These small construction projects include minor repairs to facilities, parking-lot repairs, and access-road repairs. Impacts to climate and resource sustainability resulting from small roadway and parking-lot improvement projects are anticipated to be minor and adverse. Impacts to climate and resource sustainability resulting from minor repairs to facilities are anticipated to be negligible and beneficial as such projects will be designed to improve energy efficiency, reduce water usage, and waste generation. Data on CO₂ emissions from construction of various tactical security infrastructure projects can be found at Appendix J1-9 and J1-10.

Large Construction Projects

There are approximately 15 large construction projects underway or in planning in each of the regions. These large construction projects include more substantial repairs to facilities, parking lots, and access roads. USBP needs gabions, water bars, and other drainage- or erosion-control structures to protect roads, bridges, culverts, and low-water crossings that help prevent unauthorized border crossings and provide access to all parts of the border. The majority of the dirt roads within the border region were about 24 feet wide when originally built. Over the years, some roads have experienced severe wind and water erosion, which has resulted in long, impassable stretches. In addition, vegetation has encroached to the point that these roads are now typically less than 10 feet wide.

Impacts to climate and resource sustainability resulting from substantial roadway and parking-lot improvement projects are anticipated to be negligible to minor and adverse due to vehicle and equipment emissions during construction and increased vehicle emissions in areas where new infrastructure such as roads and bridges would be created. Impacts to climate and resource sustainability resulting from substantial repairs to facilities are anticipated to be negligible to minor and beneficial, due to the potential of such projects to improve energy efficiency or to reduce water usage or waste generation.

Onsite Trade and Travel Processing Operations

CBP estimates that there 20 operations either currently underway or in planning in the WOR Region, 30 operations in the EOR Region, 10 operations in the Great Lakes Region, and 20 operations in the New England Region. Of these operations, three in the Great Lakes Region and one in the EOR Region are large, on-site trade and travel processing facility upgrades.

POEs are generally connected to local, county, or municipal sanitary, potable, sewer, and electrical utility systems. Where these are unavailable, POEs are equipped with their own septic systems, water-supply wells, and generators.

BPSs are connected to local county or municipal utility systems, when available, or have their own septic systems and water-supply wells. They also have lighting, and generators. USBP uses lighting not only at its BPSs but also at temporary checkpoints and for surveillance operations. Temporary lighting is generally mounted on a vehicle of some type. It is often powered by the grid but can be powered by diesel generators when grid connections are not available.

Under the No Action Alternative, impacts to climate and resource sustainability from the replacement of small, onsite trade and travel facility replacements would be negligible to minor and adverse. Impacts would occur due to emissions from vehicles idling while waiting for inspection at POEs and from idling CBP agent vehicles at or near POEs. Impacts would also occur due to emissions from vehicles of CBP employees commuting to and from the POE, emissions from vehicles traveling to laboratories for further agricultural inspection, and emissions from full-time operation of the POE building and associated structures. Impacts would be minimized through the use of FAST Driver cards and NEXUS cards, which allow expedited travel across the northern border. At rural border crossings, limited hours of operation are in effect, also minimizing emission rates. Impacts would vary due to the amount waste generated, materials recycled, and energy and water consumed at each site.

Checkpoint Operations

Under the No Action Alternative, each of the 4 regions would operate approximately 100 checkpoints per day. Roadway checkpoints generally consist of traffic lanes temporarily controlled by USBP. In some cases, checkpoints include support buildings to provide temporary office and holding space, as well as lights, signage, and other support equipment, including diesel generators. Impacts to climate and resource sustainability from the setup and operation of mobile traffic checkpoints under the No Action Alternative would be negligible and adverse due to emissions from vehicles idling at checkpoints, emissions from vehicles used to drive to and from the mobile traffic checkpoint location, and diesel generator emissions.

Ground Operations—Motorized

When possible, USBP agents remain on existing roads to apprehend CBVs, but agents occasionally go off road when required. All sectors use a variety of vehicles including four-wheel drive vehicles, sedans, scope trucks, ATVs, and snowmobiles. Under the No Action Alternative, each of the 4 regions would employ approximately 800 motorized vehicles per day, for a total of 3,200 motorized vehicles employed per day across the northern border.

Impacts to climate and sustainability resulting from ATV and snowmobile/snowcat patrols would be minor and adverse. CBP does not plan to acquire a large number of new ATVs and snowmobiles under the No Action Alternative. Thus, fuel consumption and emissions from these vehicles would be minor and adverse, depending on their rate of use by CBP.

CBP vehicles may sit idle for significant periods of time (four to eight hours) during the course of a typical work day. This idle time is necessary due to hostile environmental conditions (extreme heat or cold), or due to other operations that require a vehicle's internal environment to be maintained or electronics to remain fully powered.

A large portion of CBP's fleet consists of law enforcement vehicles powered by traditional fuel. These vehicles are not necessarily fuel efficient and there is a lack of alternative fuel infrastructure. Under the No Action Alternative, impacts to climate resulting from on-road vehicle patrols would be minor to moderate and adverse due to fuel consumption and emissions. Impacts to sustainability would also be minor to moderate and adverse due to the use of materials to construct and maintain these vehicles and the use of fossil fuels to power the vehicles.

Aircraft Operations

OAM agents operate 22 different types of aircraft to intercept people and contraband crossing land and water borders. Most aircraft are home based at existing airports or are tenants on military air installations, where they use existing hangar space, runways, helipads, and fueling facilities. Aircraft and helicopters are generally refueled at established airports.

Under the No Action Alternative, approximately 70 aircraft operations would take place daily across the northern border: 15 in the WOR Region, 20 in the EOR Region, 20 in the Great Lakes Region, and 15 in the New England Region. Impacts to both climate and resource sustainability across the northern border resulting from the operation of aircraft or aircraft operations would be minor and adverse. Impacts would occur due to fuel emissions from aircraft and the operation of refueling facilities.

Vessel Operations

For those sectors with water boundaries, USBP runs maritime patrols using boats and other marine-based watercraft. OAM provides USBP Sectors with a range of watercraft to assist in river or lake patrols in the EOR Region. Each sector operates and maintains between 1 and 14 boats of varying sizes and performs 2 or 3 patrol shifts per day. Patrols range from 1 to 256 miles, depending on location. Under the No Action Alternative, approximately 77 vessel operations would take place daily across the northern border: 14 in the EOR Region, 5 in the EOR Region, 42 in the Great Lakes Region, and 16 in the New England Region

Under the No Action Alternative, impacts to climate and resource sustainability resulting from waterborne patrols and the standardization and modernization of the OAM fleet would be negligible and adverse due to fuel consumption and emissions from boat patrols. Use of materials to construct and maintain boats and boat launches would also be negligible and adverse.

Operation of Nonintrusive Inspection Systems, Sensors, and Other Technologies

CBP officers conduct cargo inspections daily, deploying a proper mix of NII technologies at each POE to support the detection and interdiction of contraband, such as weapons of mass effect, illicit radioactive materials, drugs, and currency. Under the No Action Alternative, the many NII systems utilized by CBP would operate for a total of approximately 1,000 hours per day. Sensors and other technologies would be operated approximately 1,500 hours per day.

Impacts to both climate and resource sustainability from the use of NII technology under the No Action Alternative would be negligible and adverse due to the production of materials used in inspection technologies and the use of energy sources required to power the technology.

8.7.2 FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE

The overall impacts to climate and resource sustainability under the Facilities Development and Improvement Alternative are expected to be minor and adverse. Mitigation measures would be employed to the greatest extent possible, as described in greater detail in Section 8.7.6, Best Management, Minimization, and Mitigation.

Small Construction Projects

Small construction projects that may be implemented by CBP under the Facilities Development and Improvement Alternative include facility renovations and alterations, removal of vegetation from sites to accommodate buildings and paved areas, the introduction of sustainable building design elements to comply with Executive Orders 13423 and 13514, the *Guiding Principles for Sustainable New Construction and Major Renovations*, Energy Policy Act of 2005 (EPAct 2005) and Energy Independence and Security Act of 2007 (EISA 2007), landscaping, expansion of parking, construction of housing for radio repeater sites, and other minor construction. CBP estimates that approximately 30 additional projects would occur under this proposed alternative in each of the regions.

Impacts to both climate and resource sustainability from the approximately 120 small construction projects proposed under this alternative would have a negligible-to-minor impact regionally and border wide. Impacts would vary with the volume and type of materials used, emissions during construction, and emissions from facility operations.

Large Construction Projects (POEs, BPSs)

To modernize POEs, CBP and GSA rehabilitate property and facilities that they own or, they buy and upgrade or build facilities. CBP uses three size-based, standard, building concepts to replace facilities; these new designs include sustainable-building features to ensure compliance with the EPAct 2005, the EISA 2007, Executive Orders 13423 and 13514 and the *Guiding Principles for Sustainable New Construction and Major Renovations* using Leadership in Energy and Environmental Design (LEED) as a method of third party verification. Under the large construction project category, modernization would entail a level of work similar to the work in building an upgraded POE.

CBP estimates the potential for 80 large projects (20 per region) along the northern border under the Facilities Development and Improvement Alternative. Certain aspects of modernizing or upgrading an existing POE would have minor and beneficial impacts related to climate and resource sustainability. The installation of water efficient fixtures, and energy-efficient lighting, the addition of other energy-efficient systems, and the establishment of on-site, renewable-energy generating sources would reduce energy, water, and materials consumption at the facility; and reduce waste at POEs.

Large construction projects that upgrade a relatively low number of POEs in each of the four regions under the Facilities Development and Improvement Alternative would have negligible-to-minor and adverse impacts to climate due to building emissions related to energy use. Impacts to resource sustainability would be negligible to minor and adverse due to the consumption of materials, water, and energy at the facilities, reduction of pervious surface, and the generation of solid waste.

New building site design and construction would follow the guidelines in the USBP Facilities Design Guide. Construction of a relatively low number of BPSs in each of the four regions under the Facilities Development and Improvement Alternative would have negligible and adverse impacts to climate due to building emissions related to energy use. Impacts to resource sustainability would be negligible to minor and adverse due to the consumption of materials, water, and energy; reduction of pervious surface; and the generation of solid waste.

8.7.3 DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE

The overall impacts to climate and resource sustainability under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative are expected to be minor and adverse. BMPs and mitigation measures would be employed to the greatest extent possible, as described in greater detail in Section 8.7.6, Best Management, Minimization, and Mitigation.

Small Construction Projects

Under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, CBP would install communications and surveillance towers for the installation of radio antennae, radio transmitters and receivers, and RVSS and motion-detection devices. Many towers have a small building to house electronic equipment associated with the operations. Communications tower sites would each require one-half to one acre of property. Vegetation would be cleared within a 50 by 50foot footprint. An underground power line would be installed to connect the site to the commercial power grid, where possible. In rural or remote areas, a gravel access road would be constructed, causing a greater loss of vegetation cover.

In each of the regions, CBP would initiate approximately 100 small construction projects related to communications and surveillance. Towers and pertinent elements would be sited, designed, and constructed to avoid or minimize habitat loss within and near the tower footprint. Road access and fencing would be minimized to the extent possible to reduce or prevent ground disturbance. All construction would comply with EAct 2005, EISA 2007, Executive Orders 13423 and 13514 and the *Guiding Principles for Sustainable New Construction and Major Renovations*. Impacts to climate from construction and installation associated with approximately 400 total communications towers across the northern border under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative would be negligible and adverse. Impact to resource sustainability would be negligible to minor and adverse.

Ground Operations—Motorized

Under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, approximately 1,300 motorized ground operations would occur each day in each of the 4 regions. Impacts to climate and resource sustainability would be minor to moderate and adverse.

Aircraft Operations

Under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, approximately 106 combined aircraft operations would take place each day across all northern border regions. Impacts to both climate and resource sustainability resulting from the operation of aircraft or aircraft operations would be minor and adverse. Impacts would occur due to fuel emissions from aircraft and operation of refueling facilities.

Vessel Operations

Under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, CBP would initiate approximately 108 vessel operations per day across all northern border regions: 21 in the WOR Region, 10 in the EOR Region, 63 in the Great Lakes Region,

and 24 in the New England Region. Vessel operations would be associated with increased impacts to climate and resource sustainability. However, impacts would only be negligible and adverse due to fuel consumption and emissions from boat patrols.

Operation of NII Systems, Sensors, and Other Technologies

Under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, NII systems would be in operation for approximately 1,000 hours per day. Sensors and other technology would be in operation for approximately 2,500 hours per day. Impacts to both climate and resource sustainability from the use of NII technology under this alternative would be minor and adverse due to the production of materials used in inspection technologies and the use of energy sources required to power the technology.

8.7.4 TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE

The overall impacts to climate and resource sustainability under the Tactical Security Infrastructure Deployment Alternative are expected to be minor and adverse. BMPs and mitigation measures would be employed to the greatest extent possible, as described in greater detail in Section 8.7.6, Best Management, Minimization, and Mitigation.

Small Construction Projects

Under the Tactical Security Infrastructure Deployment Alternative, approximately 30 small construction projects would occur per region. These projects would include, but would not be limited to, trench cuts, construction of towers, and construction or repair of minor access roads and fences. Impacts to climate and resource sustainability resulting from 30 small roadway and parking-lot improvement projects would be minor and adverse.

Large Construction Projects

Under the Tactical Security Infrastructure Deployment Alternative, approximately five large construction projects involving the construction or repair of access roads and fences would take place. Impacts to climate and resource sustainability would be negligible to minor and adverse due to vehicle and equipment emissions during construction and to increased vehicle emissions in areas where new infrastructure, such as roads and bridges, would be created.

8.7.5 FLEXIBLE DIRECTION ALTERNATIVE

The Flexible Direction Alternative reflects the maximum amount of activities that would result from combining all of the previously described action alternatives. The number of activities or operations discussed below reflects the total level of operations that would be reached under this alternative. The overall impacts to climate and resource sustainability under the Flexible Direction Alternative are expected to be minor and adverse. BMPs and mitigation measures would be employed to the greatest extent possible, as described in greater detail in Section 8.7.6, Best Management, Minimization, and Mitigation.

Small Construction Projects

Under the Flexible Direction Alternative, approximately 160 small construction projects would occur in each of the 4 regions. Impacts to climate and resource sustainability would be minor and adverse.

Large Construction Projects

Under the Flexible Direction Alternative, approximately 25 large construction projects would occur in each of the 4 regions. Impacts to climate and resource sustainability would be minor and adverse.

Checkpoint Operations

Under the Flexible Direction Alternative, approximately 100 checkpoint operations would occur in each of the 4 regions. Impacts to climate and resource sustainability would be minor and adverse.

Ground Operations—Motorized

Under the Flexible Direction Alternative, approximately 1,300 motorized ground operations would occur each day in each of the 4 regions. Impacts to climate and resource sustainability would be minor to moderate and adverse.

Aircraft Operations

Under the Flexible Direction Alternative, the same amount of aircraft operations as in the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative (approximately 106) would occur each day across all of the northern border regions. Impacts to climate and resource sustainability would likewise be negligible and adverse.

Vessel Operations

Under the Flexible Direction Alternative, the same amount of vessel operations as in the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative (approximately 118) would occur each day across all of the northern border regions. Impacts to climate and resource sustainability would likewise be negligible and adverse.

Operation of NII Systems, Sensors, and Other Technologies

Under the Flexible Direction Alternative, NII systems across each of the regions would operate approximately 1,500 hours per day. Sensors and other technologies would operate for approximately 2,500 hours per day in each region. Impacts to climate and resource sustainability would be minor and adverse.

8.7.6 BEST MANAGEMENT, MINIMIZATION, AND MITIGATION

CBP seeks to avoid, minimize, repair, and reduce the impacts of its actions on the human environment. It does so with a combination of BMPs, siting plans, design strategies, mitigation measures, and monitoring plans best suited to the scale and the location of the particular action. Towards that end, in implementing its proposed action CBP could choose from among the following actions to avoid or minimize impacts to climate and resource sustainability:

- Continue development of CBP's Environmental Management System;
- Review and revise the CBP Fleet Handbook to incorporate meeting sustainability goals as an objective;
- Review and revise real-property acquisition and development process maps to include a sustainability review of each project;

- Develop a process to monitor compliance with sustainability goals and targets;
- Identify facilities where installation of an alternative fuel tank would increase the use of alternative fuel;
- Conduct fleet-optimization analysis (including right sizing of fleet and right configuration for defined missions);
- Establish policy and procedure to ensure that high-octane gasoline (E85) or bio-diesel fuel tanks are installed at new CBP fueling centers;
- Continue deployment of flex-fuel vehicles;
- Evaluate hybrid vehicles for administrative use;
- Develop a policy for use of videoconferencing;
- Develop a sustainable process for calculating employee-commute emissions;
- Complete a revised inventory of GHG emissions sources;
- Develop an integrated plan for how CBP will meet GHG emissions-reduction goals;
- Ensure that all new construction, as well as major renovation or repair and alteration of Federal buildings, complies with “Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings,” December 1, 2008 (Guiding Principles), EPLA 2005, EISA 2007, Executive Orders 13423 and 13514;
- Ensure that new construction designs are at least 30 percent more energy efficient than the applicable standard;
- Use cost-effective, innovative building strategies to minimize energy, water, and materials consumption in a manner that achieves a net reduction in Department-deferred maintenance costs;
- Modify existing owned facilities and bring them into compliance;
- Complete evaluation of laboratory energy audits and, as appropriate, add implementation of recommended energy-savings initiatives into budget requests;
- Ensure that all Project Management Office project managers are trained in Guiding Principles/LEED® (“Guiding Principles for Sustainable New Construction and Major Renovations”);
- Review existing contracts to ensure that sustainability requirements are included in statements of work;
- Incorporate participation in regional transportation planning (recognition and use of existing community transportation infrastructure) into existing policy and guidance;
- Update policy and guidance to ensure that EISs and environmental assessments (EA) required under NEPA for proposed new or expanded Federal facilities identify and analyze impacts associated with energy usage and alternative energy sources, where applicable;
- Complete CBP NEPA Handbook;

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

- Develop guidance for CBP service providers (GSA and the U.S. Army Corps of Engineers) for site-selection criteria and prioritization based on sustainability goals;
- Reduce potable-water-use intensity—gallons used per square foot—by at least 26 percent by FY2020;
- Reduce industrial, landscaping, and agricultural water use by at least 20 percent by FY2020;
- Achieve objectives established by the USEPA in Stormwater Guidance for Federal Facilities EISA Selection 438 (42 USC 17094);
- Develop a CBP Water Conservation Handbook;
- Complete the CBP Environmental Compliance Handbook;
- Increase source reduction of pollutants and waste;
- Divert at least 50 percent of nonhazardous solid waste by FY2015, excluding construction and demolition (C&D) debris;
- Divert at least 50 percent of C&D materials and debris by FY2015;
- Reduce printing-paper use;
- Reduce and minimize the acquisition, use, and disposal of hazardous chemicals and materials;
- Increase diversion of compost and organic materials from the waste stream;
- Decrease use of chemicals to achieve FY2020 GHG reduction targets;
- Complete the CBP Recycling and Reuse Handbook;
- Complete 300 environmental compliance assessments (scope includes identification of quantities of hazardous waste disposed annually);
- Complete baseline assessment of waste management practices at all facilities;
- Ensure that 95 percent of new contract actions require the supply and use of products and services that are energy efficient (as designated by Energy Star or Federal Energy Management Program [FEMP]), water efficient, bio-based, environmentally preferable, and not ozone-depleting, and that they contain recycled content or are non-toxic or less toxic alternatives. (For construction contract actions, this could include provisions for diesel retrofits, the use of clean fuels, and anti-idling provisions to reduce vehicle emissions if feasible.)
- Complete the CBP Green Procurement Handbook and policy;
- Establish and implement policy and guidance to ensure use of power management, duplex printing, and other energy efficient or environmentally preferred options and features on all eligible CBP electronic products;
- Update CBP policy to ensure implementation of BMPs for energy-efficient management of servers and Federal data centers;
- Add a chapter on electronics stewardship to the current CBP Electronics Security Handbook; and,

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

- Conduct an inventory of compliant and noncompliant equipment.

8.7.7 SUMMARY OF POTENTIAL IMPACTS

Table 8.7-1 summarizes the potential impacts of the alternatives on climate and resource sustainability.

Table 8.7-1. Summary of Potential Climate and Resource Sustainability Impacts

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
NO ACTION ALTERNATIVE					
Small construction projects		⊗			⊗
Large construction projects		⊗			⊗
Small on-site trade and travel processing operations		⊗			
Large on-site trade and travel processing operations		⊗			
Checkpoint operations	⊗				
Ground operations—motorized			⊗		
Aircraft operations		⊗			
Vessel operations	⊗				
Operation of NII systems	⊗				
OVERALL IMPACT	⊗	⊗			
FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE					
Small construction project		⊗			
Large construction projects		⊗			⊗
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE					
Small construction projects		⊗			
Ground operations—motorized			⊗		
Aircraft operations		⊗			
Vessel operations	⊗				
Operation of NII systems		⊗			
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE					
Small construction projects		⊗			
Large construction projects		⊗			
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
FLEXIBLE DIRECTION ALTERNATIVE					
Small construction projects		⊗			
Large construction projects		⊗			
Checkpoint operations		⊗			
Ground operations—motorized			⊗		
Aircraft operations	⊗				
Vessel operations	⊗				
Operation of NII systems		⊗			
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			

8.8 ENVIRONMENTAL CONSEQUENCES TO LAND USE

This section considers the potential adverse and beneficial impacts to the land uses described in Sections 4.8, 5.8, 6.8, and 7.8 that may result from the program alternatives. As described in those sections, a land use impact may be caused by an activity that:

- Disrupts an existing or planned future land use;
- Reduces the suitability of land to support its current or planned use;
- Constitutes a fundamental change in land use;
- Is inconsistent with existing land use authority, guidelines, or management plans; or
- Is incompatible with plans and management objectives of adjacent areas under control of other entities.

Several of the actions that CBP is considering are not expected to have any impact on land use resources. Nonmotorized ground operations (i.e., horse and foot patrol), operation of NII systems, and operation of sensors and other technologies are unlikely to disrupt existing land uses because they do not preclude particular land uses and they do not introduce significant noise or light pollution that would interrupt land use activities. Small construction projects that affect under one acre of land are also unlikely to alter land uses due to their small footprint. Such projects include minor structural and interior repairs to buildings, and construction of technology support infrastructure, such as radio communication towers. Due to the lack of expected impact on land uses, these activities are not considered further in this section. In addition, none of the alternatives are likely to result in beneficial impacts on land use.

Land use impacts of actions under each of the alternatives are dominated by the potential effects on land use of large construction projects. Large-scale facilities and infrastructure developments directly remove the land on which they are constructed from its existing use and alter the landscape such that surrounding land uses may also be affected. While the impacts of these projects would be permanent, they would remain localized at the project site and are unlikely to affect the viability of regional land-use activity. As such, impacts of these large construction projects are expected to be moderate and adverse resulting in moderate impacts on land use of each of the evaluated alternatives. Impacts of other CBP activities, such as small construction projects, patrols, and trade and travel processing operations, may increase noise or light disturbance and negatively affect the relative appeal of the area near the project site for recreation or residential development. Depending on surrounding land use (e.g., proximity to residential and recreational areas) and the length and intensity of the noise or light disturbance, these activities are likely to result in only negligible to minor impacts as the effects are localized and temporary. Likewise, because of the permanent but localized impacts of large construction projects, cumulative impacts are expected to be moderate. While land use changes result from CBP developments, these projects would affect a relatively small, localized area compared to the combined land-use effects of ongoing activities in the northern border regions, such as non-CBP energy projects (e.g., wind energy developments), mine developments, and utility and transportation projects.

8.8.1 NO ACTION ALTERNATIVE

The No Action Alternative is to continue the current pace of operations in terms of the current types and levels of CBP activities along the northern border. Impacts are dominated by large facilities and infrastructure construction projects that cause direct land use changes at a project site. When additional land is needed for facility construction, CBP seeks to acquire lands through purchase or lease from willing private sellers when not available from other Federal agencies or State or local partner agencies. This practice would continue to hold true for all acquisitions under all alternatives.

The following discussion describes how CBP activities in the No Action Alternative could affect land uses in the four regions. The following general categories of CBP activities have the potential to affect land use resources:

- Construction of new facilities or major repair and maintenance of existing facilities;
- Activities that introduce noise or light disturbance, such as construction, checkpoints, patrols, or deployment of new surveillance technologies;
- Road and bridge construction; and,
- Construction of fences or other physical barriers.

Large Construction Projects

Large CBP construction projects include modernization or expansion of POEs and construction of BPSs, permanent traffic checkpoints, and FOBs. Projects may also involve construction of fences and other physical barriers, roads, bridges, and culverts. The following discussion focuses on construction projects that affect more than one acre or a quarter mile of road.

Following are general descriptions of the types of large construction projects that may occur in each of the four regions.

Construct a BPS

This activity requires purchase or lease of approximately 10 acres to develop an office/storage building and 10,000 square feet of parking. For BPSs in remote areas, CBP would also consider the need to construct a 3,600 square foot helipad.

Modernization or Maintenance of Existing POE or BPS

Maintenance and repairs at existing facilities range from minor upgrades or repairs to major modifications, such as demolition of existing structures and construction of new ones. These activities may, therefore, be either small or large construction projects.

Set-Up of Permanent Traffic Checkpoints

The total land area required remains uncertain, but should be able to support some or all of the following components: a new, 6,000 square foot building; less than 1 acre for canine-unit kennels; storage areas for evidence, equipment, and tools; parking; tollbooth-like structures for shelter from weather; detention rooms; a HAZMAT quarantine area to store vehicles; inspection lanes; area for utilities, potable water supply, communications towers, sewage disposal, and solid waste storage; and on-site renewable energy generating sources at some sites.

Construct a New FOB

The total land area required is generally about three to five acres, and should support modular structures or buildings; portable toilet and shower facilities; portable generators; fuel; and water trailers. The FOBs are temporary and operate on a regular basis for several days to several weeks.

Construct Fences or other Physical Barriers

Fence and barrier construction along the northern border may require access roads, lighting, and other infrastructure during construction. Depending on the amount of area required, these projects may be small or large construction projects.

Access Road Extension

Extending access roads for more than a quarter of a mile is considered a large construction project.

CBP anticipates that under the No Action Alternative, up to 15± large construction projects will take place across each of the 4 regions. These projects are either currently underway or in the planning stages. Construction projects may affect land use in two ways: (1) by directly removing the parcel of land on which development will occur from its existing use; or (2) by changing the landscape in such a way that the surrounding area becomes less attractive for a particular land use (e.g., due to temporary or permanent increases in noise or visual disturbance). To the extent that construction is occurring directly against the border, this second category may also affect border areas in Canada.

The overall impacts of these activities on land use are likely to be moderate and adverse. While the change in land use at the developed sites would be unavoidable and permanent, the land area required for new developments is relatively small, ranging from one acre to tens of acres. Although conversion of some land to CBP facility development would result from these activities, the relatively small amount of land converted would be unlikely to affect the viability of any particular land use in the broader region.

The first category of land use impact is the most direct: removing a parcel of land from its existing use. For these development projects, CBP would acquire private property or Government land that is currently forested, agricultural, or pasture, or is a vacant site or existing building in a populated area. The land area required for CBP construction activities would vary by project. Acquisition of private land for Federal program development may be quantified as either a loss to the current private landowner in the form of foregone future revenue on the parcel (if the land is purchased at a value less than the present value of forecast future uses) or as a gain to the landowner as revenue derived from the sale or lease of the parcel (if the land is purchased at a value greater than the present value of forecast future uses). When purchasing (or leasing) lands from willing sellers, CBP (or a Government agency acting on behalf of CBP) would conduct market surveys that include comparable land values. The Government will make a fair market value offer to the landowner. After negotiation, the Government and the landowner would come to an agreement on the sale or lease of the property. The negotiated cost does not presume that the land use change would result in a negative or positive economic impact on willing sellers (i.e., the assumption is that the fair market value offered is equivalent to the

present value of the future uses of the land). If CBP must acquire land through eminent domain, the landowner would lose the value of that land for its existing purpose, but would be compensated at fair market value or more for the land.

Acquisition of land for construction is most likely to affect forested, agricultural, and developed lands. The percentage of forest cover ranges across the states from 55.9 percent in Washington to 79.7 percent in Idaho in the WOR Region; from 2.1 percent in North Dakota to 43.1 percent in Minnesota in the EOR Region; from 21.4 percent in Ohio to 84.0 percent in Wisconsin in the Great Lakes Region; and from 68.4 percent in Vermont to 85.0 percent in New Hampshire in the New England Region.

Agricultural land (both cultivated crops and pasture) is significantly less abundant: ranging from 2.3 percent of land area in Idaho to 12.3 percent in Washington in the WOR Region; from 20.7 percent in Minnesota to 62.3 percent in North Dakota in the EOR Region; from 6.4 percent in Wisconsin to 56.1 percent in Ohio in the Great Lakes Region; and from 2.6 percent in New Hampshire to 15.9 percent in Vermont in the New England Region.

Developed land is relatively scarce in most states: ranging from 1.1 percent in Montana to 6.0 percent in Washington in the WOR Region; from 1.7 percent in Montana to 4.3 percent in North Dakota in the EOR Region; from 4.2 percent in Wisconsin to 17.3 percent in Ohio in the Great Lakes Region; and from 2.6 percent in Maine to 5.4 percent in Vermont in the New England Region.

The second way in which construction of new facilities may affect land use is by altering the conditions or character of a landscape, making the surrounding area less attractive for a particular land use, such as recreation. Such impacts may be temporary, such as increased noise during construction, or permanent due to the noise or visual disturbance associated with a new facility or road.

Recreational users may prefer a rural, more natural landscape for activities such as hiking, fishing, hunting, or camping. To the extent that development of CBP facilities degrades the quality of the surrounding area for recreation, visitors may reduce their use of the area or may choose not to use it for recreation. Similarly, individuals residing near the new development may be negatively affected by the noise, traffic, or visual disturbances in their daily lives. Degrading the quality of land for a particular use constitutes a land use impact as defined in this analysis.

Reduced quality or quantity of recreational land use may be measured in terms of social welfare impacts to recreation or regional economic impacts. Impacts to surrounding residential developments may be evaluated by changes to property values associated with decreased willingness to pay for land adjacent to such facilities. Section 8.10 describes the data requirements and methods for quantifying the economic impacts created by the alternatives.

Recreation and residential development are the land uses most likely to be sensitive to the noise and visual disturbances of the construction projects. Relative to other land uses, recreational lands are limited across the regions, suggesting that large construction projects are unlikely to occur adjacent to areas with significant levels of recreation. The most recreational land in the

WOR Region is in Washington (1.9 million acres, 8.6 percent of land area) and includes Olympic National Park. Section 5.8 identifies that limited land area within each state in the EOR Region is in recreational land use, ranging from 0.6 percent in North Dakota to 1.8 percent in Montana, including portions of Glacier National Park. Only 1.2 percent of the Great Lakes Region's land is recreational. Recreational land occurs at very low levels in each state, ranging from just a few acres in Wisconsin to 214 acres (1.2 percent of land area) in Michigan. Only 5.3 percent of the New England Region's land area is in recreational land use. Recreational land occurs at relatively low levels in each state within the region, ranging from 46 acres in Vermont (on the percent of land in the region overlapping the state) to 370 acres (2 percent of land area) in Maine.

Developed land is similarly limited: ranging from 1.1 percent of the land area in Montana to 6.0 percent in Washington in the WOR Region; from 1.7 percent of Montana to 4.3 percent in North Dakota in the EOR Region; from 4.2 percent in Wisconsin to 17.3 percent in Ohio in the Great Lakes Region; and from 2.6 percent in Maine to 5.4 percent in Vermont in the New England Region. Consequently, relatively little residential development is likely to be adjacent to large construction projects.

Construction projects close to the border may also affect recreation and development in areas of Canada near the border. Recreation and development within two miles of the border in Canada are similar to the regions they are adjacent to. Recreational land use represents approximately 12.1 percent of the land area in the WOR Region, approximately 4.9 percent in the EOR Region, and approximately 7.5 percent in the Great Lakes Region. No identified recreational lands were identified adjacent to the New England Region. Available data do not identify any developed lands in Canada within two miles of the border from the WOR, EOR, and New England Regions. Only 0.9 percent of the land cover is identified as developed adjacent to the Great Lakes Region.

While land use impacts of construction can be characterized overall as moderate and adverse, the extent of impact associated with these activities would depend on:

- The distribution and concentration of large construction projects that CBP may undertake;
- The size of the individual project (acreage required);
- The nature of the land (i.e., existing and potential future land use) being altered for the project; and,
- Land uses surrounding a project.

Large construction projects also include construction of fences or other barriers in localized areas across the border to prohibit crossings of unchecked vehicles and individuals. Such construction may temporarily cause land use impacts. The primary impact associated with fencing along the border, however, would affect landowners of contiguous land parcels if they become bisected by the fencing or barriers.

If CBP constructs a fence or barrier across a land belonging to an individual, the existing use of that parcel may become affected or a portion of the property may no longer remain viable for its current use. For example, if a fence or barrier is erected across an agricultural field, the farmer

may have trouble accessing portions of the fragmented land. If CBP border fencing bisects contiguous land parcels, the landowner(s) will likely feel the effects.

Other Activities that Introduce Noise or Light Disturbance

In addition to the construction activities above, categories of activities under the No Action Alternative that may result in noise or light disturbance include:

- POE trade and travel processing operations (routine activities at POEs and checkpoints)—up to 20± small operations and 1 large operation in the WOR Region, up to 30± small operations in the EOR Region, up to 10± small and 3 large operations in the Great Lakes Region, and up to 20± small operations in the New England Region;
- Checkpoint operations (off-site inspections)—up to 100± per day in each of the 4 regions;
- Motorized ground operations (ATV, snowmobile, and other vehicle patrols)—up to 800± per day in each region;
- Aircraft operations—up to 15± per day in the WOR and New England Regions and 20± per day in the EOR and Great Lakes Regions; and,
- Vessel operations—up to 16± per day in the WOR Region, up to 5± per day in the EOR Region, up to 42± per day in the Great Lakes Region, and up to 14± per day in the New England Region.

These activities may increase ambient noise due to construction, traffic, or operation of various patrol vehicles. In addition, the activities may bring light or other visual disturbances through the general operation of patrols and surveillance equipment, or from increased traffic congestion at POEs.

The impacts of noise and light-disturbing activities on land use are expected to be minor and adverse; they would not directly change land use but instead may indirectly negatively affect the quality of directly adjacent land uses. However, the extent to which the surrounding land uses at any given site are sensitive to noise pollution and visual disturbances may vary. The land uses most sensitive to these types of impacts are recreation and residential development, which remain fairly limited across the northern border.

Activities that are Inconsistent with Existing Land Use Authority, Guidelines, or Management Plans

The No Action Alternative includes sustaining partnerships between CBP and Federal, state, local, tribal, and private land managers and owners. Among other responsibilities, these partnerships require managing the issue of Border Patrol access to Federal lands. The 2006 Memorandum of Understanding (MOU) among DHS, Department of Interior (DOI), and U.S. Department of Agriculture (USDA) acknowledges that CBP actions can have natural resource impacts on Federal lands; conversely, access limits due to Federal land management restrictions can affect CBP's security mission. CBP conducts ongoing discussions with its Federal land partners to work within the 2006 MOU, allowing it to implement the CBP security mission while simultaneously maintaining resource values and regulatory protection of Federal lands. These partnership discussions are intended to minimize the land use impact of CBP projects or

activities on these lands. CBP would also consult with other governmental and private partners and land managers to resolve issues of potential conflicts with current land use planning.

In conclusion, relatively small land areas (one acre to tens of acres) per project may become directly altered. The quality of recreational activities or residential developments directly surrounding the project sites may also decline. These impacts would diminish with distance from the project site. CBP may alleviate some of these impacts by locating projects on vacant or unproductive lands away from recreational and residential development areas. The overall land use impact of CBP's No Action Alternative is likely to be moderate and adverse due to the permanent, but localized, nature of potential land use changes. Large facilities and infrastructure construction projects that cause direct land use changes at a project site dominate the impacts.

8.8.2 FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE

The Facilities Development and Improvement Alternative involves major modernizations or repairs to existing POEs, construction of new BPSs, or upgrading existing BPSs to improve CBP's efficiency in operations and to respond to potential situations along the border. In addition to permanent facilities (e.g., construction of new BPSs and housing), this alternative includes potential construction of temporary facilities, such as FOBs and checkpoints that support law enforcement operations. For the same reasons as the No Action Alternative, the impacts of the Facilities Development and Improvement Alternative on land use would be moderate and adverse. These impacts would likely be greater than the No Action Alternative in proportion to the increased land area required for additional construction and development.

Under this alternative, CBP would undertake up to 20± additional large construction projects in each of the 4 regions (in addition to the No Action Alternative). On average, the land use impact associated with additional construction will rise proportionally from the impact under the No Action Alternative. This is because the per-project impact of land area experiencing converted or degraded land use (one acre to tens of acres) is similar. While up to five additional projects are possible, the proportion of total land area affected in the region remains relatively low. As stated, the extent of land use impact associated with these activities depends upon the distribution and size of new construction projects, as well as upon the nature of land use at both the project site and the surrounding areas.

In conclusion, the analysis of the impacts from the Facilities Development and Improvement Alternative on land use resources would increase proportionally to the land area required for construction and development. CBP may reduce the impacts by selecting sites that are relatively remote and on vacant, unproductive lands, whenever practicable. The overall impacts from the Facilities Development and Improvement Alternative are anticipated to be moderate and adverse for the same reasons as the No Action Alternative.

8.8.3 DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE

The Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative deploys newer, more-effective technologies to support CBP surveillance and telecommunications. This alternative calls for continued deployment of remote sensors, short-range radar, remote and mobile video surveillance, as well as new camera systems and upgrades to existing communications systems. It also involves increased surveillance and patrols at select

areas along the border. The overall impacts of this alternative on land use are likely minor and adverse, resulting in periodic, minor disturbances to land uses in localized areas.

Under this alternative, CBP would increase motorized ground surveillance by up to 1,300± missions per day in all 4 regions. Aircraft surveillance would rise by up to 23± missions per day and vessel patrols by up to 21± per day in the WOR Region. In the EOR Region, Aircraft surveillance would increase by up to 30± missions per day, and vessel patrols by up to 10± per day. In the Great Lakes Regions, aircraft surveillance would rise by up to 30± missions per day, and vessel patrols by up to 63± per day. In the New England Region, aircraft surveillance would increase by up to 23± missions per day, and vessel patrols by up to 24± per day. Increasing these activities would result in either: (1) greater frequency of noise or light disturbance at particular sites (if the missions are more frequent, but in the same areas); or (2) a rise in these disturbances across the border (if the additional missions patrol a larger area). If increased surveillance and patrols cover a larger area, the affected land area would likewise increase. In either case, however, this alternative requires no direct land use conversion. Impacts result from reduced quality of certain land uses (e.g., recreation or residential development) near the activity. CBP may minimize such impacts by conducting patrols and surveillance away from other land uses, or during periods of relatively low recreation, when feasible.

In conclusion, the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative is most likely to have a moderate, adverse impact on land use resources (considering that these activities are in addition to the No Action Alternative activities). While increased patrols and use of improved monitoring and surveillance equipment may degrade the quality of land for recreation or residential development in localized areas, these activities are unlikely to affect the viability of a given land use at the regional level.

8.8.4 TACTICAL SECURITY INFRASTRUCTURE EXPANSION ALTERNATIVE

The Tactical Security Infrastructure Alternative includes additional barrier construction at select points along the border to deter and delay CBVs. It also includes more roads and related facilities that would improve CBP's ability to respond to these violators quickly and effectively. Impacts on land use may be moderate and adverse if fences bisect contiguous land parcels. If CBP avoids constructing fences or barriers through these areas, however, impacts are more likely negligible.

Under this alternative, CBP would increase large construction projects, building access roads and fencing by up to five projects in each of the four regions (in addition to the No Action Alternative). Fencing or other barriers along the border primarily affect those individuals residing closest to the border. If the fencing or barriers fragment a landowner's property, land use impacts would occur, as described under the No Action Alternative. In some limited areas, the border may bisect contiguous landowner parcels. Thus, land use impacts would likely be adverse and moderate. The impacts would be localized and CBP may have to compensate landowners for the loss of their lands. Landowners or communities would need to be compensated due to any fragmentation of their land. CBP prefers to avoid such situations by not constructing fences through individual parcels. If CBP avoids these areas, the land use impacts of this alternative above and beyond the No Action Alternative would most likely be negligible.

In conclusion, the level of impact depends largely on where barriers are constructed. If they bisect contiguous parcels or cross-border communities, restricted access to land may affect land use. Constructing additional fencing or barriers in more remote border areas where passage is difficult to control, as well as avoiding construction of fences through contiguous land parcels, would likely result in negligible impacts on land use. This analysis anticipates that increased fencing and other physical barriers along the border may result in moderate, adverse impacts on land use.

8.8.5 FLEXIBLE DIRECTION ALTERNATIVE

As previously indicated, the Flexible Direction Alternative allows CBP to use a mix of any of the actions in the previous four alternatives on an as-needed basis to respond to evolving threats along the border. This alternative allows CBP the most flexibility in border security actions. Impacts of this alternative are most likely moderate and adverse and similar to the No Action Alternative, driven by the number of large construction projects.

Under this alternative, CBP would increase large construction projects by up to 25±, checkpoint operations by up to 100±, motorized patrols by up to 1,300±, aircraft patrols by up to 23±, and vessel patrols by up to 21± in the WOR Region. In the EOR Region, CBP would increase large construction projects by up to 25±, checkpoint operations by up to 100±, motorized patrols by up to 1,300±, aircraft patrols by up to 30±, and vessel patrols by up to 10±. In the Great Lakes Region, CBP would increase large construction projects by up to 25±, checkpoint operations by up to 100±, motorized patrols by up to 1,300±, aircraft patrols by up to 30±, and vessel patrols by up to 63±. In the New England Region, CBP would increase large construction projects by up to 25±, checkpoint operations by up to 100±, motorized patrols by up to 1,300±, aircraft patrols by up to 23±, and vessel patrols by up to 24±.

The up to 25 additional construction projects across each of the 4 regions would most likely result in a proportional increase in land use impacts above the No Action Alternative. Increased numbers of processing operations and patrols would proportionally increase either the frequency of noise and light impacts or the land area subject to these impacts. The extent of land use impact associated with these activities depends on the distribution and size of new construction projects, and the nature of the land use at the project site and the surrounding area. This alternative, however, would likely have a moderate, adverse impact on land usage. While this alternative represents the maximum scope of impact of CBP activities, the land area potentially affected remains moderate in the context of broader border region land uses. Impacts would increase if a particular land use becomes degraded regionally. The number of projects or the extent of degraded land area that would generate major impacts remains uncertain.

Similar to the No Action Alternative, this analysis anticipates that the Flexible Direction Alternative would result in moderate, adverse impacts to land use. The threshold at which CBP activities may degrade land use beyond the project level and limit land use more broadly at the regional level remains uncertain. Section 8.8.6 describes actions that may mitigate the effects of these activities on land use.

8.8.6 BEST MANAGEMENT, MINIMIZATION, AND MITIGATION

CBP seeks to avoid unnecessary adverse impacts of its actions on the human environment whenever feasible and consistent with its law enforcement imperatives. It does so with a

combination of BMPs, siting plans, design strategies, and when appropriate, mitigation measures and monitoring plans best suited to the scale and location of the particular action. Towards that end, in implementing its proposed action alternative CBP would incorporate a combination of the following actions into its activities to avoid or minimize impacts to land use as generally applicable to the site-specific situation. The following measures could minimize the potential impacts of new facilities construction:

- Consult ingwith other governmental and private partners and land managers to resolve issues of potential conflicts with current land use planning;
- Siting projects away from existing residential development or recreational areas;
- Locating projects on vacant or unproductive lands;
- Carrying out construction activities during periods of relatively low recreation levels; and,
- Developing aesthetically pleasing sites, for example, through landscaping and proper siting of waste storage areas.

The following measures could minimize the impacts on land use from activities that cause noise and light disturbance:

- Using sound-reducing equipment, where feasible;
- Locating projects away from existing residential development or recreational areas; and,
- Conducting patrols and surveillance activities during periods of relatively low recreation levels.

The following measures could minimize the impacts of border fencing activities on land use:

- Ensuring that the fencing does not fracture contiguous land parcels.

8.8.7 SUMMARY OF POTENTIAL IMPACTS

Table 8.8-1 summarizes the impacts of the alternatives on land use.

Table 8.8-1. Summary of Potential Land Use Impacts

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
NO ACTION ALTERNATIVE					
Small construction projects (< 1 acre and < 1/4 mile: e.g., minor repairs to facilities, parking lot repairs, access road repairs)	⊗				
Large construction projects (> 1 acre and > 1/4 mile: e.g., repairs to facilities, parking lot repairs, access road repairs)			⊗		

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
Small on-site trade and travel processing operations		⊗			
Large on-site trade and travel processing operations		⊗			
Checkpoint operations	⊗				
Ground operations—motorized		⊗			
Ground operations—nonmotorized	On-road	⊗			
	Off-road	⊗			
Aircraft operations		⊗			
Vessel operations		⊗			
Operation of NII Systems	⊗				
Operation of sensor and other technologies	⊗				
OVERALL IMPACT			⊗		
FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE					
Small construction project (< 1 acre and < 1/4 mile: various)	⊗				
Large construction projects (> 1 acre and > 1/4 mile: construction of BPSs, other facility construction or major modification)			⊗		
OVERALL IMPACT (INCLUDING NO ACTION)			⊗		
DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE					
Small construction projects (towers and other infrastructure to mount antennas, etc.)	⊗				
Ground operations—motorized		⊗			
Ground operations—nonmotorized	⊗				
Aircraft operations		⊗			
Vessel operations		⊗			
Operation of NII systems	⊗				

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
Operation of sensor and other technologies	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE					
Small construction projects (trench cuts, towers, minor access roads and fences)	⊗				
Large construction projects (access roads and fences)			⊗		
OVERALL IMPACT (INCLUDING NO ACTION)			⊗		
FLEXIBLE DIRECTION ALTERNATIVE					
Small construction projects	⊗				
Large construction projects			⊗		
Checkpoint operations	⊗				
Ground operations–motorized		⊗			
Ground operations–nonmotorized	⊗				
Aircraft operations		⊗			
Vessel operations		⊗			
Operation of NII systems	⊗				
Operation of sensor and other technologies	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)			⊗		

8.9 ENVIRONMENTAL CONSEQUENCES TO AESTHETIC AND VISUAL RESOURCES

The programmatic analysis takes a general approach to the application of visual resource management (VRM) analysis of the northern border area. This section considers the potential adverse and beneficial impacts of CBP's alternative actions on the visual environment. Site-specific analysis of an individual project requires use of the tools listed in Appendix G, the *Bureau of Land Management Visual Resources Management Guide*. The VRM system developed by U.S. Bureau of Land Management (BLM) defines the visual sensitivity of an area and the potential effect of a project on a visual resource. It assigns ratings of Classes I to IV based on combinations of scenic quality, sensitivity levels, and distance zones (for the Framework for Characterizing Resource Impacts on the northern border, see Chapter 3, Section 3.9).

CBP's activities span the entire 4,000-mile border between the contiguous United States and Canada, and extend approximately 100 miles south of the border. This area contains many visual resources that could experience impacts due to activities within the alternative actions. However, the mere presence of a visual resource within the 100-mile buffer of the northern border does not guarantee that it will be impacted by CBP's activities, which are site-specific. For descriptions of the regional affected environments for aesthetic and visual resources see Sections 4.9 (WOR Region), 5.9 (EOR Region), 6.9 (Great Lakes Region), and 7.9 (New England Region).

Impacts to the visual environment vary greatly with each CBP activity but the overall impacts would be expected to be long-term, adverse, and minor. Most viewers should already be accustomed to the current CBP activities and infrastructure, and no fundamentally new activities or changes to the types of infrastructure used by CBP are proposed. Most CBP activities occur in populated areas that are not as sensitive to visual impacts and most of those activities that occur in Class I or Class II areas would not permanently change those viewsheds. Most actions would have negligible impacts to the visual environment and most remodeling of infrastructure or changes in activities that create more efficient traffic flow would have beneficial impacts. Cumulative impacts would also be minor and adverse with some beneficial impacts resulting from the modernization of buildings. To the extent that structures are erected in more visually sensitive areas, site-specific visual impacts could be greater and mitigation or avoidance measures would be implemented. Mitigation measures for visual resources center on reducing visual contrast associated with implementation of project alternatives. This would be accomplished largely through appropriate building design, location, landscaping, and attention to landform characteristics (see Chapter 9, Section 9.9).

Infrastructure

Roads, buildings, utility poles, and other manmade structures provide forms, textures, and colors that contrast with the natural environment and are often visible from distant vantage points. Visual contrast is somewhat reduced in residential areas, particularly in older established neighborhoods, due to the use of natural materials and colors along with screening afforded by vegetation. New structures may obstruct view corridors from public spaces due to their height, mass, and placement, and they may protrude above the tree line in forests. Ridgeline development or development in other elevated or exposed areas may intrude on important public

views. Roads, buildings, sidewalks, and other infrastructure elements have the potential to be developed in a way that is inconsistent with the character of the community.

POE Infrastructure



Source: (USDHS, 2010b).

Unlike other states along the northern border, Washington's POEs and BPSs are more often located in large urban areas. In the Great Lakes Region, the POEs and BPSs are some of the most congested along the northern border. Like most other states along the northern border, POEs and BPSs in the New England and EOR Region are more often situated in rural areas. Providing an aesthetically pleasing environment conducive to positive staff morale is one of the goals of CBP. In 2003, CBP developed the U.S. Border Patrol Facilities Design Guide for BPSs (BPF Guide). CBP wants a quality, working environment with plantings, artwork, and other environmental amenities along with architecture that does not call attention to the facility's function and that minimizes the impact of secure construction.

CBP has used the following thresholds in the past to determine if an impact to aesthetic and visual resources caused by BPS construction would be significant:

- Not meeting mandatory requirements set forth in the BPF Guide (Section 15.1.1); and
- Modifying the site such that an object or building is disproportionate to the landscape, demands attention, or is incompatible with the surrounding landscape.

Light and Glare

Projects can have two primary sources of light: light coming from structural interiors and shining through windows and light from exterior sources, such as street lighting, building illumination, security lighting, event lighting in resort areas, traffic headlights, lights for slope grooming, and landscape lighting. Residences, hospitals, and hotels are considered light sensitive, since people who expect privacy during evening hours typically occupy these places. These inhabitants tend to be disturbed by bright lights. Glare can also pose a problem and comes mainly from sunlight reflecting off buildings with glass and reflective metal surfaces.

At night, lights in developed areas provide illumination, contrasting with the generally uninterrupted darkness of surrounding undeveloped areas. Preservation of dark night skies through appropriate lighting controls is an important goal of many communities. Glare can also be problematic in the evening and at night, caused by the reflection of artificial light sources,

such as automobile headlights. Glare is typically related to either moving vehicles or sun angles, although glare from reflected sunlight can occur regularly at certain times of the year. Glare-sensitive areas generally include residences and transportation corridors (e.g., roadways).

The BPF Guide provides design guidelines for exterior lighting. Mandatory requirements are important for safety, security, and convenience. Light poles should be located a minimum of 20 feet from the site perimeter, avoiding the use of high poles in residential neighborhoods. A timer or photocell device should control all exterior lighting.

The POE Guide also provides design guidelines for exterior lighting. It also contains mandatory requirements important for safety, security, and convenience. The significant contrast in lighting between the bright booth area at POEs and the darkness from which vehicles approach poses a problem for officers, so bright lighting on the approach route to a primary inspection area is important. Lighting must be adequate to make both the booths and the lanes visible at night (USGSA, 2006). Each commercial primary lane shall have illumination 80 feet before the inspection point to 30 feet after (USGSA, 2006). For critical inspection areas, lighting must be adequate and provide accurate color rendition, since officers need to identify a variety of substances and materials. Walks, parking areas, and other active areas require focused lighting. Cutoff luminaires can light such areas, while reducing light spillage into adjacent areas. The recommended illumination level for outdoor active areas is 3 to 5 foot-candles (FC). The recommended level becomes 1 FC in general outdoor areas and along the border fence extending to 60 feet beyond (USGSA, 2006). Light poles should be avoided in residential areas.

Personnel and Activities

Certain CBP operational activities require the use of personnel, vehicles, and technology that do not have a permanent location. Examples include UAS missions, temporary checkpoints, and patrols (e.g. on foot, by horseback, on ATV). The amount of personnel activity at permanent infrastructure sites will vary, depending on the time of day and the expected volume of traffic through those sites. Residential areas and natural landscapes used by recreational users tend to have a higher sensitivity to unexpected activities and may be the most severely impacted landscapes and user groups for these actions. However, human activities should take place around infrastructure, such as buildings and roads, and usually would not detract from the visual environment in these instances.

Horse Patrol



Source: (USDHS, 2010b).

8.9.1 NO ACTION ALTERNATIVE

The current CBP program, which would be maintained under the No Action Alternative, involves small and large construction projects including new barriers, roads, towers, and facilities, as well as maintaining current routine operations. Impacts to the visual environment vary greatly with each CBP activity in this analysis, but the overall impacts are expected to be long-term, adverse, and minor. Most viewers should have become accustomed to current CBP activities and infrastructure; no fundamentally new activities or changes to the types of infrastructure are proposed under the No Action Alternative. Routine operations conducted by CBP that may affect the visual environment include setting up and operating mobile traffic checkpoints, conducting aerial, waterborne, ATV, or snowmobile patrols, and deploying mobile surveillance units. These impacts would generally be short-term for most user groups and would range from negligible to minor and adverse.

Many CBP activities take place in populated areas that are not as sensitive to visual impacts, primarily in Class I or Class II areas where the activities would not permanently change the viewshed. Most actions would have negligible impacts to the visual environment, while most remodeling of infrastructure or alterations that create more efficient traffic flow would have beneficial impacts. If structures are erected in more visually sensitive areas, site-specific visual impacts could be greater, and mitigation or avoidance measures would be implemented.

8.9.1.1 Small Construction Projects

Construct Pedestrian or Vehicle Fences or Other Physical Barriers

Impacts from the addition of new physical barriers would range from minor and beneficial to minor and adverse. Barriers such as fences can be visually appealing and add to the visual quality of some landscapes (such as rural agriculture areas), depending on the type of fencing. In general, however, CBP uses fences and barriers that are utilitarian in both purpose and placement and that often detract from the visual environment (USDHS, 2007a). Fencing and other barriers are generally intrusive visual elements on the landscape's principal formal view and can obscure other scenic views beyond the immediate terrain. Fencing can also change the spatial orientation of views by creating new boundaries and divisions. Despite these impacts, the overall integrity of the landscape is usually maintained. Construction of fences and other physical barriers can affect the visual environment through the following actions:

- Clearing brush in rural areas;
- Clearing obstructions in urban areas;
- Constructing access roads, if necessary, for materials transport;
- Using heavy machinery to dig foundations for posts;
- Using cement trucks to pour foundations;
- Using heavy machinery to transport materials to construction sites;
- Installing fence posts into the ground using heavy machinery;
- Installing light posts when adding lighting to fenced area;
- Connecting to local electrical utility; and,

- Using lights during nighttime construction.

The nature of the impacts would range from negligible for those landscapes with lower quality views (VRM Class III or IV) or few regular viewers, to adverse, for those landscapes with high-quality views, important cultural or natural resources, or viewers who would have constant exposure to the fence at close distances (USDHS, 2007a). Beneficial impacts are also possible, but are less common (USDHS, 2007a). Such beneficial impacts could include: increased unity or dramatic impact of a view due to the fence; removal of visual clutter within the proposed project corridor which clarifies the view; prevention of littering or despoiling of a viewshed by limiting human access; or association of the fence (by a viewer) with a feeling of greater security.

Removal of existing visual elements would constitute a long-term impact. Where the existing element adds to the visual character and quality of the resource, the impact of its removal would be adverse (USDHS, 2007b). Where the existing element detracts from the visual character and quality of the resource (e.g., rusted equipment or dead trees), the removal could prove beneficial. In all cases, removal of existing elements would expose more of the fence, patrol road, and other tactical infrastructure. In settings where the addition of a fence would have a major adverse impact on visual resources, any benefit from removing existing elements would be outweighed by the more dominant adverse, visual impact of the fence. Recreational users would most keenly feel these impacts. Impacts due to the loss of access to specific visual resources could be mitigated by adjusting fence placement and including gates that permit access to those resources (USDHS, 2007b).

Construct Roads, Bridges, Culverts, and Low Water Crossings

Infrastructure impacts associated with this action would be similar to those for POE and BPS modernization and building construction. Most visual impacts would occur during the construction phase. Normal infrastructure related to vehicle traffic, such as roads, bridges, and culverts, are perceived as normal access routes. Because most viewers access the visual environment through vehicles, the necessary infrastructure related to vehicles is generally a normal part of the visual environment. Most viewer groups and landscapes would experience negligible impacts. By following BMPs and guidelines outlined by CBP's documentation, impacts should be negligibly adverse unless the new infrastructure is located in an area without previous infrastructure and with a Class I scenic quality designation.

8.9.1.2 Large Construction Projects

Construct or Modernize Existing Buildings (FOBs, POEs, BPSs)

Currently, about 15 large construction projects involving buildings such as POEs associated with POEs and BPSs are underway or currently being assessed under NEPA along the northern border in each region. Potential impacts from the construction of new buildings or expanded facilities would range from short-term and adverse to negligible, while the impacts from modernizing new buildings would mostly be beneficial and minor. Modernization of an existing building can be as simple as a few minor upgrades that go unnoticed by most viewers or as complex as constructing a new building. Likewise, most viewers expect certain lighting conditions on roads and at infrastructure adjacent to roads, so the potential light and glare produced by upgrading existing buildings would have negligible, adverse impacts on viewers. Clearing and grading the

landscape during construction, as well as the demolition of buildings and structures, would remove visual elements from existing viewsheds. CBP would use the POE Guide and the BPF Guide to make appropriate choices for landscaping, exterior appearance, and interior design for any improvements to buildings and surrounding areas. Beneficial impacts may result from updating these existing facilities (USDHS, 2010c). In addition, aesthetics of the POE may improve because existing aboveground electrical and telephone lines could be buried (USDHS, 2010d).

Overall, the modernization of an existing structure would impact the visual environment in two phases: the actual construction and the permanent facility (USDHS, 2007b). The construction equipment and activities would cause adverse impacts; however, the impacts would generally be short-term and negligible. Constructing a new FOB would have minor, negative impacts, mostly due to the remote nature of FOBs and their inherent lack of visibility. In modernization projects, a building already sits on the site. Regardless of the landscape scenic quality or viewer group affected, the adverse impact from additional development would usually be negligible because users would already be accustomed to a building in that location (USDHS, 2010d).

Set Up Permanent Traffic Checkpoints

Permanent traffic checkpoints would have similar visual qualities as a POE; they would include infrastructure such as buildings, fencing, power and telephone lines, parking areas, and special road lanes for inspection. Expected impacts would also be similar, as the visual environment would be associated with a road and thus infrastructure would not be unexpected or visually distracting unless situated along a scenic highway.

Impacts from the construction of new permanent traffic checkpoint would be similar to the construction or modernization of a POE. By following BMPs and guidelines outlined by CBP's documentation, impacts should be long term, negligible to minor, and adverse unless the new infrastructure was situated in a Class I scenic quality area without previous infrastructure. Recreational viewers in Class I areas would experience a minor to moderate, adverse impact due to the increase in visible infrastructure in a visually sensitive natural setting.

Install Monopole Towers

Towers affect the visual setting in several ways and their placement may detract from some views; potential impacts from the placement of new towers range from negligible to major and adverse. While a tower may be visible initially, it will often be less noticeable once it has been part of the landscape for some time or if the project area contains many similar towers (Steel in the Air, 2004).

The construction of telecommunication towers in rural areas is often compared with the siting of power-line rights-of-way. Towers, as with power lines, can often be located to minimize impacts along scenic highways or other visually sensitive areas. By placing them in areas already housing other towers, the aesthetic character of an area would not be altered as much and impacts would be negligible (USDHS, 2002).

High- tech equipment atop this pole is used to see and hear activities of CBVs



Source: (USDHS, 2010b).

Monopole communications towers are 80 to 130 feet tall and are installed over a 45-day period. Guy wires will not be used for tower support to reduce the possibility of bird and bat collisions. All construction will follow the DHS Environmental Planning Management Directive 025-01 for Sustainable Practices for Environmental, Energy, and Transportation Management. Once CBP has determined that a given tower is no longer needed, it will be removed within 12 months and the footprint of the tower and its associated facilities will be restored to pre-construction conditions. Towers and associated elements will be sited, designed, and constructed to avoid or minimize habitat loss within and adjacent to the tower footprint. These steps will aid in decreasing the potential visual impact.

The following is a list of potential impact-producing factors associated with previous CBP's monopole installations (USDHS, 2008; USDHS, 2002):

- The addition of monopole towers to previously undisturbed landscapes;
- A tower higher than 10 feet above the dominant trees and higher than the tallest tree within the immediate area:
 - A cleared right-of-way area around the towers, including:
 - A 0.5-acre construction staging area; and,
 - A permanently cleared 50-feet by 50-feet footprint.
 - Cleared access roads for construction and maintenance that is:
 - 100 to 200feet long in populated areas;
 - Up to 0.5 mile-long in undeveloped areas; and,
 - 12-foot-wide driving surface and 2-foot-wide shoulders (16 feet total width).
- Use of dust suppression measures, such as road watering to minimize airborne particulate matter created during construction;

- The presence of related infrastructure with:
 - Electrical lines (located underground unless no nearby commercial power source is available); and
 - A 9-foot-high chain-link security fence.
- Privacy barrier using landscaping with native vegetation;
- If culverts are needed, they generally will use:
 - A 2- to-4-foot diameter pipe approximately 36 feet long; and,
 - An 8-foot by 12-foot equipment shelter.

The primary visual elements are the tower itself and the contrast created by clearing the ground surface. The presence of towers can severely affect landscapes with sparse infrastructure (developed and industrial or undeveloped); conversely, mountain and forested areas can help mask the towers' presence. Based on previous studies of tower visibility, the visual modification from these features would tend to be dominant (major in magnitude) when viewed from under 0.5 miles, except when a competing feature or moderate-to-high skyline provides a co-dominant visual feature, such as a city with tall buildings (USDOT, 1999). A high skyline without focal-point sensitivity could render the visual modification noticeable, but not dominant. Between 0.5 miles and 1.5 miles, the tower would appear visually dominant only if the skyline was low and had no other competing features of interest. Beyond 1.5 miles, the tower would be barely noticeable or, at worst, quite subordinate (USDOT, 1999). Given the high density of viewers in developed and industrial areas in much of the Great Lakes Region, towers may be obscured by the complexity of the skyline, but may also cause a negative impact in viewsheds with low competing interest, such as a view of a lake. Given the low human density in much of the WOR, EOR, and New England Regions and their varying topography, towers would not affect large numbers of viewers and would likely be obscured by the complexity of the terrain.

Potentially major long-term visual impacts would occur if towers were sited in high-sensitivity areas or landscapes (VRM Class I areas). These impacts would be felt most keenly by recreational users, which represent a large user group in the WOR and EOR Regions due to the amount of public lands used for recreation, especially in the western part of this region. To eliminate this potential for significant major adverse visual impacts, proposed towers and associated facilities should be situated at least 1.5 miles from areas designated for their visual sensitivity (e.g., scenic roads, rivers, units of the National Park System, scenic vistas within national and state forests, and open-space districts) whenever feasible. With this siting, no major adverse long-term impacts should occur. Additionally, "stealth" a communication tower can help the tower blend in by making it look like a fake tree, cactus, bell tower, or flagpole.

OAM Facilities

OAM air facilities are primarily built upon existing airports and air fields. By following BMPs and guidelines outlined by CBP's documentation, impacts from air facility construction activities should be minor and adverse unless the new infrastructure is located in an area without previous infrastructure and with a Class I scenic quality designation.

8.9.1.3 Routine Operational Activities at an POE, BPS, or FOB

The impacts caused by most operations and technologies at POEs would remain negligible given their small size or their proximity to other CBP infrastructure. These operations and technologies are consistent with the presence of CBP's facilities and would not obscure or result in abrupt changes to the complexity of the landscape and skyline when viewed from points readily accessible to the public (USDHS, 2007c). CBP facilities are not considered valuable scenic environments and the presence of these technologies would not detract from the visual environment. Most viewer groups and landscape types would experience negligible impacts. The most adverse effect from routine operations would be traffic congestion at times of high commuter volume. In most cases, the adverse effects to the visual environment would be long-term and negligible to minor.

Routine operational activities that would result in negligible visual impacts include:

- Canine and equine patrols;
- BPS and POE operations;
- On-road vehicle patrols;
- Limited hours of operations in rural locations; and,
- Agricultural Inspections.

Routine operational technologies that would result in negligible visual impacts include:

- Nonintrusive/nondestructive inspection and detection technologies;
- Radio frequency identification devices (RIID) and related items; and,
- RVSS.

A CBP officer checks an individual's documents as a car enters the United States



Source: (USDHS, 2010b).

Set Up and Operate Mobile Traffic Checkpoints

High visibility is an inherent requirement of a traffic checkpoint; as such, modifications to the visual environment of the road have the potential for major, adverse impacts. Checkpoints in areas where CBP operates, however, are common and most motorists expect to encounter them. Normal road activities should not affect views of the road from surrounding landscapes but may become compromised if the duration and intensity of road activity is longer or greater than usual. Temporary barriers and facilities for mobile traffic checkpoints would have impacts similar to the construction phase of permanent facilities. Activities associated with mobile traffic checkpoints expected to affect the visual environment include:

- Temporary roadblocks installed primarily by mobile, truck-mounted infantry or police units for disrupting unauthorized or unwanted movement or military action;
- Potable rest facilities;
- Warning signs;
- Portable lighting if operating at dusk or night;
- Stoppage of all vehicles for inspection, for those with obvious violations, or for those that appear suspicious; and,
- Use of orange cones to slow down and direct traffic.

Both the construction and existence of a mobile-traffic checkpoint would be temporary; thus, impacts would be short-term. Although through travelers would be most affected, the adverse impacts would likely be minor. Even visually unappealing checkpoints are perceived as temporary, and most viewer groups and landscapes would experience negligible impacts. The impacts would not be sufficiently severe to diminish the integrity of most landscape features, thus the checkpoints would produce short-term, minor, adverse impacts.

Conduct UAS Missions and UAS or Manned Aerial Surveillance Patrols

Currently, UASs take off, fly, and land within a specified range in the terminal control area, and most potential impacts from conducting UAS missions would be short-term and negligible. The potential for using civil airspace, however, is possible in the near future. CBP uses specific flight plans which incorporate various flight patterns, duration, size, and altitude. They fly in all terrains and are designed to fly at high altitudes with low detectability in any terrain. CBP uses existing airfields for takeoff, landing, and storage of fixed-wing aircraft and some rotary aircraft. Some CBP facilities have helipads. CBP currently operates light helicopters and fixed-wing manned aircraft in addition to UASs. Approximately 15–20 CBP aircraft flights take place each day in each region.

Two Predator-B UASs awaiting their next mission



Source: (USDHS, 2010b).

Most visual impacts related to aircraft studied by the FAA result from airport facilities (USDOT, 2007). Airport-related lighting facilities and activities could visually affect surrounding residents and other nearby light-sensitive areas such as homes, parks, or recreational areas. Disturbing light emissions may emanate from the following sources associated with a proposed action: airfield and apron lighting, visual navigational aids, terminal lighting, employee/customer parking lighting, both airborne and ground-based aircraft operations, and roadway lighting. Consistency with FAA and other relevant design standards and compatibility with existing structures are also important factors that should be considered to minimize impacts to the visual environment.

Three UH-60 Blackhawk helicopters



Source: (USDHS, 2010b).

The flight path for most missions is usually of low sensitivity due to the sparse population and proximity to existing structures. Some sensitive areas include NPS and United States Forest Service (USFS) properties; consultation with those agencies for clarification of potential impacts would take place for site-specific projects. Aircraft in flight are a common sight. According to the FAA (USDOT, 2009), about 7,000 aircraft are flying overhead in the United States at any given time. Most viewer groups and landscapes would experience negligible impacts from the flights. Impacts to visual resources are expected to be short-term and negligible from either manned aerial surveillance patrols or from UAS missions.

Conduct Waterborne Patrols and Continue to Standardize and Modernize OAM Fleet

OAM fleet vehicles and infrastructure, alongside other commercial and recreational vehicles, are already part of the visual environment on most water systems and most potential impacts would be long term and negligible to minor with some beneficial impacts resulting from modernization of facilities. Currently, CBP conducts about 514 vessel operations per day in this region (USDHS, 2010e). CBP plans to maintain current infrastructure, such as boat launches, facilities to overwinter boats (OAM stores most boats), and secure facilities to hold and process arrestees, weapons, ammunition, or seized contraband. There are four classes of marine vessel: Coastal Enforcement, Interceptor, Platform, and Riverine. Riverine Class vessels are used by USBP on small lakes and rivers. On the coasts, the Great Lakes, and river tributaries, OAM uses Coastal Enforcement, Interceptor, and Platform Class vessels.

The visual presence of watercraft on most lakes and rivers is commonplace and expected. Watercraft in areas of high visual sensitivity (Class I or II), however, causes adverse impacts to the viewshed. Recreational users may experience minor and adverse impacts, although impacts to other viewer groups would be negligible. The impacts to the visual environment from the continued use and maintenance of the OAM fleet would be long-term, negligible to minor, and adverse. Some beneficial impacts to the visual environment may occur with modernization of the facilities.

Conduct ATV Patrols or Snowmobile Patrols

ATV and snowmobile patrols take place in areas inaccessible by motor vehicles. Currently, approximately 20 ATVs and 2 snowmobiles are used per sector to intercept illegal crossing of humans, cargo, and drugs, and the potential impacts from these patrols would generally be negligible to the visual environment. The primary complaint among nonmotorized users is that the noise destroys the solitude of natural settings and may negatively affect wildlife and vegetation (USDHS, 2010a). In the New England Region, ATV use in protected recreational areas can degrade the visual quality of the landscape. Trail erosion and compaction caused by off-road and all-terrain vehicles reduce the visual quality of recreational trails and require management action to develop and maintain safe, usable, and aesthetically pleasing trails.

ATV Patrol



Source: (USDHS, 2010b).

Impacts from the use of off-road vehicles would be felt most strongly in visually sensitive areas (Class I or II), where they could be minor to moderate and adverse. However, the number of ATVs and snowmobiles operated by CBP represents only a fraction of the total number of similar vehicles in the United States, estimated at almost four million in 2000 (USEPA, 2000). For the most part, these vehicles only interrupt the visual environment temporarily for a few people at a time (less than 100) due to their use in sparsely populated and remote regions. Most viewer groups and landscapes would experience negligible impacts. For most areas without a high level of visual sensitivity, the impacts from ATV or snowmobile patrols would be short-term and negligible to minor.

Deploy Mobile Surveillance System (MSS) Units

MSS units combine radar, a daytime camera, a nighttime camera with thermal imaging, a GPS unit, and a laser rangefinder. Each unit can be raised several meters in the back of a pickup truck and the radar makes a visual sweep across its range many times a minute. These units have roughly the same visual imprint as a large vehicle and are restricted to areas accessible by vehicle; therefore, they would not generally occur in visually sensitive or Class I landscapes. Most viewer groups and landscapes would experience negligible impacts.

Border Patrol agent assigned to the Miami Sector deploys a Mobile Remote Video Surveillance System (MRVSS)



Source: (USDHS, 2010b).

In addition to the impacts above, induced growth and development or traffic changes associated with project alternatives could produce indirect impacts on visual resources within the border region. Increased traffic congestion, along with buildings constructed for housing and businesses to support additional CBP staff could alter the visual landscape. These impacts would most likely be adverse, but negligible to minor. Some beneficial impacts would occur with modernization of some CBP facilities, and activities could increase the visual quality of an area or alleviate traffic pressure at some ports.

8.9.2 FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE

The Facilities Development and Improvement Alternative would focus on providing new permanent facilities, such as BPSs and other facilities to allow USBP agents to operate more efficiently and respond to situations more quickly. There are about 30 small projects (parking lot repairs, access road repairs, etc.) and about 20 large projects (constructing new facilities) that would occur in each region in addition to the No Action Alternative. As the analysis in this section demonstrates, by following BMPs and guidelines outlined in CBP's documentation, impacts would be long term, negligible to minor, and adverse unless the new infrastructure is located in an area without previous infrastructure and with a Class I or II scenic quality designation. Class I and II areas without infrastructure would experience minor to moderate, adverse impacts to the visual environment from the addition of new infrastructure. Modernization of existing facilities would overall have a beneficial impact on visual resources as described under the No Action Alternative.

The proposed large facilities by themselves would not necessarily produce major impacts. Instead, a project could produce a major impact if it is sited in visual proximity to a sensitive resource. For example, a FOB may be visible within a panoramic vista viewable from recreational users in a national park, thus detracting from the visual quality of the landscape. Recreational viewers would be the most impacted viewer group for this action. The potential significance of the impact could be analyzed using the VRM classification model as the guide for the determination. Modernization of existing facilities would generally have a beneficial impact on visual resources as described under the No Action Alternative.

8.9.2.1 Construct a New Facility

Constructing a new facility would have similar impacts to constructing other infrastructure as discussed in the No Action Alternative. Overall, the construction of a new building would affect the visual environment in two phases: the actual construction and the operation of the permanent facility. There would be adverse impacts from construction equipment and activities; however, the impacts would generally be short-term and negligible. If the BPF Guide is followed according to lighting for illumination levels, there would be negligible impacts from the addition of exterior lighting. Recreational viewers would be the most impacted viewer group for this action. By following BMPs and guidelines outlined in CBP's documentation, impacts should be long term, negligible to minor, and adverse unless the new infrastructure is located in an area without previous infrastructure that had a Class I scenic quality designation.

As with the No Action Alternative, indirect visual impacts could occur from induced growth. These would most likely be adverse at negligible to minor levels. Increased traffic congestion and development of buildings for construction of housing and businesses to support increases in CBP's staffing could alter the visual landscape. However, with this alternative, some beneficial impacts would be expected as modernization of some CBP facilities and activities could increase the visual quality of an area or alleviate traffic pressures at some POEs.

8.9.3 DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE

The Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative focuses on deploying more effective detection, inspection, surveillance, and communications technology and on making improvements and upgrades to current technology. This alternative would increase the number of monopole towers. Because the towers would be so far apart, viewers would likely see only one tower in any particular view. As the following analysis shows, with proper siting, no major, adverse, long-term impacts should result, and visual impacts would be long-term, minor, and adverse.

About 100 small construction projects are planned under this alternative, such as towers and other infrastructure to mount antennas. This alternative also includes increasing aircraft operations to approximately 30 in the Great Lakes and EOR Regions and about 23 flights per day in the WOR and New England Regions. This alternative also includes increasing marine vessel operations to fewer than 10 operations in the EOR Region and about 21 in the WOR Region per day. About 200 nonmotorized and 1,300 motorized ground patrols would occur each day in each of the regions. Use of systems including remote sensors, short-range radar, RVSS and MSS, new camera systems, and stationary communications systems would increase to about 2,500 hours per day in each of the regions. The use, deployment, and upgrades of these technologies would be similar to those in the No Action Alternative. Typically, with the exception of monopole towers, these actions would have a negligible impact on the visual environment, because many changes to CBP's technologies do not change the visual environment. Therefore, the impacts from this alternative on the visual environment are expected to be short-term, minor, and adverse during construction of new technologies and upgrades of technology infrastructure, and long-term and negligible for the operation of existing and increased technology.

Potentially major, adverse, long-term, visual impacts would occur if towers were cited in high-sensitivity areas or Class I areas. To eliminate the potential for major, adverse, visual impacts

during site selection, proposed towers and associated facilities should be located at least 1.5 miles from areas designated for their visual sensitivity (e.g., scenic roads, rivers, national parks and monuments, scenic vistas within national and state forests, and open-space districts) when feasible. Recreational users and residential viewers in either natural or urban landscapes would most keenly feel these impacts. Additionally, “stealthing” a communication tower can help the tower blend in by making it look like a fake tree, cactus, bell tower, or flagpole. Deployment of MSS vehicles in visually sensitive areas would cause minor, adverse, visual impacts, but these impacts would be temporary and no long-term, adverse impacts would occur.

Indirect impacts on visual resources focus on the potential for changes along the border from possible induced growth and development or traffic changes associated with project alternatives. Increased detection, inspection, surveillance, and communications along the border would negligibly affect growth and development or traffic congestion; thus, the indirect impacts of this alternative would be negligible. Some beneficial impacts due to better processing times with use of advanced technology may result.

8.9.4 TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE

The Tactical Security Infrastructure Deployment Alternative would focus on constructing additional barriers (selective fencing, vehicle barriers, etc.) at select points along the border to deter and delay CBVs. Generally these activities would result in long-term, minor, adverse impacts. It would also include construction of access roads and related facilities to increase the mobility of USBP agents for surveillance and response to international border violations. About 30 small projects (< ¼ mile in length) and about 5 large projects (> ¼ mile in length) would take place under this alternative. The construction of roads and barriers usually detracts from the visual environment as discussed in the No Action Alternative section. These activities would be avoided or mitigated in Class I or Class II VRM locations to prevent major impacts to sensitive viewsheds. Recreational users in natural landscapes would most keenly feel these impacts. In general, constructing more of these types of infrastructure would result in long-term, minor to moderate, adverse impacts to the visual environment in any class and negligible impacts to industrial landscapes.

As in the No Action Alternative, indirect impacts on visual resources center on the potential for change along the border due to induced growth and development or traffic changes associated with project alternatives. Constructing new barriers along the northern border, however, would have negligible effect on growth and traffic patterns.

8.9.5 FLEXIBLE DIRECTION ALTERNATIVE

The Flexible Direction Alternative allows CBP to use a mix of any of the actions described in the previous four alternatives on an as-needed basis to respond to evolving threats along the border. The potential extent of the visual impacts could be analyzed using the VRM model as guidance for the determination. Impacts to the visual environment vary greatly with each CBP activity in this analysis, but the potential overall impacts are expected to be long term, adverse, and minor.

Typically, with the exception of new construction and monopole towers, these actions would have a negligible impact on the visual environment, because many changes to CBP’s technologies do not change this environment. Most viewers should be accustomed to current CBP activities and infrastructure, and no fundamentally new activities or changes to the types of

infrastructure used are proposed. Most CBP activities take place in populated areas that are not as sensitive to visual impacts and most activities that occur in VRM Class I or Class II areas would not permanently change the viewshed. Most actions would have negligible impacts to the visual environment and most remodeling of infrastructure or change in activities that create more efficient traffic flow would have beneficial impacts. Therefore, the impacts from this alternative on the visual environment are expected to be short-term, minor, and adverse during the construction of new technologies and upgrades of technology infrastructure, and long-term and negligible for the operation of existing and increased technology. With the exception of updating POE facilities and technologies, most proposed CBP activities do not occur within the same visual setting, and thus few cumulative effects from the maximum of all three alternatives should occur. Modernization of existing facilities would overall have a beneficial impact on visual resources as described under the No Action Alternative.

On Patrol



Source: (USDHS, 2010b).

Impacts on visual resources could also result from possible induced growth and development or traffic changes associated with project alternatives. These impacts would most likely be adverse, but negligible to minor. Some beneficial impacts are expected as modernization of some CBP facilities and activities could enhance the visual quality of an area or alleviate traffic pressure at some POEs.

8.9.6 BEST MANAGEMENT, MINIMIZATION, AND MITIGATION

CBP seeks to avoid, minimize, repair, and reduce the impacts of its actions on the human environment. It does so with a combination of BMPs, siting plans, design strategies, mitigation measures, and monitoring plans best suited to the scale and the location of the particular action. Towards that end, in implementing its proposed action, CBP could choose from among the following actions to avoid or minimize impacts to the visual environment.

Mitigation measures for visual resources center on reducing the visual contrast associated with implementation of project alternatives. Because visual contrast is most closely associated with the addition of structural elements and changes to landforms, the following mitigation measures

are organized into those related to structures and those related to landforms. Appendix G contains a more complete list compiled by BLM, but some techniques to reduce impacts follow:

Structures:

- Use structures, when possible, that are simple, slim, and low-profile with minimal bulk and spread, avoiding over-monumentation, reducing structure depth (compared to deck edge), and maintaining proportionality;
- Use colors for structures that complement the natural landscape;
- Design tapered and rounded forms and edges, where appropriate, to soften appearance and reduce perceived bulk (for example, on bridge piers);
- Use, after evaluation, full cut-off light fixtures where feasible and safe in order to decrease impacts to the night sky; and,
- Use repeating colors and textures to provide continuity with other structural features, such as retaining walls.

Landforms:

- Implement sensitive grading techniques that blend grades with the natural terrain;
- Control erosion on all disturbed slopes and revegetate using native plant species, as appropriate, for adjacent lands and terrain;
- Reduce color contrast by staining new rock cuts; and,
- Selectively clear areas where alternatives encroach on forest edge.

Mitigation measures to minimize impacts from the monopole communications towers include: painting towers to blend into the background and using decorative tower perimeter fencing in residential areas. The color and composition of poles can be chosen to blend with or complement the surrounding landscape. Lines constructed with H-frame poles or on wood rather than steel structures may blend better with natural surroundings. Stronger conductors can minimize line sag.

Right-of-way (ROW) management can mitigate aesthetic impacts by using vegetative screens that block views of the line, leaving the ROW in a natural state at road crossings, creating curved or wavy ROW boundaries, pruning trees to create a feathered effect, and screening and piling brush from the cleared ROW so that it provides wildlife habitat.

The mitigation measures for the security fence include using context-sensitive design for the fence, or design features that minimize the appearance of fencing, including a black, visually permeable fencing.

Any infrastructure or action must be completed under existing regulations such as:

- All POEs must be designed in accordance with the U.S. POE Design Guide (USGSA, 2006);

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

- GSA-owned POEs must be designed in accordance with GSA P-100, Facilities Standards for the Public Buildings Service; and,
- BPSs must comply with the guidelines outlined in the 2003 BPF Guide.

8.9.7 SUMMARY OF POTENTIAL IMPACTS

Table 8.9-1 summarizes the impacts of CBP’s operations on visual resources.

Table 8.9-1. Summary of Potential Visual and Aesthetic Resources Impacts

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor adverse	Moderate Adverse	Major Adverse	Beneficial
NO ACTION ALTERNATIVE					
Small construction projects		⊗			
Large construction projects		⊗			⊗
Checkpoint operations	⊗				
Ground operations—motorized		⊗			
Ground operations—nonmotorized		⊗			
Aircraft operations	⊗				
Vessel operations	⊗				
Operation of NII systems	⊗				
Operation of sensor and other technologies	⊗				
OVERALL IMPACT		⊗			
FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE					
Small construction projects		⊗			
Large construction projects			⊗		⊗
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor adverse	Moderate Adverse	Major Adverse	Beneficial
DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE					
Small construction projects (towers and other infrastructure to mount antennas, etc.)		⊗			
Ground operations—motorized		⊗			
Ground operations—nonmotorized	⊗				
Aircraft operations	⊗				
Vessel operations	⊗				
Operation of NII systems	⊗				
Operation of sensor and other technologies	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE					
Small construction projects		⊗			
Large construction projects			⊗		⊗
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
FLEXIBLE DIRECTION ALTERNATIVE					
Small construction projects		⊗			
Large construction projects		⊗			⊗
Checkpoint operations	⊗				
Ground operations—motorized		⊗			
Ground operations—nonmotorized	⊗				
Aircraft operations	⊗				
Vessel operations	⊗				
Operation of NII systems	⊗				
Operation of sensor and other technologies	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			

8.10 ENVIRONMENTAL CONSEQUENCES TO SOCIOECONOMIC RESOURCES

This section considers the adverse and beneficial impacts to the socioeconomic resources detailed in Sections 4.10, 5.10, 6.10 and 7.10 that may result from CBP's alternative actions.

Socioeconomic resources reflect demographic trends and existing human capital as well as accumulated wealth, opportunities for employment, and the overall well-being of the population. In the United States, more than 28 million people, approximately 9.1 percent of the national population, live in counties that overlap the geographic area within 100 miles of the U.S-Canada border. Approximately 81.8 percent (26 million people) of the entire Canadian population resides within the study area. Most major cities in Canada, including Vancouver, Toronto, and Montreal, sit along Canada's southern border. Canada's total population is, therefore, significantly more concentrated along the border compared to the American population. The study area is relatively prosperous; the flow of goods and services, as well as people, across the border contributes to the economic activity of the northern border area as a whole. For descriptions of the regional affected environments for socioeconomic resources see Sections 4.10.2 (WOR Region), 5.10.2 (EOR Region), 6.10.2 (Great Lakes Region), and 7.10.2 (New England Region). Two appendices provide further information on socioeconomic resources: Appendix P, Regional Economic Profiles of Selected POEs and BPSs contains tables summarizing key economic sector data and trade statistics for the POEs and BPSs profiled in the regional report sections; and Appendix Q, United States–Canada Trade Statistics, has trade statistics for surface modes of transportation across the northern border.

Socioeconomic impacts may be caused by an activity that:

- Disrupts the flow of goods, services, and people across the border;
- Disrupts the social fabric of border communities;
- Changes regional income or employment levels, directly or indirectly;
- Affects population levels or population distribution;
- Changes a population's demographics;
- Limits the level or quality of regional economic activity, for example by reducing the opportunity for regional development or degrading land used for recreation; or,
- Reduces property values or otherwise affects housing markets.

This section describes the socioeconomic impacts associated with the alternatives, as well as factors that may affect the magnitude of impact. The major categories of potential socioeconomic impact are:

- Social welfare and regional economic impacts associated with decreased or degraded land uses;
- Impacts to land and property values that preclude or degrade potential land uses;
- Impacts to the social fabric of communities along the border; and,
- Economic impacts of time delay on both individuals and trade activity.

Particular CBP activities are not likely to affect socioeconomic resources. Nonmotorized ground operations (i.e., horse and foot patrol) and certain surveillance technologies are localized activities that are unlikely to result in sufficient noise to degrade land values or interrupt economic activities, such as recreation. Due to the lack of expected socioeconomic impact, these activities are not considered further in this section.

Overall, the direct and indirect socioeconomic impacts of all of CBP’s alternatives are expected to be moderate and adverse (Table 8.1-1). Both adverse and beneficial impacts associated with temporary construction activities and patrols would be minor and temporary. Adverse impacts from time delays along the border due to traffic checkpoints and POE closures, however, may be sustained and require some level of adjustment for individuals and trade activities at particular border crossings. None of the alternatives would adversely affect other socioeconomic resources, such as population demographics. Possible mitigation measures include siting CBP’s facilities away from recreational areas and performing construction activities during off-peak hours or seasons for recreation activities, and during off-peak border crossing times (Section 8.10.6). Cumulative impacts along the northern border as a whole, therefore, would be minor, though some potential exists for greater impacts on a site-specific basis in places where other development activities are concentrated.

Table 8.10-1 summarizes the categories of socioeconomic impact that may occur, by activity. Sections 8.10.1 through 8.10.5 describe impacts associated with each of CBP’s program alternatives. Section 8.10.6 provides information on project guidelines or measures that may alleviate potential impacts.

Table 8.10-1. Major Categories of Socioeconomic Impact Associated with CBP’s Activities

U.S. Customs and Border Protection Activity	Social Welfare and Regional Economic Impacts of Decreased or Degraded Recreation	Land and Property Value Impacts of Precluding or Degrading Potential Land Uses	Impacts to the Social Fabric of Border Communities	Socioeconomic Impacts of Time Delay on Individuals and Trade Activity
Small construction projects (<1 acre and <1/4 mile)	✓			✓
Large construction projects (>1 acre and >1/4 mile)	✓	✓	✓	✓
Small on-site trade and travel processing operations				✓
Large on-site trade and travel processing operations				✓
Checkpoint operations				✓
Ground operations—motorized	✓		✓	
Ground operations—nonmotorized				
Aircraft operations	✓		✓	

U.S. Customs and Border Protection Activity	Social Welfare and Regional Economic Impacts of Decreased or Degraded Recreation	Land and Property Value Impacts of Precluding or Degrading Potential Land Uses	Impacts to the Social Fabric of Border Communities	Socioeconomic Impacts of Time Delay on Individuals and Trade Activity
Vessel operations	✓		✓	
Operation of NII systems			✓	✓
Operation of sensor and other technologies			✓	✓

Social Welfare and Regional Economic Impacts of Decreased or Degraded Recreation

Most of CBP’s activities identified in Chapter 2 have some potential to affect the relative attractiveness of areas surrounding a project site for recreational activities, such as hiking, hunting, fishing, snowmobiling, ATV use, or wildlife viewing. Much of the landscape along the border is undeveloped (Sections 4.8, 5.8, 6.8, and 7.8) and may be targeted by individuals intending to commune with nature through their recreational activities. CBP activities that interrupt the natural landscape, either through noise (construction) or by increasing regional development and access, may degrade the quality of adjacent recreation activities. However, potential beneficial impacts to recreational visitors may result from a feeling of added security due to the presence of patrolling CBP units. Two general categories of economic impact may be associated with degrading the quality of an area for recreation: social welfare impacts and regional economic impacts.

Social Welfare Impacts

Social welfare impacts reflect changes in utility (defined by economists as a sense of well-being) that individuals derive from recreation activities. These impacts are measured by what individuals are willing to pay for something above and beyond what they are required to spend (e.g., on travel and equipment for recreation). Social welfare impacts occur: when individuals continue to engage in the recreation activity at the affected site, but experience a decreased willingness to pay for the activity; or when individuals choose to visit a less-preferred substitute site or activity for which they have a lower willingness to pay.

A significant body of published economics literature focuses on monetizing values for many types of recreation. These studies evaluate participation levels and spending, for example for fishing or boating, to determine individuals’ willingness to pay for the activities (i.e., per unit values for various recreation activities). In short, individuals reveal their preferences for recreational activities through their behavior. Additionally, other studies focus on the effect of site-specific characteristics (e.g., species present for wildlife viewing opportunities) and other factors (e.g., level of crowding) on willingness to pay for recreation.

The following information is required to quantify a total social welfare impact of any CBP alternative on regional recreation activities:

- The specific sites at which the identified activities will occur;

- The baseline levels of recreation occurring adjacent to these sites (i.e., the numbers of individuals participating in various recreation activities);
- Site- or state-specific per-unit values for various recreation activities;
- Individuals' elasticity of demand for recreation trips (i.e., the percentage change in quantity of trips demanded associated with a percentage change in trip price); and,
- The marginal change in willingness to pay associated with the disturbance introduced by the various CBP activities (i.e., noise, increased traffic, or increased proximity to development).

While some of these categories of information are available at the level of a PEIS, information on the types and levels of recreation activities surrounding a potential CBP project site is largely unknown. Recreation along the border may occur on many types of land not necessarily identified as recreation areas (e.g., hunting on private land or wildlife viewing on conservation lands). It is, therefore, difficult to determine where and at what levels recreational activities are occurring. Further, while data on willingness to pay for various recreation activities are available, information on the relationship between particular levels of noise disturbance or proximity to development and willingness to pay for recreation is generally scarce. Section 8.17 discusses the impacts of CBP's various alternatives on recreational values.

Regional Economic Impacts

Regional economic impacts reflect changes in expenditures (and in turn, their contribution to output, jobs, and wages) associated with reduced participation in recreation in a region. Regional economic impacts may occur when individuals choose a less-preferred substitute site or activity due to the degraded quality of the preferred site. If individuals participate in the same activity (and at the same level of spending) at an alternative site, regional economic benefits may result at the substitute site. In this sense, expenditures represent a transfer from one group or area to another (i.e., "distributional impacts"). Within a regional economy, levels of expenditures affect revenues, employment, and tax receipts—all of direct concern to residents and proprietors.

Regional economic impact analysis can assess the potential localized impacts of an economic activity, such as recreation. Specifically, such an analysis produces a quantitative estimate of the magnitude of economic activity associated with recreation. Regional economic impacts are commonly measured using regional input/output models, which rely on multipliers that represent the relationship between a change in one sector of the economy (e.g., expenditures by recreational users at local businesses) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to those businesses). These economic data generate a quantitative estimate of the shift of jobs and revenues across the local economy.

Regional economic impact analysis provides useful information about the scale and scope of localized impacts. Measures of regional economic effects, however, generally reflect shifts in resource use rather than welfare losses. Thus, these types of effects are reported separately from welfare effects (i.e., not summed).

To quantify the regional economic impacts of changes in recreation levels associated with CBP's actions, additional information is required, such as industry expenditures associated with the various recreation activities. In addition, regional multipliers or an input-output model is required. While both of these requirements may exist, a key piece of information is the specific change in recreation associated with CBP's activities, which, as described, remains difficult to forecast.

Decreased willingness to pay for recreation due to CBP's activities along the border may be temporary due to construction, or sustained due to new roads or infrastructure in pristine wilderness areas. Generally, sites adjacent to the greatest levels of recreation will experience the greatest social welfare impacts of a particular disturbance (noise or development). In addition to recreation levels, the type of recreation is a key factor in determining the magnitude of impact.

Federal and state lands in the WOR Region identified for recreational use account for 2.6 million acres, or 7.9 percent of total land area in the region (Table 4.8-2). Section 4.17.2 profiles Federal recreational sites. The state with the largest area devoted to recreational land use in the WOR Region is Washington (1.9 million acres), which includes Olympic National Park. In addition, recreational activities occur in portions of Glacier National Park in Montana that overlap the WOR Region.

Federal and state lands in the EOR Region identified for recreational uses account for 848,000 acres, or 1.2 percent of total land area in the region (Table 5.8-2). Section 5.17.2 profiles Federal recreational sites. The state with the largest area devoted to recreational land use in the EOR Region is Montana (514,000 acres), which includes portions of Glacier National Park. This suggests limited recreational activities are likely to occur adjacent to projects in the EOR Region.

Federal and state lands in the Great Lakes Region identified for recreational use account for 605,000 acres, or 1.2 percent of total land area in the region (Table 6.8-2). Section 6.17.2 profiles Federal recreational sites. The states with the largest area devoted to recreational land use are Michigan (214,000 acres) and New York (169,000 acres). About half of the recreation lands in the region are in state recreation areas and state parks.

Federal and state lands in the New England Region identified for recreational use account for 516,000 acres, or 2.0 percent of total land area in the region (Table 7.8-2). Section 7.17.2 profiles Federal recreational sites. The state with the largest area devoted to recreational land use is Maine (370,000 acres). The largest single recreational area in the region is Baxter State Park in Maine. This suggests limited recreational activity is likely to occur adjacent to projects in the New England Region.

Land and Property Value Impacts of Precluding or Degrading Potential Land Uses

Implicit in the value of a parcel of land is the potential of that land for future uses. For example, the value of a parcel of agricultural land within the study area may incorporate the value of agricultural rents (i.e., the commercial present value of the crops or other agricultural inputs) and the value of potential future development (i.e., the present value of expected increases in land rents after conversion to an alternative use, such as development) (Capozza and Li, 1994). If either agriculture or development is precluded on the parcel, its value will decrease. This

reduction in value becomes a cost to the landowner, with the magnitude of decline dependent upon the type of land use restriction imposed.

Certain CBP activities along the northern border may remove land from a particular use and thus reduce its value. This may occur, for example, where CBP purchases land for constructing facilities and other infrastructure. If CBP purchases the land from a willing seller the landowner is compensated for this loss.

CBP's activities may also affect the value of neighboring properties by introducing a community disadvantage, such as noise levels or visual disturbances. If individuals are willing to pay less for a property adjacent to a POE or other CBP site, construction of new infrastructure may impose a negative impact on the surrounding properties.

Finally, changes in property values may have regional impacts in terms of the amount of tax revenue collected by local governments and reinvested in local services. Lower property values should lead to lower assessed values with a corresponding decrease in tax revenue. Also, land purchased by the Federal Government would no longer be subject to local property taxes.

Information required to estimate the economic impacts of CBP's activities on property values includes:

- The specific sites at which the identified CBP activities will occur;
- The geographic distribution of developed or developable lands surrounding the sites; and,
- The change in willingness to pay for properties associated with the disturbance caused by various CBP activities (i.e., noise or visual disturbance).

The effects of CBP's activities on property values may occur in areas adjacent to existing development. As these areas are also already adjacent to potential noise and visual disturbances, below some threshold, residents may not consider CBP's activities to introduce an incremental disturbance. It is possible, therefore, that impacts are relatively high for properties in more rural areas as these properties may be purposefully sited away from existing development.

Impacts to the Social Fabric of Border Communities

Socioeconomic impacts to lifestyles of border communities may be the most difficult to quantify. This category of impact may occur when individuals' day-to-day activities become more difficult, such as traveling to school, participating in community events across the border, or visiting friends in nearby communities. CBP activities that impede routine crossing or cause increased wait times may affect the social fabric of communities.

For example, in the WOR Region, Point Roberts in Washington State sits on a peninsula of land extending from Canada and is not physically connected to the United States. To attend school in nearby Blaine, students in the community must cross the border at least twice a day, once into Canada and once back into the United States. Thus, the livelihood of this community depends upon accessible and efficient border crossings.

In the Great Lakes Region, the Ambassador Bridge connects Detroit, Michigan with Windsor, Ontario. The POE supports a significant commuter population into the United States from

Canada (more than 55 percent of travelers report that they cross the border daily or once a week). Weekend traffic is also significant at this POE in both directions, suggesting that shopping, recreation, and entertainment trips are popular at these times. Thus, the day-to-day activities of these communities also depend upon accessible and efficient border crossings.

The border in the New England Region bisects the communities of Calais, Maine and St. Stephen, New Brunswick (Calais POE). Residents of cross-border communities often have close ties and function as a single community. The fire departments and high schools often cooperate and share resources. The border also bisects the communities of Madawaska, Maine and Edmundson, New Brunswick (Madawaska POE). Thus, the lifestyles of these communities depend on accessible and efficient border crossings. CBP has no plans to construct fencing through cross-border communities under any of the alternatives in this analysis.

To quantify these impacts, information would be required regarding individuals' willingness to pay to avoid lifestyle disruption. This value is site-specific and depends on whether the disruption affects individuals' ability to carry out daily activities (e.g., by increasing travel time) or whether it is associated with the unpleasantness of separation from portions of their community.

This category of impact is particularly relevant to cross-border communities that operate as a single community. Individuals in these communities cross the border relatively frequently to visit friends and family and to engage in day-to-day activities, including accessing places of employment or health care.

Socioeconomic Impacts of Time Delay on Individuals and Trade Activity

Canada is the United States' most important trade partner, accounting for 16.4 percent of the total value of goods imported to and exported from the United States (USDOC, 2009b). Integrated, cross-border supply chains and production processes rely on fast, predictable transit times for raw materials and manufactured goods. The resulting production contributes significantly to the United States' economy in terms of output and employment.

In addition, thousands of people cross the border every day for business or pleasure. Canadians who enter the United States consume goods and services during their visits. For example, they stay in hotels, eat in restaurants, buy gasoline, and shop. This spending forms an important component of regional border economies and can be affected if the time required for crossing the border increases or decreases. The effects of modifying the ease of access in smaller communities straddling the border, where crossings are part of daily, routine activities, are more difficult to value.

Changes in the amount of time required to cross the border, or increased variability and uncertainty regarding likely transit times, can have measurable impacts on the magnitude and cost of cross-border travel and related commerce. Numerous organizations and researchers have conducted studies of the effect of changes in congestion and associated wait time on economic activity. These studies generally conclude that increases in time delay create disincentives to cross the border and increase shipping and related costs, ultimately affecting economic productivity (Taylor et al., 2003).

Methods to calculate the economic impact of changes in wait time differ depending on the type of entity experiencing the delay:

- For individual travelers, economic impacts of wait time depend on whether the individuals change their behavior. In other words, the impacts depend on whether the individual experiences the wait time associated with the trip, decides on an alternate route or destination, or forgoes the trip altogether. Assuming no change in behavior, the economic impact is equal to the value of the time lost while waiting. If a change in wait time or uncertainty surrounding wait time alters an individual's behavior (e.g., individual does not make trip), economic welfare impacts associated with a loss in utility, as well as regional economic impacts may be associated with lost travel expenditures.
- For freight, longer or uncertain wait times may result in increased costs, including: truck drivers' time; fuel costs; vehicle wear-and-tear; opportunity costs of idle vehicles; opportunity costs of carrying additional inventory to avoid production delays; and inventory, storage, and related security costs. In addition, for certain cargo, such as perishable goods (e.g., food), inputs into ongoing production processes (e.g., auto parts), or goods that are subject to rapidly changing or uncertain demand (e.g., holiday gifts), increased wait times may affect competitiveness and market share. In response, producers may alter their supply chains, by building facilities on the opposite side of the border or changing suppliers, to avoid delays.

The following sections describe the methods used to calculate the economic impacts of changes in wait time for individuals and freight carriers in more detail. In all cases, the effects may be positive or negative, depending on whether CBP's actions shorten or lengthen crossing times. In addition, the likelihood of impacts, such as lost trips or restructuring of supply chains, will depend on the magnitude of the incremental change in wait time relative to existing conditions.

Time Delay Impacts on Individuals

Economic impacts of wait time on an individual depend upon: the purpose of the trip (e.g., business or leisure) and whether the individual changes behavior in response to the change in travel time. If individuals do not change behavior (e.g., continue to cross border and incur wait time), the economic impact is equal to the value of their time. Conversely, time savings that may accrue would be calculated similarly. If, however, individuals forego trips due to increased wait times, or take more trips as wait times decrease, regional economies may also be affected by the resulting changes in travel expenditures.

The following information is required to quantify the total impact of changes in wait time associated with program alternatives:

- The value an individual places on an hour of time spent waiting;
- The specific sites at which construction or modernization activities, routine POE operations, and traffic checkpoints will occur;
- The length of time the activity that's causing temporary time delays will take place (i.e., construction and modernization projects and mobile traffic checkpoints);
- The specific increase (or a reasonable range) in hours of wait time;

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

- The number of individuals experiencing the time delays now and in the future (which may vary with traffic volumes daily or seasonally, and annual traffic volume will depend on other factors such as future currency exchange rates);
- The trip’s purpose for the individuals crossing the border; and,
- The likelihood that the individual will choose to avoid crossing the border at the site experiencing increased wait time, or avoid crossing the border at all (i.e., the elasticity of demand for the trip).

Only the first piece of information is readily available. In 2007, in support of its analysis of the economic impacts of implementing the Western Hemisphere Travel Initiative (WHTI) at land POEs, CBP and DHS established a methodology for valuing time spent by individuals waiting at border crossing points (USDHS, 2008). This methodology is based on guidance published by the U.S. Department of Transportation (DOT) in 1997 and takes into account more recent research. The approach follows a three-step process:

1. Determine wage rates that are relevant to the valuation of time for business and personal (e.g., leisure) travelers.
2. Estimate per-unit economic impacts associated with increased in-vehicle time as a fraction of the wage rate. DOT estimates values for in-vehicle time as a percentage of the wage rate separately for intercity and local travel, and for business and personal travel.
3. Estimate per-unit economic impacts of wait time (as opposed to the more generic “in-vehicle” time) as a function of the value of in-vehicle time for business and personal travel using a peer-reviewed study published in the transportation literature (Wardman, 2001).

Appendix D of the 2008 WHTI Regulatory Assessment provides a detailed discussion of this methodology (USDHS, 2008). This methodology is used to estimate the value of an hour of time saved or lost (Table 8.10-2). As significant uncertainty exists regarding these estimates, this analysis provides a range of impacts per person-hour of increased wait time.

Table 8.10-2. Estimated Value of Wait Time per Person-Hour in 2009 dollars

Type of Time Affected	Low	Best	High
Personal	\$14.07	\$16.41	\$21.10
Business	\$26.99	\$33.74	\$40.48

Sources: (USDOL, 2009b; USDOL, 2009c).

Notes:

- Per person-hour in 2009 dollars.
- Applying lower time values to regions with lower wages could create a bias favoring the imposition of longer wait times in those areas. To avoid such equity concerns, estimates are for the entire United States rather than by region.
- For personal travel, the value of in-vehicle time is estimated as 60 percent (low), 70 percent (best), and 90 percent (high) of the wage rate. For business travel, in-vehicle time is estimated as 80 percent (low), 100 percent (best), and 120 percent (high) of the wage rate plus benefits. Note that DOT estimates separate wait time values, not shown in this table, for truck drivers at 100 percent of their wage rate.

- A factor of 1.47 from Wardman (2001) is applied to in-vehicle time to estimate the value of wait time.

In addition to the per-person value of an hour of wait time, estimates of the cost of increased time delays requires information about the aggregate number of additional hours spent waiting at border crossings. Although the per-person-hour values in Table 8.10-2 are relatively small, these values could be aggregated across potentially thousands of affected travelers making multiple trips across the border each year.

If a change in wait time or uncertainty surrounding wait time causes individuals to change travel plans (e.g., not take trip), they will not experience the lost value of the hours they spend waiting. However, other types of economic impacts may result.

Welfare impacts may result if an individual modifies travel plans due to changes in wait time at crossings. Individuals may experience a loss in utility from not taking the trip or from taking an alternative second-best trip. It is assumed that the individual's first-choice trip is utility maximizing (i.e., that individual's choice to maximize his or her general well-being), and thus any other trip would result in a decrease in potential utility. Although the individual will experience a decrease in potential utility, it is generally assumed that an individual will only change behavior if the decrease in potential utility associated with the second-choice trip is less than the impact of the additional wait time. Thus, the welfare impacts of choosing a different trip are most likely less than the value of an increase in wait time.

Regional economic impacts may occur, however, due to a loss in travel expenditures. If an individual chooses to not take a trip, or to travel to a different area, the regional economy of the first-choice destination may suffer a loss, while the economy of the second-choice destination may experience a corresponding gain. To calculate these losses, one must understand the individual's elasticity of demand for travel, change in price of the trip, purpose of the trip (personal or business), and typical trip expenditure.

To quantify the potential regional impacts of time delay associated with the No Action Alternative, additional information is required regarding:

- Alternative trip destinations if individuals choose not to travel to their first-choice site due to the time delay;
- Average regional trip expenditures at the site for business and personal/leisure trips; and,
- Regional economic multipliers (or a regional input-output model) to describe how changes in expenditures in a particular economic sector(s) affect the broader regional economy (e.g., business that provide goods and services to the affected businesses).

Generally, POEs with the greatest traffic volumes will experience the greatest impacts of increased or decreased wait times. POEs with the greatest volumes are identified by region below:

WOR Region

Three POEs in this region experienced more than one million individual crossings in 2009 (Table 4.10-12):

- Blaine (Washington): 6.6 million individual crossings (1.6 percent of total individuals crossing the northern border);
- Sumas (Washington): 11.5 million individual crossings; and,
- Point Roberts (Washington): 1.3 million individual crossings.

Travel and tourism from British Columbia is a significant contributor to the regional economy of Whatcom County, Washington (which contains the Blaine, Sumas, and Point Roberts POEs) both in terms of regional income (visitors spent approximately \$435.5 million in Whatcom County) and employment (the county supported 7,120 travel and tourism jobs in 2009) (DRA, 2009). In the mid-1990s, the county estimated that 30 to 40 percent of retail activity depended upon Canadian consumers (WCCP, 2010b). Thus, the regional economy of the county relies on relatively efficient border crossings for visitors from Canada.

EOR Region

Only one POE in the EOR Region experienced close to one million individual crossings in 2009: (Table 5.10-12) International Falls POE in Minnesota had approximately 957,000 individual crossings (1.6 percent of total individuals crossing the northern border).

Great Lakes Region

The POEs in this region account for the majority of individual crossings across the entire northern border (Table 6.10-12). Three POEs constitute almost 40 percent of all northern border crossings in 2009:

- Buffalo-Niagara Falls (New York): 13.8 million individual crossings;
- Detroit (Michigan): 8.8 million individual crossings; and,
- Port Huron (Michigan): 4.0 million individual crossings.

New England Region

Two POEs in this region had over one million individual crossings in 2009 (Table 7.10-12):

- Calais (Maine): 1.4 million individual crossings; and,
- Derby Line (Vermont): 1.4 million individual crossings

While the number of individuals crossing is a key factor in identifying sites that may experience relatively great time delay impacts, the relative length of the delay and the purpose of travel (number of individuals traveling for business versus leisure) are also important considerations.

Time Delay Impacts on Trade Activity

The following discussion regarding economic impacts of time delays on freight crossings includes text derived from a report developed under contract to CBP's Office of International Trade (Robinson, 2009). For simplification, this discussion is framed in the context of the consequences of incremental increases in the time required to cross the border. However, positive economic impacts may result when CBP actions decrease current delays.

Similar to the economic impact of wait time on individuals, the economic impact on freight crossing the border depends on whether the freight carrier, importers, or exporters change their behavior (e.g., choose to transport goods through an alternate POE, alter inventory management practices, identify alternate sources of goods or materials). If a freight carrier crosses at the affected site and experiences a time delay, economic impacts may include an increase in the freight costs per trip, including the costs of the driver's time, fuel, and vehicle wear-and-tear. The freight company may absorb these losses through decreased profits or by reducing other expenditures, or by passing them on to the exporting or importing companies through increased prices for the transported goods. When these increased costs are passed on to the importer, the importer may either absorb the cost increases or may, in turn, pass them on in whole or in part to consumers of its products as price increases.

In addition, changes in delivery schedules for transported goods may generate other types of impacts. For example, the importer may experience longer wait times for intermediate products, or increased uncertainty about shipping times and delivery schedules. Increased transportation time may lead to more spoilage (if perishables are involved) or increased inventory carrying costs. In particular, many companies have moved to just-in-time inventory systems, which reduce the costs of capital (i.e., interest charges on borrowed funds), storage, and insurance. Such systems also allow them to tailor their inventory immediately to changing customer or production demands, decreasing costs or increasing sales. These companies rely on timely delivery of goods. Faced with longer shipping times, the companies may be forced to increase their inventory. Losses may be absorbed or passed onto consumers through higher prices.

Like individuals, freight carriers, importers, or exporters may decide to change their behavior in response to a change in wait time. Freight carriers may, for example, change their routes (using a different crossing point) or the timing of their shipments (arriving at the crossing at a less busy time) to avoid crossing delays. Assuming that affected entities will make these adjustments only if the costs are less than the costs of the additional wait, these behavioral changes would decrease the delay costs and reduce the economic impact on other firms and consumers.

If cost increases borne by the carrier are passed onto firms or consumers through increased prices for goods that rely on the transported freight, broader economic impacts to markets may occur. Rather than accept the higher prices, affected firms and individual consumers may substitute alternative goods, or otherwise reduce their need for the more expensive product. If feasible, importers may use an alternative method of transport for the good (e.g., substituting rail for truck transport) or purchase a domestically produced substitute.

Temporary increases in delays at border crossings are unlikely to have lasting impacts on markets for traded goods. Once the project causing the delay is complete, the impacts would most likely end. The magnitude of the potential impacts of time delays on trade depends on the specific length of the time delay and the supply-and-demand relationships in the affected markets. For modest increases in border crossing times (e.g., measured in minutes), the costs borne by the freight companies may dominate the results, and any price changes may be too small to have a measurable effect on importers or markets. Greater delays (e.g., measured in hours or days), however, may further affect firms, consumers, and the overall economy. In the most extreme cases, unexpected and lengthy delays (such as those immediately following the

September 11, 2001 attacks or from events such as natural disasters or widespread power outages) can shut down entire production processes.

Those CBP's activities that may cause time delays, however, are most likely to produce either temporary delays or relatively modest increases in border crossing times (minutes as opposed to hours or days). Generally, the POEs with the most freight crossings will experience the greatest economic impacts of time delays. The following is a regional breakdown of the flow of commercial activity through POEs:

WOR Region

The POEs within the WOR Region account for relatively low percentages of the total surface transportation trade value between the United States and Canada (Table 4.10-12). The greatest percent of annual trade value in the region in 2009 (4.3 percent or \$14.6 billion) took place at the POE in Blaine Washington. At the Blaine POE, machinery and mechanical appliances, electrical machinery and equipment, vehicles, and parts account for the greatest trade volume in terms of value.

In addition, as described in Section 4.10.2.6, one of the top three economic sectors (by annual payroll) in Whatcom County is retail trade (\$276 million). Thus, the economy of Whatcom County relies on efficient border crossing for trade activities.

EOR Region

The POEs within the EOR Region account for relatively low percentages of the total surface transportation trade value between the United States and Canada (Table 5.10-12). The greatest percent of annual trade value in the region in 2009 occurred at the Pembina POE in North Dakota (\$15.2 billion, 4.5 percent of the annual border trade value). At the Pembina POE, machinery and mechanical appliances, vehicles, and parts account for the greatest trade levels in terms of value.

As described in Section 5.10.2.6, three of the top five economic sectors in Pembina County by annual payroll are wholesale trade (\$15.7 million), retail trade (\$8.6 million), and transportation and warehousing (\$7.3 million). Thus, the economy of Pembina County relies on efficient border crossing for trade activities.

Great Lakes Region

Four of the POEs within the Great Lakes Region account for significant percentages of the total surface transportation trade value between the United States and Canada (Table 6.10-12). Together, these POEs account for approximately 63 percent of the total trade value by surface transport between the two countries.

- Detroit (Michigan): The Detroit POE accounts for the greatest total trade value along the northern border (\$84.7 billion in 2009, 25.1 percent of the total trade value);
- Buffalo-Niagara Falls (New York): This POE accounts for the second greatest total trade value along the northern border (\$54.5 billion in 2009, 16.7 percent of total trade value);

- Port Huron (Michigan): This POE accounts for the third greatest total trade value along the northern border (\$52.6 billion in 2009, 15.6 percent of total trade value); and,
- Champlain-Rouses Pt. (New York): This POE accounts for the fourth greatest total trade value along the northern border (\$19.2 billion in 2009, 5.7 percent of total trade value).

Detroit and Port Huron are the most active crossing points for commercial trucks (Section 6.10.2.6). The Detroit-Warren-Livonia metropolitan statistical area (MSA) is a major manufacturing region and home to the Big Three automobile manufacturers. The manufacturing sector is the largest in the region in terms of annual payroll (\$12.1 billion). Across the border, Ontario is the largest automobile manufacturing region in North America. The regional economy of the Detroit-Warren-Livonia MSA therefore relies on efficient border crossings.

New England Region

The POEs within the New England Region account for low percentages of the total trade value carried by surface transportation between the United States and Canada (Table 7.10-12). The greatest percent of annual trade value in the region in 2009 occurred at the POE in Calais, Maine (\$2.4 billion, 0.7 percent of annual trade value). At the Calais POE, fish and crustaceans, mollusks, machinery and mechanical appliances, and electrical machinery and equipment account for the greatest trade levels in terms of value.

While the value of goods crossing is a key factor in identifying sites that may experience relatively great impacts of time delay, the relative length of the delay and the nature of the cargo are also important considerations.

8.10.1 NO ACTION ALTERNATIVE

The No Action Alternative is a continuation of the current pace of operations in terms of the types and levels of CBP activities along the northern border. This alternative represents the baseline against which CBP may compare the impacts of other alternatives. Overall, the socioeconomic impacts of CBP's No Action Alternative are expected to be moderate and adverse. Both adverse and beneficial impacts associated with temporary construction activities and patrols are expected to be minor and temporary. However, adverse impacts due to time delays along the border from POE operations and traffic checkpoints may be sustained and require some adjustment for both individuals and trade activities at specific border crossings. The effects of fencing are likely to be negligible to minor. The No Action Alternative is not expected to affect other socioeconomic resources, such as population demographics.

The following discussion describes how CBP's activities in the No Action Alternative may incur socioeconomic impacts described above.

Small and Large Construction Projects

CBP activities involving construction include repair, upgrade, or expansion of POEs as well as construction of BPSs, permanent traffic checkpoints, and FOBs. Projects may also include construction of fences and other physical barriers, roads, bridges, and culverts.

CBP identifies small construction projects as those that affect less than one acre of land or less than a quarter mile of road. The relatively minor footprint and temporary nature of small

construction projects makes them unlikely to affect property values. These activities may, however, temporarily degrade the quality of the adjacent land for recreational activities. Social welfare and regional economic impacts associated with small construction projects are expected to be minor, temporary, and adverse, as any impacts would be near the project and removed entirely upon project completion. Whether such impacts would occur depends upon surrounding land uses (e.g., proximity of the small construction project to development or recreational activity), as well as the level of disturbance (e.g., noise, traffic backups) associated with the activity.

CBP identifies large construction projects as those affecting more than one acre of land or a quarter mile of road. General descriptions of large construction project types that may occur in each of the regions follow.

Construct a BPS

This activity requires purchase or lease of approximately 10 acres to develop an office/storage building and 10,000 square feet of parking. For BPSs in remote areas, CBP would also consider construction of a 3,600 square foot helipad.

Modernization or Maintenance of an Existing POE or BPS

Maintenance and repairs of existing POEs or BPSs range from minor upgrades or repairs to major modifications, such as demolition of existing structures and construction of new structures. These activities may be either small or large construction projects.

Set-Up Permanent Traffic Checkpoints

The total land area required remains uncertain, but should be able to support: a new, 6,000 square foot building; less than 1 acre for kennels to support canine units; storage areas for evidence, equipment, and tools; parking; tollbooth-like structures for shelter from weather; detention rooms; a HAZMAT quarantine area to store vehicles; inspection lanes; area for utilities, potable water supply, communications towers, sewage disposal, and solid waste storage; and on-site renewable energy generating sources at some sites.

Construct a New FOB

The total land area required remains uncertain but should support: modular structures or buildings; portable toilet and shower facilities; portable generators; and fuel and water trailers. FOBs are temporary, but required on a regular basis for several days to several weeks, to provide access to temporary checkpoints or patrol operations.

Construct Fences or other Physical Barriers

Fence and barrier construction along the border may require access roads, lighting, and other infrastructure during construction. Depending on the area required, these may be either small or large construction projects.

Access Road Extension

Extensions of access roads greater than a quarter of a mile are large construction projects.

CBP anticipates that under the No Action Alternative 15± large construction projects may be undertaken across each of the regions. These projects are either currently underway or in the planning stages.

Economic impacts of infrastructure construction may result from the construction activity itself or by the changed landscape and land use upon completion of development. Generally, impacts associated with construction activity are temporary and disappear with completion of construction. Such impacts may come from noise pollution and visual disturbance at the construction site. As described, noise pollution may temporarily affect the value of the surrounding area for economic uses during construction. For example, lands adjacent to the construction site that support recreation activities such as camping, fishing, hiking, wildlife viewing, or hunting may be less attractive to recreational users due to higher ambient noise levels. Individuals may, therefore, experience decreased enjoyment of their recreation activity, choose to visit a substitute site, or forgo the activity altogether. These changes in behavior affect social welfare values (i.e., individuals' willingness to pay for the activity) and may cause regional economic impacts if activity levels and associated regional spending decrease.

In addition, construction noise may disrupt day-to-day activities of nearby residential landowners. Residents may change their behavior: for example they may spend more time away from home during periods of high noise. Due to the temporary nature of these impacts, however, it is unlikely that the noise would alter the nature of a community or affect residential or commercial property values.

Although the disturbance associated with the construction results in only temporary impacts, establishing a new facility such as a BPS or FOB may generate sustained, moderate adverse economic impacts to socioeconomic resources. If the property acquired for the new facility is removed from another productive land use, such as agriculture or development, a change in regional economic productivity (e.g., agricultural production or new home construction may be reduced) may result. In addition, proximity to the new facility may negatively affect the value of the surrounding land for other uses such as recreation, as described. If the new facility increases traffic in the region or interrupts a preferred viewscape, the new development may also have a negative effect on neighboring property values.

If CBP purchases land from a private (non-Federal) landowner, the property purchased is no longer taxable, resulting in a decrease in local property tax revenue that supports local school systems. The magnitude of such tax-base impacts depends on both the amount of land no longer generating tax revenue and the property tax rate. It is, therefore, project-specific.

However, construction of new facilities may also, however, have a beneficial effect on regional economic activity. First, the construction activity itself may increase regional employment opportunities if the projects involve local construction and development businesses. When projects rely instead on military or National Guard engineering units for construction, individuals would be temporarily relocated to the region and would contribute to the regional economy through spending on retail and service sectors. POE modernization projects may also increase crossings at a particular site, escalate tourism in the surrounding community and increase spending at regional service and retail businesses, such as fuel stations, hotels, and restaurants. Increased regional economic activity may, in turn, generate more employment opportunities,

population density, and general growth in the surrounding area. POE modernizations or upgrades that add crossing lanes or increase processing efficiency may also decrease wait time and benefit both individuals and trade activity that rely on border crossing.

Large construction projects may also include constructing fences or other barriers in localized areas to keep vehicles and individuals from crossing the border. Constructing a barrier could negatively affect the social fabric of border communities by separating friends and families, or hindering access to their places of work or leisure. However, since CBP does not plan to construct fences through cross-border communities, these impacts would not occur.

Road and bridge construction may facilitate access to more rural, undisturbed areas, which may have a positive or negative effect on property values or land use activities, such as recreation. For example, while access to remote areas may be improved for recreation, additional noise from traffic may reduce the value of the experience for recreational users who choose more remote areas for their activities. At the scale of current CBP activities, these adverse impacts would be minor to moderate, though long-term. Similarly, providing access to undeveloped areas may open up the area for future development. While this may benefit the regional economy by attracting homebuyers and businesses, existing homeowners who currently enjoy the remote, natural landscape may experience minor to moderate adverse impacts.

In sum, large construction projects could produce moderate adverse impacts if they interrupt productive land use or adversely affect surrounding land uses, as well as moderate beneficial impacts through increased economic activity. Constructing fences or barriers through cross-border communities could cause major impacts, but CBP does not plan to construct fences through cross-border communities, thus major impacts are not expected. In addition, new or upgraded facilities may decrease delays at the border and bring beneficial impacts to local employment and economic activity.

Onsite Trade and Travel Processing Operations and Checkpoint Operations

Routine activities at POEs include processing visitors and cargo, and other surveillance and inspection activities. CBP defines one small POE trade and travel operation as all operations at discrete POEs or fixed checkpoints processing fewer than 10,000 crossings per day. CBP defines a large POE trade and travel operation as a facility processing more than 10,000 crossings per day. Under the No Action Alternative, CBP plans to continue operating 20± small operations in the New England and WOR Regions; one large operation takes place in the WOR Region with none in the New England Region. In the Great Lakes Region, CBP plans to continue operating 10± small and 3 large operations. The EOR Region plans to continue operating 30± small and no large operations under this alternative. In addition, CBP anticipates 100± checkpoint operations per day in each of the 4 regions.

Implementing inspections and processing crossings increase travel time for visitors crossing into the United States or Canada for business or leisure, as well as for trucks and trains carrying trade goods between the countries. The impact of time delays varies with the length of delay and the purpose of the trip. In the most extreme cases, time delays may affect decisions to cross the border for business or leisure, reducing tourism or regional spending, or decreasing trade between the countries. Therefore, as the populations and economies of the United States and

Canada grow and trade volume increases, the potential exists for moderate, adverse impacts from routine inspections and processing activities.

On the other hand, trade and travel processing operations may decrease wait time at the crossing such that these activities improve effectiveness and efficiency in screenings and inspections. In these cases, processing operations will have a beneficial socioeconomic impact.

Whether the operation is small (fewer than 10,000 crossings) or large, is only 1 factor in determining the magnitude of adverse or beneficial impacts. In addition to the number of crossings, other key variables in estimating the level of impact include: the reason for crossing; current wait times and the magnitude of incremental changes (e.g., minutes, hours); the amount of regional expenditures associated with the crossing; and the value of cargo crossing. Thus, impacts for both small and large processing operations and checkpoint operations could be moderate and adverse or beneficial to socioeconomic resources.

Motorized Ground Operations, Aircraft Operations, and Vessel Operations

Under the No Action Alternative, CBP proposes continued patrolling of the region at the following levels:

- Motorized ground operations (ATVs, snowmobiles, and other vehicles): 800± per day in each region;
- Aircraft operations (manned and remotely-piloted aircraft patrols): approximately 20± each in the Great Lakes and EOR Regions and 15± each per day in the WOR and New England Regions; and,
- Vessel operations (waterborne patrols on marine and riverine vessels): approximately 14± in the WOR Region; 5± in the EOR Region; 42± in the Great Lakes Regions; and 16± per day in the New England Region.

ATV and snowmobile patrols are most likely to affect rural areas. Snowmobile patrols traverse terrain not previously accessible and allow CBP to enter remote areas with limited to no human disturbance. Patrolling these areas may increase noise and negatively affect individuals who purposefully engage in recreation away from developed areas. Given the intrusive nature of these vehicles, adverse impacts on the value of recreational lands and surrounding property values could be greater than those for water and air patrols if these patrols are of sufficient number and proximity to sensitive public or private lands. Overall, these impacts could be minor to moderate, depending on the physical context of the local terrain and land ownership.

Aerial and waterborne patrols are anticipated to result in only minor impacts to communities and economies. In developed areas, the surveillance is less likely to be noticed. Conversely, in rural, undisturbed areas, the patrols may introduce some noise pollution. The patrols may, therefore, constitute a disturbance to individuals who recreate or reside in rural areas along the border specifically to avoid the noise and activity levels of more developed areas.

In addition, individuals may consider the patrols disruptive of their day-to-day activities. For example, boaters may experience decreased enjoyment of a boating trip due to waterborne patrols from increased noise or crowding, or the sense that their activity is being monitored.

Given the presence of other boats and aircraft in these areas, and the relatively small amount of activity that CBP's patrols produce, these impacts would likely be negligible. In addition, potential beneficial impacts may result due to the feeling of added security from the patrolling units.

Operation of NII Systems, Sensors, and Other Technologies

Under the No Action Alternative, CBP anticipates operating NII systems in each of the regions for approximately 1,000 hours per day and sensors and other technologies for approximately 1,500 hours per day. Continued implementation of the NII systems and other technologies supports the detection contraband and prevents it from entering into the United States.

Depending on the current protocol for inspections at particular POEs, these technologies may increase (by adding additional inspections) or decrease (by improved efficiency for existing inspections) wait times at the border. If inspections result in light disturbance along the border, these projects may have an adverse impact on property values or nearby recreation activity. In addition, if RVSSs are employed, nearby residents, businesses, or recreational users may become negatively affected due to real or perceived privacy issues.

8.10.2 FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE

The Facilities Development and Improvement Alternative involves major modernizations or repairs to existing POEs, construction of new BPSs, or upgrading existing BPSs to improve CBP's efficiency in operations and response to potential situations along the border. In addition to permanent facilities (i.e., construction of new stations and housing), this alternative includes potential construction of temporary facilities, such as FOBs and checkpoints, to support law enforcement operations. The socioeconomic impacts of this alternative are most likely moderate and adverse, as well as beneficial, as described below.

According to this alternative, CBP would undertake approximately 30± small construction projects and approximately 20± large construction projects in each of the regions in addition to the No Action Alternative.

Overall, the impacts of the Facilities Development and Improvement Alternative on socioeconomic resources would most likely be moderate. Both adverse and beneficial impacts associated with additional temporary construction activities are expected to be minor and temporary. Large construction projects for new BPSs and other facilities may remove land from its existing use, however, which may affect regional economic production depending on existing land use. These potential impacts are similar to those for CBP's construction activities.

In general, more infrastructure and facility construction along the border results in increased economic impacts. For example, additional land purchased to site CBP's facilities results in decreased value of that land in its existing use (i.e., decreased agricultural rents from regional crop production). More construction generates more noise, which can degrade recreational activities. These increased impacts are not necessarily proportional to the increase in project number (i.e., we do not assume a uniform per-project impact). The impact is site-specific and depends on the nature and level of economic activities occurring at and adjacent to the project.

This alternative may also increase beneficial impacts. If CBP modernizations to POEs alleviate traffic congestion, wait times may be reduced and time delay impacts may lessen in the long run. This change would potentially have beneficial impacts on trade and tourism.

8.10.3 DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE

The Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative focuses on deploying newer, more effective technologies to support CBP's surveillance and telecommunication activities. Overall, the socioeconomic impacts of the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative are expected to be moderate (these activities are in addition to the No Action Alternative activities). Increased patrols and use of improved monitoring and surveillance equipment are unlikely to measurably affect wait times at the border, trade volumes, property values, or recreational activities. Beneficial impacts may also accrue to the extent that use of surveillance and inspection technologies increases CBP vehicle-crossing processing efficiency. The following analysis discusses the likely socioeconomic impacts of this alternative.

This alternative continues deployment of, for example, remote sensors, short-range radar, remote and mobile video surveillance, as well as new camera systems and upgrades to existing communications systems. It also increases surveillance and patrols at select border areas.

With this alternative, CBP would undertake an additional 100± small construction projects (e.g., towers and other infrastructure) in each region, increase motorized ground patrols by 1,300± missions per day in each region, increase aircraft surveillance by 30± missions per day in the EOR and Great Lakes Regions and 23± in the WOR and New England Regions, and increase vessel operations by 63± missions per day for the Great Lakes Region, 10± for the EOR Region, 21± for the WOR Region, and 24± for the New England Region. In addition, CBP would increase operation of NII systems by 1,500± hours per day and operation of sensor and other technologies by approximately 2,500± hours per day in each region.

This alternative is expected to have moderate adverse impacts on socioeconomic resources when considered with the impacts of the No Action Alternative. As described above, aerial and waterborne patrols are anticipated to result in only minor impacts to communities and economies, mostly in more pristine areas where patrols introduce temporary and localized noise pollution. These impacts occur during the patrols and are unlikely to disrupt the opportunity for any given area to support recreation or other activities in the region. Increased patrols may also feel intrusive to individuals engaged in day-to-day activities.

Deployment of NII systems and other technologies may increase or decrease wait times at the border, depending on the status of inspections at the site. These delays are likely minor relative to other activities affecting crossing time, such as traffic. In addition, increased use of RVSS may generate privacy concerns from neighboring residents, businesses, or recreational users.

8.10.4 TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE

The Tactical Security Infrastructure Deployment Alternative includes construction of additional barriers at select points along the border to deter and delay CBVs. In addition, it includes additional roads and related facilities that would improve CBP's ability to respond to potential

CBVs quickly and effectively. Overall impacts of increased fencing and other physical barriers along the border, as proposed in this alternative, could have moderate, adverse, economic impacts (when considered with the activities in the No Action Alternative), depending on where and how the barriers are constructed. As CBP does not plan to construct fences through cross-border communities, minor impacts are expected. Opening additional undeveloped areas by improving or expanding road and trail systems could also have minor, beneficial, economic impacts through increased economic activity.

Under this alternative, CBP would increase small construction projects related to access roads and fencing by approximately 30± projects and large projects by approximately 5 projects across each of the regions (in addition to the No Action Alternative activities). Small projects affect less than one acre or a quarter mile and are likely to have only negligible to minor additional impacts on socioeconomic conditions.

Large construction projects may generate minor, adverse, economic impacts as well as beneficial, economic impacts. The impact due to barrier construction depends primarily on where the barriers are constructed. Because CBP plans to erect additional fencing in more remote areas where border passage is difficult to control, the impacts are likely to be negligible to minor.

Expanding or improving road and trail infrastructure may result in positive or negative impacts. If remote, pristine areas are valued as such (i.e., increased access is not preferred), individuals may be less willing to pay for property or recreational opportunities if access is increased. However, improved road infrastructure may also facilitate access for recreational users and increase visitation to regions, generating additional regional economic activity.

8.10.5 FLEXIBLE DIRECTION ALTERNATIVE

The Flexible Direction Alternative allows CBP to use a mix of any of the actions in the previous four alternatives on an as-needed basis to respond to evolving threats along the border, allowing the most flexibility in border security actions. For similar reasons to the No Action Alternative, the socioeconomic impact of the Flexible Direction Alternative is most likely moderate and adverse. The activity levels are only one factor in determining the magnitude of socioeconomic impact. The site choice (i.e., existing and surrounding land uses) for the projects and land area disturbed by individual projects are also key factors. Thus, the increased activity of the Flexible Direction Alternative, while greater than that of the No Action Alternative, is most likely to generate moderate, adverse impacts. However, depending on the site-specific project parameters the socioeconomic impacts may be greater.

Under this alternative, CBP would increase small construction projects by 160± per year, large construction projects by 25±, checkpoint operations by 100±, motorized ground patrols by 1,300±, aircraft patrols by 30± missions per day for the EOR and Great Lakes Regions and 23± for the WOR and New England Regions, and increase vessel operations by up to 63± missions per day for the Great Lakes Region, 10± for the EOR Region, 21± for the WOR Region, and 24± for the New England Region. This alternative also includes increased operation of NII systems by 1,500± hours per day, and operation of sensor or other technologies by 2,500± hours per day in each of the 4 regions.

The additional activity levels (beyond the No Action Alternative) of the Flexible Direction Alternative would most likely have an increased socioeconomic impact across the region. Additional land area required for new BPSs and other facilities increases the production values associated with removing land from its existing use (e.g., decreased agricultural rents if the facility is developed on farmland). The magnitude of this impact depends on the existing land use and the amount of land developed.

Additional construction projects also likely to increase the amount of area affected by noise (thus influencing the property values and recreational activities of more neighboring land parcels). Increased patrolling may open up previously pristine areas to noise pollution.

Beneficial impacts of these activities on socioeconomic conditions would likewise increase. If additional infrastructure and deployed technology increase the speed or ease of border crossing, regional economies and individual travelers may benefit. New facilities may also bring employment opportunities along with increased spending at local businesses. In addition, expanding roads and trails may provide more opportunities for recreation.

8.10.6 BEST MANAGEMENT, MINIMIZATION, AND MITIGATION

CBP seeks to avoid, minimize, repair, and reduce the impacts of its actions on the human environment. It does so with a combination of BMPs, siting plans, design strategies, mitigation measures, and monitoring plans best suited to the scale and location of the particular action. Towards that end, CBP could choose from among the following actions to avoid or minimize impacts to communities, regional economies, and cross-border trade. All measures are only relevant to particular projects if they are both practical and feasible.

The following measures may minimize social welfare and regional economic impacts associated with decreased or degraded land uses:

- Siting projects away from recreational areas;
- Applying BMPs related to reducing sound from construction activities (e.g., using sound-reducing equipment); and,
- Undertaking construction and patrol activities during off-peak hours or seasons for recreational activities.

The following measures may minimize impacts to land and property values associated with precluding or degrading potential land uses:

- Siting projects on vacant Federal lands or at abandoned Federal facilities;
- Siting projects on vacant or unproductive lands;
- Acquiring lands through purchase or lease from willing sellers; and,
- Developing aesthetically pleasing landscapes (e.g. by revegetating disturbed grounds).

The following measures may minimize the economic impacts of time delay on individuals and trade activity:

- Engaging in construction or other delay-generating activities during periods of relatively low traffic volumes, to the extent practicable and feasible;

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

- Constructing additional traffic lanes at busy POEs or at checkpoints with the greatest delays; and,
- Monitoring how CBP processing procedures at border crossings affect wait times to determine whether the costs of additional wait times outweigh the benefits of implementing processing procedures.

8.10.7 SUMMARY OF POTENTIAL SOCIOECONOMIC IMPACTS

Table 8.10-3 summarizes the socioeconomic impacts of CBP’s alternatives.

Table 8.10-3. Summary of Potential Socioeconomic Impacts

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
NO ACTION ALTERNATIVE					
Small construction projects (<1 acre and <1/4 mile: e.g., minor repairs to facilities, parking lot repairs, access road repairs, etc.)		⊗			
Large construction projects (>1 acre and >1/4 mile: e.g., repairs to facilities, parking lot repairs, access road repairs, etc.)			⊗		⊗
Small on-site trade and travel processing operations			⊗		⊗
Large on-site trade and travel processing operations			⊗		⊗
Checkpoint operations			⊗		⊗
Ground operations—motorized		⊗			
Ground operations—nonmotorized	On-road	⊗			
	Off-road	⊗			
Aircraft operations		⊗			
Vessel operations		⊗			
Operation of NII systems		⊗			⊗
Operation of sensor and other technologies		⊗			⊗
OVERALL IMPACT			⊗		

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
FACILITIES DEVELOPMENT ALTERNATIVE					
Small construction projects (<1 acre and <1/4 mile)		⊗			
Large construction projects (>1 acre and >1/4 mile)			⊗		⊗
OVERALL IMPACT (INCLUDING NO ACTION)			⊗		
DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATION TECHNOLOGY EXPANSION ALTERNATIVE					
Small construction projects (towers and other infrastructure to mount antennas, etc.)		⊗			
Ground operations—motorized		⊗			
Aircraft operations		⊗			
Vessel operations		⊗			
Operation of NII systems		⊗			⊗
Operation of sensor and other technologies		⊗			⊗
OVERALL IMPACT (INCLUDING NO ACTION)			⊗		
TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE					
Small construction projects (trench cuts, towers, minor access roads and fences)		⊗			
Large construction projects (access roads and fences)		⊗			⊗
OVERALL IMPACT (INCLUDING NO ACTION)			⊗		

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
FLEXIBLE DIRECTION ALTERNATIVE					
Small construction projects		⊗			
Large construction projects			⊗		⊗
Checkpoint operations			⊗		⊗
Ground operations—motorized		⊗			
Ground operations—nonmotorized	⊗				
Aircraft operations		⊗			
Vessel operations		⊗			
Operation of NII systems		⊗			⊗
Operation of sensor and other technologies		⊗			⊗
OVERALL IMPACT (INCLUDING NO ACTION)			⊗		

8.11 ENVIRONMENTAL CONSEQUENCES TO CULTURAL AND PALEONTOLOGICAL RESOURCES

This section considers the potential impacts of CBP's alternative actions on cultural and paleontological resources. Action alternatives may have an adverse effect on cultural, historical, archaeological, and paleontological resources, primarily if they involve new construction in previously undisturbed areas; if they entail the rehabilitation or demolition of a property listed or eligible for listing on the National Register of Historic Places (National Register); or if the action introduces visible intrusions in a historic landscape or within or adjacent to a historic district. For descriptions of the regional affected environments for cultural, historical, archaeological, and paleontological resources, see Sections 4.11.2 (WOR Region), 5.11.2 (EOR Region), 6.11.2 (Great Lakes Region), and 7.11.2 (New England Region).

Cultural resources include both prehistoric and historical archaeological sites, Native American Traditional Cultural Properties, and architectural and other above-ground resources. Procedures for the identification, evaluation, and treatment of cultural resources are contained in numerous Federal and state laws and regulations including, but not limited to, the National Historic Preservation Act of 1966 (NHPA) and the Paleontological Resources Preservation Act of 2009 (PRPA).

CBP actions that could potentially affect cultural resources include expansion of POEs; construction of permanent traffic checkpoint facilities, roads, fences, barriers, RVSSs, and detection and communication towers; and destructive activities such as tunnel demolition. Impacts to cultural resources could be major if properties eligible for listing on the National Register were affected by a proposed action. The level of impact could range from negligible to major depending on the type of resource identified. Impacts to historic structures or other above-ground objects within the viewshed of a proposed RVSS or communications tower could also range from negligible to major depending on whether the proposed design affects the historical integrity or setting of the historic property (see Sections 4.11.3, 5.11.3, 6.11.3, 7.11.3). However, the intent and expected result of NHPA and PRPA consultation and the process of National Register listing would be to mitigate any adverse impacts as much as possible, consistent with CBP's homeland-security responsibilities (see Section 9.11). As a result, direct, indirect, and cumulative impacts to cultural, historic, and archaeological resources across the northern border as a whole would not be significant.

The specific components of action alternatives with the greatest potential for impacts on cultural and paleontological resources that could range from minor to major and adverse in some cases and beneficial in others include:

- Construction, modification or repair of POEs, BPSs, OAM bases, training facilities, and permanent traffic checkpoint facilities;
- Construction of roads, fences, barriers, and related infrastructure;
- Installation of RVSSs;
- Installation of detection and communication towers;
- Remediation of illegal tunnels; and,

- Installation of UGSs.

In general, CBP's day-to-day operations do not have a direct physical impact on cultural or paleontological resources, nor do they produce a permanent visual change in the viewshed of cultural resources; therefore CBP's day-to-day operations have no impact and have not been carried forward for detailed analysis. CBP's day-to-day operations include, but are not limited to, travel processing; cargo inspections; canine enforcement teams; fraud prevention; aerial surveillance; line-watch operations; ground patrols; and aircraft, watercraft, and vehicle maintenance.

8.11.1 NO ACTION ALTERNATIVE

The No Action Alternative would potentially have minor to major, adverse impacts on cultural and paleontological resources in some cases and beneficial impacts in others. These impacts would potentially occur from construction of new facilities (BPSs, etc.), infrastructure (roads, fences, etc.), and communication facilities (towers, etc.), as well as from physical changes resulting from facility, technology, and infrastructure renovations, alterations, and replacements. New construction and physical changes may also affect the view to and from adjacent properties. Physical changes have the potential to remove or destroy the distinctive characteristics (physical components or features) of cultural resources (typically of buildings or structures) that make the resources significant. Physical changes can also change the viewshed of above-ground cultural resources in a way that detracts from the visual aspects of their character and significance.

Construction and Modification of Buildings and Ground Disturbing Activities

Major, adverse impacts on archaeological and paleontological resources would potentially occur due to inadvertent damage or destruction during construction of new CBP facilities and infrastructure. Minor, adverse impacts could result from construction projects that are within view of cultural resources because these projects may detract from the historic visual quality of the viewshed. Minor, adverse impacts would potentially occur on historic properties if CBP implements rehabilitation or maintenance projects that do not use historic-preservation design standards. Beneficial impacts would occur when CBP designs projects that avoid and protect cultural or paleontological resources, retains and reuses historic buildings and structures, and utilizes historic-preservation design standards in renovations.

The exact locations of construction projects are unknown at this time, except that they could take place anywhere within 100 miles of the northern border.

8.11.2 FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE

As with the No Action Alternative, and for similar reasons, the Facilities Development and Improvement Alternative would potentially have minor to major, adverse impacts on cultural and paleontological resources in some cases and beneficial impacts in others.

Construction and Modification of Buildings and Ground Disturbing Activities

The emphasis of the Facilities Development and Improvement Alternative on replacing or providing new permanent facilities, such as BPS housing, and making major modifications to permanent facilities, such as POEs, would potentially have the most impact of all the alternatives on cultural and paleontological resources.

The exact location of construction projects are unknown at this time, except that they could take place anywhere within 100 miles of the northern border.

8.11.3 DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE

As with the alternatives above, and for similar reasons, the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative would potentially have minor to major, adverse impacts on cultural and paleontological resources in some cases and beneficial impacts in others.

Construction and Modification of Buildings and Ground Disturbing Activities

Similar to the alternatives above and for the same reasons, both small and large construction projects under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative would potentially have minor to major, adverse impacts on cultural and paleontological resources in some cases and beneficial impacts in others. Communication towers are typically built within or adjacent to CBP facilities; however, some towers have been constructed in remote locations, usually on tops of ridges, to enhance relay of radio transmissions and provide remote-surveillance operations. Many of the towers would require construction of a concrete-block building to house electronic equipment associated with communication operations. In these cases, cultural and paleontological resources may be affected. Sensors are small transmitters, consisting of 12-inch plastic cubes, buried approximately two to three feet below ground surface on or near roads and trails in undocumented-alien travel corridors. The sensors are seismic and magnetic, capable of detecting ground vibrations and vehicles. On the average of twice per year, sensor locations may be changed in response to shifts in the patterns of illegal traffic. The impact of installing a single ground sensor is negligible. This activity has the potential to have a minor impact on cultural or paleontological resources in cases where numerous sensors are installed within a limited area.

The exact location of construction projects are unknown at this time, except that they could take place anywhere within 100 miles of the northern border.

8.11.4 TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE

As with the alternatives above and for similar reasons, the Tactical Security Infrastructure Deployment Alternative would potentially have minor to major, adverse impacts on cultural and paleontological resources in some cases and beneficial impacts in others.

Construction and Modification of Buildings and Ground Disturbing Activities

Because the construction of new roads, fences, and barriers can involve significant ground disturbance, these projects have the potential to result in moderate to major, adverse impacts to cultural and paleontological resources. Trail-construction activities proposed under this alternative may not involve significant ground disturbance if they are located within the existing footprint, width, and curvature of a trail and use in-kind materials (except in cases where ground disturbance results from clearing and grading). Unless ground disturbance is avoided, construction of new trails has the potential to affect cultural and paleontological resources; however, in most cases, the impact will be minor.

Tunnel remediation activities included under the Tactical Security Infrastructure Deployment Alternative have traditionally not been undertaken along the northern border and are therefore not considered potential sources of impacts to archeological or paleontological resources.

The exact location of construction projects are unknown at this time, except that they could take place anywhere within 100 miles of the northern border.

8.11.5 FLEXIBLE DIRECTION ALTERNATIVE

As with the alternatives above, and for similar reasons, the Flexible Direction Alternative would potentially have minor to major, adverse impacts on cultural and paleontological resources in some cases and beneficial impacts in others.

Construction and Modification of Buildings and Ground Disturbing Activities

Similar to the alternatives above, and for the same reasons, both small and large construction projects under this alternative would have the potential for minor to major, adverse impacts on cultural and paleontological resources in some cases and beneficial impacts in others.

8.11.6 BEST MANAGEMENT, MINIMIZATION, AND MITIGATION

Federal consultation protocols established under the NHPA and PRPA rely extensively on consultation between Federal agencies and contracting parties to identify ways to avoid or minimize adverse impacts to cultural and paleontological resources. When CBP's mission, especially with regard to national security and law enforcement, may adversely affect cultural and paleontological resources, the agency is committed to seeking mitigation strategies that are acceptable to all interested stakeholders while being cost-effective and practical. The specific type and degree of mitigation techniques vary considerably state-to-state and project-to-project across a broad spectrum of cultural and paleontological resources. However, the types of impacts to which these resources are subjected generally fall into the land use, aesthetic, and visual categories.

8.11.7 SUMMARY OF POTENTIAL IMPACTS ON CULTURAL AND PALEONTOLOGICAL RESOURCES

Table 8.11-1 summarizes the potential impacts of the five alternatives on cultural and paleontological resources. Activities that involve construction of new facilities, roads, barriers, and related infrastructure rise to the level of potential major impacts while most operational activities have a negligible impact. In general, CBP activities have a minor, adverse impact on cultural and paleontological resources.

Table 8.11-1. Summary of Potential Impacts on Cultural and Paleontological Resources

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
NO ACTION ALTERNATIVE					
Construction Activities					
Modernize, upgrade, or repair existing POEs, BPSs, OAM bases, training facilities, or permanent traffic checkpoints		⊗			
Construct a BPSs or permanent traffic checkpoints				⊗	
Construct roads, fences, barriers, and related infrastructure				⊗	
Install and maintain UGSs		⊗			
Set up permanent traffic checkpoints			⊗		
Install RVSSs		⊗			
Avoid and protect cultural or paleontological resources; retain and reuse historic buildings and structures; use historic-preservation design standards for renovations					⊗
Install detection and communication towers			⊗		
Remediate illegal tunnels	⊗				
Operational Activities	⊗				
OVERALL IMPACT		⊗			
FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE					
Construction Activities					
Modernize, upgrade, or repair existing POEs, BPSs, OAM bases, training facilities, or permanent traffic checkpoints		⊗			
Construct a BPSs or permanent traffic checkpoints				⊗	
Construct roads, fences, barriers, and related infrastructure				⊗	
Install and maintain UGSs		⊗			

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
Set up permanent traffic checkpoints			⊗		
Install RVSSs		⊗			
Avoid and protect cultural or paleontological resources; retain and reuse historic buildings and structures; use historic-preservation design standards for renovations					⊗
Install detection and communication towers			⊗		
Remediate illegal tunnels	⊗				
Operational Activities	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE					
Construction Activities					
Modernize, upgrade, or repair existing POEs, BPSs, OAM bases, training facilities, or permanent traffic checkpoints		⊗			
Construct a BPSs or permanent traffic checkpoints				⊗	
Construct roads, fences, barriers, and related infrastructure				⊗	
Install and maintain UGSs		⊗			
Set up permanent traffic checkpoints			⊗		
Install RVSSs		⊗			
Avoid and protect cultural or paleontological resources; retain and reuse historic buildings and structures; use historic-preservation design standards for renovations					⊗
Install detection and communication towers			⊗		
Remediate illegal tunnels	⊗				
Operational Activities	⊗				

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE					
Construction Activities					
Modernize, upgrade, or repair existing POEs, BPSs, OAM bases, training facilities, or permanent traffic checkpoints		⊗			
Construct a BPSs or permanent traffic checkpoints				⊗	
Construct roads, fences, barriers, and related infrastructure				⊗	
Install and maintain UGSs		⊗			
Set up permanent traffic checkpoints			⊗		
Install RVSSs		⊗			
Avoid and protect cultural or paleontological resources; retain and reuse historic buildings and structures; use historic-preservation design standards for renovations					⊗
Install detection and communication towers			⊗		
Remediate illegal tunnels	⊗				
Operational Activities	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
FLEXIBLE DIRECTION ALTERNATIVE					
Construction Activities					
Modernize, upgrade, or repair existing POEs, BPSs, OAM bases, training facilities, or permanent traffic checkpoints		⊗			
Construct a BPSs or permanent traffic checkpoints				⊗	
Construct roads, fences, barriers, and related infrastructure				⊗	

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
Install and maintain UGSs		⊗			
Set up permanent traffic checkpoints			⊗		
Install RVSSs		⊗			
Avoid and protect cultural or paleontological resources; retain and reuse historic buildings and structures; use historic-preservation design standards for renovations					⊗
Install detection and communication towers			⊗		
Remediate illegal tunnels	⊗				
Operational Activities	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			

8.12 ENVIRONMENTAL CONSEQUENCES TO ENVIRONMENTAL JUSTICE AND THE PROTECTION OF CHILDREN

Executive Order (EO) 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” (February 11, 1994) and EO 13045, “Protection of Children from Environmental Health Risks and Safety Risks,” (April 21, 1997) each require Federal agencies to identify and address any disproportionately high and adverse effects of its programs, policies, and activities on minority and low-income populations and children. This section considers the potential adverse and beneficial impacts of CBP’s alternative actions for environmental justice and the protection of children. For descriptions of the regional affected environments for environmental justice and protection of children, see Sections 4.12.2 (WOR Region), 5.12.2 (EOR Region), 6.12.2 (Great Lakes Region), and 7.12.2 (New England Region).

Wherever an action may have particular consequences for socioeconomic resources or human health and safety, a potential for environmental-justice impact may exist. Although the actions to be addressed as a part of this analysis are necessarily more localized in nature and can be addressed more effectively at the site-specific level, the potential for certain actions to have environmental-justice effects or consequences for the health and safety of children can be evaluated qualitatively at the programmatic level. The types of CBP action that could produce environmental-justice impacts include:

- Actions that impede or enhance the flow of people and goods across the border that may also have the potential for differential effects where minority or low-income groups are more dependent on international travel for personal or economic reasons than would be the case for the general population;
- Construction of new facilities or the upgrading, expansion, and renovation of existing facilities in minority or low-income communities, or in areas where large concentrations of children are present;
- Closure or relocation of existing facilities that may affect social or economic conditions in minority or low-income communities where these populations are present; and,
- Construction and operation of new infrastructure, communications, or surveillance towers that may have the potential to disrupt minority or low-income communities in which they are located.

Where a particular action is not expected to have any effect on the general population or its potential effects are considered to be low for all populations, it is eliminated from further consideration as a part of this analysis of environmental-justice impacts. The following actions would not be expected to have a potential for impact because the primary effect associated with them is potential delay in travel time, which would affect all members of the travelling public equally without respect to minority or low-income status:

- Routine activities at a LPOE;
- Operation of a BPS;
- Set-up of mobile traffic checkpoints; and,
- Operation of traffic checkpoints.

Other activities would also be expected to have no environmental-justice impact because the potential impact would affect all segments of the population equally; because the overall effect would be negligible for the health and well-being of all local populations; because the overall effect would not be expected to affect the demographic characteristics, economic resources, setting, and character of a community or local neighborhoods; or because the overall effect would not be expected to affect the sense of satisfaction or identity expressed by residents of a local community or immediate neighborhood. These activities include:

- Installation and maintenance of UGSs;
- Operation of a BPS;
- UAS remotely piloted aircraft missions;
- Manned aerial patrols;
- Waterborne patrols on OAM and riverine vessels;
- Standardization and modernization of the OAM fleet along the northern border;
- Motorized and nonmotorized ground operations;
- MSS units along the northern border;
- Enforcement of the I-68 program for recreational boaters; and,
- Sustaining existing or introducing new partnerships.

However, individual effects may be experienced at the site-specific level where smaller but substantial concentrations of the populations of concern for this analysis may be present in areas close to individual actions proposed under each of the alternatives considered. Approximately 76.9 percent of the population of the U.S. study area (all regions combined) and 76.6 percent of the population of the total Canadian study area lives in concentrated population centers.

The potential for differential and disproportionate impacts to minority or low-income populations would increase in those areas where proposed actions under any of the alternatives are located near individual residential communities where populations of concern for environmental-justice effects are found in greater numbers. Site-specific consideration of the potential for human health and safety (HH&S) effects to children is more important in those areas where project actions are located near residential development, schools, parks, and recreational facilities, or in other areas where children are likely to be present, such as churches and shopping areas. Consideration of actions with the potential to impact these populations should be included in subsequent, tiered, site-specific analyses for any of the actions proposed here that may have a potential environmental-justice or human-health effect, or that may pose a risk to public or worker safety.

There are two general populations of concern for the analysis of environmental-justice effects and the protection of children. One is the traveling public, which may be affected by changes in CBP operational procedures, inspection regimes, or surveillance activity. These changes may result in time delays or otherwise impair cross-border transit for travelers.

The second population includes residents of the border communities or other populations that make use of local community resources like commercial or recreational facilities. Border communities may be influenced by CBP operations, especially those related to construction or other physical changes in the surrounding environment that may have social, economic, or human-health effects for local populations. Populations of concern to the analysis of environmental-justice effects and the protection of children in the regions do not meet the threshold of being either greater than 50 percent or meaningfully greater than the population percentage in the general population or other appropriate unit of geographic analysis. Minority populations in the border communities of the U.S. study area represent a substantially smaller percentage of the total population than is found in the total U.S. population. Border communities in the Canadian portion of the study area are also substantially less diverse than in the Canadian population as a whole. As a result, the border communities of the U.S. and Canadian study areas represented for this PEIS are generally less diverse than the Nation as a whole.

The percentage of the study-area populations living at or below the poverty level is collectively lower than the national level for communities in the United States and only slightly higher for communities in Canada. Poverty levels for border communities within individual states and provinces are generally equivalent to state, provincial, and national levels, or in some cases, only slightly higher. Percentages of children under the age of 18 are comparable to state, provincial, and national levels. As a result, at the programmatic level of analysis, large concentrations of minority and low-income populations, or populations of children younger than 18 years of age, have not been identified for further analysis in this PEIS.

The actions considered under each of the alternatives presented here would not inherently result in a categorically disproportionate impact to any of the populations of concern. That is, the characteristics of these actions do not specifically target minority or low-income populations for a higher or disproportionate impact than any other population. The generic impact of the actions themselves would be essentially equivalent for all population segments based on the nature of the action itself. However, where minority or low-income populations, or populations of children under age 18, are found to represent disproportionately high percentages of any affected populations, they may be more susceptible to a particular risk or consequence than the general population. The potential for these populations to be displaced, suffer a loss of employment or income, or otherwise experience adverse effects to general health and well-being may represent a potential environmental-justice effect.

Because of the incremental nature of CBP's activities across the northern border as a whole, no new potential for environmental-justice effects or increased risks to children would be anticipated under any of the alternatives, beyond those already resulting from currently ongoing program construction and operations. Where particular actions might affect or be affected by ongoing activities at the local level, the analysis of potential environmental-justice or human-health effects to minority or low-income populations, or populations of children under the age of 18, would necessarily be site specific.

Extensive mitigation measures would not be required under any alternative because the potential risk to human health, especially for populations of children under the age of 18, would be minimized through adherence to all applicable Federal and state safety regulations.

Because of the small, incremental nature of planned CBP activities and the relative absence of impacted populations, adverse effects to minority and low-income populations and children across the northern border as a whole would not be significant. Therefore, negligible-to-minor direct or indirect adverse impacts would be expected from all of the alternatives under consideration. Likewise, because of the modest incremental changes involved in all of the alternatives, no significant cumulative impacts would be expected.

8.12.1 NO ACTION ALTERNATIVE

The No Action Alternative would continue CBP's ongoing program at the current level of operations. CBP would maintain its existing facilities and infrastructure and would provide replacement as necessary. No new potential for environmental-justice effects or increased risk to children would be anticipated under this alternative. In general, both the potential beneficial and adverse effects of the No Action Alternative would be experienced equally by all members of the affected border communities, depending on their proximity to the actual location of any proposed action. Minority or low-income individuals would not be likely to experience high or disproportionate effects from the actions to be taken under this alternative solely on the basis of their inclusion as part of the populations of concern. Where particular activities are located in areas with high concentrations of minority or low-income populations, some potential for disproportionate effect may be present. Any adverse effects experienced by these populations would be negligible to minor overall.

Particular activities may pose a higher risk to the health and safety of children, especially those related to construction safety and where human-health effects may be of concern; however, CBP's continuing commitment to the use of best practices in all operations would be expected to minimize any potential for associated impact. In general, in accordance with the analysis following in this section, the overall impact of this alternative to populations of concern for environmental justice would be minor for both beneficial and adverse effects.

Small Construction Projects

Small construction projects, including the expansion and modification of small buildings, communications towers, and security infrastructure, such as fencing, along with facility maintenance and repair and upgrades to mechanical systems, would be expected to have negligible effects for environmental-justice populations and the protection of children. In general, construction projects may have the potential to affect local populations living in areas immediately adjacent to the project or in nearby communities. Any direct, adverse impacts associated with small-site construction or maintenance operations would be experienced by local residents in relation to their proximity to the actual construction site without regard to their inclusion as populations of concern for this analysis.

Some temporary, adverse impacts may be experienced by local populations and site workers during construction. These risks may include dust inhalation, exposure to hazardous chemicals, and construction-related accidents. Increased traffic associated with construction can cause a temporary disruption of local travel during the construction period. Individual residents or households in the local community could also experience a small but beneficial economic impact from increased employment and economic activity within the community as a direct result of construction activities.

Construction sites can be a potential risk to the health and safety of children in surrounding residential neighborhoods. In addition to increasing exposure to human-health risks for especially sensitive populations, construction sites can often be attractive to children as a source of curiosity or a play area, creating a potential safety risk as well. Assuming best practices would be employed by CBP during construction, affected sites would be secured to prevent unauthorized, random access by children.

Because smaller construction projects would have a correspondingly smaller footprint, any adverse impacts to local populations would be limited to individuals living close to the actual site and the workers on the site itself. These impacts would be expected to be experienced by all segments of the affected population equally.

Small construction projects would not be expected to result in disproportionately high or adverse impacts to minorities or low-income populations or increase the HH&S risks to children. Some potential for isolated concentrations of populations of concern may exist at specific site locations, however. These conditions would be addressed as part of site-specific ESs or EISs at the time these individual projects are evaluated. As a result, the potential effect of small construction projects on minority and low-income populations and children would be expected to be negligible.

Large Construction Projects

Similar to small construction projects, large construction projects, including new facilities, major modifications and modernization of POEs and BPSs, as well as access roads, security infrastructure, and demolition or closure of existing structures, would have the potential to affect environmental-justice populations and children. Because of the larger scale of these operations (footprint greater than one acre), a larger segment of the general population would potentially experience effects than would be the case for smaller construction projects. The potential for significant concentrations of populations of concern to be present among these populations would also increase. As a result, the potential for impact would be expected to be negligible to minor.

Temporary, short-term, adverse impacts similar to those described for small construction projects may be experienced by local populations and site workers during construction. Longer-term effects to individuals and local communities may be associated with potential displacement of local resident populations as a result of land acquisition for new structures or the alteration of the setting and character of the nearby community through demolition of existing structures or creation of visual and other barriers. Increased traffic on local roads during the construction period and during actual operation may result in travel delays for local residents. A negligible to minor but longer-term, direct, beneficial impact to the local economy may be experienced as a result of increased economic activity generated in the local community by construction-related employment and expenditures and indirectly by increased retail and other spending in the local community.

Local residents would experience any adverse impacts associated with large construction projects in relation to their proximity to the actual construction site. Although all members of any potentially affected community would be expected to have exposure to benefits associated

with these activities, minority and low-income populations could benefit to a greater extent from increased employment and business opportunities that may be generated in the local community.

Although CBP facilities along the U.S.-Canadian border tend to be located in rural, less densely-populated places outside of major metropolitan areas, the majority of the population in the border communities lives in larger population centers. Locations where construction is more likely to involve specific minority or low-income neighborhoods, such as urban areas, would increase the potential for impacts. Where construction is removed from settled, urbanized areas, little or no impact would be anticipated.

To the extent that all population segments would experience construction-related impacts equally, minority and low-income populations would not be expected to be adversely affected to any greater extent than the general population as a whole. Except where facilities are located in specific residential areas that contain large minority or low-income populations or where large numbers of children are present, any high or disproportionate impact to populations of concern for environmental-justice associated with large construction projects would not be anticipated. However, the increased scale and specific site locations of large construction projects increases the possibility that these concentrations may be present in any local populations. Any potential for effect would be expected to be negligible to minor.

Small Onsite Trade and Travel Processing Operations

Environmental-justice impacts to the traveling public or resident populations in areas where small on-site trade and travel processing operations are carried out would be negligible. This does not mean that the public at large will not experience some effects associated with travel delays or other intrusions. However, there is no reason to expect that minority and low-income populations or children will experience these delays to any greater or lesser extent than would be the case for the general public as a whole. Any changes in processing operations or procedures would not alter the demographic characteristic of the traveling population and would therefore not be expected to increase the proportion of populations of concern in the traveling public at any particular point. At the site-specific level, minority or low-income groups that are more dependent on international travel for personal or economic reasons than the general public may experience greater inconvenience than the general public at large. However, at the programmatic level, these populations are not readily identifiable.

Large Onsite Trade and Travel Processing Operations

Impacts associated with large on-site trade and travel processing operations are similar in kind to those described for small on-site trade and travel processing operations. However, the greater number of crossings per day involved with large-scale processing operations increases the probability that larger numbers of minority and low-income populations may be present within the traveling public. Any associated environmental-justice impacts would be considered negligible to minor under these circumstances.

8.12.2 FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE

The Facilities Development and Improvement Alternative would maintain CBP's capacity to securely and efficiently carry out its operations and ensure adequate space requirements for

current and projected force and checkpoint capacity. CBP would anticipate construction of new BPSs or modernization or replacement of existing stations under this alternative.

In general, potential beneficial or adverse effects for the populations of concern in this analysis would be negligible to minor, depending on the proximity of these populations to the proposed site of activity and the degree to which these populations are represented in greater proportion than would be found in the general populations of the surrounding communities. Anticipated construction activity under this alternative would increase the possibility that sites selected for new or modernized BPSs may be close to populations of concern for environmental-justice or the protection of children. Changes to trade and travel processing operations may have a minor, adverse impact on those minority and low-income populations that are more dependent on international travel for economic or personal reasons. Some minor, beneficial impacts may be associated with increased employment and business opportunities associated with any anticipated construction projects.

Small Construction Projects

Impacts from construction under this alternative are similar to those described for the No Action Alternative. The number of small construction projects anticipated under this alternative would be expected to increase from the No Action baseline. In general, the effects of small construction projects would be experienced most directly by those individuals living close to any of the proposed projects without regard to ethnic origin or socioeconomic status.

Although the greater level of small construction activity under this alternative might increase the likelihood that populations of concern may be present in the immediate vicinity of selected projects, the effects associated with small construction projects normally do not extend to a large population beyond the immediate site vicinity. As a result, increasing the number of projects would not necessarily increase the potential to affect larger numbers of populations of concern for environmental-justice. Environmental-justice effects associated with this alternative would therefore be generally negligible for those circumstances where minority groups and low-income groups are not present.

Environmental-justice and HH&S effects for the populations of concern under this analysis would be negligible to minor, depending on the proximity of these populations to the proposed construction site and the degree to which these populations are represented in greater proportion than would be found in the general populations of the surrounding communities. The increased level of construction activity anticipated under this alternative would increase the possibility that sites selected for upgraded LPOEs and BPSs may be close to populations of concern for environmental-justice or the protection of children. Changes to trade and travel processing operations may have a minor, adverse impact on those minority and low-income populations that are more dependent on international travel for economic or personal reasons. Overall impacts associated with this alternative would be negligible to minor.

Large Construction Projects

Impacts from construction under this alternative are similar to those described under the No Action Alternative. In general, these effects would be experienced by all individuals living in the vicinity of the proposed projects without regard to ethnic origin or socioeconomic status. However, the Facilities Development and Improvement Alternative includes an increase in the

number of large construction projects undertaken by CBP. Some potential may exist for increased likelihood that populations of concern may be present in the immediate vicinity. Adverse, environmental-justice effects associated with this alternative would be generally negligible for those circumstances where minority groups and low-income groups are not present, but may rise to minor where environmental-justice populations are present. A negligible, but potentially beneficial impact to the local economy may be experienced as a result of increased economic activity generated by construction-related activity.

Small Onsite Trade and Travel Processing Operations

Effects would be similar to those described under the No Action Alternative. Where existing POEs are expanded or improved, some beneficial impact to all populations may be anticipated, including those populations of concern for environmental justice. For existing facilities or those not included as a part of this action, a negligible, potentially adverse impact similar to that described under the No Action Alternative may be anticipated.

Large Onsite Trade and Travel Processing Operations

Effects would be similar to those described under the No Action Alternative. Where existing POEs are expanded or improved, some beneficial impact to all populations may be anticipated, including those populations of concern for environmental justice. For facilities not included under this alternative, a potential negligible to minor, adverse impact similar to that described under the No Action Alternative may be anticipated.

8.12.3 DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE

Actions proposed under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative would emphasize the use of new and additional technologies to carry out CBP's responsibilities. This alternative would have the beneficial effect of reducing the potential for differential impacts to environmental-justice populations associated with construction of new facilities proposed under several of the other alternatives considered for this analysis.

Reliance on the expansion of existing technologies and the acquisition of new systems would substantially reduce the potential for differential impacts to environmental-justice populations associated with construction of new facilities proposed under several of the other alternatives considered for this analysis. Potential human-health effects that may be associated with the introduction of new or expanded technologies would not be specific to minority or low-income communities in particular. Overall effects associated with this alternative would be generally minor for all populations of concern for environmental-justice analysis. Where towers or other infrastructure elements are located close to large concentrations of minority or low-income populations, an increased concern for adverse impact to populations of concern may be anticipated.

Small Construction Projects

Expansion of surveillance technologies under this alternative would require a substantial increase over the No Action Alternative in small construction projects to provide additional support

structures in the form of towers, poles, and antennas. Impacts associated with small construction projects under this alternative would be similar to those described for the No Action Alternative.

Towers and other communications structures may represent a visual intrusion on the setting and character of local communities around the site. These effects would be experienced widely throughout the community by all population segments. Minority and low-income communities may be more susceptible to adverse effects, depending on the location of these facilities. Potential effects would be reduced through the use of existing structures (including buildings) and the sharing of facilities with other agencies.

By reducing the need to acquire additional acreage for new buildings and other large construction projects, this alternative reduces the potential for differential effects on populations of concern for environmental-justice that may be associated with these projects. Potential HH&S effects associated with new construction would also be reduced. HH&S effects associated with the acquisition or implementation of new or expanded technologies would not be expected to be specific to any one community within the general population.

As a result, the potential for environmental-justice impacts or impacts to other sensitive populations, such as children, would be expected to be similar for all populations of concern. To the extent that minority populations are present in larger concentrations in the immediate vicinity of tower sites and in the surrounding communities, a potential for minor, adverse impacts may exist.

8.12.4 TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE

Implementation of tactical security measures along the northern border of this region would substantially decrease the potential for impacts to environmental-justice populations associated with the construction and modernization of POEs, BPSs, or surveillance infrastructure. Additional infrastructure may be objectionable to segments of the general public; however, this does not inherently imply disproportionately high or adverse impacts to environmental-justice populations as compared to the potential effects on the general population. The effects associated with the Tactical Security Infrastructure Deployment Alternative would be experienced by all populations within the affected area regardless of low-income status or minority identification. Potential effects associated with this alternative would be expected to be negligible to minor, depending on the proximity of minority or low-income populations to the actual site of the infrastructure project.

Residential portions of highly urbanized areas or of larger communities tend to have greater proportions of low-income or minority individuals in their populations than may be true for the general population. As a result, these populations may experience a higher or disproportionate effect from infrastructure projects than other populations.

Small Construction Projects

Construction-related impacts associated with small projects such as trench cuts, towers, minor access roads, and fences would be similar to those described for the No Action Alternative. However, physical barriers may require the acquisition of additional land and some new construction activity. Additionally, although much of the northern border runs through relatively

remote areas, urbanized areas, as well as a number of smaller communities and private landowners, are also present.

Physical barriers represent a visual intrusion to the setting and the character of the surrounding community and are often resented by local residents, especially private landowners when such barriers divide private holdings or interfere with the scenic qualities of certain areas. To the extent that minority and low-income neighborhoods are located along the northern border, the potential for minor, adverse impacts to environmental-justice populations would be anticipated. Where these communities are not present in significant proportions in comparison to the general population, the overall environmental-justice impact would be negligible.

Large Construction Projects

Activities associated with large-scale projects for the construction of access roads, fences, and other barriers would be expected to have impacts similar to smaller scale efforts. Because of the larger scale of these operations, effects would be experienced by a larger segment of the population than would be the case for smaller construction projects, increasing the potential for significant concentrations of populations of concern in the affected area to be differentially affected. As a result, the potential for impact would be expected to be minor to moderately adverse, depending on the proximity of populations of concern to the physical barriers created.

8.12.5 FLEXIBLE DIRECTION ALTERNATIVE

The Flexible Direction Alternative combines elements of the other proposed alternatives into a mix of program actions to meet CBP's future requirements as it carries out its responsibilities. Because the actual configuration of program elements that may be implemented is not predictable, the evaluation of effects for environmental justice and the protection of children considers the potential effects that would result from combining all of the action alternatives.

The potential beneficial and adverse effects of this alternative would be expected to be experienced equally by all members of the affected border communities, depending on their proximity to the actual location of any proposed action. Minority or low-income individuals would not experience high or disproportionate effects from the actions to be taken under this alternative solely on the basis of their inclusion as part of the populations of concern. Any potential for differential impacts to minority or low-income populations under this alternative is essentially a site-specific consideration based on proximity to the location of the particular action to be taken. Where activities are located in areas with high concentrations of minority or low-income populations, some potential for disproportionate effects may be present. Any adverse effects experienced by these populations would be expected to be negligible to minor overall. Exercise of CBP's best practices in the location and execution of specific operations would be expected to minimize any potential for associated impact to the health and safety of children.

Small Construction Projects

Small construction projects anticipated under this alternative would have the same generic effects for environmental justice and the protection of children as described under the Facilities Development and Improvement Alternative. Construction projects in general may have the potential to adversely affect local populations living in areas immediately adjacent to the project or in nearby communities. Any direct, adverse impacts associated with small-site construction or

maintenance operations would be experienced by local residents in relation to their proximity to the actual construction site.

The level of activity anticipated under the maximum condition for this alternative increases to approximately 160 projects. Because smaller construction projects would have a correspondingly smaller footprint, any adverse impacts to local populations would be limited to individuals living close to the actual site of construction and any workers on the site itself. By increasing the number of individual projects, this alternative might be expected to increase the likelihood that populations of concern may be present in the immediate vicinity of selected projects.

The effects associated with small construction projects normally do not extend beyond the immediate site vicinity. In those circumstances where physical barriers are constructed, they may represent a visual intrusion on the setting and character of the surrounding community that is resented by local residents, especially private landowners. To the extent that these structures are more likely to be situated in minority and low-income neighborhoods, the potential for minor, adverse impacts to environmental-justice populations would be anticipated.

In general, increasing the number of potentially affected individuals does not necessarily increase the probability that populations of concern will be disproportionately affected by activities under this alternative. Environmental-justice effects associated with this alternative would therefore be generally negligible, increasing to minor for those circumstances where minority groups and low-income groups are present in larger numbers at specific sites.

Large Construction Projects

Impacts associated with large construction projects would be similar to those described under the Facilities Development and Improvement Alternative. The activity anticipated under this alternative may increase to 25 projects per region. However, it is expected that this would not substantially increase the likelihood that populations of concern may be present in the immediate vicinity of these projects. As with small construction projects, where physical barriers are introduced into the local environment, residents, especially landowners, may experience minor impacts associated with alteration of the setting and the character of the local neighborhood or surrounding community.

Where environmental-justice populations are present in greater proportion than is found in the general population at the individual site level, a potential for disproportionately high and adverse effects may be associated with implementation of this alternative. However, in general, this probability would not be substantially increased. Adverse, environmental-justice effects associated with this alternative would be generally negligible for those circumstances where minority groups and low-income groups are not present, but may rise to minor where environmental-justice populations are present.

Small Onsite Trade and Travel Processing Operations

Impacts to the traveling public or resident populations in areas where small on-site trade and travel processing operations are carried out would be expected to be negligible to environmental-justice issues or the protection of children. Any travel delays associated with this alternative will not be experienced by minority and low-income populations or children to any greater or lesser

extent than by the general public as a whole. Any changes in processing operations or procedures would not alter the demographic characteristics of the traveling population and would therefore not be expected to increase the proportion of populations of concern in the general traveling public at any particular point. At the site-specific level, minority or low-income groups that are more dependent on international travel for personal or economic reasons than the general public may experience greater inconvenience than the general public at large. However, at the programmatic level, these populations are not readily identifiable.

Large Onsite Trade and Travel Processing Operations

Impacts associated with large on-site trade and travel processing operations would be similar to those described for small on-site trade and travel processing operations. However, the higher number of crossings per day associated with large processing operations would likely increase the probability of affecting greater numbers of minority and low-income populations within the traveling public. Any associated environmental-justice impacts would be considered to be potentially negligible to minor under these circumstances.

8.12.6 BEST MANAGEMENT, MINIMIZATION, AND MITIGATION

CBP seeks to avoid, minimize, repair, and reduce the impacts of its actions on the human environment. It does so with a combination of BMPs, siting plans, design strategies, mitigation measures, and monitoring plans best suited to the scale and the location of the particular action. Towards that end, in implementing its proposed action CBP could choose from among the following actions to avoid or minimize environmental-justice impacts or health-and-safety risks to children.

To the extent that CBP employs BMPs in the construction of new facilities and the modernization and management of existing facilities, potential adverse effects to individuals would be minimal for all populations and would not be disproportionately experienced by populations of concern for environmental-justice. Extensive mitigation measures would not be required under any alternative.

Potential risk to HH&S for resident populations, workers, and populations of children in the area of CBP projects would be minimized through adherence to all applicable Federal and state health-and-safety regulations. Where construction sites are located near population concentrations, site safety measures, including barriers and warning signs, would be posted around the site perimeter to deter unauthorized intrusion, especially by children. Vehicles and equipment would be secured when not in use or when the site is unattended.

Continued participation by the general public in the implementation of CBP policies and programs would be expected to minimize any potential for impact to communities in the vicinity of CBP operations. Where CBP introduces structures and physical barriers, such as towers and extensive fencing, in more urbanized areas that may be more likely to contain high concentrations of populations of concern, additional mitigation measures may be required. Efforts to identify and consult with any affected individual property owners or the residents of affected communities would be a part of any mitigation strategy under any of the alternatives proposed. Extensive engagement with these individuals in the planning and execution of CBP programs would be expected to minimize any potential for impact to communities in the vicinity

of construction projects. CBP would also ensure that any construction conforms to local planning and zoning ordinances.

8.12.7 SUMMARY OF POTENTIAL IMPACTS

Table 8.12-1 summarizes the potential environmental-justice impacts from all the alternatives.

Table 8.12-1. Summary of Potential Environmental-Justice Impacts from All CBP Alternatives

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
NO ACTION ALTERNATIVE					
Small construction projects (<1 acre and <1/4 mile: e.g., minor repairs to facilities, parking lot repairs, access road repairs)	⊗				
Large construction projects (>1 acre and >1/4 mile: e.g., repairs to facilities, parking lot repairs, access road repairs)		⊗			⊗
Small on-site trade and travel processing operations	⊗				
Large on-site trade and travel processing operations		⊗			
OVERALL IMPACT		⊗			

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE					
Small construction projects (<1 acre and <1/4 mile: reconstruction or construction of new POEs, USBP structures, parking lot repairs, access road repairs)	⊗				
Large construction projects (>1 acre and >1/4 mile: reconstruction or construction of new POEs, USBP structures, parking lot repairs, access road repairs)		⊗			⊗
New small on-site trade and travel processing operations (new POEs)	⊗				⊗
New large on-site trade and travel processing operations (new POEs)		⊗			⊗
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE					
Small construction projects (towers and other infrastructure to mount antennas)		⊗			⊗
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE					
Small construction projects (trench cuts, towers, minor access roads and fences)		⊗			

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
Large construction projects (access roads and fences)			⊗		
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
FLEXIBLE DIRECTION ALTERNATIVE					
Small construction projects		⊗			
Large construction projects		⊗			⊗
Small on-site trade and travel processing operations	⊗				⊗
Large on-site trade and travel processing operations		⊗			⊗
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			

8.13 ENVIRONMENTAL CONSEQUENCES TO HUMAN HEALTH AND SAFETY

Many of the routine activities conducted by CBP have the potential to impact HH&S. Such activities include, but are not limited to inspections, interdictions, mission training, use of weaponry, and patrols over land, water, and air. HH&S relates to the health and safety of the general public including vehicle occupants, CBP and station employees, and maintenance personnel. Safety can also refer to safe operations of aircraft or other equipment. In order to improve the health and safety of CBP employees and the general public during intentional destructive acts (IDA) and routine CBP activities and interdictions, CBP employees go through several weeks of training at the Border Patrol Academy. One of CBP's main purposes is to protect U.S. citizens from IDAs; Appendix R evaluates the human health and safety impacts of IDAs along the northern border.

Since the majority of agents perform their jobs in rural areas and respond to potentially dangerous situations by themselves, it is important that every employee receive training. Employees who participate in horse, canine, ATV, snowmobile, water, or air patrols receive further training. Special units, such as the Border Patrol Tactical Unit (BORTAC) and Border Search, Trauma and Rescue (BORSTAR), also receive additional training. For descriptions of the affected environment for HH&S in each region, see Section 4.13.2 (WOR Region), Section 5.13.2 (EOR Region), Section 6.13.2 (Great Lakes Region), and Section 7.13.2 (New England Region).

Under all alternatives, current operations across the northern border would continue to meet CBP's goals of securing the Nation's borders, protecting the United States from the entry of dangerous people and goods, and preventing unlawful trade and travel. CBP's approach would be consistent across the northern border, and though impacts to HH&S would vary with each CBP activity, overall direct and indirect impacts to HH&S would range from beneficial and minor to moderate adverse for all alternatives. The biggest risks to HH&S posed by CBP's operations are as follows:

- Radiation exposure at POEs;
- Radio frequency (RF) and electromagnetic (EM) radiation exposure from surveillance towers;
- Accidents from aerial patrols; and,
- Pursuit and interdiction activities.

With the continued application of the training, licensing, and regulation requirements for the people and equipment involved in these activities, overall adverse impacts are expected to be minor to moderate, while there are clear, beneficial, health and safety impacts to the public from CBP's efficient and successful conduct of these activities.

Because of the minor to moderate and incremental nature of all of the alternatives, the cumulative impacts from CBP and non-CBP actions to HH&S would be the same for all alternatives across the northern border. CBP's focus on facilities development under the Facilities Development and Improvement Alternative could increase the risks associated with

building these facilities. However, impacts would still be minor to moderate and adverse, as long as CBP's safety policies, training, and procedures were followed. Major unanticipated health, security, or fire incidents from construction and operation of POEs could strain or exceed local responder capacity, causing a minor to moderate, adverse impact.

Overall, any adverse impacts would be expected to be minor to moderate, while there are clear beneficial health and safety impacts to the public from CBP's conduct of these activities. Necessary mitigation measures are particular to the specific action as well as to the physical characteristics of the environment selected for the action (see Section 9.12) The variation of mitigation requirements varies greatly along the northern border, especially with regard to local and state regulations.

Because of the small, incremental nature of planned CBP activities and the relative absence of impacted populations, adverse effects to Human Health and Safety across the northern border as a whole would not be significant. Therefore, minor to moderate, direct or indirect, adverse impacts would be expected from all of the alternatives under consideration. Likewise, because of the modest incremental changes involved in all of the alternatives, no significant cumulative impacts would be expected.

8.13.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, current operations would continue in order to meet CBP's goals of securing the Nation's borders, protecting the United States from the entry of dangerous people and goods, and preventing unlawful trade and travel.

Impacts to HH&S vary with each CBP activity described in the analysis. Overall, impacts to HH&S would be both beneficial and minor adverse. The biggest risks to HH&S posed by CBP's No Action Alternative are from radiation exposure at POEs, RF and EM exposure from communication towers, and accidents from aerial patrols and pursuit and interdiction activities. With the continued application of the training, licensing, and regulation requirements for the people and equipment involved in these activities, overall adverse impacts would be expected to be minor to moderate, while there are clear, beneficial, health and safety impacts to the public from CBP's efficient and successful conduct of these activities. The activities include:

Construction

Small and large construction under way or in planning would have long-term, beneficial impacts and short-term, minor to moderate, adverse impacts. Improvements to POEs, checkpoints, and BPSs would increase the effectiveness of surveillance and intelligence operations along the northern border, limiting the number of terrorists and terrorist weapons entering the United States.

Adverse impacts could occur due to construction accidents. Construction workers at any of the construction sites are exposed to safety risks from the inherent dangers of construction sites. The hazards and risks of construction, alteration, and repair of CBP's facilities include falling from rooftops, getting injured by unguarded machinery, being struck by heavy construction equipment, getting electrocuted, and being exposed to silica dust or asbestos (USDOL, no date). The main hazards and risks of CBP constructing roads include pedestrian workers being struck by traffic, work zone construction vehicles, or heavy construction equipment; and inhalation of

asphalt and dust (LHSFNA, 1998). Contractors would be required to establish and maintain safety programs at the construction site and follow current Occupational Safety and Health Administration (OSHA) safety regulations.

Since construction regulations will be followed, adverse impacts from construction-related accidents would be expected to be short-term (during construction) and minor to moderate.

Routine Operations

Routine operations along this region would have long-term, beneficial and short-term, minor to moderate, adverse impacts on HH&S. These routine activities along the border help CBP agents prevent terrorists and terrorist weapons from entering the United States, and will continue to do so as long as they are kept in place. Further, these routine operations protect U.S. citizens from IDAs. This beneficial impact is an important component of CBP's mission.

Even though CBP interdictions are intended to ensure the Nation's security while facilitating efficient trade and travel, and are proven to have a beneficial impact to HH&S, interdictions place CBP agents and the general public in short-term danger. If an accident or IDA were to occur during the enforcement of the CBP mission, it may result in short-term, adverse impacts. In order to increase the percentage of interdictions along the northern border and to reduce the chance of accidents and IDAs, CBP agents go through vigorous training.

CBP's Office of Training and Development is responsible for basic training of USBP agents. All CBP agents receive basic law enforcement education at the Border Patrol Academy (The Academy) in New Mexico where they attend a course in integrated law, physical training, firearms instruction, and driving. At the Academy, CBP's USBP trainees are trained to apprehend violators of the immigration laws, and agents receive training to support CBP's priority antiterrorism mission: preventing terrorists and terrorist weapons from entering the United States (USDHS, 2009b). USBP agents are given the skills to develop activities response plans to IDAs and to hazmat spills, accidental fires, and explosions along the border (USDHS, 2009b).

CBP's trainees are taught how to conduct interviews, recognize violations of Federal criminal statutes, and operate in the field. Agents also go through firearms training in range safety, survival shooting techniques, judgment pistol shooting, quick point, and instinctive reaction shooting. All USBP agents also receive training in how to properly perform cardiopulmonary resuscitation (CPR) and are equipped with safety devices, such as bulletproof vests, to minimize the risk of violent assaults or gunshots.

The mission of the BORTAC is to respond to terrorist threats of all types anywhere in the world, and to conduct training and operations both within the United States and in other countries. The program includes a physical test, pistol qualifications test, swimming, treading water, and drown-proofing. After the testing phase is completed, candidates undergo weeks of intense training in small unit tactics, operation planning, advanced weapon skills, defensive tactics, and airborne operations. Before graduating, candidates must demonstrate the ability to function in a team environment under stress and sleep deprivation (USDHS, 2010b).

The BORSTAR Team is tasked with providing immediate response to the Border Patrol and other local, county, and state agents (USDHS, 2010c). These teams are highly specialized to respond to emergency search and rescue situations anywhere in the United States. Members of the BORSTAR team undergo highly specialized training in physical fitness, medical skills, technical rescue, navigation, communication, swiftwater rescue, and air operations. BORSTAR agents first go through a 5-week Basic BORSTAR Academy and then go through additional training to become specialists in the various disciplines (USDHS, 2010c).

OAM agents and CBP officers receive similar basic training at Glynco, Georgia at the Federal Law Enforcement Training Center. Both OAM agents and CBP officers receive training in executing search warrants, making arrests, using firearms, employing defensive tactics, crime scene, antiterrorism, ethics, interviewing techniques and legal issues. OAM agents also receive training in physical security, asset protection, and driver training. CBP officers receive further training in incident and crisis management, inspections, hazardous materials, community first aid and safety, agricultural threats, personal search, and the use of NII equipment. CBP officers may also be trained at different field offices and by CBP's Office of Training and Development in Artesia, New Mexico (USGAO, 2011).

The training USBP and OAM agents and CBP officers receive help to prevent major, adverse impacts to HH&S. Minor to moderate, adverse impacts could result from unavoidable accidents and IDAs.

Trade and Travel Processing Operations

Beneficial, long-term impacts would result from CBP agriculture inspections, reducing the number of diseases crossing the border. Short-term, minor to moderate, adverse impacts would occur if a nonindigenous disease were to be released into the United States.

Agricultural specialists would continue to work at POEs and checkpoints to prevent diseases from entering the United States. CBP personnel participating in agricultural inspections receive training developed by CBP and USDA Animal and Plant Health Inspection Service (APHIS). Dogs play an important part in CBP's agricultural inspections, and CBP agricultural inspectors receive training in the use of dogs to search for agricultural pests. Both CBP and APHIS conduct reviews of agricultural inspections and training to make sure they comply with CBP and APHIS standards (USDA & USDHS, 2007).

To deal with emergency situations, APHIS and CBP have developed a comprehensive plan to respond to a broad range of domestic agro-bioterrorist events. CBP's agricultural inspectors also receive training in agricultural quarantine and inspection activities to minimize an outbreak of disease in the United States (USDA and USDHS, 2007). Accidents are unavoidable, and minor to moderate, adverse impacts could occur from the accidental release or escape of a disease vector. Beneficial, long-term impacts result every time a nonindigenous disease or disease vector is kept out of the United States.

Ground Surveillance and Situational Response Activities

Motorized and Nonmotorized Patrols

Motorized operations range from 2 to 200 miles, averaging 50 miles per patrol. Some 65 percent of patrols are conducted on-road; the other 35 percent are conducted off-road. In each region, there are approximately 350 to 425 motorized operations and 40 to 50 nonmotorized operations per day.

Conduct On-Road Vehicle Patrols—Both beneficial and adverse impacts would result from on-road vehicle patrols. Long-term, beneficial impacts occur from the interdictions that result from surveillance. Short-term, minor to moderate, adverse impacts to HH&S could occur during vehicle accidents and injuries.

During motorized operations there is a potential for accidents and injuries to CBP personnel and the general public. As patrols increase, the risk of accidents increases, although an increase in patrols does not guarantee any specific increase in accidents or injuries. Also, in areas where people are more concentrated (e.g. the Great Lakes Region), the risk of accidents or injuries is greater. Although an increase in patrols and population increases the risk of an accident or injury, the actual number of accidents and injuries is low. CBP has had only two Border Patrol fatalities due to vehicle accidents along the northern border since 1924 (ODMP, 2011a): the first in 1925 (ODMP, 2011b) and the more recent in 1988 (ODMP, 2011c). Nevertheless, since CBP is a law enforcement agency, it is important to note that traffic-related accidents were the number one cause of fatalities for law enforcement officers in 2010 (NLEOMF, 2011).

To minimize the risks of accidents and injuries, CBP takes certain steps with its vehicle operators. CBP patrol personnel are trained in the safe and efficient operation of motor vehicles. Training emphasis is on laws of motion, vehicle dynamics, and driver response. Since agents operate vehicles in many different conditions throughout the United States, the safe operation of patrol vehicles under a variety of extreme conditions is important to the accomplishment of CBP's mission.

To graduate from the Border Patrol Academy, trainees have to complete a van/utility vehicle operation, skid control, and emergency response test. Once an intern passes the tests, he or she is trained further in pursuit driving, vehicle stops (low-risk and high-risk), night driving, 4x4 off-road driving, and evasive driving of sport-utility vehicles and vans (USDHS, 2009b).

When conducting on-road vehicle patrols, CBP agents are sometimes required to engage in emergency driving, including vehicle pursuits. The policy of CBP is that CBP officers and Border Patrol agents engage in emergency driving only when, and as long as, they determine that the law enforcement benefit of emergency driving outweighs the immediate danger created by such emergency driving. While emergency driving, an officer or agent would continually consider and evaluate critical safety issues and balance the law enforcement need for emergency driving against the immediate and potential danger posed to the general public by the continuation of such emergency driving (USDHS, 2007). To increase the safety of CBP employees and the general public, CBP agents would follow CBP's emergency driving protocol for employees (USDHS, 2007). A further discussion on CBP's emergency driving is found in "CBP Emergency Driving and Vehicular Pursuits" (USDHS, 2007).

Due to CBP's training and policy, minor to moderate, short-term, adverse impacts to HH&S would occur. Vehicle accidents can be minimized with proper training. Due to an increase in interdictions from vehicle patrols, beneficial, long-term impacts to HH&S would also occur.

Conduct ATV Patrols—ATV patrols have both beneficial and minor to moderate adverse impacts to HH&S. Long-term, beneficial impacts would occur when the rate of ATV interdictions increases due to ATV patrols in areas that cannot be patrolled with other vehicles. ATVs can be used for off-road patrols. Short-term, minor to moderate, adverse impacts could result when ATV patrols engage in dangerous interdictions and during harsh weather, low lighting, and tough terrain. During ATV operations, there is a potential for accidents and injuries to CBP personnel and the general public. As patrols increase, the risk of accidents also increases, although an increase in patrols does not guarantee any specific increase in accidents or injuries. To minimize the occurrence of ATV accidents and injuries, CBP takes certain steps with its ATV operators. USBP agents in the ATV unit go through a mandatory rider safety course in how to eliminate ATV-related accidents and agent injuries. The course assumes trainees have no experience driving ATVs, and all personnel are taught the basics of the ATV, principles to maintain control, rider awareness, and how to identify terrain and obstacles. Personnel have to successfully complete the ATV course prior to assignment to the ATV unit (USDHS, 2010d).

Because of the training USBP agents receive, adverse HH&S impacts during ATV patrols would be only short-term and minor to moderate. The training would help reduce the number of accidents caused by ATV patrols.

Conduct Snowmobile Patrols—Snowmobile patrols have both long-term beneficial and short-term, minor to moderate, adverse impacts to HH&S. Long-term, beneficial impacts occur from interdictions that result from snowmobile patrols in areas that cannot be patrolled with other vehicles. During snowmobile operations there is a potential for accidents and injuries to CBP personnel and the general public. As patrols increase, the risk of accidents also increases, although an increase in patrols does not guarantee any specific increase in accidents or injuries.

To minimize the occurrence of snowmobile accidents and injuries, CBP takes certain steps with its snowmobile operators. USBP agents engaging in snowmobile patrols go through additional training to improve rider safety and snowmobile-related accidents and injuries. Short-term, adverse impacts could result when snowmobile patrols are engaging in dangerous interdictions and when accidents occur. No major adverse impact would be expected to occur, because USBP agents are trained to deal with dangerous situations.

Conduct Canine Patrols—Canine patrols have both long-term, beneficial and short-term, minor to moderate, adverse impacts to HH&S. Long-term, beneficial impacts occur from interdictions that occur during, or result from, canine patrols.

Short-term, adverse impacts could result when canine patrols are engaging in dangerous interdictions and when accidents occur. Accidents are unavoidable, but to minimize the occurrence of accidents, CBP's officials who conduct canine patrols receive additional training.

CBP's Canine Program is responsible for training canine instructors, canine handlers, and canines to assist CBP in its mission. Canine teams receive training and certification in all aspects of animal behavior as well as in handling, training, and employing a detection canine. Disciplines would include concealed human or narcotics detection, passenger processing narcotic detection, search and rescue, and currency or firearms detection. Canines used as CBP agriculture detector dogs are trained at the USDA's National Detector Dog Training Center in Atlanta, Georgia (USDHS, 2010e).

The amount of training that CBP personnel receive would help reduce the number of accidents caused by canine patrols, but some accidents could occur, causing short-term, minor to moderate, adverse impacts.

Conduct Horse Patrols—Horse patrols have both long-term, beneficial and short-term, minor to moderate adverse impacts to HH&S. Long-term, beneficial impacts occur from interdictions that occur during, or result from, horse patrols.

Applicants for the horse patrol agent position go through a 2-phase selection process consisting of an oral interview and a riding skills test. Once this is completed, agents are required to attend an 8-week training academy and new agents are trained in horsemanship, anatomy, veterinary care, and trailering (USDHS, 2010d).

Continuing horse patrols would have both beneficial and minor adverse impacts on HH&S. Horse patrols produce interdictions across the northern border, but accidents involving CBP personnel and bystanders could still occur. The amount of training that CBP personnel receive would help reduce the number of accidents caused by horse patrols.

Aircraft Operations

Conduct Manned Aerial Surveillance Patrols—Continuing manned aerial surveillance patrols have both long-term beneficial and short-term, adverse impacts on HH&S. Interdictions across the northern border would continue, having a beneficial impact on HH&S. During manned aerial surveillance operations, there is a potential for accidents and injuries to CBP personnel and the general public. As patrols increase, the risk of accidents also increases, although an increase in patrols does not guarantee any specific increase in accidents or injuries. Accidents involving OAM agents and the general public would have adverse impacts. According to the Officer Down Memorial Page website, CBP has had one fatality involving an OAM pilot along the northern border. The pilot crashed in Washington State in 1998 while flying over a rugged area in the Sumas Mountains (ODMP, 2011d).

To minimize the frequency and severity of manned aerial surveillance accidents and injuries, OAM takes certain steps with its aircraft pilots. OAM pilots must have certain qualifications to fly. In order to become a pilot for OAM, agents must pass an FAA Class 1 flight physical and hold a valid FAA commercial pilot's license with an instrument rating and other rating(s) appropriate to the position to be filled (USDHS, 2010a).

Certain flight hours and experience are required for participation in manned aerial patrols. OAM personnel need 1,500 flight hours, 250 hours of pilot-in-command, 100 hours within 12 months prior to hire, 75 hours night or instrument experience, an FAA first class medical certificate, and

an FAA commercial pilot certificate with the following ratings: airplane, single-engine or multi-engine land with instrument; or rotor craft helicopter with instrument. Other certificates that meet or exceed the requirements of the commercial certificate are also acceptable (e.g., airline transport certificate) (USDHS, 2010a).

Once the applicant's records are reviewed and found to be sufficient, a formal interview is conducted by a 3- or 4-person panel consisting of a supervisory air interdiction agent, an instructor pilot, and a human resources representative. Instructor pilots then conduct flight evaluations graded to commercial pilot standards to assess basic pilot tasks (USDHS, 2010a).

Because of the skills required to become an OAM pilot, no major, adverse impacts would be expected to occur from manned aerial surveillance patrols. Short-term, minor to moderate, adverse impacts could result from accidents.

Conduct UAS Patrols—UASs are used to support CBP's mission. The following UAS would be used by OAM to support UAS missions at Grand Forks Air Force Base, North Dakota:

- MQ-9 Predator B aircraft; and,
- Guardian Predator B.

OAM is guided by the FAA mission for air traffic procedures and airspace issues regarding air transportation security issues to ensure the safety of CBP personnel and the general public. The FAA mission is to ensure the safety and efficiency of the National Airspace System.

Day-to-day operations and maintenance activities conducted for UAS are performed in accordance with the U.S. Air Force (USAF) safety regulations, published USAF technical orders, and standards prescribed by USAF occupational safety and health requirements. For example, at Grand Forks Air Force Base in Grand Forks, North Dakota, all required emergency response equipment is available; there are no shortfalls, and no waivers are in effect. All Air Force bases that CBP utilizes would be equipped with required fire suppression systems.

Continuing UAS patrols would have both long-term beneficial and short-term, minor, adverse impacts on HH&S. UAS patrols produce interdictions across the northern border, having a long-term, beneficial impact.

The primary public concern with regard to flight safety is the potential for aircraft accidents. Such mishaps may occur as a result of mid-air collisions, collisions with man-made structures or terrain, weather-related accidents, mechanical failure, pilot error, or bird-aircraft collisions. (USDHS, 2008b).

Under the No Action Alternative, UAS accidents could still occur. From FY 2006 to July 13, 2010, the latest date for which information is available, CBP reported more than 5,000 flight hours. The accident rate was 52.7 accidents per 100,000 flight hours (the standard on which safety data are reported). This accident rate is more than seven times the general aviation accident rate (7.111 accidents/100,000 flight hours) and 353 times the commercial aviation accident rate (0.149 accidents/100,000 flight hours).

While this accident rate is higher than that of general or commercial aviation, it is important to note that the total reported flight hours are very small in comparison to the 100,000 hour standard typically used to reflect aviation safety data and accident rates.

CBP had five deviations (where the aircraft has done something unplanned or unexpected and violated airspace regulation) in FY 2009 (Kalinowski & Allen, 2010).

To minimize the occurrence and frequency of accidents, several safety measures are taken during UAS patrols. This section addresses ground safety, explosives safety, and flight safety associated with UAS missions and maintenance. Ground safety considers issues associated with human activities and operations and maintenance activities that support unit operations. One specific aspect of ground safety is antiterrorism/force protection (AT/FP) considerations. Explosives safety discusses the management and use of ordnance or munitions associated with installation operations and training activities. Flight safety considers aircraft flight risks.

Under the No Action Alternative, UAS accidents could still occur. As of April 27, 2011, over 9,800 cumulative flights have been conducted and the CBP UAS program has experienced 3 accidents and 2 incidents. The majority of these accidents were the result of human error, including the first accident in 2006 at the hands of a contract pilot. Of note, there has never been any loss of life or damage to private property as a result of these accidents/incidents.

As a result of terrorist activities, the U.S. Department of Defense and USAF have developed a series of AT/FP guidelines that CBP follows. These guidelines address a range of considerations that include access to the military installation, access to facilities on the installation, facility siting, exterior design, interior infrastructure design, and landscaping. The intent of this siting and design guidance is to improve security, minimize fatalities, and limit damage to facilities in the event of a terrorist attack. Many military installations were developed before such considerations became a critical concern. Thus, under current conditions, many units are not able to comply with all present AT/FP standards. However, as new construction occurs, it would incorporate these standards, and as facilities are modified, AT/FP standards would be incorporated to the maximum extent practicable.

The Predator B, utilized by OAM, is not equipped for ordnance, nor would it utilize other explosive devices. A range of munitions required for performance of Predator B missions are maintained and stored in accordance with USAF explosive safety directives, and all munitions maintenance is carried out by trained, qualified personnel using USAF approved technical procedures.

No major, adverse impacts would be expected to occur. Due to accidents, short-term, minor to moderate, adverse impacts would be expected. The safety procedures put in place would help minimize the number of accidents that would occur. Short-term, minor to moderate, adverse impacts would occur because accidents are unavoidable.

Vessel Operations

Conduct Waterborne Patrols—Waterborne patrols have both long-term, beneficial and short-term, minor to moderate, adverse impacts to HH&S. Long-term, beneficial impacts occur from interdictions that occur during, or result from, waterborne patrols. Short-term, adverse impacts

could result when waterborne patrols are engaging in dangerous interdictions and when accidents occur.

During vessel operations there is a potential for accidents and injuries to CBP personnel and the general public. As patrols increase, the risk of accidents also increases, although an increase in patrols does not guarantee any specific increase in accidents or injuries. Since OAM and USBP agents engage in high-speed pursuit on water, CBP's accident rates may be higher than they are for recreational boating.

To minimize the occurrence of vessel accidents and injuries, CBP takes certain steps with its vessel operators. To become a CBP OAM marine or USBP riverine interdiction agent, one must have additional training, and it is preferred that one have marine/law enforcement experience (USDHS, 2010f).

Because of the training OAM and USBP agents receive, no major, adverse impacts would occur. Minor to moderate, adverse impacts on HH&S could occur from waterborne patrols. The amount of training that CBP personnel receive would help reduce the number of accidents caused by waterborne patrols.

Use NII Technology—Because CBP uses several different NII technologies that have similar impacts, high-energy X-ray imaging scanner (HEXRIS) and gamma-imaging inspection system programs are used as an example for the overall impacts caused by NII technology.

As radiation-producing devices, these systems could have long-term, negligible, adverse impacts to HH&S. Exposure to high levels of radiation would increase a person's probability of developing cancer and hereditary genetic damage (HPS, 2004). Beneficial impacts would also occur because the use of these technologies results in interdictions across the northern border.

Use HEXRIS Technology—The HEXRIS employs advanced high-energy digital X-ray imaging technology that has been used successfully in various industrial applications such as field inspection of structures like bridges and buildings. These systems are subject to review by radiation protection authorities, but they are not subject to state regulation because they are operated by a Federal agency.

Under the No Action Alternative, CBP would continue the deployment and operation of HEXRIS at POEs in the United States. Four different HEXRIS models are available for this

Human Exposure—All maintenance personnel who maintain the linear accelerator (linac) and X-ray source components are employees of the equipment manufacturer. By the nature of their jobs, they have the potential to be exposed to a higher level of radiation than the system operators and members of the general public. Maintenance of the linac and X-ray source components have to comply with the EPA, OSHA, and states' (where applicable) strict dose standards for radiation workers. For a more detailed discussion of dose standards, see the Programmatic EA for Deployment and Operation of HEXRIS at Sea and POEs (USDHS, 2010e).

Exposure Pathways—The radiation exposure pathway for all personnel and the general public is created from exposure to scattered radiation from the X-ray source during scanning operations. However, in all cases, the radiation dose does not exceed 0.1 rem in a year (USDHS, 2010e).

purpose and are discussed in detail in CBP's Programmatic Environmental Assessment for Deployment and Operation of HEXRIS at Sea and LPOEs (USDHS, 2010g).

HEXRIS is designed so that the radiation dose levels where members of the public will be (e.g. work stations, operator control stations, and waiting areas) are below CBP-prescribed limits of 0.1 rem in a year. Detailed radiation surveys, performed by or under the supervision of CBP's Radiation Safety Office, have confirmed that these design criteria have been met. In all cases, exposures were measured using a worst-case scatter in the X-ray beam. A worst-case scatter scenario is not likely to occur; therefore, the estimated exposure levels are conservative by a substantial amount. As an additional precaution, as the HEXRIS are delivered, exposure measurements are made to ensure that the systems are in compliance with exposure limits.

This exposure limit applies to all CBP employees and contractors who work on or maintain HEXRIS but not the linear accelerator (linac) or X-ray source components. This means that system operators are not exposed to a higher radiation dose than the standard established for the general public. Occupational exposure to the effective radiation dose standard CBP has adopted is not expected to cause a significant increase in the risk of cancer (USDHS, 2010g).

To meet the threshold radiation dose limit, CBP established controlled areas for HEXRIS. No personnel would be allowed in the controlled areas during scanning operations. Controlled areas are discussed in detail in CBP's Programmatic Environmental Assessment for Deployment and Operation of HEXRIS at Sea and LPOEs (USDHS, 2010g).

During scanning operations, signs in multiple languages are posted at the controlled area boundary to indicate the radiation hazard. Ground guides, which can be items such as jersey barriers, cones, other items, or individuals who provide visual signals (e.g., CBP radiation officers), are positioned at various locations around the controlled area to warn persons of the danger, as well as to provide visual references. Ground guides delimit the controlled area. Each system incorporates an infrared safety barrier that stops the forward movement of the inspection system, as well as the production of X-rays should the beam barrier be broken.

In the extreme with respect to radiation exposure, a system operator (or a member of the general public) could be situated at the edge of a controlled area 8 hours a day, every workday of the year (that is to say, 2,000 hours per year) and not receive more exposure than the limits prescribed by the Nuclear Regulatory Commission (NRC) and the states.

The controlled areas ensure that the systems conform to the radiation protection guidelines of reducing the radiation levels to "As Low As Reasonable Achievable" (ALARA). In addition, 10 CFR 20.1101(b) requires that: "[t]he licensee shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as is reasonably achievable"(USDHS, 2010g).

Negligible, long-term, and adverse impacts would be expected, because, even though radiation exposure is well below the national standard, some exposure would still occur.

Exposures are expected to be well below the maximum levels of exposure set by the NRC, OSHA, the U.S. Food and Drug Administration (FDA), and the states to protect the general

public (which includes system operators, truck drivers, POE personnel, and other CBP personnel); therefore, the health and safety impacts from radiological exposure would not have a significant, major, adverse impact. Adverse impacts would be long-term and negligible.

Effects of Irradiation on Food—The CBP’s Radiation Safety Office has conducted tests to determine the worst-case scenario of radiation doses to food as a result of implementing the HEXRIS program. The total absorbed dose deposited in food subjected to scanning by a HEXRIS operating at 6.0 MeV (worst case, gantry system) is approximately 0.0015 rem per scan; on the same order as that received by a person hidden in a cargo container. This dose is 240 times less than the average annual background dose in the United States of 0.360 rem.

The FDA at 21 CFR 179.21 requires a label be affixed to each machine stating that no food shall be exposed to X-ray radiation sources to receive an absorbed dose in excess of 50 rem. The HEXRIS absorbed dose is approximately 33,333 times less than this limit.

Maintenance—CBP’s personnel do not maintain the linac or the X-ray source enclosure. CBP’s personnel periodically maintain the detectors and test the systems using procedures described in the operator’s manuals. The manufacturers perform all nonroutine, linac and X-ray source maintenance.

Radiation Safety Engineering Controls—HEXRIS incorporates redundant safety controls such as emergency stop buttons at several locations on the systems that allow the entire operation, including X-ray production, to be quickly shut down. In addition, the personnel assigned to operate the systems are specifically trained for safe X-radiation system operations according to standards established by CBP’s Office of Training and Development. Training for the system operators consists of lectures, courses, and a written examination in basic radiation physics, radiation safety, and biological effects of radiation, instrumentation, radiation control, and operating procedures during normal and emergency conditions (USDHS, 2010g).

Effects of Irradiation on Persons Hiding in Cargo Containers—The NRC has established the maximum allowable value of radiation dose that may be received by individuals (members of the general public) to be 0.1 rem in a year. Most state regulations also adopt this same standard.

It is possible that people will hide themselves in cargo containers in order to surreptitiously enter the United States. A person concealed in a cargo container that is scanned by a HEXRIS is exposed to X-radiation as a direct consequence of the inspection process.

CBP’s Radiation Safety Officer has conducted testing to determine the dose that a person hidden in a truck or cargo container would experience during a scanning operation. The total absorbed dose from a system operating at 6.0 MeV (worst case, gantry system) is approximately 0.0015 rem per scan, on the same order as that received by food. This dose is 240 times less than the average annual background dose in the United States of 0.360 rem and 66 times below levels permissible to the general public. Neither cargo container drivers nor any other personnel pass through the beam during scanning operations (USDHS, 2010g).

Assuming 0.0015 rem per scan, to reach the maximum allowable per year radiation dose, a person would have to be scanned over 66 times in a year. Since the chance of this frequency of exposure is remote, it is concluded that radiation from the HEXRIS will have negligible, long-term, and adverse impacts (USDHS, 2010g).

Use Gamma-Imaging Inspection System

Technology—The Vehicle and Cargo Inspection System (VACIS®) is a family of gamma-imaging systems that provides NII capability to aid CBP in stemming the flow of contraband into the United States. CBP deploys four VACIS® configurations: the VACIS® II, Mobile VACIS®, Rail VACIS®, and Pallet VACIS®.

Radiation Safety Exclusion Zones—In order to limit VACIS radiation dose to no more than .00005 rem per hour above typical background/man-made radiation, CBP established radiation safety exclusion zones for VACISII, Mobile VACIS, Rail VACIS and Pallet VACIS. Neither the general public nor CBP personnel are allowed in the radiation safety exclusion zones during VACIS operations. The radiation safety exclusion zones for the four VACIS configurations are established from field measurements conducted by a certified health physicist, and are described further in CBP's Programmatic Environmental Assessment for Gamma Imaging Inspection Systems (USDHS, 2004b).

Since CBP has decided that the upper permissible level of radiation dose for its personnel is the same as that of the general public in unrestricted areas, CBP's inspectors are not designated as occupational radiation workers. CBP chooses the criterion of 2,000 hours per year as the maximum expected exposure time (i.e., 8 hours a day, 5 days a week, 50 weeks a year) for its personnel (which is considered the worst-case exposure regime for any individual, general public or otherwise). Based on this time of exposure, and based on the public dose criterion of 0.1 rem per year, a typical CBP inspector who is assigned at a gamma-imaging inspection system operational site does not experience a radiation dose greater than 0.00005 rem per hour above typical background/man-made radiation.

Effects of Irradiation on Cargo—The total radiation dose experienced by cargo subjected to VACIS® II scanning is approximately 0.005 mrad (5 µrad) per scan, which is approximately five orders of magnitude less than the typical 360 mrad (360,000 µrad) per year dose experienced as a result of natural and man-made background radiation (USDHS, 2004b). No major, adverse impacts of irradiation on cargo would be expected. Negligible, long-term, adverse impacts would result. Although radiation exposure levels are well below the national standards, exposure still occurs.

A CBP memorandum for record from Dr. Siraj M. Khan, Certified Health Physicist, dated November 22, 1999, addresses VACIS® compliance with FDA regulations regarding irradiation of food. This memorandum states:

Title 21, Part 179, Subpart B, Section 179.21, Paragraph (b) (2) (ii) of the Code of Federal Regulations (CFR) requires that a statement that no food shall be exposed to radiation sources listed in paragraph (a) (1) and (2) of that section so as to receive an absorbed dose in excess of 10 grays (1000 rads) be attached to equipment using these radiation sources.

The Vehicle and Cargo Inspection System (VACIS®) uses a sealed cesium-137 radiation source for the inspection of trucks, cargo containers, railcars, and other vehicles. A radiation safety survey was performed in 1996 on a prototype VACIS®

using a one curie cesium-137 source. Subsequent calculations based on those measurements indicate that the radiation dose to food at the center of the truck is 5 microrad, which is a billion [sic] times less than that allowed by this regulation. Details of these calculations are presented in the technical report entitled Radiation Safety Guidelines for a Contraband Detection System dated November 1996. The radiation dose to food from mobile VACIS[®] and railroad VACIS[®] will be about 8 and 10 microrad, respectively, because they use 1.6 and 2 curie radiation sources.

Based on the above discussion, the VACIS[®] equipment (fixed truck, mobile and railroad) is in full compliance with 21 CFR 179.21.

No major, adverse impact would be expected on food. Long-term, negligible, adverse impacts would result; even though radiation exposure levels are well below the national standards, exposure still occurs.

Effects of Irradiation on Persons—As stated, the NRC has established the maximum allowable value of radiation dose that may be received by individuals in unrestricted areas (individual members of the general public) to be 100 mrem (100,000 μ rem) per year above typical background/man-made radiation.

CBP conducted testing to determine the dose that a person hidden in cargo would experience during VACIS[®] scanning operations. As of the 2004 VACIS Programmatic Environmental Assessment, this test had not been completed for the Pallet VACIS[®] system. The maximum measured doses (μ rem per scan) for VACIS[®] II, Mobile VACIS[®], and Rail VACIS[®] are 5, 4, and 2.5, respectively.

Assuming the worst-case scenario (i.e., VACIS II[®] at 5 μ rem per scan), to reach the maximum allowable per year radiation dose, a person would have to be scanned 20,000 times per year (which equates to approximately 54 scans per day, every day, for 1 year). Since the chance of this frequency of exposure is extremely remote, it is concluded that VACIS[®] will have a negligible, long-term, and adverse impact, because some radiation exposure would still be expected.

Source Material Operations

Transportation—The VACIS[®] ¹³⁷Cs radiation source has an effective operational life of 15 years, the ⁶⁰Co source has an effective operational life of 5 years, and the VACIS[®] configuration (exclusive of radiation source) has an estimated operational lifetime of 30 years. Hence, transportation of the radiation source material separate from the VACIS[®] equipment may be required only during installation at each VACIS[®] site, during replenishment operations (transporting in the fresh source, and transporting out the spent source), and when each VACIS[®] site is decommissioned. In all cases, the shipment of the source material will be in full and total compliance with U.S. Department of Transportation (DOT) regulations (USDHS, 2004b).

Additionally, the source material will be transported within the Mobile VACIS[®] equipment as the equipment moves between sites. Though movements of mobile VACIS[®] will be conducted at variable intervals, these movements would have no adverse impact on the heavy traffic typically experienced at POEs, because the public will not be exposed to radiation.

In all cases, the marking, packaging, and transportation of the source material in all VACIS[®] configurations will be in full and total compliance with DOT regulations 49 CFR Part 172.310 “Class 7 (radioactive) Materials, Marking”; 49 CFR Part 173.471, “Packaging”; and 10 CFR Part 71, “Packaging and Transportation of Radioactive Material.”

Installation—VACIS[®] II and Rail VACIS[®] components will be shipped individually and assembled where the system is to be used. No radiation exposure to VACIS[®] personnel or to members of the public will result from either the shipment or assembly of the system, because the radiation source will not yet have been installed in the system. Each ¹³⁷Cs/⁶⁰Co source will be shipped in a shielded cask to the VACIS[®] site and will be installed in the VACIS[®] equipment by the vendor, SAIC. Mobile VACIS[®] will be shipped to its initial installation site as a unit with the ¹³⁷Cs source already installed by the vendor, SAIC.

Maintenance—CBP’s personnel will periodically perform limited maintenance on VACIS[®], such as lubricating the tracks on VACIS[®] II and replacing small components such as light bulbs on all VACIS[®] configurations. Whenever this maintenance is performed, the shutter on the ¹³⁷Cs/⁶⁰Co source shielded container will be kept in the closed position.

Nonroutine maintenance will be performed by the vendor, SAIC. Whenever major disassembly of the VACIS[®] equipment is required, the ¹³⁷Cs/⁶⁰Co source will be removed from the system and kept in a shielded storage cask.

Disposal—Each VACIS[®] installation will generate radioactive waste in the form of either reusable or nonreusable ¹³⁷Cs radiation source material. The disposal of each form of radioactive waste will follow DOT regulations (USDHS, 2004b).

Effects of Accidents—Under accident conditions associated with handling, storage, and use of the ¹³⁷Cs/⁶⁰Co source housing, it is unlikely that any person would receive an external radiation dose or dose commitment in excess of the dose to the appropriate organ as specified in Table 8.13-1.

Table 8.13-1. Body Dose Threshold Data

Body Part	Dose (rem)
Whole body, head and trunk, active blood-forming organs, gonads, or lens of eye	15
Hands and forearms, feet and ankles, localized areas of skin averaged over areas no larger than 1 cm ² (0.15 in ²)	200
Other organs	50

Indicates lowest dose that will cause negative effects.

Source: (USDHS, 2004b).

The worst accident due to the design of the machine is the open shutter scenario and the inability to close the shutter on the ¹³⁷Cs source-shielded container. The recommended response plan for this situation can be found in CBP’s Programmatic Environmental Assessment for Gamma Imaging Inspection Systems (USDHS, 2004b).

Radiation Safety—VACIS[®] II, Mobile VACIS[®], Pallet VACIS[®], and Rail VACIS[®] all incorporate redundant safety controls, such as emergency shutoff pushbutton controls at several locations on the VACIS[®] equipment. Additionally, in the event of a power loss, each VACIS[®] configuration has a safe shutoff mode in which the shutter on the ¹³⁷Cs/ ⁶⁰Co source-shielded container automatically closes.

To ensure that no significant, major, adverse impacts occur, the personnel assigned to operate VACIS[®] are specifically trained for safe gamma radiation system operations. Training for the VACIS[®] operators consists of lectures and courses in basic radiation physics, radiation safety, and biological effects of radiation, instrumentation, radiation control, and operating procedures during normal and emergency conditions.

Licensing—CBP holds an NRC materials license for ¹³⁷Cs/ ⁶⁰Co sealed sources. The NRC requires that CBP be in full and total compliance with the materials license and all of the 28 conditions specified in the license, in addition to all statements, representations, and procedures in the license's application and correspondence as indicated on page 8 of the license. Nuclear Regulation (NUREG)-1556, Volume 4, October 1998, entitled *Program-Specific Guidance About Fixed Gauge Licenses*, will then automatically become a condition of CBP's license.

Because of CBP's officer training, compliance with laws and regulations, and response plans, there would be no significant, major, adverse impact to humans from exposure to radiation from the VACIS[®] programs. Exposure levels would remain well below regulation standards of 5 rem in 1 year or 10 rem over a lifetime. Long-term, negligible, adverse impacts would be expected because some radiation exposure is expected.

In conclusion, NII technology would have both long-term, beneficial and long-term, minor or negligible, adverse impacts to the general public and CBP employees. Installing and using NII technology would produce interdictions across the northern border for as long as the technology is in place. NII technology gives CBP employees a tool to help locate terrorists and terrorist weapons entering the United States. Since the dose of radiation received from NII technologies is below 5 rem in a year during normal operating procedures, adverse impacts would occur only in abnormal circumstances. These circumstances may arise from stowaways in cargo or from technology malfunctions. If a person were to receive a radiation dose of 5 rem or higher, cancer and hereditary genetic damage could occur (HPS, 2004).

Even though radiation levels are below regulation standards, short-term, negligible, adverse impacts could still occur, because individuals would still be exposed to radiation (USDHS, 2004b; HPS, 2004).

Radio Frequency

Use Communication Towers Radio Frequency Identification Technology—Communication towers are another tool that CBP uses to increase the rate of interdictions across the northern border. Interdictions have a long-term beneficial impact on human health and safety.

Communication towers are equipped with radio wave and microwave communication systems as well as radar systems to help maintain a secure border. Like any RF transmitter, all of these

systems emit RF energy and EM radiation; therefore, a potential for short-term, negligible, adverse effects exists.

Equipment components that emit RF energy and EM radiation are commonly mounted along each tower at approximately 80 to 180 feet above ground level, depending on the local terrain. At these heights, it is highly improbable that any individual would come into direct contact with any RF and EM emissions; therefore, human exposure would be highly unlikely and no significant, major, adverse impacts would be expected. RF-emitting equipment would be installed and operated by qualified workers operating under applicable OSHA standards. Therefore, the likelihood of exposure to adverse levels of RF radiation is low. Impacts from environmental exposure to RF and EM emissions would therefore be negligible.

Because RF energy and EM radiation equipment is commonly mounted high enough along each tower, maintenance and operational personnel working within the secure tower site are not exposed to RF energy and EM radiation that exceeds maximum permissible exposure limits set by the FCC. Therefore, human exposure for maintenance and operational personnel would be highly unlikely (USDHS, 2008a). Long-term negligible impacts would occur from RF and EM emissions being put into the environment.

While the communication systems and the frequencies in which they would be operated are considered law enforcement sensitive and cannot be disclosed, compliance with FCC regulations is required, and recognized safety standards must be met. Use of the telecommunications radio spectrum is regulated and access is controlled, and rules for its use are enforced because of the possibilities of radio frequency interference between uncoordinated uses. The electromagnetic spectrum is considered a common good, or a natural resource, so it can be adversely impacted by use (USDHS, 2008a).

RF spectrum is scarce, because one use of a portion of the spectrum precludes any other simultaneous use of that portion. Therefore, prior to initial operation of the tower system, CBP's communications tower operators are required to submit an application for certification of CBP's telecommunications equipment and its proposed operating frequencies to the National Telecommunications and Information Administration (NTIA) for approval. The NTIA reviews all Federal agencies' new telecommunications systems and certifies that space on the frequency spectrum will be available for component systems that operate within certain frequency ranges.

This review, approval, and certification process helps ensure that the agencies' communications equipment will not cause frequency interferences with nearby users of other communications equipment (e.g., cell phones, televisions) that use the same or adjacent portions of the frequency spectrum. Therefore, adverse impacts from the RF environment created by the installation, operation, and maintenance of the communication and radar systems on the proposed towers would likely be long-term, negligible, and adverse due to the minimal exposure limits associated with both the type of equipment used and the elevated locations in which they would be positioned (USDHS, 2008a).

Beneficial impacts would be long-term because the continued deployment of the communication towers would likely increase interdictions across the northern border and ultimately deter or prevent illegal entry.

Firing Ranges

The use of firing ranges would result in beneficial, long-term impacts and short-term, negligible to minor, adverse impacts. Beneficial impacts occur from improving the CBP agent's effectiveness when engaging in interdictions along the border.

Adverse impacts would occur due to lead and noise exposure. CBP agents could be exposed to lead on indoor or outdoor ranges. Lead from outdoor firing ranges could leach into the public's water supply, exposing people to lead poisoning. Exposure levels above 80 µg/dL may lead to serious, permanent health damage (NYDH, 2009). CBP agents could also be exposed to harmful noise levels, causing damage to the inner ear.

To protect CBP agents and officers from lead and noise exposure on firing ranges, current safety procedures follow all Federal regulations. To minimize the leaching of lead into the general public's water supply, procedures pursuant to hazardous waste standards are followed.

Even though agents will not be exposed to lead and noise levels above Federal standards, agents are still exposed to lead and harmful noise levels, resulting in adverse, short-term, negligible to minor impacts.

8.13.2 FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE

The Facilities Development and Improvement Alternative would focus on providing new and permanent facilities such as BPSs and POEs to allow CBP personnel to operate more efficiently and respond to situations more quickly.

Under the Facilities Development and Improvement Alternative, CBP would make or initiate major modifications (equivalent to large construction) to existing POEs, if needed to meet operational needs. CBP officers would continue to be allocated to POEs as necessary to meet operational needs to secure trade and travel in accommodation to seasonal traffic pattern shifts. Overall, impacts to HH&S would be both beneficial and minor to moderate adverse. Under this alternative, risks to HH&S are from agricultural inspections and construction- and work-related accidents. With proper training and adherence to regulations, major, adverse impacts would not be expected to occur.

Impacts to HH&S vary with each CBP activity described in the analysis. Overall, impacts to HH&S would be both beneficial and minor to moderate adverse. Construction- and work-related accidents pose the biggest risks to HH&S. However, with the continued application of the training, licensing, and OSHA regulation requirements for the people and equipment involved in these activities, overall adverse impacts would be expected to be minor to moderate, while there are clear beneficial health and safety impacts to the public from CBP's conduct of these activities.

Small and Large Construction Projects

Small and large construction projects would have short-term, minor to moderate, adverse and long-term, beneficial impacts to HH&S. POEs can take approximately seven years to design, build, and make fully functional. This includes project planning, financing, approval, and construction. Impacts to HH&S from this alternative would be similar to those already occurring at POEs. Overall, there could be a beneficial impact because interdictions could increase from

the presence of a BPS in an area previously without one, or a modernized building that meets operational needs as they arise. Training of CBP employees would continue and OSHA safety regulations would be followed. An initial short-term increase in construction-related accidents could occur as POEs are modernized; however, across the entire region, this would be minor to moderate and adverse, and, over time, construction-related activities would decrease.

Routine Operations

Onsite Trade and Travel Processing Operations

Small on-site trade and travel processing operations would increase in this region. This would have a long-term, beneficial impact on HH&S. Increasing agricultural inspections would increase the number of nonindigenous diseases discovered at or before the border and stopped from entering the country. Short-term, minor to moderate impacts would occur if a nonindigenous disease were released into the United States. CBP will continue to train employees to minimize adverse effects.

8.13.3 DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE

The Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative focuses on deploying more effective Detection, Inspection, Surveillance and Communications technologies in support of CBP's activities. It would include improvements to the identification and inspection technologies used at POEs. Overall, impacts to HH&S would be both beneficial and minor to moderate adverse. Under this alternative, the risks to HH&S are from exposure to RF and EM emissions from communication towers; aircraft and vessel patrol accidents; and construction- and work-related accidents. With proper training and adherence to regulations, major, adverse impacts would not be expected to occur.

Impacts to HH&S vary with each CBP activity described in the analysis. Overall, impacts to HH&S would be both beneficial and negligible to moderate adverse. Exposure to RF and EM emissions from communication towers and pursuit and interdiction activities during vessel and aircraft patrols pose the biggest risks to HH&S. However, with the continued application of the training, licensing, and OSHA regulation requirements for the people and equipment involved in these activities, overall adverse impacts would be expected to be negligible, while there are clear, beneficial health and safety impacts to the public from CBP's conduct of these activities.

Construction

Small Construction Projects

Small construction projects would have short-term, minor to moderate, adverse and long-term, beneficial impacts to HH&S. Small projects under this alternative include upgrades and maintenance on towers and other infrastructure to mount antennas. CBP agents would continue to receive training, and all construction projects will follow OSHA regulation requirements. Construction-related accidents could occur. This would be minor to moderate and adverse, but over time, construction-related activities would decrease.

Routine Operations

Aircraft and Vessel Operations

Aircraft and vessel operations would also increase under this alternative. Increasing operations would increase the rate of interdictions and would result in a long-term, beneficial impact to HH&S. Short-term, minor to moderate, adverse impacts would also occur due to accidents.

Operation of NII Systems and Operation of Sensor and Other Technologies

An increase in operation of NII systems and operation of sensor and other technologies would result in both negligible, adverse and beneficial impacts. This alternative would implement upgraded surveillance and telecommunications systems including but not limited to:

- Remote sensors;
- Short-range radar;
- Remote and mobile video detection, inspection, surveillance, and communications systems;
- New camera systems; and,
- Upgrades to stationary communications systems.

These upgrades would improve agent and officer communications systems, and enable USBP and OAM to focus their efforts on identified threat areas and deploy personnel to resolve incidents with maximum efficiency.

Implementing these listed upgrades would have impacts similar to those described in the No Action Alternative. Increasing the use of RVSSs and MSSs has the potential to expose greater numbers of individuals to radiation, but the radiation exposure levels of individuals would still be under the requirements of NRC regulations and would not exceed 0.1 rem per year above the typical 0.360 rem per year dose provided by natural background and man-made radiation. Therefore, impacts to HH&S would be negligible and adverse because the risk of exposure is unlikely. In addition, beneficial impacts could occur because the rate of interdictions could increase along the northern border.

8.13.4 TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE

This alternative would focus on constructing additional barriers, such as selective fencing or vehicle barriers, at selected points along the border to deter and delay CBVs, as well as access roads and related facilities to increase the mobility of CBP agents for surveillance and response. This alternative would hinder CBVs and improve CBP's capability to respond quickly and effectively. Impacts to HH&S would be both beneficial and minor to moderate adverse. Under this alternative, construction- and work-related activities pose risks to HH&S; however, with proper training and adherence to regulations, major, adverse impacts would not be expected to occur.

Impacts to HH&S vary with each CBP activity described in the analysis. Overall, impacts to HH&S would be both beneficial and minor adverse. Under this alternative, CBP operations from pursuit and interdiction activities and construction- and work-related accidents pose risks to

HH&S. However, with the continued application of the training, licensing, and OSHA regulation requirements for the people and equipment involved in these activities, overall adverse impacts would be expected to be beneficial, while there are clear, minor, adverse HH&S impacts to the public from CBP's conduct of these activities and from the unavoidable accidents that could ensue.

Small and Large Construction Projects

The Tactical Security Infrastructure Deployment Alternative would focus on small construction and large construction projects along the border. Small and large construction projects would have short-term, minor to moderate, adverse and long-term beneficial impacts. Small construction projects will include trench cuts, towers, minor access roads, and small fences (less than 1/4 mile long) at selected points along the border. Large construction projects include access roads and fences (more than 1/4 mile long) at selected points along the border. These projects will deter and delay CBVs; some of them, such as building access roads and related facilities, will increase the mobility of USBP agents for surveillance and response to various border violations. Training of CBP's employees would continue and OSHA safety regulations would be followed. The increase in mobility of USBP agents from additional access roads could increase interdictions. In addition, accidents could decrease because vehicle patrols would be conducted on dedicated, less congested, access roads. Though mobility could help decrease accidents, accidents would still occur, resulting in short-term, minor to moderate, adverse impacts. Constructing new barriers and fencing has the potential to produce minor, temporary increases in vehicle accident levels.

8.13.5 FLEXIBLE DIRECTION ALTERNATIVE

The Flexible Direction Alternative focuses on creating the most effective response to the changing threat environment along the northern border. It is impossible to predict what portion or overall mix each of the above directions is likely to be needed at any point in time, and the necessary mix is likely to change constantly because the threat environment changes constantly. For analysis purposes, the activities under the Flexible Direction Alternative equal the implementation of the activities of all the other action alternatives. Impacts to HH&S would be both beneficial and minor to moderate adverse. Under this alternative, radiation exposure at POEs, RF and EM exposure from communication towers, and accidents during pursuit and interdiction activities pose the biggest risks to HH&S. With proper training and adherence to regulations, major, adverse impacts are not anticipated.

Impacts to HH&S vary with each CBP activity described in the analysis, and impacts to HH&S would result from implementation of all three action alternatives. The biggest risks to HH&S are from radiation exposure at POEs, RF and EM exposure from communication towers, accidents from aerial patrols, and accidents in pursuit and interdiction activities. With the continued use of the training, licensing, and regulation requirements for the people and equipment involved in these activities, overall adverse impacts would be expected to be minor to moderate, while there are clear, beneficial, health and safety impacts to the public from CBP's efficient and successful conduct of these activities.

Construction

Small and Large Construction Projects

Small and large construction projects would have short-term, minor to moderate, adverse and long-term, beneficial impacts. Per region, small construction projects would increase to around 160± new projects, and large construction projects would increase to around 25± new projects. Interdictions would increase, resulting in long-term, beneficial impacts. During these construction projects, short-term, minor to moderate impacts would occur due to construction related projects. OSHA regulations will be followed to minimize any construction-related accidents.

Routine Operations

On-site Trade and Travel Processing Operations

Small on-site trade and travel processing operations would increase in this region. This would have a long-term, beneficial impact on HH&S. Increasing agricultural inspections would increase the number of nonindigenous diseases discovered at or before the border and stopped from entering the country. Short-term, minor to moderate impacts would occur if a nonindigenous disease were released into the United States. CBP will continue to train employees to minimize adverse effects.

Ground Operations, Aircraft Operations, and Vessel Operations

Both short-term, minor to moderate, adverse impacts and long-term, beneficial impacts would result from an increase in ground, aircraft, and vessel operations under this alternative. The number of ground, aircraft, and vessel operations would increase along the border. USBP and OAM agents would continue to receive appropriate training. This would create long-term, beneficial impacts along the border, because interdictions would increase. Short-term, minor and moderate impacts would occur due to accidents. CBP would continue to train USBP and OAM agents to minimize effects.

Operation of NII Systems and Sensors and Other Technologies

An increase in operation of NII systems and operation of sensor and other technologies would result in both negligible, adverse and beneficial impacts. This alternative would increase the use of NII systems as well as sensors and other technologies. The increase in these technologies would enable USBP and OAM to focus their efforts on identified threat areas, improve agent and officer communications systems, and deploy personnel to resolve incidents with maximum efficiency.

Fielding these listed upgrades would have impacts similar to those described in the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative. Increasing the use of NII technology has the potential to expose greater numbers of individuals to radiation, but the radiation exposure levels of individuals would still be within the amount allowed by NRC regulations and would be no higher than 0.1 rem per year above the typical 0.360 rem per year dose. Also, the use of EM- and RF-emitting devices will comply with FCC regulations and safety procedures. Therefore, impacts to HH&S would be negligible and adverse because

exposure is unlikely. In addition, beneficial impacts would occur because interdictions would increase along the border.

8.13.6 BEST MANAGEMENT, MINIMIZATION, AND MITIGATION

Necessary mitigation, avoidance, and minimization measures are particular to the specific action as well as the physical characteristics of the environment selected for the action. The application of mitigation requirements varies greatly along the northern border, especially with regard to local and state regulations. In general, the following mitigation measures may be implemented in compliance with regulatory authorities.

CBP seeks to avoid, minimize, repair, and reduce the impacts of its actions on the human environment. It does so with a combination of BMPs, siting plans, design strategies, mitigation measures, and monitoring plans best suited to the scale and the location of the particular action. Towards that end, in implementing its proposed action CBP could choose from the following actions to avoid or minimize impacts to HH&S:

BMPs for Routine Activities

Health and safety BMPs for routine activities include but are not limited to:

- Develop and implement a health and safety plan to be followed throughout all phases of a project;
- Coordinate overflights with Federal land managers for aerial patrols over Federal land management units when practicable;
- Provide occupational health and safety orientation training to all employees, consisting of basic hazard awareness, site-specific hazard awareness, safe working practices, and emergency procedures;
- Consider public safety during helicopter flights (e.g., avoid populated areas, schools, and areas being crop dusted);
- Conduct daily safety assessment meetings to identify potential safety issues (e.g., site access, construction, work practices, security, transportation of heavy equipment, traffic management, emergency procedures, wildlife encounters, and fire control and management) and measures to mitigate them;
- Provide fire suppression equipment in all vehicles; and,
- Use appropriate procedures for storage and transportation of blasting equipment and explosive materials, including appropriate signage indicating its location (IEED, 2010).

BMPs for Radiological Health and Safety

BMPs for radiological health and safety include but are not limited to:

- Incorporating safety warnings and precautions into technical manuals and operator manuals;
- Training operators and scanning operations supervisors in the hazards associated with radiation-producing equipment;

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

- Incorporating emergency stop buttons on the equipment that allow the system, including X-ray production, to be shut down quickly, if necessary;
- Training operators and scanning operations supervisors in the location and use of emergency stop buttons; and,
- Establishing radiation-controlled areas during scanning operations (USDHS, 2004b).

8.13.7 SUMMARY OF POTENTIAL IMPACTS

Table 8.13-2 summarizes the potential impacts of the alternatives on HH&S.

Table 8.13-2. Summary of Potential Human Health & Safety Impacts

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
NO ACTION ALTERNATIVE					
Small construction projects (< 1 acre and < 1/4 mile: e.g., minor repairs to facilities, parking lot repairs, access road repairs)		⊗	⊗		⊗
Large construction projects (> 1 acre and > 1/4 mile: e.g., repairs to facilities, parking lot repairs, access road repairs)		⊗	⊗		⊗
Small onsite trade and travel processing operations		⊗	⊗		⊗
Large onsite trade and travel processing operations		⊗	⊗		⊗
Checkpoint operations		⊗	⊗		⊗
Ground operations—motorized		⊗	⊗		⊗
Ground operations—nonmotorized	on-road	⊗	⊗		⊗
	off-road		⊗		⊗
Aircraft operations		⊗	⊗		⊗
Vessel operations		⊗	⊗		⊗
Operation of NII systems	⊗				⊗
Operation of sensor and other technologies	⊗				⊗
OVERALL IMPACT		⊗	⊗		⊗

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE					
Small construction project (< 1 acre and < 1/4 mile: e.g., reconstruction/construction of new POEs, USBP structures, parking lot repairs, access road repairs)		⊗	⊗		⊗
Large construction projects (> 1 acre and > 1/4 mile: e.g., reconstruction/construction of new POEs, USBP structures, parking lot repairs, access road repairs)		⊗	⊗		⊗
New small onsite trade and travel processing operations (new POEs)		⊗	⊗		⊗
New Large onsite trade and travel processing operations (new POEs)		⊗	⊗		⊗
OVERALL IMPACT (INCLUDING NO ACTION)		⊗	⊗		⊗
DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE					
Small construction projects (e.g., towers and other infrastructure to mount antennas)		⊗	⊗		⊗
Aircraft operations		⊗	⊗		⊗
Vessel operations		⊗	⊗		⊗
Operation of NII systems	⊗				⊗
Operation of sensor and other technologies	⊗				⊗
OVERALL IMPACT (INCLUDING NO ACTION)		⊗	⊗		⊗
TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE					
Small construction projects (trench cuts, towers, minor access roads and fences)		⊗	⊗		⊗
Large construction projects (access roads and fences)		⊗	⊗		⊗
OVERALL IMPACT (INCLUDING NO ACTION)		⊗	⊗		⊗

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
FLEXIBLE DIRECTION ALTERNATIVE					
Small construction projects		⊗	⊗		⊗
Large construction projects		⊗	⊗		⊗
Small onsite trade and travel processing operations		⊗	⊗		⊗
Large onsite trade and travel processing operations		⊗	⊗		⊗
Checkpoint operations		⊗	⊗		⊗
Ground operations—motorized		⊗	⊗		⊗
Ground operations—nonmotorized		⊗	⊗		⊗
Aircraft operations		⊗	⊗		⊗
Vessel operations		⊗	⊗		⊗
Operation of NII systems	⊗				⊗
Operation of sensor and other technologies	⊗				⊗
OVERALL IMPACT (INCLUDING NO ACTION)		⊗	⊗		⊗

8.14 ENVIRONMENTAL CONSEQUENCES OF HAZARDOUS MATERIALS

A *hazardous waste* is defined by the Resource Conservation and Recovery Act (RCRA) as a solid waste, or combination of solid wastes, that, because of its quantity; concentration; or physical, chemical, or infectious characteristics may:

- Cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or,
- Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

CBP implements its RCRA requirements consistently across the northern border as a whole. For descriptions of the regional affected environments for hazardous materials, see Sections 4.14.2 (WOR Region), 5.14.2 (EOR Region), 6.14.2 (Great Lakes Region), and 7.14.2 (New England Region).

Across the northern border as a whole, direct and indirect impacts from CBP management of hazardous wastes would range from beneficial to minor adverse for all alternatives. Non-CBP actions in close proximity to CBP activities, such as building and road construction and local industry, would add to the hazardous material impacts caused by CBP activities. These actions would produce hazardous waste comparable to that produced by CBP activities. Materials used during construction, demolition, and modernization of buildings and roads would be comparable to those used by CBP.

Only minor increases in the cumulative effects of hazardous materials would occur as a result of construction, maintenance, and operation activities. Across the northern border as a whole, the effects of all of the alternatives, when combined with other ongoing and proposed projects in the area, would not be expected to have a significant cumulative effect. BMPs would be implemented as standard operating procedures during all construction activities and would include proper handling, storage, or disposal of solid and hazardous or regulated materials. The impacts of hazardous waste would vary greatly with each CBP activity described in this analysis, but the overall cumulative impacts would be expected to be short-term, adverse, and minor. This assumes that CBP would continue to follow the appropriate mitigation measures and BMPs to avoid accidental releases and spills of hazardous materials (see Section 9.14).

8.14.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, CBP would continue the current level of operations with approximately the same manpower. This alternative would include routine maintenance and repairs of facilities, equipment, and technology (including commercial upgrades of equipment presently in use as these become available). Under this alternative, current operation procedures would continue in order to meet CBP's goals to secure the Nation's borders, protect it from the entry of dangerous people and goods, and prevent unlawful trade and travel. Using a risk-based approach, CBP would employ the most effective inspection and scanning technology available at designated POEs, airports, seaports, permanent traffic checkpoints, and international areas in which CBP would operate to detect and prevent the entry of hazardous materials, goods, and instruments of terror into the United States (USDHS, 2009).

An important component of CBP's goals is to protect U.S. citizens from IDAs. For further information on IDAs, Appendix R evaluates the HH&S impacts of IDAs along the northern border.

Large and Small Construction Projects Currently Under Way or in Planning

When prescribed hazardous-waste management procedures are properly followed, large and small construction projects would cause direct, short-term and long-term, negligible to minor, adverse impacts and indirect, long-term, negligible, adverse impacts. Large and small construction projects—such as the construction of pedestrian fences, vehicle fences, or other physical barriers; access and drag roads; bridges; culverts; and low-water crossings—would not generate significant levels of hazardous waste or require construction that could potentially affect hazardous-waste sites. There would be the potential for gas and oil leaks from vehicles and equipment used during construction. Hazardous-material leaks of this scale would result in negligible to minor, adverse impacts. On a site-specific basis, proposed construction sites would be evaluated to determine if there are any hazardous materials or oil or gaswell sites located within or around the project boundary.

Hazardous materials used during construction, maintenance, and repair of POEs would involve special hazards and the production of hazardous waste. The construction of permanent traffic checkpoints, BPSs, and facilities to support OAM and OFO activities would involve the same hazards. On this scale, a spill or accidental release of hazardous materials would result in direct, short-term and long-term, negligible to minor, adverse impacts to the immediate area. Soil and water contamination are possible consequences of an accidental release of hazardous materials on a construction site. There would be indirect, long-term, negligible, adverse impacts due to spill potential of hazardous materials. A spill could migrate off-site or contaminate groundwater that then migrates off-site. Subsequent cleanup of a spill could result in minimal emissions migrating off-site from the treatment and disposal process.

Because of the random nature of illegal dumping along the border areas, it would be difficult to determine the location and quantity of hazardous waste that may be present within a project corridor. If hazardous materials or wastes are present, there would be a potential for exposure to these wastes during construction activities. Construction personnel would be informed about the potential to encounter hazardous wastes that may be present from illegal dumping and the appropriate procedures to use if suspected hazardous contamination is encountered (USDHS, 2008b).

During the duration of a project, the engineer would be notified immediately if a visual observation or odor indicates that materials on sites owned or controlled by CBP are hazardous. CBP would be responsible for testing and removing or disposing of hazardous materials not introduced by the contractor on sites owned or controlled by CBP. The contractor would not be required to test, remediate, or remove hazardous materials that the contractor did not introduce onto the work locations. The engineer would have the authority to suspend the work wholly or in part during the testing, removal, or disposition of hazardous materials on sites owned or controlled by CBP (TDOT, 2004).

If a visual observation or odor indicated that materials delivered to the work locations by the contractor are hazardous, an approved commercial laboratory would test the materials for

contamination. If any of these materials were found to be contaminated, they would be removed, remediated, and disposed of. Testing, removal, and disposition of hazardous materials introduced onto the work location(s) by the contractor would be at the contractor's expense (TDOT, 2004).

Steps would be taken in an effort to reduce the likelihood of spills. Typical requirements regarding the management of hazardous wastes on a construction project include:

- Ensuring that all construction personnel are properly trained regarding management of hazardous wastes;
- Ensuring that construction materials that are potentially hazardous are stored under watertight conditions but are still readily available for use;
- Ensuring that hazardous waste collected from the project is stored and disposed of in a manner that is appropriate for that particular type of waste;
- Ensuring that the contractor is prepared to respond to spills or leaks that occur anywhere on the project site; and,
- Ensuring that failure to clean up spills, or improper storage of hazardous materials, triggers sampling and analysis.

When procedures are properly followed while conducting large and small construction projects, the result would be direct, short-term and long-term, negligible to minor, adverse impacts on the soil, water, and vegetation. There would be indirect, long-term, negligible, adverse impacts due to spill potential of hazardous materials and the possibility of a spill migrating off-site or contaminating groundwater that would then migrate off-site. Subsequent cleanup of a spill could result in minimal emissions migrating off-site from the treatment and disposal process.

Checkpoint Operations and Large and Small On-Site Trade and Travel Processing Operations

An accidental release or spill of hazardous materials used while operating checkpoints and large and small on-site trade and travel processing could potentially occur, which would result in direct, short-term and long-term, negligible, adverse impacts as well as indirect, long-term, negligible, adverse impacts. Operational activities at traffic checkpoints and trade and travel processing at POEs would result in the use of fuels, oils, lubricants, and other hazardous materials. Ongoing impacts would be similar to those resulting from current operations because no change would occur in the buildings and facilities currently being used or in the type, frequency, or intensity of operations. There would be direct, long-term, negligible, adverse impacts under this alternative due to a spill potential of small amounts of housecleaning chemicals stored inside the POE building and the small amounts of gasoline and motor oil stored in sheds. Media, potentially contaminated with these hazardous materials, would be disposed of in accordance with Federal, state, and local regulations. Direct, long-term, negligible, adverse impacts under the No Action Alternative exist due to the potential of leakage or spilling of hazardous materials from vehicles parked at the POE or being inspected at the POE, which could include gasoline, diesel, hydraulic fluid, motor oil, transmission fluid, and antifreeze. A slightly increased traffic volume in the long-term would result in slightly increased potential spills of this

type. Direct, long-term, negligible, adverse impacts under the No Action Alternative exist due to the presence and potential leakage of dielectric fluid from the pole-mounted transformer.

CBP would continue to recognize the need to develop a safe, uniform, and environmentally sound plan for the processing of this type of merchandise. CBP would be committed to taking all steps necessary to reduce the risk of injury or illness caused by hazardous materials in the workplace. CBP officers would ensure that all hazardous cargo is clearly marked, labeled, packaged, or placarded in accordance with the requirements of all Federal agencies. Hazardous cargo that is leaking or improperly marked, labeled, packaged, and placarded would not be released by CBP. CBP personnel would also ensure that confined spaces, such as shipping containers, truck trailers, and rail cars, have been properly ventilated before conducting an examination of the contents. If properly trained CBP personnel and examination facilities are not available to safely inspect or sample hazardous cargo, the importer/exporter would select a qualified hazardous-material contractor (from a list compiled locally) to perform the examination or sampling under CBP's supervision. All costs incurred would be borne by the importer/exporter (USDHS, 2006a).

If spilled or leaked, cleaning solvents would be harmful to the surrounding environment, including the soil, water, and wildlife. A spill or leak would result in direct, short-term and long-term, negligible, adverse impacts to the immediate soil, water, and vegetation. There would be indirect, long-term, negligible, adverse impacts due to spill potential of hazardous materials. A spill could migrate off-site or contaminate groundwater that then migrates off-site. Subsequent cleanup of a spill could result in minimal emissions migrating off-site from the treatment and disposal process.

CBP regulates the usage of these materials in an effort to prevent chemical contamination of the surrounding area. To prevent risk of hazardous exposure, CBP agents managing cleaners and solvents would:

- Document all chemicals used to clean a facility, including how many gallons are stored, a short description of how they are to be used, the type of hazard they present, and where they are stored;
- Include material safety data sheets and first-aid information with the documentation for each chemical product;
- Remove chemicals that are inactive, especially products in storage for more than six months;
- Evaluate all chemicals for safer yet equally effective cleaning alternatives;
- Keep cleaning chemicals in their original containers to ensure that the containers are clearly marked and labeled with the manufacturer's instructions for use and safety;
- Have secondary labels on hand for chemicals used from concentrates to reduce the possibility of unlabeled bottles;
- Safely store cleaning chemicals away from direct sunlight, heat, and food items;
- Make sure unauthorized building occupants do not have access to chemicals;

- Store chemicals in well-ventilated areas and store some chemicals separately from others, when required per manufacturers' instructions;
- Use safety posters or safety graphics without words and multilingual chemical-use instructions to overcome language barriers;
- Encourage maintenance personnel to seek medical advice if any irritation or allergic reaction to a cleaning chemical develops; and,
- Continue to monitor the chemical safety program and provide ongoing training (Kauffman, 2006).

Ground, Aircraft, and Vessel Operations

Oil leaked from ground, aircraft, and vessel operations would result in direct, short-term and long-term, negligible, adverse impacts and indirect, long-term, negligible, adverse impacts. Hazardous materials, such as petroleum products, would be used throughout the northern border for various functions, including fueling machinery used to conduct on-road vehicle, ATV, snowmobile, and waterborne patrols. If leaked, the environmental effects of motor oil would be a concern for both air and water quality. These products could have effects on the soil, water, and vegetation in the immediate area.

In order to prevent accidental spills and releases of hazardous materials used while conducting manned and unmanned aerial surveillance patrols, CBP would follow proper procedures and perform regular maintenance and inspection of aircrafts. Fuels (e.g., jet fuel, diesel, and gasoline) would be stored in large storage tanks. CBP would give prompt attention to vehicle oil leaks as a means of preventing environmental motor-oil contamination. The hazardous wastes produced from these materials would be tracked to ensure proper identification, storage, transportation, and disposal, and implementation of waste minimization programs (USDHS, 2008a).

Oil leaked from vehicles would result in direct, short-term and long-term, negligible, adverse impacts. There would be indirect, long-term, negligible, adverse impacts due to spill potential of hazardous materials. A spill could migrate off-site or contaminate groundwater that then migrates off-site. Subsequent cleanup of a spill could result in minimal emissions migrating off-site from the treatment and disposal process.

Repair and Maintenance of Nonintrusive Inspection, Surveillance, and Support Equipment

Repairing and maintaining NII, surveillance, and support equipment would result in direct, short-term and long-term, negligible, adverse impacts due to the potential for battery leakage. There would also be indirect, long-term, negligible, adverse impacts due to spill potential of hazardous materials. A spill could migrate off-site or contaminate groundwater that then migrates off-site. Subsequent cleanup of a spill could result in minimal emissions migrating off-site from the treatment and disposal process.

Used batteries would be handled, managed, maintained, stored, and disposed of in accordance with applicable Federal and state rules and regulations for the management, storage, and disposal of hazardous materials, hazardous waste, and universal waste. To the extent practicable, all batteries would be recycled locally.

Other Activities Common to One or More Operations

Interdiction

There would be indirect, long-term, minor, adverse impacts due to spill potential of seized hazardous materials. Interdiction of hazardous materials crossing the border would result in direct, short-term and long-term, minor, beneficial impacts. Potential sources of pollution from hazardous wastes could occur in the WOR Region of the northern border from the transboundary movement of hazardous materials/wastes and abandoned or illegal hazardous-waste sites (USDOJ, 2001). When hazardous materials are intercepted at the border, the likelihood of accidental or purposeful release is greatly reduced.

The seizure of hazardous materials, such as fireworks, explosives, and freon, would be a last resort as a possible enforcement action. In any potential hazmat situation, the involved CBP officer would explore various alternatives to dispose of the violation. In the event that seizure is necessary to force compliance, the seizing officer and the CBP Fines, Penalties, and Forfeitures (FP&F) officer would consider the use of a constructive seizure agreement in consultation with other involved agencies, such as the Consumer Products Safety Commission, USEPA, or DOT, to avoid the expense of special storage by national seized-property contractors. If seizure would be necessary to support a criminal prosecution, the FP&F officer would task the national seized-property contractor to provide appropriate storage (Sobel, 2010).

In the event that seizure was performed, all hazardous materials seized by CBP would be logged, stored, and then collected by the national seized-property contractor, who then would be responsible for destroying (incinerating) the seized property or logging it and sending it to another agency for use as evidence (the more common situation). CBP has a few incinerators, but they are typically used for destroying illegal agricultural materials.

No seized hazardous materials would be stored in CBP permanent or temporary storage facilities. Any hazardous material not constructively seized would be transferred to the custody of the national seized-property contractor. In the case of “administrative custody,” where the property would be stored by a vendor of the national seized-property contractor but would not be consigned to the contractor (e.g., firearms and explosives), the original chain of custody Form 6051 would be placed in the seized-property file (Sobel, 2010).

The seized-property specialist would contact the national seized-property contractor to arrange pick-up and processing immediately on receipt of notification by seizing officers of a hazardous-materials seizure that is not released under a constructive seizure agreement (Sobel, 2010).

If CBP, in consultation with any other involved Federal agency, decided to authorize a disposition other than destruction, the disposition would be coordinated and in compliance with the other involved Federal agency to ensure that the disposition would be lawful and safe. The disposition order would specify any special instructions required by any involved Federal agency (Sobel, 2010).

There would be indirect, long-term, minor, adverse impacts due to spill potential of seized hazardous materials. A spill could migrate offsite or contaminate groundwater that then migrates

off-site. Subsequent cleanup of a spill could result in minimal emissions migrating off-site from the treatment and disposal process.

Operation of Firing Ranges and Armories

The main concern with outdoor firing ranges would be the fate and transport of heavy metals from bullets and bullet fragments accumulating in soil, resulting in direct, short-term and long-term, negligible, adverse impacts as well as indirect, long-term, negligible, adverse impacts. Of these metals, lead would be the predominant contaminant (Scott, 2001). Once leached into the soil, lead could then contaminate groundwater. If new firing ranges would be built or existing ranges undergo remediation, they would follow USEPA guidelines for remediation of outdoor firing ranges. The approach proceeds in several steps:

- Munitions fragments would be sifted from the soil and recycled. Doing so would make them exempt from hazardous-waste reporting and management requirements.
- The remaining soil would be sampled and analyzed to determine if the leachable level is at or above the USEPA limit of 5 mg/L. If it does not exceed the limits, the soil would be disposed of, reused, or left in place with no further action needed.
- If it exceeds the limit, the soil would be analyzed in layers to determine the extent of the contamination. Layers that do not exceed the limit would need no further action.
- Contaminated soil would be treated or disposed of by placement in a hazardous-waste landfill, on-site stabilization and solidification, and soil washing.

In older firing ranges, designers did not consider the impact of lead on the environment. Newer designs would incorporate technologies to reduce lead pollution (Scott, 2001).

Lead contamination on this scale would result in direct, short-term and long-term, minor, adverse impacts. There would also be indirect, long-term, negligible, adverse impacts due to spill potential of hazardous materials. A spill could migrate off-site or contaminate groundwater that then migrates off-site. Subsequent cleanup of a spill could result in minimal emissions migrating off-site from the treatment and disposal process.

8.14.2 FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE

Direct, short-term and long-term, negligible to minor, adverse impacts and indirect, long-term, negligible, adverse impacts under the Facilities Development and Improvement Alternative would be similar to the direct, short-term and long-term, negligible, adverse impacts under the No Action Alternative.

This alternative would focus on replacing existing facilities, such as BPS housing and other facilities, or making major modifications to permanent facilities, such as POEs, to allow agents, officers, and agricultural specialists within CBP to operate more efficiently and respond to situations more quickly. The construction or expansion of facilities would result in short-term increases in solid and electronic waste from demolition and disposal. Site-specific analysis would be necessary to check for hazardous materials, since construction may affect these materials if present.

Hazardous materials used during the maintenance and repair of buildings, such as POEs, would involve special hazards and the production of hazardous waste. Construction activities would use fuels, oils, lubricants, and other hazardous materials. An accidental release or spill of these substances could potentially occur (USDHS, 2003). A spill could migrate off-site or contaminate groundwater that then migrates off-site. Subsequent cleanup of a spill could result in minimal emissions migrating off-site from the treatment and disposal process.

Steps would be taken in an effort to reduce the likelihood of spills. Typical requirements regarding the management of hazardous wastes on a construction project would be to ensure that:

- All construction personnel are properly trained regarding management of hazardous wastes;
- Construction materials that are potentially hazardous are stored under watertight conditions but are still readily available for use;
- Hazardous waste collected from the project is stored and disposed of in a manner that is appropriate for that particular type of waste;
- The contractor is prepared to respond to spills or leaks that occur anywhere on the project site; and,
- Failure to clean up spills, or improper storage of hazardous materials, triggers sampling and analysis activities.

During all construction activities, mitigations would be used, including those listed in sub-Section 8.14.6 for the prevention of hazardous-material releases. This protects the environment as well as the workers and citizens in the surrounding area.

Direct, short-term and long-term, negligible to minor, adverse impacts under the Facilities Development and Improvement Alternative would be similar to the direct, short-term and long-term, negligible, adverse impacts under the No Action Alternative. Additionally, under the Facilities Development and Improvement Alternative, there would be direct, short-term and long-term, negligible, adverse impacts due to spill potential from increased amounts of hazardous materials onsite during construction, demolition, repair, and alteration activities. These could be, but are not limited to, diesel fuel, gasoline, paint, adhesives, and solvents. Hazardous materials associated with construction equipment would be used in accordance with Federal, state, and local regulations. Any spills from construction activities would be immediately contained and disposed of properly. Demolition activities would properly dispose of any hazardous materials, incorporate LEED criteria, and comply with the Federal Leadership in High Performance and Sustainable Buildings Guiding Principles.

There would be indirect, long-term, negligible, adverse impacts under the Facilities Development and Improvement Alternative due to the potential for spills during the transfer of hazardous materials both onsite and offsite, and subsequent processing would result in minimal emissions from the treatment and disposal process.

Impacts would be mitigated by following procedures for proper waste disposal and by complying with EO 13101, "Greening the Government through Waste Prevention, Recycling and Acquisition," and other applicable guidance and regulations (USDHS, 2006b).

8.14.3 DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE

The Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative would result in direct, short-term and long-term, negligible, adverse impacts and indirect, long-term, negligible, adverse impacts. The installation of new data infrastructure and technology systems would result in short-term increases in hazardous waste from demolition and disposal. A site-specific analysis to check for hazardous materials would be necessary since construction may affect these materials if present.

This alternative would focus on conducting more surveillance operations and deploying more and better surveillance and communication technologies. It would include either hiring additional USBP and OAM agents, or shifting these agents from other borders, to conduct surveillance and respond to situations. It would include improvements to the identification and inspection technologies used by OFO. It would also include continuing deployment of integrated and upgraded surveillance and telecommunications systems—such as remote sensors; short-range radar; remote- and mobile-video detection, inspection, surveillance and communications systems; new camera systems; and upgrades to stationary communications systems—that would improve CBP’s situational awareness and allow it to more efficiently and effectively direct its resources for CBVs interdiction.

During construction of new towers and access roads, the potential exists for petroleum, oil, and lubricant (POL) contamination due to storage of POL material for maintenance and refueling of vehicles and fuel storage tanks. On this scale, a spill or accidental release of hazardous materials would result in direct, short-term and long-term, negligible to minor, adverse impacts of the immediate area. Soil and water contamination is a possible consequence of an accidental release of hazardous materials on a construction site. There would be indirect, long-term, negligible, adverse impacts due to spill potential of hazardous materials. A spill could migrate off-site or contaminate groundwater that then migrates off-site. Subsequent cleanup of a spill could result in minimal emissions migrating off-site from the treatment and disposal process.

Activities to prevent the accidental release of POL would include primary and secondary containment measures. Cleanup materials such as oil mops would be maintained at each site for appropriate spill response. Drip pans would be provided for power generators and other stationary equipment to capture any POL spilled during maintenance activities or leaks from equipment (USDHS, 2008c). The installation of monopole communication towers would result in negligible, adverse impacts. CBP is currently working on the development of spill response plans for POL sites (Sobel, 2010).

All hazardous wastes and materials, including universal waste (such as batteries and fluorescent light bulbs) would be handled in accordance with applicable Federal and state laws and guidelines governing these items.

Repairing and maintaining these systems would result in direct, short-term and long-term, negligible, adverse impacts due to the potential for batteries to leak. There would also be indirect, long-term, negligible, adverse impacts due to spill potential of hazardous materials. A spill could migrate off-site or contaminate groundwater that then migrates off-site. Subsequent cleanup of a spill could result in minimal emissions migrating off-site from the treatment and

disposal process. Used batteries would be handled, managed, maintained, stored, and disposed of in accordance with applicable Federal and state rules and regulations. To the extent practicable, all batteries would be recycled locally.

Oil leaked from vehicles would result in direct, short-term and long-term, negligible, adverse impacts. There would be indirect, long-term, negligible, adverse impacts due to spill potential of hazardous materials. A spill could migrate off-site or contaminate groundwater that then migrates off-site. Subsequent cleanup of a spill could result in minimal emissions migrating off-site from the treatment and disposal process.

Following procedures for proper waste disposal and complying with EO 13101 and other applicable guidance and regulations would help mitigate potential impacts. With implementation of these procedures and regulations, the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative would result in direct, short-term and long-term, negligible, adverse impacts. There would be indirect, long-term, negligible, adverse impacts due to spill potential of hazardous materials. A spill could migrate off-site or contaminate groundwater that then migrates off-site. Subsequent cleanup of a spill could result in minimal emissions migrating off-site from the treatment and disposal process.

8.14.4 TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE

The Tactical Security Infrastructure Deployment Alternative would result in direct, short-term and long-term, negligible, adverse impacts and indirect, long-term, negligible to minor, adverse impacts. Only minor increases in the use of hazardous substances would occur as a result of the construction and maintenance of fences and roads. During construction and installation activities, fuels, oils, lubricants, and other hazardous materials would be used. An accidental release or spill of any of these substances could occur. A spill would result in potentially direct, short-term and long-term, negligible to minor, adverse impacts to onsite soils. However, the amounts of fuel and other lubricants and oils would be limited, and the equipment needed to quickly limit any contamination would be located onsite. There would be indirect, long-term, negligible, adverse impacts due to spill potential of hazardous materials. A spill could migrate off-site or contaminate groundwater that then migrates offsite. Subsequent cleanup of a spill could result in minimal emissions migrating off-site from the treatment and disposal process.

This alternative would focus on constructing additional barriers, such as selective fencing or vehicle barriers, at selected points along the border to deter and delay CBVs, as well as access roads and related facilities to increase the mobility of USBP agents for surveillance and response. This alternative would hinder CBVs and improve CBP's capability to respond quickly and effectively.

POLs would be stored at temporary staging areas to maintain and refuel construction equipment. However, these activities would include primary and secondary containment measures. Cleanup materials such as oil mops would also be maintained at the site to allow immediate action in case an accidental spill occurs, in accordance with the project's Spill Prevention, Control, and Countermeasures Plan (SPCC). Drip pans would be provided for power generators and other stationary equipment to capture any POL spilled during maintenance activities or leaks from equipment. Sanitary facilities would be provided during construction activities, and waste

products would be collected and disposed of by licensed contractors. No gray water would be discharged to the ground.

Oil leaked from vehicles would result in direct, short-term and long-term, negligible, adverse impacts. There would be indirect, long-term, negligible, adverse impacts due to spill potential of hazardous materials. A spill could migrate off-site or contaminate groundwater that then migrates offsite. Subsequent cleanup of a spill could result in minimal emissions migrating offsite from the treatment and disposal process.

8.14.5 FLEXIBLE DIRECTION ALTERNATIVE

The Flexible Direction Alternative would result in combinations of alternatives for CBP to choose from in an effort to adapt to changes in threat levels. Hazardous-material impacts would vary depending on the chosen mix of security measures. Choosing this alternative would allow CBP to follow any of the above alternatives based on what it judges to be most effective to respond to the changing threat environment. It is impossible to predict what portion of the overall mix each of the above directions is likely to be needed at any time, and the needed mix is likely to change constantly because the threat environment changes constantly. Therefore, CBP is assessing the maximum scope of impact that might result from selecting this alternative as the sum of the impacts that would result from full implementation of all three action alternatives. This would result in direct, short-term and long-term, negligible to minor, adverse impacts due to spill potential of hazardous materials. There would also be indirect, long-term, negligible to minor, adverse impacts for the same reason. A spill could migrate offsite or contaminate groundwater that then migrates offsite. Subsequent cleanup of a spill could result in minimal emissions migrating off-site from the treatment and disposal process.

8.14.6 BEST MANAGEMENT, MINIMIZATION, AND MITIGATION

CBP seeks to avoid, minimize, repair, and reduce the impacts of its actions on the human environment. It does so with a combination of BMPs, siting plans, design strategies, mitigation measures, and monitoring plans best suited to the scale and location of a particular action. Towards that end, in implementing its proposed action CBP could choose from among the following actions to avoid or minimize impacts resulting from hazardous or regulated materials and waste.

Mitigations would be implemented as standard operating procedures during all construction activities and would include proper handling, storage, or disposal of solid and hazardous or regulated materials (USDHS, 2008c). To minimize potential impacts from hazardous and regulated materials, all fuels, waste oils, and solvents would be collected and stored in tanks or drums within a secondary containment system that consists of an impervious floor and bermed sidewalls. The refueling of machinery would be completed in accordance with accepted industry and regulatory guidelines, and all vehicles would be required to have drip pans during storage to contain minor spills and drips. Although a major spill would be unlikely to occur, any spill of reportable quantity would be contained immediately within an earthen dike, and the application of an absorbent (e.g., granular, pillow, sock) would be used to absorb and contain the spill.

Lead pipe or lead-painted metal would be removed before renovation or demolition or separated from the demolition waste pile. They could also be recycled as scrap metal. Lead in batteries or fluorescent lamps that could be recycled or disposed of as universal waste has less stringent

management requirements than waste that can be disposed of as dangerous waste. High-intensity discharge lamps with regulated amounts of lead could not be disposed of as universal wastes. They would be managed as dangerous wastes (ECY, 2010).

All waste oil and solvents would be recycled. All nonrecyclable hazardous and regulated wastes would be collected, characterized, labeled, stored, transported, and disposed of in accordance with all Federal, state, and local regulations, including proper waste manifesting procedures. To ensure oil pollution prevention, a SPCC plan would be in place prior to the start of construction activities, and all personnel would be briefed on the implementation and responsibilities of this plan as is typical in CBP/Secure Border Initiative projects. A spill of any petroleum liquids (e.g., fuel or material listed in 40 CFR 302, Table 302.4) of a reportable quantity would be cleaned up and reported to the appropriate Federal and state agencies (USDHS, 2008c).

USEPA's mitigations for outdoor firing ranges call for reclaiming lead and recycling it into new shot and bullets. This would reduce the amount of virgin lead that would have to be mined. CBP would implement strategies to help prevent lead contamination. Probably the most promising pollution prevention strategy for both indoor and outdoor firing ranges is the development of the "green bullet." Rather than lead, this new bullet is a slug made from tungsten and tin. Tungsten is a non-toxic metal with a higher density than lead. The material can easily be pressed into shape to replace many small-caliber bullets (Scott, 2001).

8.14.7 SUMMARY OF POTENTIAL IMPACTS

Table 8.14-1 summarizes the potential impacts on the human environment of CPB activities involving hazardous and otherwise regulated materials.

Table 8.14-1. Summary of Potential Impacts of Hazardous and Otherwise Regulated Materials

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
NO ACTION ALTERNATIVE					
Small construction projects (< 1 acre and < 1/4 mile: e.g., minor repairs to facilities, parking lot repairs, access road repairs)		⊗			
Large construction projects (> 1 acre and > 1/4 mile: e.g., repairs to facilities, parking lot repairs, access road repairs)		⊗			
Small on-site trade and travel processing operations	⊗				
Large on-site trade and travel processing operations	⊗				
Checkpoint operations	⊗				

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
Ground operations—motorized, onroad	⊗				
Ground operations—motorized, offroad	⊗				
Ground operations—nonmotorized	⊗				
Aircraft operations	⊗				
Vessel operations	⊗				
Operation of NII systems	⊗				
Other activities common to one or more operations (interdiction, firing ranges, armories)		⊗			⊗
OVERALL IMPACT		⊗			⊗
FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE					
Small construction projects (< 1 acre and < 1/4 mile: reconstruction or construction of new POEs, USBP structures, parking lot repairs, access road repairs)		⊗			
Large construction projects (> 1 acre and > 1/4 mile: reconstruction or construction of new POEs, USBP structures, parking lot repairs, access road repairs)		⊗			
New small on-site trade and travel processing operations	⊗				
New large on-site trade and travel processing operations	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)	⊗	⊗			
DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE					
Small construction projects (towers and other infrastructure to mount antennas)	⊗				
Ground operations—motorized, onroad	⊗				
Ground operations—motorized, offroad	⊗				

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
Ground Operations—nonmotorized	⊗				
Aircraft operations	⊗				
Vessel operations	⊗				
Operation of NII systems	⊗				
Operation of sensor and other technologies	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)	⊗				
TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE					
Small construction projects (trench cuts, towers, minor access roads, and fences)		⊗			
Large construction projects (access roads and fences)		⊗			
OVERALL IMPACT (INCLUDING NO ACTION)	⊗	⊗			
FLEXIBLE DIRECTION ALTERNATIVE					
Small construction projects		⊗			
Large construction projects		⊗			
Small on-site trade and travel processing operations	⊗				
Large on-site trade and travel processing operations	⊗				
Checkpoint operations	⊗				
Ground operations—motorized, onroad	⊗				
Ground operations—motorized, offroad	⊗				
Ground operations—nonmotorized	⊗				
Aircraft operations	⊗				
Vessel operations	⊗				
Operation of NII systems	⊗				
Operation of sensor and other technologies	⊗				

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
Other activities common to one or more operations (interdiction, firing ranges, armories)		⊗			⊗
OVERALL IMPACT (INCLUDING NO ACTION)	⊗	⊗			

8.15 ENVIRONMENTAL CONSEQUENCES TO UTILITIES AND INFRASTRUCTURE

This section analyzes potential adverse and beneficial impacts to utilities and infrastructure from current and potential future CBP activities in each of the four regions.

Utilities and infrastructure refer to the systems of public works, utilities, and transportation networks that provide the basic framework for a community. Utilities include water, power supply, and waste management. Transportation networks are discussed separately in Section 8.16, Roadways and Traffic, which follows this section. Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly man-made with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as urban or developed. For descriptions of the regional affected environments for utilities and infrastructure see Sections 4.15.2 (WOR Region), 5.15.2 (EOR Region), 6.15.2 (Great Lakes Region), and 7.15.2 (New England Region).

Across the northern border as a whole, all alternatives are likely to continue to use the same facilities, technologies, activities, and infrastructure that are in use or currently planned by CBP. Any long-term, adverse, direct, and indirect impacts to utilities and infrastructure from the No Action Alternative, the Facilities Development and Improvement Alternative, and the Tactical Security Infrastructure Deployment Alternative would be negligible; impacts under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative and the Flexible Direction Alternative would be minor. Electricity is provided to most CBP facilities by a grid system, and drinking water and sewage treatment are provided by municipal piping systems or on-site wells and septic tanks. Overall, the projected demand on these systems due to construction or modernization of CBP's facilities would not be expected to exceed their capacities. Infrastructure maintenance, repair, and alterations at existing CBP facilities would follow BMPs as well as CBP's policy to mitigate adverse impacts through a sequence of avoidance, minimization, and compensation measures. Given the minor increase in demand on utilities required for the continued and proposed CBP activities, the capacities of the existing systems are likely adequate to meet current and foreseeable future demand.

Although no significant adverse impacts were identified through the analysis of this section that would require mitigation measures to reduce impacts to non-significant levels, CBP would use efficiency-increasing BMPs to mitigate or minimize impacts to utilities and infrastructure. The following activities are expected to have no impacts to utilities and infrastructure because their footprint is too small or indirect to cause any noticeable change or degradation of existing uses:

- Construction of pedestrian or vehicle fences or other physical barriers;
- Construction (extensions, upgrades, or repairs) of access roads, fences, drag roads, bridges, culverts, and low-water crossings;
- Ground surveillance and situational response activities (motorized and nonmotorized, use of UGS and other technology);
- Aircraft surveillance and situational response activities; and,
- Maritime surveillance and situational response activities.

The current and proposed CBP activities that would cause an increase in demand would produce impacts below the significance threshold, since the capacities of existing utility systems would be adequate to meet current and foreseeable demand. All direct and indirect, adverse impacts to utilities would be negligible to minor for the five alternatives across the northern border. Beneficial impacts would occur because replacement systems would invariably be more efficient. Similarly, the cumulative impacts of CBP activities under all alternatives, when analyzed in conjunction with non-CBP activities, would be negligible to minor due to the incremental, increased demand on utility resources. Beneficial impacts would occur from the addition of electrical and fuel supplies.

8.15.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, CBP would (1) continue the current level of operations at facilities in use or currently planned, and (2) continue to maintain and repair facilities, technology, and infrastructure at their current level as described in Section 2.3. These activities would not strain the capacity of existing utility resources and would have negligible, adverse and beneficial impacts. The discussion of utilities and infrastructure in each of the four regions is driven by the types of impacts to utility resources that CBP's actions have produced in the past and could produce in the future. The types of CBP actions that could produce utility impacts include:

- No more than 20 small construction projects, currently under way or in the planning phase that are close to or already under construction; including repairs and maintenance or minor modifications to existing POEs and BPSs, utility system upgrades, small additions to OAM facilities, and technology support infrastructure;
- No more than 15 large construction projects, including modification to POEs and construction or modernization of BPSs already in the planning phase and close to or already under construction;
- About 30± small, on-site trade and travel processing operations;
- About 100± checkpoint operations per day;
- Operation of NII technologies for 1,000± hours per day; and,
- Operation of sensor and other technologies for 1,500± hours per day.

Long-term, adverse and beneficial impacts to utilities and infrastructure from the No Action Alternative would be negligible. Electricity is provided to most CBP facilities by a grid system, and drinking water and sewage treatment are provided by municipal piping systems or on-site wells and septic tanks. Overall, the projected demand on these systems due to construction of small or large CBP facilities would not be expected to exceed their capacities.

Infrastructure maintenance, repair and alterations, and modifications at existing CBP facilities would follow a suitable combination of BMPs, siting plans, design strategies, mitigation measures, and monitoring plans to lessen the severity of impacts (as described below in Section 8.15.6), and thus would have a negligible impact on utility resources. Site-specific analysis would be conducted for any given project to ensure that it would not cause utility overstrain.

Small Construction Projects

Repairs and Maintenance or Minor Modification to Existing POEs and BPSs

Repairs and maintenance or minor modification to existing facilities are routine, and as such would not strain the existing capacities of utility resources and have negligible, adverse and beneficial impacts. These repairs and maintenance activities could include replacement of individual utility systems, such as replacement of a septic system; construction of a potable water well with new piping, pumps, treatment systems, and storage tanks; relocation of electrical and telephone lines (transferring them underground); construction of on-site renewable energy-generating sources; and construction of sidewalks, entrances, and structures.

Interim repairs and alterations (R&A) to address immediate, emerging needs of an existing POE might be undertaken as needed until new construction is completed.

R&A may include, but is not limited to, upgrades to meet electrical capacity and local code compliance; provision of a back-up generator capable of covering all short-term power requirements, full emergency power capacity, and adequate HVAC; provision of vehicle control systems; upgrades of interior space; and updates to information systems and data connectivity. Routine repairs, maintenance, modifications, alterations, and upgrades of utility systems are not expected to increase demand on water, energy, or wastewater systems and thus would have a negligible, adverse and beneficial impact on utility resources. Impacts would be beneficial when on-site renewable energy-generating sources are constructed and utility systems are replaced to be more efficient.

Small Additions to OAM Facilities

Since small additions to OAM facilities would not strain existing utility capacities, impacts would be negligible and adverse and beneficial. OAM leases facilities from military and commercial airfields and airports, as well as marina berths. It leases commercial space from Government agencies, such as the U.S. Coast Guard, or commercial marinas. A construction program is not likely to be implemented in the future in leased space, and small additions to OAM facilities should not strain utility capacities. These small additions would be limited to interim R&A to address immediate, emerging needs of an OAM facility until new construction is completed.

R&A may include, but is not limited to, upgrades to meet electrical capacity and local code compliance; provision of a back-up generator capable of covering all short-term power requirements, full emergency power capacity, and adequate HVAC; provision of vehicle control systems; interior space upgrades; and updates to information systems and data connectivity. R&A made to OAM facilities are not expected to increase demand on utility capacities, so impacts would be negligible and adverse and beneficial (when utility systems are upgraded to be more efficient).

Technology Support Infrastructure

Construction of technology support infrastructure such as RVSS and radio communication towers in each of the four regions would not strain existing energy and communication resources; so impacts would be negligible. Construction of communication towers would include installation of underground and overhead power lines to connect to commercial,

electrical grid power. Construction of communication towers would also include installation of battery back-up power systems for telecommunication equipment including microwave transmission, surveillance cameras, and radar dishes on towers. Such technologies require grid power and generators with propane fuel tanks as secondary back-up generators; use of these fuel sources would increase demand for energy resources and fuel needed for generators.

In the past, CBP has followed BMPs as well as its own policy to mitigate adverse impacts through a sequence of avoidance, minimization, and compensation. If BMPs and mitigation measures are implemented, capacities of energy and communication systems would not be exceeded; thus, adverse impacts would be negligible. Beneficial impacts would occur where on-site renewable energy-generating sources are constructed and utility systems are replaced to be more efficient.

Large Construction Projects

Construct a New BPS

Construction of completely new BPSs in new locations that are already underway or are advanced in the planning process would increase demand on electrical, water, wastewater, and fuel supply capacities; however, by following the prescribed design and construction standards, negligible, adverse impacts are expected on utility resources. Construction would include installation of about 0.1 miles of underground or overhead power and telephone lines, an emergency generator with a diesel or propane tank, approximately four propane tanks for HVAC, and exterior lighting, as well as provision of a potable water supply and sewage disposal. In urban areas, new BPSs would connect to the municipal water supply and municipal sewer system. In rural areas, construction of a new facility would include installation of an on-site potable well, including pipes and storage tanks, as well as installation of an on-site septic tank and associated drainage field. Most construction includes the use of diesel fuel for primary or emergency electricity.

The location of the new station would be compliant with the U.S Border Patrol Facilities Design Guide (Design Guide) to Incorporate LEED Certified Construction standards, as well as with the siting criteria that support operation requirements of the stations, such as “availability of utilities (water, sewage, power, and communications).” Therefore, construction of these facilities would be expected to create only negligible impacts to utility resources (USDHS, 2003c).

Major Modifications to POEs and BPSs

Major modifications to POEs and BPSs, either already underway or in the advanced planning stage, follow the POE Guide and Design Guide; so impacts to all utility resources are expected to be negligible. Major modifications of existing POEs and BPSs include modernization, which can range from renovations and alterations to complete facility replacements. Upgrades could include several or all of the following: adding electrical capacity; replacing water treatment systems; updating infrastructure and telephone and data connectivity; and increasing lighting around the building and inspection areas.

Major POE and BPS modification projects may include demolition of existing structures and construction of new structures on essentially the same site for POEs, or on a different site for BPSs. This could include installing about 0.1 miles of underground or overhead power and

telephone lines, and replacing a communication tower or septic system as well as connecting to the municipal water supply, where possible, or constructing a new potable well, with piping, pumps, treatment systems, and storage tanks.

Construction of a new ancillary building would require additional propane tanks for HVAC and emergency generators. When possible, construction of a new ancillary building would include establishment of on-site renewable energy-generating sources. All modernized POEs are expected to maintain current staffing levels and hours of operation, so no measurable increases in POE utility consumption would be expected. All impacts to utility resources are expected to be negligible and adverse and beneficial, since the POE Guide and Design Guide prescribe more sustainable and energy-efficient utilities, which would create long-term and beneficial impacts by increasing the capacity and operating efficiency of utility infrastructure.

Small Onsite Trade and Travel Processing Operations

Continued operations at the 20± small operations in the New England and WOR regions; 10± small operations in the Great Lakes Region; and 30± small operations in the EOR Region along with the anticipated 100± checkpoint operations per day in each of the 4 regions would be expected to cause negligible, adverse impacts on utility resources. CBP defines one small POE trade and travel operation as all operations at discrete POEs or fixed checkpoints processing fewer than 10,000 crossings per day. POEs are generally connected to county or municipal sewer, water, and electrical utility systems. Many of these facilities have an onsite emergency electric generator with diesel fuel tanks; the tanks must be refilled as needed. Where municipal utilities are unavailable, POEs are equipped with their own septic systems, water supply wells, and generators. Operations might include pumping septic tanks once every three months to two years, depending on a tank's remaining capacity, and providing treatment twice a year. Facilities that use propane or natural gas for HVAC, or that use propane or diesel-powered emergency generators and store the fuel in onsite tanks, would refill tanks as needed. Based on analyses of impacts produced at comparable POEs, processing operations would produce negligible, adverse impacts (USDHS, 2010a).

Large Onsite Trade and Travel Processing Operations

Continued operations at the four POEs with more than 10,000 crossings per day, located in the Great Lakes and WOR Regions, would be expected to create negligible impacts. Large POEs are generally connected to county or municipal sewer, water, and electrical utility systems. Some are also equipped with telecommunication facilities, antennas, and other telecommunications equipment to support radio communications. Based on analyses of impacts produced at comparable POEs, and given the current level of demand on utilities, processing operations will not exceed utility capacities and therefore produce negligible, adverse impacts (USDHS, 2010b).

Operation of NII Systems

Continued operation of NII technologies would not strain the existing capacity of energy resources, so impacts are expected to be negligible. NII systems include large-scale, X-ray and gamma-ray imaging systems and radiation detection technology, such as gamma-imaging inspection systems and personal radiation detectors, radioactive isotope identifiers (RIIDS), and HEXRIS. To process people, all POEs are linked to the Integrated Automated Fingerprint

Identification System (IAFIS) and Advance Passenger Information System (APIS). CBP prepared a programmatic EA for the introduction of the gamma-imaging inspection system in 2004, and concluded that “sufficient public service utility capacity will exist at POEs to adequately handle operation of VACIS[®] (Vehicle and Cargo Inspection System, a gamma-imaging inspection system) installations” (USDHS, 2004). Thus, continuing with approximately 1,000 hours of operation per day in each of the 4 regions would have a negligible impact on utility resources.

Operation of Other Technologies

Operation of other inspection technologies would not strain the capacity of current energy resources and are expected to have negligible impacts. Technologies would include remote video surveillance, electronic sensors, or other X-ray type equipment that use gamma ray technology to examine contents of vehicles. Continuing approximately 1,500 hours of operation per day would not be expected to increase energy demand and would therefore have a negligible impact.

Checkpoint Operations

The 100± checkpoint operations anticipated per day are not expected to strain existing electrical, water, wastewater, and fuel resources, and they would have negligible impacts on utilities. Traffic checkpoints involve inspections of interior-bound conveyances, including passenger vehicles (e.g., cars, trucks, vans, buses) and container and similar cargo trucks. Checkpoints, in some cases, include temporary support buildings to provide office and holding space, as well as lights, signage, and other support equipment. Set-up and maintenance of mobile traffic checkpoints consists of a small number of USBP vehicles used by agents to drive to the location. Each location includes a portable water supply and rest facility, and some may also require lighting if operated at dusk or at night. Mobile traffic checkpoints are temporary installations; thus, impacts to utilities would be short term, negligible, and adverse.

8.15.2 FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE

The Facilities Development and Improvement Alternative would focus on providing for current and projected space needs that would enable USBP agents to operate more efficiently and respond to situations more quickly. The overall staffing levels of officers would change as needed to meet the purpose of the expanded and new facilities beyond those already planned and discussed in the No Action Alternative. Included also in this alternative is the construction of new semi-permanent and temporary facilities, such as FOBs, necessary to support CBP law enforcement agents and officers as they carry out operational duties.

Since CBP seeks to reduce and avoid impacts through a sequence of avoidance, minimization, mitigation, and compensation measures, modifying and constructing permanent and temporary facilities would not cause existing utility capacities to be exceeded. This alternative would create long-term, minor, adverse impacts to utility systems for each region. In addition, beneficial impacts would occur where on-site renewable energy systems and more efficient utility systems are constructed.

Site-specific analyses would be conducted for any given project to ensure that it would not cause utility overstrain. The increased demands from the Facilities Development and Improvement

Alternative would add long-term, minor, adverse, cumulative impacts to utility supplies serving project sites.

Small Construction Projects

The construction of no more than 30 small projects slated to take place in each region over the next 5 to 7 years (beyond those 20 or so already planned) would have negligible impacts to utilities, similar to those discussed in the No Action Alternative but not necessarily more severe. More repairs and maintenance and modifications to existing POEs and BPSs, small additions to OAM facilities, and construction of technology support infrastructure would not be expected to strain existing utility capacities. Following BMPs, design strategies, mitigation measures, and monitoring plans to avoid or lessen adverse impacts wherever possible should mean that the expected increase in demand on utilities will not exceed their maximum supply capacities; therefore, impacts would be negligible and adverse. Impacts would also be beneficial when water, wastewater, and energy systems are replaced or upgraded to be more efficient.

Large Construction Projects

The construction, or major modification of roughly 20 CBP facilities (beyond the 15 or so already planned) to take place in each region over the next 5 to 7 years would have impacts similar to those discussed under the No Action Alternative, though impacts would be more severe since this alternative includes an increase in overall staffing levels to meet the purpose of the expansion or new facility.

Construction of completely new BPSs in a new location, in addition to those discussed in the No Action Alternative, would increase demand on electrical, water, wastewater, and fuel supply capacities. However, compliance with the Design Guide to incorporate LEED Certified Construction standards, as well as the siting criteria would ensure the ample availability of utility system capacities. It is assumed that the new structures would be constructed in close proximity to those they are replacing, utilizing existing infrastructure to transport water, natural gas, and electricity to the site.

Major modifications to CBP facilities would have impacts similar to those discussed in the No Action Alternative, producing beneficial impacts where outdated utility systems are made more efficient. This alternative proposes to achieve LEED certification, which aims to reduce the demand on such utilities. Given the negligible to minor increase in demand on utilities required for the proposed construction and modernization activities, the capacities of the existing systems should be adequate to meet current and foreseeable future demand.

Construct Permanent and Temporary Facilities

Included also in this alternative is the construction of permanent and temporary facilities, such as FOBs, housing (where local housing stock may not be readily available), and temporary checkpoints. Such construction would increase short-term demand for utility resources.

Since FOBs are by definition self-contained, stand-alone sites that CBP establishes in remote areas, construction would typically include carrying portable supplies of potable water, generators, and waste disposal by truck, by horse, and, if necessary, by helicopter where motorized vehicles are not allowed. FOBs provide living and office accommodations for USBP agents operating remotely; agents also camp as necessary.

The setup and maintenance of mobile traffic checkpoints consist of a small number of USBP vehicles used by agents to drive to the location. Each location includes a portable water supply and rest facilities, and some may also require lighting if operated at dusk or at night. Mobile traffic checkpoints are temporary installations; thus, impacts to utilities would be short-term, minor, and adverse.

8.15.3 DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE

Under this alternative, future changes in the program would focus on deploying more effective surveillance and communications technologies in order to process visitors and cargo more rapidly. This would create the need for additional support infrastructure in the form of poles and towers in many locations, and would produce negligible impacts to energy and fuel resources.

The greater use of technological and communications security tools would have negligible to minor impacts on energy resources. CBP shares use of existing towers with other law enforcement agencies to the extent possible, which would reduce the expected increase in energy and water demand. Even when new construction or new deployments are required, the minor energy, water, and waste demands would be well within existing capacities. Site-specific analysis would be conducted for any given project to ensure it would not cause utility overstrain. Therefore, the cumulative, as well as overall, impact to utility resources would be negligible.

Small Construction Projects

The construction of approximately 100 additional support infrastructure elements (in the form of poles and towers) beyond those already planned in the No Action Alternative would increase demand on energy and fuel and have negligible to minor, adverse impacts on utilities.

Technologies requiring grid power and generators and propane fuel tanks as secondary back-up generators, would increase demand for energy and fuel. To the extent practicable, CBP would use existing structures—buildings and towers of appropriate heights or towers shared with other law enforcement agencies—for mounting antennas and RVSSs, to reduce the overall impacts of tower and pole construction. This would reduce impacts to energy and fuel resources, resulting in negligible to minor, adverse impacts.

Operation of NII Systems

Increasing the total hours of operation of NII technology to 1,500 hours per day across the region could increase energy demand over that of the No Action Alternative and cause minor impacts. Site-specific analysis would be necessary at a given location to determine local transmission constraints, but a net increase of 500 hours of operation would be expected to produce only minor impacts to utility resources.

Operation of Sensor and Other Technologies

Increasing the total hours of operation to a maximum of 2,500 hours of operation per day for technologies such as remote video surveillance, electronic sensors, gamma-imaging inspection system machines, or other X-ray equipment that uses gamma ray technology to examine contents of vehicles could increase the demand on energy resources and produce minor impacts. While a net increase of 0 hours of operation would produce negligible impacts to energy resources, as

discussed in the No Action Alternative, a net increase of 1,000 hours of operation would produce adverse but minor impacts to energy.

8.15.4 TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE

The Tactical Security Infrastructure Deployment Alternative would focus on constructing about 30 additional trench cuts, towers, minor access roads, and fences—beyond those already planned—at selected points in each of the 4 regions. This alternative includes the construction of no more than five access roads and fences longer than a quarter of a mile, none of which would impact utility resources.

The operational activities included in the Tactical Security Infrastructure Deployment Alternative would have negligible, direct, indirect, and cumulative impacts to utility resources, as supply capacities would remain virtually unaffected. Since the construction of towers, discussed above as having negligible impacts, is the only action in this proposed alternative that would impact utility resources differently than would the No Action Alternative, impacts to utility resources would be negligible.

8.15.5 FLEXIBLE DIRECTION ALTERNATIVE

The Flexible Direction Alternative would include the full implementation of all three action alternatives; it therefore represents the maximum envelope of impact that might result. The activities carried out under this alternative would never exceed the sum of the activities of the other alternatives, whose ceiling would be defined as: 160± small construction projects, 25± large construction projects, around 100 total checkpoint operations per day, 1,500 hours of operation per day of NII systems, and 2,500 hours of operation per day of sensor and other technologies in each region. These aggregate actions would produce minor impacts to utility resources and would produce the greatest impact to utility resources of the four alternatives.

Long-term, adverse impacts to utilities and infrastructure from the Flexible Direction Alternative would be minor and adverse. Even with the increased demand on utilities required for the Flexible Direction Alternative, the capacities of existing systems are likely to be adequate to meet current and foreseeable future demand. Site-specific analysis would be conducted for any given project to ensure that it would not cause utility overstrain. This alternative would produce long-term, minor, and adverse, cumulative impacts, since current utility supply capacities would not be exceeded.

Small Construction Projects

Construction of no more than 160± small projects, beyond those already planned, could produce minor impacts to all utility resources. This might include more repairs and maintenance to existing POEs and BPSs, small additions to OAM facilities, and construction of technology support infrastructure, and would have minor impacts on energy and fuel resources. Following BMPs to avoid or lessen adverse impacts wherever possible for all small construction projects should mean that the expected increase in demand to utilities will not exceed their maximum supply capacities; therefore impacts would be minor.

Large Construction Projects

Impacts from construction of fewer than 25± additional large construction projects would likely produce minor impacts to utilities. There would be efficiency gains from constructing new systems using CBP sustainability parameters, but overall demand would still likely increase due to the volume of new sources of demand. Since the capacities of the existing systems would still be expected to be adequate to meet current and foreseeable future demand, adverse impacts would be minor.

Operation of NII Systems

As discussed in the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, a net increase of 500 hours of operation would produce minor, adverse impacts to utility resources.

Operation of Sensor and Other Technologies

As described in the Detection, Inspection, Surveillance and Communications Technology Expansion Alternative, a maximum net increase of 1,000 hours of operation would increase demand on energy resources. Increasing the total hours of operation to 2,500 would produce adverse and minor impacts to energy.

8.15.6 BEST MANAGEMENT, MINIMIZATION, AND MITIGATION

CBP seeks to avoid, minimize, repair, and reduce the impacts of its actions on the human environment. It does so with a combination of BMPs, siting plans, design strategies, mitigation measures, and monitoring plans best suited to the scale and the location of the particular action. Although no significant, adverse impacts were identified through the analysis of this section that would require mitigation measures to reduce impacts to non-significant levels, CBP could choose from among the following actions to avoid or minimize impacts to utilities and infrastructure:

- Use strategies that in aggregate use at least 20 percent less potable water than the indoor water-use baseline calculated for the building, after meeting fixed performance requirements under the Energy Policy Act of 1992 (USDHS, 2010a);
- Use water-efficient landscape and irrigation strategies, including water reuse and recycling, to reduce outdoor potable water consumption by at least 50 percent over that consumed by conventional means (USDHS, 2010a);
- Maintain existing facilities and infrastructure, replacing those facilities and infrastructure as needed to sustain current operations in accordance with BMPs, working with Government agencies to comply with the respective regulations and avoid adverse impacts wherever possible; wherever reasonable and possible to do so, lessen unavoidable adverse impacts through cooperative efforts with the appropriate agencies (Grone, et al., 2006); and,
- When constructing new, individual utilities, such as replacing a septic system, implement green building strategies to achieve a minimum “Certified” rating under the LEED New Construction and Major Renovation Version 3.0, and comply with Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding (Grone, et al., 2006).

8.15.7 SUMMARY OF POTENTIAL IMPACTS

Table 8.15-1 summarizes the potential impacts of CBP’s alternatives on utility resources.

Table 8.15-1. Summary of Potential Utility Impacts

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
NO ACTION ALTERNATIVE					
Small construction projects (< 1 acre and < 1/4 mile: e.g., minor repairs to facilities, parking lot repairs, access road repairs)	⊗				
Large construction projects (> 1 acre and > 1/4 mile: e.g., repairs to facilities, parking lot repairs, access road repairs)	⊗				⊗
Small onsite trade and travel processing operations	⊗				
Large onsite trade and travel processing operations	⊗				
Checkpoint operations	⊗				
Operation of NII systems	⊗				
Operation of sensor and other technologies	⊗				
OVERALL IMPACT	⊗				
FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE					
Small construction projects (< 1 acre and < 1/4 mile: reconstruction/of new POEs, USBP structures, parking lot repairs, access road repair)	⊗				
Large construction projects (> 1 acre and > 1/4 mile: major modification to POEs or USBP structures, construction of new BPS, parking lot repairs, access road repairs)	⊗				⊗
Small onsite trade and travel processing operations	⊗				
Large onsite trade and travel processing operations	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			⊗

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE					
Small construction projects (towers and other infrastructure to mount antennas)	⊗	⊗			
Operation of NII systems	⊗	⊗			
Operation of sensor and other technologies	⊗	⊗			
OVERALL IMPACT (INCLUDING NO ACTION)	⊗	⊗			
TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE					
Small construction projects (trench cuts, towers, minor access roads and fences)	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)	⊗				
FLEXIBLE DIRECTION ALTERNATIVE					
Small construction projects		⊗			
Large construction projects	⊗				⊗
Small onsite trade and travel processing operations	⊗				
Checkpoint operations	⊗				
Operation of NII systems		⊗			
Operation of sensor and other technologies		⊗			
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			

8.16 ENVIRONMENTAL CONSEQUENCES TO ROADWAYS AND TRAFFIC RESOURCES

This section outlines the potential adverse and beneficial impacts of CBP's alternative actions on transportation resources within the region. Effects would be less than major unless the activity would need to establish new roads or permanently close existing roads.

The northern border study area contains many locations that could experience impacts to transportation as a result of implementation of any of the alternatives. The United States relies heavily on a vast transportation network to expedite the flow of goods and people to and from Canada. Providing efficient border crossing, while providing the highest level of security and safety for all motorists, is of utmost importance. Over the past decade, many POEs have received technological and highway safety-related upgrades. States and municipalities maintain roadways leading to the borders to allow for tourism and trade in their areas.

CBP's activities affecting roadways and traffic include enforcement of customs, immigration, and agriculture regulations at United States borders, and CBP has primary responsibility for preventing unlawful entry into the United States while ensuring the safe and efficient flow of goods and people. For the northern border as a whole, these activities are focused around the POEs, but construction activities, the operation of other facilities, and patrol activities could have some effects on transportation resources. For descriptions of the regional affected environments for roadways and traffic, see Sections 4.16.2 (WOR Region), 5.16.2 (EOR Region), 6.16.2 (Great Lakes Region), and 7.16.2 (New England Region).

Across the northern border as a whole, all of the alternatives could potentially cause significant adverse effects to transportation resources in two specific situations: (1) the establishment of a new road, or (2) the permanent closure of an existing road or POE. However, other CBP activities are specifically designed to increase traffic throughput at POEs, to speed border crossings, or to reduce the number of on-road and off-road CBP patrols. These activities have beneficial effects on transportation resources and for all of the alternatives across the northern border as a whole, would result in only minor, adverse, direct and indirect effects to transportation resources. Notably the vast majority of CBP's activities along the northern border are relatively small, diverse, and not concentrated in any area. Mitigation measures available to further reduce adverse impacts involve timing construction and operational activities to avoid peak roadways and traffic conditions (see Section 8.16.6). CBP's activities would not be expected to combine with one another or with other concurrent activities to create cumulative, adverse effects on transportation resources. As a result, except for the two exceptions outlined above, CBP's activities would not contribute appreciably to cumulative effects on transportation or traffic.

Several CBP activities are specifically designed to increase traffic throughput at POEs, to speed border crossings, or to reduce the number of on-road and off-road CBP patrols. These activities, described in detail in Chapter 2, would have a beneficial effect on transportation resources. Therefore, they have not been carried forward for detailed analysis. These activities include:

- Operation of NII systems; and,
- Operation of sensor and other technologies.

8.16.1 NO ACTION ALTERNATIVE

The No Action Alternative would have short-term, minor and potentially long-term, major, adverse effects to transportation resources. Short-term, minor effects would be primarily due to construction projects. Long-term, minor effects would be primarily due to motorized ground, aircraft, and vessel patrols. The potential for long-term, major, adverse effects would only exist in cases where CBP's activities included either the establishment of a new road or the permanent closure of an existing road.

The No Action Alternative would have the potential for major, adverse effects to transportation resources. Either the establishment of a new road or the permanent closure of an existing road may have a major, adverse effect. If these activities become necessary, additional site-specific analysis would be required to determine the necessary level of NEPA and the actual level of effects. All other activities outlined under the No Action Alternative would have no more than minor, adverse effects to transportation resources in the short- and long-term.

Under this alternative, CBP would continue the current level of operations and would continue to maintain and repair existing facilities, technology, and infrastructure. Effects related to all currently planned projects have already been addressed or are being addressed in separate NEPA documents. The vast majority of activities:

- Would not increase permanent roadway traffic (i.e., on-road automobile and truck traffic);
- Would not reduce the level of service (LOS) at nearby intersections or roadway segments to an unacceptable level;
- Would not contribute to a violation of any local, state, and Federal laws and design guidelines; and,
- Would not interfere appreciably with public transit, rail, air, or pedestrian travel.

8.16.2 FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE

The Facilities Development and Improvement Alternative would have short-term, minor and potentially long-term, major, adverse effects to transportation resources. Short-term effects would be primarily due to construction projects. Long-term effects would be due to the operation of new or modified facilities that may result in the establishment of new roads or permanent closure of existing roads. If these activities become necessary, additional site-specific analysis would be required to determine the necessary level of NEPA and the actual level of effects.

Construction Projects

Traffic congestion would increase as a result of additional construction vehicles and traffic delays near both large and small construction sites. These effects would be temporary and would end with the construction phase. The condition of the roadway infrastructure surrounding construction activities would normally be sufficient to support any increase in construction vehicle traffic. In addition, temporary road closures or detours to accommodate utility system work could be expected, creating short-term traffic delays. Such effects would be reduced by minimizing construction vehicle movement during peak traffic hours and placing construction

staging areas where they would least interfere with traffic. All construction vehicles would be equipped with backing alarms, two-way radios, and “slow moving vehicle” signs when appropriate. Because of their temporary nature, effects from these activities would be minor.

Although the actual construction of a new facility would have only minor effects, the establishment of both large and small facilities would have the potential for major, adverse effects to transportation resources. These effects may be in the form of rerouted traffic to areas where it was previously absent, reducing the LOS at intersections or roadway segments to unacceptable levels near the new facility. Depending on the location, rerouted traffic could interfere appreciably with public transit or pedestrian travel. Local, state, and Federal laws and design guidelines would need to be carefully examined and followed during any activity of this nature. At this time, CBP is uncertain about exactly where and when new facilities would be established. If a new facility is planned, subsequent NEPA analysis would be conducted to determine the specific effects.

Once established, ongoing operation of a new or upgraded facility would have negligible long-term effects on transportation resources. In general, the ability of CBP to accommodate more inspections and reduce congestion and accidents has allowed the facilities to remain in step with the natural background growth in cross-border traffic. Regardless of the location selected, additional through lanes, upgrades in transportation infrastructure, and security processing points would have net beneficial effects on traffic. All upgrades would fully comply with local, state and Federal laws and design guidelines as outlined in Appendix S-1. Minor, adverse effects to pedestrian and off-road traffic would be expected with restricted access points to and from the facility. Individuals would likely be required to traverse greater distances and possibly backtrack to areas adjacent to the border outside the facility.

Impacts would be greater if facility reconfigurations directly increase the number or types of vehicles crossing the border, require the closure or elimination of major thoroughfares or freeways servicing the area, or would not meet either the state or Federal guidelines for roadways. During the final design stage, traffic analysis would be conducted to ensure all roadway segments and intersection adjacent to the facility would function at an adequate LOS.

8.16.3 DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE

The Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative would have short- and long-term, minor, adverse effects on transportation resources. In addition to activities outlined in the No Action Alternative, these effects would be primarily due to additional small construction projects, additional motorized ground patrols, and additional aircraft and vessel operations.

Construction Projects

As with the Facilities Development and Improvement Alternative, both small and large construction projects would have short-term, minor effects to transportation resources under the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative. The establishment of both large and small facilities would have the potential for major, adverse effects to transportation resources. These effects may be in the form of rerouted traffic to areas where it was previously absent, reducing the LOS at intersections or roadway segments to

unacceptable levels near the new facility. Depending on the location, rerouted traffic could interfere appreciably with public transit or pedestrian travel. At this time, CBP is uncertain exactly where and when new facilities would be established. If a new facility is planned, subsequent NEPA analysis would be conducted to determine the specific effects.

Ground Operations—Motorized

Conducting additional motorized ground operations along the northern border would have long-term, minor, adverse effects to transportation resources. For ease of discussion, these activities have been separated into three distinct areas: (1) on-road vehicle patrols, (2) ATV patrols, and (3) snowmobile patrols.

On-road Vehicle Patrols

On-road vehicle patrols would normally originate at the BPS or POE. Regardless of location, effects would be more noticeable on surface streets near the facility than on other roadways. If the facility supported 50 agents, the agents would commute to the station, for a total of 100 additional one-way inbound trips each day. These trips would occur over three shifts, resulting in approximately 33 additional one-way trips per shift. Once at work, all agents would be on patrol, equating to an additional 33 one-way trips per shift. Agents do not normally return to the station until the end of the patrol unless detainees are returned for processing. This occurs approximately 20 to 25 times per month. Therefore, the total daily commute and work-related trips would be approximately 66 additional one-way trips per shift (approximately 198 trips per 24-hour period), with an additional 40 to 50 one-way trips each month.

The additional vehicles outlined in this alternative represent a negligible increase in the total traffic volume, regardless of the type of roadway or the location of the new BPS. This small increase in traffic would not normally affect the capacity of any nearby roadway or intersections adjacent to the site. In addition, this limited activity would have no impact on public transit or air traffic in any area. In the final design stages, facilities would be designed to include ample parking and to meet all local, state, and Federal design guidelines. These effects would be minor, and moderate changes in the size of the facility or number of personnel would not substantially change the level of effects under NEPA.

ATV Patrols

Conducting ATV patrols would have long-term, negligible, adverse effects on transportation resources. These effects would be due to a relatively small number of ATVs used along the northern border. USBP owns and operates only a limited number of ATVs for surveillance in this region; each has the ability to make several patrols per day. These activities are widespread, occur mainly in remote areas, and make up only a small fraction of off-road operations within the study area. Even with the additional operations, this limited number of trips would not interfere with the ability of utilized trails and other off-road areas to serve their primary functions, nor would they have any measurable effect on on-road or off-road traffic within this region.

Snowmobile Patrols

Conducting snowmobile patrols would have long-term, negligible, adverse effects on transportation resources. These effects would be due to the use of a relatively small number of

snowmobiles within this region. USBP owns and operates only a limited number of snowmobiles for surveillance within this region; each has the ability to make several patrols per day. These activities are widespread, occur mainly in remote areas, and make up only a small fraction of off-road operations within the study area. Even with the additional operations, this limited number of operations would not interfere with the ability of trails and other off-road areas to serve their primary functions, nor would they have any measurable effect on on-road or off-road traffic within this region. Therefore, the effects from snowmobile patrols on transportation resources would be less than major.

Because of their limited nature, additional on-road, ATV, and snowmobile patrols would have a less than major effect on transportation resources.

Aircraft Operations

Conducting additional aircraft patrols along the northern border would have long-term, negligible, adverse effects on transportation resources. Aircraft patrol activities are separated into two distinct areas: (1) manned aerial surveillance patrols, and (2) UAS missions.

Manned Aerial Surveillance Patrols

Conducting additional manned aerial surveillance patrols would have long-term, negligible, adverse effects on transportation resources. These effects would be caused by a relatively small number of aircraft operations at airports and air installations. Under this alternative, OAM would continue to own and operate only a limited number of aircraft for surveillance, each able to make several patrols per day. Even with the increase in operations under this alternative, these activities make up only a small fraction of air operations at the airport and air installations at which these aircraft are based, and make up only a tiny fraction of the total aircraft activity within the region. These limited numbers of operations would not interfere with the ability of the airports and air installations to perform their primary functions, nor would they have any measurable effect on the overall air operations in this region.

UAS Missions

Conducting additional UAS missions would have long-term, negligible, adverse effects on transportation resources. These effects would be due to a relatively small number of UAS operations at airports and air installations. Under this alternative, OAM would continue to own and operate only a limited number of UASs for surveillance in this region, each able to travel for days during a single flight. Even with the increase in operations under this alternative, these activities make up only a small fraction of air operations at the installations used to deploy the UASs, and make up only a tiny fraction of the total aircraft activity within the region. These limited numbers of operations would not interfere with the ability of an air installation to perform its primary functions nor would they have any measureable effect on the overall air operations in this region.

Vessel Operations

Conducting additional waterborne patrols would have long-term, negligible, adverse effects on transportation resources. These effects would result from a relatively small number of additional watercraft used in waterways along the northern border. CBP OAM owns and operates only a limited number of marine vessels for surveillance in this region, each able to make several

patrols per day. These activities make up only a small fraction of marine operations in the waterways adjacent to POEs and OAM facilities where they are berthed, and make up only a tiny fraction of the total watercraft activity within the study area. These limited numbers of operations would not interfere with the ability of the facilities utilized to perform their primary functions, nor would they have any measurable effect on the overall marine operations along the waterways within this region.

8.16.4 TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE

The Tactical Security Infrastructure Deployment Alternative would have short-term, minor and potentially long-term, major, adverse effects on transportation resources. In addition to activities outlined in the No Action Alternative, these effects would be primarily due to additional construction projects and the potential for the establishment of new roads.

Construction Projects

As with the Facilities Development and Improvement Alternative, both small and large construction projects would have short-term, minor, adverse effects. Establishment of new roads would have the potential for major, adverse effects to transportation resources. These effects may be in the form of rerouted traffic to areas where it was previously absent, reducing the LOS at intersections or roadway segments to unacceptable levels near the new facility. Depending on the location, rerouted traffic could interfere appreciably with public transit or pedestrian travel. Local, state, and Federal laws and design guidelines would need to be carefully examined and followed during any activity of this nature. At this time, CBP is uncertain exactly where and when new facilities would be established. If a new roadway is planned, subsequent NEPA analysis would be conducted to determine the specific effects. Notably, under this alternative, new trails, fencing, barriers, and trench cuts are unlikely to have any ongoing long-term effects on roadways or traffic.

8.16.5 FLEXIBLE DIRECTIONAL ALTERNATIVE

The Flexible Direction Alternative would have short-term, minor and potentially long-term, major, adverse effects to transportation resources. Short-term effects would be primarily due to additional construction projects. Long-term effects would be due to operation of new or modified facilities that may establish new roads or permanently close existing roads. At this time, CBP is uncertain as to exact locations or timing for the establishment of new facilities.

As with the No Action Alternative, the Flexible Direction Alternative would have the potential for major, adverse effects to transportation resources. Either the establishment of a new road or the permanent closure of an existing road may have major, adverse effects; subsequent NEPA analysis would be conducted to determine the specific effects. If these activities become necessary, additional site specific analysis would be required to determine the necessary level of NEPA analysis and the actual level of effects.

Construction Projects

As with the Facilities Development and Improvement Alternative, both small and large construction projects would have short-term, minor, adverse effects.

As with the Facilities Development and Improvement Alternative, and for similar reasons, operation of an upgraded POE could have the potential for long-term, major, adverse effects on transportation resources. The establishment of both large and small facilities would have the potential for major, adverse effects to transportation resources. These effects may be in the form of rerouted traffic to areas where it was previously absent, reducing the LOS at intersections or roadway segments to unacceptable levels near new facilities. Depending on the location, this may interfere appreciably with public transit or pedestrian travel. At this time, CBP is uncertain exactly where and when new facilities would be established. If a new facility is planned, subsequent NEPA analysis would be conducted to determine the specific effects.

Motorized Ground Patrols

As with the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, conducting additional motorized ground patrols along the northern border would have long-term, minor, adverse effects.

Aircraft Operations

As with the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, conducting additional aircraft patrols along the northern border would have long-term, minor, adverse effects.

Vessel Operations

As with the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, conducting additional waterborne patrols would have long-term, minor, adverse effects.

8.16.6 BEST MANAGEMENT, MINIMIZATION, AND MITIGATION

No mitigation would be required for USBP activities that would have less than major effects on transportation resources. The following BMPs could be taken to avoid or minimize the impacts of CBP's projects on transportation:

- Minimize construction vehicle movement during peak traffic hours;
- Place construction staging areas where they would least interfere with traffic;
- Equip construction vehicles with backing alarms, two-way radios, and "slow moving vehicle" signs when appropriate;
- Coordinate with local, state, and Federal transportation authorities when planning access or use of public roadways;
- Follow all local, state, and Federal planning guidelines and regulations when maintaining or upgrading roadway infrastructure; and,
- Comply with all traffic regulations when operating on-road, nonroad, and off-road vehicles.

8.16.7 SUMMARY OF POTENTIAL IMPACTS

Table 8.16-1 summarizes the comparison of impacts to transportation resources from the various alternatives.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Table 8.16-1. Summary of Potential Impacts to Transportation Resources

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor adverse	Moderate Adverse	Major Adverse	Beneficial
NO ACTION ALTERNATIVE					
Small construction projects		⊗			
Large construction projects		⊗			
Checkpoint operations		⊗			
Ground operations—motorized		⊗			
Ground operations—nonmotorized	⊗				
Aircraft operations		⊗			
Vessel operations		⊗			
Operation of NII systems					⊗
Operation of sensor and other technologies					⊗
OVERALL IMPACT		⊗		⊗	
FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE					
Small construction projects		⊗			
Large construction projects		⊗			
OVERALL IMPACT (INCLUDING NO ACTION)		⊗		⊗	
DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE					
Small construction projects (towers and other infrastructure to mount antennas, etc.)		⊗			
Ground operations—motorized		⊗			
Ground operations—nonmotorized	⊗				
Aircraft operations		⊗			
Vessel operations		⊗			
Operation of NII systems					⊗
Operation of sensor and other technologies					⊗
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor adverse	Moderate Adverse	Major Adverse	Beneficial
TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE					
Small construction projects		⊗			
Large construction projects		⊗			
OVERALL IMPACT (INCLUDING NO ACTION)		⊗		⊗	
FLEXIBLE DIRECTION ALTERNATIVE					
Small construction projects		⊗			
Large construction projects		⊗			
Checkpoint operations		⊗			
Ground operations—motorized		⊗			
Ground operations—nonmotorized	⊗				
Aircraft operations		⊗			
Vessel operations		⊗			
Operation of NII systems					⊗
Operation of sensor and other technologies					⊗
OVERALL IMPACT (INCLUDING NO ACTION)		⊗		⊗	

8.17 ENVIRONMENTAL CONSEQUENCES TO RECREATION RESOURCES

The purpose of classifying recreational areas is to understand the various types and potential for impacts that CBP actions could produce more fully. For this reason, the analysis below discusses the impacts in the context of low-, medium-, and high-use recreation areas. This section considers the potential adverse and beneficial impacts of CBP's alternative actions on recreation. It is unlikely that a new BPSs will be constructed within a national park, national forest, wildlife refuge, or recreation area, so this action will not be analyzed for impacts.

The northern border includes a wide range of recreational resources—from urban parks to the most rugged designated wilderness terrain in the continental United States. CBP conducts its activities with full awareness of and sensitivity to the recreational values on the lands it is charged with protecting. It does not manage recreational lands; therefore, both the nature and limitations of its activities must be developed in partnerships with recreational landowners.

Impacts on recreation would occur if a CBP activity eliminated areas of important or unique recreational opportunities or facilities, degraded the quality of the recreational experience in such areas, or limited access to recreational areas through physical or administrative restriction. A wide variety of recreational areas exist along the northern border on both the U.S. and Canadian sides, including U.S. national parks (NP), national forests (NF), national wildlife refuges (NWR), and national recreation areas (NRA), as well as Canadian national park reserves, provincial parks, protected areas, and natural areas. While significantly more recreational areas exist in the western half of the continent, there are recreational areas in each northern border region. For descriptions of the regional affected environments for recreation see Sections 4.17.2 (WOR Region), 5.17.2 (EOR Region), 6.17.2 (Great Lakes Region), and 7.17.2 (New England Region).

Continuing CBP activities would have minor to moderate impacts on recreation due to the wide range of CBP's actions across the entire northern border. These impacts would tend to be higher in low-impact use areas and lower in high-impact use areas due to pre-existing development and different visitor expectations. The actions with the most significant adverse impacts include construction of a new BPS, installation of monopole towers if these towers disrupt a scenic vista, and construction of facilities to support OAM operations. Actions with minor impacts include installation and maintenance of UGSs, manned and unmanned aircraft missions, and canine patrols. Actions that could have beneficial impacts include construction of new roads, bridges, culverts, or low-water crossings and enforcement of the I-68 program. Continued strengthening of partnerships, communication, and discussion with knowledgeable personnel in recreation areas can ensure that the placement of new infrastructure, patrol routes, and other actions would have a lower impact. Minimizing the amount of development, traffic, and disruption in previously undisturbed areas are key for minimizing recreation impacts.

Considering current use patterns in the affected area and consulting with appropriate land managers can mitigate the negative impacts of development patrols and other CBP actions (see Section 9.17). Due to the minimal to moderate, but incremental, nature of CBP's impacts to recreation, as well as their widely dispersed nature, the cumulative impacts to recreation across the northern border would be negligible.

8.17.1 NO ACTION ALTERNATIVE

Actions that may potentially have minor to moderate impacts are large construction projects, communications towers, motorized patrols, and waterborne patrols. Actions that could potentially have negligible to minor impacts are small construction projects, on-site travel processing operations, non-motorized patrols, manned and unmanned aircraft operations, and use of sensor technologies. The operation of NII systems may result in beneficial impacts to recreation. While several other non-CBP actions in the four regions could have recreation impacts, it is unlikely that CBP activities in the No Action Alternative will produce major, cumulative impacts.

Small Construction projects

Some small construction projects could have minor impacts during the construction period. Small construction projects will temporarily increase traffic carrying supplies and equipment. If this traffic moves along little used access roads in low-impact recreational use areas, it could disturb the solitude of the recreational area. However, most traffic heading towards POEs and BPSs is likely to be on more major roads in medium- to high-impact use areas. POEs within protected land are on high-impact use areas already, so the noise and visual disturbance of repairs and maintenance are unlikely to alter the recreation experience.

If other small construction projects occur in low-impact use areas, the noise, visual disturbance, and human traffic could have a minor impact on the quality of the recreational experience or limit access to recreational areas. This impact is likely to be negligible in medium- or high-impact areas where human development, noise, and light are already present.

Access road extensions and repairs could have minor, beneficial impacts by increasing or improving entry to recreational areas. As with other construction projects, however, noise, traffic, light, and human development have the potential to degrade the quality of a recreational experience temporarily in low-impact use areas and some medium-impact use areas. These impacts are likely to be far less noticeable in high-impact use areas.

Small construction projects that include technology infrastructure, such as radio communications towers, could affect recreation in more permanent ways (in addition to the impacts from construction already described). It is unlikely that a new radio tower will dramatically limit the ability of visitors to access the recreation space, except for the small, fenced-off footprint immediately surrounding the tower. The most important impact to recreation from technology infrastructure is disruption of a scenic vista.

Section 8.9.3 discusses the visual impact of towers on scenic vistas. Many recreational users seek uncluttered vistas as part of the recreational experience of hiking, camping, photography, and other activities. A tower without camouflage that disrupts a striking and undisturbed scenic vista may have a major impact in any type of recreation area. For example, in Mount Rainier NP (WOR Region) and Cuyahoga Valley NP (EOR Region), backcountry users highly value scenic views; a tower could degrade or destroy this nature-focused and solitary experience. In other examples, Kootenai National Forest (WOR Region) and White Mountain National Forest (New England Region) are both medium- to high-impact use areas and have many developed campgrounds and several lookouts and cabins. A tower that degrades a relatively pristine view from one of these campgrounds, lookouts, or cabins could cause a major impact on visitors'

experiences if the tower blocks the pristine view shed. If a previously intact scenic vista is interrupted, the impact could be moderate to major

If power lines are placed underground and interactions with sensitive habitat or avian migration are reduced, this activity should not have a major impact.

If recommendations in Section 8.9.3 are followed regarding the siting (at least 1.5 miles from areas designated for visual sensitivity) and camouflage of towers, impacts on scenic vistas would drop to minor or negligible. If tower siting provided access to previously unavailable parts of a recreation area (e.g., new trails), some benefits for visitors would result.

Security infrastructure, such as fencing, could have impacts at a few locations in the WOR Region. Generally, a fence running directly along the border of a national park, forest, wildlife refuge, or recreation area is unlikely to cause major impacts on recreation since most parks terminate at the border. However, some parks are contiguous with Canadian parks and some recreational activities, such as backcountry hiking and camping, can cross the border occasionally. In the WOR Region, Glacier NP in Montana and Waterton Lakes NP in Alberta, Canada are managed collaboratively. Additionally, the North Cascades NP and Okanogan NF in Washington are contiguous with Skagit Valley, EC Manning, and Cathedral Provincial parks in British Columbia. A fence could restrict or limit access to recreational areas or trails in the low-impact use areas of these parks.

Additionally, fences in some locations could potentially change scenic vistas and limit visitors' ability to enjoy natural landscapes. Fences that disrupt animal movement through habitats could also lessen opportunities for visitor observation or make hunting or viewing of wildlife less productive. Overall, fences in low-impact use areas could produce a moderate impact by degrading the visitors' experience of unperturbed wilderness. Fences in medium- and high-impact use areas could have different impacts if they restrict access to specific recreational areas used by more people. Impacts in these areas could be minor to moderate.

In summary, small construction projects are likely to have minor impacts on recreation, depending on their location and how construction materials are transported. Construction of access roads could bring beneficial impacts. Impacts caused by construction of communications towers would be minor to moderate, depending on whether a viewshed is obstructed. The impact to recreation of fencing installation could be minor to moderate. Under the No Action Alternative, small construction projects would continue at their current level, estimated at less than 20± projects in each of the four regions. If these projects are fairly evenly distributed over the border and generally avoid designated recreation areas, the overall impact of these projects on recreation in all four regions is likely to be minor given the size and extent of recreation areas.

Large Construction Projects

Large construction projects could produce greater impacts and affect a wider array of recreation areas than small projects. The acquisition of new property for LPOE or BPS expansion and modernization in recreational sensitive areas could eliminate hiking, camping, and other recreational uses within the site footprint, and limit or degrade recreational use outside the footprint. Construction and installation of necessary support infrastructure, such as water, sewage, and electrical supply lines, could further limit recreational acreage. Existing hiking

trails, campsites, and areas designated for specific activities, such as skiing or hunting, might need to be adjusted or relocated. Light, noise, and traffic during facility operation would also limit camping near the POE.

The different stages of modernizing an LPOE located within a larger area having recreational use may impose several other potential impacts to recreation. In the WOR Region, for example, most of Glacier NP in Montana is undeveloped and valued for its wild character. Overall, the park is characterized as a low-impact use area. However, the Chief Mountain POE is located within the park. The area within visual range of the LPOE would not be considered a low-impact use area and visitors do not expect a solitary wilderness experience near this portion of the park so these impacts are likely to be minor. Modernization efforts would not cause a major disruption or change the quality of the nearby area for recreation users in low-impact use areas.

As another example, the Eastport Land POE sits within the Kootenai NF in Idaho. The developed campgrounds and other recreational facilities are located in other parts of this forest. No campgrounds or other destinations exist near the POE. An increase in traffic, noise, and lighting during and after construction may have some minor temporary impact on recreation activities and users in the outer vicinity. Overall, impacts in recreation areas of this type are likely to be minor or negligible.

In the EOR, Great Lakes, and New England Regions, no POEs are located within Federal protected areas.

Impacts are also likely to be negligible for high-impact use areas, where recreation activities also coexist with the LPOE.

If modernization requires heavy use of roads that traverse recreational land, results in an expansion of the land size, or light or noise effect of the LPOE, minor impacts on the recreation experience could result. Such an impact would likely occur if the POE is close to a recreation area, such as the Morgan-Loring POE near the Charles M. Russell NWR (New England Region).

Small and Large POE Trade and Travel Processing Operations

While several existing LPOEs are located in or adjacent to national parks and forests, it is unlikely that continuing trade and travel processing operations at any of these sites would have a major impact on recreation. CBP works with park and forest personnel to minimize any operational impacts on recreational use. Such coordination, communication, and partnership activities would continue.

Processing actions may increase both wait times and traffic, which could limit or delay southbound visitors' access to recreation areas. Visitors may experience increased frustration, particularly if wait times are sufficiently great to have a notable impact. However, CBP works with local recreation managers and uses technology and methods to ensure efficient processing. Assuming that all measures are taken to minimize wait times, the impact is likely to be negligible. If wait times are very long (exceeding 30 minutes), these operations could have a greater impact.

Off-site Trade and Travel Processing Operations

CBP estimates that it could establish 80 and 100 checkpoints in the WOR Region. It is highly unlikely that CBP would establish a permanent traffic checkpoint within a national park, forest, wildlife refuge, or recreation area. It is possible that a security situation could require establishment of a checkpoint on roads leading to and from one of these recreation areas, which would impede or delay traffic flow. The impacts could be similar for all types of recreational areas, though they would be felt more severely in areas with high visitor numbers or fewer roads in and out of the park. While minor traffic delays entering or leaving a recreation area would diminish the visitor experience slightly, this impact would be negligible to minor unless traffic wait times are excessive (greater than ~20 minutes), in which case the impact could become moderate due to visitor frustration. If traffic checkpoints were set up in locations that could affect recreational users, CBP would work with park or forest personnel to alert visitors to the security situation to the greatest extent appropriate.

CBP could set up a mobile traffic checkpoint on a road to a recreation site on the border. In most areas like this, paved roads offer access to recreational activities. Additionally, several sites, such as Colville NF (WOR Region), Montezuma NWR (Great Lakes Region), or White Mountain Forest (EOR Region) have major scenic highways and scenic driving is a major recreation activity. A checkpoint on one of these byways could disrupt the visitor experience in a moderate way by increasing traffic and wait time. The noise and traffic associated with the checkpoint could potentially disrupt recreational experiences nearby, such as backcountry camping, though this impact would be minor and short term. Additionally, increased traffic associated with a roadblock checkpoint could limit access to recreational areas and could degrade visitor experience.

Impacts from wait times would be proportional to the amount of traffic towards the site, so they could range from minor to moderate. They are not expected become more severe in all but the most extreme cases, where a high-impact use area must be blockaded during a peak recreational travel period. Depending on the distribution, density, and proximity of the 80 to 100 checkpoints projected for the WOR Region, impacts from checkpoints could be slightly higher.

Ground Operations—Motorized

Motorized patrols, such as ATVs and snowmobiles, could affect recreation in the WOR Region in various ways. Currently, 350 to 425 motorized patrols per day are projected across the WOR Region; 800 motorized patrols per day are projected across each of the other 3 regions.

CBP conducts ATV patrols in areas authorized by statute and the land manager for ATV use. As numbers of off-road riders have increased, ATV and off-highway vehicle (OHV) riders have developed higher levels of frictions with regulations restricting movement across borders outside of designated access points (Proescholdt, 2007). Controversy between sub-groups of hunters (those who use ATVs while hunting and those who do not) have already occurred, so it is likely that the use of ATVs in normally quiet backcountry areas would disturb hikers, hunters, and campers who value the quiet, solitary nature of their recreation. These conflicts and controversy are likely to continue.

CBP actions are not likely to cause major impacts unless ATV patrols expand outside areas where ATV use is popular, or CBP deploys a large number of ATVs compared to the ATVs

already in common use. Many high-impact use areas already allow use of OHVs, ATVs, and snowmobiles, so ATV use by CBP is not inconsistent in those areas. If CBP patrols significantly increase the number of ATVs in a park, minor to moderate impacts could result. For example, if a park currently has 5,000 visitors using ATVs in a month, an additional 50 ATV patrols could be considered a moderate change and cause moderate impact. Adding three ATV patrols would be negligible to minor. Potential beneficial impacts may result from the feeling of added security due to the presence of patrolling units.

Overall, because the local effects of ATV patrols are intermittent and would cease if patrols ceased, impacts will vary from minor to moderate in low- and medium-impact use areas to minor or negligible in high-impact use areas. Table 8.17-1 compares the numbers of registered ATVs in each state.

Table 8.17-1. Registered All-Terrain Vehicles by State, 2009

State	Number of Registered ATVs
WOR Region	
Idaho ¹ (2009)	98,283
Montana ² (2011)	60,000±
Washington ³ (2011)	390,060
EOR Region	
Minnesota ⁴ (2005)	350,000
Montana ² (2011)	60,000±
North Dakota ⁵ (2007	22,737
Great Lakes Region	
Michigan	NA
Minnesota ⁴ (2005)	350,000
New York ⁶ (2009)	12,747
Ohio	NA
Pennsylvania	NA
Wisconsin ⁷ (2009)	275,400
New England Region	
Maine ⁸ (2007)	63,467
New Hampshire	NA
New York ⁹ (2009)	12,747
Vermont	NA

(Iverson, 2010; Hargrove, 2011; Mitchell, 2011; North Dakota Parks and Recreation Department, 2007; ATV Minnesota, 2005; Wisconsin Department of Natural Resources; Maine DIFW, 2008; New York Department of Motor Vehicles, 2010; No data available for Michigan, Ohio, Pennsylvania, New Hampshire or Vermont).

Snowmobiling is a popular activity in state and national recreational areas along the northern border, especially in the WOR Region. Snowmobile registrations (2009) in this region ranged from 50,000 in Idaho to 23,440 in Montana; in the EOR Region, they ranged from 277,290 in Minnesota to 21,000 in North Dakota; in the Great Lakes Region, they ranged from 301,805 in Michigan to 19,500 in Ohio; and in the New England Region, they ranged from 146,662 in New York to 41,000 in Vermont (International Snowmobile Manufacturers Association, No Date). Unless the security situation requires it, CBP only conducts snowmobile patrols in areas authorized for their use. Snowmobiles are similar to ATVs, but do not move as quickly or create quite as much noise, so their impact could be slightly less. While visitor numbers may be lower in the winter, many park visitors enjoy snowshoeing and cross-country skiing in the winter, so snowmobile use could impact these recreation activities.

In some medium-impact use areas, such as Little Pend Oreille NWR in Washington or Lewis and Clark NF in Montana, snowmobile riding is already permitted in certain areas. Other medium-use areas, such as Nisqually NWR, also in Washington, do not permit motorized vehicles. In low-impact use areas such as Moosehorn NWR (New England Region), snowmobile riding is not permitted in any areas. Other areas, including private, local, and state recreation areas, permit snowmobile use. Therefore, impacts will vary widely from area to area. Expanding snowmobile trails or areas would have a larger impact on recreation.

Conducting snowmobile patrols in permitted areas is unlikely to have a large impact. Increased snowmobile traffic could place added stress on trails or snowmobile recreation, but would not represent a new or inconsistent use. The impact in these types of areas would be minor or negligible.

Table 8.17.2 shows the number of registered snowmobiles per state across the northern border.

Table 8.17-2. Registered Snowmobiles per State, 2009

State	Number of Registered Snowmobiles
WOR Region	
Idaho	50,000
Montana	23,440
Washington	31,532
EOR Region	
Minnesota	277,290
Montana	23,440
North Dakota	21,000
Great Lakes Region	
Michigan	301,805
Minnesota	277,290
New York	146,662
Ohio	19,500

State	Number of Registered Snowmobiles
Pennsylvania	45,270
Wisconsin	232,320
New England Region	
Maine	98,600
New Hampshire	73,625
New York	146,662
Vermont	41,000

Source: (ACSA, 2010).

CBP attempts to minimize the impacts of its vehicle patrols in recreational areas. Patrols in recreation areas would likely either use paved roads and scenic byways (if available) or two-tracks through unpaved terrain. On paved roads, this would not represent a different or inconsistent use, and would therefore have minimal impact. When patrols use two-tracks, they could disrupt the solitary nature of backcountry recreation and increase noise. These impacts are likely to be minor in low-impact use areas, since the patrols would follow established tracks in previously disturbed areas. If tracks run near campgrounds or popular hiking trails, disturbance impacts would be greater.

In a medium-impact use area, impacts could be greater due to a higher volume of visitors and a greater concentration of campgrounds and established trails. In a high-impact use area, impacts are likely to be similar if two-tracks are located near campgrounds, cabins, or lodges. Impacts in medium-and high-impact use areas could be minor to moderate.

Ground Operations–Nonmotorized

CBP conducts a variety of nonmotorized patrols, including those on foot and those using horses and dogs. Approximately 150± nonmotorized ground patrols are projected for this alternative for each of the regions.

It is unlikely that canine kennels would be established in existing protected areas. The dogs are very highly trained to focus on specific tasks. Canine patrols are used in rough terrain near and between POEs. Of the limited use and the training the animals receive, it is anticipated that the impact in recreationally protected areas would be negligible.

Many recreation areas of all types allow horseback riding in remote areas with many trails for horseback use. Recreation areas generally have regulations regarding feeding and tacking animals. There are several areas in the regions classified as low-impact use areas—such as Dungeness NWR (WOR Region), Moosehorn NWR (New England Region), Medicine Lake NWR (EOR Region) or Iroquois NWR (Great Lakes Region)—that do not allow horseback riding due to more delicate ecology and a desire to limit human interference with habitat. Horseback patrols in these areas would likely not be permitted for other reasons as they would interfere with recreation experiences by changing the solitary, natural experience for visitors.

Horseback patrols in areas that already allow recreational animal use would have a negligible impact since visitors expect this use and CBP patrols would not significantly increase the number of horses on trails. The small increase in animal use and traffic may put some extra stress on trails and may contribute to crowding during peak times on popular trails. This impact is likely to be negligible or minor. The use of horses in more remote areas is not likely to disturb or degrade backcountry experiences, since horses are relatively quiet and are more consistent with natural scenery.

Foot patrols are likely to have even less impacts than either horse or canine patrols. In low-impact use areas, frequent foot patrols could result in less solitude for a small number of visitors. However, this impact is likely to be negligible in all types of recreation areas.

Collectively, these types of patrols also provide a beneficial impact in that Border Patrol agents offer a law enforcement presence that tends to reduce crime in the recreational areas. In some cases, Border Patrol agents may assist the recreational law enforcement officers in crowd control or during emergencies.

It is projected that 150± patrols will be used for each of the four regions. These patrols will be spread across a large area, so they are unlikely to cause major impacts in recreational areas.

Aircraft Operations

Additional aircraft patrols could result in noise that disrupts or degrades quiet recreational activities such as camping, hiking, boating, or horseback riding. Currently, approximately 15± aircraft in both the WOR and New England Regions, 20± aircraft in the EOR Region, and 15 aircraft vehicles in the Great Lakes Region are projected for continuing operations under the No Action Alternative. Frequent aircraft could visually disrupt the solitary nature of backcountry recreational areas. This impact would be highest in low-impact use areas, but would be negligible to minor due to the small number of aircraft distributed across a large region. Section 8.9.3 contains a more detailed discussion of visual impacts related to aircraft. These impacts could also affect recreation if aircraft support facilities are very close to or within recreation areas in which light and noise emissions and developments might disturb recreation, especially in low-impact use areas. Section 8.6.3 contains a discussion of noise from UASs.

Both medium- and high-impact use areas would incur less impact from aircraft operations since visitors are less likely to expect completely quiet and solitary experiences. Other noise-generating activities consistent with high- or medium-impact use sites would contribute to higher ambient noise levels. Seeing aircraft in flight is a common in developed areas, so the visual impact would also be negligible.

The impacts on recreation of manned aircraft missions would be similar to unmanned aircraft missions. Impacts will vary in intensity dependent on altitude, noise level of the aircraft, and frequency of patrols. This impact would be minor in any recreation area if visitors or recreational areas are within the visual or auditory envelope of patrolling aircraft.

Vessel Operations

Several recreation sites, such as Cascades NP in Washington (WOR Region), Superior National Forest in Minnesota (EOR Region), and Huron-Manistee National Forest (Great Lakes Region),

lie along marine borders or contain islands, such as the Apostle Islands National Lakeshore. Very few recreation sites in the New England Region have marine borders or contain islands. State, local, and private recreation areas may contain marine recreation areas. Vessel patrols near these areas could disturb water-related recreational activities, such as boating, kayaking, and water sports, and is more likely to be an issue in pristine areas with little water traffic. For example, Dungeness NWF lies along the Dungeness Bay (WOR Region). Additional motorized patrols in wilderness areas could disturb the quiet, solitary nature of the experience and disrupt wildlife, lessening opportunities for wildlife observation. Waterborne patrol operations could also require access restrictions to recreation areas, limiting visitor experiences. Potential beneficial impacts may occur from a feeling of added security due to the patrolling units.

In this alternative, no more than 14± OAM vessel operations per day are projected for the WOR Region, 5± vessel operations per day in the EOR Region, 42± vessel operations per day would be used each day in the Great Lakes Region, and 16± vessel operations per day in the New England Region. The impacts of marine patrols on medium- and high-impact use areas would likely prove negligible, given the relatively few OAM patrol boats compared to recreational boats already on the water. As context, Table 8.17-3 provides the number of recreational boats registered in each of the states along the northern border.

Table 8.17-3. Recreational Vessel Registration by State (2009)

Border State	Recreational Vessel Registration 2009
WOR Region	
Idaho	90,501
Montana	83,394
Washington	269,845
EOR Region	
Minnesota	811,775
Montana	83,394
North Dakota	51,609
Great Lakes Region	
Michigan	811,670
Minnesota	811,775
New York	479,161
Ohio	424,877
Pennsylvania	337,747
Wisconsin	626,304

Border State	Recreational Vessel Registration 2009
New England Region	
Maine	109,169
New Hampshire	95,402
New York	479,161
Vermont	30,480

Source: (USDHS, 2010).

Operation of NII Systems

Any actions, such as operating inspection technologies, with the potential to increase wait times at POEs could likewise produce delays for visitors in reaching recreational sites. CBP continually makes efforts to ensure that technology speeds up visitor and cargo processing, rather than increases delays. Such efforts could affect recreation beneficially by allowing easier access to recreation areas while reducing criminal activities.

Operation of Sensor and Other Technologies

In low-impact use areas, such as wilderness and backcountry areas of national forests, national parks, or other areas of solitude (e.g., Bend NWF in Montana, Ottawa National Forest, and White Mountain National Forest), an increase in vehicle traffic due to deployment of MSS or towers maintenance vehicles could increase noise, light, and vehicle and human traffic which could disrupt and degrade hiking, skiing, camping, or hunting experiences. Such disruptions may also disturb wildlife, lessen opportunities for wildlife observation, or degrade hunting. Overall, the impact of implementing sensor technologies in low-impact use areas could range from minor to moderate, depending on the number and placement of towers, and the use of trucks and other systems in relation to vistas and areas of solitary recreation.

Deploying technology in medium-impact use areas could incur impacts similar to those in both low- and high-impact use areas. Visitors to the park’s more developed campgrounds and recreation areas are less likely to notice a relatively minor increase in traffic and noise. However, visitors to the less developed sections of the park or forest may have their experience degraded or disrupted by any of the described causes.

The impact in high-impact use areas would be less, because these areas already have significant vehicle and foot traffic and they support recreational activities that produce noise and light. For example, Lake Roosevelt National Recreation Area (WOR and EOR Regions) has boating facilities, campsites, visitor stations, trails, and paved and unpaved roads. While some less developed areas exist in this NRA, most visitors can reasonably expect to see and hear other people and machines. Disruption of scenic vistas by a tower, however, could still have a minor to moderate impact.

When UGSs are installed, CBP access by foot, truck, or ATV could create small amounts of noise or disturbance, and disturb or degrade the solitary nature of backcountry recreation. This issue is more likely in low-impact use areas, but this impact is likely to be temporary and negligible to minor, or nonexistent in more heavily trafficked areas.

In conclusion, small construction projects are likely to have negligible to minor impacts on recreation. Communication towers have the largest potential impact within this category of actions. Large construction projects could have minor to moderate impacts.

On-site trade and travel processing operations at both small and large POEs would have negligible to minor impacts on recreation if access to recreation is slowed or diminished. Overall, adverse impacts of off-site trade and travel processing operations are likely to be minor, even in low-impact use areas.

The impacts of motorized patrols, including ATVs, snowmobiles, and vehicles would be negligible to minor in areas where this use is already permitted and where infrastructure, such as paved roads or trails, is already developed. Impacts could be moderate to major if patrols were extended to previously unauthorized areas. Impacts of nonmotorized patrols, such as canine, horseback, and foot patrols, would be negligible to minor.

Manned and unmanned aircraft operations could result in minor impacts to recreation if visitors or recreational areas are within the visual or auditory envelope of patrolling aircraft. The impact of waterborne patrols could be minor to moderate in low-impact use recreation areas, depending on patrol locations and frequency, and negligible to minor in medium-impact and high-impact use areas.

The operation of NII systems may have a beneficial impact on recreation. Finally, the use of sensor technologies in most protected areas would be negligible, with the potential for minor impacts in low-impact use areas.

Overall, the No Action Alternative, in which actions continue at current levels, is likely to have negligible to minor, adverse impacts on recreation. While several other non-CBP actions in the WOR Region could have recreation impacts, it is unlikely that CBP activities in the No Action Alternative will produce major cumulative impacts.

8.17.2 FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE

The Facilities Development and Improvement Alternative could have slightly higher recreation impacts than the No Action Alternative, due primarily to the increase in large construction projects. However, this increase depends largely on the location of these projects. If new projects are not within or very close to protected recreation areas, impacts would not be substantially greater than for the No Action Alternative.

Small Construction Projects

In the Facilities Development and Improvement Alternative, fewer than 30± additional new small construction projects are anticipated for each of the 4 regions. Whether this increase could change the impact on recreation will depend on the type of construction projects and their locations.

Certain types of small construction projects affect recreation more than others. For example, radio towers can obstruct scenic vistas, and construction of sheds or other buildings in low-impact use areas may disturb solitary and natural recreation experiences causing minor to moderate impacts. However, other small construction projects, especially those in medium-

impact or high-impact use areas have negligible to minor impacts. Considering the size and extent of recreation areas in each of the four regions, it is unlikely this small increase in small construction projects would have a significantly greater impact than those anticipated in the No Action Alternative. The impact would remain minor.

Large Construction Projects

In this alternative, fewer than 5 new large construction projects are anticipated, in addition to the 15± projects anticipated in the 4 regions currently in progress or planned. The overall impact of large construction projects under current levels could be minor to moderate. Depending on the location of new large construction projects, impacts for this alternative range from minor to moderate.

In conclusion, the Facilities Development and Improvement Alternative may have slightly higher recreation impacts than the No Action Alternative, due primarily to the increase in large construction projects. However, this increase depends a great deal on the location of these additional projects. If new projects are not within or very close to protected recreation areas, impacts will not be substantially greater than the No Action Alternative. Accounting for this range of possibilities, the impact of the Facilities Development and Improvement Alternative on recreation is expected to be minor to moderate.

8.17.3 DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE

Increases in actions, such as tower construction and vessel operation, could have moderate adverse impacts on recreation. The operation of NII systems is likely to prove beneficial, and impacts from aircraft operations would likely produce minor impacts.

Small Construction Projects

The Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative anticipates 100 additional small construction projects, especially projects involving communications towers. At current levels, the impact of small construction projects is predicted to be minor. However, towers may have a moderate to major, adverse impact if they disturb scenic vistas. The increase from 20 to 120± projects, with towers making up the majority of additional projects, could result in increased impacts—impacts felt by more visitors than the No Action Alternative. The greater number of towers in this alternative could, therefore, have a moderate impact on recreation.

Ground Operations

This alternative includes 1,300± motorized patrols per day. This rise from 800± patrols per region in the No Action Alternative could have similar increases in impacts. These impacts could disturb the quiet, solitary experience of recreation, especially in low- and medium-impact use areas. The impact will be lower in areas that already permit motorized vehicles. Overall, this impact may be minor to moderate and adverse.

This alternative also includes 200± nonmotorized ground patrols. While this increase in patrols may contribute to slightly greater disturbances of quiet, solitary experiences, the foot, horse, and

canine patrols are generally not very disruptive to recreation. Therefore, the impact from nonmotorized patrols is likely to be negligible to minor.

Aircraft Operations

This alternative represents an increase from approximately 15 aircraft operations per day to about 23 operations per day in the WOR and New England Regions and an increase from about 20 aircraft operations per day to around 30 per day in the EOR and Great Lakes Regions. The addition of eight more patrol operations each in the WOR and New England Regions and 10 more each per day in the EOR and Great Lakes Regions could increase the noise and visual disturbance in each region, especially if patrols are on recreational land. Overall, impacts to recreation are expected to be minor from this alternative.

Vessel Operations

In the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, 21 vessel operations (WOR Region), 10± vessel operations (EOR Region), 63± vessel operations (Great Lakes Region), and 24± vessel operations (New England Region) are anticipated in each region—an increase from the 14 (WOR Region), 5± (EOR Region), 42± (Great Lakes Region) and 16± (New England Region) operations in the No Action Alternative. The additional vessel patrols could increase impacts depending on the location of the patrols. While the impact of waterborne patrols in low-impact use areas or areas that currently do not allow motorized boat use could be moderate, the overall impact of vessel operations in this alternative is expected to be negligible to minor.

Operation of NII Systems

If the increased use of this technology results in shorter wait times at POEs, an increase in hours of operation of NII systems could have a minor, beneficial impact on recreation.

Operation of Sensor and Other Technologies

In this alternative, the operation of sensor, MSS, and other technologies would increase from less than 1,500 individual 1-hour operations per day to approximately 2,500 individual 1-hour operations per day. In the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, impacts are expected to range from minor to moderate, depending on the location, previous disturbance, and level of activity associated with the sensors. The increase could result in a higher level of activity or increase the need for maintenance or more sensors, which could heighten the impact to a moderate level.

In conclusion, increases in actions, such as tower construction and vessel operation, in this alternative could have moderate, adverse impacts on recreation. While the operation of NII systems is likely to be beneficial and impacts from aircraft operations are not likely to change dramatically, the overall impact of this alternative on recreation could be moderate and adverse.

8.17.4 TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE

The impacts of this alternative are not likely to be greater than those of the No Action Alternative. There are some exceptions—fences dividing cross-border recreation areas and towers that disrupt scenic vistas—but the overall impacts of this alternative are expected to remain minor.

Small Construction Projects

This alternative will have an increase of fewer than 30± small construction projects in each region, with a focus on physical barriers such as fences, trench cuts, and access roads. As noted, physical barriers are unlikely to affect recreation except in a few specific locations in each region where recreation areas are contiguous across the border. Roads may improve access to recreation areas, providing a beneficial impact. Additionally, some towers may be built. The visual impact of towers to recreation has already been discussed. Some minor to moderate temporary impacts may result, especially in low-impact use areas, during the construction period for all types of projects. Overall, the impact of small construction projects in this alternative is not likely to rise above minor levels.

Large Construction Projects

Fewer than five new large construction projects in each region are anticipated under this alternative. The construction of both access roads and fences will create temporary, minor to moderate, adverse impacts due to noise, traffic, and visual disturbances. The roads may increase recreation access and have beneficial impacts. Overall, the impact of large construction projects in this alternative is likely to be minor.

In conclusion, the actions associated with this alternative overall are not predicted to add majorly to the moderate adverse recreation impacts of the No Action Alternative. Some exceptions exist, such as fences across contiguous borders or towers which disrupt scenic vistas, but the overall impacts of this alternative are expected to be moderate and adverse.

8.17.5 FLEXIBLE DIRECTION ALTERNATIVE

This alternative includes the previously discussed alternatives. Maximizing the activities of all three alternatives together would likely produce the highest level of impact discussed in previous alternatives, leading to moderate impacts on recreation. The location of specific actions will greatly influence impacts to recreation. Overall, this alternative is expected to have moderate impact in medium-impact and high-impact use areas and moderate to major impacts on low-impact use areas. If the increased activity levels in this alternative concentrated near a valued recreation site, the recreation impacts could become major.

Small Construction Projects

The Flexible Direction Alternative encompasses all three of the other alternatives, with actions anticipated at their maximum possible level. Impacts, therefore, would likely be the maximum level of impact of the other alternatives. Adding all three alternatives together would likely produce moderate impacts on recreation.

In conclusion, this alternative contains all actions and their corresponding impacts from all other alternatives and represents the maximum possible activity level for each. Therefore, the overall impact level must be at least as high as the alternative with the highest level of impact—the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative. The location of specific actions will greatly influence exactly how this alternative affects recreation. Overall, this alternative is expected to have moderate impacts in medium-impact and high-impact use areas and moderate to major impacts on low-impact use areas. If the increased

activity levels proposed in this alternative are concentrated near a valued recreation site, the recreation impacts could become major.

8.17.6 BEST MANAGEMENT, MINIMIZATION, AND MITIGATION

Consideration of current use patterns in the affected area and consultations with appropriate land managers could minimize the adverse impacts of construction projects, towers, vessel operations and patrols, and other actions. CBP seeks to avoid, minimize, repair, and reduce the impacts of its actions on the human environment. It does so through a combination of BMPs, siting plans, design strategies, mitigation measures, and monitoring plans best suited to the scale and location of the particular action. Towards that end, CBP could choose from the following actions to avoid or minimize impacts to recreation in implementing its proposed action:

- Decisions about traffic routes and timing of construction should consider hiking trails, camping and hunting areas, along with seasonal use patterns;
- Projects that require acquisition of new land should account for proximity to recreation areas, such as campgrounds, visitor centers, horse stables, and avoid them where practicable;
- Minimizing development, traffic, and disruption in previously undisturbed areas is critical for minimizing recreation impacts. Other actions that result in construction, traffic, or noise should be considered in planning in order to minimize cumulative impacts on any recreation area; and,
- Continued strengthening of partnerships, communication, and discussion with land managers of recreation areas can ensure that the placement of new infrastructure, patrol routes, and other actions would have minimal impact.

8.17.7 SUMMARY OF POTENTIAL IMPACTS

Table 8.17-4 shows the impacts of each action on recreation.

Table 8.17-4. Summary of Potential Recreation Impacts

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
NO ACTION ALTERNATIVE					
Small construction projects (<1 acre and <1/4 mile: e.g., minor repairs to facilities, parking lot repairs, access road repair)		⊗			
Large construction projects (>1 acre and >1/4 mile: e.g., repairs to facilities, parking lot repairs, access road repairs)		⊗	⊗		
Small on-site trade and travel processing operations	⊗				
Large on-site trade and travel processing operations	⊗				
Checkpoint operations		⊗			
Ground operations—motorized	⊗	⊗	⊗		
Ground operations—nonmotorized	On-road	⊗			
	Off-road		⊗		
Aircraft operations		⊗			
Vessel operations		⊗			
Operation of NII systems					⊗
Operation of sensor and other technologies	⊗	⊗	⊗		
OVERALL IMPACT		⊗			

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
FACILITIES DEVELOPMENT AND IMPROVEMENT ALTERNATIVE					
Small construction project (<1 acre and <1/4 mile: reconstruction or construction of new POEs, USBP structures, parking lot repairs, access road repairs)		⊗			
Large construction projects (>1 acre and >1/4 mile: reconstruction or construction of new POEs, USBP structures, parking lot repairs, access road repairs)		⊗	⊗		
New small on-site trade and travel processing operations (new POEs)	⊗				
New large on-site trade and travel processing operations (new POEs)	⊗				
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			
DETECTION, INSPECTION, SURVEILLANCE, AND COMMUNICATIONS TECHNOLOGY EXPANSION ALTERNATIVE					
Small construction projects (towers and other infrastructure to mount antennas, etc.)			⊗		
Ground operations—motorized			⊗		
Ground operations—nonmotorized	⊗				
Operation of NII systems					⊗
Operation of sensor and other technologies			⊗		
OVERALL IMPACT (INCLUDING NO ACTION)			⊗		
TACTICAL SECURITY INFRASTRUCTURE DEPLOYMENT ALTERNATIVE					
Small construction projects (trench cuts, towers, minor access roads and fences)		⊗			
Large construction projects (access roads and fences)		⊗			
OVERALL IMPACT (INCLUDING NO ACTION)		⊗			

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Impact-Producing Activity	Level of Impact				
	Negligible Adverse	Minor Adverse	Moderate Adverse	Major Adverse	Beneficial
FLEXIBLE DIRECTION ALTERNATIVE					
Small construction projects			⊗	⊗	
Large construction projects		⊗	⊗		
Small on-site trade and travel processing operations	⊗				
Large on-site trade and travel processing operations	⊗				
Checkpoint operations		⊗	⊗		
Ground operations—motorized			⊗		
Ground operations—nonmotorized		⊗			
Aircraft operations		⊗			
Vessel operations			⊗		
Operation of NII systems					⊗
Operation of sensor and other technologies			⊗		
OVERALL IMPACT (INCLUDING NO ACTION)			⊗		

8.18 CUMULATIVE IMPACTS

8.18.1 INTRODUCTION

Cumulative effects to the environment develop from past, present, and reasonably foreseeable future actions. This PEIS covers a large area potentially impacted by the activities and alternatives. This cumulative effects analysis is intended to provide CBP decision makers and readers with an understanding of reasonably foreseeable projects and the types of activities that could contribute to additional resource impacts should CBP adopt any aspects of the alternatives presented. The following sections on cumulative impacts discuss non-CBP projects and ongoing activities that could contribute to increased impacts on environmental resources. Specific geographic areas within the study area with the potential for cumulative resource impacts are identified in detail in most cases. However, when a specific resource requires future consideration based on imminent increases in impacts, the analysis provides more discussion of potential additive impact concerns that may need to be addressed in future NEPA documentation for future projects that may contribute to ongoing impacts.

8.18.2 AIR QUALITY

For the purposes of this PEIS, CBP determined that there were a few categories of ongoing activities across all northern border regions with air emission impacts for consideration in cumulative effects analysis. These activities are similar to CBP operations in type and range of operation and/or type and area of resulting air quality impacts. These include ongoing vehicular traffic in the northern border regions and recreational use of ATVs, off-road vehicles, and snowmobiles. Due to CBP's presence in and around national, state, and other forested areas, forestry and logging operations share the same spatial extent as CBP activities with emissions to the air. Similarly Federal, state, and local road repair and construction activities also contribute to air emissions.

Within the regions, several additional ongoing activities and proposed or underway projects beyond CBP's control have potential cumulative impacts to air quality.

In the WOR Region, the West Pine Zone pre-commercial thinning and prescribed fire (Washington), the Line Creek Coal Mine Expansion, the McNab Aggregate Mine, the BP Cherry Point Cogeneration Project, and the Sumas Generating Station all will have notable contributions to air emissions ranging from particulates to greenhouse gasses.

In the EOR Region ongoing activities such as mineral mining, wind farms, and energy parks, as well as cattle and hog farming, emit dust, methane, and other naturally occurring gases and combustion byproducts into the air. New projects with potential for regional air quality impacts include the Hartland Wind Farm, the Highwood Generating Station, Mon Dak Power Facility, Bakken Pipeline, Keystone XL Pipeline, Vantage Pipeline, St. Louis County Union Depot and Northern Lights Express, Willmar Municipal Utility, Corncob Co-combustion Plant Modification, Goodhue County Wind Project, and Polymet Land Exchange for mining on national forest lands.

In the Great Lakes Region, air emission sources include ongoing vessel traffic, and projects such as the Bruce to Milton Transmission Reinforcement, the Darlington New Nuclear Power Plant, the Hammond Reef Gold Mine, and Marathon Copper (open-pit) Mine, as well as the Port

Granby Long-Term Low-Level Radioactive Waste Management, the Lewis County Water/Wastewater Implementation Project, the Curt Manufacturing Facility, and the Alberta Clipper Project.

In the New England Region, ongoing mining for sand, gravel, cement, peat, stone, and clay contributes to particulate emissions as well as combustion product emissions from mining equipment.

Minor, short- and long-term, cumulative effects would be expected. Impacts on air quality would be primarily due to the construction and operation of CBP's facilities, as well as field activities. A wide range of other activities along the northern border that produce some amount of air pollutants would, of course, occur within each region across the northern border as a whole. Every state takes into account the effects of all past, present, and reasonably foreseeable projects, activities, and associated emissions during the development of their state implementation plan under the CAA. As noted above, estimated emissions generated by CBP's activities for all alternatives would be de minimis — so limited that they would not interfere with timely attainment of the NAAQS. Therefore, implementation of any of the proposed alternatives would not contribute appreciably to any adverse, cumulative, air quality impacts. Thus, impacts across the northern border as a whole would not be significant, and no air quality mitigation measures would be required.

Like the No Action Alternative and for similar reasons, the Facilities Development and Improvement Alternative; the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative; the Tactical Security Infrastructure Deployment Alternative; and the Flexible Direction Alternative would have minor, adverse, cumulative effects on air quality. No large-scale project or proposals have been identified that when combined with CBP activities would threaten the attainment status of any region, impede the timely attainment of the NAAQS in a nonattainment area, or lead to a violation of any Federal, state, or local air regulation. Therefore, cumulative effects to air quality would be minor.

8.18.3 BIOLOGICAL RESOURCES

Under all of CBP's proposed alternatives, the overall cumulative effect of projected CBP activities is less than major when considered with similar non-CBP activities and other activities with the potential for effects on wildlife and vegetation. General area construction can serve as a good comparative example of the potential for impacts to biological resources of an activity in combination with similar non-CBP activities. The volume of CBP's construction and maintenance activities represents a small fraction of total ongoing construction and maintenance. Cumulative impacts are possible due to the nature and frequency of these projects if they occur in the same geographic region. However, these incremental, additive impacts are expected to be minimal in comparison to initial direct and indirect impacts. Similarly, in the construction of a new, unimproved dirt road (under the Tactical Security Infrastructure Deployment Alternative), the incremental contribution to biological resources of CBP activities to projected potential impacts from other activities is generally minimal.

In the WOR Region, the Kittitas Valley Wind Power Project, the Desert Claim Wind Power Project, the Teanaway Solar Reserve Project, the Satsop Combustion Turbine Project, the BP Cherry Point Cogeneration Project, and the Sumas Generating Station all have the potential for

impacts to biological resources. Areas to watch might include CBP activities such as future tower construction that might combine with wind and solar projects to impact bat and bird migration behavior. Also, increased activity around and within areas such as the North Cascades National Park (Washington) or the Kootenai National Forest (Idaho) could have cumulative impacts on grizzly bear habitat and behavior. Currently, no major projects with potential effects on biological resources are known to be planned for those areas.

In the EOR Region, the Polymet Land Exchange (Minnesota), the Southern Lights Project (North Dakota), and the Quintana Capital Group Pipeline (North Dakota), along with the Langdon (North Dakota) and Goodhue County (Minnesota) wind projects have the largest physical presence. The Polymet Land Exchange will result in loss of around 1,000 acres of wetlands and conversion of over 6,000 acres of Superior National Forest for use in sulfide mining with other lands exchanged. Two federally listed animal species, the Canada lynx and the gray wolf, and several animal and plant species of concern at the state or regional forest level have been found on or near the parcels considered in the exchange. Future consideration of potential impacts to species and habitat around the Superior National Forest may depend on any long-term changes to these populations.

In the Great Lakes Region, the Bruce to Milton Transmission Reinforcement Project (New York), the Lewis County Water/Wastewater Implementation Project (New York), the Darlington New Nuclear Power Plant, the Northwest Ohio Intermodal Facility (Ohio), OneCommunity (Ohio), Com Net, Inc. (Ohio), the Thumb Loop Transmission Line Project (Michigan), and the Weston-Arrowhead Transmission Line (Wisconsin) all have the potential for impacts to biological resources.

In the New England Region, the Aroostook County Transportation Plan (Maine), the Northern Forest Canoe Trail (Maine), the Kibby Mountain Extension Project (Maine), the Groveton LINC Cell Phone Tower (New Hampshire), the Granite Reliable Wind Park (New Hampshire), and the Northern Vermont Fiber Optic Connection Project (Vermont) all have the potential for impacts to biological resources.

When considering the potential for impacts to biological resources from potential CBP construction, maintenance and repair, and operational activities under the No Action Alternative, the Facilities Development and Improvement Alternative, the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, and the Tactical Security Infrastructure Deployment Alternative, the incremental contribution of CBP activities along with other non-CBP projects and activities would be minimal in all of the regions. CBP would conduct further consideration of potential cumulative impacts on a site-specific basis when its future projects warrant them.

8.18.4 GEOLOGY AND SOILS

The degree of impact to geology and soils varies depending on location, existing conditions, and activity. Most infrastructures, facilities, towers, mining operations, wind farms and other power generating projects, along with developed areas are widespread throughout the entire area potentially affected by CBP activities. Large forestry and logging operations are most common within the western forests. In these areas, clearing of natural lands would adversely impact soils by increasing the potential for erosion and mass movement. Water-crossing construction and

repair sites would have consequences similar to those listed in the No Action Alternative. The overall cumulative effects to geology and soils of the No Action Alternative, the Facilities Development and Improvement Alternative, the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, the Tactical Security Infrastructure Deployment Alternative, and the Flexible Direction Alternative, when combined with the effects of other construction projects that occupy the same geographic or interconnected geophysical areas, would be expected to be minor to moderate and adverse.

In the WOR Region, non-CBP energy projects include the BP Cherry Point Cogeneration Project (Washington) and the Sumas Generating Station (Washington) are within 25 miles of CBP facilities.

In the EOR Region, non-CBP energy projects, such as existing wind facilities in the Horseshoe Bend Wind Park (Montana), Valley County Wind Farm (Montana); and the Glacier Wind Farm (Montana) are within 20 miles of CBP POEs and BPSs.

In the Great Lakes Region, the ComNet, Inc. fiber optics line project, and in the New England Region, the Northern Vermont Fiber Optic Connection Project, potentially run within a few miles of multiple BPSs and POEs.

8.18.5 WATER RESOURCES

Consideration of all activities having a potential impact on water resources in all alternatives across the northern border as a whole, combined with the understanding that BMPs would be implemented, and considering the dispersed nature of the non-CBP projects and their resulting impacts, leads to the conclusion that the overall direct and indirect impacts of all of the alternatives across the northern border would be minor and adverse (see Section 8.5.3). As a result of CBP's overall small, incremental contributions to water quality and supply issues, cumulative impacts to water resources across the northern border as a whole would be negligible as well.

In the WOR Region, ongoing activities such as forestry, logging, and farming (dairy and crops), impact water quality through erosion and runoff into surface waters. Projects such as the BP Cherry Point Cogeneration Project (Washington), the Westmoreland Savage Corporation's Savage Mine (Montana), the Montanore Silver-Copper Project (Montana), the Line Creek Coal Mine Expansion (Washington), and the McNab Aggregate Mine (Washington) also have potential to impact surface and ground water resources from discharges to water, surface runoff, and withdrawal from water supplies for use in processes. Subsurface mining can also impact groundwater flows, recharge, and quality if not fully managed.

The EOR Region also has various types of farming and ranching activities (wheat, barley, sugar beets, soy beans, cattle, and hog production) that can impact water supply for irrigation and water quality from runoff of agricultural wastes and pesticides. Projects that can also impact water resources through runoff and erosion include the Mon Dak Power Facility (North Dakota/Montana), the Bakken Pipeline (North Dakota), the Vantage Pipeline (North Dakota), the Keystone XL Pipeline (Montana), the Southern Lights Pipeline Project (North Dakota), and the Quintana Capital Group Pipeline (North Dakota). The Highwood Generating Station in Montana (coal-fired power plant) also has potential to discharge to water bodies.

In the Great Lakes Region, ongoing vessel traffic makes discharges to lakes and rivers. Projects such as the Bruce to Milton Transmission Reinforcement and the Darlington New Nuclear Power Plant will affect water resources through runoff and discharges as well as use. The Hammond Reef Gold Mine and Marathon Copper Mine also would have potential runoff impacts — an open-pit mine with ore being processed at a nearby processing facility. Two projects in New York are designed to effect greater efficiencies in use of water resources: the St. Lawrence County Industrial Development Agency Water Line (New York) would establish a second water main in St. Lawrence County, and the Lewis County Water/Wastewater Implementation Project (New York) would improve water and wastewater efficiencies. These projects may be beneficial to long-term sustainability of water supply, but they will also have potential adverse impacts from runoff and emergency discharges.

Other projects with potential to impact water resources through erosion and runoff include the Midtown Rising residential/commercial development (New York), the Northwest Ohio Intermodal Facility (Ohio), OneCommunity (Ohio), Com Net, Inc. (Ohio), the Thumb Loop Transmission Line Project (Michigan), Curt Manufacturing (Wisconsin), the Alberta Clipper (Wisconsin), and the Weston-Arrowhead Transmission Line (Wisconsin).

In the New England Region, ongoing mining (sand, gravel, cement, peat, stone, and clay), farming (potatoes, dairy cows, trees), and forestry and logging precipitate runoff issues. In New Hampshire, the Glen Ellis Site Improvement Project and the Crawford Stewardship Project both seek to improve recreation and quality of life opportunities, but may have erosion and runoff associated with site development and operation, maintenance, and improvement of existing recreation facilities. The Northern Forest Canoe Trail Project likewise will improve recreation in Maine, New Hampshire, Vermont, and New York, but will have some erosion impacts. The Northern Vermont Fiber Optic Connection Project and the Aroostook County Transportation Plan would have construction runoff and sustained runoff impacts.

A number of ongoing or planned non-CBP projects could contribute to a cumulative effect on water resources, as identified and analyzed in Section 8.5.3.1 under the No Action Alternative. The cumulative effects of these projects are also relevant to the Facilities Development and Improvement Alternative and the Tactical Security Infrastructure Deployment Alternative. The Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative and the Flexible Direction Alternative would have the greatest number of vessel operations (particularly in the Great Lakes Region) in addition to the ongoing construction under the No Action Alternative. CBP would implement standard and appropriate recommended BMPs for all construction projects. In general, CBP vessels would be a negligible source of disturbance or inadvertent discharges to surface waters. Non-CBP projects and their resulting impacts are regionally dispersed; therefore, cumulative effects would be minor and adverse.

8.18.6 NOISE

In addition to CBP's activities, a wide range of other activities along the northern border produce noise.

In the WOR Region, these include the West Pine Zone pre-commercial thinning and prescribed fire (Washington), the Satsop Combustion Turbine Project (Washington), and the BP Cherry Point Cogeneration Project (Washington). In the EOR Region, there are the existing wind

facilities (Montana): Horseshoe Bend Wind Park, Valley County Wind Farm, and Glacier Wind Farm. There are also the Goodhue County Wind Project (Montana), the Louis County Union Depot and Northern Lights Express (Montana), and the Langdon Wind Project (North Dakota). In the Great Lakes Region, there is the Curt Manufacturing Warehouse Facility (Wisconsin), the Northwest Ohio Intermodal Facility (Ohio), and the Lewis County Water/Wastewater Implementation Project (New York). In the New England Region, the Kibby Mountain Extension Project (Maine) will involve constructing 11 more wind power turbines in Franklin County.

Noise generated by CBP's activities for all alternatives across the northern border as a whole would be minor and not concentrated, except as noted at POEs and BPSs. These activities would constitute small, incremental increases in the overall noise environment, and thus are not expected to contribute appreciably to adverse, cumulative noise impacts. As a result, across the northern border as a whole, no noise impacts would be major enough to require mitigation measures.

8.18.7 CLIMATE AND RESOURCE SUSTAINABILITY

The CBP northern border proposals include projects and activities that could have minor impacts to climate and resource sustainability. Although the overall impact associated with these actions is negligible to minor in most cases, when these actions are combined with other activities along the northern border, the potential for incremental impact associated with CBP operations must be considered.

A summary of other actions that may be relevant to northern border operations is presented in Appendix F, Cumulative Scenarios. Actions of particular concern to the climate and resource sustainability analysis include those that would incrementally contribute to climate change, emissions of greenhouse gases, and use of nonrenewable resources. The activities proposed under the No Action Alternative would have a generally negligible, but potentially minor, climate and sustainability effect. Therefore, these activities would not likely contribute substantially to any significantly adverse, cumulative impact. As a result, any incremental impact would be negligible to minor in its overall effect.

The potential for impacts associated with the Facilities Development and Improvement Alternative, the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, the Tactical Security Infrastructure Deployment Alternative, and the Flexible Direction Alternatives would be generally similar. The increased number of activities under these alternatives increases the potential for impacts from CBP activities. However, this increased activity would not be sufficient to contribute substantially to the overall effect when considered with other relevant actions in the border communities. They would be expected to have a generally negligible to minor, cumulative effect.

In general, for all regions, the activities proposed under the alternatives considered would have a generally negligible to minor, incremental effect. Therefore, they would not likely contribute substantially to any significantly adverse, cumulative impact. Where particular actions may affect or be affected by ongoing activities at the local level, the analysis of potential climate and sustainability effects would necessarily be site-specific.

8.18.8 LAND USE

Considering the incremental effects of other past, present, and reasonably foreseeable future actions in the study area, the cumulative impacts on land use resources from the No Action Alternative, the Facilities Development and Improvement Alternative, the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, the Tactical Security Infrastructure Deployment Alternative, and the Flexible Direction Alternative would likely be moderate and adverse. While the impacts would be permanent, they would remain localized at the project site and unlikely to affect the viability of regional land use activity. Those CBP activities involving facilities and infrastructure construction would be the largest source of impact. Such activities directly remove the land on which the facilities are constructed from the existing use and alter the landscape in a way that may detract from surrounding land uses. If the amount of land converted for CBP infrastructure and facility development in combination with other projects violated local, state, or regional land use plans, zoning requirements or goals, or otherwise surpassed a threshold that affected the viability of existing land uses—such as recreation, agriculture, conservation, or development—the cumulative impacts could be major.

In the WOR Region, non-CBP energy projects within 25 miles of CBP facilities include the BP Cherry Point Cogeneration Project and Sumas Generating Station (Washington). These facilities represent changes in land use from previously undeveloped or low-development public and private properties. Other projects more distant from CBP border facilities include Westmoreland Savage Corporation's Savage Mine (Montana) and Kittitas Valley Wind Power Project (Washington), as well as the Teanaway Solar Reserve Project, Satsop Combustion Turbine Project, and Desert Claim Wind Power Project (Washington). These projects are being developed on forest, rangeland, and logged areas, as well as on more developed and more urban private and public lands.

In the EOR Region, non-CBP energy projects in Montana, such as existing wind facilities in the Horseshoe Bend Wind Park, the Valley County Wind Farm, and the Glacier Wind Farm are within 20 miles of CBP POEs; BPSs represent a recent change to land usage in the region. The stations are relatively distant from Goodhue County Wind Project, which is outside the range of the study area. The Polymet Land Exchange (Minnesota), which would result in near-term loss of natural resource recreation areas for sulfide mining, and the Westmoreland Savage Corporation's Savage Mine represent traditional land uses for the region, but are examples of past and future expansion of mining presence in Minnesota and Montana, respectively.

In the Great Lakes Region, projects with land use impacts include the St. Lawrence County Industrial Development Agency Water Line (New York), the Bruce to Milton Transmission Reinforcement Project (New York), the Lewis County Water/Wastewater Implementation Project (New York), Midtown Rising (New York), the Northwest Ohio Intermodal Facility (Ohio), OneCommunity (Ohio), Com Net, Inc.(Ohio), the Thumb Loop Transmission Line Project (Michigan), and the Weston-Arrowhead Transmission Line.

In the New England Region, the Aroostook County Transportation Plan (Maine) would create a new highway, clearing previously undisturbed land. Other projects that would impose land use changes include the Northern Forest Canoe Trail (Maine) and the Northern Vermont Fiber Optic Connection Project (Vermont).

Moderate impacts, such as those from development of a BPS or major modernization project at an existing POE, would affect a relatively small, localized area compared to the combined land use effects of ongoing activities in the northern border regions, described below. In particular, any proposed modification to an existing POE that involves acquisition of non-commercial or industrial properties would represent a change in land use; however, the location of POEs occurs proximate to the border at existing road crossings such that it is an inherently expected land use that is not discretionary in placement although design and footprint are variable.

Increasing these activities would result in either (1) greater frequency of noise or light disturbance at particular sites (if the missions are more frequent, but in the same areas), or (2) more of these disturbances across the border (if the additional missions patrol a larger area). If increased surveillance and patrols cover a larger area, the affected land area would likewise increase. In either case, however, this alternative requires no direct land use conversion. Impacts result from reduced quality of certain land uses (e.g., recreation or residential development) near the activity. CBP may minimize such impacts by conducting patrols and surveillance away from other land uses or during periods of relatively low recreation, when feasible.

The cumulative impacts of the Detection, Inspection, Surveillance, and Communications Expansion Alternative on land use resources are expected to be moderate and adverse because no direct change to the use of a particular land parcel is expected. Instead, the increased noise or light disturbance may affect the relative appeal of the area near the project site for recreation or residential development. The cumulative impact of this alternative is, therefore, unlikely to be noticeably greater than that of the No Action Alternative (only negligible to minor additional impacts beyond the No Action Alternative activities). A threshold may exist above which noise and visual disturbances cause more than a minor impact, such that activities would degrade regionally. That specific threshold remains uncertain, and depends on the context of site-specific and surrounding land use (e.g. residential versus recreational).

8.18.9 AESTHETICS

Under all alternatives, CBP's activities would occur over a broad range of landscapes that would also be affected by the actions of other agencies, non-governmental organizations, and the public. Potential cumulative impacts would occur from the addition or existence of road repair and construction; communications towers from other Federal, state, local, and private owners; wind turbine projects, such as the Kibby Mountain Wind Farm and Extension Project; infrastructure remodeling and development; and forestry and logging.

The amount of impact caused by each of these actions varies along the northern border. Infrastructure, facilities, towers, and developed areas are widespread throughout the entire border region. Non-CBP road repair and infrastructure improvements, combined with modernization of CBP infrastructure, would result in a cumulative beneficial impact by creating a modern and well-maintained area.

Forestry and logging are most common along the eastern and western forests, where the visual and aesthetic appeal stems from the lack of infrastructure, development, and cleared areas. By clearing and developing additional lands, the proposed CBP actions would decrease the amount of untouched landscapes. The clearing of natural lands and the erection of large buildings or

towers in natural settings by CBP, in addition to other similar projects, would result in an adverse, cumulative impact to the visual environment.

Wind turbine projects are common in the Midwest and eastern states, and non-CBP-owned communications towers are prolific throughout the entire area. Both towers and wind turbines are very large, obviously manmade structures, and are usually situated in rural or natural landscapes. The presence of additional structures within the same viewshed increasingly detracts from the visual environment. The addition of CBP monopole towers would cause minor, adverse, cumulative impacts to the visual environment when located in the same viewshed as similar structures.

Cumulative impacts from the No Action Alternative would be minor and adverse with some beneficial impacts from the ongoing modernization of buildings.

The Facilities Development and Improvement Alternative and the Tactical Security Infrastructure Deployment Alternative would have long-term, minor, and adverse impacts beyond the impacts of the No Action Alternative from the additional widely dispersed facilities and infrastructure, with some beneficial impacts from the modernization of CBP buildings. Most impacts from the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative would be negligible due to the small effect that most changes or additions to technology have on the visual environment. Communication and surveillance towers have the potential for additional minor and adverse impacts. For reasons provided in previous discussion, the Flexible Direction Alternative's cumulative impacts would be minor and adverse, with some beneficial impacts from the modernization of buildings. Under all alternatives, if structures would need to be erected in more visually sensitive areas, site-specific visual impacts could be greater and mitigation or avoidance measures would be implemented.

8.18.10 SOCIOECONOMICS

When combined with the impacts of other projects and factors, the cumulative impacts of CBP's alternatives would be moderate and adverse. The Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative and the Tactical Security Infrastructure Deployment Alternative would likely have only minor, additive, adverse impacts compared with those of the No Action Alternative, whereas the Facilities Development and Improvement Alternative and the Flexible Direction Alternative may have additional moderate, adverse impacts. The majority of activities, such as small construction projects, various types of patrols, and surveillance technologies, are all likely to generate minor, adverse impacts.

Minor impacts, as previously defined, are temporary and disappear once the impacting agent is removed (e.g., noise associated with small construction projects or patrols). Moderate impacts, such as potential increases in wait times, are primarily associated with POE operations and checkpoints. Many other actions already contribute to traffic delays, including non-CBP-related road repair and construction, and other CBP security programs. Further, while CBP construction and infrastructure development may introduce temporary or permanent noise or visual disturbances, these are minor compared to the mining and wind energy construction and development projects anticipated in the region. Moderate impacts, such as those associated with increased wait times, may be reduced with proper mitigation (as described in section 8.10.6), or may require the community to adjust to disruptions.

Although patrols introduce noise and disturbance, these impacts are limited to the location and timing of a particular vehicle, aircraft, or vessel mission. Once the impacting agent is eliminated, the affected activity or community would return to a condition with no measurable effects from the action. Furthermore, additional inspection technology at POEs or checkpoints may have either adverse or beneficial effects on wait time at crossings. Additional inspections and surveillance equipment are likely to generate impacts limited to the project site, and not affect economic activities within the broader region.

Beneficial impacts are also associated with large construction projects in that they improve regional employment opportunities, increase visitation to a region, or decrease travel times to cross the border.

In the EOR Region, examples of non-CBP projects that contribute to cumulative socioeconomic impacts include the St. Louis County Union Depot and Northern Lights Express (Minnesota) projects for planned high-speed passenger rail line between Twin Ports and Twin Cities, and the Quintana Capital Group Pipeline (North Dakota).

In the New England Region, examples of non-CBP projects that contribute to cumulative socioeconomic impacts include the Kibby Mountain Extension Project (Maine), the Groveton LINC Cell Phone Tower Project (Maine), and The Northern Vermont Fiber Optic Connection Project (Vermont).

If other resource, energy, and economic development projects occur in the same areas as CBP's increased construction activities, additional impacts may be felt on surrounding lands. However, the low density of facilities, even under the Flexible Direction Alternative, would still render the cumulative impacts, at most, moderately adverse. As described, opening additional undeveloped areas through access road construction and development could also bring beneficial economic impacts with increased regional employment and economic activity.

8.18.11 CULTURAL AND PALEONTOLOGICAL RESOURCES

The nature of potential impacts to cultural and paleontological resources, including permanent physical changes to resources such as demolition or physical removal of materials, could result in impacts that are long-term. Though not in themselves adverse, multiple incremental changes to individual historic facilities have the potential over time to result in adverse impacts if the changes remove significant character-defining materials that eventually diminish the significance of the property. Under the No Action Alternative, CBP would undertake 80± small construction projects and 60± large construction projects along the northern border. The Facilities Development and Improvement Alternative would result in additional small and large construction projects (120± and 80±, respectively). Most projects under these alternatives are anticipated to consist of repairs to facilities and infrastructure, rather than construction of new facilities, minimizing the potential to impact cultural and paleontological resources.

The Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative entails an increased number of construction projects (400±) across the northern border region. Many projects involve building communication towers and infrastructure, which increases the potential for long-term, adverse impacts due to the need to site the structures in a wide variety of locations, some of which may be the location of cultural and paleontological

resources or within the viewshed of Native American cultural resources. Multiple incremental changes to viewsheds from the introduction of multiple towers are not in themselves adverse. However, they have the potential over time to result in adverse impacts if the addition of multiple towers within sight of one another sufficiently changes the visual quality of historic viewsheds in a way that diminishes their significance.

The Tactical Security Infrastructure Deployment Alternative would potentially have minor to major, long-term, adverse impacts on cultural and paleontological resources in some cases and beneficial impacts in others. The number of small and large construction projects in the northern border region as a whole would be modest (480± and 80± respectively) with most of the projects likely to consist of trench components less than a quarter mile in length, rather than large construction projects (more than a quarter mile in length), minimizing the potential to impact cultural resources.

Under the Flexible Direction Alternative, the number of small and large construction projects in the northern border region as a whole would be larger (640± and 100±, respectively, over the No Action Alternative) than under the other alternatives, increasing the potential for impacts on cultural and paleontological resources; yet, as with those alternatives, most of the projects are likely to consist of repairs to facilities and infrastructure, rather than construction of new facilities, minimizing the potential to impact cultural and paleontological resources.

In addition, CBP (or GSA for those properties owned by that agency) would carry out facility and infrastructure projects in consultation with State and Tribal Historic Preservation Offices and other consulting parties under Section 106 of the National Historic Preservation Act. That review process is intended to identify mutually agreeable project designs that avoid or minimize adverse effects, with the result that most projects would result in minor impacts. In addition, some projects would be designed to avoid cultural or paleontological resources entirely, or to repair or rehabilitate historic properties in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. These projects would thereby result in beneficial, long-term impacts.

8.18.12 ENVIRONMENTAL JUSTICE AND THE PROTECTION OF CHILDREN

The CBP northern border proposals include projects and activities that could affect minority or low-income populations or populations of children under age 18, depending on their proximity to the actual site of CBP operations. Although the overall environmental justice impact associated with these actions is negligible to minor in most cases, when these actions are combined with other activities along the northern border, the potential for incremental impacts associated with CBP operations must be considered.

A summary of other actions that may be relevant to northern border operations is presented in Appendix A, the Northern Border PEIS Public Scoping Report. Actions of particular concern to the environmental justice analysis include those that would directly affect populations living in areas adjacent to, or not far removed from, the site of the activity, and those that might pose a significant or otherwise disproportionately adverse risk to the health and safety of the local population. Where potential impacts are unequally distributed across community segments, especially with regard to minority and low-income populations, or where these impacts pose a

disproportionately high risk to the health and safety of children, an environmental justice concern may exist.

The activities proposed under the No Action Alternative would have a generally negligible, but potentially minor, environmental justice effect. Therefore, they would not likely contribute substantially to any significantly adverse, cumulative impact. As a result, any incremental impact would be negligible to minor in its overall effect.

The potential for and type of impact associated with the Facilities Development and Improvement Alternative, the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, the Tactical Security Infrastructure Deployment Alternative, and the Flexible Direction Alternative would be generally similar. The increased number of activities under these alternatives increases the potential for impacts from CBP activities. However, this increased activity would not be sufficient to contribute substantially to the overall effect when considered with other relevant actions in the border communities. They would be expected to have a generally negligible to minor, cumulative effect.

In general, for all regions, the activities proposed under the alternatives considered here would have a generally negligible to minor, incremental effect. Therefore, they would not likely contribute substantially to any significantly adverse, cumulative impact. Where particular actions may affect or be affected by ongoing activities at the local level, the analysis of potential environmental justice or human health effects to minority or low-income populations or populations of children under the age of 18 would necessarily be site specific.

8.18.13 HUMAN HEALTH AND SAFETY

The potential for cumulative human health impacts from the combination of actions proposed by CBP and others along the northern border, results from the additive and synergistic effects of increased projects and activities, which provide increased opportunities for human exposure to individually minor or negligible health hazards. Cumulative impacts on HH&S are possible because of the accumulated risk of multiple projects. For the purposes of this analysis, CBP is concerned with cumulative impacts that would be expected from the addition or continued existence of the following:

- Technologies or activities that produce radiation;
- Technologies or activities that produce RF energy and EM radiation; and,
- Activities that increase lead concentrations.

The degree of impact to HH&S varies in relation to location along the northern border. Technologies or activities that produce radiation would have negligible to minor, adverse impacts to HH&S. According to the NRC, low doses (less than 10,000 mrem) spread out over long periods of time—years to decades—do not cause an immediate problem on any body organ. The effects of low doses of radiation, if any, would occur at the cellular level; thus changes may not be observed for many years (usually 5 to 20 years) after exposure (USNRC, 2004). These activities would be covered under OSHA, and the level of radiation exposure would be within standards set by such regulation. However, adverse impacts could still occur.

The chance of exposure to RF, EM, and lead emissions would increase with an increase in the number of RF-, EM-, and lead-emitting technologies used. Technologies that produce RF and EM emissions are regulated under OSHA and would have negligible to minor, adverse impacts. Lead concentrations from munitions in the environment can be regulated by RCRA, the Comprehensive Environmental Response, Compensation, and Liability Act, or the Clean Water Act, depending on site location; they would have negligible to minor, adverse impacts. Since CBP's activities would raise the risk of exposure, the U.S. population could experience health problems over time from accumulated exposure to these emissions.

Activities that produce radiation, RF, EM, and lead, which could contribute to cumulative impacts in the WOR Region include:

- Continued use of wind turbines. Wind turbines' electrical generators and medium-voltage transformers emit low-level EM (CECO, no date).
- Continued use of communication towers. Communication towers are scattered across the WOR Region. Still the WOR Region has a lower concentration of communication towers than does the Great Lakes Region. Communication towers emit both EM and RF emissions (<http://www.cellreception.com/towers/>, no date).
- The Kittitas Valley Wind Project. A total of 52 wind turbines would interconnect to the Bonneville Power Administration transmission systems in Kittitas County, Washington.
- The Satsop Combustion Turbine Project. The project consists of two combustion turbine generators in a two-on-one configuration, with a single steam turbine generator. It is located in Grays Harbor County, Washington.
- The Desert Claim Wind Power Project. The project is located in Kittitas County, Washington and will have a maximum of 95 turbines with a total height of 410 feet.
- Marten Ridge Wind Energy Project. The project is located near Fernie, British Columbia. The proposal consists of 40 wind turbines and an overhead transmission line. Both the wind turbines and the transmission line produce EM radiation.

Activities that produce radiation, RF, EM, and lead, which could contribute to cumulative impacts in the EOR Region include:

- Continued use of wind turbines. Wind turbines' electrical generators and medium-voltage transformers emit low-level EM (CECO, no date).
- Continued use of communication towers. Communication towers are scattered across the EOR Region. Still, the EOR Region has a lower concentration of communication towers than does the Great Lakes Region. Communication towers emit both EM and RF emissions (CellReception.com, no date).
- Planned use of the Langdon Wind Project. Located in Cavalier County, North Dakota, this project proposes 106 wind turbines and a 35-mile transmission line that will be upgraded from 41.6kV to 115kV.
- Planned use of the Langdon Wind Project. The project is located in Goodhue County, Minnesota and will include a maximum of 50 400-foot turbines.

Activities that produce radiation, RF, EM, and lead, which could contribute to cumulative impacts in the Great Lakes Region include:

- Continued use of wind turbines. Wind turbines' electrical generators and medium-voltage transformers emit low-level EM radiation (CECO, no date).
- Continued use of acid-lead battery manufacturing facilities.
- Continued use of nuclear power facilities.
- Continued use of communication towers. Communication towers are scattered across the Great Lakes Region. Compared to the other regions, the Great Lakes Region has a high concentration of communication towers. Communication towers emit both EM and RF emissions (CellReception.com, no date).
- The LEEDCo Wind Project. Located off the coast of Lake Erie, Ohio, this project will generate 1,000-MW of electricity and will be operational in 2012.

Activities that produce radiation, RF, EM, and lead, which could contribute to cumulative impacts in the New England Region include:

- Continued use of wind turbines. Wind turbines' electrical generators and medium-voltage transformers emit low-level EM (CECO, no date).
- Continued use of communication towers. Communication towers are scattered across the New England Region. Still, the New England Region has a lower concentration of communication towers than does the Great Lakes Region. Communication towers emit both EM and RF emissions (CellReception.com, no date).
- Planned use of the Kibby Mountain Extension Project. Located in Franklin County, Maine, this project proposes to add 11 turbines on Sisk Mountain.
- Planned use of the Granite Reliable Wind Park Project. Located in Coos County, New Hampshire, the park is currently in development and when operating will be a 99-MW wind park.

The cumulative overall adverse impacts to HH&S from non-CBP projects and the Facilities Development and Improvement Alternative and the Tactical Security Infrastructure Deployment Alternative would be the same as for the cumulative overall adverse impacts to HH&S from non-CBP projects and the No Action Alternative. Generally, the cumulative impacts would be minor and adverse with minimal incremental health factor risks with the increased activity under each of the action alternatives and the potential for closer proximity to non-CBP activities with potential human health effects.

The Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative and the Flexible Direction Alternative would increase the number of sources of RF and EM emissions. It is unlikely, however, that enough communications towers, wind turbines, and transmission lines would be erected close enough together to produce dangerous levels of RF and EM emissions, although emission exposure would increase. Additional beneficial safety and human health impacts would be anticipated because the rate of interdictions would likely increase along the northern border.

8.18.14 HAZARDOUS MATERIALS

Hazardous wastes are defined by RCRA as solid waste or a combination of solid wastes, which, because of quantity, concentration, or physical, chemical, or infectious characteristics may cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness, or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. CBP implements its RCRA requirements consistently across the northern border as a whole. For descriptions of the regional affected environments for hazardous materials see Sections 4.14.2 (WOR Region), 5.14.2 (EOR Region), 6.14.2 (Great Lakes Region), and 7.14.2 (New England Region).

Across the northern border as a whole, under all of the alternatives, current operations would continue in order to meet CBP's goals to secure the Nation's borders from the entry of dangerous people and goods and to prevent unlawful trade and travel. Using a risk-based approach, CBP would employ the most effective inspection and scanning technology available at designated POEs, airports, seaports, and permanent traffic checkpoints to detect and prevent the entry of hazardous materials, goods, and instruments of terror into the United States (USDHS, 2009).

Overall, across the northern border, direct and indirect impacts from CBP's management of hazardous wastes would range from beneficial to minor adverse for all alternatives. Non-CBP actions in close proximity to CBP's activities, such as small and large construction projects and motorized ground operations, would add to the hazardous material impacts caused by CBP's activities. These actions would produce comparable hazardous waste to that of CBP's activities. Materials used during ground operations and during the large and small construction projects would be comparable to those used by CBP.

Only minor increases in the cumulative effects of hazardous materials would occur as a result of construction, maintenance, and operation activities. Across the northern border as a whole, the effects of all of the alternatives, when combined with other ongoing and proposed projects in the area, would not be expected to have a significant, cumulative effect. BMPs would be implemented as standard operating procedures during all construction activities, and would include proper handling, storage, or disposal of solid and hazardous or regulated materials. The impacts of hazardous waste would vary greatly with each CBP activity described in this analysis, but the overall cumulative impacts would be expected to be short-term, adverse, and minor. This assumes that CBP would continue to follow the appropriate mitigation measures and BMPs to avoid accidental releases and spills of hazardous materials.

8.18.15 UTILITIES AND INFRASTRUCTURE

There are potential cumulative impacts to all utility resources from the combination of actions proposed by CBP and the activities conducted by others in each of the regions along the northern border. Continued activities at non-CBP-owned communication towers in all four regions would have long-term, negligible impacts to electrical supply since energy supply capacities allow for expected marginal growth, and the demand from the proposed activities is not likely to strain capacity.

In the WOR Region, construction and operation of the silver-copper mine in Montana and Idaho would have a negligible impact on utility resources; however, construction of the associated

transmission line would have a long-term, beneficial impact to electrical resources because of the added transmission capacity. Continued operations and construction of wind farms, solar and turbine projects, and transmission lines in Washington would have long-term, beneficial impacts to utility resources by adding more environmentally friendly sources of electricity supply.

In the EOR Region, continued mineral mining activities in Montana, Minnesota, and North Dakota that demand water, such as quarrying and milling, put stress on water supply and would have long-term, minor, and adverse impacts to water resources. Upgrades or maintenance of mines would have a negligible impact to utility resources. Construction, upgrades, and/or maintenance of nonrenewable power plants (coal and nuclear) would have short-term, minor, and adverse impacts to water resources and beneficial impacts to electrical and HVAC resources. Continued operations and construction of wind farms, crude oil pipelines, renewable energy plants, and transmission lines in Minnesota, Montana, and North Dakota would have long-term, minor, and adverse impacts to water resources and beneficial impacts from the addition of electrical fuel and capacity.

In the Great Lakes Region, continued operations and construction of wind farms, crude oil pipelines, renewable energy plants, and transmission lines in Michigan, Wisconsin, and Ohio would have a long-term, beneficial impact to electrical resources by adding transmission capacity. Improved efficiency of water supply and wastewater facilities in New York would have a long-term, beneficial impact to water and wastewater resources. Improved energy dispatching, system reliability, and planning capabilities in Michigan, Illinois, Ohio, and Pennsylvania will have long-term, beneficial impacts to electrical and fuel capacity resources by increasing efficiency of transmission systems.

In the New England Region, mining activities requiring water, such as quarrying and milling operations, put stress on water supply and would have a long-term, minor, and adverse impact to water resources. Construction of fiber optic cable lines would have long-term, beneficial impacts to communication utilities by the addition of technological infrastructure. Construction of wind farms in Maine and New Hampshire would have long-term, beneficial impacts to utility resources by adding more environmentally friendly sources of electricity supply.

Cumulative impacts would be expected from the following activities (beginning with those in the WOR Region, then travelling east):

- Continued activities at non-CBP-owned communication towers (across the northern border);
- Continued construction of the Kittitas Valley Wind Power Project (52 turbines) and Desert Claim Wind Power Project near Ellensburg in Kittitas County, Washington (95 turbines);
- Construction of the Teanaway 75-MW Solar Reserve Project 90 miles east of Seattle just outside Cle Elum, Washington. The photovoltaic installation will have a reserve capacity able to supply power to 45,000 homes;
- Construction of the Satsop Combustion Turbine Project in Gray Harbor County, Washington will produce a nominal output of approximately 530-MW per year, with a maximum annual output of approximately 650-MW;

- Construction of the 72-MW, natural, gas-fired, combined-cycle BP Cherry Point Cogeneration Project near Blaine in Whatcom County, Washington would provide electricity to the Bonneville Federal Columbia River transmission system;
- Continued operations at Sumas Generating Station in Sumas, Washington, which produces 125-MW of electricity when operating at maximum capacity (enough to meet the peak electricity needs of about 94,000 households);
- Construction of Montanore Silver-Copper Project in the Coeur d'Alene Mining District, on the Montana-Idaho border is targeting an initial annual production rate of 8 million ounces of silver and 60 million pounds of copper. Major infrastructure for the project will include construction of a 230-volt (500-kV electrical) transmission line approximately 17 miles in length, access road and bridge improvements, and water treatment facilities;
- Continued mineral mining in Minnesota, North Dakota, and Minnesota;
- Continued operations at Langdon Wind Project in Langdon, North Dakota; Horseshoe Bend Wind Park in Great Falls, Montana; Valley County Wind Farm near Glasgow, Montana; and Glacier Wind Farm near Ethridge, Montana. Operations of the Goodhue Wind Project in Goodhue County, Minnesota are slated to begin in 2011;
- Continued operations of the Southern Lights Project, which includes a 313-mile, 20-inch crude oil pipeline from Cromer, Manitoba to Clearbrook, Minnesota;
- Construction of the 300-mile Quintana Capital Group pipeline will extend from Watford City in western North Dakota to Fallon County in eastern Montana;
- Planned construction to connect the 123.4 km oil pipeline from Steelman, Saskatchewan to Cromer, Manitoba to a pipeline in North Dakota, designed to transport up to 145,800 barrels oil per day;
- Planned construction of the Montana segment of the 1,661-mile, 36-inch crude oil pipeline Keystone Gulf Coast Expansion, which would begin at Hardisty, Alberta and enter the United States at Port Morgan, Montana;
- Continued operations at Westmore Savage Corporation's Savage Mine in Sidney, Montana, a pit surface mine that produces approximately 350,000 tons of lignite annually;
- Construction of 150 miles of high-speed passenger rail between Twin Ports and Twin Cities, Minnesota;
- Construction of 180 km, double-circuit, 500,000-volt (500 kV) transmission line from the Bruce Power facility in Kincardine, Ontario to Hydro One's Milton Switching Station in the Town of Milton, New York; with an additional 3,000-MW of energy from clean and renewable resources;
- Improvement of Lewis County Water/Wastewater Implementation Project in Lewis County, New York;
- Construction of the LEEDCo wind project off the coast of Lake Erie in Ontario to eventually generate 1,000-MW of electricity;

- Construction of the Thumb Loop Transmission Line Project, 140 miles of double-circuit 345,000-volt (345-kV) lines and 4 new substations from Tuscola to Huron County, Michigan;
- Continued operations of Enbridge Energy, LP's Alberta Clipper, a 1,000-mile, 36-inch pipeline from northern Canada to Superior, Wisconsin, which pumps 19 million gallons of oil daily to the Midwest;
- Construction of the 220-mile, 345-kV Weston-Arrowhead Transmission Line from the Weston Power Plant near Wausau, Wisconsin;
- The Midwest Independent Transmission System Operator Smart Grid Project that will pass through Minnesota, Montana, and North Dakota, and improve energy dispatching, system reliability, and planning capabilities in several independent transmission systems throughout the Great Lakes states (Michigan, Illinois, Ohio, and Pennsylvania);
- Ongoing mining of sand, gravel, cement, peat, stone, and clay in Maine;
- Continued operations of the 44-wind-turbine Kibby Mountain Wind Farm in Franklin County, Maine and construction of 11 (3-MW) wind turbines to produce an additional 92 million kW hours per year, the equivalent of supplying 13,000 average-sized Maine households;
- Construction of Groveton LINC Cell Phone Tower in Groveton, Coos County, New Hampshire to provide enhanced cell phone coverage;
- Construction of the 99-MW Granite Reliable Wind Park in Coos County, New Hampshire; and,
- Construction of fiber optic cable from Stanhope, Quebec to Norton, Vermont.

The overall cumulative impact of CBP activities under the No Action Alternative would be long-term, minor, and adverse when analyzed in conjunction with continued activities at non-CBP-owned communication towers. CBP would follow a suitable combination of BMPs, siting plans, design strategies, mitigation measures, and monitoring plans to lessen the severity of impacts (as described in Section 8.15.6). Continued operations and construction of wind farms, crude oil pipelines, renewable energy plants, and transmission lines would have beneficial impacts resulting from the addition of electrical and fuel supplies.

Under the Facilities Development and Improvement Alternative, CBP's facilities development activities would at most double. There are currently about 40 POE projects under development by OFO, ranging from renovations and alterations to completely new stations, as well as over 65 USBP projects, ranging from minor construction such as landscaping, expansion of parking, and housing for radio repeater sites, to completely new stations in new locations. Though some beneficial impacts would result from the modernization of buildings and their facilities, the incremental impact of facilities construction would contribute to increased demand on utility resources. Following proper standards, criteria, and mitigations would ensure that maximum supply capacities are not exceeded. The proposed CBP activities would produce long-term, minor, and adverse cumulative impacts to utility resources.

Under CBP's Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, deployment of detection, inspection, surveillance and communications technologies would increase. Even combined with continued activities at non-CBP-owned communication towers, the cumulative impact to electrical demand would be negligible in the long-term, since energy supply capacities allow for expected marginal growth, and the demands of the proposed activities are not expected to strain capacity. In addition, continued operations and construction, upgrade, or maintenance of nonrenewable power plants (coal and nuclear), wind farms, crude oil pipelines, renewable energy plants, and transmission lines would have beneficial impacts to electrical and HVAC energy resources. For these reasons, cumulative, adverse impacts would be negligible to minor.

Under the Tactical Security Infrastructure Deployment Alternative, none of the increased activities (except for the construction of towers) would affect utility resources differently than would those in the No Action Alternative. Therefore, this alternative would also have negligible, cumulative impacts.

Under the Flexible Direction Alternative, CBP's aggregate construction projects would increase more than fivefold in comparison with the No Action Alternative. The increase in activities from this alternative would contribute to increased demand on utility resources. Since following proper BMPs would ensure that maximum supply capacities are not exceeded, the proposed CBP activities would produce long-term, minor, and adverse cumulative impacts to utility resources.

8.18.16 ROADWAYS AND TRAFFIC

CBP's current activities and proposed programs, when combined with other projects and activities, have the potential for moderate, cumulative, adverse effects overall. Notably, the vast majority of CBP activities along the northern border are relatively small, diverse, and not concentrated in any area. Hence, most planned activities would have minor effects to transportation resources. Planned CBP activities are not expected to combine with each other or with other concurrent activities to create cumulative, adverse effects on transportation resources. The potential for major, cumulative, adverse effects would only exist in cases where CBP activities included the establishment of a new road, or the long-term or permanent closure of an existing road. Road closures are not contemplated as mechanisms for advancing border security or facilitating trade and travel; however, changes in priorities have the potential to result in a major change in a roadway's status in the next five to seven years. If these changes become necessary, additional site-specific analysis would be required to determine the necessary level of NEPA analysis and the actual level of effects. The road closure scenario is not a part of any of the alternatives, but is possible under any of them. All other activities would have less than major cumulative effects.

Ongoing road repair and construction projects could have short-term, minor or moderate, adverse impacts on traffic from road closures and rerouting, requiring users to adapt to and possibly endure longer travel times and congestion. Ongoing road repair and construction projects may also have long-term, beneficial impacts from improved road conditions and the alleviation of traffic via road or lane expansions. One such project in the New England Region is the Aroostock County Transportation Plan, which includes a proposal for a new, two-lane, controlled-access highway extending east and north from the Route 1/Route 89 intersections, crossing Route 1 north of the Cary Medical Center, and connecting to Route 161. Short-term,

cumulative, moderate, adverse impacts could occur if POEs in the vicinity were to undergo modifications to activity under the Facilities Development or Flexible Direction Alternative within the same timeframe. There would also be potential for long term, moderately beneficial traffic impacts after all construction was completed and traffic flow improved. The Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative could also result in improvements to traffic flow by increasing the efficiency of vehicle screening.

The No Action Alternative could cause major, cumulative, adverse effects under circumstances where CBP would need to implement a road closure for an extended period of time. Notably, the vast majority of CBP's activities along the northern border are relatively small, diverse, and not concentrated in any area. Hence, most planned activities would have minor effects to transportation resources. Planned CBP activities are not expected to combine with each other or with other concurrent activities to create cumulative, adverse effects on transportation resources.

In areas with greater concentrations of CBP activities, the potential exists for greater individual and cumulative impacts to traffic and road-system function. The potential for major, cumulative, adverse effects would only exist in cases where CBP activities included either the establishment of a new road or the permanent closure of an existing road. If these activities become necessary, additional site-specific analysis would be required to determine the necessary level of NEPA analysis and the actual level of effects. All other activities would have less than major cumulative effects. Proper site-specific NEPA documentation would be provided to evaluate the potential impacts of any major road modifications.

Like the No Action Alternative, the Facilities Development and Improvement Alternative, the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative, and the Tactical Security Infrastructure Deployment Alternative all have the potential for major, adverse effects on transportation resources; however, this would only be true in cases where CBP activities included either the establishment of a new road or the permanent closure of an existing road. If these actions became necessary, additional site-specific analysis would be required to determine the necessary level of NEPA analysis and the actual level of effects. All other activities would have minor effects to transportation resources.

8.18.17 RECREATION

Several non-CBP projects in the regions have the potential to affect recreation resources. CBP's actions, therefore, could produce cumulative impacts to recreation:

WOR Region

- Kittitas Valley Wind Power Project, in Kittitas County, Washington is near the Snoqualmie and Wenatchee National Forests. The project site includes forest and rangeland that may currently be used for recreation. Construction of wind turbines could limit access to or eliminate recreational opportunities on the project site, or degrade its aesthetic appeal.
- Teanaway Solar Reserve Project is located outside of Cle Elum, Washington; it is also near the Snoqualmie and Wenatchee National Forests. The project will be located on previously logged land, but may restrict access to, degrade, or eliminate recreation in the national forests. The Desert Claim Wind Power Project site is also located near these two

forests. The construction and visual impacts of this project may degrade recreation opportunities in the vicinity.

- Satsop Combustion Turbine Project will be located in Grays Harbor County and is near Olympic National Park. This project may restrict access to, degrade, or eliminate local recreation opportunities.

EOR Region

- Polymet Land Exchange: This land exchange would result in the acquisition of 6,650 acres of U.S. Forest Service land in Superior National Forest for sulfide mining. This project may have a range of impacts on recreation, including loss of recreation lands and land access, a change in the scenic and natural quality of remaining nearby recreation areas, and effects on wildlife. CBP actions near Superior National Forest will consider this large project to avoid compounding impacts on recreation.

Great Lakes Region

- St. Lawrence County Industrial Development Agency Water Line: While this New York project is not near any federally protected lands, the visual impacts of the project could affect state, local, and private recreation lands.
- Bruce to Milton Transmission Reinforcement Project: This transmission line project will traverse Canada and New York and may change the scenic quality of local, state, and private recreation.
- One Community: This project in northeastern Ohio may affect recreation by changing the scenic and visual quality of landscapes.
- LEEDCo: This Ohio-based wind farm project could impact visual landscapes.
- Thumb Loop Transmission Line Project: This transmission project is located near Huron National Forest in Michigan and could produce impacts from construction and visual alterations.

New England Region

- Glen Ellis Site Improvement Project: This project will take place in the White Mountain National Forest and will involve small construction and maintenance of facilities. The overall outcome of the project is likely to be beneficial to recreation in the area, but some temporary, minor impacts may occur while access to certain areas is limited and while construction results in noise, waste, increased traffic, and visual disturbance.
- Crawford Stewardship Project: This project will also take place in the White Mountain National Forest and will involve maintenance and improvement of existing recreation facilities. Similar to the Glen Ellis Project, this project would result in long-term benefits and temporary, minor, adverse impacts during construction.
- Aroostook County Transportation Plan: This project includes a new two-lane highway, which could produce impacts due to temporary construction and permanent impacts to the viewshed, noise, and wildlife.

- Northern Forest Canoe Trail: This project involves building recreational infrastructure along a canoe trail in New York, Vermont, New Hampshire, Canada, and Maine, which is likely to have beneficial impacts on recreation.
- Northern Vermont Fiber Optic Connection Project: This project may result in temporary impacts due to construction and long-term impacts from land clearing.

Other non-CBP actions that may affect recreation and which have a broader scope include dairy farming, farming of crops, mining, wind farming, and the modernization and expansion of Canada Border Services Agency facilities. Farming may affect recreation if agricultural operations expand into areas currently used for private or public recreation. Mining would affect recreation if recreation land is mined, resulting in changes in access, scenic quality, wildlife disturbance, and other impacts associated with construction and development. Similarly, wind farms may alter viewsheds and have construction and development impacts; they may also restrict access to recreation opportunities.

Expansion of Canada Border Services facilities may affect recreation in much the same ways that expansion of CBP facilities may impact recreation.

The area near the Wenatchee and Snoqualmie National Forests has several foreseeable projects, so special consideration must be given to projects in this area.

In general, each of these non-CBP projects is unlikely to lead to major, cumulative impacts on public recreation, since they are separated by distance and time from the CBP projects described in this alternative.

Many of the non-CBP projects in the regions involve construction. Under the Facilities Development and Improvement Alternative and the Flexible Direction Alternative, CBP projects that generate construction-related impacts such as noise, visual disturbance, and traffic could be compounded by additional, nearby construction projects. Since several non-CBP construction projects cluster near the Snoqualmie, Wenatchee, and Superior national forests, CBP will need to consider the potential cumulative impacts of any additional small and large CBP construction projects in this general area. However, it is expected that CBP projects would only produce, at most, minor, cumulative impacts given the proper siting considerations discussed in Section 8.17.5.

Actions emphasized in the Detection, Inspection, Surveillance, and Communications Technology Expansion Alternative and the Flexible Direction Alternative generate impacts from visual or noise disturbances. Several of the non-CBP projects proposed or planned, such as the Desert Claim Wind Power Project, may also have moderate visual impacts. The impacts from these projects add to the visual clutter of the landscape; construction of multiple communications towers could further exacerbate this problem. If these projects are within the viewshed of recreational areas, they may alter the visual quality of the recreational experience. Additional construction projects may also create impacts such as temporary noise, lighting, and traffic disturbances, as well as permanent access restrictions or changes in land use. If pristine viewsheds near recreation areas are avoided by both CBP and non-CBP projects, the impacts may remain minimal. It is possible that the cumulative impacts of additional projects that may

affect the scenic quality of recreational areas will exacerbate the impacts of these alternatives and could be minor to moderate.

Other non-CBP construction projects will be much larger in size and scope than the type of projects emphasized in the Tactical Security Infrastructure Deployment Alternative. Therefore, cumulative impacts of additional CBP actions on recreation under this alternative will be negligible.

The accumulation of activities under the Flexible Direction Alternative could have a synergistic impact on recreational values in the region—including solitude, opportunities for wildlife interaction, and aesthetic appeal—depending on the location, nature, timing, and extent of the proposed activities. The high volume of activity under this alternative has the potential to create major impacts to recreation if it concentrates the full range of increased activities near an important recreational site.

Other projects that could affect recreation due to construction or visual disturbances may combine with the impacts of previously described actions. Overall, the cumulative impacts of non-CBP projects could range from minor to moderate due primarily to construction impacts, scenic quality changes, and an increase in human traffic and developments.

Final

Programmatic Environmental Impact Statement For Northern Border Activities

Section 9: Environmental Design and Planning Considerations



July 2012

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CONTENTS

9	Environmental Design and Planning Considerations	9-1
9.1	Introduction	9-1
9.2	Air Quality.....	9-2
9.3	Biological Resources.....	9-2
9.3.1	Mitigation for Impacts to General Wildlife and Habitat.....	9-2
9.3.2	Mitigation for Impacts to Wetlands and Aquatic Resources	9-2
9.3.3	Mitigation for Impacts to Protected Species.....	9-3
9.4	Geology and Soils	9-4
9.5	Water Resources.....	9-5
9.6	Noise.....	9-6
9.7	Climate Change and sustainability.....	9-7
9.8	Land Use	9-9
9.9	Aesthetic and Visual Resources	9-9
9.10	Socioeconomic Resources.....	9-11
9.11	Cultural and Paleontological Resources.....	9-11
9.12	Environmental Justice/Protection of Children	9-12
9.13	Human Health and Safety	9-12
9.14	Hazardous Materials.....	9-13
9.15	Utilities and Infrastructure	9-14
9.16	Roadways and Traffic	9-15
9.17	Recreation.....	9-15

9 ENVIRONMENTAL DESIGN AND PLANNING CONSIDERATIONS

9.1 INTRODUCTION

The National Environmental Policy Act (NEPA) Section 102(2)(A) requires that Federal agencies “utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making which may have an impact on man's environment.” One of the primary methods of applying this systematic approach is employing mitigation measures, or actions that reduce the severity of environmental impacts of Federal actions. The Department of Homeland Security (DHS) makes mitigation of the environmental impacts of its actions a primary consideration. DHS’s Management Directive 023.01 requires that stewardship of the air, land, water, and cultural resources be compatible with the planning and execution of the mission of DHS. Environmental stewardship must also be compatible with the planning and execution of the mission of DHS’s component agencies, including the U.S. Customs and Border Protection (CBP).

To meet its environmental stewardship responsibilities, CBP integrates environmental planning requirements into operational planning, program development, and management methodologies consistent with homeland security requirements, fiscal policies, and other considerations of national policy. CBP seeks to avoid, minimize, repair, and reduce the impacts of its actions on the human environment. It does so with a combination of best management practices, siting plans, design strategies, mitigation measures, and monitoring plans best suited to the scale and the location of the particular action. The agency recognizes that when environmental stewardship responsibilities are not managed effectively, there may be social, financial, and administrative costs, as well as the potential for lower quality mission outcomes.

In compliance with monitoring and mitigation requirements (40 CFR 1505.3), reasonable mitigation measures should be identified to address the impacts of a proposed action and alternatives. Any mitigation measures selected must be clearly outlined in the project’s Record of Decision (ROD). Mitigation measures must also be included in the proposed budget for the project or made part of the approved project application. Best management practices (BMPs) and existing environmental management systems (EMS) should be used to implement a project and to monitor the predicted environmental effects. Adaptive management techniques should be used to modify the implementation of a project as new information becomes available.

In conformance with 40 CFR 1507.2, CBP must provide adequate staff, funding, and time to integrate environmental planning into its missions and to perform appropriate NEPA analysis for programs; plans; policies; projects; regulations; orders; legislation; or applications for permits, grants, or licenses involved in the actions associated with the Northern Border Programmatic Environmental Impact Statement (PEIS). Should mitigation be necessary to reduce the environmental effects of a proposed action, CBP would be responsible for providing the costs of appropriate mitigation of such environmental impacts. Mitigation measures proposed for the actions discussed in the PEIS are outlined below for each environmental resource analyzed in the

document. In implementing its proposed action CBP could choose from among the following actions to avoid or minimize impacts to environmental resources.

9.2 AIR QUALITY

No mitigation measures would be required for air quality.

9.3 BIOLOGICAL RESOURCES

It is CBP's policy to reduce impacts to biological resources by implementing avoidance, minimization, mitigation, and compensation measures. Many standard mitigation measures have been incorporated as standard operating procedures by CBP on past projects. In some cases, mitigation solutions are required by law and for certain direct impacts. These measures would be negotiated and coordinated with applicable Federal, state, and local agencies.

9.3.1 MITIGATION FOR IMPACTS TO GENERAL WILDLIFE AND HABITAT

Ground-disturbing construction activities should not take place during wildlife migration or breeding periods without consultation with the U.S. Fish and Wildlife Service (USFWS) and applicable Federal, state, local, Tribal or private land managers and owners. If construction or demolition is scheduled to start during these periods, steps should be taken to prevent species from using areas of potential impact. Possible steps include:

- Covering equipment and structures;
- Surveying specific sites for nesting migratory birds prior to clearing them; and,
- Establishing buffers around known breeding and high-use areas.

Reducing vehicular use in sensitive areas helps to protect wildlife habitat. Vehicle barriers also discourage activity in sensitive areas. Routinely washing and inspecting vehicles for vegetation, seeds, and insects and animals would reduce the risk of transporting non-native/invasive species into off-road environments.

USFWS recommendations to communications companies and the Federal Communications Commission on tower height, lighting regimes, and placement (USDOJ, 2000) should help CBP avoid adverse impacts to wildlife.

CBP would implement BMPs to prevent soil erosion and sedimentation during construction.

Use of native vegetation as part of site landscaping could benefit some birds, small mammals, and insects by providing food and cover.

9.3.2 MITIGATION FOR IMPACTS TO WETLANDS AND AQUATIC RESOURCES

Consultation with USFWS will be needed if endangered or threatened species are found in affected wetlands.

Section 404 of the Clean Water Act requires that projects affecting wetlands follow the sequential process of avoiding adverse wetland and surface-water effects, then minimizing

impacts not practicably avoided, and compensating for impacts that cannot be further minimized through wetland mitigation and restoration.

Secondary impacts to wetlands would be mitigated through use of BMPs that reduce erosion and sedimentation during port of entry (POE) construction. These practices include minimizing the length of time that bare soil remains exposed, including timely reseeded and mulching. Construction and maintenance of potable water and long-term sediment and surface-water retention features could further reduce erosion and sedimentation. CBP may provide and implement an erosion and sediment control plan to protect wetlands and other waterways from additional storm water runoff. Landscaping near wetlands would include native species to avoid introducing invasive species. Invasive plant species management includes the cleaning of construction equipment prior to site entry.

Mitigation is required to compensate for unavoidable wetland loss. Depending on the state, mitigation could include purchase of credits from a wetland mitigation bank, monetary compensation for wetland loss, or wetland restoration or preservation.

CBP would provide and implement a long-term erosion and sediment control plan for storm water treatment structures. Secondary impacts from new lighting structures would be reviewed during the permitting process based on potentially affected wildlife (e.g., breeding amphibians). Landscaping near wetlands could include planting native species to avoid introducing invasive species. Invasive plant species management would also include cleaning construction equipment prior to site entry.

All disturbed areas should be mulched and re-vegetated with native woody and herbaceous species when feasible.

To protect fish spawning, no in-water work should occur during seasons designated by appropriate resource agencies for the potentially affected protected species, and similar time constraints may affect work scheduling if aquatic endangered species' breeding, nesting, or egg-laying activities take place.

CBP activities that may accidentally introduce invasive species should be monitored and introductions of harmful plants prevented, when possible. Vehicles and watercraft should be routinely inspected and washed off to remove non-native/invasive vegetation, seeds, insects, and marine animals to reduce the risk of transporting species into surface.

9.3.3 MITIGATION FOR IMPACTS TO PROTECTED SPECIES

Implementing avoidance and minimization efforts may reduce potential impacts to listed species. The potential effects by region are as follows. Species locations by county can be found in Appendix M.

- In the West of the Rockies (WOR) Region, for example, woodland caribou (*Rangifer tarandus caribou*), spotted owl (*Strix occidentalis*), and marbled murrelet (*Brachyramphus marmoratus*) have specific habitat requirements. Construction and disturbance in high-quality, intact habitat where these species occur should be avoided to the greatest extent practicable. In addition to avoiding construction disturbance in areas

of intact grizzly bear (*Ursus arctos horribilis*) habitat, minimization of new road construction and limiting road access by means including closing unneeded roads on Federal land can create roadless habitat for grizzlies and other threatened and endangered species. Such measures should be balanced to avoid creating national security vulnerabilities. CBP can minimize impacts to the leatherback turtle (*Dermochelys scoriacea*) by reducing use of nocturnal lighting around marine and coastal sites, which can disturb navigation, in areas of known turtle activity.

- In the East of the Rockies (EOR) Region, the same considerations as in the WOR Region apply for reducing impacts to grizzly bears. The black-footed ferret (*Mustela nigripes*) requires extensive grassland habitat, particularly in North Dakota. Construction and disturbance activities in high quality, intact habitat that this species inhabits should be avoided, as this is one of the most endangered mammals in the United States (USDOJ, 2008b). Impacts to migrating whooping cranes (*Grusa mericanus*) may be minimized by avoiding marshes and prairie potholes in the summer and known migratory pathways in the spring and fall.
- In the Great Lakes Region, the piping plover (*Charadrius melodus*) nests along the shoreline of lakes Superior, Michigan, Huron, Erie, and Ontario. Activities that disturb nest sites should be avoided to the greatest extent practicable. The Hine's emerald dragonfly (*Somatochlora hineana*) requires specific wetland habitat. Construction and disturbance activities in or near documented critical habitat should be avoided.
- In the New England Region, the roseate tern (*S. dougallii*) is a beach-nesting species with populations along the Atlantic Coast. Activities that disturb nest sites should be avoided to the greatest extent practicable. Atlantic salmon (*Salmo salar*) populations are in decline so construction and disturbance activities in or near designated critical habitat should be avoided.

9.4 GEOLOGY AND SOILS

Mitigation measures are particular to the specific action as well as the physical characteristics of the environment in which the action will take place. The range of mitigation requirements varies greatly along the northern border, especially regarding local and state regulations. As described in Chapter 4, geological and soil evaluations would be completed prior to the implementation of proposed actions. The following general mitigation measures and BMPs may be implemented in compliance with regulatory authorities:

- Potential impacts related to regional seismic hazards would be addressed in the design concept for projects with reinforced concrete and masonry used during construction if deemed necessary.
- Potential mass movement (landslide) hazards related to slope stability would be addressed by avoiding areas that may be prone to such hazards with protective barriers to reinforce areas of potential risk.
- Potential impacts related to soils would be addressed on a case-by-case basis. Soils that are highly erodible would be subject to erosion prevention and sediment control plans, depending on local regulations. A Federal National Pollutant Discharge Elimination System (NPDES) permit may also be required based on the proximity of the action to water bodies of concern. Dust control plans would also aid in reducing impacts. Soil

compaction would be controlled by reusing established access roads and trails instead of creating new pathways. Drainage along impermeable surfaces should reflect the specific hydrologic requirements of the area to be served. Re-vegetation would also improve soil conditions and reduce erosion potential. Spill Prevention Control and Countermeasures Plans may be a requirement for actions that may contribute hazardous materials to soil horizons.

9.5 WATER RESOURCES

The following BMPs would be employed to reduce the effects of CBP's activities on water resources:

- Silt fences for new construction;
- Diversion ditches for new construction;
- Reseeding and reestablishment of vegetation (using native vegetation where appropriate) on bare soil as soon as possible following construction;
- To offset potential impacts from soil compaction, highly compacted areas left after construction would be scarified and aerated;
- Mulching, straw berms, and temporary cover crops as appropriate;
- Construction, operation, and maintenance of portable and long-term sediment and surface water retention features;
- Appropriate erosion and sediment control would be in place and functional before earth-moving operations begin and would remain intact throughout the project. Disturbed areas would be planted as quickly as possible to prevent erosion;
- Design and construction measures would include development of surface-water control features to ensure that post-development runoff from construction sites does not exceed pre-development runoff;
- Construction of roads in waterways or riparian areas should be avoided to the extent possible;
- Areas around buildings and parking lots would be vegetated to minimize soil erosion. In addition, catch basins, diversion ditches, and pipe conveyances may be necessary to handle the additional storm water runoff;
- Design elements such as grass swales and landscaped features would be incorporated to help minimize runoff and soil erosion;
- Storm gutters and other storm drainage system improvements would be installed in conjunction with construction of the new facilities;
- Provide onsite detention or retention basins for developed sites to reduce the rate of runoff to historic natural levels;
- Provide drainage improvements, including storm water channels that intercept runoff directed toward areas that had not previously accepted runoff and divert it to natural receiving waters;

- Avoid building new infrastructure in 100-year floodplains. Follow local regulations that govern development of floodplains;
- Use accepted engineering design practice and/or established state or local standards to design the capacity of road drainageways, bridges, culverts, and low-water crossings in a manner that minimizes erosion and creation of sediment at the structure;
- Use accepted engineering practices to design water and waste systems that are properly sized for facility occupancy;
- Remove canine waste from kennel areas and properly dispose of in waste systems such as municipal sewers or septic systems;
- Ensure temporary or permanent water supply and waste disposal systems would be in place and operational when forward operating bases (FOB) are manned;
- Vehicles that regularly use low-water crossings should be washed frequently and made free of fluid leakage to prevent discharge of contaminants at low-water crossings;
- Provide training to watercraft operators in the safe operation of boats, including handling, storage, disposal, and use of fuels and lubricants; include training in safe interim storage of intercepted materials to prevent spillage or leakage;
- Implement a mandatory two-week (80 hour) ATV rider safety course, designed to educate riders in order to eliminate ATV-related accidents and agent injuries and to develop driving skills that minimize effects on the environment;
- Under conditions of unstable travel surfaces, drive ATVs at speeds that avoid rutting, if possible;
- Work within partnerships or initiate new ones to identify and make provisions for repair or maintenance of roads or trails that are easily rutted;
- Avoid placing horse stables in drainage swales and areas with poor soil drainage; try to grade area around stables to divert runoff away from structure, and avoid placing horse stables near ponds, streams, and wetlands (LSU, 2009);
- Install gutters, downspouts, and splash blocks on all horse-related structures; create a sacrifice area for horses, i.e., a small enclosure or paddock area that serves as a horse's outdoor living space when the soil is saturated or the pastures overgrazed (LSU, 2009).
- Maintain and manage pastures, including choosing appropriate vegetation species, in ways that reduce mud and soil erosion in order to maintain water quality (LSU, 2009); and,
- If a POE, or any other CBP facility is closed on a site that utilized onsite water wells or tank storage of fuels, oils, or other potential water resource contaminants, these physical systems must also be closed following procedures typically required by a state environmental protection agency.

9.6 NOISE

No mitigation measures would be required for noise.

9.7 CLIMATE CHANGE AND SUSTAINABILITY

Measures that may be implemented to reduce or eliminate potential adverse impacts on climate change and sustainability are as follows.

- Continue development of CBP's Environmental Management System (EMS).
- Review and revise CBP *Fleet Handbook* to incorporate meeting sustainability goals as an objective.
- Review and revise real property acquisition and development process maps to include a sustainability review of each project.
- Develop a process to monitor compliance with sustainability goals and targets.
- Identify facilities where installation of an alternative fuel tank would increase the use of alternative fuel.
- Conduct fleet optimization analysis (including right-sizing of fleet and right configuration for defined missions).
- Establish policy and procedures to ensure that E85 (ethanol) or biodiesel fuel tanks are installed at new CBP fueling centers.
- Continue deployment of flex fuel vehicles.
- Evaluate hybrid vehicles for administrative use.
- Develop policy for use of videoconferencing.
- Develop sustainable process for calculating employee commute emissions.
- Complete revised inventory of Scope 3 GHG emissions sources.
- Develop an integrated plan for how CBP will meet Scope 3 Greenhouse Gas (GHG) emissions reduction goals.
- All new construction as well as major renovation or repair and alteration of Federal buildings shall comply with "Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings, December 1, 2008."
- New construction designs shall be at least 30 percent more energy-efficient than the applicable standard.
- Use cost-effective, innovative building strategies to minimize energy, water, and materials consumption in a manner that achieves a net reduction in department-deferred maintenance costs;
- Modify existing owned facilities and bring them into compliance.
- Complete evaluation of Laboratory Energy Audits and, as appropriate, add implementation of recommended energy savings initiatives into budget requests.
- Ensure that all Project Management Office project managers are trained in "Guiding Principles"/LEED® ("Guiding Principles for Sustainable New Construction and Major Renovations").

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

- Review existing contracts to ensure sustainability requirements are included in scopes of work (SOW).
- Incorporate participation in regional transportation planning (recognition and use of existing community transportation infrastructure) into existing policy and guidance.
- Update policy and guidance to ensure that all environmental impact statements and environmental assessments required under NEPA for proposed new or expanded Federal facilities identify and analyze impacts associated with energy usage and alternative energy sources, and complete *NEPA Handbook*.
- Develop guidance for CBP's Service Providers (GSA and U.S. Army Corps of Engineers) for site selection criteria and prioritization based on the sustainability goals.
- Continue collocation studies with the U.S. Coast Guard.
- Reduce potable water use intensity by at least 26 percent by FY 2020.
- Reduce industrial, landscaping, and agricultural water use by at least 20 percent by FY 2020.
- Achieve objectives established by the U.S. Environmental Protection Agency (USEPA) in "Stormwater Guidance for Federal Facilities EISA Selection 438" (42 USC 17094).
- Develop CBP's Water Conservation Handbook.
- Complete CBP's Environmental Compliance Handbook.
- Increase source reduction of pollutants and waste.
- Divert at least 50 percent of nonhazardous solid waste by FY2015, excluding construction and demolition (C&D) debris.
- Divert at least 50 percent C&D materials and debris by FY2015.
- Reduce printing paper use.
- Reduce and minimize the acquisition, use, and disposal of hazardous chemicals and materials.
- Increase diversion of compostable and organic materials from the waste stream.
- Decrease use of chemicals to assist in achieving FY2020 GHG reduction targets.
- Complete CBP's Recycling and Reuse Handbook.
- Complete 300 Environmental Compliance Assessments (scope includes identification of quantities of hazardous waste disposed annually).
- Complete baseline assessment of waste management practices at all facilities.
- Ensure that 95 percent of new contract actions require the supply and use of products and services that are energy efficient (as designated by Energy Star or Federal Energy Management Program [FEMP]), water efficient, bio-based, environmentally preferable, and not ozone-depleting, and that they contain recycled content or are non-toxic or less toxic alternatives. (For construction contract actions, this could include provisions for diesel retrofits, the use of clean fuels, and anti-idling provisions to reduce vehicle emissions if feasible.)

- Complete CBP's *Green Procurement Handbook* and policy.
- Establish and implement policy and guidance to ensure use of power management, duplex printing, and other energy efficient or environmentally preferred options and features on all eligible CBP electronic products.
- Update CBP's policy to ensure implementation of BMPs for energy-efficient management of servers and Federal data centers.
- Add chapter on electronics stewardship to the current CBP *Electronics Security Handbook*.
- Conduct inventory of compliant and noncompliant equipment.

9.8 LAND USE

CBP could minimize potential impacts of new facilities construction by:

- Siting projects away from existing residential development or recreational areas;
- Siting projects on vacant or unproductive lands;
- Conducting construction activities during periods of relatively low recreation levels; and,
- Developing aesthetically pleasing sites, for example, through landscaping and proper siting of waste storage areas.

CBP could minimize the impacts on land use from activities that cause noise and light disturbance by:

- Utilizing sound-reducing equipment, where feasible;
- Siting projects away from existing residential development or recreational areas; and,
- Conducting patrols and surveillance activities during periods of relatively low recreation levels.

CBP could minimize the impacts of border fencing activities on land use activities by:

- Ensuring that the fencing project does not fracture a contiguous land parcel.

9.9 AESTHETIC AND VISUAL RESOURCES

Mitigation measures include preventing or reducing the impacts of light pollution on the "Natural Lightscape" or "Night Sky," wildlife, and people.

Mitigation measures for visual resources also include reducing visual contrast associated with implementation of project alternatives. Because visual contrast is most closely associated with the addition of structural elements and change to landform characteristics, the following mitigation measures are organized into those related to landform and those related to structures. Appendix G contains a more complete list compiled by the U. S. Bureau of Land Management (BLM), but some possible techniques to reduce impacts include the following:

- Structures:

- To the extent possible, use structures that are simple, slim, and low-profile with minimal bulk and horizontal emphasis, avoiding over-monumentation, reducing structure depth as compared to deck edge, and keeping structures proportional.
- To eliminate this potential for significant major adverse visual impacts, proposed towers and associated facilities should be situated at least 1.5 miles from areas designated for their visual sensitivity (e.g., scenic roads, rivers, national parks and monuments, scenic vistas within national and state forests, and open-space districts) whenever feasible.
- Design colors of structures to complement the natural landscape.
- Design tapered and rounded forms and edges where appropriate to soften appearance and reduce perceived bulk (for example, on bridge piers).
- Use repeating colors and textures to provide continuity with other structural features such as retaining walls.
- Use, after evaluation, full cut-off light fixtures where feasible and safe to decrease impacts to the night sky.
- Landforms:
 - Implement sensitive grading techniques that blend grading with the natural terrain;
 - Treat all disturbed slopes for erosion control; revegetate using native plant species as appropriate for adjacent land use and terrain;
 - Reduce color contrast through rock staining in areas of new rock cuts; and,
 - Selectively clear areas where alternatives encroach on forest edge.

Mitigation measures to minimize potential impacts from the monopole towers would include, but are not limited to, painting the proposed towers to blend into their background, using competing interest in visually sensitive areas, and the use of decorative tower perimeter fencing in residential areas. The color and construction material of poles can be chosen to blend with or complement the landscape around them. Lines constructed using H-frame poles or on wood rather than steel structures may blend in better with natural surroundings. Stronger conductors can minimize line sag.

Right-of-way (ROW) management can mitigate aesthetic impacts by planting vegetative screens to block views of the line, leaving the ROW in a natural state at road crossings, creating curved or wavy ROW boundaries, pruning trees to create a feathered effect, and screening and piling brush from the cleared ROW so that it provides wildlife habitat.

The mitigation measures outlined for security fencing includes using context-sensitive design of the fence, or design features to minimize the appearance of fencing, including using a black, visually permeable fencing.

Any infrastructure or action must be completed in accordance with existing regulations such as, but not limited to, the following:

- All POEs must be designed in accordance with the U.S. Land Port of Entry (LPOE) Design Guide (For Official Use Only).
- GSA-owned POEs must be designed in accordance with GSA P-100, Facilities Standards for the Public Buildings Service.
- Border Patrol stations must comply with the guidelines outlined in the 2003 U.S. Border Patrol Facilities Design Guide.

9.10 SOCIOECONOMIC RESOURCES

The three main strategies to minimize adverse social welfare and regional economic impacts of the above alternatives are as follows:

- Minimize some of the social welfare and regional economic impacts of decreased or degraded recreation by siting projects away from recreational areas, to the extent possible;
- Minimize impacts of noise disturbance from construction by undertaking construction activities during off-peak hours or seasons for recreational activities along with other noise reducing BMP's;
- Minimize impacts to land and property values by siting projects on: vacant Federal lands, abandoned Federal facilities, other vacant or unproductive land, or on land purchased or leased from willing sellers;
- Develop aesthetically pleasing landscapes;
- Minimize impacts of delay by engaging in construction activities during periods of relatively low traffic volumes to the extent it is practicable and feasible;
- Construct additional traffic lanes at busy POEs or checkpoints; and,
- Monitor how CBP processing procedures at border crossings affect wait times to determine whether the costs of additional wait times outweigh the benefits of implementing processing procedures.

9.11 CULTURAL AND PALEONTOLOGICAL RESOURCES

Federal consultation protocols established under the National Historic Preservation Act (NHPA) and the Paleontological Resources Preservation Act of 2009 (PRPA) rely extensively on consultation between Federal agencies and contracting parties to identify ways to avoid or minimize adverse impacts to cultural and paleontological resources. When CBP's mission, especially with regard to national security and law enforcement, may adversely affect cultural and paleontological resources, the agency is committed to seeking mitigation strategies that are acceptable to all interested stakeholders while being cost effective and practical. The specific types and degree of mitigation techniques vary considerably state-to-state and project-to-project across a broad spectrum of cultural and paleontological resources. However, the types of impacts to which these resources are subjected generally fall into the land use, aesthetic, and visual categories.

9.12 ENVIRONMENTAL JUSTICE/PROTECTION OF CHILDREN

Extensive mitigation measures would not be required under any alternative. To the extent that CBP employs BMPs in the construction of facilities and the modernization and management of existing facilities, potential adverse effects to individuals would be minimal for all populations and would not be disproportionately experienced by populations of concern for environmental justice. Potential risk to human health, especially for populations of children under the age of 18 would be minimized through adherence to all applicable Federal and state safety regulations. Where construction sites are located near population concentrations, site safety measures, including barriers and warning signs, would be posted around the site perimeter to deter unauthorized intrusion, especially by children. Vehicles and equipment would be secured when not in use or when the site is unattended. Continued participation with the general public by CBP in the implementation of its policies and programs would be expected to minimize any potential for impact to communities in the vicinity of CBP's operations.

When CBP introduces structures and physical barriers, such as towers, neighborhoods and communities immediately surrounding facilities in more urbanized areas are more likely to contain high concentrations of populations of concern, and mitigation measures may be required. Efforts to identify and consult with any affected individual property owners or the residents of affected communities would be a part of any mitigation strategy under this alternative. Extensive engagement with these populations in the planning and execution of physical barriers, and for the purpose of explaining their necessity, would be expected to minimize any potential for impact to communities in the vicinity of infrastructure projects. CBP would also ensure that any construction conforms to local planning and zoning ordinances.

9.13 HUMAN HEALTH AND SAFETY

CBP seeks to avoid, minimize, repair, and reduce the impacts of its actions on the human environment. It does so with a combination of BMPs, siting plans, design strategies, mitigation measures, and monitoring plans best suited to the scale and the location of the particular action. Towards that end, in implementing its proposed action, CBP could choose from among the following actions to avoid or minimize impacts to Human Health and Safety.

Health and safety BMPs for routine activities include but are not limited to:

- Develop and implement a health and safety plan to be followed throughout all phases of a project;
- Coordinate overflights with Federal land managers for aerial patrols over Federal land management units when practicable;
- Provide occupational health and safety orientation training to all employees, consisting of basic hazard awareness, site-specific hazards awareness, safe working practices, and emergency procedures;
- Consider public safety during helicopter flights (e.g., avoid populated areas, schools, and areas being crop dusted);
- Conduct daily safety assessment meetings to identify potential safety issues (e.g., site access, construction, work practices, security, transportation of heavy equipment, traffic

management, emergency procedures, wildlife encounters, and fire control and management) and measures to mitigate them;

- Provide fire suppression equipment in all vehicles; and,
- Use appropriate procedures for storage and transportation of blasting equipment and explosive materials, including appropriate signage indicating its location.

BMPs for radiological health and safety include but are not limited to:

- Incorporating safety warnings and precautions into technical manuals and operator manuals;
- Training operators and scanning operations supervisors in the hazards associated with radiation producing equipment;
- Incorporating emergency stop buttons on the equipment that allow the system, including X-ray production, to be quickly shut down if necessary;
- Training operators and scanning operations supervisors in the location and use of emergency stop buttons; and,
- Establishing radiation-controlled areas during scanning operations.

9.14 HAZARDOUS MATERIALS

CBP seeks to avoid, minimize, repair, and reduce the impacts of its actions on the human environment. It does so with a combination of BMPs, siting plans, design strategies, mitigation measures, and monitoring plans best suited to the scale and the location of the particular action. Towards that end, in implementing its proposed action CBP could choose from among the following actions to avoid or minimize impacts to hazardous or regulated materials.

Mitigations would be implemented as standard operating procedures during all construction activities, and would include proper handling, storage, or disposal of solid and hazardous or regulated materials.

To minimize potential impacts from hazardous and regulated materials, all fuels, waste oils, and solvents would be collected and stored in tanks or drums within a secondary containment system that consists of an impervious floor and bermed sidewalls capable of containing the volume of the largest container stored therein. The refueling of machinery would be completed in accordance with accepted industry and regulatory guidelines, and all vehicles would be required to have drip pans during storage to contain minor spills and drips. Although a major spill would be unlikely, any spill of reportable quantities would be contained immediately within an earthen dike, and the application of an absorbent (e.g., granular, pillow, sock, etc.) would be used to absorb and contain the spill.

Lead pipe or lead painted metal would be removed before renovation or demolition or separated from the demolition waste pile. It can also be recycled as scrap metal. Lead in batteries or fluorescent lamps that could be recycled or disposed as universal waste has less stringent management requirements than waste that can be disposed as dangerous waste. High-intensity

discharge lamps with regulated amounts of lead could not be disposed as universal wastes, but would be managed as dangerous wastes.

All waste oil and solvents would be recycled. All non-recyclable hazardous or regulated wastes would be collected, characterized, labeled, stored, transported, and disposed of in accordance with all Federal, state, and local regulations, including proper waste manifesting procedures.

To ensure prevention of oil pollution, a spill prevention, control, and countermeasures plan would be put in place prior to the start of construction activities, and all personnel would be briefed on the implementation and responsibilities of this plan as is typical in CBP projects. A spill of any petroleum liquids (e.g., fuel) or material listed in 40 CFR 302 Table 302.4 of a reportable quantity would be cleaned up and reported to the appropriate Federal and state agencies.

USEPA's mitigations for outdoor firing ranges call for reclaiming lead and recycling it into new shot and bullets. This would reduce the amount of virgin lead that would have to be mined. CBP would implement strategies to help prevent lead contamination. Probably the most promising pollution prevention strategy for both indoor and outdoor firing ranges is the development of the "green bullet."

The impacts of hazardous waste vary greatly with each CBP activity described in this analysis, but the overall impact can be expected to be short-term, adverse, and minor. This assumes that CBP would continue to follow the appropriate mitigation measures and BMPs to avoid accidental releases and spills of hazardous materials.

9.15 UTILITIES AND INFRASTRUCTURE

Although no significant adverse impacts were identified through the analysis of proposed utilities and infrastructure that would require mitigation measures to reduce impacts to non-significant levels, CBP could choose from among the following actions to avoid or minimize impacts on utilities and infrastructure:

- Employ strategies that in aggregate use a minimum of 20 percent less potable water than the indoor water use baseline calculated for the building, after meeting the Energy Policy Act of 1992 fixed performance requirements.
- Use water-efficient landscape and irrigation strategies, including water reuse and recycling, to reduce outdoor potable water consumption by a minimum of 50 percent over that consumed by conventional means.
- Maintain existing facilities and infrastructure, replacing those facilities and infrastructure as needed to sustain current operations in accordance with BMPs, working with Government agencies to comply with the respective regulations and avoid adverse impacts wherever possible. Wherever reasonable and possible to do so, lessen unavoidable adverse impacts through cooperative efforts with the appropriate agencies.
- When construct new, individual utilities like replacing a septic system, implement green building strategies to achieve a minimum "certified" rating under the LEED New Construction and Major Renovation Version 3.0 and comply with Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding.

9.16 ROADWAYS AND TRAFFIC

The following steps could be taken to avoid or minimize the impacts of CBP's projects on transportation:

- Minimize construction vehicle movement during peak traffic hours;
- Place construction staging areas where they would least interfere with traffic;
- Equip construction vehicles with backing alarms, two-way radios, and "slow moving vehicle" signs when appropriate;
- Coordinate with local, state, and Federal transportation authorities when planning access or use of public roadways;
- Follow all local, state, and Federal planning guidelines and regulations when maintaining or upgrading roadway infrastructure; and,
- Comply with all traffic regulations when operating on-road, non-road, and off-road vehicles.

9.17 RECREATION

Adverse impacts of development, patrols, and other actions could be minimized by altering the current use patterns in the affected area upon consultation with appropriate land managers. The following issues should be considered when making decisions about border actions:

- Decisions about traffic routes and timing of construction should consider hiking trails, and camping and hunting areas, as well as current seasonal use patterns.
- Projects that require the acquisition of new land should take into account proximity to nearby recreation areas such as campgrounds, visitor centers, and horse stables.
- Minimizing the amount of development, traffic, and disruption in previously undisturbed areas is critical to minimizing recreation impacts. Other actions that result in construction, traffic, or noise should also be considered in planning to minimize the cumulative impacts on any one recreation area.
- Continued strengthening of partnerships, communication, and discussion with land managers of recreation areas can ensure that the placement of new infrastructure, patrol routes, and other actions would have a minimal impact.

Final

Programmatic Environmental Impact Statement For Northern Border Activities

Section 10: Future NEPA



July 2012

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CONTENTS

10	Future Planning and NEPA Compliance	10-1
10.1	NEPA Compliance.....	10-1
10.2	Future Planning.....	10-2

FIGURES

Figure 10.1-1.	The PEIS and Project National Environmental Policy Act Analysis.....	10-1
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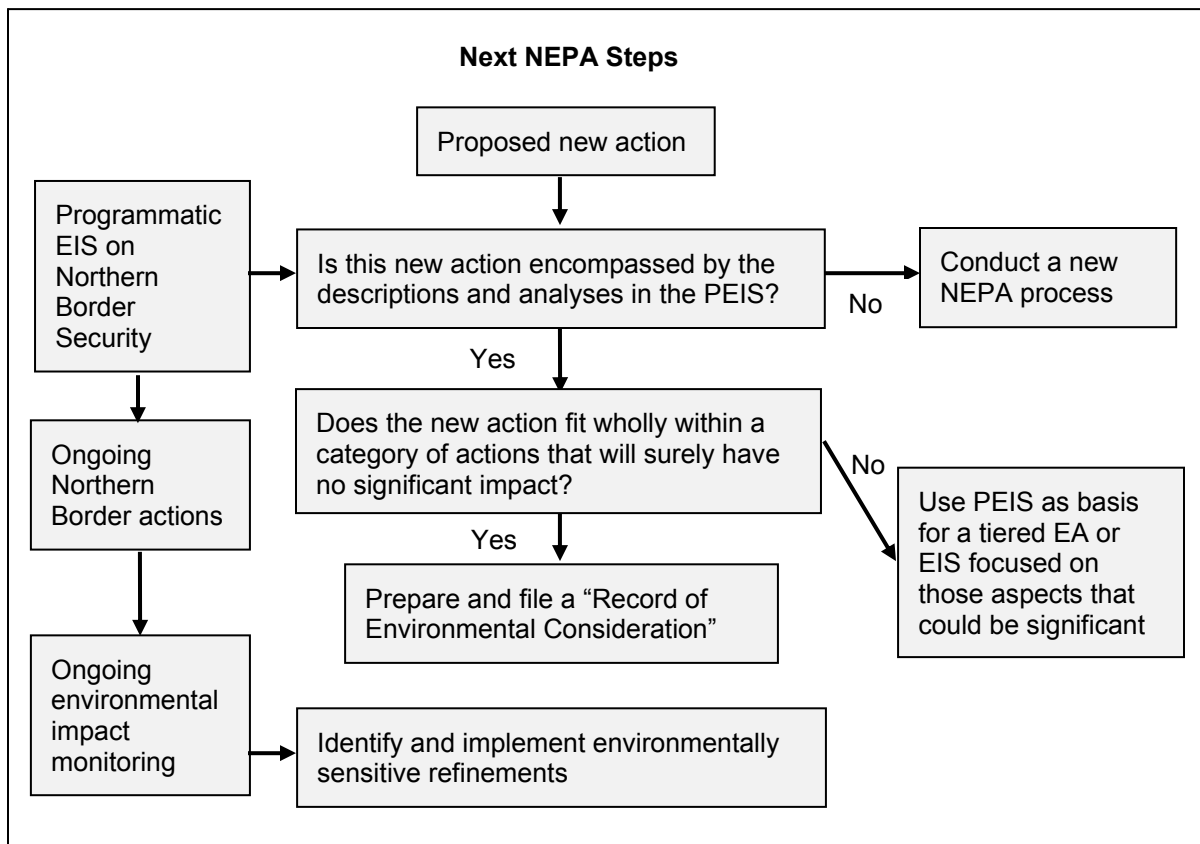
10 FUTURE PLANNING AND NEPA COMPLIANCE

The U.S. Customs and Border Protection (CBP) will use this document in several ways. In the near term, CBP’s decision makers will use this Programmatic Environmental Impact Statement (PEIS), along with other considerations in regard to security, effectiveness, and cost, in their selection of one of the alternative program strategies discussed in this document. CBP will publish its decision in a Record of Decision, which will present the agency’s rationale for the choice it has made. That decision will be made no less than 30 days after CBP publishes the Final PEIS. The decision will consider comments received on the Final PEIS.

10.1 NEPA Compliance

CBP will use this PEIS as a foundation environmental planning tool over the next five to seven years. When CBP offices or subcomponents develop specific proposals to build new structures, implement new technologies, or add new tactical security infrastructure along the northern border, planners will consult this PEIS to help determine what environmental considerations to focus upon in site-specific analysis and documentation. As shown in Figure 10-1, the planners’ next steps will depend on the extent to which the new action is encompassed within the “envelope” created by this PEIS.

Figure 10.1-1. The PEIS and Project National Environmental Policy Act Analysis



Proposals for new unique activities or programs of activities not otherwise covered within the PEIS would require unique and entirely independent National Environmental Policy Act (NEPA) analysis processes. These would require a new Environmental Assessment or Environmental

Impact Statement (EIS) depending on the potential for significant environmental impacts. In such a case, this PEIS provides only limited relevant input to the new effort in terms of background information about CBP goals and the baseline overview of potentially affected environmental resources.

Proposals for activities of the type and magnitude addressed in this EIS that only have potential for negligible effects and, no extraordinary circumstances elevating impact concerns, would be subject to minimal environmental review in accordance to existing DHS guidance for categorically excluded items found in DHS Directive 023-01. In such a case, CBP would prepare a brief statement affirming that the new action has no potential for significant impacts and otherwise fits within the envelope of this PEIS.

10.2 Future Planning

Most new actions will likely fit somewhere between these extremes. They will likely have some potential effects that are not fully addressed in the PEIS. For example, the new actions may have effects influenced by the particular location of the action. In these cases, additional NEPA analyses would be needed. As appropriate and applicable, the new NEPA analysis will draw from this PEIS to craft the more specific analyses for the new action. The new “tiered” document(s) will not need to repeat those aspects of the existing impact analysis that are still pertinent to the new action. Instead, the new document will focus on issues specific to the new action and its location. This will save CBP time and effort in future environmental planning by capitalizing on the investment made in this PEIS.

CBP will also use this PEIS to help refine its current, ongoing activities to, when appropriate, lessen environmental impacts without jeopardizing essential security considerations. A key component of this effort will be the creation and implementation of an impact-monitoring program for each of its projects with the potential to impact the environment adversely. Under this “adaptive management” effort, CBP will periodically measure the conditions of key environmental resources affected by its activities. Based on monitoring results, CBP will periodically determine if adaptations would be feasible that would further enhance beneficial effects or lessen adverse effects. CBP anticipates that the full development of this mitigation monitoring and impacts management effort will involve other Federal agencies in the border area. These agencies include, but are not limited to the U.S. Fish and Wildlife Service, the U.S. Forest Service and the National Park Service.

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Final

Programmatic Environmental Impact Statement For Northern Border Activities

Section 11: List of Preparers



July 2012

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11 LIST OF PREPARERS

Final Programmatic Environmental Impact Statement Preparers

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Lauren Cusick (CBP), M.S. Environmental Studies; J.D.	3 years: NEPA document preparation, analysis, and review
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Draft Programmatic Environmental Impact Statement Preparers

Name and Document Contribution (Mangi Personnel, unless otherwise indicated)	Associated Professional Experience
Erica Earhart, MNR Natural Resources Geology, Topography, and Soils	1 year: geology, topography, water resource studies, GIS, comment management
Rick Heffner, MA Sociology Environmental Justice and Protection of Children	23 years: socioeconomic analysis, social research, policy analysis, land use planning and community development, sustainability, adaptive reuse, social equality
Dave Henney, BS Civil and Environmental Engineering Senior Reviewer: Air Quality; Noise; Climate Change and Sustainability; Water Resources; Hazardous Materials; and Geology, Topography, and Soils	37 Years: management of environmental programs and projects, NEPA and Environmental Planning Programs for Federal agencies
Tori Hudgins, BS Environmental Policy and Planning	1 year: urban and regional planning, land use, environmental law

Name and Document Contribution (Mangi Personnel, unless otherwise indicated)	Associated Professional Experience
Hazardous Materials	
Nathalie Jacque, BS International Economics and Environmental Affairs and Environmental Science Utilities and Infrastructure	1 year: socioeconomics, emissions trading, environmental economics and policy
Bruce Kaplan, MS Environmental Law Senior Reviewer: Roadways and Traffic; Human Health and Safety; Socioeconomic Resources; Recreation; Land Use; Aesthetic and Visual Resources; Environmental Justice and Protection of Children; and Utilities and Infrastructure	26 years: management of economic analyses, environmental analyses, regulatory projects, primary research studies, communications projects, socioeconomic analyses.
Tim Lavallee, MS Civil and Environmental Engineering Air Quality; Noise; Roadways and Traffic	16 years: engineering, air quality assessment, land use planning, environmental analysis, NEPA processes, regulatory compliance, environmental noise assessment
James Mangi, Ph.D., Ecology Project Oversight	32 years: has taught NEPA to Corps of Engineers in eight course offerings; assisted Federal and state agencies in the development of NEPA regulations and guidance
Charlene Mangi, BS Biology Recreation	5 year: socioeconomic research, biological research, environmental scoping
Eveline Martin, MS Forest Ecology Biological Resources; Analytic Approach	12 years: Natural resource management, botany, ecological restoration, NEPA documentation, experience in vegetation, knowledge of native flora, fire effects monitoring
Carrie Oberholtzer, MPS in Forest Natural Resources Management Human Health and Safety	1 year experience: management and controlling invasive species, botany, watershed management, natural resource policy and law
Chelsie Romulo, MNR Natural Resource Management Aesthetic and Visual Resources	1 year: wildlife biology, NEPA documentation, research, GIS
Marissa Staples, MS Environmental Science and Policy Document management; Methodology; Climate Change and Sustainability; Senior Reviewer: Cultural, Historical, and Archeological Resources	8 years: NEPA analyses, LEED green building, document management, resource sustainability, environmental science and policy, residential and commercial development
Randy Williams, MS Wildlife Biology Senior Reviewer: Biological Resources	32 years: wildlife biology, environmental impact analysis, land management, NEPA compliance and environmental permitting, wetland restoration, and reforestation.
M. Bowen (Normandeau), MS Zoology Biological Resources	34 years: management of complex multi-disciplinary projects, coastal development, sewage disposal, thermal effluents, transportation infrastructure
Lee Carbonneau (Normandeau), MS Wildlife Ecology Affected Environment for Biological Resources	25 years: wetland science, terrestrial ecology, wetland delineation and assessment, mitigation design, wildlife inventory, habitat assessment, hazardous waste site remediation
Kimberly R. Peace (Normandeau), MS Marine Science	10 years: natural resource permit applications, wetland

Name and Document Contribution (Mangi Personnel, unless otherwise indicated)	Associated Professional Experience
Affected Environment for Biological Resources	delineation, endangered, threatened, or rare species surveys, environmental monitoring and permitting
Joanne E. Theriault (Normandeau), MS Natural Resources Affected Environment for Biological Resources	6 years: reptile/amphibians surveys, invertebrate taxonomy, wetland/stream delineation, habitat assessment of threatened/endangered plants
Jennifer West (Normandeau) MS Plant Science Affected Environment for Biological Resources	23 years: project management, wetland assessment, soil science, soil mapping, permitting, invasive species control
D. Ackerman (Western Plains Consulting), MS Biology Biological Resources	Wildlife Biologist/Natural Resource Specialist, wildlife surveys/inventories, wetland delineation, post-construction mortality studies
Myron Senechal (Western plains consulting), CPESC Biological Resources	30 years: Natural Resource Conservationist, soil, water, animals, plants, air resources, farm and ranch communities, urban environmental issues
John Shulz (Western Plains Consulting), MS Zoology Affected Environment for Biological Resources	30 years: wildlife/natural resources field, public and private habitat management, private land programs, wildlife surveys, game research and management
Sara Simmers (Western Plains Consulting), MS Environmental Science Affected Environment for Biological Resources	Floristic surveys, vegetation sampling, plant ecology research, GIS mapping, biological sampling, environmental data collection, development of restoration/reclamation plans
Jennifer Baxter (Industrial Economics), MES Environmental Policy and Management Land Use; Socioeconomic Resources	14 years: land use, socioeconomics, environmental science, environmental policy
Sarah Bolthrunis (Industrial Economics), BA Economics and Environmental Studies GIS Data Gathering and Analysis; Land Use	1.5 years: economics and environmental studies
Christopher W. Chan (Industrial Economics), MS Environmental Engineering and Science Affected Environment for Socioeconomic Resources	15 years: engineering, environmental engineering, engineering management
Maura Flight (Industrial Economics), MS Economics Socioeconomic Resources; Land Use	8 years: environmental science and economics, resources valuation and management, regional economic impact analysis, NEPA economic impact analysis
Sarah Larochelle (Industrial Economics), MS Conservation Biology Socioeconomic Resources; Land Use Data Analysis	1.5 years: economics, resource economics and policy
Lindsay Ludwig (Industrial Economics), MS Applied Economics Socioeconomic Resources	2.5 years: economics, applied economics
David Metz (Industrial Economics), MS Economics Socioeconomic Resources	4.5 years: economics, resource economics and policy

Name and Document Contribution (Mangi Personnel, unless otherwise indicated)	Associated Professional Experience
G. Plumeau (Cederburg Science), MS Ecology Biological Resources	25 years: natural resources, open space management, environmental assessments, surveys for wildlife and wetlands, wetland and woodland mitigation plans
Janet O'Neill (RDA Civil), MS Environmental Health Engineering Water Resources; Purpose and Need; Description of Alternatives	35 years: NEPA documentation, wetlands delineation and permitting, wetland biology
Scott Carpenter (Garcia/Associates) M.A. Museum Education/American Civilization and Historic Preservation Cultural Resources	33 years:
Graham Neale (Garcia/Associates) M.S. Wildlife Ecology Biological Resources; Wildlife	15 years: Terrestrial and avian ecology, predator-prey relationships, Endangered Species Act, Migratory Bird Treaty Act, Clean Water Act
Ferdinand Oberle (Garcia/Associates) M.S. Geology Paleontology	8 years:
Wendy Roberts (Garcia/Associates) Ph.D. Zoology Biological Resources	25 years: project management, aquatic ecology, herpetology, ecological study design and statistical analysis, technical writing and editing
Josh Robino (Garcia/Associates) B.A. Earth Science GIS; Mapping	10 years: GIS specialist, conservation planning, wetlands, archeological/historical resources
Rad Smith (Garcia/Associates) B.A. Painting Graphics	15 years:
Pam Spinelli (Garcia/Associates) M.S. Wildland Resource Science Biological Resources; Wildlife	25 years: fish, wildlife, botanical surveys, habitat assessments, endangered species, resources management plans, applied research
Rob Witthaus (Garcia/Associates) B.S. Biological Sciences Wetlands	15 years: Environmental compliance, habitat enhancement, habitat restoring, endangered species monitoring, wetland delineation and restoration
Mike Cinquino (Panamerican), Ph.D. Anthropology Cultural, Historical, Archeological, Native American Issues	30 years: analytical and historic research, cultural resources, regulations, EAs, cultural resource management plans, prehistoric National Register evaluations

Final

Programmatic Environmental Impact Statement For Northern Border Activities

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July 2012

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Programmatic Environmental Impact Statement For Northern Border Activities

Section 13: Glossary



July 2012

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13 GLOSSARY

Aboriginal Peoples (Canada)	As recognized by the Canadian Constitution, Aboriginal Peoples are descendants of the original inhabitants of North America and include Indians (commonly designated First Nations), Métis, and Inuit populations.
Air Quality Control Region (AQCR)	A contiguous area where air quality is relatively uniform. AQCRs may consist of two or more cities, counties, or other governmental entities, and each region is required to adopt consistent pollution control measures across the political jurisdictions involved.
Alfisol	A soil order that is primarily clay.
Alkaline tolerant	Plants tolerant of soils with pH above 7; opposite of acid-tolerant.
Ammonite	A group of extinct invertebrates; a type of mollusk closely related to squid and octopus.
Anadromous	Sea-run fishes that hatch in and return to their natal freshwater streams or rivers to spawn.
Andisol	Soil with high glass content, such as those in areas of volcanic activity.
Aquatic nuisance species	Invasive animal species of concern, including undesirable species such as quagga or zebra mussels and rusty crayfish.
Aquifer	A water-bearing stratum of permeable rock, sand, or gravel.
Aridisol	Desert soils that typically develop in arid or semi-arid regions.
Attainment areas	A zone within which the level of a pollutant is considered to meet the National Ambient Air Quality Standards.
ATVs	All-terrain vehicles; either three-wheeled or four-wheeled vehicles capable of traveling off-road or on uneven, rugged terrain.
A-weighted decibels	An expression of the relative loudness of sounds in air as perceived by the human ear.
Ballast water	Water in onboard tanks on large ships to maintain lateral stability during travel on the ocean or large lakes.
Barren land	As defined in the National Land Cover Data Classification (NLCD) Legend: barren areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits, and other accumulations of earthen material. Generally, vegetation accounts for less than 15 percent of total cover.
Basement rocks	The oldest rocks in a given area.
Bentonite	A type of clay formed from weathering of volcanic ash, usually in the presence of water.
Biface/bifacial	A stone tool modified or flaked on two edges, often used as a knife or cutting tool.

Bioturbation	The displacement and mixing of marine sediments by living organisms.
Blastoids	A common ancient marine fossil called “sea buds” that look like hickory nuts.
Brachiopods	Marine “lampshells” with two hard valves enclosing the body.
Bryozoa	Small aquatic invertebrates known as “moss animals.”
Carrying capacity	The maximum population of a species (as of deer) that an area will support without undergoing deterioration.
Cephalopods	A category of mollusks to which octopus, squid, and cuttlefish belong.
Champsosaurs	Large, semiaquatic, extinct reptiles somewhat similar to crocodiles.
Child	As defined by the U.S. Census Bureau, any unmarried individual under the age of 18 years.
Class I	Class 1 federal lands include areas such as national parks, national wilderness areas, and national monuments. These areas are granted special air quality protections under Section 162(a) of the federal Clean Air Act.
Conodonts	Small extinct marine organisms that resembled eels and had sharp teeth.
Continental Divide	Natural, high-elevation boundary line separating waters that flow into the Atlantic Ocean or Gulf of Mexico from those that flow into the Pacific Ocean.
Core	A primary stone piece from which smaller flakes are removed to fashion finished tools.
Corner-notched point	A projectile point with characteristic notches at the corners of the tool’s base.
Crinoids	Marine organisms known as “sea lilies” or “feather stars.”
Criteria pollutants	Six primary air pollutants found throughout the United States as defined by EPA pursuant to the Clean Air Act. They are particulates, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead.
Day-night sound level	The A-weighted equivalent sound level for a 24-hour period with 10 dB added to levels between 10 p.m. to 7 a.m.
Decibel	A logarithmic unit of measurement that expresses the ratio of a sound pressure level to a standard reference level. The decibel is useful for a wide variety of measurements in science (for this application, it is sound).

Developed	Land cover type that, for the purposes of this report, is a sum of the following NLCD classifications for development (Open Space, Low Intensity, Medium Intensity, and High Intensity). These areas commonly include housing units, surfaces that are more than 20 percent impervious (e.g., pavement), and commercial/industrial complexes.
Dolostone	Ancient sedimentary rocks similar to limestone.
Drainage or leach field	A field used to remove contaminants and impurities from the liquid that emerges from the septic tank.
Drumlin	An elongated hill formed by glacial ice acting on unconsolidated soils.
Ecoregion	An area defined by environmental conditions and natural features, including climate, landforms, and soils.
Entisol	A young soil with only an A horizon; entisols are the most extensive soils in the world.
Equivalent sound level	The level of a steady-state noise without impulses or tone components that is equivalent to the actual noise emitted over a period of time.
Erodibility	The measure of susceptibility to erosion, which is the wearing away of material.
Erosion	Breakdown of the continents, bedrock, large rock, or soil aggregates into smaller components, caused by wind, waves, rain, snow, or ice.
Erratics	Rocks relocated by glaciers or other geologic forces.
Escarpment	A steep slope or long cliff that results from erosion or faulting and separates two relatively level areas of differing elevations.
Esker	A long winding ridge of gravel and sand formed by past glaciers.
Evapotranspiration	The sum of water from evaporation and plant transpiration to the atmosphere.
Fir-waves	Set of alternating bands of fir trees in consecutive stages of development; observed in forests on exposed mountain slopes.
Flake tool	A small utilized tool made from a single small flake without the diagnostic characteristics of a finished artifact.
Fledged	Successfully emerged from the nest; as in a passerine bird making its first flight away from the nest.
Forearc	The region in a volcanic arc system that separates the volcanic front from the subducting oceanic plate.
Fossiliferous	Containing fossils.
Gastropods	A group of animals usually referred to as slugs and snails.
Glare	Light reflected off surfaces.
Gondwana	The southernmost of two continents formed when the original supercontinent Pangea broke up.

Graptolites	Extinct fossil colonial animals.
Grinder pump	A waste management device used in a septic tank that turns on once the waste inside the tank reaches a specific level and grinds it.
Groundwater	water within the earth especially that supplies wells and springs
Gullying	Land and soil depressions created by water erosion.
Gymnosperms	A type of seed-bearing plant including modern day conifers and ginkgo trees.
Herbaceous	As defined in the NLCD Classification Legend; Areas dominated by grammanoid or herbaceous vegetation, generally greater than 80 percent of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.
Herptiles	Amphibians and reptiles.
Hertz	A unit of frequency equal to 1 cycle per second.
Histosol	Soils that contain primarily organic material that form in areas of persistent moisture such as wetlands.
Holocene	Of, relating to, or being the present epoch of geological history.
Humus	A brown or black complex variable material resulting from partial decomposition of plant or animal matter and forming the organic portion of soil.
Hydraulic flow	The volume of fluid that passes through a given surface per unit time.
Hyoliths	Extinct animals with conical shells.
Inceptisol	Soils that develop on surfaces that have not had adequate time to develop soil profiles and thus do not have extensive soil horizons.
Intentional destructive act	Includes intentional malevolent acts, intentional malicious acts, and acts of terrorism.
Intraplate quake	An earthquake that occurs inside the tectonic plate, as opposed to its boundaries.
Intrinsic quality	Scenic, historic, recreational, cultural, archaeological, or natural features that are considered representative, unique, irreplaceable, or distinctly characteristic of an area.
Karst	A terrain formed by the dissolution of layers of limestone.
Kettle lakes	Lakes formed when melting glacial ice leaves a depression surrounded by glacial till, and the depression fills with water.
Keystone species	Species for which the impact on its biological community or ecosystem is disproportionately large in relation to its abundance.
Lanceolate	The shape of a tool (usually of flaked stone) in the form of the head of a lance, oval in outline with a sharp point at one or both ends.

Land subsidence	A gradual or sudden sinking of ground due to subsurface movement.
Level of Service (LOS)	A qualitative measure of the operating conditions of an intersection or other transportation facility. There are six LOS (A through F) defined; LOS A represents the best operating conditions, with no congestion, and LOS F is the worst, with heavy congestion.
Linear accelerator (linac)	The device most commonly used for external beam radiation treatments for patients with cancer.
Line of sight areas	Areas that are in the view.
Lithic	A flaked stone tool or waste fragment made by a reductive process of removing flakes and pieces of stone from a larger piece.
Lithologically	Related to the physical characteristics of a rock or rock formation.
Loam	A soil consisting of a friable (easily crumbled or pulverized) mixture of varying proportions of clay, silt, and sand.
Loess	Silt deposits from wind activity.
Loess-covered hills	Hills composed of wind-blown silt (fine soil particles).
Low income population	Populations that meet the threshold for poverty established by the U.S. Census Bureau's Population Reports on Income and Poverty. For Canada, the poverty threshold is defined on the basis of "low income" persons.
Lycopods	Related to modern club mosses; extinct forms were tree-sized.
Madrone	A Coast Range small tree species with very rich brown (chocolate-colored) bark.
Mélange	A disordered mix of rocks of different shapes, sizes, ages, and origins.
Mesic	Habitat with a medium or moderate supply of moisture (e.g., a mesic forest or mesic prairie).
Metamorphosed rock	Rock that is transformed inside the earth due to high temperature and pressure.
Microphytic	Plants of microscopic or nearly microscopic size, often forming a crust on the soil.
Mineral leaching	The loss of minerals by liquid.
Minimum peak horizontal ground acceleration value	The lowest value of an earthquake-propelled particle's change in speed at the ground level horizontally.

Minority population	Individuals who self-identify as belonging to any of the following protected groups: Hispanic (may include individuals of any other category); Black or African American (not of Hispanic origin); American Indian or Alaska Native; and Asian, Native Hawaiian, or Other Pacific Islander. In Canada, Aboriginal Peoples are also included in the minority category.
Mollisol	Organic-rich soils that typically form under grasslands in semi-arid to semi-humid areas.
Mollusks	A large group of invertebrate animals including gastropods and cephalopods.
Moraines	Unconsolidated soil and rock in ridges, mounds, or hummocks deposited by retreating glaciers.
Muck	Soil consisting mostly of stable organic matter where decomposition ceases.
Mylonite	Crushed rocks that can reform and are found in areas of faulting.
National Ambient Air Quality Standards (NAAQS)	Standards established by the EPA that apply to outdoor air throughout the country. Primary standards are designed to protect human health, with an adequate margin of safety, including sensitive populations such as children, the elderly, and individuals suffering from respiratory disease.
National Emissions Standards for Hazardous Air Pollutants	Emissions standards set by the EPA for an air pollutant not covered by NAAQS that may cause an increase in fatalities or in serious, irreversible, or incapacitating illness.
Nautiloids	A large group of marine mollusks, most of which are extinct today, except for the chambered nautilus.
New Source Performance Standards	Pollution control standards issued by the EPA. The term is used in the Clean Air Act to refer to air pollution emission standards, and in the Clean Water Act to refer to standards for discharges of industrial wastewater to surface waters.
Nonattainment areas	A locality where air pollution levels persistently exceed national standards or contributes to ambient air quality in a nearby area that fails to meet standards.
Oreodonts	A sheep-like extinct mammal.
Organic loading	The amount of organic material added to a body of water.
Orogeny	Mountain building.
Ostracod	A small crustacean enclosed in two hard valves, sometimes called a “seed shrimp” because of its appearance.
Palouse	Region of undulating landscape in eastern Washington and Idaho with native short grasses, now an upland or dry-land farming area, producing wheat and legumes.
Pangea	The single continent that existed millions of years ago before it broke up into the continents found today on Earth.

Peat	Accumulation of incompletely decayed vegetation.
Pelecypods	A class of animals that contains the bivalves clams, oysters, and mussels.
Perennial	Continuing to grow year after year; opposite of annual.
Perforator	A tool made of stone, bone, antler, wood, or other material with a small diameter tip of elongated shape used for perforating other materials such as wood, hide, or other materials.
Permeability	A measure of the ability of fluids to transverse the soils.
Phase I Cultural Resource Investigation	An early phase of a cultural resource documentation project involving review and summary of existing information and literature to document known cultural resources within a project area.
Phase II Cultural Resource Investigation	A later phase of a cultural resource documentation project involving a limited sample survey or inventory of a project area for cultural resources.
Phase III Cultural Resource Investigation	A later phase of a cultural resource documentation and evaluation project involving a complete pedestrian survey of a project area and including an inventory of all discovered and previously known precontact and postcontact cultural properties.
Physiographic provinces	A landform region with common geological history creating similar terrain.
Piezometric surface	In an unconfined aquifer, the height to which groundwater rises. In a confined aquifer, the height to which groundwater would rise if not confined. The height of the piezometric surface indicates the energy present in groundwater.
Placoderms	Extinct armored fish that had jaws.
Plutonic rocks	A type of igneous rock that forms deep beneath the earth.
PM ₁₀	Particulate matter less than 10 microns in diameter.
PM _{2.5}	Particulate matter less than 2.5 microns in diameter.
Polyhedral core	A stone core with many faces resulting from the purposeful removal of large exterior flakes.
Populations of concern	Any of the populations identified as minority, low income, or children that are the subject populations for consideration in an analysis of environmental justice impacts or the protection of children.
Precontact	The general cultural period of prehistory referring to the time of Native American groups living in an area prior to the initial contact with Anglo-European settlers.
Postcontact	The general term for describing the historic cultural period after the time of initial contact and interaction between Native American peoples and Anglo-European settlers.

Preform	A stone shaped by flaking into a definable bifacial or unifacial form from which finished tools can be made by further stages of lithic reduction.
Projectile point	A tool of flaked stone, bone, metal, or other material used as a projectile, often attached to a shaft of wood, bone, or other material and used as a projectile such as a spear, dart, or arrow.
Provincial administration	An establishment of provincial or territorial government primarily engaged in activities of a governmental nature, such as legislative activities, judicial activities, taxation, public order and safety, and the administration of provincial or territorial government programs.
Protohistoric	A general cultural time period immediately prior to or at the time of initial contact between Native American Peoples and European settlers. A phase when the Native American cultures exhibit traits of traditional artifacts and methods mixed with European trade goods and materials.
Pseudokarst	Pseudokarst-geological formations similar to karst in development but without carbonate bedrock.
Potential to emit (PTE)	Potential to emit, the maximum amount of air contaminants that a source could emit if each process operated at 100 percent of its design capacity 24 hours/day, 365 days/year; materials that emit the most air contaminants are used or processed 100 percent of the time; and air pollution control equipment is turned off.
Pyroclastic	Rocks (and sometimes gas) that are released through volcanic activity.
Rain-shadow effect	Effect caused by the process in which moist air on the windward side of a mountain rises and cools, causing precipitation to fall as rain or snow, and leaving the leeward side of the mountain or mountain range dry.
Richter scale	The measurement of earthquake magnitude.
Ring of Fire	The area of the Pacific Ocean where many earthquakes and volcanic activity occur.
Ruck march	Long march with a heavy backpack on.
Scree	Aggregation of loose rocks on a slope.
Seismicity/seismic	Relating to earthquakes or earth vibration generally caused by tectonic plate movements.
Shrub/Scrub	As defined in the NLCD Classification Legend, areas dominated by shrubs less than 5 meters tall, with shrub canopy typically greater than 20 percent of total vegetation. This class includes true shrubs, young trees in an early successional stage, or trees stunted from environmental conditions.
Side-notched point	A projectile point with characteristic notches in the side of the tool's base.

Silviculture	Forestry; the practice of deliberately controlling the growth, composition, health, and quality of forests.
Soil horizons/strata	A layer of soil with physical characteristics similar to those of the soil above and below.
Spodosol	An acidic soil with a sub-layer of humus typically found in cool, humid areas such as forests.
State Implementation Plan (SIP)	The state plan for complying with the Federal Clean Air Act. A SIP consists of narrative, rules, technical documentation, and agreements that an individual state will use to clean up areas not meeting NAAQS.
Stemmed point	A projectile point with a discernable stem at its base that has a width dimension that is different from the blade (e.g., contracting stem, expanding stem, or straight stem).
Strata	A horizontal soil layer.
Stratigraphic	Related to the study of rock layers.
Stromatoporoids	Ancient organisms related to sponges that grew massive calcareous layers, leaving obvious fossils.
Subalpine zone	Zone below timberline, either in a mountainous area or to the south of the tree line in an Arctic area.
Subduction zone	Where one oceanic tectonic plate slides underneath another tectonic plate.
Swiftwater rescue	The removal of persons from threat or harm from water that is moving faster than walking pace.
Tableland	Landscape with buttes and flat-topped plateaus.
Talus	A sloping mass of rocky fragments at the base of a cliff.
Taphonomic	Refers to the process by which organisms become fossils.
Taxonomy	Soil taxonomy is the science of classifying soils based on their physical qualities and characteristics.
Thrust faulting (thrusting)	Faulting that pushes one layer of rock over another, causing a break in the earth's crust.
Till deposits	Accumulations of unsorted glacial sediment.
Titanotheres	An extinct group of large-hoofed mammals.
Trackway	A series of fossil footprints.
Trailing	Putting a horse in a trailer to travel to a destination.
Ultisol	A soil that has a high acid content and low fertility, and has been leached of minerals by the processes of weathering.
Unifacial	A stone tool modified or flaked on only one edge, often used as a scraper or cutting tool.
Vertical zonation	Vegetation or "life zone" with vertical separation by altitude, equal to vegetation and climate zonation from a change in latitude (higher altitude zones are similar to more northerly zones).

Viral hemorrhagic septicemia (VHS)	A virus affecting fish.
Viewshed	All the surface areas visible from an observer's viewpoint.
Viewer group	Classes of viewers differentiated by their visual response to the facility and its setting. Response is affected by viewer activity, awareness, and values.
Viewer sensitivity	The viewer's variable receptivity to the elements within the environment they are viewing. Sensitivity is affected by viewer activity and awareness.
Visual element	A particular feature of the visual environment.
Visual impact	The degree of change in visual resources and the viewer response to those resources caused by a development project.
Visual quality	Character of the landscape that generally gives visual value to a setting.
Volcanic arc	An arc of volcanoes parallel to a mountain range when viewed on a map.
Windthrow	The effect created when multiple trees in a forest are uniformly blown down by high winds.

Final

Programmatic Environmental Impact Statement For Northern Border Activities

Section 14: Index



July 2012

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14 INDEX

- Abies balsamea*, 5-19, 6-13, 7-17
 Acadia National Park, 7-10, 7-43, 7-143
Acer, 4-21, 6-20, 7-18
Acipenser fulvescens, 5-23, 6-21, 7-19
Acroptilon repens, 5-21
 action alternative, 2-15, 2-20, 3-1, 3-3, 3-38, 3-48, 8-64, 8-110, 8-125, 8-177, 8-196, 8-224, 8-240, 8-255, 8-304
 Adirondack Park Preserve, 6-10
 Agassiz Beach Ridges, 5-10
 Agassiz Wilderness, 5-10
 air quality control region, 3-4, 4-4, 5-4, 6-4, 7-4, 8-4
 Akamina Kishinena Provincial Park, 4-10, 5-10
 Alberta and British Columbia, 5-10
 Alberta, 4-15, 4-58, 5-10, 5-11, 5-56, 5-57, 5-58, 5-65, 5-66, 5-76, 5-77, 5-79, 5-81, 5-82, 5-83, 5-84, 5-91, 5-92, 5-118, 5-120, 5-122, 5-124
 Alberta, 8-271, 8-291, 8-294, 8-307, 8-308
Alces alces, 6-18, 7-16
 all-terrain vehicle, 1-10, 2-7, 8-4, 8-141; ATV, 3-61, 5-149, 6-164, 8-60, 8-71, 8-72, 8-81, 8-90, 8-91, 8-100, 8-105, 8-121, 8-131, 8-132, 8-141, 8-152, 8-168, 8-202, 8-207, 8-234, 8-262, 8-263, 8-274, 8-275, 8-281, 9-6; ATVs, 1-9, 4-131, 4-133, 5-135, 5-137, 6-148, 6-150, 7-130, 7-132, 8-4, 8-31, 8-32, 8-41, 8-53, 8-54, 8-65, 8-66, 8-75, 8-79, 8-84, 8-85, 8-98, 8-132, 8-133, 8-159, 8-194, 8-247, 8-257, 8-258, 8-259, 8-264, 8-272, 9-6
 Allagash River, 7-34
 Allagash Wilderness Waterway State Park, 7-10
 Allegheny, 6-21
 Allegheny National Forest, 6-2, 6-10, 6-164
 alpine meadows, 4-13, 4-18, 5-21, 6-13, 7-2
 alternatives, 1-1, 1-2, 1-18, 1-20, 1-21, 1-23, 2-2, 2-3, 2-4, 2-13, 2-14, 2-19, 2-20, 3-1, 3-2, 3-3, 3-4, 3-8, 3-9, 3-10, 3-14, 3-19, 3-20, 3-22, 3-24, 3-25, 3-29, 3-30, 3-35, 3-36, 3-40, 3-46, 3-47, 3-49, 3-60, 4-4, 4-23, 4-46, 4-72, 4-92, 4-109, 5-4, 5-22, 5-42, 5-70, 5-92, 5-110, 6-4, 6-21, 6-41, 6-48, 6-71, 6-98, 6-123, 7-4, 7-18, 7-36, 7-65, 7-85, 7-107, 8-1, 8-2, 8-4, 8-6, 8-19, 8-20, 8-22, 8-23, 8-24, 8-42, 8-43, 8-49, 8-51, 8-58, 8-59, 8-60, 8-62, 8-66, 8-73, 8-76, 8-79, 8-93, 8-96, 8-103, 8-106, 8-108, 8-109, 8-111, 8-116, 8-118, 8-121, 8-134, 8-136, 8-137, 8-138, 8-141, 8-142, 8-144, 8-147, 8-149, 8-155, 8-162, 8-164, 8-166, 8-168, 8-169, 8-175, 8-176, 8-177, 8-181, 8-183, 8-186, 8-189, 8-190, 8-210, 8-212, 8-216, 8-219, 8-221, 8-226, 8-231, 8-232, 8-239, 8-241, 8-244, 8-251, 8-268, 8-272, 8-273, 8-275, 8-277, 8-278, 8-279, 8-280, 8-281, 8-282, 8-283, 8-286, 8-287, 8-291, 8-294, 9-1, 9-9, 9-10, 9-11
Amblema neislerii, 5-19
Ambystoma maculatum, 6-18, 7-16
 American beaver, 4-19
 American Indian Religious Freedom Act, 1-22; AIRFA, 1-22
 American kestrel, 4-19
 American marten, 6-13, 8-39, 8-44
 American pipit, 4-19
 American toad, 6-18, 7-16
 American wigeon, 5-18
 Ammonoosuc rivers, 7-19
 amphibians, 3-14, 5-19, 5-23, 6-21, 7-19, 8-29, 8-40, 8-45, 8-51, 9-3
Anas acuta, 5-18
Andropogon gerardii, 5-20
 Androscoggin River Basin, 7-36
 antiterrorism/force protection, 8-210
 Animal and Plant Health Inspection Service; APHIS, 8-205, 8-206
 Apostle Islands National Lakeshore, 6-10, 6-165, 8-279
 aquatic insects, 5-19, 5-23, 6-21, 7-19
Ardea herodias, 5-19
 Arikara, 5-113
 Army Corps of Engineers, 1-23, 5-23, 8-31, 8-112
 Aroostook Band of Micmac Indians, 7-106
 ARRA, 2-10, 2-18
Artemisia, 4-20, 5-20
 asbestos-containing material, 3-57, 4-131, 5-136, 6-149, 7-128
 aspen, 4-13, 5-20, 6-19
 Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation, 5-111, 5-113
 Assiniboine, 5-41, 5-42, 5-108, 5-111, 5-113
 Atlantic salmon, 7-14, 7-15, 7-19, 8-30, 8-52, 9-4

- Au Sable rivers, 6-21
 Audubon National Wildlife Refuge, 5-10
 avian species, 4-18, 7-16, 8-37, 8-50
Aythya valisineria, 5-18
 Bad River Band of the Lake Superior Tribe of Chippewa Indians, 6-123
Balaenoptera physalus, 7-17
 balsam fir, 5-19, 6-13, 7-17
banksiana, 5-19
 Barker Mountain Natural Area Preserve, 4-10
 barrier, 4-53, 8-37, 8-40, 8-110, 8-113, 8-115, 8-128, 8-156, 8-157, 8-162, 8-199; barriers, 1-1, 1-18, 2-4, 2-14, 2-17, 3-47, 3-48, 3-61, 7-2, 8-17, 8-28, 8-29, 8-39, 8-43, 8-44, 8-45, 8-46, 8-49, 8-63, 8-65, 8-78, 8-87, 8-98, 8-117, 8-121, 8-124, 8-132, 8-138, 8-144, 8-164, 8-167, 8-171, 8-177, 8-178, 8-180, 8-181, 8-182, 8-183, 8-184, 8-190, 8-195, 8-196, 8-197, 8-198, 8-213, 8-223, 8-231, 8-234, 8-240, 8-246, 8-264, 8-284, 9-2, 9-5, 9-13
 Baxter State Park, 7-2, 7-10, 7-48, 8-155
 Bay Mills Indian Community of the Ojibwe, 6-123, 6-125
 beargrass, 4-13
 best management practice, 1-2, 2-2, 3-1, 3-21, 3-63, 4-129, 5-133, 6-147, 7-126, 8-1, 8-30, 8-46, 8-47, 8-87, 9-1; best management practices, 1-1, 2-1, 3-1, 3-20, 3-60, 4-121, 5-125, 6-138, 7-120, 8-1, 8-27, 8-42, 8-43, 8-80, 9-1; BMP, 8-30, 9-12; BMPs, 4-121, 5-125, 6-138, 7-120, 8-42, 8-43, 8-44, 8-45, 8-51, 8-52, 8-53, 8-54, 8-59, 8-62, 8-74, 8-97, 8-101, 8-102, 8-103, 8-104, 8-106, 8-117, 8-125, 8-126, 8-129, 8-134, 8-135, 8-137, 8-163, 8-185, 8-211, 8-212, 8-216, 8-226, 8-231, 8-232, 8-234, 8-237, 8-240, 8-241, 8-250, 8-268, 8-275, 8-276, 8-287, 8-290, 8-291, 9-1, 9-2, 9-3, 9-4, 9-5, 9-9, 9-12, 9-13, 9-14, 9-15
Betula, 6-20, 7-18
 Big Reed Pond Forest Preserve, 7-10
 big-leaf maple, 4-21
 birch, 6-20, 7-18
 black bass, 6-21
 black bear, 4-19, 5-18, 6-18, 7-16
 black cottonwood, 4-21
 black spruce, 5-19, 7-17
 black-backed woodpecker, 6-17, 7-16, 8-29
 black-footed ferret, 5-17, 8-52, 9-4
 Blackfeet Indian Reservation, 5-89, 5-91, 5-98
 Blackfeet Tribe of the Blackfeet Indian Reservation of Montana, 4-109, 4-111
 blue grama, 5-20
 blue grouse, 4-19
 blue jay, 7-16
 bluebunch wheatgrass, 5-20
 Bluestem Prairie Scientific and Natural Area, 5-10
 Bob Marshall Wilderness, 4-10, 4-58, 4-148, 5-149
 bobcat, 6-18, 7-16, 8-33
 Bois Forte Band of Chippewa Indians, 5-111, 5-113, 5-114
Boloria titania montinus, 7-13
Bonasa umbellus, 7-16
 border fence, 1-19, 8-131
 Borderland Management Task Forces; BMTFs, 2-3
 BORSTAR (Border Patrol Search, Trauma, and Rescue), 8-202, 8-205
 BORTAC (Border Patrol Tactical Unit), 8-202, 8-205
 Boundary Pass, 4-22
 Boundary Reservoir, 4-23
 Boundary Waters Canoe Area Wilderness, 5-10, 5-42, 5-149
Bouteloua dactyloides, 5-20
Bouteloua gracilis, 5-20
 Bowdoin National Wildlife Refuge, 5-10
 Border Patrol Station; BPS, 1-11, 1-13, 2-6, 2-7, 2-8, 4-49, 4-74, 4-76, 4-90, 4-91, 4-93, 4-94, 4-95, 4-96, 4-103, 4-105, 4-106, 4-107, 5-2, 5-46, 5-88, 5-93, 5-94, 5-101, 5-102, 5-105, 5-108, 5-109, 5-137, 6-45, 6-88, 6-89, 6-90, 6-91, 6-93, 6-94, 6-95, 6-96, 6-99, 6-115, 6-116, 6-121, 6-150, 6-152, 7-2, 7-41, 7-69, 7-83, 7-97, 7-98, 7-99, 7-100, 7-102, 7-104, 7-129, 7-131, 8-59, 8-62, 8-76, 8-98, 8-100, 8-117, 8-130, 8-133, 8-137, 8-165, 8-166, 8-179, 8-186, 8-187, 8-220, 8-237, 8-249, 8-250, 8-257, 8-262, 8-269, 8-272, 8-297
 British Columbia, 4-10, 4-11, 4-15, 4-17, 4-22, 4-30, 4-42, 4-45, 4-54, 4-60, 4-61, 4-62, 4-70, 4-71, 4-76, 4-79, 4-80, 4-81, 4-84, 4-85, 4-86, 4-93, 4-94, 4-95, 4-96, 4-99, 4-116, 4-118, 4-119, 4-120, 4-121, 5-10, 5-93, 8-160, 8-271, 8-303
 brook trout, 5-23, 6-21, 7-19

<p>buffaloberry, 5-20 buffalograss, 5-20 Bufo americanus, 6-18, 7-16 Bufo hemiophrys, 5-19 bull trout, 4-15 Bureau of Indian Affairs, 1-26, 4-110, 5-112, 6-124, 7-106; BIA, 1-26 Bureau of Land Management, 1-26, 3-32, 4-2, 5-61, 6-60, 7-56, 8-129, 9-10; BLM, 1-26, 3-32, 3-33, 3-34, 3-39, 3-43, 3-66, 4-2, 4-66, 4-73, 5-61, 5-68, 6-60, 6-69, 7-56, 7-63, 7-65, 8-129, 8-146, 9-10 Bureau of Reclamation, 4-44, 4-66, 5-61, 6-60, 7-56; BOR, 4-66, 5-61, 6-60, 7-56 Bureau of Transportation Statistics, 4-91, 5-89, 6-91, 7-83 Burt Lake Band of Ottawa & Chippewa Indians, Inc., 6-123 Buteo platypterus, 7-16 Cabinet Mountains Wilderness, 4-10, 4-148 Cambrian-Ordovician Aquifer System, 6-38 Camels Hump State Park, 7-10 Canada lynx, 4-15, 7-15, 8-292 Canada thistle, 5-21, 8-30 Canada, 1-1, 1-3, 1-5, 1-7, 1-10, 1-12, 1-19, 1-20, 1-21, 2-1, 2-3, 2-18, 3-11, 3-30, 3-31, 3-32, 3-34, 3-35, 3-41, 3-46, 3-49, 3-50, 4-8, 4-10, 4-11, 4-13, 4-15, 4-16, 4-17, 4-22, 4-30, 4-43, 4-45, 4-56, 4-57, 4-58, 4-59, 4-60, 4-61, 4-62, 4-68, 4-70, 4-71, 4-76, 4-77, 4-79, 4-80, 4-81, 4-82, 4-84, 4-85, 4-86, 4-87, 4-89, 4-93, 4-94, 4-95, 4-96, 4-99, 4-116, 4-118, 4-119, 4-120, 4-121, 4-122, 4-135, 4-137, 4-139, 4-148, 5-8, 5-10, 5-11, 5-12, 5-14, 5-16, 5-21, 5-42, 5-43, 5-51, 5-52, 5-54, 5-55, 5-56, 5-57, 5-58, 5-63, 5-65, 5-66, 5-73, 5-74, 5-76, 5-77, 5-79, 5-81, 5-82, 5-83, 5-84, 5-87, 5-91, 5-92, 5-93, 5-94, 5-118, 5-120, 5-121, 5-122, 5-123, 5-124, 5-125, 5-140, 5-143, 5-144, 6-8, 6-10, 6-11, 6-13, 6-38, 6-41, 6-42, 6-50, 6-52, 6-54, 6-55, 6-56, 6-57, 6-62, 6-64, 6-67, 6-74, 6-76, 6-78, 6-79, 6-80, 6-81, 6-82, 6-83, 6-84, 6-85, 6-88, 6-93, 6-94, 6-95, 6-96, 6-97, 6-98, 6-99, 6-100, 6-105, 6-113, 6-114, 6-116, 6-130, 6-132, 6-133, 6-134, 6-135, 6-136, 6-137, 6-138, 6-153, 6-156, 6-157, 7-2, 7-10, 7-16, 7-35, 7-36, 7-38, 7-46, 7-47, 7-49, 7-50, 7-51, 7-52, 7-53, 7-57, 7-59, 7-60, 7-68, 7-71, 7-72, 7-74, 7-75, 7-76, 7-77, 7-78, 7-79, 7-82,</p>	<p>7-85, 7-86, 7-87, 7-90, 7-95, 7-111, 7-113, 7-114, 7-115, 7-116, 7-117, 7-118, 7-119, 7-132, 7-134, 7-136, 8-1, 8-30, 8-118, 8-120, 8-129, 8-150, 8-156, 8-157, 8-160, 8-163, 8-164, 8-168, 8-188, 8-259, 8-271, 8-292, 8-308, 8-312 Canadian Council on Ecological Areas, 4-56, 5-51, 6-50, 7-46 Canadian toad, 5-19 Canis latrans, 6-18 canvasback, 5-18 carbon dioxide, 3-28, 8-103 carbon monoxide, 3-5, 5-4 cardiopulmonary resuscitation, 8-204 Caribou, 4-16, 7-35, 7-141 categorical exclusion, 1-24, 2-11; CATEX, 1-24 Catharus guttatus, 6-17, 7-16 Catharus, 4-19, 6-17, 7-16 Cathedral Provincial Park and Protected Area, 4-11 Catostomus commersonii, 5-23, 6-21, 7-19 Cayuga Nation of New York, 6-123, 6-125 Cayuga Nation, 6-123, 6-125 Canadian Council on Ecological Areas; CCEA, 4-56, 5-51, 6-50, 7-46 Cedar Point National Wildlife Refuge, 6-10, 6-164 census metropolitan area, 3-46, 4-81 Centaurea maculosa, 5-21 Cervus canadensis, 4-19, 8-29, 8-33, 8-35, 8-40 cesium-137, 8-215 cetaceans, 4-19, 7-17 Chambly Canal, 7-37 channel catfish, 5-23 Charadrius melodus, 5-16, 6-15, 6-16, 6-17, 7-15, 8-32, 8-52, 9-4 Charles M. Russell National Wildlife Refuge, 5-10, 5-148 Chase Lake Wilderness, 5-10 Chelydra serpentina, 5-19 Chequamegon National Forest, 6-10 Chequamegon-Nicolet National Forest, 6-165 Chinook salmon, 4-22, 8-30, 8-46 Chinook, 4-19, 4-22, 8-30, 8-46 Chippewa Indians, 6-125 Chippewa National Forest, 5-10 Chippewa-Cree Indians of the Rocky Boy's Reservation, 5-111, 5-113 Chippewa, 5-10, 6-93, 6-125</p>
---	---

<p>chokecherry, 5-20 Chum salmon, 4-22 chum, 4-19 Cirsium arvense, 5-21 Clarke Fork, 4-22 Clean Air Act; CAA, 1-22, 1-23, 3-4, 3-6, 3-8, 3-10, 4-6, 5-4, 5-6, 6-4, 6-6, 7-4, 7-6, 8-4, 8-5, 8-9, 8-22, 8-291 Clean Water Act; CWA, 1-23 climate change, 3-27, 3-28, 3-29, 3-30, 3-31, 3-65, 4-45, 4-53, 5-496-48, 7-44, 8-103, 8-295, 9-7 coastal zone management program, 6-68; CZMP, 3-36, 4-71, 4-72, 7-61, 7-62 Coastal Zone Management Act; CZMA, 1-23, 3-36 Coeur d'Alene National Forest, 4-147 Coeur D'Alene Tribe of the Coeur D'Alene Reservation, 4-109 Coeur d'Alene, 4-79, 4-147 coho salmon, 4-19, 4-22 Columbia River Treaty, 4-45 Colville National Forest, 4-10, 4-145, 4-146 Colville Reservation, 4-66 Comertown Pothole Prairie Preserve, 5-10 comment period, 1-25 comments, 1-25, 3-12, 10-1 commercial off-the-shelf, 1-15, 2-11 Common garter snakes, 6-18, 7-16 common raven, 4-18 common shiner, 5-23 common shiner, 7-19 Comprehensive Environmental Response, Compensation, and Liability Act, 1-23, 3-54, 3-60, 4-130, 5-135, 6-148, 7-127t, 8-303; CERCLA, 1-23, 3-54, 3-60, 4-130, 5-135, 6-148, 7-127 Confederated Salish & Kootenai Tribes of the Flathead Reservation, 4-109, 4-112 Confederated Tribes and Bands of the Yakama, 4-109 Confederated Tribes of the Chehalis Reservation, 4-109, 4-111 Confederated Tribes of the Colville Reservation, 4-109, 4-111 Connecticut River, 7-19, 7-37, 7-90, 7-93, 7-96 construction and demolition, 8-112, 9-9 construction of barriers, 1-18</p>	<p>construction of facilities, 3-20, 8-57, 8-269, 9-12 construction of roads, 8-43, 8-44, 8-50, 8-144 construction, 1-18, 1-21, 2-3, 2-4, 2-5, 2-6, 2-7, 2-8, 2-9, 2-10, 2-11, 2-13, 2-14, 2-15, 3-3, 3-8, 3-11, 3-14, 3-15, 3-20, 3-22, 3-23, 3-24, 3-26, 3-31, 3-37, 3-48, 3-53, 3-55, 3-58, 3-62, 3-65, 4-47, 4-48, 4-49, 4-56, 4-94, 4-99, 4-101, 4-122, 4-132, 4-137, 4-138, 5-17, 5-43, 5-44, 5-45, 5-46, 5-51, 5-92, 5-93, 5-100, 5-125, 5-137, 5-143, 6-43, 6-44, 6-45, 6-50, 6-109, 6-111, 6-112, 6-138, 6-150, 6-156, 7-39, 7-40, 7-41, 7-46, 7-85, 7-119, 7-129, 7-134, 7-135, 8-4, 8-6, 8-7, 8-8, 8-9, 8-10, 8-11, 8-12, 8-13, 8-14, 8-15, 8-17, 8-18, 8-19, 8-20, 8-21, 8-22, 8-23, 8-24, 8-25, 8-27, 8-28, 8-29, 8-30, 8-31, 8-34, 8-37, 8-38, 8-39, 8-40, 8-41, 8-42, 8-43, 8-44, 8-45, 8-46, 8-47, 8-48, 8-49, 8-50, 8-51, 8-52, 8-53, 8-54, 8-55, 8-57, 8-58, 8-59, 8-60, 8-61, 8-62, 8-63, 8-64, 8-65, 8-68, 8-69, 8-74, 8-75, 8-76, 8-77, 8-78, 8-79, 8-80, 8-81, 8-82, 8-83, 8-84, 8-86, 8-87, 8-88, 8-90, 8-98, 8-100, 8-101, 8-102, 8-103, 8-104, 8-107, 8-108, 8-109, 8-110, 8-111, 8-112, 8-113, 8-114, 8-115, 8-116, 8-117, 8-118, 8-119, 8-120, 8-121, 8-122, 8-123, 8-124, 8-125, 8-126, 8-127, 8-128, 8-130, 8-132, 8-133, 8-134, 8-135, 8-136, 8-137, 8-138, 8-139, 8-143, 8-144, 8-145, 8-147, 8-148, 8-149, 8-151, 8-152, 8-154, 8-155, 8-158, 8-164, 8-165, 8-166, 8-167, 8-169, 8-170, 8-171, 8-172, 8-173, 8-174, 8-175, 8-176, 8-177, 8-178, 8-179, 8-180, 8-181, 8-188, 8-189, 8-190, 8-191, 8-192, 8-193, 8-194, 8-195, 8-196, 8-197, 8-198, 8-199, 8-200, 8-201, 8-203, 8-204, 8-211, 8-220, 8-221, 8-223, 8-224, 8-226, 8-227, 8-228, 8-229, 8-230, 8-231, 8-232, 8-237, 8-238, 8-239, 8-240, 8-241, 8-242, 8-243, 8-244, 8-246, 8-247, 8-248, 8-249, 8-250, 8-251, 8-252, 8-253, 8-254, 8-255, 8-256, 8-257, 8-258, 8-259, 8-260, 8-261, 8-262, 8-264, 8-265, 8-266, 8-267, 8-269, 8-270, 8-271, 8-272, 8-281, 8-282, 8-283, 8-284, 8-285, 8-286, 8-287, 8-288, 8-289, 8-290, 8-291, 8-292, 8-293, 8-294, 8-295, 8-296, 8-298, 8-299, 8-300, 8-301, 8-305, 8-306, 8-307, 8-308, 8-309, 8-310, 8-311, 8-312, 8-313, 9-2, 9-3, 9-4, 9-5, 9-6, 9-</p>
---	--

- 8, 9-9, 9-10, 9-11, 9-12, 9-13, 9-14, 9-15, 9-16
- Convolvulus arvensis*, 5-21
- cooperation, 1-10, 1-11, 1-20, 2-3, 4-2, 4-44, 5-2, 6-2, 7-83, 8-63
- Cornus florida*, 5-20, 6-19, 7-18, 6-20
- Coulee Dam National Recreation Area, 4-10
- Cowlitz Indian Tribe, 4-109
- coyote, 6-18
- creek chub, 6-21, 7-19
- critical habitat, 3-12, 4-15, 4-16, 5-16, 6-15, 6-16, 6-17, 7-14, 8-30, 8-46, 8-51, 8-52, 8-53, 9-4
- Crow Wing, 5-22
- cultural resources training, 1-8
- cultural resources, 1-6, 1-7, 1-8, 1-23, 3-2, 3-3, 3-48, 3-49, 3-65, 4-97, 4-99, 4-100, 4-102, 4-108, 4-144, 5-95, 5-96, 5-97, 5-98, 5-99, 5-100, 5-110, 6-67, 6-101, 6-106, 6-122, 7-88, 7-91, 7-92, 7-96, 7-105, 8-177, 8-178, 8-300, 8-301, 9-1
- cultural, 1-6, 1-7, 1-8, 1-23, 3-2, 3-3, 3-39, 3-41, 3-43, 3-48, 3-49, 3-51, 3-65, 4-23, 4-59, 4-96, 4-97, 4-99, 4-100, 4-102, 4-108, 4-110, 4-144, 5-93, 5-94, 5-95, 5-96, 5-97, 5-98, 5-99, 5-100, 5-110, 5-111, 5-112, 6-67, 6-96, 6-99, 6-101, 6-106, 6-110, 6-122, 6-124, 7-88, 7-90, 7-91, 7-92, 7-93, 7-96, 7-105, 7-106, 8-133, 8-177, 8-178, 8-179, 8-180, 8-181, 8-182, 8-183, 8-184, 8-185, 8-300, 8-301, 9-1, 9-12
- cumulative effect, 8-2, 8-22, 8-48, 8-145, 8-230, 8-259, 8-290, 8-291, 8-293, 8-295, 8-296, 8-302, 8-305, 8-310; cumulative impact, 3-1, 3-3, 8-27, 8-50, 8-57, 8-68, 8-103, 8-116, 8-177, 8-189, 8-202, 8-203, 8-230, 8-247, 8-252, 8-254, 8-255, 8-270, 8-281, 8-286, 8-290, 8-292, 8-293, 8-296, 8-297, 8-298, 8-299, 8-300, 8-301, 8-302, 8-303, 8-304, 8-305, 8-308, 8-309, 8-310, 8-311, 8-313, 8-314, 9-16; cumulative impacts, 3-1, 3-3, 8-24, 8-45, 8-51, 8-62, 8-96, 8-108, 8-166, 8-177, 8-189, 8-190, 8-216, 8-232, 8-237, 8-239, 8-240, 8-254, 8-264, 8-269, 8-272, 8-274, 8-275, 8-278, 8-279, 8-280, 8-281, 8-282, 8-284, 8-285, 8-286, 8-287, 8-290, 8-291, 8-292, 8-294, 8-295, 9-16
- Customs Area Surveillance Center; CASC, 3-16, 3-23, 3-27, 3-38, 3-61
- Cuyahoga Valley National Park, 6-10, 6-164, 8-271
- Cyanocitta cristata*, 7-16
- Delaware Tribe-Ohio, 6-123
- Dendroica magnolia*, 7-16
- Department of Commerce, 3-12, 4-19, 4-94, 6-67, 7-17, 1-1, 1-3, 2-1, 3-29; DOC, 4-19, 7-17
- Department of Homeland Security, 4-2, 5-2, 6-2, 7-44, 8-47, 8-103, 9-1; DHS, 1-1, 1-2, 1-3, 1-7, 1-11, 1-20, 1-21, 1-22, 1-24, 2-1, 2-18, 3-29, 3-30, 3-36, 10-2, 4-2, 4-53, 4-124, 5-2, 5-49, 5-128, 6-2, 6-48, 6-141, 7-44, 7-121, 8-47, 8-103, 8-122, 8-135, 8-158, 9-1
- Department of Interior, 1-7, 4-19, 7-17, 8-26, 8-122; DOI, 1-7, 1-22, 1-23, 1-25, 1-26, 3-14, 3-36, 3-39, 4-2, 4-19, 5-2, 6-2, 7-17, 8-122
- Detroit River, 6-41
- discarded military munitions, 3-55
- disruption, 3-39, 8-62, 8-156, 8-190, 8-269, 8-270, 8-272, 8-286, 9-16
- Douglas-fir, 4-13, 4-19, 4-20, 4-21, 5-15, 5-21
- Dreissena polymorpha*, 5-23
- dry forest, 4-20, 7-13
- dugong, 4-19, 7-17
- Eagle Creek State Nature Preserve, 6-10
- eastern hemlock, 5-19, 7-17
- eastern prairie fringed orchid, 7-16
- EC Manning Provincial Park, 4-11
- ecoregion, 4-8, 4-18, 4-19, 4-20, 5-8, 5-21, 6-2, 6-8, 6-13, 6-19, 6-20, 6-21, 7-8, 7-18, 7-19, 7-20
- electromagnetic, 4-126, 4-127, 5-132, 6-145, 6-146, 7-124, 8-37, 8-202, 8-219
- elm, 5-20, 6-19
- Endangered Species Act, 4-16, 5-16, 6-15, 7-14; ESA, 1-23, 1-25, 3-12, 3-13, 3-14, 3-35, 4-15, 5-16, 6-15, 7-14, 7-15, 8-53
- endangered, 3-12, 3-13, 3-36, 4-15, 4-16, 4-17, 5-16, 5-17, 5-18, 6-15, 6-16, 6-17, 7-14, 8-25, 8-30, 8-34, 8-37, 8-39, 8-40, 8-44, 8-48, 8-50, 8-51, 8-52, 8-53, 8-91, 8-93, 8-100, 9-3, 9-4; federally listed endangered, 4-15, 7-14, 7-15
- environmental assessment, 1-24, 8-112, 9-8; EA, 1-24, 2-12, 3-52, 8-112, 8-251
- environmental impact statement, 1-24, 3-66, 9-8; EIS, 1-24, 3-52, 10-2, 6-67, 8-73
- environmental management system, 9-1

environmentally preferable, 2-20, 8-113, 9-9;
 environmentally preferred, 8-113, 9-9
Esox lucius, 5-23, 6-21, 7-19
Eumeces septentrionalis, 5-19
Euphorbia esula, 5-21
 evergreens, 5-20, 6-19, 6-20, 7-18
 expansion, 2-8, 2-9, 3-18, 3-29, 3-43, 3-45, 3-46, 2-9, 2-10, 3-19, 3-31, 3-46, 3-47, 3-48
 family Parulidae, 6-17, 7-16
 Farmland Protection Policy Act, 3-19; FPPA, 3-19
 Free and Secure Trade program; FAST, 8-105
 FEC, 6-150
 Federal Aviation Administration, 1-12, 4-124, 5-128, 6-140, 7-121, 8-33; FAA, 1-12, 1-15, 4-124, 5-128, 6-140, 6-141, 7-121, 8-33, 8-139, 8-140, 8-209
 Federal Communications Commission, 1-13, 4-127, 5-132, 6-145, 7-124, 8-49, 9-2; FCC, 1-13, 4-127, 5-132, 6-145, 7-124, 8-49, 8-219, 8-225
 Federal Emergency Management Agency, 3-22, 4-44, 5-42, 6-41, 7-37; FEMA, 3-22, 4-44, 5-42, 6-41, 7-37, 8-69
 Federal Energy Management Program, 8-113, 9-9; FEMP, 8-113, 9-9
 Federal Law Enforcement Training Center; FLETC, 8-205
 fence, 1-19, 8-44, 8-50, 8-121, 8-131, 8-133, 8-136, 8-147, 8-271, 9-11; fences, 1-18, 2-6, 2-14, 2-15, 3-15, 3-21, 3-23, 3-27, 3-37, 3-39, 3-47, 3-48, 3-61, 4-74, 4-101, 5-69, 6-70, 7-64, 8-23, 8-24, 8-28, 8-43, 8-44, 8-45, 8-55, 8-66, 8-68, 8-69, 8-78, 8-80, 8-84, 8-109, 8-110, 8-117, 8-121, 8-124, 8-128, 8-132, 8-164, 8-167, 8-171, 8-175, 8-177, 8-178, 8-180, 8-181, 8-182, 8-183, 8-184, 8-195, 8-201, 8-223, 8-229, 8-231, 8-239, 8-244, 8-246, 8-254, 8-258, 8-271, 8-284, 8-285, 8-289, 9-5; fencing, 1-19, 2-4, 2-7, 2-14, 3-40, 4-101, 7-2, 8-17, 8-29, 8-40, 8-41, 8-43, 8-44, 8-63, 8-98, 8-108, 8-121, 8-124, 8-126, 8-132, 8-134, 8-144, 8-146, 8-147, 8-156, 8-164, 8-171, 8-189, 8-198, 8-223, 8-240, 8-264, 8-271, 8-272, 9-10, 9-11
 ferryboats, 4-22
Festuca idahoensis, 5-20
 field bindweed, 5-21
 fin whale, 7-17
 Finger Lakes National Forest, 6-10
 fish and wildlife, 3-12, 3-65, 4-13, 4-14, 4-23, 4-41, 4-45, 4-66, 5-40, 5-61, 6-15, 6-39, 6-60, 7-34, 7-56
 fisher, 6-18, 7-16, 8-44
 fisheries, 4-44, 5-23, 5-42, 6-68
 Flathead National Forest, 4-10, 4-148
 Flathead Reservation, 4-66
 Flathead River, 4-41, 4-42, 4-45, 4-148
 flowering dogwood, 5-20, 6-19, 6-20, 7-18
 forest management plan, 4-146; FMP, 4-146, 4-147
 Fond du Lac Band, 5-111, 5-113
 Forest County Potawatomi Community, 6-123, 6-125
 Forest River Biology Area, 5-10
 Fort Belknap Indian Community of the Fort Belknap Reservation of Montana, 5-111, 5-113
 Fort Belknap Reservation, 5-61
 Fort Berthold Reservation, 5-61, 5-113
 Fort Fairfield, 7-35, 7-98, 7-101, 7-129, 7-131, 7-136
 Fort Kent, 7-35, 7-95, 7-99, 7-136
 forward operating base, 1-11, 2-4, 3-15, 4-132, 5-137, 6-150, 7-129, 8-1, 9-6; forward operating bases, 1-10, 2-4, 3-14, 4-125, 5-129, 6-142, 7-124, 8-1, 9-6; FOB, 3-44, 8-70, 8-118, 8-134, 8-137, 8-142, 8-165, 8-166, 9-6; FOBs, 1-10, 1-12, 2-4, 2-5, 2-9, 3-14, 3-19, 3-22, 3-25, 3-35, 3-57, 3-59, 3-60, 3-65, 4-125, 5-2, 5-129, 6-142, 7-2, 7-124, 8-1, 8-4, 8-25, 8-34, 8-53, 8-55, 8-64, 8-75, 8-79, 8-109, 8-110, 8-114, 8-125, 8-126, 8-155, 8-156, 8-160, 8-236, 8-238
 forward-looking infrared radar, 1-15
 fox sparrow, 4-19
 fox, 4-19, 6-18, 7-16
 fragmentation of habitat, 8-39
 Frenchville, 7-35
 galleta, 5-20
 gamma rays, 4-125, 5-130, 6-144, 7-122
 Garden Island State Recreation Area, 5-10
 General Conformity Rule; GCR, 3-6, 8-4, 8-5, 8-9, 8-10, 8-11, 8-13, 8-16, 8-17, 8-18, 8-21
 Georgia Basin, 4-22, 8-30, 8-46
 greenhouse gas; GHG, 3-2, 3-27, 3-28, 3-30, 3-31, 8-111, 8-113, 9-8, 9-9
 giant floater mussel, 5-19
 Glacier National Park, 4-10, 4-13, 4-17, 4-42, 4-52, 4-58, 4-73, 4-148, 5-10, 5-21, 5-48, 5-

<p>53, 5-66, 5-69, 5-91, 8-120, 8-154, 8-271, 8-272</p> <p>Glacier Peak Wilderness, 4-10, 4-58, 4-147</p> <p>Glyptemys, 6-18, 7-16</p> <p>Gogebic, 5-23</p> <p>Golden Lake State Wildlife Management Area, 5-10</p> <p>goldenrods, 5-20</p> <p>gorbuscha, 4-19, 4-22</p> <p>Grand Portage Band of Lake Superior Chippewa, 5-111, 5-113</p> <p>Grand Portage National Monument, 5-10</p> <p>Grand Portage State Park, 5-11</p> <p>Grand Traverse Band of Ottawa and Chippewa Indians, 6-123, 6-125</p> <p>Grasslands National Park of Canada, 5-11</p> <p>grasslands, 4-1, 4-2, 4-14, 4-18, 4-19, 4-37, 5-14, 5-18, 5-21, 5-35, 5-61, 8-29, 8-33, 8-40, 8-44</p> <p>gray jay, 6-17, 7-16</p> <p>gray seal, 7-17</p> <p>great blue heron, 5-19</p> <p>Great Lakes Water Quality Agreement, 6-41, 6-42</p> <p>Great Wass Island Preserve, 7-10</p> <p>Green Mountain National Forest, 7-141</p> <p>Green Mountains, 7-10, 7-33, 7-85</p> <p>green-winged teal, 5-18</p> <p>greenhouse gas, 3-2, 3-27, 3-30</p> <p>greenhouse gas, 8-103, 8-290, 8-296</p> <p>grizzly, 4-13, 4-16, 8-25, 8-47, 8-274, 9-4; grizzlies, 8-47, 9-4; grizzly bear, 4-13, 4-16; grizzly bear, 8-28, 8-52, 8-292, 9-4; grizzly bears, 4-16, 8-25, 8-47, 9-4</p> <p>Groton State Forest, 7-10</p> <p>Grus americana, 5-16</p> <p>Gunlogson Arboretum Nature Preserve, 5-11</p> <p>H.R. Morgan State Nature Preserve, 5-11</p> <p>habitat fragmentation, 8-25, 8-44</p> <p>habitat, 3-11, 3-12, 3-13, 3-14, 3-15, 3-22, 3-34, 3-39, 4-1, 4-10, 4-13, 4-15, 4-16, 4-19, 4-22, 4-40, 4-41, 4-45, 4-63, 4-71, 5-10, 5-14, 5-15, 5-16, 5-17, 5-22, 5-38, 5-40, 5-58, 5-66, 5-149, 6-10, 6-13, 6-14, 6-16, 6-17, 6-20, 6-37, 6-39, 6-57, 6-65, 6-68, 7-2, 7-10, 7-13, 7-15, 7-18, 7-20, 7-32, 7-34, 7-53, 8-25, 8-27, 8-29, 8-30, 8-31, 8-32, 8-33, 8-34, 8-35, 8-36, 8-37, 8-38, 8-39, 8-40, 8-41, 8-43, 8-44, 8-45, 8-46, 8-47, 8-48, 8-49, 8-50, 8-51, 8-52, 8-53, 8-54, 8-68, 8-108, 8-135, 8-147,</p>	<p>8-271, 8-277, 8-292, 9-2, 9-4, 9-11; habitats, 2-19, 3-10, 3-11, 3-12, 3-13, 3-39, 3-62, 4-1, 4-2, 4-13, 4-14, 4-18, 4-20, 4-133, 5-1, 5-13, 5-18, 5-19, 5-21, 5-137, 6-13, 6-17, 6-18, 6-19, 6-39, 6-150, 7-1, 7-12, 7-15, 7-16, 7-17, 7-106, 7-132, 8-22, 8-26, 8-31, 8-32, 8-33, 8-35, 8-36, 8-37, 8-40, 8-41, 8-43, 8-46, 8-255</p> <p>Halichoerus grypus, 7-17</p> <p>Hannahville Indian Community, 6-123</p> <p>harbor seal, 7-17</p> <p>Haro Strait, 4-22</p> <p>harp seal, 7-17</p> <p>hazardous air pollutant, 3-7, 8-12</p> <p>heating, ventilation, and air conditioning, 4-48, 4-133, 5-45, 5-138, 6-44, 6-151, 7-40, 7-130</p> <p>Helianthus annuus, 5-20</p> <p>hemlock, 4-14, 4-20</p> <p>hermit thrush, 6-17, 7-16</p> <p>Hesperia comma, 5-19</p> <p>Hesperostipa comata, 5-20</p> <p>High-Energy X-Ray Inspection System; HEXRIS, 8-212, 8-213, 8-214, 8-251</p> <p>Hiawatha National Forest, 6-10, 6-161, 6-162</p> <p>Hidatsa, 5-113</p> <p>High Ross Treaty, 4-45</p> <p>Hines emerald dragonfly, 6-17</p> <p>historic properties, 4-101, 4-102, 4-106, 5-99, 5-100, 6-108, 6-112, 7-94, 7-96, 8-178, 8-301</p> <p>historic, 1-7, 3-2, 3-32, 3-33, 3-44, 3-48, 3-65, 4-6, 4-23, 4-98, 4-99, 4-100, 4-101, 4-102, 4-104, 4-105, 4-106, 4-107, 4-108, 5-6, 5-97, 5-98, 5-99, 5-100, 5-110, 6-6, 6-105, 6-106, 6-107, 6-108, 6-109, 6-110, 6-112, 6-119, 6-120, 6-121, 7-6, 7-90, 7-91, 7-92, 7-93, 7-94, 7-95, 7-96, 7-101, 7-143, 8-3, 8-26, 8-75, 8-97, 8-177, 8-178, 8-181, 8-182, 8-183, 8-184, 8-185, 8-300, 8-301, 9-6</p> <p>Ho-Chunk Nation of Wisconsin, 6-123</p> <p>Hoh Indian Tribe of the Hoh Indian Reservation, 4-109, 4-112</p> <p>hop hornbeam, 5-20, 6-19, 6-20, 7-18,</p> <p>Houlton Band of Maliseet Indians of Maine, 7-106</p> <p>Houlton, 1-14, 2-13</p> <p>Houlton, 7-2, 7-3, 7-35, 7-97, 7-98, 7-106, 7-120, 7-136</p>
---	---

<p>human health and safety, 1-24, 3-52, 3-53, 4-122, 5-125, 6-138, 7-119, 8-186, 8-187, 8-202, 8-218; HH&S, 4-122, 4-125, 4-126, 4-128, 4-129, 5-125, 5-130, 5-131, 5-133, 5-134, 6-138, 6-144, 6-145, 6-146, 6-147, 7-119, 7-122, 7-123, 7-125, 7-126, 8-187, 8-190, 8-192, 8-194, 8-198, 8-202, 8-203, 8-204, 8-205, 8-206, 8-207, 8-208, 8-210, 8-211, 8-212, 8-220, 8-221, 8-222, 8-223, 8-224, 8-225, 8-226, 8-231, 8-302, 8-304</p> <p>humpback whale, 7-17</p> <p>Huron National Forest, 6-10, 8-312</p> <p>Huron Potawatomi, Inc. (Nottawaseppi Huron Band), 6-123</p> <p>Huron-Manistee National Forest, 6-162, 8-279</p> <p>Hypophthalmichthys molitrix, 5-23</p> <p>Ictalurus punctatus, 5-23</p> <p>Idaho fescue, 4-15, 5-20</p> <p>Idaho, 1-1, 3-5, 3-10, 4-1, 4-2, 4-3, 4-4, 4-8, 4-10, 4-15, 4-16, 4-22, 4-30, 4-33, 4-36, 4-37, 4-40, 4-43, 4-56, 4-57, 4-59, 4-60, 4-68, 4-71, 4-73, 4-75, 4-77, 4-79, 4-82, 4-83, 4-85, 4-88, 4-95, 4-98, 4-99, 4-100, 4-101, 4-102, 4-105, 4-111, 4-115, 4-116, 4-117, 4-118, 4-119, 4-121, 4-146, 4-147, 5-20, 5-35, 5-72, 6-33, 6-73, 7-29, 8-4, 8-71, 8-73, 8-119, 8-272, 8-275, 8-276, 8-279, 8-292, 8-306</p> <p>impacts to species, 1-7, 8-292</p> <p>impacts to wildlife, 9-2</p> <p>impacts, 1-1, 1-2, 1-7, 1-18, 1-19, 1-21, 1-23, 2-1, 2-2, 2-3, 2-4, 2-5, 2-7, 2-9, 2-12, 2-18, 2-19, 2-20, 3-1, 3-2, 3-3, 3-4, 3-7, 3-8, 3-9, 3-10, 3-11, 3-13, 3-14, 3-18, 3-19, 3-21, 3-24, 3-27, 3-28, 3-29, 3-30, 3-34, 3-36, 3-38, 3-39, 3-41, 3-42, 3-43, 3-45, 3-46, 3-47, 3-48, 3-49, 3-50, 3-51, 3-57, 3-59, 3-60, 3-62, 3-64, 3-65, 10-2, 4-4, 4-23, 4-45, 4-46, 4-52, 4-57, 4-69, 4-70, 4-71, 4-72, 4-92, 4-115, 4-119, 4-120, 4-121, 5-4, 5-21, 5-22, 5-33, 5-42, 5-47, 5-51, 5-65, 5-67, 5-68, 5-69, 5-70, 5-92, 5-95, 5-117, 5-123, 5-124, 6-4, 6-21, 6-41, 6-46, 6-48, 6-51, 6-66, 6-68, 6-69, 6-71, 6-98, 6-103, 6-131, 6-137, 6-138, 7-4, 7-8, 7-18, 7-36, 7-41, 7-45, 7-60, 7-62, 7-63, 7-65, 7-85, 7-114, 7-118, 7-119, 8-1, 8-2, 8-4, 8-8, 8-11, 8-12, 8-15, 8-16, 8-19, 8-20, 8-22, 8-23, 8-24, 8-25, 8-26, 8-27, 8-28, 8-29, 8-30, 8-31, 8-32, 8-33, 8-34, 8-35, 8-36, 8-37, 8-38, 8-39, 8-40, 8-41, 8-42, 8-43, 8-44, 8-</p>	<p>45, 8-46, 8-47, 8-48, 8-49, 8-51, 8-52, 8-53, 8-54, 8-55, 8-56, 8-57, 8-58, 8-59, 8-62, 8-63, 8-69, 8-70, 8-73, 8-74, 8-76, 8-79, 8-80, 8-88, 8-92, 8-93, 8-96, 8-98, 8-99, 8-100, 8-101, 8-102, 8-103, 8-104, 8-105, 8-106, 8-108, 8-110, 8-111, 8-112, 8-113, 8-114, 8-115, 8-116, 8-117, 8-118, 8-121, 8-124, 8-125, 8-126, 8-128, 8-129, 8-130, 8-131, 8-132, 8-133, 8-134, 8-135, 8-136, 8-137, 8-138, 8-139, 8-141, 8-142, 8-143, 8-144, 8-145, 8-146, 8-147, 8-148, 8-149, 8-150, 8-151, 8-152, 8-153, 8-155, 8-156, 8-157, 8-158, 8-159, 8-160, 8-161, 8-162, 8-163, 8-164, 8-166, 8-167, 8-168, 8-169, 8-174, 8-175, 8-177, 8-178, 8-179, 8-180, 8-181, 8-182, 8-183, 8-184, 8-185, 8-186, 8-189, 8-190, 8-191, 8-192, 8-193, 8-194, 8-195, 8-196, 8-197, 8-198, 8-200, 8-201, 8-202, 8-204, 8-205, 8-206, 8-207, 8-208, 8-209, 8-210, 8-211, 8-212, 8-216, 8-217, 8-218, 8-219, 8-220, 8-221, 8-222, 8-223, 8-224, 8-225, 8-226, 8-227, 8-231, 8-232, 8-233, 8-234, 8-235, 8-236, 8-237, 8-238, 8-239, 8-240, 8-241, 8-244, 8-250, 8-251, 8-253, 8-254, 8-255, 8-256, 8-257, 8-258, 8-259, 8-260, 8-261, 8-262, 8-263, 8-264, 8-265, 8-266, 8-267, 8-268, 8-269, 8-272, 8-273, 8-274, 8-275, 8-276, 8-277, 8-278, 8-279, 8-280, 8-281, 8-282, 8-283, 8-284, 8-286, 8-287, 8-288, 8-290, 8-291, 8-292, 8-293, 8-294, 8-295, 9-1, 9-2, 9-3, 9-4, 9-5, 9-7, 9-8, 9-9, 9-10, 9-11, 9-12, 9-13, 9-14, 9-15, 9-16</p> <p>Indian grass, 5-20</p> <p>Indiana bat, 6-15, 6-16, 7-16</p> <p>Integrated Automated Fingerprint Identification System, 1-14, 8-251; IAFIS, 1-14, 8-251</p> <p>Integrated Border Enforcement Team; IBET, 1-21</p> <p>Intergovernmental Panel on Climate Change; IPCC, 3-28</p> <p>invasive species, 3-12, 5-21, 7-17, 8-22, 8-30, 8-40, 8-41, 8-44, 8-45, 8-46, 9-2, 9-3</p> <p>Iroquois National Wildlife Refuge, 6-163, 8-277</p> <p>Isle Royale National Park, 6-10, 6-13, 6-47, 6-163</p> <p>Isotrea medeoloides, 7-16</p> <p>J. Clark Salyer National Wildlife Refuge, 5-11</p> <p>jack pine, 5-19, 6-19</p>
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<p>Jamestown S'Klallam Tribe of Washington, 4-109</p> <p>juniper, 4-14, 5-20</p> <p>Juniperus communis, 5-20</p> <p>Kabetogama State Forest, 5-11</p> <p>Kabetogama,, 5-23</p> <p>Kalispel Indian Community of the Kalispel Reservation, 4-109, 4-112</p> <p>Kaniksu National Forest, 4-10, 4-147</p> <p>Karner blue butterfly, 7-16</p> <p>Kennebec River Basin, 7-35</p> <p>Kennedy Coulee, 5-11</p> <p>keta, 4-19, 4-22</p> <p>Keweenaw Bay Indian Community, 6-123, 6-125</p> <p>killer whale, 4-15, 4-19</p> <p>Kingdom State Forest, 7-10</p> <p>kisutch, 4-19, 4-22</p> <p>Kootenai National Forest, 4-2, 4-10, 4-148, 8-271, 8-292</p> <p>Kootenai Tribe of Idaho, 4-109, 4-112</p> <p>Kootenai Tribe, 4-42, 4-45, 4-109, 4-112</p> <p>La Verendrye Provincial Park, 5-11</p> <p>Lac Courte Oreilles Band of Lake Superior Chippewa Indians of Wisconsin, 6-123</p> <p>Lac du Flambeau Band of Lake Superior Chippewa Indians, 6-123, 6-126</p> <p>Lac Vieux Desert Band of Lake Superior Chippewa Indians, 6-123, 6-126</p> <p>Lake Champlain, 1-10, 6-99, 7-2, 7-37, 7-90, 7-91, 7-96, 7-121</p> <p>Lake Chelan National Recreation Area, 4-10, 4-143, 4-144</p> <p>Lake Memphremagog, 7-2</p> <p>Lake of the Woods Provincial Park, 5-11</p> <p>Lake of the Woods, 1-12, 5-1, 5-11, 5-23</p> <p>Lake Pend Oreille, 4-22, 4-23</p> <p>lake sturgeon, 5-23, 6-21, 7-19</p> <p>Lake Superior Provincial Park, 6-10</p> <p>Lake Superior, 5-1, 5-2, 5-14, 5-23, 5-27, 5-67, 5-149, 6-10, 6-13, 6-24, 6-68, 6-69, 6-72, 6-93, 6-112, 6-125, 6-161, 6-162, 6-163, 6-165</p> <p>lake trout, 5-23, 6-21, 7-19</p> <p>Lake Umbagog, 7-2, 7-19</p> <p>Lake Winnepesaukee, 7-2, 7-19</p> <p>largemouth bass, 6-21, 7-19</p> <p>Larix laricina, 7-17</p>	<p>lead-based paint, 3-57, 3-58, 4-131, 5-136, 6-149, 7-128; LBP, 3-57, 3-58, 4-131, 5-136, 6-149, 7-128</p> <p>lead, 1-15, 2-2, 2-13, 2-14, 3-5, 3-11, 3-19, 3-58, 4-99, 4-128, 4-129, 4-132, 5-67, 5-97, 5-133, 5-134, 5-137, 6-49, 6-146, 6-147, 6-150, 7-94, 7-125, 7-126, 8-10, 8-15, 8-18, 8-21, 8-28, 8-29, 8-35, 8-39, 8-40, 8-41, 8-45, 8-155, 8-162, 8-219, 8-220, 8-236, 8-241, 8-291, 8-302, 8-303, 8-304, 8-313, 9-14, 9-15</p> <p>leafy spurge, 5-21, 8-30</p> <p>leatherback turtle, 4-17, 8-31, 8-34, 8-52, 9-4</p> <p>Leech Lake Band of Chippewa Indians, 5-111, 5-114</p> <p>Lepus americanus, 7-15</p> <p>level of service, 8-260; LOS, 4-136, 4-137, 4-139, 5-141, 5-142, 5-144, 6-154, 6-155, 6-157, 7-133, 7-134, 7-136, 8-260, 8-261, 8-262, 8-264, 8-265</p> <p>Lewis and Clark National Forest lands, 5-11</p> <p>light pollution, 3-31, 3-39, 4-56, 5-51, 6-50, 7-46</p> <p>light pollution, 8-29, 8-33, 8-40, 8-116, 9-10</p> <p>Linaria vulgaris, 5-21</p> <p>Little Bitterroot, 4-23</p> <p>little bluestem, 5-14, 5-20</p> <p>Little Missouri National Grassland, 5-11, 5-12</p> <p>Little River Band of Ottawa Indians, 6-124</p> <p>Little Traverse Bay Bands of Odawa Indians, 6-124</p> <p>lizards, 4-19</p> <p>Lodgepole pines, 5-21</p> <p>long-eared myotis, 5-18, 8-32</p> <p>Lostwood National Wildlife Refuge, 5-11, 5-149</p> <p>Lostwood Wilderness, 5-11</p> <p>Lower Elwha Tribal Community of the Lower Elwha Reservation, 4-109, 4-112</p> <p>Lower Sioux Indian Community, 5-111</p> <p>Lower Yellowstone River, 5-11</p> <p>Land port of entry; LPOE, 6-157, 6-158, 7-136, 7-137, 8-186, 8-272, 8-273, 9-11</p> <p>Lummi Tribe of the Lummi Reservation, 4-110, 4-111</p> <p>Luxilus cornutus, 5-23, 7-19</p> <p>Lycaeides melissa samuelis, 7-16</p> <p>Lynx rufus, 6-18, 7-16, 8-33</p> <p>machine-readable zone, 1-14</p> <p>magnolia warbler, 7-16</p> <p>Mahoosuc Mountains, 7-10</p>
---	---

Maine, 1-1, 1-2, 1-12, 1-13, 2-13, 3-6, 4-85, 6-2, 6-100, 7-1, 7-2, 7-3, 7-4, 7-8, 7-10, 7-14, 7-15, 7-16, 7-19, 7-25, 7-29, 7-32, 7-33, 7-34, 7-35, 7-36, 7-37, 7-43, 7-45, 7-46, 7-47, 7-48, 7-49, 7-56, 7-57, 7-61, 7-62, 7-63, 7-64, 7-66, 7-69, 7-71, 7-75, 7-78, 7-81, 7-85, 7-86, 7-89, 7-90, 7-91, 7-94, 7-95, 7-96, 7-97, 7-98, 7-99, 7-101, 7-106, 7-107, 7-110, 7-111, 7-112, 7-114, 7-116, 7-129, 7-131, 7-132, 7-141, 7-142, 7-143, 8-58, 8-72, 8-73, 8-119, 8-120, 8-155, 8-156, 8-161, 8-164, 8-275, 8-277, 8-280, 8-292, 8-294, 8-295, 8-297, 8-300, 8-304, 8-306, 8-308, 8-312

major (impacts or activities) , 1-2, 1-9, 2-3, 2-6, 2-9, 2-10, 2-19, 3-1, 3-3, 3-7, 3-9, 3-12, 3-13, 3-15, 3-18, 3-19, 3-21, 3-24, 3-25, 3-28, 3-31, 3-37, 3-38, 3-39, 3-41, 3-42, 3-44, 3-45, 3-46, 3-57, 3-59, 3-60, 3-61, 3-65, 4-6, 4-8, 4-21, 4-22, 4-26, 4-36, 4-46, 4-47, 4-48, 4-52, 4-57, 4-64, 4-70, 4-73, 4-75, 4-81, 4-88, 4-89, 4-90, 4-91, 4-92, 4-93, 4-94, 4-95, 4-107, 4-130, 4-137, 4-140, 5-6, 5-8, 5-33, 5-36, 5-37, 5-42, 5-43, 5-44, 5-47, 5-51, 5-59, 5-66, 5-67, 5-68, 5-71, 5-73, 5-81, 5-88, 5-89, 5-90, 5-91, 5-92, 5-94, 5-108, 5-134, 6-2, 6-4, 6-6, 6-8, 6-20, 6-32, 6-41, 6-42, 6-43, 6-44, 6-51, 6-58, 6-63, 6-67, 6-68, 6-69, 6-73, 6-75, 6-82, 6-90, 6-91, 6-92, 6-93, 6-94, 6-95, 6-96, 6-97, 6-98, 6-101, 6-102, 6-105, 6-107, 6-109, 6-121, 6-145, 6-147, 7-6, 7-34, 7-36, 7-37, 7-38, 7-42, 7-45, 7-53, 7-61, 7-62, 7-63, 7-66, 7-68, 7-76, 7-82, 7-83, 7-84, 7-85, 7-87, 7-105, 7-127, 7-129, 8-10, 8-11, 8-12, 8-16, 8-23, 8-24, 8-25, 8-26, 8-33, 8-34, 8-37, 8-40, 8-42, 8-43, 8-68, 8-80, 8-83, 8-84, 8-85, 8-86, 8-88, 8-89, 8-91, 8-92, 8-104, 8-109, 8-114, 8-117, 8-118, 8-125, 8-126, 8-128, 8-130, 8-134, 8-135, 8-136, 8-141, 8-154, 8-156, 8-158, 8-160, 8-166, 8-167, 8-168, 8-169, 8-178, 8-179, 8-192, 8-194, 8-196, 8-197, 8-198, 8-200, 8-201, 8-202, 8-203, 8-204, 8-205, 8-206, 8-207, 8-209, 8-210, 8-222, 8-226, 8-237, 8-242, 8-244, 8-245, 8-246, 8-247, 8-248, 8-249, 8-250, 8-254, 8-255, 8-256, 8-257, 8-258, 8-261, 8-264, 8-266, 8-268, 8-273, 8-274, 8-277, 8-278, 8-279, 8-282, 8-291, 8-292, 8-294, 8-295, 9-7, 9-10, 9-14

Makah Indian Tribe of the Makah Indian Reservation, 4-110, 4-111

Malmberg Prairie, 5-11

manatee, 4-19, 7-17

Mandan, 5-113

Manitoba, 5-11, 5-41, 5-42, 5-56, 5-57, 5-58, 5-65, 5-66, 5-76, 5-77, 5-79, 5-81, 5-82, 5-84, 5-92, 5-93, 5-94, 5-118, 5-120, 5-122, 5-124, 8-307

maple-beech forests, 5-20, 6-19, 6-20, 7-18

maple, 6-20, 6-100, 7-18, 7-87

marbled murrelet, 4-15, 4-18, 8-52, 9-4

Margariscus margarita, 5-19, 8-32

Marias, 5-22, 5-41

Marine Mammal Protection Act, 3-13, 4-19, 7-17; MMPA, 3-13, 3-14, 4-19, 4-21, 7-17

marine mammals, 3-13, 3-14, 4-19, 7-17

Marmota flaviventris, 5-18

Martes americana, 6-13, 8-39

Martes pennant, 6-18, 7-16, 8-32, 8-44

Martes pennanti, 6-18, 8-32, 8-44

masquinongy, 5-23, 6-21, 7-19

Match-e-be-nash-she-wish Band of Pottawatomi Indians, 6-124

Maumee rivers, 6-21

maximum permissible exposure, 4-127, 4-129, 5-132, 5-134, 6-145, 6-147, 7-124, 7-126, 8-219

Migratory Bird Treaty Act; MBTA, 1-23, 3-13, 3-14

Medicine Lake National Wildlife Refuge, 5-11, 5-148

Medicine Lake Wilderness, 5-11

Megaptera novaeangliae, 7-17

memorandum of understanding, 5-2, 6-2; MOU, 1-22, 3-29, 3-35, 3-36, 4-2, 5-2, 6-2, 8-122

Menominee Indian Tribe of Wisconsin, 6-123

Mephitis, 6-18, 7-16

Merrimack River, 7-36

Michigan, 1-1, 1-14, 3-5, 5-16, 5-94, 6-1, 6-2, 6-3, 6-4, 6-8, 6-10, 6-11, 6-15, 6-16, 6-17, 6-20, 6-21, 6-31, 6-33, 6-35, 6-37, 6-38, 6-39, 6-41, 6-46, 6-47, 6-50, 6-52, 6-53, 6-54, 6-55, 6-60, 6-62, 6-65, 6-68, 6-69, 6-70, 6-71, 6-75, 6-76, 6-77, 6-80, 6-81, 6-82, 6-83, 6-84, 6-85, 6-87, 6-93, 6-94, 6-95, 6-99, 6-100, 6-103, 6-104, 6-105, 6-107, 6-108, 6-111, 6-112, 6-119, 6-120, 6-123, 6-125, 6-129, 6-130, 6-131, 6-132, 6-133, 6-134, 6-135, 6-136, 6-161, 6-162, 6-165, 8-29, 8-32, 8-39, 8-52, 8-71, 8-73, 8-120, 8-154, 8-156, 8-

161, 8-163, 8-275, 8-276, 8-279, 8-292, 8-294, 8-297, 8-306, 8-308, 8-312, 9-4
 Michipicoten Island Provincial Park, 6-10
 Micropterus dolomieu, 5-23, 6-21, 7-19
 migration patterns, 8-29; migration, 3-13, 4-80, 5-22, 5-76, 6-78, 6-110, 7-71, 8-28, 8-29, 8-32, 8-38, 8-39, 8-43, 8-45, 8-46, 8-49, 8-53, 8-271, 8-292
 Milk River Natural Area, 5-11
 Milk Rivers, 4-45, 5-43, 6-42, 7-38
 Mille Lacs Band of Ojibwe, 5-111
 Minnesota Chippewa Tribe, 5-111
 Minnesota, 1-1, 1-12, 3-5, 5-1, 5-2, 5-3, 5-4, 5-8, 5-10, 5-11, 5-12, 5-14, 5-16, 5-22, 5-23, 5-24, 5-35, 5-38, 5-39, 5-42, 5-48, 5-51, 5-52, 5-53, 5-54, 5-55, 5-61, 5-63, 5-67, 5-68, 5-70, 5-74, 5-76, 5-79, 5-80, 5-83, 5-86, 5-93, 5-94, 5-96, 5-98, 5-99, 5-100, 5-102, 5-111, 5-113, 5-117, 5-118, 5-119, 5-121, 5-123, 5-129, 5-149, 6-33, 6-99, 6-105, 8-39, 8-71, 8-72, 8-73, 8-119, 8-161, 8-275, 8-276, 8-279, 8-280, 8-292, 8-297, 8-299, 8-303, 8-306, 8-307, 8-308; MN, 5-88, 5-100, 5-101, 5-101, 5-102, 5-102, 5-144, 6-157
 Mirror Pool Wildlife Management Area, 5-11
 Missisquoi National Wildlife Refuge, 7-10
 Mississippian Aquifers, 6-38
 Missouri Coteau, 5-11
 mitigation, 2-19, 3-1, 3-13, 3-60
 mitigation, 8-19, 8-20, 8-24, 8-27, 8-33, 8-34, 8-42, 8-43, 8-45, 8-48, 8-56, 8-63, 8-64, 8-65, 8-66, 8-68, 8-69, 8-70, 8-71, 8-73, 8-74, 8-79, 8-93, 8-96, 8-97, 8-101, 8-102, 8-103, 8-104, 8-117, 8-121, 8-124, 8-138, 8-139, 8-142, 8-163, 8-169, 8-177, 8-185, 8-186, 8-190, 8-211, 8-216, 8-226, 8-231, 8-232, 8-234, 8-236, 8-237, 8-240, 8-250, 8-268, 8-273, 8-277, 8-280, 8-281, 8-287, 8-290, 9-1, 9-2, 9-3, 9-4, 9-7, 9-10, 9-11, 9-12, 9-13, 9-14, 10-2; mitigations, 1-1, 2-1, 3-13, 3-20, 4-117, 5-120, 6-134, 7-116, 8-63, 8-64, 8-65, 8-66, 8-68, 8-69, 8-74, 8-223, 8-227, 8-290, 9-14
 mobile surveillance system, 2-7, 3-16, 4-49, 5-46, 6-45, 7-40, 8-42
 moderate (impacts), 3-1, 3-3, 3-6, 3-7, 3-9, 3-21, 3-41, 3-45, 3-59, 3-60, 4-68, 4-107, 5-15, 5-63, 5-108, 6-23, 6-62, 6-121, 7-58, 7-105, 8-5, 8-22, 8-25, 8-29, 8-31, 8-32, 8-33, 8-34, 8-38, 8-39, 8-42, 8-43, 8-45, 8-48, 8-51, 8-

52, 8-53, 8-54, 8-55, 8-56, 8-57, 8-58, 8-66, 8-68, 8-71, 8-80, 8-81, 8-91, 8-92, 8-99, 8-101, 8-103, 8-108, 8-110, 8-112, 8-114, 8-115, 8-116, 8-117, 8-126, 8-133, 8-134, 8-136, 8-142, 8-155, 8-157, 8-158, 8-159, 8-160, 8-161, 8-162, 8-168, 8-189, 8-190, 8-191, 8-192, 8-193, 8-194, 8-195, 8-196, 8-197, 8-198, 8-206, 8-207, 8-208, 8-209, 8-210, 8-211, 8-247, 8-253, 8-254, 8-255, 8-257, 8-258, 8-260, 8-263, 8-264, 8-265, 8-266, 8-267, 8-268, 8-275, 8-278, 8-279, 8-281, 8-291, 8-294, 8-295
 modernization, 1-11, 2-5, 2-6, 2-9, 2-17, 3-59, 4-125, 5-129, 6-142, 7-124, 8-25, 8-48, 8-68, 8-99, 8-100, 8-109, 8-121, 8-125, 8-126, 8-132, 8-134, 8-135, 8-137, 8-149, 8-157, 8-175, 8-178, 8-180, 8-182, 8-185, 8-216, 8-231, 8-232, 8-234, 8-237, 8-256, 8-279, 8-280, 8-290, 8-294, 9-12
 monitoring, 5-15, 6-16, 8-23, 8-26, 8-27, 8-36, 8-42, 8-58, 8-74, 8-104, 8-115, 8-117, 8-136, 8-159, 8-161, 8-184, 8-210, 8-224, 8-230, 8-235, 8-238, 8-265, 8-286, 9-1, 9-12, 9-13
 Montana, 1-1, 3-5, 3-10, 10-2
 Montana, 4-1, 4-2, 4-3, 4-4, 4-8, 4-10, 4-16, 4-17, 4-19, 4-21, 4-22, 4-24, 4-30, 4-33, 4-36, 4-37, 4-40, 4-41, 4-42, 4-43, 4-45, 4-52, 4-56, 4-57, 4-58, 4-59, 4-60, 4-66, 4-67, 4-68, 4-73, 4-75, 4-77, 4-79, 4-82, 4-83, 4-85, 4-88, 4-95, 4-98, 4-99, 4-100, 4-103, 4-104, 4-111, 4-115, 4-116, 4-117, 4-118, 4-119, 4-120, 4-121, 4-148, 5-1, 5-2, 5-3, 5-4, 5-8, 5-10, 5-11, 5-12, 5-16, 5-17, 5-19, 5-21, 5-22, 5-23, 5-24, 5-30, 5-32, 5-35, 5-38, 5-39, 5-40, 5-41, 5-48, 5-50, 5-51, 5-52, 5-53, 5-54, 5-55, 5-61, 5-62, 5-63, 5-69, 5-70, 5-72, 5-74, 5-76, 5-79, 5-80, 5-83, 5-86, 5-91, 5-92, 5-97, 5-98, 5-99, 5-100, 5-107, 5-110, 5-113, 5-117, 5-118, 5-119, 5-121, 5-123, 5-137, 5-139, 5-148, 5-149, 6-73, 8-4, 8-39, 8-71, 8-73, 8-119, 8-120, 8-154, 8-271, 8-272, 8-275, 8-276, 8-279, 8-280, 8-293, 8-294, 8-295, 8-296, 8-297, 8-306, 8-307, 8-308
 Montezuma National Wildlife Refuge, 6-164, 8-273
 moose, 4-19, 4-97, 5-95, 6-18, 6-101, 7-16, 7-88, 8-33, 8-35
 Moosehorn National Wildlife Refuge, 7-141, 7-142, 8-276, 8-277

<p>Mosquito Creek Wetland Area, 6-10 Mount Baker National Recreation Area, 4-10 Mount Baker Wilderness, 4-10 mountain bluebird, 4-19 mountain goat, 4-19 mountain lion, 4-19, 8-35, 8-37 movement of wildlife, 3-13 Moyie River, 4-1, 4-22 mpacts, 10-2 Muckleshoot Indian Tribe of the Muckleshoot Reservation, 4-110, 4-111 Muckleshoot Indian Tribe, 4-110, 4-111 mule deer, 4-19, 5-18, 7-16, 8-29, 8-40 Mullet, 5-23 munitions and explosives of concern, 3-55; MEC, 3-55 munitions constituents, 3-54, 3-55; MC, 3-55 muskellunge, 5-23 muskellunge, 6-21, 7-19 Mustela nigripes, 5-17, 8-52, 9-4 Myotis evotis, 5-18, 8-32 Myotis sodalis, 6-15, 7-16 NAAQS, 3-4, 3-6, 3-10, 4-5, 5-5, 6-5, 7-5, 8-5, 8-9, 8-11, 8-22, 8-291 namaycush, 5-23, 6-21, 7-19 NAS, 4-124, 5-128, 6-140, 6-141, 7-121 NASA Plum Brook Station, 6-11 Nash Stream Forest, 7-10 National Environmental Policy Act, 1-1, 1-2, 2-1, 3-1, 10-i, 10-1, 10-2, 4-47, 5-44, 6-43, 7-39, 8-4, 9-1; NEPA, 1-1, 1-2, 1-3, 1-12, 1- 13, 1-22, 1-24, 1-25, 2-1, 2-2, 2-3, 2-8, 2-9, 2-13, 2-14, 3-1, 3-6, 3-8, 3-25, 3-28, 3-35, 3- 49, 3-62, 3-63, 3-65, 4-47, 5-44, 6-43, 7-39, 8-4, 8-6, 8-9, 8-10, 8-11, 8-12, 8-13, 8-16, 8- 17, 8-18, 8-21, 8-25, 8-26, 8-38, 8-48, 8-50, 8-88, 8-89, 8-90, 8-91, 8-93, 8-94, 8-97, 8- 98, 8-99, 8-100, 8-112, 8-134, 8-260, 8-261, 8-262, 8-264, 8-265, 8-290, 8-310, 8-311, 9- 1, 9-8, 10-i, 10-1, 10-2 national forest, 1-7, 3-64, 3-65, 3-66, 3-68, 4- 2, 4-10, 4-66, 4-71, 4-93, 4-96, 4-123, 4-135, 4-141, 4-143, 4-146, 4-147, 5-2, 5-10, 5-61, 5-126, 5-140, 5-146, 5-148, 6-2, 6-10, 6-60, 6-139, 6-153, 6-159, 6-161, 6-163, 6-165, 7- 2, 7-10, 7-56, 7-120, 7-139, 7-141, 8-269, 8- 280, 8-290, 8-311, 8-313 National Historic Preservation Act, 1-23, 3-35, 5-96, 8-177, 8-301, 9-12; NHPA, 1-23, 8- 177, 8-180, 9-12</p>	<p>National Marine Fisheries Service, 3-12; NMFS, 3-12; NOAA, 3-36 National Park Service, 1-11, 3-11, 4-42, 4-143, 5-7, 5-48, 5-143, 6-7, 6-47, 7-7, 7-43, 8-73, 10-3; NPS, 1-11, 1-26, 3-11, 3-15, 3-17, 3- 26, 3-32, 3-33, 3-34, 3-39, 3-41, 3-65, 4-42, 4-51, 4-58, 4-66, 4-138, 5-7, 5-48, 5-53, 5- 61, 5-143, 6-7, 6-47, 6-53, 6-60, 6-69, 6-156, 6-163, 7-7, 7-43, 7-48, 7-56, 7-63, 7-92, 7- 135, 8-73, 8-140 national park, 3-4, 3-15, 3-25, 3-26, 3-32, 3- 64, 3-65, 3-66, 3-68, 4-2, 4-6, 4-10, 4-47, 4- 51, 4-58, 4-66, 4-70, 4-123, 4-135, 4-138, 4- 141, 4-143, 5-6, 5-10, 5-44, 5-48, 5-53, 5-57, 5-61, 5-66, 5-98, 5-126, 5-140, 5-143, 5- 146, 6-6, 6-10, 6-43, 6-47, 6-60, 6-64, 6-93, 6-139, 6-153, 6-156, 6-159, 6-161, 7-2, 7-6, 7-10, 7-39, 7-43, 7-56, 7-60, 7-120, 7-132, 7-135, 7-139, 7-141, 8-26, 8-60, 8-86, 8-91, 8-93, 8-100, 8-142, 8-144, 8-269, 8-271, 8- 273, 8-280, 9-10 national recreation area, 3-32, 3-64, 4-58, 4- 141, 4-143, 5-146, 6-159, 6-161, 7-139, 7- 141, 8-269; NRA, 3-64, 4-141, 4-144, 4-145, 4-146, 5-146, 5-148, 6-159, 7-139, 8-269, 8- 281 National Register, 3-48, 4-101, 4-102, 4-103, 4-104, 4-105, 4-106, 4-107, 4-108, 5-97, 5- 98, 5-99, 5-100, 5-103, 5-104, 5-105, 5-107, 5-108, 5-109, 5-110, 6-108, 6-110, 6-112, 6- 113, 6-114, 6-115, 6-116, 6-117, 6-118, 6- 119, 6-120, 6-121, 6-122, 7-94, 7-96, 7-97, 7-98, 7-99, 7-100, 7-101, 7-102, 7-103, 7- 104, 8-177 National Telecommunications and Information Administration, 1-13, 8-219; NTIA, 1-13, 1-14, 8-219 national wildlife refuge, 3-64, 3-66, 4-141, 4- 143, 5-98, 5-146, 6-159, 6-161, 7-2, 7-139, 7-141, 8-269 Native American lands, 7-2 Native Americans, 3-49, 3-50, 4-100, 4-108, 5-98, 5-110, 6-106, 6-122, 7-90, 7-91, 7-93, 7-105 Natural Resources Conservation Service, 3- 19; NRCS, 3-19 New Hampshire, 1-2, 1-14, 3-6, 6-100, 7-1, 7- 2, 7-3, 7-8, 7-10, 7-11, 7-13, 7-14, 7-15, 7- 16, 7-19, 7-32, 7-33, 7-34, 7-36, 7-37, 7-46, 7-47, 7-49, 7-56, 7-57, 7-63, 7-66, 7-69, 7-</p>
--	--

71, 7-74, 7-75, 7-78, 7-81, 7-85, 7-86, 7-89, 7-90, 7-92, 7-93, 7-94, 7-95, 7-96, 7-102, 7-106, 7-107, 7-110, 7-111, 7-112, 7-114, 7-115, 7-117, 7-141, 8-62, 8-72, 8-73, 8-119, 8-275, 8-277, 8-280, 8-292, 8-294, 8-304, 8-306, 8-308, 8-312
 new source review, 3-10
 new source review, 8-11, 8-12
 Newfoundland Lake, 7-2, 7-19
 NEXUS, 6-96, 8-105
 Neys Provincial Park, 6-11
 Niagara River, 6-3, 6-41, 6-96, 6-113
 night sky, 3-39, 8-146, 9-11
 Nisqually Indian Tribe of the Nisqually Reservation, 4-110, 4-112
 non-native coho, 6-21; non-native, 4-21, 5-21, 6-21, 6-68, 8-35, 8-41, 8-44, 8-49, 8-51, 9-2, 9-3
 nonintrusive inspection, 3-10, 3-52, 8-4, 8-86; NII, 1-14, 2-6, 2-7, 2-9, 2-11, 2-13, 2-15, 3-52, 3-63, 8-4, 8-23, 8-24, 8-54, 8-55, 8-56, 8-68, 8-83, 8-84, 8-86, 8-101, 8-102, 8-106, 8-107, 8-109, 8-111, 8-114, 8-115, 8-116, 8-126, 8-127, 8-128, 8-147, 8-148, 8-149, 8-152, 8-169, 8-171, 8-172, 8-174, 8-175, 8-176, 8-205, 8-212, 8-214, 8-218, 8-222, 8-225, 8-227, 8-228, 8-229, 8-234, 8-242, 8-243, 8-244, 8-247, 8-251, 8-254, 8-255, 8-257, 8-258, 8-260, 8-266, 8-267, 8-268, 8-270, 8-280, 8-281, 8-282, 8-284, 8-287, 8-288, 8-289
 Nooksack Indian Tribe of Washington, 4-110, 4-112
 North Cascades National Park, 4-10, 4-52, 4-73, 4-143, 4-144, 8-292
 North Fork Crow, 5-22
 Northern Montana prairies, 5-11
 northern pike, 5-23, 6-21, 7-19
 northern pintail, 5-18
 northern prairie skink, 5-19, 8-32
 northern redbelly snake, 5-19, 8-32
 northern spotted owl, 4-15, 4-18, 8-39
 Notice of Availability; NOA, 1-25
 Notice of Intent, 8-48; NOI, 1-24, 1-25, 8-48
 Notophthalmus viridescens, 6-18, 7-16
 National Pollutant Discharge Elimination System ; NPDES, 1-23, 8-62, 8-65, 9-5
 oak-hickory forests, 5-20, 6-19
 oak-hickory, 5-20, 6-19, 6-20, 7-18

Occupational Safety and Health
 Administration, 3-53, 4-122, 5-125, 6-138, 7-119, 8-204; OSHA, 3-53, 4-122, 4-126, 4-127, 4-128, 4-129, 5-125, 5-131, 5-132, 5-133, 5-134, 6-138, 6-144, 6-145, 6-146, 6-147, 7-119, 7-123, 7-124, 7-125, 7-126, 8-204, 8-213, 8-218, 8-220, 8-221, 8-223, 8-224, 8-302
 Odocoileus virginianus, 6-18, 8-33, 8-35
 off-highway vehicle, 4-143, 4-146, 4-147, 6-161, 8-274; OHV, 6-161, 6-162, 6-163, 6-165, 8-274; OHVs, 8-258
 off-road vehicle, 3-10, 3-26, 3-67, 4-49, 5-46, 6-45, 6-164, 7-2, 7-41, 8-141, 8-266, 8-290, 9-16; ORV, 3-61, 4-49, 5-46, 6-45, 7-41, 8-34, 8-35, 8-45; ORVs, 4-48, 5-44, 6-43, 7-38, 8-31, 8-32
 Office of Administration, 3-29
 Office of Air and Marine, 1-4, 2-1, 3-16, 3-61, 4-3, 4-103, 4-107, 5-2, 5-105, 5-109, 6-2, 6-95, 6-116, 6-121, 7-3, 7-100, 7-104, 8-34; OAM, 1-4, 1-10, 1-11, 1-13, 1-14, 1-15, 1-20, 2-1, 2-4, 2-6, 2-11, 3-16, 3-24, 3-27, 3-38, 3-48, 3-52, 3-61, 3-63, 4-3, 4-103, 4-106, 4-107, 4-124, 5-2, 5-105, 5-107, 5-109, 5-128, 5-129, 5-137, 6-2, 6-115, 6-116, 6-121, 6-140, 6-141, 7-3, 7-98, 7-100, 7-104, 7-121, 8-34, 8-38, 8-106, 8-137, 8-140, 8-177, 8-181, 8-182, 8-183, 8-184, 8-187, 8-205, 8-209, 8-211, 8-222, 8-225, 8-231, 8-238, 8-247, 8-248, 8-252, 8-255, 8-263, 8-264, 8-269, 8-279
 Office of Field Operations, 1-4, 2-1, 4-3, 4-103, 4-105, 4-107, 5-2, 5-102, 5-105, 5-109, 6-3, 6-95, 6-116, 6-121, 6-122, 7-3, 7-100, 7-104, 8-42, 8-62; OFO, 1-4, 1-8, 1-20, 1-24, 2-1, 2-4, 4-3, 4-103, 4-105, 4-106, 4-107, 5-2, 5-3, 5-100, 5-101, 5-102, 5-103, 5-104, 5-105, 5-107, 5-108, 5-109, 6-3, 6-112, 6-113, 6-114, 6-115, 6-116, 6-119, 6-120, 6-121, 6-122, 7-3, 7-97, 7-98, 7-99, 7-100, 7-102, 7-103, 7-104, 8-42, 8-62, 8-231, 8-238, 8-309
 Office of Information Technology, 1-4, 8-42; OIT, 1-4, 8-42
 Office of Technology, Innovation, and Acquisition; OTIA, 1-4, 1-14, 2-12, 8-42
 Ogallala Aquifer, 4-40, 5-38, 6-38, 7-32
 Ohio, 1-1, 3-5, 5-16, 5-94, 6-1, 6-2, 6-3, 6-4, 6-8, 6-10, 6-15, 6-16, 6-21, 6-33, 6-35, 6-37, 6-38, 6-46, 6-47, 6-49, 6-50, 6-52, 6-53, 6-54,

<p>6-55, 6-62, 6-66, 6-67, 6-71, 6-75, 6-77, 6-81, 6-82, 6-84, 6-87, 6-88, 6-95, 6-99, 6-103, 6-105, 6-106, 6-107, 6-110, 6-111, 6-125, 6-129, 6-130, 6-131, 6-132, 6-134, 6-136, 6-164, 8-39, 8-53, 8-71, 8-73, 8-119, 8-120, 8-275, 8-276, 8-280, 8-292, 8-294, 8-295, 8-297, 8-304, 8-306, 8-308, 8-312; OH, 6-91, 6-155</p> <p>Okanogan National Forest, 4-11, 4-147</p> <p>Olympic Mountains, 4-20, 4-26</p> <p>Olympic National Forest, 4-11</p> <p>Olympic National Park, 4-11, 4-52, 4-59, 4-93, 4-145, 8-120, 8-154, 8-311</p> <p>Oncorhynchus kisutch, 6-21</p> <p>Oneida Indian Nation of New York, 6-123, 6-125</p> <p>Oneida Indian Nation, 6-123, 6-125</p> <p>Oneida Tribe of Indians of Wisconsin, 6-123</p> <p>Onondaga Nation of New York, 6-123, 6-125</p> <p>Ontario, 5-11, 5-12, 5-42, 5-93, 5-94, 6-2, 6-3, 6-10, 6-11, 6-16, 6-20, 6-56, 6-57, 6-64, 6-78, 6-79, 6-80, 6-82, 6-83, 6-84, 6-85, 6-93, 6-94, 6-95, 6-96, 6-97, 6-98, 6-99, 6-100, 6-109, 6-116, 6-130, 6-132, 6-133, 6-134, 6-135, 6-136, 6-137, 6-163, 6-164</p> <p>Ontario, 8-32, 8-52, 8-156, 8-164, 8-308</p> <p>Ontario, 9-4</p> <p>Operational Integration Centers; OIC, 3-16, 3-23, 3-27, 3-38, 3-61</p> <p>Opheodrys vernalis, 5-19</p> <p>Orcas, 4-19, 4-21</p> <p>Orcinus orca, 4-15, 4-19</p> <p>Orconectes rusticus, 5-23</p> <p>Oregon ash, 4-21</p> <p>Oregon white oak, 4-14, 4-21</p> <p>Osoyoos, 4-23</p> <p>operational sustainability performance plan, 3-29; OSPP, 3-29, 3-30</p> <p>Ossipee Lake, 7-2, 7-19</p> <p>Ostrya virginiana, 5-20, 6-19, 6-20, 7-18</p> <p>Ottawa National Forest, 6-11, 6-162, 6-163, 8-280</p> <p>Ottawa National Wildlife Refuge, 6-11, 6-164</p> <p>Outpost Wetlands Natural Area and Police Outpost Provincial Park, 5-11</p> <p>overflight, 8-82</p> <p>ozone, 3-5, 3-10, 8-10, 8-15, 8-18, 8-21; O3, 3-5, 3-6, 3-7, 5-4, 6-4, 8-6</p> <p>Pacific Lowland Mixed Forest Province, 4-20</p> <p>Pacific madrone, 4-21</p>	<p>Pacific silver fir, 4-20</p> <p>Paleontological Resources Preservation Act, 8-177, 9-12; PRPA, 8-177, 8-180, 9-12</p> <p>Panicum virgatum, 5-20</p> <p>particulate matter, 3-4, 4-4, 4-5, 5-4, 6-4, 7-4, 8-136</p> <p>partnership, 1-19, 2-17, 8-113, 8-253;</p> <p>partnerships, 1-18, 2-3, 2-17, 4-2, 5-2, 6-2, 7-2, 8-66, 8-71, 8-113, 8-174, 8-250, 8-265, 9-6, 9-16</p> <p>Pasayten Wilderness, 4-2, 4-11, 4-58, 4-147</p> <p>Passamaquoddy Tribe of Maine, 7-106</p> <p>Passumpsic rivers, 7-19</p> <p>Peace Bridge, 6-96, 6-113, 6-116</p> <p>pearl dace, 5-19, 8-32</p> <p>Pedicularis furbishiae, 7-16</p> <p>Pembina Gorge, 5-12</p> <p>Pembina Trail Preserve, 5-12</p> <p>Pembina, 5-2, 5-3, 5-12, 5-22, 5-88, 5-93, 5-102, 5-104, 8-163</p> <p>Pend Oreille River, 4-1, 4-22</p> <p>Pennsylvania, 1-1, 1-25, 3-5, 5-16, 5-94, 6-1, 6-3, 6-4, 6-8, 6-10, 6-15, 6-16, 6-28, 6-33, 6-35, 6-37, 6-38, 6-39, 6-47, 6-50, 6-52, 6-54, 6-55, 6-62, 6-67, 6-68, 6-75, 6-78, 6-81, 6-82, 6-83, 6-84, 6-87, 6-88, 6-96, 6-99, 6-102, 6-105, 6-106, 6-107, 6-109, 6-110, 6-112, 6-116, 6-125, 6-129, 6-130, 6-131, 6-132, 6-134, 6-136, 6-150, 6-164, 7-93, 8-71, 8-73, 8-275, 8-276, 8-280, 8-306, 8-308; PA, 6-1, 6-91, 6-116, 6-155, 10-1</p> <p>Pennsylvanian Aquifers, 6-38</p> <p>Penobscot River Basin, 7-35</p> <p>Penobscot Tribe of Maine, 7-106</p> <p>Perca flavescens, 5-23, 6-21, 7-19</p> <p>Perisoreus canadensis, 6-17, 7-16</p> <p>personal radiation detector, 1-14, 2-11, 8-251</p> <p>Petromyzon marinus, 5-23</p> <p>Pheucticus ludovicianus, 6-17, 7-16</p> <p>Phoca groenlandica, 7-17</p> <p>Phoca vitulina, 7-17</p> <p>physical barriers, 2-6, 3-15, 3-21, 3-23, 3-27, 3-61, 3-68, 8-28, 8-43, 8-117, 8-124, 8-132, 8-164, 8-171, 8-195, 8-196, 8-197, 8-198, 8-231, 8-246, 8-284, 9-13</p> <p>Picea glauca, 6-19, 7-17, 7-18</p> <p>Picea mariana, 5-19, 7-17</p> <p>Picea rubens, 6-19, 7-18</p> <p>Pickrel Creek Wildlife Area, 6-11</p> <p>Picoides arcticus, 6-17, 7-16, 8-29</p>
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<p>Pictured Rocks National Lakeshore, 6-11, 6-47, 6-70</p> <p>Pigeon River Provincial Park, 5-12</p> <p>Pine Butte Swamp Preserve, 5-12</p> <p>pink salmon, 4-22</p> <p>pinnipeds, 4-19, 7-17</p> <p>Pinus contorta, 5-21</p> <p>Pinus resinosa, 5-19</p> <p>Pinus strobus, 5-19, 6-19, 7-17</p> <p>piping plover, 5-16, 6-15, 6-16, 7-15, 8-32, 8-52, 9-4</p> <p>Plantanthera leucopheaea, 7-16</p> <p>Plethedon cinereus, 6-18, 7-16, 7-17</p> <p>Pleuraphis jamesii, 5-20</p> <p>polar bear, 4-19, 7-17</p> <p>polychlorinated biphenyls, 3-57, 4-131, 5-136, 6-41, 6-149, 7-128; PCBs, 3-57, 4-131, 5-136, 6-41, 6-149, 7-128</p> <p>ponderosa pine, 4-13, 4-14, 4-20, 5-14, 5-20, 6-13; ponderosa pines, 4-13, 6-13</p> <p>Populus, 4-20, 5-20</p> <p>Porcupine Mountains State Park, 6-11</p> <p>porcupine, 4-19</p> <p>Port Gamble Indian Community of the Port Gamble Reservation, 4-109, 4-112</p> <p>port of entry, 4-3, 5-108, 6-3, 9-3; ports of entry, 1-3, 1-8, 2-4, 2-6, 3-3, 5-3, 6-41, 6-153, 7-3, 7-132, 8-1, 8-28; POE, 1-13, 2-4, 2-6, 2-7, 2-8, 2-9, 2-10, 3-47, 4-3, 4-66, 4-89, 4-90, 4-91, 4-93, 4-94, 4-95, 4-96, 4-103, 4-105, 4-106, 4-107, 4-122, 4-139, 5-61, 5-87, 5-91, 5-92, 5-93, 5-94, 5-100, 5-101, 5-102, 5-103, 5-104, 5-105, 5-107, 5-108, 5-109, 5-144, 5-145, 6-3, 6-45, 6-60, 6-72, 6-88, 6-93, 6-94, 6-95, 6-96, 6-97, 6-98, 6-99, 6-100, 6-112, 6-113, 6-114, 6-115, 6-116, 6-119, 6-120, 6-121, 6-122, 6-151, 7-3, 7-66, 7-68, 7-83, 7-85, 7-86, 7-87, 7-97, 7-98, 7-99, 7-100, 7-102, 7-103, 7-104, 7-129, 7-130, 8-18, 8-37, 8-50, 8-53, 8-62, 8-70, 8-88, 8-89, 8-90, 8-98, 8-99, 8-100, 8-105, 8-106, 8-107, 8-117, 8-121, 8-130, 8-131, 8-133, 8-134, 8-137, 8-145, 8-147, 8-151, 8-155, 8-156, 8-158, 8-161, 8-163, 8-164, 8-165, 8-167, 8-213, 8-233, 8-248, 8-249, 8-250, 8-259, 8-262, 8-265, 8-272, 8-273, 8-297, 8-299, 8-309, 9-3, 9-7; POEs, 1-3, 1-4, 1-5, 1-6, 1-8, 1-9, 1-12, 1-13, 1-14, 1-15, 1-21, 1-24, 2-4, 2-6, 2-7, 2-8, 2-9, 2-10, 2-13, 2-15, 3-3, 3-15, 3-16, 3-21, 3-23, 3-27, 3-37, 3-38, 3-39, 3-</p>	<p>41, 3-46, 3-47, 3-48, 3-52, 3-61, 3-62, 3-63, 4-3, 4-44, 4-49, 4-74, 4-76, 4-77, 4-89, 4-92, 4-93, 4-95, 4-122, 4-132, 4-133, 4-134, 4-135, 4-138, 4-139, 4-140, 5-3, 5-42, 5-46, 5-69, 5-70, 5-71, 5-73, 5-74, 5-87, 5-90, 5-91, 5-92, 5-93, 5-94, 5-125, 5-137, 5-138, 5-139, 5-140, 5-143, 5-144, 5-145, 6-3, 6-41, 6-45, 6-70, 6-71, 6-72, 6-74, 6-76, 6-88, 6-93, 6-94, 6-95, 6-100, 6-138, 6-150, 6-151, 6-152, 7-3, 7-37, 7-41, 7-64, 7-65, 7-66, 7-68, 7-69, 7-82, 7-84, 7-86, 7-119, 7-129, 7-130, 7-131, 8-1, 8-4, 8-31, 8-37, 8-38, 8-50, 8-59, 8-70, 8-76, 8-78, 8-86, 8-87, 8-88, 8-89, 8-90, 8-98, 8-104, 8-105, 8-107, 8-108, 8-117, 8-121, 8-122, 8-130, 8-131, 8-134, 8-137, 8-143, 8-146, 8-147, 8-150, 8-158, 8-160, 8-161, 8-162, 8-163, 8-164, 8-165, 8-167, 8-169, 8-170, 8-173, 8-177, 8-179, 8-181, 8-182, 8-183, 8-184, 8-190, 8-193, 8-195, 8-200, 8-202, 8-203, 8-205, 8-212, 8-216, 8-220, 8-221, 8-224, 8-228, 8-230, 8-231, 8-232, 8-237, 8-243, 8-247, 8-248, 8-249, 8-250, 8-251, 8-252, 8-255, 8-257, 8-259, 8-264, 8-270, 8-272, 8-277, 8-280, 8-281, 8-284, 8-288, 8-293, 8-295, 8-297, 8-299, 8-305, 8-310, 9-11, 9-12</p> <p>potential to emit, 3-8, 3-9, 8-12</p> <p>Prairie Island Indian Community in the State of Minnesota, 5-111</p> <p>prairie rose, 5-20</p> <p>preferred alternative, 8-73</p> <p>Presque Isle, 6-67, 6-116, 7-35</p> <p>Presumpscot River Basin, 7-36</p> <p>prevention of significant deterioration, 3-10, 8-11; PSD, 3-8, 3-9, 4-6, 5-6, 6-6, 7-6, 8-11, 8-12, 8-13, 8-19</p> <p>Priest River, 4-147</p> <p>privately owned vehicle, 5-94, 6-94, 7-85, 7-86; privately owned vehicles, 5-91, 6-91, 7-83; POV, 6-97, 6-98; POVs, 5-91, 6-91, 6-93, 6-94</p> <p>proposal, 1-1, 1-2, 2-1, 2-2, 3-12, 3-15, 3-20, 3-23, 3-26, 3-37, 8-26, 8-27, 8-41, 8-43, 8-46, 8-303, 8-310</p> <p>proposed action, 1-1, 1-2, 1-19, 1-20, 1-22, 1-23, 1-24, 2-1, 2-2, 2-4, 2-5, 2-8, 2-16, 3-1, 3-3, 3-9, 3-10, 3-30, 3-32, 3-42, 3-45, 3-50, 3-52, 3-63, 4-4, 4-75, 5-4, 5-71, 6-4, 6-72, 7-4, 7-66, 8-1, 8-26, 8-47, 8-51, 8-53, 8-65, 8-80, 8-111, 8-125, 8-139, 8-146, 8-177, 8-187, 8-</p>
--	--

- 189, 8-196, 8-198, 8-225, 8-240, 8-285, 9-1, 9-2, 9-5, 9-13, 9-14
- proposed alternative, 3-4, 3-25, 8-4, 8-22, 8-25, 8-26, 8-86, 8-107, 8-196, 8-254, 8-291
- Prunus virginiana*, 5-20
- Pseudoroegneria spicata*, 5-20
- public involvement, 1-1, 1-22, 1-24, 3-8;
public meetings, 1-25, 1-26
- Public Lands Liaison Agent; PLLA, 1-6, 2-3
- Puget Sound, 4-19, 4-21, 4-24, 4-43, 8-30, 8-46
- Pukaskwa National Park, 6-11
- purple fritillary, 7-13
- Puyallup Tribe of the Puyallup Reservation, 4-109, 4-112
- Pyganodon grandis*, 5-19
- quagga mussels, 5-23
- Quileute Tribe of the Quileute Reservation, 4-109, 4-111
- Quinault Reservation, 4-66
- Quinault Tribe of the Quinault Reservation, 4-109, 4-111
- radio frequency, 1-14, 4-126, 4-139, 5-132, 5-144, 6-145, 6-158, 7-123, 7-137, 8-27, 8-37, 8-219; RF, 4-126, 4-127, 4-128, 5-132, 5-133, 6-145, 6-146, 7-123, 7-124, 7-125, 8-202, 8-203, 8-218, 8-219, 8-221, 8-224, 8-302, 8-303, 8-304
- radio-frequency identification devices; RFID, 1-14, 8-27
- radiation isotope identification device; RIID, 1-14, 8-138
- Rainy River, 5-1, 5-42
- Raquette rivers, 6-21
- Ravenna Army Ammunition Plant, 6-11
- Resource Conservation and Recovery Act; RCRA, 1-23, 3-55, 3-56, 3-57, 4-128, 4-130, 4-131, 5-133, 5-135, 5-136, 6-146, 6-148, 6-149, 7-125, 7-127, 7-128, 8-230, 8-302, 8-305
- Record of Decision; ROD, 1-3, 1-25, 9-1
- recovery zone, 4-17
- recreation areas, 3-32, 3-38, 3-64, 3-65, 3-66, 3-68, 4-59, 4-62, 4-141, 4-143, 5-54, 5-57, 5-146, 5-147, 5-148, 6-53, 6-54, 6-57, 6-65, 6-159, 6-161, 7-49, 7-52, 7-139, 7-141, 8-153, 8-155, 8-269, 8-272, 8-273, 8-276, 8-277, 8-278, 8-279, 8-280, 8-281, 8-282, 8-284, 8-285, 8-286, 8-297, 8-311, 8-313, 9-16
- recreational land, 3-33, 3-39, 4-58, 4-62, 4-74, 5-53, 5-57, 5-71, 6-53, 6-57, 6-69, 7-48, 7-52, 7-63, 8-119, 8-120, 8-154, 8-155, 8-168, 8-269, 8-273, 8-283
- recreational use, 1-22, 3-41, 3-42, 3-65, 3-66, 3-67, 4-75, 5-72, 6-53, 6-73, 6-98, 7-48, 7-65, 7-67, 8-131, 8-137, 8-142, 8-154, 8-155, 8-166, 8-167, 8-169, 8-171, 8-172, 8-270, 8-271, 8-272, 8-273, 8-290
- recreational vehicle, 8-140; RV, 3-67, 3-68, 6-162
- recreational, 1-7, 1-22, 2-20, 3-2, 3-16, 3-24, 3-27, 3-32, 3-33, 3-37, 3-38, 3-39, 3-41, 3-42, 3-61, 3-65, 3-66, 3-67, 3-68, 3-69, 4-6, 4-23, 4-45, 4-58, 4-62, 4-74, 4-75, 4-94, 4-136, 4-137, 4-138, 4-139, 4-141, 4-143, 4-144, 4-145, 4-146, 4-147, 4-148, 5-6, 5-53, 5-57, 5-71, 5-72, 5-141, 5-142, 5-143, 5-145, 5-146, 5-148, 6-6, 6-50, 6-53, 6-57, 6-69, 6-73, 6-93, 6-98, 6-111, 6-112, 6-154, 6-155, 6-156, 6-158, 6-159, 6-163, 6-164, 7-6, 7-48, 7-52, 7-63, 7-65, 7-67, 7-85, 7-133, 7-134, 7-137, 7-139, 7-141, 8-72, 8-74, 8-91, 8-96, 8-116, 8-119, 8-120, 8-122, 8-125, 8-126, 8-131, 8-137, 8-139, 8-140, 8-141, 8-142, 8-151, 8-152, 8-153, 8-154, 8-155, 8-165, 8-166, 8-167, 8-168, 8-169, 8-170, 8-171, 8-172, 8-173, 8-187, 8-188, 8-211, 8-269, 8-270, 8-271, 8-272, 8-273, 8-274, 8-275, 8-277, 8-278, 8-279, 8-280, 8-281, 8-283, 8-290, 8-298, 8-311, 8-312, 8-313, 9-9, 9-10, 9-12
- Red Cliff Band of Lake Superior Chippewa Indians of Wisconsin, 6-123, 6-125
- Red Lake Band of Chippewa Indians, 5-111, 5-113
- Red Lake, 5-22, 5-23, 5-61, 5-111, 5-113
- red pine, 5-19
- red spruce, 6-14, 6-19, 7-13, 7-18
- red squirrel, 6-18, 7-16
- red-backed salamander, 7-16
- red-spotted newt, 6-18, 7-16
- red-tailed hawk, 4-19
- redbacked salamander, 6-18
- remote video surveillance system, 1-14, 2-4, 3-16, 3-49, 8-42; RVSS, 1-14, 1-19, 2-4, 2-7, 2-11, 2-13, 3-16, 3-23, 3-27, 3-38, 3-49, 3-61, 4-133, 5-138, 6-151, 7-130, 8-42, 8-76, 8-108, 8-138, 8-143, 8-171, 8-177, 8-249
- repairs and alterations, 8-248; R&A, 8-248
- reptiles (various native), 5-23, 6-21, 7-19

- Richelieu River, 7-37
 Rifle River Recreation Area, 6-11
 Rivers and Harbors Act, 1-23
 road construction, 2-13, 8-41, 8-44, 8-45, 8-52, 8-230, 8-300, 9-4
 road, 1-10, 1-18, 2-7, 2-9, 2-13, 2-17, 3-2, 3-42, 4-74, 4-75, 4-137, 4-138, 4-140, 5-71, 5-72, 5-93, 5-143, 5-145, 6-72, 6-73, 6-139, 6-156, 6-158, 6-163, 7-66, 7-120, 7-134, 7-135, 7-137, 8-22, 8-30, 8-38, 8-41, 8-44, 8-45, 8-46, 8-52, 8-54, 8-57, 8-58, 8-59, 8-63, 8-65, 8-75, 8-81, 8-82, 8-83, 8-100, 8-101, 8-105, 8-108, 8-117, 8-119, 8-126, 8-133, 8-134, 8-136, 8-138, 8-142, 8-147, 8-165, 8-171, 8-174, 8-199, 8-200, 8-227, 8-228, 8-230, 8-242, 8-243, 8-256, 8-257, 8-259, 8-260, 8-261, 8-265, 8-270, 8-273, 8-287, 8-288, 8-290, 8-291, 8-297, 8-298, 8-299, 8-300, 8-307, 8-310, 8-311, 9-4, 9-6, 9-11
 roads, 1-1, 1-5, 1-7, 1-10, 1-14, 1-18, 2-4, 2-6, 2-8, 2-9, 2-13, 2-14, 2-15, 2-17, 3-15, 3-20, 3-21, 3-23, 3-27, 3-31, 3-35, 3-37, 3-40, 3-42, 3-47, 3-48, 3-61, 3-67, 3-68, 4-2, 4-10, 4-71, 4-74, 4-75, 4-99, 4-100, 4-101, 4-123, 4-135, 4-138, 4-140, 4-143, 4-144, 4-145, 4-146, 4-147, 4-148, 5-10, 5-66, 5-70, 5-71, 5-99, 5-126, 5-140, 5-143, 5-145, 6-10, 6-65, 6-71, 6-72, 6-107, 6-108, 6-139, 6-153, 6-156, 6-158, 7-2, 7-10, 7-65, 7-66, 7-91, 7-94, 7-120, 7-132, 7-135, 7-137, 7-142, 8-1, 8-23, 8-24, 8-28, 8-29, 8-31, 8-36, 8-38, 8-43, 8-44, 8-45, 8-46, 8-49, 8-50, 8-52, 8-55, 8-58, 8-61, 8-62, 8-63, 8-65, 8-66, 8-75, 8-77, 8-78, 8-79, 8-80, 8-81, 8-84, 8-104, 8-105, 8-109, 8-117, 8-118, 8-124, 8-128, 8-131, 8-132, 8-133, 8-134, 8-136, 8-137, 8-144, 8-154, 8-164, 8-165, 8-166, 8-171, 8-172, 8-175, 8-177, 8-178, 8-179, 8-180, 8-181, 8-182, 8-183, 8-184, 8-190, 8-195, 8-201, 8-204, 8-223, 8-229, 8-230, 8-231, 8-238, 8-239, 8-240, 8-244, 8-246, 8-254, 8-258, 8-259, 8-260, 8-264, 8-269, 8-270, 8-272, 8-273, 8-277, 8-281, 8-284, 8-289
 roads, 9-4, 9-5, 9-6, 9-7, 9-10
 Roosevelt Campobello International Park, 7-10
 Rosa arkansana, 5-20
 rose-breasted grosbeak, 6-17, 7-16
 roseate tern, 7-15, 8-52, 9-4
 Roseau, 5-3, 5-22, 5-101
 Ross Lake National Recreation Area, 4-11, 4-45, 4-143, 4-144
 rostriformis bugensis, 5-23, 8-34
 ruffed grouse, 7-16
 Rufus Wood, 4-23
 Russian knapweed, 5-21, 8-30
 rusty crayfish, 5-23
 Sable Islands Provincial Nature Reserve, 5-12
 Saco River Basin, 7-36
 Safe Drinking Water Act, 3-21
 sagebrush, 4-19, 4-20, 5-20, 5-21
 Saginaw Chippewa Indian Tribe of Michigan, 6-123, 6-125
 Saint Croix International Historic Site, 7-143
 Saint Regis Mohawk Tribe, 6-123, 6-125
 Saint-Francois basin, 7-37
 Saint-Francois River, 7-37
 salamanders, 4-19
 Salmo salar, 7-14, 7-19, 8-30, 8-52, 9-4
 Salmo-Priest Wilderness, 4-2, 4-11, 4-146, 4-147
 Salt Spring Islands, 4-22
 Salvelinus fontinalis, 5-23, 6-21, 7-19
 Samish Indian Tribe, 4-109
 Sander vitreus, 5-23, 6-21, 7-19
 Sandpoint Island Provincial Park and Quetico Provincial Park, 5-11
 sassafras, 5-20, 6-19, 6-20, 7-18
 Sauk-Suiattle Indian Tribe of Washington, 4-109, 4-111
 Sault Ste. Marie Tribe of Chippewa Indians of Michigan, 6-123
 Schizachyrium scoparium, 5-14, 5-20
 Sciurus vulgaris, 7-16
 scoping meetings, 1-25
 scoping period, 1-24, 1-25
 scoping, 1-24, 1-25
 Scorpaeniformes, 7-19
 scotch broom, 4-21, 8-29
 sculpin, 7-19
 sea lamprey, 5-23
 sea otter, 4-19, 4-22
 sea otter, 7-17
 sea-run rainbow trout, 4-19
 seals, 4-19, 4-21, 7-17
 Secure Border Initiative; SBI, 1-4
 Selkirk Mountains, 4-16
 Selkirk recovery zone, 4-16, 4-17
 Semotilus atromaculatus, 6-21, 7-19
 Seneca Nation of New York, 6-123, 6-125

- sensitive species, 3-41, 4-16, 8-25, 8-29, 8-32
 Shakopee Mdewakanton Sioux Community of Minnesota, 5-111
 Shepherdia, 5-20
 Shoalwater Bay Tribe of the Shoalwater Bay Indian Reservation, 4-109, 4-111
 shoreline master program, 4-71
 shrews, 6-18, 7-16
 Silurian-Devonian Aquifers, 6-38
 silver carp, 5-23
 silver-spotted skipper, 5-19
 SIP, 3-6, 3-10, 8-4, 8-5, 8-22
 site specific (analysis), 3-15, 4-128, 5-133, 6-146, 7-125, 8-189, 8-265, 8-302
 Skagit Valley Provincial Park, 4-10
 Skagit, 4-10, 4-22, 4-23, 4-41, 4-45, 4-144, 4-146, 8-271
 Skokomish Indian Tribe of the Skokomish Reservation, 4-109, 4-112
 skunk, 6-18, 7-16
 Skykomish, 4-22
 Slate Islands Provincial Park, 6-11
 Sleeping Giant Provincial Park, 6-11
 small whorled poponia, 7-16
 smallmouth bass, 5-23, 6-21, 7-19
 smooth green snake, 5-19
 snapping turtle, 5-19
 Snoqualmie National Forest, 4-11, 8-313
 Snoqualmie Tribe, 4-109
 snowshoe hares, 7-15
 SO₂, 3-5, 3-7, 3-8
 SO₂, 8-6
 socioeconomic impact, 3-46, 3-47, 4-76, 5-73, 6-74, 7-68, 8-2, 8-150, 8-151, 8-164, 8-168, 8-169, 8-170, 8-172, 8-173, 8-299, 8-300
 socioeconomic, 1-24, 3-1, 3-3, 3-46, 3-47, 4-76, 4-89, 4-126, 5-73, 5-87, 5-131, 6-74, 6-88, 6-144, 7-68, 7-82, 7-123, 8-2, 8-150, 8-151, 8-164, 8-166, 8-168, 8-169, 8-170, 8-171, 8-172, 8-173, 8-186, 8-192, 8-193, 8-299, 8-300
 sockeye salmon, 4-22
 sockeye, 4-19, 4-22
 Sokaogon Chippewa Community, 6-123
 Somatochlora hineana, 6-17, 8-52, 9-4
 Sorex, 6-18, 7-16
 Sorghastrum nutans, 5-20
 sound exposure level, 8-88
 species habitat, 8-27, 8-37, 8-41, 8-43, 8-46, 8-47
 species, 3-2, 3-11, 3-12, 3-13, 3-14, 3-15, 3-34, 3-36, 4-13, 4-15, 4-16, 4-18, 4-19, 4-20, 4-21, 4-22, 4-44, 4-71, 4-97, 5-14, 5-15, 5-16, 5-17, 5-18, 5-19, 5-20, 5-21, 5-23, 5-66, 5-95, 6-13, 6-14, 6-15, 6-16, 6-17, 6-18, 6-19, 6-21, 6-65, 6-68, 6-101, 7-13, 7-14, 7-15, 7-16, 7-17, 7-18, 7-19, 7-88, 8-25, 8-27, 8-28, 8-29, 8-30, 8-31, 8-32, 8-34, 8-35, 8-36, 8-37, 8-38, 8-39, 8-40, 8-41, 8-43, 8-44, 8-45, 8-46, 8-47, 8-48, 8-49, 8-50, 8-51, 8-52, 8-53, 8-82, 8-91, 8-93, 8-100, 8-146, 8-153, 8-292, 9-2, 9-3, 9-4, 9-7, 9-11
 Species at Risk Act (Canada); SARA, 3-12
 Spednic Lake, 7-10
 Spilogale, 6-18
 Spirit Lake Tribe, 5-111, 5-113
 Spokane Reservation, 4-66
 Spokane State Park, 4-10
 Spokane Tribe of the Spokane Reservation, 4-109, 4-112
 sport fisheries, 4-22
 sport-utility vehicle, 2-7, 8-206
 spotted knapweed, 5-21, 8-30
 spotted salamander, 6-18, 7-16
 Spring Creek Canyon Natural Area Preserve, 4-11
 spruce, 6-20, 7-13, 7-14, 7-18, 8-29
 Squaxin Island Tribe of the Squaxin Island Reservation, 4-109, 4-112
 St. Croix Chippewa Indians of Wisconsin, 6-123
 St. Croix Chippewa, 6-123
 St. Mary, 4-45, 5-2, 5-22, 5-43, 6-41, 6-42, 7-38
 Standing Rock Sioux Tribe (North Dakota & South Dakota), 5-111
 state forest, 8-137, 8-144, 9-10
 State Historic Preservation Office(r); SHPO, 4-99, 4-100, 4-102, 5-96, 5-97, 5-98, 5-99, 5-100, 6-102, 6-103, 6-106, 7-90, 7-92, 7-96
 State Implementation Plan, 3-6, 8-4
 steelhead trout, 4-15, 4-19, 4-22, 4-44, 8-46
 Stephen Mather Wilderness, 4-2, 4-11, 4-73, 4-143
 Sterna dougallii, 7-15
 Stillaguamish Tribe of Washington, 4-109
 Stockbridge Munsee Community, 6-123
 Storeria occipitomaculata, 5-19, 8-32
 Strait of Georgia, 4-22
 Strait of Juan de Fuca, 4-22, 4-145, 8-30, 8-46

<p>subalpine forests, 4-15, 4-18 sugar maple, 6-19 sulfur dioxide, 3-5 Sunapee Lake, 7-2, 7-19 sunflower, 5-20 Superior National Forest, 5-12, 5-66, 5-149, 8-279, 8-292, 8-311 Suquamish Indian Tribe of the Port Madison Reservation, 4-110, 4-112 Swinomish Indians of the Swinomish Reservation, 4-110, 4-112 switchgrass, 5-20 Symphoricarpos occidentalis, 5-20 tamarack, 5-14, 6-14, 7-13, 7-17 Tamiasciurus hudsonicus, 6-18 Thamnophis, 6-18, 6-19, 7-16 Theodore Roosevelt National Park, 5-12, 5-48, 5-53, 5-71 Theodore Roosevelt Wilderness, 5-12 threatened and endangered, 3-12, 4-13, 4-15, 4-16, 5-14, 5-16, 6-13, 6-15, 7-13, 7-14, 8-25, 8-30, 8-37, 8-38, 8-44, 8-48, 8-50, 8-52, 8-53, 9-4 Three Affiliated Tribes of the Fort Berthold Reservation(Mandan, Arikara, and Hidatsa), 5-111 three-ridge mussel, 5-19 thrushes, 6-17 Thuja occidentalis, 5-19, 6-13 Tiger Mt, 4-11 Tonawanda Band of Seneca Indians of New York, 6-123, 6-126 Tongue, 5-22 tower, 2-12, 3-19, 3-42, 3-43, 4-119, 4-125, 5-124, 5-130, 6-138, 6-143, 7-119, 7-125, 8-33, 8-36, 8-44, 8-101, 8-125, 8-126, 8-127, 8-134, 8-135, 8-137, 8-165, 8-181, 8-204, 8-233, 8-236, 8-251, 8-252, 8-260, 8-262, 8-263, 8-271, 9-2, 9-10; towers, 1-1, 1-14, 1-17, 2-5, 2-6, 2-12, 2-13, 3-14, 3-20, 3-22, 3-25, 3-29, 3-35, 3-37, 3-42, 3-45, 3-46, 3-49, 3-57, 3-59, 3-60, 4-47, 4-124, 4-125, 5-44, 5-66, 5-129, 5-130, 6-43, 6-67, 6-142, 6-143, 7-37, 7-61, 7-124, 7-125, 8-20, 8-21, 8-25, 8-26, 8-27, 8-28, 8-32, 8-33, 8-34, 8-36, 8-37, 8-38, 8-44, 8-49, 8-57, 8-60, 8-77, 8-101, 8-102, 8-108, 8-109, 8-118, 8-119, 8-123, 8-125, 8-126, 8-127, 8-134, 8-135, 8-136, 8-137, 8-139, 8-154, 8-159, 8-163, 8-165, 8-166, 8-167, 8-169, 8-170, 8-171, 8-</p>	<p>172, 8-173, 8-176, 8-180, 8-181, 8-184, 8-186, 8-188, 8-189, 8-203, 8-204, 8-205, 8-206, 8-208, 8-209, 8-212, 8-213, 8-222, 8-226, 8-227, 8-231, 8-236, 8-237, 8-240, 8-248, 8-250, 8-251, 8-252, 8-260, 8-261, 8-262, 8-264, 8-265, 8-267, 8-271, 8-276, 8-277, 8-278, 8-281, 8-282, 8-283, 8-284, 8-286, 8-287, 8-290, 9-10, 9-12 training, 1-7, 2-15, 3-16, 3-21, 3-24, 3-27, 3-31, 3-38, 3-48, 3-52, 3-61, 4-49, 4-122, 5-46, 5-125, 6-45, 6-97, 6-138, 7-41, 7-119, 8-27, 8-54, 8-71, 8-72, 8-74, 8-89, 8-177, 8-181, 8-182, 8-183, 8-184, 8-202, 8-203, 8-204, 8-205, 8-206, 8-207, 8-208, 8-210, 8-211, 8-218, 8-220, 8-221, 8-223, 8-224, 8-225, 8-226, 8-234, 8-277, 9-6, 9-13 traditional cultural property; TCP, 3-48, 4-108, 5-110, 6-122, 7-105; TCPs, 3-45, 4-103, 5-104, 6-117, 7-101 transboundary, 4-45, 5-43, 6-42, 7-38, 8-235 tribal land(s), 1-4, 3-52, 4-66, 5-61, 5-87, 5-89, 5-91, 6-60 Toxic Substances Control Act; TSCA, 3-57 Tsuga canadensis, 5-197-17 Tulalip Tribes of the Tulalip Reservation, 4-110 Turtle Mountain Band of Chippewa Indians of North Dakota, 5-111, 5-113 Turtle Mountain Provincial Park, 5-11 Turtle Mountain Wetland, 5-12 turtles, 4-17, 4-19, 8-31, 8-34 Tuscarora Nation of New York, 6-124, 6-126 U.S. Air Force, 8-209; USAF, 8-209, 8-210, 8-211 U.S. Army Corps of Engineers, 3-22, 4-44, 8-31, 9-8; USACE, 1-23, 3-34, 4-44, 8-31, 8-50 U.S. Border Patrol Facilities Design Guide, 8-130, 9-11 U.S. Border Patrol, 1-4, 3-35, 4-2, 4-103, 4-105, 4-107, 5-1, 5-102, 5-105, 5-109, 6-2, 6-95, 6-116, 6-121, 7-2, 7-100, 7-104, 8-4, 8-130, 9-11; USBP, 1-4, 1-7, 1-9, 1-10, 1-11, 1-12, 1-13, 1-14, 1-18, 1-20, 1-24, 2-1, 2-4, 2-8, 2-9, 2-10, 2-11, 2-15, 3-35, 3-36, 4-2, 4-3, 4-103, 4-105, 4-106, 4-107, 4-123, 4-124, 5-1, 5-101, 5-102, 5-105, 5-108, 5-109, 5-126, 5-129, 5-134, 6-2, 6-3, 6-96, 6-115, 6-116, 6-121, 6-139, 6-140, 6-141, 6-147, 7-2, 7-3, 7-97, 7-98, 7-99, 7-100, 7-104, 7-120, 7-121, 8-4, 8-37, 8-43, 8-59, 8-61, 8-70, 8-71,</p>
--	--

<p>8-72, 8-83, 8-104, 8-105, 8-106, 8-108, 8-140, 8-142, 8-144, 8-200, 8-204, 8-205, 8-207, 8-211, 8-222, 8-223, 8-225, 8-228, 8-238, 8-240, 8-243, 8-251, 8-253, 8-257, 8-263, 8-265, 8-288, 8-309</p> <p>U.S. Census Bureau, 3-49, 4-8, 5-8, 6-8, 6-76, 7-8; USCB, 3-49, 3-50, 4-8, 4-77, 4-84, 4-117, 4-118, 4-119, 4-120, 5-8, 5-74, 5-81, 5-82, 5-91, 5-119, 5-121, 5-122, 5-123, 6-8, 6-76, 6-82, 6-83, 6-131, 6-133, 6-134, 6-135, 7-8, 7-69, 7-76, 7-77, 7-86, 7-111, 7-114, 7-115, 7-116</p> <p>U.S. Coast Guard, 1-13, 2-11, 4-3, 8-248, 9-8; USCG, 1-6, 1-13, 1-21, 4-3</p> <p>U.S. Customs and Border Protection, 1-25, 2-1, 3-1, 4-1, 5-1, 6-1, 7-1, 8-1, 9-1, 10-1; CBP, 1-i, 1-ii, 1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, 1-11, 1-12, 1-13, 1-14, 1-15, 1-16, 1-17, 1-18, 1-19, 1-20, 1-21, 1-22, 1-23, 1-24, 1-25, 1-26, 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-8, 2-9, 2-10, 2-11, 2-12, 2-13, 2-14, 2-15, 2-16, 2-17, 2-18, 2-19, 2-20, 3-1, 3-2, 3-3, 3-4, 3-6, 3-9, 3-10, 3-11, 3-14, 3-15, 3-20, 3-21, 3-22, 3-23, 3-24, 3-25, 3-26, 3-27, 3-28, 3-29, 3-30, 3-31, 3-32, 3-35, 3-36, 3-37, 3-38, 3-41, 3-42, 3-46, 3-47, 3-48, 3-49, 3-52, 3-53, 3-54, 3-55, 3-60, 3-61, 3-62, 3-63, 3-64, 3-68, 10-1, 10-2, 10-3, 4-1, 4-2, 4-3, 4-4, 4-6, 4-8, 4-24, 4-44, 4-47, 4-48, 4-49, 4-53, 4-56, 4-58, 4-71, 4-73, 4-74, 4-75, 4-76, 4-89, 4-97, 4-102, 4-103, 4-104, 4-105, 4-107, 4-116, 4-122, 4-124, 4-125, 4-126, 4-128, 4-129, 4-132, 4-133, 4-135, 4-138, 4-139, 4-140, 5-1, 5-2, 5-4, 5-6, 5-8, 5-24, 5-42, 5-44, 5-45, 5-46, 5-49, 5-51, 5-53, 5-66, 5-67, 5-68, 5-71, 5-72, 5-73, 5-87, 5-91, 5-93, 5-95, 5-100, 5-102, 5-103, 5-105, 5-106, 5-107, 5-109, 5-110, 5-118, 5-125, 5-128, 5-129, 5-130, 5-131, 5-133, 5-134, 5-137, 5-139, 5-140, 5-143, 5-145, 6-1, 6-2, 6-3, 6-4, 6-6, 6-8, 6-22, 6-41, 6-43, 6-44, 6-45, 6-48, 6-50, 6-53, 6-65, 6-69, 6-71, 6-72, 6-73, 6-74, 6-88, 6-101, 6-112, 6-116, 6-119, 6-121, 6-122, 6-130, 6-138, 6-140, 6-141, 6-144, 6-147, 6-150, 6-152, 6-153, 6-156, 6-158, 7-1, 7-2, 7-3, 7-4, 7-6, 7-8, 7-20, 7-37, 7-39, 7-40, 7-41, 7-44, 7-46, 7-48, 7-61, 7-63, 7-66, 7-67, 7-68, 7-82, 7-88, 7-96, 7-100, 7-101, 7-102, 7-104, 7-105, 7-111, 7-119, 7-121, 7-122, 7-123, 7-125, 7-126, 7-129, 7-131, 7-135, 7-137, 8-1,</p>	<p>8-4, 8-6, 8-7, 8-8, 8-8, 8-9, 8-11, 8-12, 8-14, 8-15, 8-17, 8-19, 8-20, 8-22, 8-25, 8-26, 8-27, 8-28, 8-29, 8-30, 8-31, 8-32, 8-33, 8-34, 8-36, 8-37, 8-38, 8-41, 8-42, 8-43, 8-46, 8-47, 8-48, 8-49, 8-50, 8-52, 8-53, 8-54, 8-57, 8-58, 8-60, 8-61, 8-62, 8-63, 8-64, 8-68, 8-69, 8-70, 8-71, 8-74, 8-75, 8-76, 8-77, 8-78, 8-79, 8-80, 8-86, 8-88, 8-89, 8-91, 8-92, 8-93, 8-94, 8-95, 8-96, 8-97, 8-99, 8-100, 8-103, 8-104, 8-105, 8-106, 8-107, 8-108, 8-109, 8-111, 8-112, 8-113, 8-116, 8-117, 8-118, 8-119, 8-120, 8-121, 8-122, 8-123, 8-124, 8-125, 8-129, 8-130, 8-131, 8-132, 8-134, 8-135, 8-136, 8-137, 8-138, 8-139, 8-140, 8-141, 8-142, 8-143, 8-145, 8-146, 8-147, 8-150, 8-151, 8-152, 8-153, 8-154, 8-155, 8-156, 8-157, 8-158, 8-161, 8-162, 8-164, 8-165, 8-166, 8-167, 8-168, 8-169, 8-170, 8-171, 8-172, 8-173, 8-177, 8-178, 8-179, 8-180, 8-181, 8-186, 8-188, 8-189, 8-190, 8-191, 8-192, 8-193, 8-196, 8-198, 8-202, 8-203, 8-204, 8-205, 8-206, 8-207, 8-208, 8-209, 8-210, 8-211, 8-212, 8-213, 8-214, 8-215, 8-216, 8-217, 8-218, 8-219, 8-220, 8-221, 8-223, 8-224, 8-225, 8-230, 8-231, 8-233, 8-234, 8-235, 8-236, 8-237, 8-238, 8-239, 8-240, 8-241, 8-246, 8-247, 8-249, 8-250, 8-251, 8-252, 8-253, 8-255, 8-256, 8-259, 8-260, 8-261, 8-262, 8-264, 8-265, 8-269, 8-270, 8-273, 8-274, 8-275, 8-277, 8-278, 8-280, 8-281, 8-285, 8-290, 8-291, 8-292, 8-293, 8-295, 8-296, 8-297, 8-298, 8-299, 8-300, 8-301, 8-302, 8-303, 8-305, 8-308, 8-309, 8-310, 8-311, 8-312, 8-313, 9-1, 9-2, 9-3, 9-4, 9-5, 9-7, 9-8, 9-9, 9-10, 9-12, 9-13, 9-14, 9-15, 9-16</p> <p>U.S. Department of Agriculture, 1-7, 1-12, 3-19, 4-2, 6-2, 7-85, 8-26, 8-122; USDA, 1-12, 1-22, 1-25, 3-19, 3-28, 3-36, 3-65, 4-2, 4-128, 4-146, 4-147, 4-148, 4-149, 5-2, 5-23, 5-133, 5-149, 6-2, 6-146, 6-161, 6-162, 6-163, 6-165, 7-85, 7-125, 7-141, 7-142, 8-32, 8-35, 8-39, 8-44, 8-45, 8-46, 8-122, 8-205, 8-206, 8-208</p> <p>U.S. Department of Defense, 8-210; DOD, 3-32, 3-33, 3-34, 4-66, 5-61, 6-60, 7-56</p> <p>U.S. Department of Energy; DOE, 4-66, 5-61, 6-60, 7-56</p> <p>U.S. Department of Transportation, 8-158, 8-216; DOT, 3-32, 4-134, 4-138, 5-139, 5-143,</p>
--	--

- 6-156, 7-127, 7-135, 8-71, 8-158, 8-159, 8-216, 8-217, 8-235
- U.S. Environmental Protection Agency, 3-4, 4-6, 5-6, 6-6, 6-130, 8-88, 9-8; USEPA, 1-23, 1-25, 3-4, 3-5, 3-6, 3-22, 3-25, 3-54, 3-56, 3-57, 3-58, 4-6, 4-48, 4-52, 4-57, 4-116, 4-129, 4-130, 4-131, 5-6, 5-45, 5-48, 5-52, 5-118, 5-133, 5-135, 5-136, 6-4, 6-6, 6-40, 6-41, 6-44, 6-47, 6-52, 6-130, 6-147, 6-148, 6-149, 7-4, 7-6, 7-40, 7-43, 7-47, 7-111, 7-126, 7-127, 7-128, 8-87, 8-88, 8-112, 8-141, 8-235, 8-236, 8-241, 9-8, 9-15
- U.S. Fish and Wildlife Service, 1-12, 3-11, 4-17, 5-7, 5-16, 6-7, 6-16, 7-7, 7-18, 8-49, 9-2, 10-3; USFWS, 1-12, 1-26, 3-11, 3-12, 3-33, 3-34, 3-39, 3-65, 4-17, 4-66, 5-17, 5-61, 6-7, 6-16, 6-53, 6-60, 6-69, 7-7, 7-18, 7-56, 7-63, 8-49, 8-51, 8-53, 9-2, 9-3
- U.S. Food and Drug Administration, 8-213; FDA, 8-213, 8-215
- U.S. Forest Service, 3-12, 3-32, 4-2, 5-2, 6-2, 7-56, 8-311, 10-3; USFS, 1-11, 1-25, 3-32, 3-33, 3-34, 3-39, 3-65, 4-2, 4-58, 4-66, 5-2, 5-7, 5-53, 5-61, 6-2, 6-7, 6-53, 6-60, 6-69, 7-7, 7-56, 7-63, 8-140
- U.S. General Services Administration, 1-12, 2-9; GSA, 1-12, 1-13, 2-9, 4-104, 4-108, 5-110, 6-119, 7-101, 8-107, 8-112, 8-147, 8-301, 9-8, 9-11
- U.S. Geological Survey, 3-31, 4-8, 4-30, 5-8, 6-8, 7-8; USGS, 3-31, 4-8, 4-30, 4-56, 4-59, 4-60, 4-110, 5-8, 5-30, 5-51, 5-54, 5-55, 5-112, 6-8, 6-27, 6-50, 6-54, 6-55, 6-124, 7-8, 7-25, 7-46, 7-49, 7-50, 7-106;
- U.S. Global Change Research Program, 3-28, 4-53, 5-49, 6-48, 7-44; USGCRP, 3-28, 4-53, 4-55, 5-49, 5-50, 6-48, 6-49, 7-44, 7-45
- U.S. Immigration and Customs Enforcement, 1-12; ICE, 1-12, 1-21, 1-22
- UL Bend Wilderness, 5-12
- Ulmus, 5-20, 6-19
- unattended ground sensor, 1-14, 2-6, 3-16, 3-49; UGS, 2-6, 2-12, 3-16, 3-38, 8-61, 8-63, 8-246
- unexploded ordnance, 3-55; UXO, 3-55
- unmanned aircraft system, 1-15, 3-26, 8-76; UAS, 1-15, 2-7, 3-61, 4-49, 4-124, 4-140, 5-2, 5-46, 5-128, 5-145, 6-45, 6-140, 6-141, 6-158, 7-41, 7-121, 7-138, 8-vi, 8-76, 8-93, 8-95, 8-99, 8-131, 8-139, 8-140, 8-187, 8-209, 8-210, 8-263
- upgrade, 1-14, 3-57, 1-15, 3-61; upgrades, 3-65
- Upper Skagit Indian Tribe of Washington, 4-110, 4-112
- Upper Skagit Indian Tribe, 4-110, 4-112
- Urocyon, 6-18, 7-16
- Van Buren, 7-35, 7-98, 7-99, 7-136
- Vegetational zonation, 7-18
- vegetative habitat, 8-25, 8-44, 8-50, 8-53
- Vermont, 1-2, 1-14, 3-6, 6-99, 6-100, 7-1, 7-2, 7-3, 7-8, 7-10, 7-14, 7-15, 7-16, 7-19, 7-25, 7-29, 7-32, 7-33, 7-37, 7-46, 7-47, 7-49, 7-56, 7-57, 7-66, 7-69, 7-71, 7-74, 7-75, 7-76, 7-78, 7-81, 7-85, 7-86, 7-89, 7-90, 7-91, 7-92, 7-93, 7-94, 7-95, 7-96, 7-102, 7-103, 7-105, 7-106, 7-107, 7-110, 7-111, 7-112, 7-114, 7-115, 7-117, 7-130, 7-141, 8-37, 8-58, 8-72, 8-73, 8-119, 8-120, 8-161, 8-275, 8-277, 8-280, 8-292, 8-293, 8-294, 8-297, 8-300, 8-308, 8-312; VT, 7-83, 7-102, 7-103, 7-104, 7-136
- visual impacts, 3-38, 3-39, 3-41, 3-42, 3-46, 4-73, 4-74, 4-75, 5-68, 5-70, 5-72, 6-69, 6-71, 6-73, 7-63, 7-65, 7-66, 8-129, 8-132, 8-133, 8-137, 8-138, 8-139, 8-143, 8-144, 8-145, 8-278, 8-299, 8-311, 8-313, 9-10
- visual resource, 2-19, 3-2, 3-3, 3-39, 3-43, 4-73, 5-68, 6-69, 7-63, 8-2, 8-129, 8-130, 8-133, 8-140, 8-142, 8-143, 8-144, 8-145, 8-146, 8-147, 9-10
- VOC, 3-7, 8-6, 8-7, 8-8, 8-10, 8-14, 8-15, 8-17, 8-19, 8-20
- Voyageurs National Park, 5-12, 5-42, 5-48, 5-53, 5-66, 5-68
- visual resource management (VRM), 3-39, 3-41, 3-43, 4-73, 5-68, 6-69, 7-63, 8-129, 8-133, 8-137, 8-143, 8-144, 8-145
- Vulpes, 6-18, 7-16
- Wabanaki Nation, 7-106
- walleye, 5-23, 5-42, 6-21, 7-19
- walrus, 4-19, 7-17
- Washington, 1-1, 1-12, 1-13, 1-25, 3-5, 4-1, 4-2, 4-3, 4-8, 4-10, 4-11, 4-13, 4-14, 4-16, 4-17, 4-20, 4-21, 4-22, 4-24, 4-30, 4-33, 4-36, 4-37, 4-40, 4-41, 4-43, 4-44, 4-45, 4-52, 4-54, 4-56, 4-57, 4-58, 4-59, 4-60, 4-66, 4-68, 4-71, 4-72, 4-73, 4-74, 4-75, 4-77, 4-79, 4-82, 4-83, 4-85, 4-86, 4-87, 4-88, 4-93, 4-94,

<p>4-95, 4-96, 4-98, 4-99, 4-100, 4-101, 4-102, 4-105, 4-106, 4-107, 4-111, 4-114, 4-116, 4-117, 4-118, 4-119, 4-120, 4-121, 4-132, 4-133, 4-134, 4-143, 4-145, 4-146, 4-147, 5-2, 5-72, 6-73, 6-85, 7-23, 7-85, 7-86, 8-30, 8-46, 8-71, 8-73, 8-119, 8-120, 8-130, 8-154, 8-156, 8-160, 8-163, 8-209, 8-271, 8-276, 8-279, 8-290, 8-292, 8-293, 8-295, 8-296, 8-303, 8-306, 8-307, 8-311; WA, 4-90, 4-91, 4-105, 4-106, 4-107, 4-108, 4-139</p> <p>waterbirds, 5-23, 6-21, 7-19</p> <p>watercraft, 1-9, 3-46, 4-2, 4-48, 5-44, 5-12, 6-43, 7-38, 8-30, 8-46, 8-68, 8-75, 8-89, 8-99, 8-132, 8-167, 8-249, 9-3, 9-6</p> <p>Waterton Lakes National Park and Akamina-Kishinena Provincial Park, 5-10</p> <p>Wenatchee National Forest, 4-11, 4-147, 8-311</p> <p>Western Hemisphere Travel Initiative; WHTI, 8-158, 8-159</p> <p>western hemlock, 4-19, 4-21</p> <p>western red cedar, 4-14, 4-19, 4-21</p> <p>Western snowberry, 5-20</p> <p>western tanager, 4-19</p> <p>wetlands, 1-24, 3-13, 3-14, 3-22, 4-1, 4-2, 4-13, 4-21, 4-22, 4-40, 4-41, 4-56, 4-60, 4-98, 5-14, 5-18, 5-19, 5-20, 5-22, 5-23, 5-38, 5-40, 5-51, 5-52, 5-55, 5-67, 6-17, 6-19, 6-20, 6-37, 6-39, 6-50, 6-51, 6-52, 6-55, 6-65, 6-66, 6-67, 6-102, 6-103, 6-104, 7-1, 7-2, 7-18, 7-19, 7-32, 7-33, 7-34, 7-46, 7-47, 7-48, 7-50, 7-90, 7-143, 8-31, 8-35, 8-39, 8-41, 8-45, 8-48, 8-50, 8-51, 8-82, 8-292, 9-3, 9-7</p> <p>whales, 4-19, 7-17, 8-31</p> <p>white cedar, 5-19, 6-13, 7-19</p> <p>White Earth Band of Minnesota Chippewa, 5-111, 5-114</p> <p>White Mountain National Forest, 7-11, 7-56, 7-63, 7-85, 7-141, 7-142, 8-271, 8-280, 8-312</p> <p>white oak-shagbark hickory, 5-20</p> <p>white pine, 5-19, 6-19, 7-17</p> <p>white spruce, 6-19, 7-17, 7-18</p> <p>white sucker, 5-23, 6-21, 7-19</p> <p>white-tailed deer, 4-97, 5-95, 6-18, 6-101, 7-88, 8-33, 8-35</p> <p>white-throated sparrow, 7-16</p> <p>whooping crane, 5-16, 8-39, 8-52, 9-4</p> <p>wild and scenic rivers, 3-43, 3-65, 4-2, 4-23, 4-41, 4-144, 4-146, 4-147, 4-148, 5-40, 6-</p>	<p>39, 6-159, 6-161, 6-162, 7-34, 7-141, 8-75, 8-78</p> <p>wild Atlantic salmon populations, 7-15</p> <p>Wildcat River, 7-34</p> <p>wildlife habitats, 8-35, 8-38, 8-48</p> <p>wildlife management area, 3-33, 3-34, 5-61, 6-53; WMA, 5-11</p> <p>wildlife migration, 8-49, 9-2</p> <p>wildlife movement, 8-38, 8-41</p> <p>wildlife populations, 3-11, 3-13, 8-44</p> <p>Wisconsin, 1-1, 3-5, 4-36, 4-37, 5-14, 5-16, 5-35, 5-76, 6-1, 6-8, 6-10, 6-14, 6-15, 6-16, 6-17, 6-24, 6-27, 6-33, 6-35, 6-37, 6-38, 6-50, 6-51, 6-52, 6-54, 6-55, 6-62, 6-68, 6-69, 6-75, 6-78, 6-81, 6-82, 6-84, 6-87, 6-104, 6-105, 6-108, 6-111, 6-112, 6-122, 6-125, 6-129, 6-130, 6-131, 6-132, 6-134, 6-136, 6-165, 7-25, 7-29, 8-29, 8-71, 8-73, 8-119, 8-120, 8-275, 8-276, 8-280, 8-292, 8-294, 8-295, 8-306, 8-308; WI, 5-100, 6-122</p> <p>wood turtles, 6-18, 7-16</p> <p>wooded riparian stands, 4-19, 5-21</p> <p>woodland caribou, 4-16, 8-52, 9-4</p> <p>Wyandot Nation of Ohio, 6-124</p> <p>Wyandot Nation, 6-124</p> <p>yellow perch, 5-23</p> <p>yellow perch, 6-21, 7-19</p> <p>yellow toadflax, 5-21</p> <p>yellow-bellied marmot, 5-18</p> <p>zebra mussels, 5-23</p> <p>Zippel Bay State Park, 5-12</p> <p>Zonotrichia albicollis, 7-16</p>
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