

Proposed Lake Ontario National Marine Sanctuary

Draft Environmental Impact Statement and Draft Management Plan



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Cover photo: Tibbets Point Lighthouse sits where Lake Ontario meets the St. Lawrence River.
Photo: Matt McIntosh/NOAA

Abstract

The National Oceanic and Atmospheric Administration (NOAA) is proposing to designate a national marine sanctuary to manage a nationally significant collection of shipwrecks and other underwater cultural resources in eastern Lake Ontario and the Thousand Islands region in upstate New York. In accordance with the National Environmental Policy Act (NEPA, 42 USC 4321 *et seq.*) and the National Marine Sanctuaries Act (NMSA, 16 USC 1434), NOAA has prepared a draft environmental impact statement (DEIS) that considers three alternatives for the proposed national marine sanctuary. In this DEIS, NOAA uses criteria and evaluation standards under the regulations implementing NEPA (40 CFR parts 1500-1508 (1978)) and the NOAA implementing procedures for NEPA (NOAA Administrative Order 216-6A) to evaluate the environmental consequences of each alternative.

Under the No Action Alternative, NOAA would not designate a national marine sanctuary in New York. Under Alternative 1, the proposed sanctuary boundary would include 1,786 square miles in eastern Lake Ontario and the Thousands Islands region of the St. Lawrence River. Alternative 1 would incorporate 67 known shipwrecks and one aircraft. Under Alternative 2, the proposed sanctuary would cover the same 1,724 square mile area in eastern Lake Ontario, but would not include the segment of the St. Lawrence River. Under Alternative 2, the sanctuary would encompass 43 known shipwrecks and one aircraft. While alternatives 1 and 2 have different geographic boundaries, NOAA proposes to apply the same proposed regulatory concepts and draft management plan to manage sanctuary resources under both alternatives. NOAA is soliciting public comment on the alternatives in this DEIS to inform its selection of a final preferred alternative.

This document also serves as a resource assessment that details the present and future uses of the areas identified for potential national marine sanctuary designation, and it includes a proposed management plan that describes the proposed goals, objectives, and strategies for managing the proposed sanctuary. No significant adverse impacts to biological and physical resources, cultural and historic resources, marine area use, recreation, or socioeconomics are expected under any alternative. Long-term beneficial impacts are anticipated if the proposed action is implemented.

Comments on this DEIS will be accepted until September 10, 2021.

Lead Agency: National Oceanic and Atmospheric Administration

For Further Information Contact: Ellen Brody, Great Lakes Regional Coordinator, email: ellen.brody@noaa.gov



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of National Marine Sanctuaries
1305 East-West Highway
Silver Spring, Maryland 20910

Dear Reviewer:

In accordance with the National Environmental Policy Act (NEPA), we enclose for your review the National Oceanic and Atmospheric Administration (NOAA) Office of National Marine Sanctuaries (ONMS) draft environmental impact statement (EIS) for the proposed designation of a new national marine sanctuary in eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River.

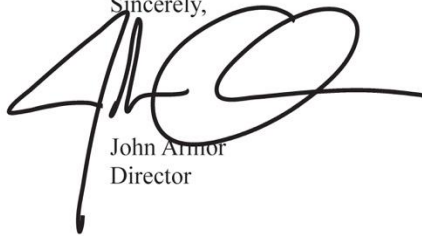
NOAA prepared this document to assess the environmental impacts of designating a national marine sanctuary under the National Marine Sanctuaries Act (NMSA). The NMSA requires that an EIS be prepared for designation of a national marine sanctuary regardless of the significance of the impacts of the proposed action.

NOAA is also publishing a draft management plan for public comment along with the draft EIS. This document announces the availability of the draft EIS for public comment. Comments will be accepted until September 10, and should be submitted electronically via the Federal e-Rulemaking Portal. To submit an comment electronically, go to www.regulations.gov and search for docket NOAA-NOS-2021-0050. Written comments may also be directed to the sanctuary official identified below.

Responsible official: John Armor, Director
Office of National Marine Sanctuaries

Sanctuary official: Ellen Brody, Great Lakes Regional Coordinator
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Sincerely,



John Armor
Director

About this Document

This draft environmental impact statement (DEIS) and draft management plan provide detailed information and analysis of a range of reasonable alternatives for the proposed designation of a new national marine sanctuary in eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River.

NOAA prepared this DEIS in accordance with the National Environmental Policy Act (NEPA, 42 USC 4321 *et seq.*); NOAA Administrative Order (NAO) 216-6A, which describes NOAA requirements, policies, and procedures for implementing NEPA; and the National Marine Sanctuaries Act (NMSA, 16 USC 1431 *et seq.*), which requires preparation of an environmental impact statement for all sanctuary designations. While the Council on Environmental Quality (CEQ) regulations implementing NEPA were revised as of September 14, 2020 (85 FR 43304, July 16, 2020), NOAA prepared this DEIS using the 1978 CEQ regulations because this environmental review began on April 17, 2019, when NOAA published a Notice of Intent to conduct scoping and prepare a DEIS for designating the proposed sanctuary (80 FR 5699).

Scoping included a 105-day public period during which NOAA solicited public comments related to the scale and scope of the proposed sanctuary, including ideas presented in the sanctuary nomination. In addition, NOAA hosted four public meetings in June 2019 and accepted comments through a web-based portal and by traditional mail until July 31, 2019. During the scoping period, 82 individuals provided written input. About 165 people attended the four scoping meetings, with 28 people providing oral comments. In general, comments were strongly supportive of the goals of sanctuary designation, including protecting Lake Ontario's nationally significant shipwrecks, enhancing tourism and the local economy, and fostering education and science programs.

NOAA is the lead agency for this proposed action. NOAA's Office of National Marine Sanctuaries (ONMS) would be the implementing office for this proposed action.

Recommended Citation

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Table of Contents

Abstract	i
Table of Contents	iv
Acknowledgements	v
Glossary of Acronyms	v
Executive Summary	vi
Chapter 1: Introduction	1
1.1 National Marine Sanctuary System.....	1
1.2 Sanctuary Nomination for the Proposed Lake Ontario National Marine Sanctuary.....	4
1.3 Sanctuary Designation and Environmental Review Process	5
1.4 Scope of the Environmental Review	9
1.5 Organization of this Draft Environmental Impact Statement	10
1.6 Public Review of the DEIS	10
Chapter 2: Purpose and Need for Action	11
2.1 Purpose of the Proposed Action.....	11
2.2 Need for the Proposed Action.....	12
2.3 Co-Management with New York State	14
Chapter 3: Alternatives	15
3.1 Introduction.....	15
3.2 No Action Alternative	15
3.3 Development of the Action Alternatives	16
3.4 Alternative 1 (Eastern Lake Ontario and Thousand Islands).....	18
3.5 Alternative 2 (Eastern Lake Ontario).....	27
3.6 Alternatives Considered but Not Carried Forward.....	29
Chapter 4: Affected Environment	30
4.1 Introduction.....	30
4.2 Maritime Heritage Significance and Underwater Cultural Resources	30
4.3 Human Uses and Socioeconomics	60
4.4 Physical Environment.....	76
4.5 Biological Resources	84
Chapter 5: Analysis of Environmental Consequences of Alternatives	93
5.1 Introduction.....	93
5.2 Impacts of the No Action Alternative.....	95
5.3 Impacts of Alternative 1	95
5.4 Impacts of Alternative 2.....	110
5.5 Cumulative Impacts	112
5.6 Comparison of Impacts of the Alternatives.....	118
Chapter 6: Conclusions	121
6.1 Unavoidable Adverse Impacts	121
6.2 Relationship of Short-term and Long-term Productivity.....	121
6.3 Irreversible and Irrecoverable Commitment of Resources	121
References	123
Index	128
Appendix A: Draft Management Plan for Proposed Lake Ontario National Marine Sanctuary	129
Appendix B: Compliance with Additional Regulatory Requirements	145
Appendix C: Analysis of Relevant Federal and State Statutes	168
Appendix D: List of Document Preparers	178

Acknowledgements

This document was prepared by NOAA's Office of National Marine Sanctuaries, with assistance from the New York Department of State; New York Office of Parks, Recreation, and Historic Preservation; New York State Museum; New York Office of General Services; New York Department of Environmental Conservation; and Division of Military and Naval Affairs. A full list of preparers is in Appendix D.

Glossary of Acronyms

ACHP	Advisory Council on Historic Preservation
ARPA	Archaeological Resources Protection Act
ASV	Autonomous Surface Vehicle
AUV	Autonomous Underwater Vehicle
BOEM	Bureau of Ocean Energy Management
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CZMA	Coastal Zone Management Act
DEIS	Draft Environmental Impact Statement
EIS	Environmental Impact Statement
ESA	Endangered Species Act
LWD	Low Water Datum
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NMSA	National Marine Sanctuaries Act
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NOS	National Ocean Service
NPS	National Park Service
NRHP	National Register of Historic Places
NYSDEC	New York State Department of Environmental Conservation
NYSDOS	New York State Department of State
OHWM	Ordinary High Water Mark
OLE	NOAA Office of Law Enforcement
ONMS	NOAA Office of National Marine Sanctuaries
OPRHP	New York Office of Parks, Recreation, and Historic Preservation
ROV	Remotely Operated Vehicle
SMCA	Sunken Military Craft Act
SHPO	State Historic Preservation Officer
USCG	United States Coast Guard
USV	Uncrewed Surface Vehicle
UUV	Uncrewed Underwater Vehicle

Executive Summary

Introduction

An intriguing window into history lies on the bottom of Lake Ontario and the St. Lawrence River. Forgotten shipwrecks, hidden in these cold fresh waters, are among the best preserved in the world, offering a chance to learn, share, and connect to the past. As the gateway between the Great Lakes and the ocean, the maritime landscape of this area represents connections between diverse cultures, between a nascent nation and the frontier, and of commerce, opportunity, and ingenuity. The cultural legacy of people who lived along its shores and journeyed across its waters is showcased by the remains left behind and the stories passed down.

To help preserve and interpret this rich legacy, the National Oceanic and Atmospheric Administration's (NOAA's) Office of National Marine Sanctuaries (ONMS) proposes to designate a national marine sanctuary in New York's eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. The proposed sanctuary would manage a collection of nationally significant maritime heritage resources, including historic shipwrecks. Research, education, and community involvement are hallmarks of ONMS. Through co-management with the state of New York, NOAA would work to ensure future generations can learn about and explore these underwater treasures above and beneath the waves. In partnership with local communities, NOAA would provide a national stage for promoting heritage tourism and recreation to connect more Americans with this special place.


Sanctuary Nomination

On January 17, 2017, leaders of four counties (Oswego, Jefferson, Cayuga, and Wayne) and the city of Oswego, with support from Governor Andrew Cuomo, submitted a nomination to NOAA asking NOAA to consider designating an area in eastern Lake Ontario waters as a national marine sanctuary. The nomination focused on protecting and interpreting a nationally significant collection of 21 historic shipwrecks and one aircraft in a 1,746 square mile area in eastern Lake Ontario. According to the nomination, archival research indicated that an additional 47 shipwrecks and two historic aircraft could be found within the nominated area.

Vessels that historically plied Lake Ontario's waters often met with treacherous conditions, which resulted in numerous shipwrecks. The lake's cold, fresh water preserves these shipwrecks well, creating a "submerged museum" of historic sites with exceptional archaeological, historical, and recreational value. This collection includes one shipwreck, *St. Peter*, which is listed on the National Register of Historic Places (NRHP), as well as a 19th century Great Lakes cargo vessel, *David Mills*, which is a New York State Submerged Cultural Preserve and Dive Site.

Need for a Sanctuary

This collection of nationally significant, historic, underwater cultural resources would benefit from the long-term protection and management afforded by the National Marine Sanctuaries Act (NMSA) by reducing threats to the resources that could adversely affect their historical, archeological, recreational, and educational value. Threats to these nationally significant sites include both natural processes and human activities. Natural processes include the damaging



impacts of wind, waves, currents, storms, ice, and invasive species, such as zebra and quagga mussels, which currently cover many Lake Ontario shipwrecks. Human threats include anchor damage, damage due to poorly attached mooring lines, artifact removal, artifacts being moved within a shipwreck site, and remotely operated vehicle tethers or fishing gear becoming entangled on a shipwreck. Together, these processes threaten the long-term sustainability of historic shipwrecks and negatively impact their recreational and archaeological value.

To address these threats, NOAA would implement a management plan with regulatory and non-regulatory activities to reduce threats. For example, NOAA would install mooring buoys and other access points to provide safe access to shipwrecks. NOAA would also develop site-specific regulations to complement and supplement existing federal and state statutes and enforcement efforts designed to protect underwater cultural resources.

Public Involvement

An important component of the sanctuary designation and environmental review process includes public involvement. NOAA hosted four public meetings during the initial scoping period to solicit public comment related to the scale and scope of the proposed sanctuary.

NOAA also established a Sanctuary Advisory Council to bring members of the local community together to provide advice to NOAA, to serve as a liaison with the nominating community, and to assist in guiding NOAA through the designation process. The council consists of 15 members representing the following seats: citizens-at-large, divers/dive clubs/shipwreck explorers, maritime history, education, tourism, economic development, recreational fishing, and shoreline property owners. In addition, representatives of the four counties, the city of Oswego, the U.S. Coast Guard, the Port of Oswego Authority, New York Sea Grant, and the state of New York are non-voting members.

Proposed Action

Based upon the state's nomination and with input from the public; federal, state, and local agencies; and Indigenous nations and tribes, NOAA proposes to establish a national marine sanctuary in eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. In establishing the proposed sanctuary, NOAA would:

- Set a boundary to identify these nationally significant shipwrecks and other underwater cultural resources and to interpret the maritime cultural landscape that surrounds them;
- Develop and implement a management plan to provide a comprehensive, long-term plan to manage the sanctuary; and
- Create and implement regulations to protect underwater cultural resources.

NOAA prepared this draft environmental impact statement (DEIS) based on the requirements of Section 304(a)(4) of the National Marine Sanctuaries Act and in accordance with the National Environmental Policy Act. This document describes the affected environment, the proposed action and alternatives, and the environmental consequences to the human and natural environment of each of the alternatives.

Alternatives

NOAA is evaluating a No Action Alternative and two action alternatives. Under the No Action Alternative, NOAA would not move forward with the designation of the Lake Ontario National Marine Sanctuary.

The two action alternatives include three components: (1) a boundary component, (2) a regulatory component, and (3) a management plan component. NOAA is proposing the same regulatory concepts and management plan to manage the sanctuary under both alternatives 1 and 2. NOAA is considering two possible boundaries for the proposed sanctuary. Alternative 1's boundary encompasses a portion of eastern Lake Ontario and a segment of the Thousand Islands region of the St. Lawrence River, while Alternative 2 only encompasses the same portion of eastern Lake Ontario. The same proposed management plan and regulations would apply to both alternatives. NOAA has not selected a preferred alternative and is requesting public comment on a boundary for the proposed sanctuary.

Boundaries

Under Alternative 1, the proposed sanctuary boundary would include 1,786 square miles in eastern Lake Ontario and the Thousands Islands region of the St. Lawrence River. More specifically, the sanctuary would incorporate 1,724 square miles of eastern Lake Ontario waters and 62 square miles of the St. Lawrence River from the mouth of the river to Chippewa Bay. The sanctuary would border the counties of Wayne, Cayuga, Oswego, and Jefferson and a portion of St. Lawrence County (Figure E.1). Alternative 1 would include a total of one aircraft and 64 known shipwrecks, including one shipwreck, *St. Peter*, that is listed on the NRHP (Table E.1). Additional underwater cultural resources that may be within this area include archaeological features other than shipwrecks, such as remnants of shipwrecks, remnants of piers, aids to navigation, and potential Indigenous artifacts. This area may include approximately 20 potential shipwreck sites (shipwrecks may exist, but additional research is needed to verify and describe these shipwrecks), three aircraft, and 12 other underwater archaeological sites.

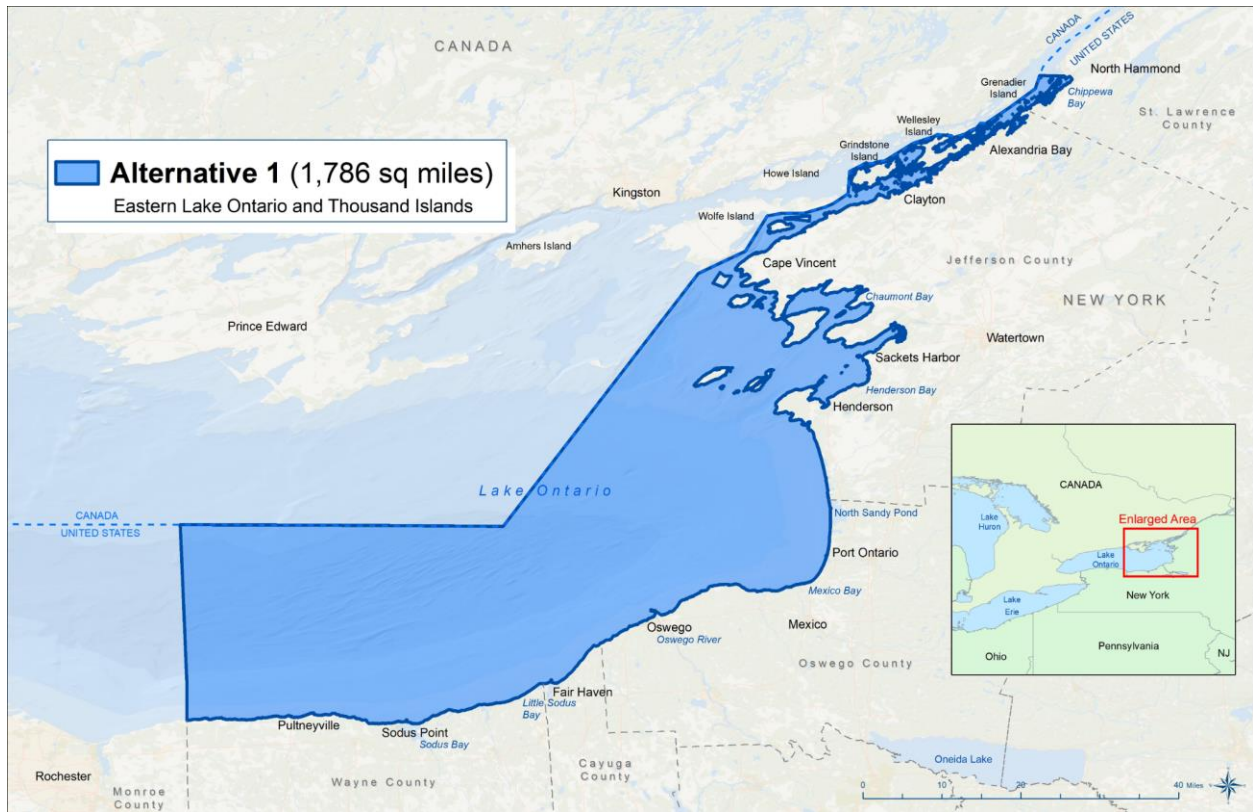


Figure E.1. Geographic boundary of Alternative 1. Image: NOAA

Under Alternative 2, the proposed sanctuary boundary would include 1,724 square miles of eastern Lake Ontario. This area includes the same underwater cultural resources included in Alternative 1 in the eastern Lake Ontario segment but would not include underwater cultural resources in the St. Lawrence River (Figure E.2). Alternative 2 would include a total of one aircraft and 43 known shipwrecks, including one shipwreck, *St. Peter*, listed on the NRHP (Table E.1). Additional potential underwater cultural resources within this area may include approximately 20 potential shipwreck sites (shipwrecks may exist, but additional research is needed to verify and describe these shipwrecks), three aircraft, and several other underwater archaeological sites.

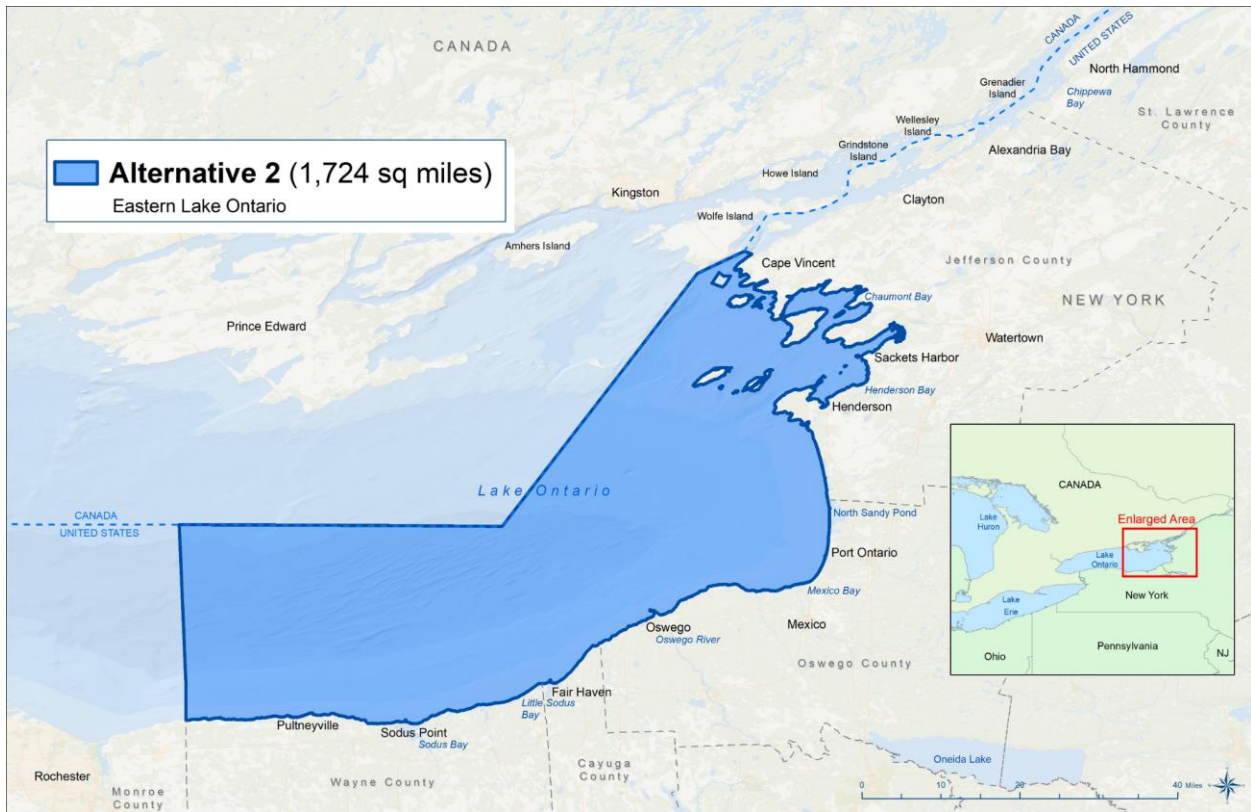



Figure E.2. Geographic boundary of Alternative 2. Image: NOAA

Table E.1. Number of known and potential shipwrecks and aircraft within the boundaries of Alternative 1 and Alternative 2, which cover part of eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River.

	Known Shipwrecks	Potential Shipwrecks	Known Aircraft	Potential Aircraft
Alternative 1 (1,786 square miles) Eastern Lake Ontario and Thousand Islands	64	20	1	3
Alternative 2 (1,724 square miles) Eastern Lake Ontario	43	20	1	3

Proposed Regulatory Concepts

NOAA is proposing the following concepts for regulations under both alternatives 1 and 2 to manage and protect the underwater cultural resources in the proposed Lake Ontario National Marine Sanctuary. As identified in Chapter 2, the regulations would address threats to underwater cultural resources and would complement and supplement existing New York statutes protecting underwater cultural resources. NOAA is seeking public comment on these concepts and will consider these comments when preparing a proposed rulemaking to designate the sanctuary.



NOAA proposes the following concepts for sanctuary regulations:

- Prohibit damage to sanctuary resources
- Prohibit grappling into or anchoring on shipwreck sites
- Prohibit the use of tethered systems (such as remotely operated vehicles) without a permit
- Prohibit the possession, sale, or transport of any sanctuary resource within or outside of the sanctuary

Draft Management Plan


NOAA is proposing to implement the same draft management plan under both Alternative 1 and Alternative 2. Management plans are sanctuary specific planning and management documents used by all national marine sanctuaries. Management plans fulfill many functions, including outlining staffing and budget needs; setting priorities and performance measures for resource protection, research, and education programs; and guiding development of future budgets and management activities. This plan would chart the course for the proposed sanctuary over the next five to ten years (See Appendix A for the draft management plan).

Based on public input provided during scoping, input from the Sanctuary Advisory Council, and NOAA's expertise managing other national marine sanctuaries, the proposed management plan for Lake Ontario consists of five action plans and would be applied to either alternative:

- **Sanctuary Operations:** Create sanctuary infrastructure and program support to ensure effective implementation of the management plan.
- **Education and Outreach:** Enhance public awareness, understanding, and stewardship of the sanctuary, the Great Lakes, and the ocean.
- **Research and Monitoring:** Conduct research to support resource protection, resource management, and education initiatives.
- **Tourism and Economic Development:** Create opportunities to promote the sanctuary to enhance tourism and support the business sector.
- **Resource Protection:** Strengthen resource protection by conducting on-water resource protection activities, promoting responsible use of sanctuary resources, developing education initiatives for users, and enhancing enforcement efforts.

Summary of Impacts

NOAA evaluated the impacts of its alternatives on underwater cultural resources, human uses and socioeconomic resources, physical resources, and biological resources. The central underwater cultural resources analyzed in this document are historic shipwrecks. The human uses and socioeconomic resources analyzed are tourism and recreation, commercial activities, military activities, and population statistics. The major physical resources identified include geology, climate, and water quality. The major biological resources identified include aquatic



species, coastal and terrestrial resources, aquatic invasive species, and protected species and their associated habitats.

NOAA's analysis of the potential environmental impacts of each alternative in this DEIS concludes that there would be no significant adverse impacts to biological and physical resources, cultural and historic resources, marine area use, recreation, or socioeconomics under any alternative. NOAA anticipates significant long-term beneficial impacts if the proposed action is implemented.

Chapter 1: Introduction

The National Oceanic and Atmospheric Administration’s (NOAA’s) Office of National Marine Sanctuaries (ONMS) proposes to designate a national marine sanctuary in New York state waters in eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. This draft environmental impact statement (DEIS) analyzes the environmental impacts of a range of alternatives associated with the proposed sanctuary designation. This document is also a resource assessment document that details the present and future uses of the areas identified for potential designation and includes a proposed management plan that describes the proposed goals, objectives, and strategies for managing sanctuary resources.

1.1 National Marine Sanctuary System

NOAA’s ONMS serves as the trustee for a network of underwater parks encompassing more than 620,000 square miles of marine and Great Lakes waters from Washington state to the Florida Keys and from New England to American Samoa. The network includes a system of 15 national marine sanctuaries and Papahānaumokuākea and Rose Atoll marine national monuments (see Figure 1.1).

National marine sanctuaries are special areas set aside for long-term protection, conservation, and management and are part of our nation’s legacy to future generations. They contain deep ocean habitats of resplendent marine life, kelp forests, coral reefs, whale migration corridors, deep-sea canyons, historically significant shipwrecks, and other important underwater archaeological sites. Each sanctuary is a unique place worthy of special protection. Because they serve as natural classrooms, cherished recreational spots, and places for valuable commercial activities, national marine sanctuaries represent many things to many people.

ONMS works with diverse partners and stakeholders to promote responsible, sustainable ocean and Great Lakes uses that ensure the health of our most valued places. A healthy ocean and Great Lakes are also the basis for thriving recreation, tourism, and commercial activities that drive coastal economies.

NATIONAL MARINE SANCTUARY SYSTEM

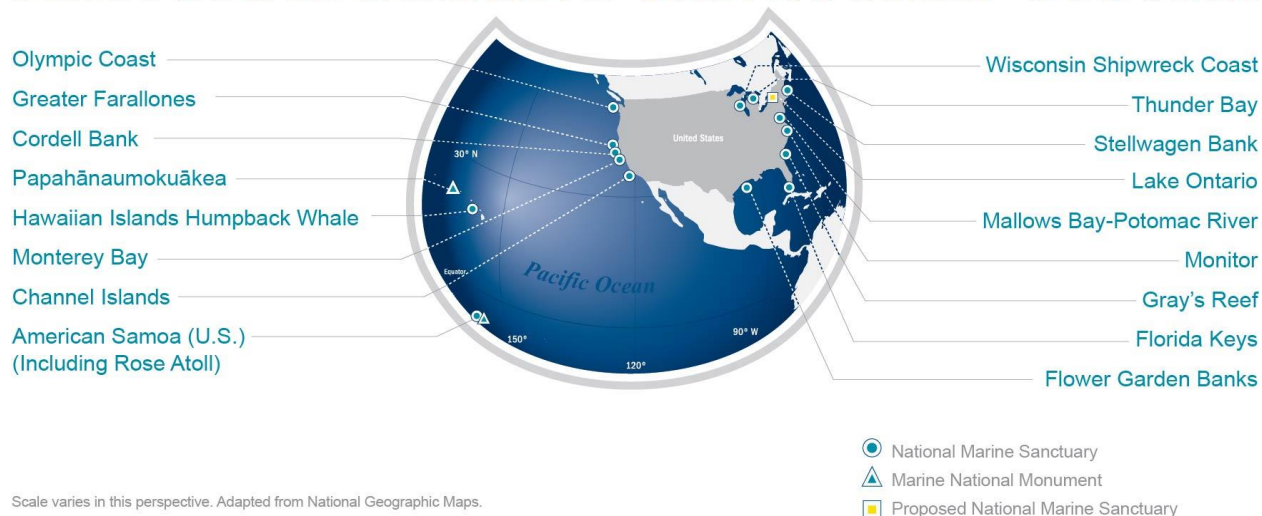


Figure 1.1. The National Marine Sanctuary System. Image: NOAA

1.1.1 National Marine Sanctuaries Act of 1972

The [National Marine Sanctuaries Act](#)¹ (NMSA; formally Title III of the Marine Protection, Research and Sanctuaries Act of 1972, 16 USC 1431 *et seq.*) is the legislation governing the National Marine Sanctuary System. The NMSA authorizes the Secretary of Commerce to identify and designate as a national marine sanctuary any discrete area of the Great Lakes or marine environment that is of special national or in some cases, international significance, and to manage these areas as the National Marine Sanctuary System. An area may be of special national significance due to its conservation, recreational, ecological, historical, scientific, educational, cultural, archaeological, or aesthetic qualities; the communities of living marine resources it harbors; or its resource or human-use values.

National marine sanctuaries may be designated in the areas of coastal and ocean waters, the Great Lakes and their connecting waters, and submerged lands, which the United States exercises jurisdiction over. Day-to-day management of national marine sanctuaries is delegated by the Secretary of Commerce to ONMS.

Congress first passed the NMSA into law in 1972. Since then, Congress amended and reauthorized it in 1980, 1984, 1988, 1992, 1996, and 2000. The overall purposes and policies of the NMSA are to:

- Identify and designate as national marine sanctuaries areas of the marine environment which are of special national significance and to manage these areas as the National Marine Sanctuary System;

¹ <http://sanctuaries.noaa.gov/library/national/nmsa.pdf>

- Provide authority for comprehensive and coordinated conservation and management of these marine areas, and activities affecting them, in a manner which complements existing regulatory authorities;
- Maintain the natural biological communities in the national marine sanctuaries, and to protect, and where appropriate, restore and enhance natural habitats, populations and ecological processes;
- Enhance public awareness, understanding, appreciation and wise and sustainable use of the marine environment, and the natural, historical, cultural, and archeological resources of the National Marine Sanctuary System;
- Support, promote, and coordinate scientific research on, and long-term monitoring of, the resources of these marine areas;
- Facilitate to the extent compatible with the primary objective of resource protection, all public and private uses of the resources of these marine areas not prohibited pursuant to other authorities;
- Develop and implement coordinated plans for the protection and management of these areas with appropriate federal agencies, state and local governments, Native American tribes and organizations², international organizations, and other public and private interests concerned with the continuing health and resilience of these marine areas;
- Create models for the conservation of managing these areas, including the application of innovative management techniques. These models include creating incentives for new conservation and management ideas; and
- Cooperate with global programs encouraging conservation of marine resources.

1.1.2 Comprehensive Management of the National Marine Sanctuary System

The NMSA includes a finding by Congress that ONMS will “improve the conservation, understanding, management, and wise and sustainable use of marine resources” (16 USC 1431(a)(4)(A)). The NMSA further recognizes that “while the need to control the effects of particular activities has led to enactment of resource-specific legislation, these laws cannot in all cases provide a coordinated and comprehensive approach to the conservation and management of the marine environment” (16 USC 1431(a)(3)). Accordingly, ONMS promotes partnerships among resource management agencies, the scientific community, stakeholders, and the public at-large to realize the coordination and program integration that the NMSA calls for in order to comprehensively manage national marine sanctuaries.

1.1.3 Sanctuary Nomination Process

On June 13, 2014, NOAA published a rule (79 FR 33851) to establish a process by which communities may submit applications to have NOAA consider nominations of areas of the marine and Great Lakes environments as national marine sanctuaries. This rule contains the criteria and considerations NOAA uses to evaluate national marine sanctuary nominations, describes the process for submitting national marine sanctuary nominations, and promulgates

² Terminology from the National Marine Sanctuaries Act

the regulations necessary to implement this action (see 15 CFR part 922, subpart B). NOAA reviews nominations against the established criteria and either accepts the nomination or returns it to the community for further development. Nominations describe the area that the community is interested in seeing designated as a national marine sanctuary, including the resources that make the area special and how the community would like to see the area managed.

Once a nomination is accepted by NOAA, it is placed on an inventory of successful nominations that NOAA may consider for designation as a national marine sanctuary. Addition to the inventory does not guarantee that a nominated area will become a national marine sanctuary. National marine sanctuary designation is a separate process, which by law is highly public and participatory and often takes several years to complete. Nominations on the inventory expire after five years if NOAA does not decide to begin a designation process for that area. In November 2019, NOAA established a process to evaluate whether nominations that are approaching this expiration date should remain on the inventory for another five years (84 FR 61546). All [nominations are available online](#)³.

1.2 Sanctuary Nomination for the Proposed Lake Ontario National Marine Sanctuary

On January 17, 2017, pursuant to section 304 of the NMSA and the Sanctuary Nomination Process (SNP; 79 FR 33851), leaders of four counties (Oswego, Jefferson, Cayuga, and Wayne) and the city of Oswego, with support from Governor Andrew Cuomo, acting on behalf of the state of New York, [submitted a nomination to NOAA](#)⁴ asking NOAA to consider designating an area in eastern Lake Ontario waters as a national marine sanctuary.

The nomination focused on acknowledging the national significance of both the submerged cultural resources (21 historic shipwrecks and one aircraft) and the historical context of a 1,746 square mile area in eastern Lake Ontario. According to the nomination, archival research indicated that an additional 47 shipwrecks and two historic aircraft could be found within the nomination area. Vessels that historically plied Lake Ontario's waters often met with treacherous conditions, which resulted in numerous shipwrecks. The lake's cold, fresh water preserves these shipwrecks extremely well, creating a “submerged museum” of historic sites with exceptional archaeological, historical, and recreational value. This collection includes *St. Peter*, which is listed on the National Register of Historic Places (NRHP) and *David Mills*, a 19th century Great Lakes cargo vessel that is a New York state Submerged Cultural Preserve and Dive Site. The nomination also suggested including HMS *Ontario*, which is the oldest confirmed shipwreck and the only fully intact British warship found in the Great Lakes.

As described in the nomination, eastern Lake Ontario shaped our nation's history. Indigenous communities have held a unique bond with their heritage and natural surroundings for centuries. Key historical events include military conflicts, maritime innovation and

³ <https://nominate.noaa.gov/nominations/>

⁴ https://nmsnominate.blob.core.windows.net/nominate-prod/media/documents/lake_ontario_nms_nomination_appendix_011717.pdf

entrepreneurship, and American westward expansion. This eastern transportation corridor is one of the most historically significant regions in the Great Lakes and the country. Lake Ontario dominated maritime trade and transportation for centuries, beginning with the watercraft of early Indigenous peoples. During the colonial period, Lake Ontario was a theater of conflict as European powers, and later the American Republic, fought to win access to the vast resources of the Great Lakes. Military actions occurred in the region during the French and Indian War, the Revolutionary War, and the War of 1812. Later, this region was critical to the development of the American West and the nation's industrial core.

The nominators of the proposed Lake Ontario National Marine Sanctuary defined the following five goals:

1. To preserve, interpret, and protect the region's and the nation's submerged maritime heritage resources and artifacts within the boundaries of the proposed national marine sanctuary.
2. To expand and enrich regional and international research and educational programs and opportunities for all levels of educational pursuit, from primary school science and history to postgraduate studies and institutional research in marine sciences, maritime history, archaeology, and related disciplines, thereby facilitating the development of future leaders and experts in the many fields related to Great Lakes maritime heritage.
3. To build and strengthen partnerships and collaborations between federal, state, local, Indigenous, and international agencies for implementing best practices in maritime heritage resource management.
4. To pursue and develop strengthened partnerships and co-programming in the areas of tourism, education, and heritage preservation with local, state, regional, national, and international entities.
5. To support, strengthen, and grow the economic and tourism goals of the counties of Jefferson, Oswego, Cayuga, and Wayne, along with the city of Oswego and state of New York; to develop conservation and management strategies for submerged cultural resources that are concurrent with, and do not impede, commercial and recreational uses of the waters within the proposed sanctuary.

1.3 Sanctuary Designation and Environmental Review Process

The NMSA authorizes the Secretary of Commerce to identify and designate as a national marine sanctuary any discrete area of the Great Lakes or marine environment that is of special national significance. Section 304(a) of the NMSA describes the sanctuary designation process, including several analyses and activities that provide a basis for the sanctuary designation and opportunity for public participation. The main activities and analyses include the following:

- A notice in the Federal Register of the proposed designation and a summary of the draft management plan
- A resource assessment that describes present and potential uses of the area (Section 4.3)
- A draft management plan for the proposed national marine sanctuary, which is a document that outlines the proposed goals, objectives, and strategies for managing

sanctuary resources for the next five years, as described in Section 304(a)(2)(C) of the NMSA (see Appendix A)

- Maps depicting the boundaries of the proposed sanctuary (see sections 3.4.1 and 3.5.1)
- An assessment and basis for why the proposed sanctuary meets the designation standards and factors for consideration, as described in sections 303(a) and 303(b)

In addition, Section 304(a)(2) of the NMSA requires NOAA to prepare a DEIS pursuant to the National Environmental Policy Act (NEPA) as part of the sanctuary designation process. NEPA requires that federal agencies include in their decision-making processes appropriate and careful consideration of all environmental effects of proposed actions, and analyze potential environmental effects of proposed actions and their alternatives.⁵ The NEPA process is intended to encourage and facilitate public involvement in decisions that affect the quality of the human environment.

1.3.1 Public Involvement

An important component of the sanctuary designation and environmental review process includes public involvement, as well as coordination and consultations with other federal, state, and local agencies, which are described below.

1.3.1.1 Scoping

The first step of NOAA's environmental review process for the proposed Lake Ontario sanctuary designation was the issuance on April 17, 2019, of a Notice of Intent to conduct scoping and prepare an Environmental Impact Statement (EIS) (84 FR 16004). Scoping included a 105-day public period during which NOAA solicited public comments related to the scale and scope of the proposed sanctuary, including ideas presented in the sanctuary nomination. In addition, NOAA hosted four public meetings in June 2019 and accepted comments through a web-based portal and by traditional mail until July 31, 2019. All comments received – through any of these formats – are available to the public through [Regulations.gov](https://www.regulations.gov)⁶.

⁵ While the Council on Environmental Quality (CEQ) regulations implementing NEPA were revised as of September 14, 2020 (85 FR 43304, Jul. 16, 2020), NOAA prepared this DEIS using the 1978 CEQ regulations because this environmental review began on April 17, 2019, when NOAA published a Notice of Intent to conduct scoping and prepare a Draft Environmental Impact Statement (DEIS) for designating the proposed sanctuary (80 FR 5699).

⁶ <https://www.regulations.gov/document?D=NOAA-NOS-2019-0032-0001>



Figure 1.2: Public scoping meeting in Watertown, New York, held on June 13, 2019. Photo: NOAA

During the scoping period, 82 individuals provided written input. About 165 people attended the four scoping meetings, with 28 people providing oral comments. In general, comments were strongly supportive of the goals of sanctuary designation, including protecting Lake Ontario's nationally significant shipwrecks, enhancing tourism and the local economy, and fostering education and science programs. A few commenters noted the inaccessibility of many shipwrecks, as well as the accuracy of known and suspected shipwrecks listed in the nomination and Federal Register notice.

Several commenters suggested adding the Thousand Islands region of the St. Lawrence River to the proposed sanctuary boundary, highlighting the large number of shipwrecks in the river, the accessibility of these shipwrecks to divers, and the need to protect them.

1.3.1.2 Sanctuary Advisory Council

In February 2020, NOAA established a Sanctuary Advisory Council to bring members of the local community together to provide advice to NOAA, to serve as a liaison with the nominating community, and to assist in guiding NOAA through the designation process. The council consists of 15 members representing the following seats: citizens-at-large, divers/dive clubs/shipwreck explorers, maritime history, education, tourism, economic development, recreational fishing, and shoreline property owners. In addition, representatives of the four counties, the city of Oswego, the U.S. Coast Guard, the Port of Oswego Authority, New York Sea Grant, and the state of New York are non-voting members.

1.3.2 Consultations

In addition to NEPA, NOAA is required to consult with various agencies to comply with several related statutes, regulations, and executive orders (EO) as part of this federal action (see Appendix B for additional information).

1.3.2.1 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA, 54 USC 306108) requires federal agencies to consider the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. “Historic property” means any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the NRHP maintained by the Secretary of the Interior. This term includes artifacts, records, and material remains that are related to and located within such properties, including properties of traditional religious and cultural importance to an Indigenous nation or tribe or Native Hawaiian organization. The regulations implementing Section 106 of the NHPA (36 CFR 800) guide federal agencies in meeting this responsibility through a process to identify historic properties potentially affected by the undertaking, assess its effects, and seek ways to avoid, minimize, or mitigate any adverse effects on historic properties, all of which occur in consultation with interested parties.

NOAA has determined that although designation of a national marine sanctuary and related rulemaking for sanctuary-specific regulations meet the definition of an undertaking as defined at 800.16(y), these activities are not of the type that have the potential to cause effects on historic properties, and therefore NOAA has no further obligations under Section 106, per 800.3(a)(1). NOAA, however, recognizes that designation of a national marine sanctuary will lead to subsequent activities that may constitute undertakings subject to Section 106 review under the NHPA and therefore NOAA is pursuing execution of a Programmatic Agreement (PA) pursuant to 36 CFR 800.14(b). The PA will provide a framework and process for consideration of future undertakings resulting from management of the sanctuary, associated field operations, and other activities, if the sanctuary were designated. NOAA will develop this agreement in consultation with the New York State Historic Preservation Officer (SHPO), the ACHP, and other consulting parties identified.

1.3.2.2 Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

Under Executive Order 13175 of November 6, 2000, federal departments and agencies are charged with engaging in regular and meaningful consultation and collaboration with officials of federally-recognized nations and tribes during the development of federal policies that have implications for Indigenous nations and tribes, and are responsible for strengthening the government-to-government relationship between the United States and Indigenous nations and tribes. NOAA identified the following seven federally-recognized nations and tribes: Cayuga Nation, Oneida Nation, Onondaga Nation, Seneca Nation, Saint Regis Mohawk Tribe, Tonawanda Seneca Nation, and Tuscarora Nation. NOAA sent letters to these seven nations and tribes prior to publication of the Notice of Intent (December 14, 2018) and after the scoping

period concluded (December 11, 2019). NOAA engaged in its first government-to-government consultation with the Onondaga Nation on July 30, 2020.

1.3.2.3 Coastal Zone Management Act

In 1972, Congress enacted the Coastal Zone Management Act (CZMA, 16 USC 1451 *et seq.*) to encourage coastal states, Great Lake states, and U.S. Territories and Commonwealths to preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone. Section 307 of the CZMA is known as the "federal consistency" provision. The federal consistency provision requires federal actions (inside or outside a state's coastal zone) that affect any land or water use or natural resource of a state's coastal zone, to be consistent with the enforceable policies of the state coastal management program. The term "effect on any coastal use or resource" means any reasonably foreseeable effect on any coastal use or resource resulting from the activity, including direct and indirect (cumulative and secondary) effects (15 CFR 930.11(g)). The federal consistency regulations can be found at 15 CFR part 930.

NOAA worked with the state of New York on developing the range of alternatives in this DEIS because it takes place wholly within New York state waters. NOAA will publish a proposed rulemaking to designate the sanctuary after receiving public comment on the DEIS. At that time, NOAA will prepare a consistency determination and send a letter to the New York Coastal Management Program to request the state's concurrence with the determination.

1.4 Scope of the Environmental Review

This DEIS analyzes and summarizes the environmental consequences of the proposed action and alternatives. The alternatives include proposed sanctuary boundaries, proposed regulatory concepts, and a sanctuary management plan to support the management and protection of the sanctuary's resources. The geographic scope of the affected environment in Chapter 4 and analysis of environmental consequences in Chapter 5 encompasses eastern Lake Ontario and the Thousand Islands Region of the St. Lawrence River.

Additionally, NOAA would implement non-regulatory actions as described in the proposed Lake Ontario National Marine Sanctuary draft management plan (Appendix A). The management plan outlines a series of management goals and strategies in the areas of research and monitoring, education and outreach, tourism and economic development, sanctuary resource protection, and sanctuary operations.

Some sanctuary management activities that may occur within the proposed sanctuary, including issuance of permits, are outside the scope of this DEIS, as NOAA does not have sufficient information regarding these projects at this time to conduct a meaningful analysis. When more details become available about these activities or when new activities arise, NOAA will assess whether their effects are adequately described in this DEIS. If they are not, NOAA will conduct additional environmental reviews and develop independent environmental compliance and consultation documentation, as needed. For each permit application received, NOAA would evaluate all environmental compliance requirements at that time, including compliance with NEPA and other environmental status (e.g., Endangered Species Act, Coastal Zone Management Act, and National Historic Preservation Act).

1.5 Organization of this Draft Environmental Impact Statement

This DEIS is organized as follows:

Chapter 1: Provides background on the National Marine Sanctuary System, the sanctuary nomination for Lake Ontario, and the sanctuary designation and environmental review processes under NMSA and NEPA.

Chapter 2: Outlines the purpose and need for the proposed designation of a national marine sanctuary in Lake Ontario.

Chapter 3: Describes the process to develop alternatives. Identifies the no action alternative, the two action alternatives, and the alternatives considered but eliminated from detailed evaluation. For each alternative, Chapter 3 describes the proposed boundary, regulations, and management plan.

Chapter 4: Describes the environment affected by the proposed sanctuary designation, including an overview of shipwrecks, the cultural maritime landscape, and human uses within the proposed sanctuary.

Chapter 5: Provides an analysis of the potential environmental consequences of each alternative and compares the environmental consequences across alternatives.

Chapter 6: Describes the unavoidable adverse impacts, the relationship of short-term and long-term productivity, and irreversible or irretrievable commitment of resources associated with the alternatives, per the requirements of NEPA.

1.6 Public Review of the DEIS

The next step of public involvement is to ensure wide circulation of the DEIS and to solicit public comments on this document. A public review period of at least 45 days follows publication of the DEIS. Availability of the DEIS is announced in the Federal Register, on various email lists, and on the project website. Public hearings will be held no sooner than 30 days after the notice is published in the Federal Register. During the public comment period, NOAA anticipates receiving oral and written comments from organizations; interested individuals; federal, state, and local agencies and officials; and nations and tribes. After the public comment period is over, NOAA will review the comments. If necessary, NOAA will make changes to the EIS and management plan as a result of the public comments. A summary of these comments and the corresponding responses from the agency will be included in the Final EIS.

This DEIS does not include specific regulatory text. NOAA will release proposed regulations separately following public comment on this DEIS. At that time, a detailed discussion of the regulatory text will be included in the notice of proposed rulemaking and published in the Federal Register for public comment.

Chapter 2: Purpose and Need for Action

2.1 Purpose of the Proposed Action

The purpose of the proposed action is to designate a national marine sanctuary in New York state waters in eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. The proposed designation would manage a nationally significant collection of historic shipwrecks and other underwater cultural resources through the implementation of a management plan that includes actions that are both non-regulatory and regulatory. Many of these shipwrecks have a high level of structural integrity due to the preservative properties of the cold, fresh lake water in which they are submerged, as well as the great depth at which several of them lie. NOAA is proposing this designation to: (1) protect nationally significant underwater cultural resources by addressing existing management gaps; (2) enhance ongoing research, education, and outreach efforts in support of these resources; (3) enhance responsible access to shipwrecks; and (4) promote recreation, tourism, and economic development opportunities. NOAA would co-manage the sanctuary with the state of New York.

The proposed designation of a national marine sanctuary in Lake Ontario would fulfill the purposes and policies of the NMSA, including:

- (1) “to identify and designate as national marine sanctuaries areas of the marine environment which are of special national significance and to manage these areas as the National Marine Sanctuary System” (16 USC 1431(b)(1));
- (2) “to provide authority for comprehensive and coordinated conservation and management of these marine areas, and activities affecting them, in a manner which complements existing regulatory authorities” (16 USC 1431(b)(2));
- (3) “to enhance public awareness, understanding, appreciation, and wise and sustainable use of the marine environment, and the . . . historical, cultural, and archaeological resources of the National Marine Sanctuary System” (16 USC 1431(b)(4));
- (4) “to support, promote, and coordinate scientific research on, and long-term monitoring of, the resources of these marine areas” (16 USC (b)(5));
- (5) “to facilitate to the extent compatible with the primary objective of resource protection, all public and private uses of the resources of these marine areas not prohibited pursuant to other authorities” (16 USC 1431(b)(6)); and
- (6) “to develop and implement coordinated plans for the protection and management of these areas with appropriate Federal agencies, State and local governments, Native American tribes and organizations⁷, international organizations, and other public and private interests concerned with the continuing health and resilience of these marine areas” (16 USC 1431(b)(7)).

⁷ Terminology from the National Marine Sanctuaries Act

2.2 Need for the Proposed Action

The need for the proposed action is to protect and preserve nationally significant underwater cultural resources in eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. Threats to these nationally significant sites include both natural processes and human activities. Natural processes include the damaging impacts of wind, waves, currents, storms, ice, and invasive species, such as zebra and quagga mussels, which currently cover many Lake Ontario shipwrecks. Human threats include anchor damage from dive boats, damage due to poorly attached mooring lines, artifact removal, artifacts being moved within a shipwreck site, remotely operated vehicle tethers entangled within a shipwreck, and fishing gear entangled within a shipwreck. Together, these processes threaten the long-term sustainability of historic shipwrecks and other underwater cultural resources and negatively impact their recreational and archaeological value.

To address these threats there is a need to:

- Protect these significant underwater cultural resources through a regulatory and non-regulatory framework;
- Document, further locate, and monitor these resources;
- Provide interpretation of their cultural, historical, and educational value to the public; and
- Promote responsible use of these resources for their recreational value.

2.2.1 Complementing and Supplementing Existing Regulatory Authorities

Without adequate legal protection, underwater cultural resources are extremely vulnerable to human disturbance. Even when there are legal protections, gaps in the law or in application of the law can still result in exploitation, damage, and irreparable loss and to our understanding of the past. When Congress amended the NMSA in 1984, it recognized that while there were numerous statutes that managed specific natural and historical resources, there were no statutes that took a holistic approach to managing multiple resources in marine areas. Therefore, Congress clarified that one purpose of the NMSA is to provide coordinated and comprehensive management of special areas of the marine environment that would complement other existing resource protection laws (Pub. L. 98-498, 98 Stat. 2296 (1984)).

By designating this area as a national marine sanctuary, NOAA would implement site-specific regulations to complement and supplement existing federal and state statutes designed to protect underwater cultural resources and fill current legal gaps to ensure this area of special national significance is recognized, managed, researched, interpreted, and accessible to the public. See Section 3.4.2 for an overview of potential sanctuary regulations and Appendix C for a comprehensive analysis of how the NMSA would complement and supplement existing state and federal authorities. A summary is provided below.

Federal statutes that provide some level of protection for underwater cultural resources include the Sunken Military Craft Act (SMCA; 10 USC 113 note (2004)), Archaeological Resources

Protection Act (ARPA; 16 USC 470aa *et seq.*), NHPA, CZMA, and NEPA. The SMCA protects sunken military craft from injury, removal, or disturbance. However, the SMCA only applies to a small subset of sunken vessels in the proposed sanctuary, as the vast majority of abandoned shipwrecks in the sanctuary are not military vessels. The ARPA, NHPA, CZMA, and NEPA all created public processes whereby federal agencies must assess alternatives or mitigation measures to minimize impacts to cultural resources by any federal action that is undertaken, licensed, or permitted by a federal agency or funded with federal dollars. However, preservation provisions in these laws do not apply to activities conducted by private citizens; are project-specific; and do not provide a comprehensive, long-term resource management framework for underwater cultural resources.

New York state statutes that provide some protection for cultural resources are the State Education Law and The New York Historic Preservation Act of 1980. Historic shipwrecks in New York are protected by the State Education Law, which makes it unlawful for any person to “investigate, excavate, remove, injure, appropriate or destroy any object of archaeological, historical, cultural, social, scientific, or paleontological interest situated on, in or under lands owned by the state of New York without written permission of the commissioner of education” (N.Y. Educ. Law 233(4)). However, the program is largely focused on permitting terrestrial resources rather than submerged resources. By focusing entirely on underwater cultural resources, the proposed sanctuary would enhance existing state protections and programs for these resources.

Related, the New York Historic Preservation Act of 1980 mirrors the NHPA by requiring state agencies to assess the potential impacts of projects that they fund, permit, or approve on cultural resources that are eligible or listed on the State Register of Historic Places and National Register of Historic Places. However, only one shipwreck in Lake Ontario has been listed on these registers, and the act applies to activities that are funded, licensed, or approved by state agencies but not to those conducted by private entities. The NMSA would supplement the New York Historic Preservation Act of 1980 by applying to activities conducted by federal, state, and private citizens and would protect all shipwrecks and other cultural underwater resources within sanctuary boundaries regardless of whether they are eligible or listed on the State Register of Historic Places and National Register of Historic Places.

Designating the proposed national marine sanctuary under the NMSA would complement and supplement these state and federal cultural resource protection laws by creating a uniform regulatory regime to manage these nationally significant resources. Sanctuary regulations would protect all underwater cultural resources in the sanctuary’s boundaries, regardless of whether the sites are eligible or listed on the state and national registers, or whether they are military craft or privately owned vessels. The regulations in the proposed sanctuary would also apply to all federal, state, and private undertakings. As mentioned above, designation under the NMSA would provide an active, comprehensive management regime for these nationally significant underwater cultural resources that the other federal statutes do not cover.

Sanctuary designation also provides additional enforcement authorities to protect resources. A violation of state law would be classified as a criminal violation; there are no civil penalties prescribed under state law. In addition, there are limited mechanisms for detecting violations or

for responding to reported violations of Section 233 permits. In contrast, the NMSA authorizes NOAA to assess civil penalties for violations of the NMSA or its implementing regulations, as well as damages against parties that injure sanctuary resources. Criminal actions require a higher standard and more effort on the part of law enforcement. Civil penalties provide for a simpler “ticket-based” approach to violations.

2.2.2 Management Tools to Address Threats to Underwater Cultural Resources

Field research, collection of baseline data, and long-term monitoring are integral to mitigating negative human and natural impacts on underwater cultural sites. NOAA relies on monitoring programs for sanctuary resources because it helps the agency identify resource changes over time, evaluate negative impacts at underwater cultural sites, and develop a range of resource protection measures. These mitigation measures include placing permanent moorings at shipwreck sites, developing anchoring and site access best management practices, increasing targeted law enforcement activities, targeting education and outreach initiatives, and prioritizing research and surveying projects.

In addition, there are numerous shipwrecks yet to be discovered in the proposed sanctuary. Locating these shipwrecks through remote sensing surveys is an essential step in fully characterizing and managing the area. A national marine sanctuary can both provide and attract resources and partners to accomplish these surveys, thereby enhancing proactive management of underwater cultural resources. New York state does not have the existing capacity to meet this need.

Finally, NOAA would develop education and outreach programs to educate the public about the significance of these underwater cultural resources and to promote sustainable recreation and tourism opportunities in the proposed sanctuary. NOAA’s education and outreach efforts encourage the responsible use of sanctuary resources, promote a sense of public stewardship, help reduce human impacts, and promote accessibility.

2.3 Co-Management with New York State

NOAA would co-manage the proposed sanctuary with New York state. NOAA’s expertise in cultural resource management would complement the state’s current historical resource protection activities and bring a comprehensive and coordinated management approach to this historic collection of nationally significant underwater cultural resources. NOAA would work with the state and other partners to conduct research and monitoring activities to fill important gaps in the archeological knowledge and historical context of these shipwrecks, enforce sanctuary regulations, enhance public appreciation of the significance of these resources, mitigate human impacts, maintain sustainable access to the resources, and encourage public stewardship of the area.

Chapter 3: Alternatives

3.1 Introduction

This chapter describes the alternatives NOAA developed and the process used to develop them. NOAA developed its reasonable range of alternatives, including the No Action Alternative, as required by the CEQ's NEPA regulations (40 CFR 1502.14, 1505.1(e) (1978))⁸ and the NOAA NEPA Companion Manual.

NOAA is considering a No Action Alternative and two action alternatives. Under the No Action Alternative, NOAA would not move forward with the designation of Lake Ontario National Marine Sanctuary. Under each of the action alternatives, NOAA would designate a national marine sanctuary and implement regulations and a sanctuary management plan to manage the sanctuary. In this chapter, NOAA outlines concepts for sanctuary regulations. NOAA will consider this feedback in the next step of the designation process when formulating proposed regulations for Lake Ontario National Marine Sanctuary.

Each of the action alternatives are comprised of three components, including:

Boundary: Boundaries of the proposed sanctuary.

Regulations: Initial regulatory concepts NOAA would implement to manage the proposed sanctuary.

Management Plan and Field Activities: Non-regulatory activities, such as education, outreach, and research that NOAA would implement to manage the sanctuary.

3.2 No Action Alternative

Under the No Action Alternative, NOAA would not designate the proposed Lake Ontario National Marine Sanctuary. The long-term protection and management of New York's underwater cultural resources would remain under existing state and federal authorities and programs. Under this alternative, existing legal protection now provided by Section 233 of the New York Education Law would not be strengthened by sanctuary regulations. Without the designation of the proposed Lake Ontario National Marine Sanctuary, NOAA resources would not be available to strengthen partnerships, to assist in the comprehensive management of underwater cultural resources, and to provide additional resources for education, research, monitoring, and enforcement.

⁸ This provision was relocated to 40 C.F.R. 1507.3(c) by the 2020 CEQ regulations. As noted above, *supra* note 1, this review is proceeding under the 1978 CEQ regulations.

3.3 Development of the Action Alternatives

This section describes how NOAA developed the proposed action alternatives, including proposed sanctuary boundaries, regulatory concepts, and management plan activities.

3.3.1 Development of Proposed Boundaries

This section identifies how NOAA developed its two boundary options:

1. 1,786 square miles in eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River
2. 1,724 square miles in eastern Lake Ontario

The first step in developing boundary options involved reviewing the sanctuary nomination, gathering comments during the scoping period, working with the Sanctuary Advisory Council, and coordinating with the state of New York. The second step involved NOAA's internal research to better understand the location and importance of shipwrecks and other maritime heritage resources within the region, and then developing proposed boundaries to manage such resources.

3.3.1.1 Consultations and Public Input

New York's nomination asked NOAA to consider designating an area of eastern Lake Ontario as a national marine sanctuary. According to the nomination, this area includes a nationally significant collection of 21 known shipwrecks and one aircraft in that portion of eastern Lake Ontario. The nomination also included HMS *Ontario*, a shipwreck in a noncontiguous area west of the eastern Lake Ontario area. In addition, the nomination indicated that according to contemporary vessel loss reports and news reports, there may be an additional 47 shipwrecks and two historic aircraft within the nominated area.

During NOAA's 105-day public comment period (April - July 2019), individuals provided comments that strongly supported the goals of sanctuary designation, including protecting Lake Ontario's nationally significant shipwrecks, enhancing tourism and the local economy, and fostering education and science programs. Several commenters suggested adding a portion of the St. Lawrence River to the proposed sanctuary boundary based on the number of shipwrecks in the Thousand Islands region of the river and the opportunities to manage and protect these shipwrecks.

NOAA also established a Sanctuary Advisory Council to provide advice to the agency during the sanctuary designation process. The council provided input to NOAA on the Draft Management Plan during the period of April 2020 through November 2020, as well as ongoing input, including information on the area's shipwrecks.

As the proposed sanctuary would be co-managed by NOAA and the state of New York, NOAA consulted with state agency personnel on all aspects of the proposed sanctuary, including the boundary options. The state of New York supported considering the addition of the Thousand Islands region of the St. Lawrence River as a boundary alternative. Based on these consultations and public input, NOAA added an alternative that includes a portion of the Thousand Islands region of the St. Lawrence River.

3.3.1.2 NOAA's Research on Development of Proposed Boundaries

To inform its identification of boundary options, NOAA conducted research to verify the accuracy of information in the nomination and to consider whether the nominated boundary should be modified to include additional underwater cultural resources. Following the NRHP site eligibility guidelines, NOAA only considered resources over 50 years of age to be “historic.”

Maritime historians have long had an interest in Great Lakes shipping and commerce. To identify underwater cultural resources in eastern Lake Ontario and the St. Lawrence River, NOAA worked with existing Great Lakes shipwreck databases to compile a list of potential shipwrecks, aircraft, and other archaeological sites. NOAA conducted additional historical research for each vessel and aircraft to determine if the site is likely still located within the nominated area, or if it was destroyed and/or salvaged after the wrecking event. NOAA then reached out to Great Lakes historians, Lake Ontario and St. Lawrence River shipwreck experts, and regional archaeologists to determine the accuracy of these historical records (see Section 4.2 for a detailed analysis of the resources in the area). In many cases, divers and shipwreck explorers who surveyed these reported loss locations for shipwreck remains did not locate the targets. In these instances, it is likely that the vessel or aircraft was removed (but not recorded as such) or the loss location was reported incorrectly. These resources are tracked in a database by NOAA but are not included in the counts of potential resources within the proposed sanctuary.

3.3.2 Development of Proposed Regulatory Concepts

Under the NMSA, NOAA establishes site-specific regulations at each national marine sanctuary based on threats to sanctuary resources. Based on an analysis of threats facing underwater cultural resources in Lake Ontario and the Thousand Islands Region, input from public scoping meetings, consultation with the state of New York, and input from the Sanctuary Advisory Council, NOAA is considering the following prohibitions for the proposed Lake Ontario National Marine Sanctuary:

- Damage/injury to underwater cultural resources
- Use of anchors and grappling hooks at shipwreck sites
- Use of tethered systems (such as remotely operated vehicles) at shipwreck sites without a permit
- Possession and sale of artifacts

NOAA is seeking public comment on the concepts of these prohibitions. A description of the draft prohibitions is in Section 3.4 (Alternative 1). In the next step of the designation process, NOAA will consider public comments it has received when formulating proposed regulations for Lake Ontario National Marine Sanctuary. See Section 1.6 for more information on this public process.

3.3.3 Development of Draft Management Plan

Management plans are sanctuary-specific planning and management documents used by all national marine sanctuaries. Management plans fulfill many functions, including describing regulations and boundaries; outlining staffing and budget needs; setting priorities and

performance measures for resource protection, research, and education programs; and guiding development of future budgets and management activities. This plan would chart the course for the proposed sanctuary over the next five to ten years.

NOAA received input from the Sanctuary Advisory Council on the Draft Management Plan, including strategies and activities to achieve the proposed sanctuary's management goals. Using management plans from Thunder Bay National Marine Sanctuary and proposed Wisconsin Shipwreck Coast National Marine Sanctuary as examples, Sanctuary Advisory Council subcommittees wrote the following Action Plans: Research and Monitoring, Education and Outreach, Tourism and Economic Development, and Resource Protection. After a period of review by Sanctuary Advisory Council members, the council passed a resolution on November 19, 2020, to submit the Draft Management Plan to NOAA.

Based on public input provided during scoping, input from the Sanctuary Advisory Council, and NOAA's expertise managing other national marine sanctuaries, NOAA identified the following goals for the Draft Management Plan:

- **Sanctuary Operations Action Plan:** Create sanctuary infrastructure and program support to ensure effective implementation of the management plan.
- **Education and Outreach Action Plan:** Enhance public awareness, understanding, and stewardship of the sanctuary, the Great Lakes, and the ocean.
- **Research and Monitoring Action Plan:** Conduct research to support resource protection, resource management, and education initiatives.
- **Tourism and Economic Development Action Plan:** Create opportunities to promote the sanctuary to enhance tourism and support the business sector.
- **Resource Protection Action Plan:** Strengthen resource protection by conducting on-water resource protection activities, promoting responsible use of sanctuary resources, developing education initiatives for users, and enhancing enforcement efforts.

3.4 Alternative 1 (Eastern Lake Ontario and Thousand Islands)

This section describes the components of Alternative 1, which includes a proposed boundary, proposed regulatory concepts, and implementation of a management plan. NOAA will specify the proposed boundary coordinates, including the areas proposed to be excluded, when NOAA publishes a proposed rule for public review and comment.

3.4.1 Proposed Boundary (Alternative 1)

3.4.1.1 Boundary Description

Under Alternative 1, the proposed sanctuary boundary would include 1,786 square miles in eastern Lake Ontario and the Thousands Islands region of the St. Lawrence River. More specifically, the sanctuary would incorporate 1,724 square miles of eastern Lake Ontario waters and 62 square miles of the St. Lawrence River from the mouth of the river to Chippewa Bay northeast of Oak Island. The sanctuary would border the counties of Wayne, Cayuga, Oswego, and Jefferson, and a portion of St. Lawrence County (Figure 3.1).

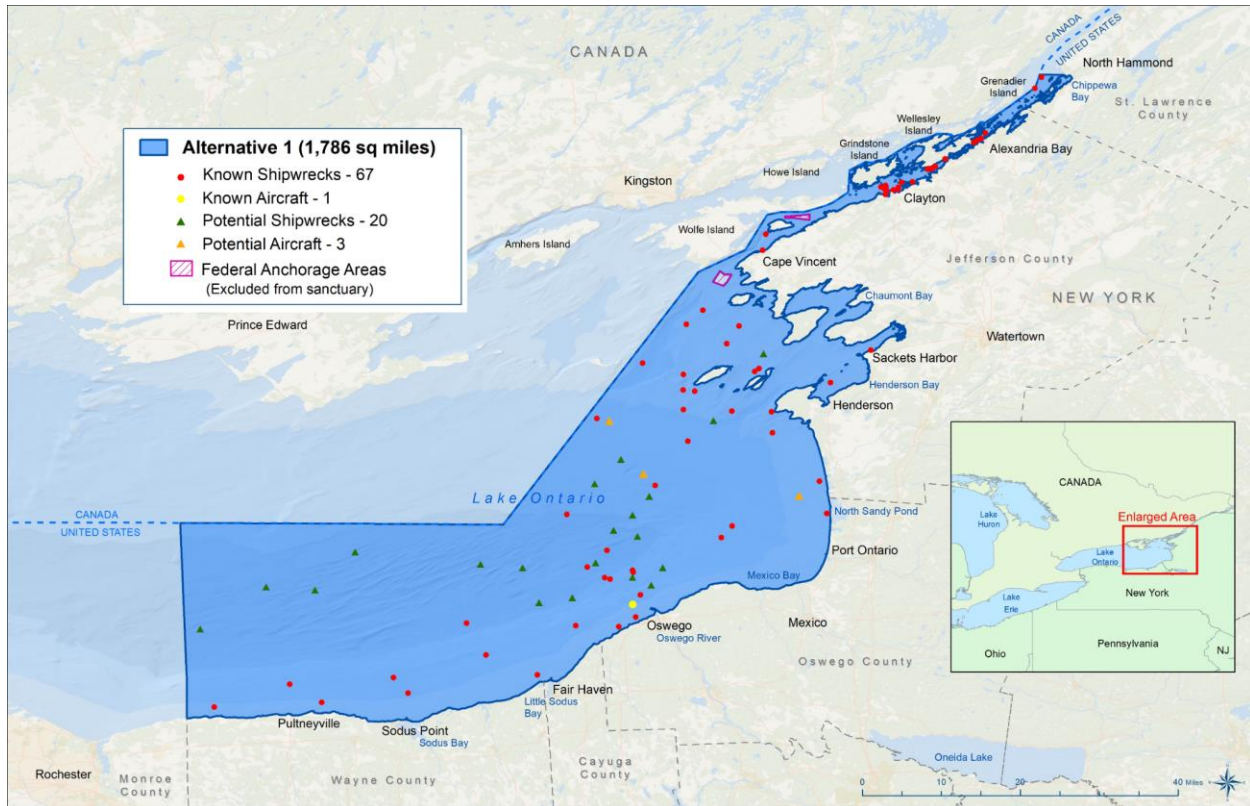


Figure 3.1. Geographic boundaries of Alternative 1, which covers 1,786 square miles of eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. Image: NOAA.

For the Lake Ontario shoreline, NOAA would set the shoreline sanctuary boundary at the Low Water Datum (LWD). The LWD is set at a fixed elevation of 243.3 feet above sea level. The LWD is determined by the U.S. Army Corps of Engineers and is the chart datum to which soundings are referenced for NOAA charts in the Great Lakes. The LWD is also well understood internationally because it is a fixed datum for each lake relative to the International Great Lakes Datum 1985. The state of New York uses the LWD as the line that delineates public ownership.

NOAA would set the northern boundary along the U.S. and Canadian border in both Lake Ontario and the St. Lawrence River. The western sanctuary boundary would be at the western border of Wayne County and the eastern boundary would be around Chippewa Bay in St. Lawrence County. Along the St. Lawrence River, the landward boundary would be the Ordinary

High Water Mark (OHWM), which delineates the publicly-owned bottomlands. The OHWM is defined as “the line on the shore in non-tidal areas established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding area” (U.S. Army Corps of Engineers New York District, 2014).

3.4.1.2 Underwater Cultural Resources Within the Boundary

As listed in Table 3.1, Alternative 1 would include a total of one aircraft and 67 known shipwrecks, including one shipwreck, *St. Peter*, listed on the NRHP. Additional underwater cultural resources that may be within the boundaries include other aircraft and archaeological features other than shipwrecks, such as remnants of shipwrecks, remnants of piers, aids to navigation, and potential Indigenous artifacts. This area may also include approximately 20 potential shipwreck sites (shipwrecks may exist, but additional research is needed to verify and describe these shipwrecks), two aircraft, and 12 other underwater archaeological sites. See Section 4.2 for additional information regarding the historical and cultural importance of these shipwrecks.

Table 3.1. Number of known and potential shipwrecks to be discovered within Alternative 1’s boundary, which covers part of eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River.

	Known Shipwrecks	Potential Shipwrecks	Known Aircraft	Potential Aircraft
Eastern Lake Ontario	43	20	1	3
Thousand Islands Region	21	0	0	0
Total Sites Within Alternative 1	64	20	1	3

3.4.1.3 Exclusion of Areas from Proposed Boundary

To ensure compatible use with commercial shipping and other activities, NOAA would exclude the ports and harbors of Oswego, Pultneyville, Little Sodus, Great Sodus, and Port Ontario⁹. NOAA would also exclude the federal navigation channel approaches, designated open water dredge disposal areas, and federal anchorage areas from the proposed sanctuary. NOAA is proposing to exclude these areas from the sanctuary boundary to avoid unintended effects on port operations critical to the local, regional, and national economies. NOAA would also exclude privately owned bottomlands from the sanctuary.

⁹ NOAA is not proposing the exclusion of Cape Vincent and Sackets Harbor at this time due to the presence of underwater cultural resources.

3.4.2 Proposed Regulatory Concepts (Alternative 1)

NOAA is proposing the following concepts for definitions and regulations to implement under Alternative 1 to manage and protect the underwater cultural resources in the proposed Lake Ontario National Marine Sanctuary. The regulations address threats to underwater cultural resources as identified in Chapter 2 and would complement and supplement existing New York statutes protecting underwater cultural resources. NOAA is seeking public comment on these proposals and will consider these comments when preparing a proposed rulemaking to designate the sanctuary.

Under Alternative 1, NOAA proposes the following **definitions** to clarify how the regulations would apply in the proposed sanctuary:

Generally, “sanctuary resource” would be defined as: all prehistoric, historic, archaeological, and cultural sites and artifacts within the sanctuary boundary, including all shipwreck sites. This includes any historic sunken craft, its components, cargo, contents, and associated debris field.

Generally, “tethered system” would be defined as: remotely operated vehicles (ROVs), drop cameras, and other submersibles that are connected directly to a station-holding surface support craft by means of a tether/umbilical. The term ‘tethered systems’ in this definition does not include towed systems, such as side-scan sonar, magnetometers, survey trawls, or other survey instruments that are pulled behind a vessel via a tow cable.

NOAA proposes the following concepts for sanctuary regulations:

1. Prohibit damage to sanctuary resources.

NOAA is proposing to prohibit the following activities: moving, removing, recovering, altering, destroying, possessing, or injuring sanctuary resources. This prohibition aims to reduce the risk of harm to sanctuary resources. NOAA has implemented similar regulations at other national marine sanctuaries and has determined that it effectively protects underwater cultural resources while allowing for compatible uses within the sanctuary.

This prohibition would strengthen Section 233 of the New York State Education Law, which makes it unlawful for any person to “investigate, excavate, remove, injure, appropriate or destroy any object of archaeological, historical, cultural, social, scientific or paleontological interest situated on, in or under lands owned by the state of New York without written permission of the commissioner of education” (N.Y. Educ. Law 233(4)). This state regulation currently applies to all Lake Ontario and St. Lawrence River waters and would continue to apply to these resources if the sanctuary were designated.

2. Prohibit grappling into or anchoring on shipwreck sites.

To preserve the integrity of shipwreck sites in the proposed sanctuary, NOAA is proposing to prohibit grappling into or anchoring on shipwreck sites. In consultation with the state of New York, specifically the New York State Office of Parks, Recreation and Historic Preservation, New York State Museum, and New York Department of State, these state agencies noted the importance of preventing anchor damage to shipwreck sites. In addition,

the Sanctuary Advisory Council subcommittee on resource protection noted that anchor damage exists at some shipwreck sites.

To facilitate sustainable recreational access to shipwrecks, NOAA would develop a mooring program to install and maintain access at popular dive sites. These moorings would include buoys and other types of access infrastructure for sites where buoy placement is not advisable, such as in shipping channels. Moorings would provide secure and convenient anchoring points for users, which would mitigate damage from grappling or anchoring. NOAA would also publish guidelines on best practices for anchoring near shipwreck sites to avoid violating this prohibition.

3. *Implement permit system for operating tethered systems at shipwreck sites.*

NOAA is proposing to manage operation of tethered systems at shipwreck sites by implementing a no-fee permit system for such operations. NOAA would review project proposals to ensure that operators are adequately prepared to access sanctuary resources in a responsible manner and would adhere to best management practices when exploring and documenting shipwreck sites.

Tethered systems are widely used in submerged mapping and exploration activities and are currently the best way to access cultural resources at depths beyond recreational and technical diving limits. Depending on the system used, these can pose various threats to shipwrecks, including collision damage, discarded ballast weights, and tether entanglement issues, which could result in extreme tension on delicate shipwreck resources. As tethered instrument use has continued to increase in the scientific, commercial, and recreational user communities, there is a heightened threat of damage to underwater cultural resources by these systems. The impact from such activities can result in damage to artifact assemblages, the aesthetic value of the site, and the structural integrity of a site. This may be a threat in the proposed sanctuary, as there are a high number of wrecks that have intact masts and high site integrity. Site integrity is necessary for determination of NRHP eligibility, and loss of integrity may make an associated resource ineligible.

This proposed prohibition is not intended to apply to towed remote sensing, including side-scan sonar operations. NOAA has determined that these systems do not pose the same threat to sanctuary resources as the tethered systems described above because most of the sanctuary resources in the proposed sanctuary are deep enough to avoid interacting with towed system gear, which primarily operate at shallow depths.

4. *Prohibit possessing, selling, purchasing, transporting, importing, or exporting any sanctuary resource within or outside of the sanctuary.*

This prohibition is intended to deter illegal salvage and sale of sanctuary resources and to further the policy of *in situ* preservation. As noted, the listed activities would be prohibited both within and outside of the sanctuary.

5. *Emergency Regulations*

Nationwide sanctuary regulations include a general authority for instituting emergency regulations. Emergency regulations would be used on a limited basis and under specific conditions when an imminent risk to sanctuary resources exists and a temporary prohibition would prevent the destruction or loss of those resources. NOAA proposes to include in the Lake Ontario National Marine Sanctuary regulations site-specific procedures for issuing emergency regulations. Under these procedures, an emergency regulation would not take effect without the approval of the governor of New York or her/his designee or designated agency. NOAA would only issue emergency regulations that address an imminent risk for a maximum of six months or a fixed amount of time less than six months. Emergency regulations could only be extended once for no more than an additional six months. In the circumstance that NOAA proposes to make an emergency regulation permanent, NOAA would be required to conduct a full rulemaking process and associated environmental review, which would include a public comment period.

3.4.2.1 *Permitting*

NOAA proposes to include in the Lake Ontario National Marine Sanctuary regulations the authority to issue general permits, certifications, and authorizations to allow otherwise regulated or prohibited activities to occur in the sanctuary under certain conditions. Pursuant to NMSA section 310, NOAA has the authority to issue special use permits for certain categories of activities described in the Federal Register. As described below, the NMSA provides these authorities as a range of options to allow sanctuary managers the flexibility to address compatible uses while protecting sanctuary resources.

General Permits

Similar to other national marine sanctuaries, NOAA proposes to require a sanctuary general permit when an individual wishes to conduct an activity within the proposed sanctuary that is otherwise prohibited by sanctuary regulations (see proposed prohibitions above). General permits may only be issued for otherwise prohibited activities that further the purposes of sanctuary education, research, or management. NOAA would execute this permit authority using the existing application procedures and permit review criteria. The [permit application materials](#)¹⁰ and additional information related to general permits are available online.

Authorizations

NOAA proposes to issue authorizations that would allow an individual to conduct an otherwise prohibited activity within the sanctuary if that activity is specifically authorized by any valid federal, state, or local lease, permit, license, approval, or other authorization. The proposed authorization authority is intended to streamline regulatory requirements by reducing the need for multiple permits for the same activity.

¹⁰ <https://sanctuaries.noaa.gov/management/permits/>

Certifications

NOAA proposes to issue certifications to allow an otherwise prohibited activity to occur within the sanctuary if that activity were specifically authorized by any valid federal, state, or local lease, permit, license, approval, or other authorization before the time of designation, pursuant to 15 CFR 922.47. NOAA would consider issuing certifications for such authorized activities that are in place at the time the sanctuary designation becomes effective, provided that the holder of such authorization or right complies with NOAA's certification procedures and criteria within the timeline NOAA lays out to complete certifications. The certification process allows ("grandfathers") certain existing authorized activities while seeking to minimize the impact on sanctuary resources through terms or conditions established during the certification process.

Special Use Permits

Under section 310 of the NMSA (16 USC 1441), NOAA may issue a special use permit and collect fees for the conduct of specific activities in a national marine sanctuary if such authorization is necessary to either (1) "establish conditions of access to and use of any sanctuary resource" or (2) "promote public use and understanding of a sanctuary resource." NOAA has identified several categories of [special use permit activities](#)¹¹.

Generally, applicants for special use permits would submit a general permit application (as described above). Applications for special use permits would be reviewed to ensure that the activity is compatible with the purposes for which the sanctuary is designated and that the activities carried out under the special use permit are conducted in a manner that does not destroy, cause the loss of, or injure sanctuary resources.

The NMSA requires that NOAA provide "appropriate public notice before identifying any category of activity subject to a special use permit" (section 310(b) of the NMSA). NOAA issued two Federal Register notices to describe the types of activities that require the issuance of a special use permit (78 FR 25957 (May 3, 2013); 82 FR 42298 (September 7, 2017)). To qualify for a special use permit, an activity must be among those listed in these notices.

NOAA also requires special use permittees to purchase and maintain comprehensive general liability insurance, or post an equivalent bond, against claims arising out of activities conducted under the permit. The NMSA allows NOAA to assess and collect fees for the conduct of any activity under a special use permit. The fees are calculated to recover the administrative costs of issuing the permit, the cost of implementing the permit, and the fair market value of the use of sanctuary resources. The fees may be used for issuing and administering permits and managing national marine sanctuaries.

3.4.3 Proposed Management Plan and Field Activities (Alternative 1)

This section describes the management plan and associated field activities NOAA would implement in the proposed Lake Ontario National Marine Sanctuary under Alternative 1.

¹¹ <https://sanctuaries.noaa.gov/management/permits/special.html>

3.4.3.1 Proposed Management Plan (Alternative 1)

Under Alternative 1, NOAA would implement a sanctuary management plan that describes the goals, actions, and strategies intended to help conserve and promote the underwater cultural resources that have been located in the proposed sanctuary and those that await discovery, as well as to foster sustainable use of the proposed sanctuary. See Appendix A for the full draft management plan.

Management plans are sanctuary-specific planning documents that outline a series of management goals and strategies in the areas of education and outreach, research and monitoring, resource protection, and sanctuary operations. The management plan complements the proposed sanctuary regulations in key areas. It would set priorities to guide sanctuary programs and operations and provide the public with an understanding of the sanctuary's strategies to conserve and promote the underwater cultural resources of the proposed sanctuary. The actions are designed to strengthen and complement existing regulatory and non-regulatory protections currently in place under the state of New York.

The proposed management plan for Lake Ontario consists of five action plans:

- **Sanctuary Operations:** Create sanctuary infrastructure, staffing, and program support to ensure effective implementation of the overall management plan.
- **Research and Monitoring:** Conduct research to support resource protection, resource management, and education initiatives.
- **Education and Outreach:** Enhance public awareness, understanding, and stewardship of the sanctuary, the Great Lakes, and the ocean.
- **Tourism and Economic Development:** Create opportunities to promote the sanctuary to enhance tourism and support the business sector.
- **Resource Protection:** Strengthen resource protection by conducting on-water resource protection activities, promoting responsible use of sanctuary resources, developing education initiatives for users, and enhancing enforcement efforts.

NOAA proposes to work in cooperation on the Draft Management Plan action plans with the New York Office of Parks, Recreation and Historic Preservation; New York State Museum; New York State Office of General Services; New York State Department of Environmental Conservation; and New York State Department of State (including the New York Coastal Management Program) in their role as trustees for state resources. In addition, partnerships with private businesses, non-governmental organizations, educational and cultural institutions, and other local, state, and federal agencies would provide expertise for scientific research and exploration, resources and capacities for site monitoring and enforcement, and support for education and outreach programs. The many partnerships developed over the course of this nomination and designation process have been, and would continue to be, critical to the success of the sanctuary.

3.4.3.2 Proposed Field Activities to Implement the Sanctuary Management Plan (Alternative 1)

In order to implement the proposed Draft Management Plan, NOAA would conduct the following categories of field activities: vessel operations and maintenance; scuba or snorkel operations; deployment of autonomous underwater vehicles (AUVs), remotely operated vehicles (ROVs), and potentially gliders and drifters; and installation of permanent mooring systems.

Vessel Operations and Maintenance

The Great Lakes field season typically occurs from early spring through late fall. Experience at Thunder Bay National Marine Sanctuary, located in Lake Huron, suggests that NOAA would operate vessels approximately 40-50 days on the water per year, though less in the sanctuary's initial years of operation. NOAA's Great Lakes fleet is managed by the NOAA Great Lakes Environmental Research Lab but used by several NOAA program offices. Vessels in the fleet range from 26-80 feet in length with a variety of capabilities to support remote sensing sonar operations, diving, and other marine operations and archaeological fieldwork. All NOAA-operated vessels would follow ONMS best management practices for field activities and NOAA [Small Boat Safety Program](#)¹² guidelines (NAO 209-125).

Scuba Diving, Echosounders (Sonars), Remotely Operated Vehicles, and Other Operations

One of the priorities in the management plan would be to characterize the proposed sanctuary's underwater cultural resources and landscape features. This is typically accomplished with remote sensing surveys using sonars, diving, and remotely operated vehicle (ROV) operations when underwater cultural resources are found. Experience at Thunder Bay National Marine Sanctuary suggests that as the sanctuary matures, NOAA and its partners would conduct approximately 300 dives per year (fewer in initial years of sanctuary operation), use both towed and hull-mounted sonars for several weeks per year, and support other operations, such as autonomous and remotely operated underwater vehicles, as opportunities arise.

Due to the depths of some shipwreck sites, accessing these sites would require technical diving operations. These operations would generally consist of up to six bottom/support divers in the water accessing shipwreck sites at depths between 150-330 feet. When engaged in this type of diving, sanctuary research vessels typically operate in a "live boat" mode, meaning they are not anchored. A small weighted visual surface buoy marker would be deployed on the dive site to guide divers to the bottom. Divers typically conduct non-invasive recording (photo-video documentation and measurements) and deploy self-contained lift bags (air-fillable canvas float bags) as an ascent line.

NOAA staff would employ echosounders (sonars) to locate and identify underwater cultural resources and landscape features. The sanctuary would use towed and hull-mounted echosounders that transmit repeated series of short sound pulses to image the subsurface. The echosounders may be single beam or multibeam, which transmits a fan of acoustic energy for greater bottom coverage. During a survey, a vessel equipped with one or more echosounders

¹² <https://www.noaa.gov/organization/administration/nao-209-125-noaa-small-boat-safety-program>

"mows the lawn" at a slow speed to ensonify (or visualize) the subsurface and ensure full coverage within each project area. NOAA would conduct up to 20 expeditions per year using towed or hull-mounted sonars. Each deployment would typically last for up to one week and operate 12-24 hours per day.

NOAA uses ROVs and uncrewed systems to carry and operate scientific instruments and cameras to collect data. NOAA would conduct up to 20 deployments of ROVs or other uncrewed systems per year. ROVs are operated remotely by a human operator and are often tethered to a crewed vessel. Uncrewed systems operate with various levels of autonomy and include uncrewed underwater vehicles (UUVs, sometimes referred to as autonomous underwater vehicles or AUVs) and uncrewed surface vehicles (USVs, sometimes referred to as autonomous surface vehicles or ASVs). These items use a variety of propulsion sources, including diesel, diesel/electric, battery, solar, buoyancy driven, and wave-gliding propulsion systems.

Deployment of Infrastructure for Site Access, Including Mooring Systems

One method of promoting public access while protecting shipwrecks is to install and maintain permanent moorings at popular diving locations. Moorings would provide secure and convenient anchoring points for users and eliminate the need for anchoring directly into a shipwreck site. In addition, moorings facilitate public access and safer diving by providing a sturdy means of descent and ascent for divers.

NOAA anticipates installing permanent moorings at certain shipwreck sites within the proposed sanctuary. The mooring systems would generally consist of a mooring block positioned near a shipwreck site, to which appropriately sized tackle, subsurface float, and surface buoy would be attached and would be regularly inspected and maintained for safety and utility. NOAA would follow best practices when selecting mooring installation locations, such as avoiding any cultural resources or sensitive benthic habitats.

Due to the unique geography of the region, particularly in the St. Lawrence River, some diveable shipwreck sites are located on the bottom directly underneath active shipping lanes. Consequently, surface moorings as described above may not be feasible at such sites. Subsurface systems or offset guidelines may be developed to create infrastructure that would limit impacts to the shipwrecks and create a safe, secure means of egress, without leaving a permanent obstruction in the waterway.

3.5 Alternative 2 (Eastern Lake Ontario)

3.5.1 Proposed Boundary (Alternative 2)

3.5.1.1 Boundary Description

Under Alternative 2, the proposed sanctuary boundary would include 1,724 square miles of eastern Lake Ontario. This area includes the same underwater cultural resources included in Alternative 1 in the eastern Lake Ontario segment, but would not include underwater cultural resources in the St. Lawrence River. NOAA would set the boundary within Lake Ontario as described above for Alternative 1 (Figure 3.2).

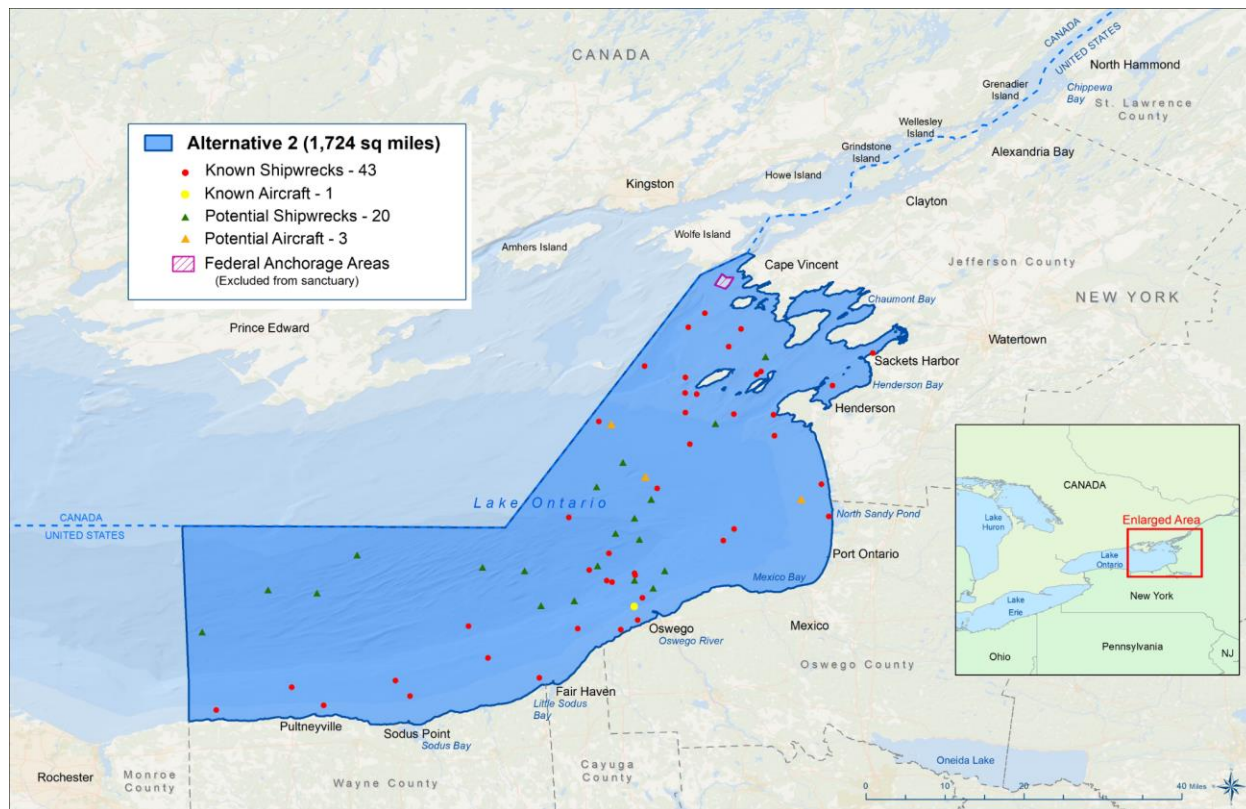


Figure 3.2. Geographic boundaries of Alternative 2, which would cover 1,724 square miles of eastern Lake Ontario. Image: NOAA

3.5.1.2 Underwater Cultural Resources Within the Boundary

As listed in Table 3.2, Alternative 2 would include a total of one aircraft and 43 known shipwrecks, including one shipwreck (*St. Peter*) that is listed on the NRHP. Additional underwater cultural resources that may be within the boundaries include other aircraft and archaeological features other than shipwrecks, such as remnants of shipwrecks, remnants of piers, aids to navigation, and potential Indigenous artifacts. This area may also include approximately 20 potential shipwreck sites (shipwrecks may exist, but additional research is needed to verify and describe these shipwrecks), three aircraft, and several other underwater archaeological sites. See Section 4.2 for additional information regarding the historical and cultural importance of these shipwrecks.

Table 3.2. Number of known and potential shipwrecks to be discovered within Alternative 2's boundary, which covers part of eastern Lake Ontario.

Sanctuary Resource	Number of Sites Within Alternative 2
Known Shipwrecks	43
Potential Shipwrecks	20
Known Aircraft	1
Potential Aircraft	3

3.5.1.3 Exclusion of Areas from Proposed Boundary

To ensure compatible use with commercial shipping and other activities, NOAA would exclude the ports and harbors of Oswego, Pultneyville, Little Sodus, Great Sodus, and Port Ontario¹³. NOAA would also exclude the federal navigation channel approaches, designated open water dredge disposal areas, and federal anchorage areas (in the St. Lawrence River) from the proposed sanctuary. NOAA is proposing to exclude these areas from the sanctuary boundary to avoid unintended effects on port operations critical to the local, regional, and national economies. NOAA would also exclude privately owned bottomlands from the sanctuary.

3.5.2 Proposed Regulatory Concepts (Alternative 2)

The regulations under Alternative 2 would be the same as those described above under Alternative 1 (see Section 3.4.2).

3.5.3 Proposed Management Plan and Field Activities (Alternative 2)

The management plan and field activities under Alternative 2 would be the same as those described above under Alternative 1 (see Section 3.4.3).

3.6 Alternatives Considered but Not Carried Forward

3.6.1 Addition of a Noncontiguous Zone to Protect the HMS *Ontario* Shipwreck

The original nomination included a noncontiguous area to protect the wreck of the Revolutionary War-era British warship HMS *Ontario*. The ship was launched at Carleton Island in 1780 for use on Lake Ontario during the Revolutionary War. The vessel carried troops and supplies between Fort Niagara, Fort Ontario, and Fort Haldimand (St. Lawrence River). While returning from Fort Niagara in late 1780, HMS *Ontario* was lost in a storm with all hands. HMS *Ontario* represents one of the most significant Great Lakes shipwrecks due to its age, state of preservation, and historic significance. The vessel sits upright on the bottom with its two masts intact.

NOAA considered including a noncontiguous zone in the proposed sanctuary to protect HMS *Ontario*. However, NOAA does not know the location of the wreck at this time. If the proposed sanctuary is designated, NOAA would conduct research to search for the vessel with the possible goal of adding this significant shipwreck to the sanctuary in the future. The Draft Management Plan includes a strategy for HMS *Ontario*.

¹³ NOAA is not proposing the exclusion of Cape Vincent at this time due to the presence of underwater cultural resources.

Chapter 4: Affected Environment

4.1 Introduction

This chapter describes the resources and human uses within or near the proposed sanctuary¹⁴ that could be affected by the proposed action, including alternatives to the proposed action. For the purposes of this DEIS, the affected environment is defined as the human uses of the environment, as well as the natural environment, within eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River, including:

- Maritime heritage significance and underwater cultural resources (Section 4.2)
- Human uses and socioeconomic resources (Section 4.3)
- Physical resources (Section 4.4)
- Biological resources (Section 4.5)

This chapter also serves as the resource assessment of present and potential uses of the area to meet the requirements of Section 304(a) of the NMSA. Additionally, Section 4.2 presents NOAA's identification of historic properties within the area of potential effects for the proposed undertaking, pursuant to NOAA's consultation responsibilities under Section 106 of the NHPA.

This description of the affected environment serves as the baseline for analyzing the environmental consequences of implementing the proposed action and alternatives detailed in Chapter 5.

4.2 Maritime Heritage Significance and Underwater Cultural Resources

Section 4.2 highlights the historical significance of eastern Lake Ontario and the Thousand Islands region and describes the known and potential underwater cultural resources in the proposed sanctuary. This section is organized as:

- Historical background and significance of eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River;
- List of known shipwrecks and aircraft in the proposed sanctuary, with some of them highlighted in more detail. Resources in eastern Lake Ontario are presented first, followed by resources in the Thousand Islands region of the St. Lawrence River; and
- List of potential shipwrecks and aircraft and a description of other underwater cultural resources.

¹⁴ For purposes of this chapter, the term "proposed sanctuary" is the area in Alternative 1 (eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River).

4.2.1 Historical Background and Significance of Eastern Lake Ontario and Thousand Islands Region of the St. Lawrence River

Eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River comprises a historically rich area where the long relationship between human activity and the maritime environment has created meaning and a sense of place. That meaning and sense of place is expressed and preserved in a wide variety of maritime cultural resources, from sacred places and cultural practices to lighthouses and historic shipwrecks. The first regional inhabitants, the ancestors of the Haudenosaunee Confederacy, developed a deep understanding of the lake and its resources, and NOAA acknowledges their cultural and historical significance to this area¹⁵. Together, these tangible and intangible elements form a rich maritime cultural landscape. The proposed sanctuary's extraordinary collection of historic shipwrecks and underwater cultural resources are a central feature in this cultural landscape.

The region's shores have been inhabited for thousands of years and evidence of early human occupation exists in the proposed sanctuary. Additional sites likely exist as well, offering the potential for archaeological survey and investigation, points of collaboration with Indigenous peoples, and new ways of appreciating North America's earliest cultures.

The 64 known historic shipwrecks and one aircraft in the proposed sanctuary span more than two centuries and possess exceptional archaeological, historical, and recreational value. The collection is bracketed in time by the French-built sailing vessel *Iroquoise* lost during the French and Indian War in 1761, and the 640-foot steel freighter *Roy A. Jodrey* sunk in 1974. Represented in the collection are commercial and military vessels from colonial wars and the War of 1812, as well as submerged battlefields at Oswego and Sackets Harbor. Other shipwrecks represent the earliest maritime commerce on the Great Lakes, including the nearly intact *Lady Washington* built in 1797 and with its mast standing. As the age of steam arrived in Lake Ontario, innovative local shipbuilders embraced the technology, and these vessels too can be found in the proposed sanctuary, preserving the work of entrepreneurs and craftsmen.

Essential to the interpretation, public appreciation, and management of these tangible links to our nation's past are the historical and cultural contexts within which underwater cultural resources exist. This section provides that context, opening briefly with a wide lens (the Great Lakes system), and then focusing on the prehistory and relevant historical areas of significance within the proposed sanctuary. Several shipwrecks and aircraft are highlighted within this section, and a listing of all known and documented historic losses (potential sites) can be found in Tables 4.1 and 4.2.

4.2.1.1 The Great Lakes

Lake Ontario is one of the five North American Great Lakes - the largest group of freshwater lakes on Earth by total area and a natural highway extending over 1,000 miles into the heart of North America. For millennia before European contact, these inland seas served as important

¹⁵ For more information on the Onondaga Nation and the Haudenosaunee's historical connection to Lake Ontario, refer to https://www.onondaganation.org/wp-content/uploads/2021/05/Lake_Ontario_Onondaga.pdf

lines of trade and communication for Indigenous peoples. Over the past 300 years, these waters have been further utilized by Euro-Americans and have greatly contributed to the growth of North American industry and commerce. Marine transport on the Great Lakes played a crucial role in the European exploration, colonization, and industrialization of the region.

During the 19th and early 20th centuries, the Great Lakes evolved from a self-contained maritime network into the nation's busiest commercial waterway, where innovative ships and technologies moved raw materials and agricultural products in larger quantities and at lower costs than at any previous time in history (Figure 4.1). During this period, entrepreneurs and shipbuilders on the Great Lakes launched tens of thousands of ships of many different designs. Sailing schooners, grand palace steamers, revolutionary propeller-driven passenger ships, and industrial bulk carriers transported America's business and industry. In the process, they brought hundreds of thousands of people to the Midwest and drove the dramatic growth of the region's farms, cities, and industries.

The Midwest, and indeed the United States, could not have developed with such speed and vast economic and cultural impacts without the Great Lakes. Lake Ontario's history is intimately tied with the broad historical patterns of human activity across the Great Lakes system. However, as the eastern-most of the five Great Lakes (and until the early 1800s essentially cut off from the "upper lakes" by Niagara Falls), Lake Ontario has a distinctive history that sets it apart from the rest of the Great Lakes.

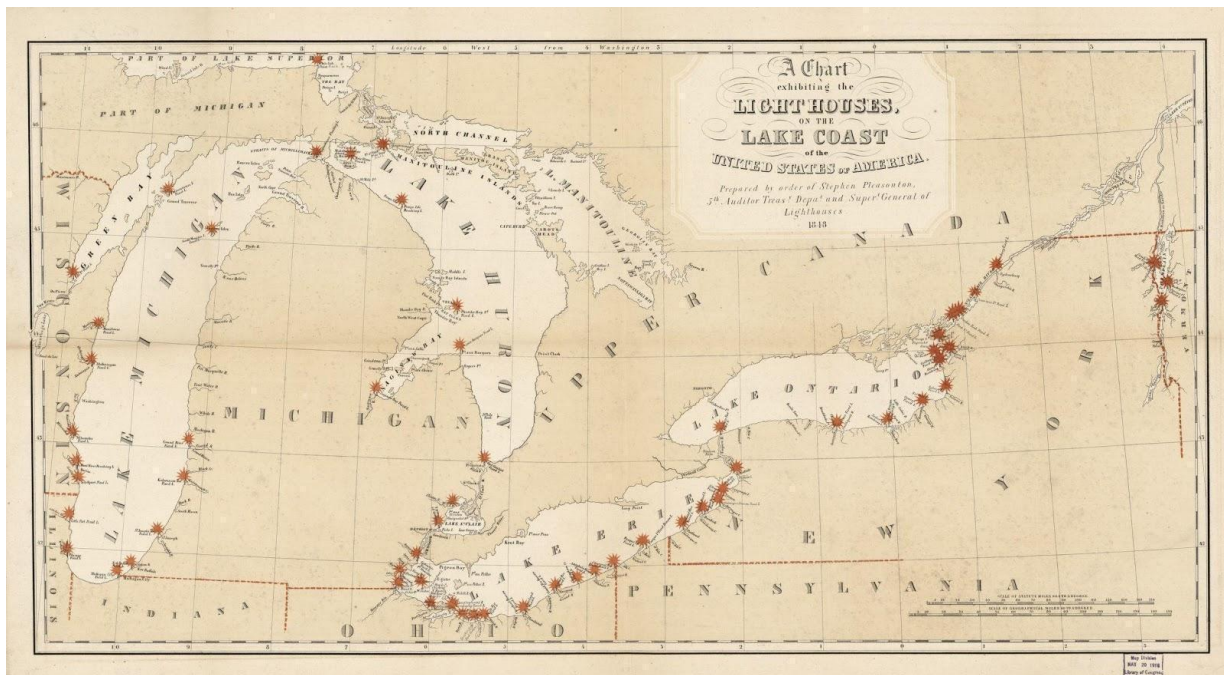


Figure 4.1. A map showing lighthouse locations on four of the Great Lakes in 1848. The magnitude of this infrastructure—essentially constructed to ensure the uninterrupted flow of commerce—speaks to the early economic importance of the Great Lakes. Today, about 160 million tons of cargo, valued at \$15 billion, moves annually on the Great Lakes according to the Lake Carriers' Association. Image: Library of Congress

4.2.1.2 Indigenous Cultures

Following the retreat of North American glaciers, vast tracts of land across New York state supported spruce forests, grasslands, and megafauna, including herds of caribou, mammoths, and mastodon (Halligan 2011:50; Bradley 2020:646). Lake Iroquois, the glacially formed precursor to Lake Ontario, covered much of the current study area as water levels were approximately 100 feet higher. Archaeological evidence from then-shoreline sites suggest early regional occupants were living in close proximity to the water and may have been building watercraft to access lacustrine resources (Schulz et al. 2011:33). As glaciers continued to retreat, lake levels dropped rapidly, forcing populations to follow the changing shoreline. Today, this intermediate shoreline dating to approximately 9,000 years before present (BP) is located under the waters of Lake Ontario. Difficulty in surveying and accessing these areas has resulted in little archaeological evidence of human settlement (Halligan 2011:50).

Approximately 5,000 years BP, the changing landscape once again restructured resources around Lake Ontario. Lake levels began rising towards their modern average, again forcing coastal populations further inland (Ford 2018:40). Despite these environmental changes, communities persisted through reliance on diverse subsistence practices. From 2,500 to 500 BP, small communities occupied the shores of Lake Ontario and the surrounding river valleys. During this period, pottery appears at terrestrial archaeological sites, as does evidence of early agricultural practices. Fishing, too, was a dietary staple leading Ritchie and Funk (1973: 351) to suggest that canoes were a primary means of regional transportation. Indeed, waterways are transportation highways that facilitated the exchange of goods and information and maintained cultural alliances (Ritchie and Funk 1973:351; Ford 2018:41).

By 1,000 years BP, the distinct cultural groups living along the lake shoreline had unified as the Haudenosaunee Confederacy under the Great Law of Peace instituted by the Peacemaker (Onondaga Nation 2019:3). Maritime tools and resources are central features in the Peacemaker's work and governance of the early Confederacy. The Peacemaker created a canoe to transport both himself and his message of peace to the founding nations—the Mohawk, Oneida, Onondaga, Cayuga, and Seneca. The use of canoes to bring the nations together continued with Grand Council meetings held at the conflux of the Oneida, Seneca, and Oswego River systems (Onondaga Nation 2019:4). Similarly, the wampum belt (constructed from marine shells obtained through trade networks) was instituted by Hiawatha during the time of the Peacemaker to unify the five nations (Figure 4.2). Wampum belts continued in use as tools for recording Haudenosaunee laws, history, and political interactions (Smithsonian National Museum of the American Indian 2009:6-7). The wampum practice continues today.



Figure 4.2. A replica of the Hiawatha wampum depicting the Five Nations of the Haudenosaunee Confederacy. Image courtesy of the National Museum of the American Indian (Catalog Number: 26/9056)

Haudenosaunee maritime practices conducted throughout the 17th and 18th centuries include sailing, fishing, canoeing, canoe building, ice-fishing, netting, and weir construction (Recht 1997; Bradley 2020:329,391,645). Archaeological remains associated with these craft traditions and resources have been documented on lakeshore areas adjacent to the proposed sanctuary boundary and in contemporary historical sources. Increased underwater archaeological survey (coupled with technological advances) may yield additional archaeological evidence of these practices within the proposed sanctuary.

The Treaty of Canandaigua (1794) between the Haudenosaunee Confederacy and the United States guaranteed control of Haudenosaunee lands and waterways to the Six Nations of the Haudenosaunee Confederacy.¹⁶ Today, the Haudenosaunee remain the Indigenous stewards of Lake Ontario, its connected waterways, and surrounding lands (Onondaga Nation 2019). Portions of the original homelands of the Onondaga Nation, Cayuga Nation, Seneca Nation, and Oneida Nation (St. Lawrence River) lie within the boundaries of the proposed sanctuary. The Haudenosaunee relationship with Lake Ontario pre-dates European arrival in the New World and is significant to understanding the connection between people and place—past and present.

4.2.1.3 European Arrival, Colonial Powers, and Nations at War

Although European explorers and fur traders reached Lake Ontario by the early 1600s, the southern lakeshore remained under Haudenosaunee control throughout that century, with Indigenous nations conducting the majority of lake commerce and transportation. Following the Great Peace Treaty in 1701, the French and Haudenosaunee forged a trading alliance that saw French missions established along preexisting Haudenosaunee trade routes, including the Oswego and Salmon rivers.

Like many European powers, both the French and the Dutch financed exploratory missions to document and exploit resources in the New World. Understanding that aligning with Indigenous nations was key to surviving in these lands, many explorers forged alliances and fur trading partnerships with Indigenous communities. However, increasing European demand for furs (transported largely via water routes) inflamed preexisting tensions and led to a series of

¹⁶ In 1772, the Tuscarora people became the Sixth Nation of the Haudenosaunee Confederacy.

conflicts known today as the Beaver Wars. Further, as British colonists encroached on Lake Ontario's southern shore, the arrival of a second colonial power both reinforced the French-Haudenosaunee alliance and brought new tensions to maritime trading.

By 1755, increasing British colonial interest drove the construction of Fort Ontario at Oswego as a means of defending Britain's claim to Lake Ontario against the French. During the ensuing Seven Years' War, the British sought to destabilize French and Haudenosaunee shipping routes, while the French targeted British vessels and Fort Ontario—resulting in the 1756 Battle of Fort Oswego. Lake Ontario and its shoreline became a battlefield. Ultimately, Great Britain prevailed and the French ceded to the British crown at the war's end.

During the Revolutionary War, British control of regional waterways expanded to include Fort Haldimand and its shipyard located on the St. Lawrence River. While no naval battles occurred on Lake Ontario during the Revolutionary War, it remained a hub for British naval activity. At the end of the war, many resources in New York state were turned over to the United States, yet Loyalists and British soldiers remained on the St. Lawrence River and in Kingston, Ontario—the latter being a mere 50 miles from Oswego. The remaining British military presence set the stage for conflict with a new American nation.

In 1812, the United States declared war on Great Britain and Lake Ontario once again became a hub of naval activity. Outnumbered by British vessels on the lake, American shipwrights undertook a frenzied shipbuilding campaign that led to a naval arms race between the United States and British Canada. Sackets Harbor developed a naval depot and shipyard for the war effort while Fort Ontario became a key staging area for supplies and ordnance. British forces targeted both of the ports, although they would remain under American control through the end of the War of 1812 (Figure 4.3).

Three vessels related to the War of 1812 are likely located within the proposed sanctuary, one of which is known. The American armed sailing vessel USS *Jefferson*, built at Sackets Harbor in 1814, saw brief action. Stored at Sackets Harbor at the end of the war, by 1825 the derelict vessel was fully abandoned. Investigated in the 1980s by archaeologists, USS *Jefferson* remains significant to our understanding of American shipbuilding during the war. It is possible to walk out on the marina docks and see portions of the hull lying on the marina bottom, making this vessel a tangible part of our national heritage (Ford personal communication, 2020).

Two other potential War of 1812 naval vessels are reported within the proposed sanctuary: *Lady of the Lake*, a schooner that saw action in several battles and USS *Oneida*, which also saw action and was reportedly sunk in the St. Lawrence River after the war. An additional two shipwrecks contemporary to the War of 1812 may also be in the proposed sanctuary: the schooners *Commodore Perry* (sunk 1820) and *Appelona* (sunk 1822). Though merchant craft, they were part of the increased American shipbuilding effort and would offer further insight into specialized regional vessel form and function. Discovering these wrecks would provide new links to the War of 1812 and early United States history.



Figure 4.3. *ATTACK on FORT OSWEGO, LAKE ONTARIO, N. AMERICA. May 6.th 1814*, by Robert Havell (1769-1832). Royal Collection Trust. Found at: <https://militarymaps.rct.uk/other-18th-19th-century-conflicts/battle-of-fort-oswego-1814-attack-on-fort-oswego>

When the war concluded in 1815, America's energy turned to economic development of eastern Lake Ontario, emphasizing industry and shipping over naval superiority. The area's military significance, however, would re-emerge during World War II (WWII), with pilot training over eastern Lake Ontario. As a part of the Allied war effort, both upstate New York and Canada housed training facilities for aviators, and Fort Ontario was a U.S. Army training site, hospital, rehabilitation center, and refugee camp. Lake Ontario's fierce storms claimed three training aircraft by the war's end. Two American and one Canadian aircraft were lost over the lake between 1942 and 1944: a U.S. Army Air Force (USAAF) Douglas C-47 Skytrain transport, USAAF B-24 Liberator bomber, and Canadian Royal Air Force Avro Anson trainer aircraft. Both the Liberator and Avro Anson crews remain unaccounted for. One post-WWII aircraft, too, was lost in 1952 during a training exercise. This USAAF Beechcraft C-45 Expeditor was located by local shipwreck explorers in 2014 and is within recreational diving depth.

4.2.1.4 Shipbuilding and Shipwrights

Intimately tied with the maritime culture of eastern Lake Ontario are the region's shipyards, whose owners and workers made the commercial and economic expansion of the region and nation possible. Oswego boasts one of the Great Lakes' earliest shipbuilding traditions, beginning in 1755 with the establishment of Fort Oswego. By the end of the War of 1812, Oswego, Sackets Harbor, and Storrs Harbor shipbuilders were constructing a wide variety of vessels, from sailing schooners and sloops to sidewheel steamers, tugs, and yachts. Vessels built in the regions of Oswego and Sackets Harbor account for six shipwrecks and eight potential shipwrecks within the proposed sanctuary. Approximately 45 vessels built by other shipyards in the region also wrecked within the proposed sanctuary.



Figure 4.4. Oswego was a busy port in 1855. Image: Library of Congress

One of the most prolific shipwrights in Oswego was Andrew Miller, an Irish immigrant who arrived in New York State in the 1830s (Figure 4.4). His shipyard and sawmill operated between the early 1840s and 1876, producing at least three vessels wrecked within the proposed sanctuary: schooner *Comanche* (salvaged and refitted), steam tug *Tornado*, and schooner *Carthaginian*. As bulk cargo carriers, *Comanche* and *Carthaginian* traveled between Lakes Michigan and Ontario, ensuring that raw materials from the Midwest made it to eastern cities. Notably, bulk cargo carriers account for the majority of mid-19th century vessels plying the proposed sanctuary's waters.

In December 1867, *Carthaginian* went ashore while trying to enter Oswego Harbor. Strong gales ripped the bowsprit from the vessel, and the hull soon filled with water. Stranded on the deck overnight, the crew was rescued from the vessel the next morning. In the following days, the grain cargo began spilling from the hull, prompting many residents to visit the beached

wreck. Though the shipwreck was salvaged, its story, and the many others like it, play an essential role in the interpretation of historic shipwrecks and our appreciation of past generations.

As an industrial waterway, eastern Lake Ontario also required smaller vessel types, such as barges and tugs, to ensure the safe and efficient passage of cargoes. Barges and tugs dredged critical areas for shipping, towed vessels in distress, and assisted with salvage. Well-known on the waterfront, the steam tug *Tornado*, launched from Andrew Miller's shipyard in 1862 (Figure 4.5). Beyond harbor duties, the tug aided several shipwrecked crews and is frequently cited in newspapers as providing assistance to stranded vessels. While the vessel has not been found, the reported wrecking location suggests that parts of *Tornado* may lie within the proposed sanctuary.

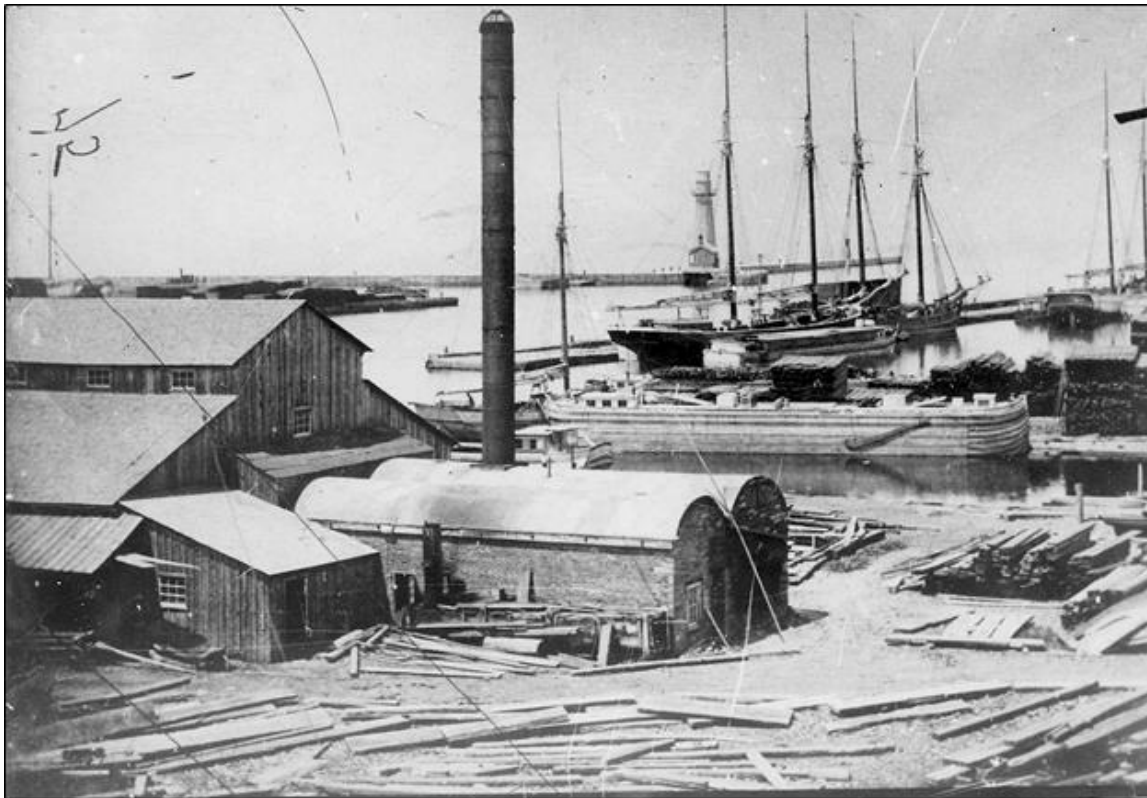


Figure 4.5. Photograph of the Miller Shipyard at Oswego, New York, ca. 1865-1875. Image is part of the Richard Palmer collection curated online by Walter Lewis at www.maritimehistoryofthegreatlakes.ca

Through the lens of history and sanctuary resources, important and colorful local figures also emerge. At age 13 Horatio N. Throop (1807-1884), from Pultneyville, worked with local shipwrights to construct small craft. In 1826 at the age of 19, he built his first schooner, *Sophia*, which carried bulk goods from Canada to New York. While returning to New York with a cargo of corn the following year, the wooden vessel began taking on water, finally sinking four miles from shore. Captain Throop survived, swimming the distance to shore, and was soon at work on his next vessel. Following *Sophia's* sinking, Throop also assisted shipwrecked mariners from the wreck of *Phoebe*, a Canadian schooner.

Throughout Throop's career as a shipwright and entrepreneur, he successfully adapted to change, and his early experimentation with steam propulsion led to its successful use on several Great Lakes vessels. The Throop-built steamers *Ontario* and *Bay State* operated throughout the proposed sanctuary waters, although they were eventually lost. In the last years of his life, Throop's passion for shipbuilding followed the changing maritime trends on Lake Ontario. His final project, construction of the steam yacht *Magic* (Figure 4.6), later burned at its dock in Mexico Bay.

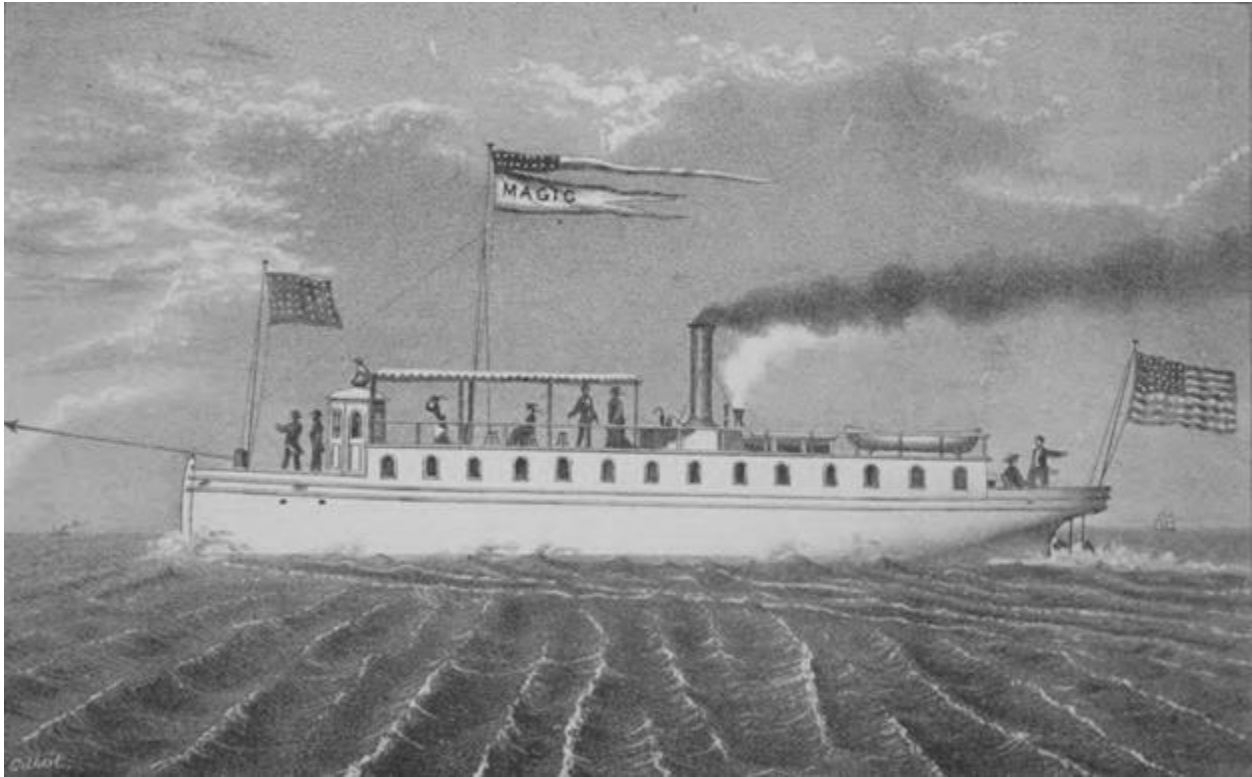


Figure 4.6. Illustration titled *Steam Yacht MAGIC*. Designed, Built & Owned by H.N. Throop, Pultneyville, Wayne Co., NY by Williamson. Image: History of Wayne County, New York (1877:190)

4.2.1.5 Historic Salvage and Diving

Throughout history, salvage has been a central element of the maritime world, and communities on the eastern shore of Lake Ontario have a long history of commercial diving and salvaging shipwrecks to reuse and repurpose their materials.

By the second half of the 1800s, several commercial salvage companies operated on eastern Lake Ontario. The often dangerous work of refloating, repairing, and quickly returning a stranded vessel to use was their primary aim. When a vessel was total loss, efforts turned to salvaging cargoes, rigging, machinery, and anything else of value. Divers were used when a wreck was completely submerged, as with the schooner *St. Peter*, built in 1873 and located within the proposed sanctuary. While transporting coal from Oswego to Toledo in late October 1898, *St. Peter* foundered in a gale off Sodus, New York. The following year, the site was rediscovered by the South Shore Wrecking Company, which hoped to recover the body of the captain's wife. Investigation of the site, located in 120 feet of water, was a feat for 19th century

diving technology. Numerous local residents accompanied the wrecking crew to the site to see the diving rig and salvage operations. While the recovery was unsuccessful, divers worked at the site through the summer, salvaging rigging and reducing the standing masts, as the site was a hazard to navigation. In 1971, divers rediscovered the site, and it is a popular attraction today (Figure 4.7).



Figure 4.7. The bow of the schooner *St. Peter*. The nearly intact shipwreck rests in 120 feet of water, well preserved by Lake Ontario's cold, fresh water. Photo: NOAA

Several commercial vessels were successfully raised or refloated from proposed sanctuary waters. Vessels returned to service from the lakebed include the propeller *Wisconsin* (sank 1867), the paddlewheel steamer *Watertown* (wrecked 1865; recovered and rebuilt 1866), and the propeller *Rosedale* (washed ashore 1897). For divers salvaging the steambarge *Ellsworth* off Stoney Island, no amount of fortitude could save the hull. After catching fire in 1877, the vessel settled close to shore in 20 feet of water. The following year, the owner returned to the site with a crew equipped to raise the hull. While the divers successfully recovered the engine, the vessel, badly burned, broke in two at the surface and fell once again to the lakebed. The local dive community located the remnants of both *Wisconsin* and *Ellsworth*, which are within the proposed sanctuary.

4.2.1.6 Additional Significance of the Thousand Islands Region of the St. Lawrence River

The Thousand Islands region of the St. Lawrence River is, of course, geographically distinct from, but also connected to, eastern Lake Ontario. Consequently, its history and culture are also distinct and connected. While the St. Lawrence River has always been used for transportation

and commerce, changing American attitudes towards recreation and vacationing transformed the Thousand Islands region during the late 19th and early 20th centuries. As tourists flocked to the riverside communities from larger population centers, a robust maritime industry centered around small pleasure craft, passenger ferries, river cruises, and yacht races soon followed. Eight of the 21 shipwrecks in the proposed St. Lawrence River boundary are associated with 19th and 20th century recreation and tourism. While some of these wreck events only involved financial losses, such as the burning of the passenger steamer *Islander* at its dock, others were far more tragic. The collision and subsequent sinking of the pleasure yacht *Catherine* in 1890, for example, stirred local sentiments as only seven of the 12 passengers on board survived the wreck. A local salvage diver recovered the remaining passengers, a feat for the novice diver given the wreck's 70-foot depth.

4.2.2 Underwater Cultural Resources

This section describes the underwater cultural resources within the proposed sanctuary in eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. While shipwrecks are the more numerous underwater cultural resources in the proposed sanctuary, the collection of underwater sites that would become sanctuary resources is diverse. These underwater sites have significant historical, archaeological, and recreational value. As eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River each have distinctive histories and underwater cultural resources, they are discussed separately in this chapter.

4.2.2.1 Known Shipwrecks and Aircraft in Eastern Lake Ontario

Forty-three historic shipwrecks and one aircraft have been located within eastern Lake Ontario. The shipwrecks and aircraft discussed below are a representation of known sites within this area, and presented with build/sinking dates in parentheses. The full list of known sites and documented historic losses (potential sites) within eastern Lake Ontario can be seen in Tables 4.1 and 4.2, respectively.

Table 4.1. Known shipwrecks within the proposed Lake Ontario boundary. The column "site access" denotes the minimum depth required for divers to access the site. For the purposes of this research, snorkel depths are those less than 15 feet (5 meters), recreational diving limits are set to 130 feet (40 meters), and technical diving limits extend from 130 feet to 330 feet (40-100 meters). Any depth beyond 330 feet is considered outside diver limits.

Vessel Name	Vessel Type	Use Dates	Site Access
<i>American</i>	Schooner	1870-1894	Recreational Diving
<i>Ariadne</i>	Schooner	1867-1886	Snorkeling
<i>Atlas</i>	Schooner	1836-1839	Extreme Technical Limits/ Outside Diver Limits
<i>Bay State</i>	Propeller	1852-1862	Technical Diving
<i>Black Duck</i>	Scow-sloop	1859-1872	Outside Diver Limits
<i>C-45 Expedito</i>	Aircraft	Sank 1952	Technical Diving
Canal Boat 1	Canal boat	19th Century	Outside Diver Limits
Canal Boat 2	Canal boat	19th Century	Technical Diving

Vessel Name	Vessel Type	Use Dates	Site Access
<i>City of New York</i>	Propeller	1863-1921	Technical Diving
<i>Congercoal</i>	Propeller	1882-1917	Snorkeling
<i>Cormorant</i>	Propeller tug	1941-1958	Recreational/ Technical Diving
Dagger-board Schooner	Schooner	1820s/1830s	Outside Diver Limits
<i>David W. Mills</i>	Propeller	1874-1919	Snorkeling/Recreational Diving
<i>Ellsworth</i>	Barge	1869-1879	Recreational Diving
<i>Etta Belle</i>	Schooner	1851-1873	Technical Diving
<i>Rum Runner</i>	Steam Yacht	Sank 1895	Recreational Diving
Gildea Wreck	Wooden Vessel	19th Century	Snorkeling/Recreational Diving
<i>Gordon</i>	Dredge	Sank 1879	Outside Diver Limits
<i>H. B.</i>	Schooner-barge	1890-1912	Recreational Diving
<i>Hartford</i>	Schooner	1873-1894	On Shore
<i>Hiawatha</i>	Barge	1890-1917	Recreational Diving
Historic Barge	Barge	Late 19th/Early 20th Century	Recreational Diving
<i>Homer Warren</i>	Propeller	1863-1919	Technical Diving
House Boat	House Boat	20th Century	Recreational Limits
<i>Isaac G. Jenkins</i>	Schooner	1873-1875	Outside Diver Limits
<i>J. W. Langmuir</i>	Schooner	1865-1875	Recreational Diving
<i>James Buckley</i>	Schooner-barge	1884-1912	Recreational Diving
<i>Jefferson</i>	Brig	1814-1825	Recreational Diving/Private Property
<i>Lady Washington</i>	Schooner	1797-1803	Technical Diving
<i>Mary Kay</i>	Propeller diesel tug	1957-1988	Recreational Diving
<i>Northstar</i>	Schooner	1854-1886	Recreational Diving
<i>Ocean Wave</i>	Schooner	1868-1890	Outside Diver Limits
Old Schooner	Schooner	19th Century	Recreational Diving
Old Steamer	Steamer	19th Century	Recreational Diving
<i>Orcadian</i>	Brig	1854-1858	Outside Diver Limits
<i>Queen of the Lakes</i>	Schooner	1858-1906	Outside Diver Limits
<i>Roberval</i>	Propeller	1907-1916	Presumed Technical Dive/ Outside Diver Limits

Vessel Name	Vessel Type	Use Dates	Site Access
<i>Royal Albert</i>	Schooner	1858-1868	Outside Diver Limits
Schooner Barge	Schooner-barge	Unknown	Technical Diving
<i>St. Peter</i>	Schooner	1873-1898	Recreational Diving
<i>Three Brothers</i>	Schooner	1827-1833	Presumed Technical Diving or Outside Diver Limits
<i>T.J. Waffle</i>	Propeller scow	1914-1919	Presumed Outside Diver Limits
U.S. Coast Guard cable boat 56022	Steel cable boat	1942-1977	Recreational Diving
<i>William Elgin</i>	Schooner	1871-1888	Outside Diver Limits

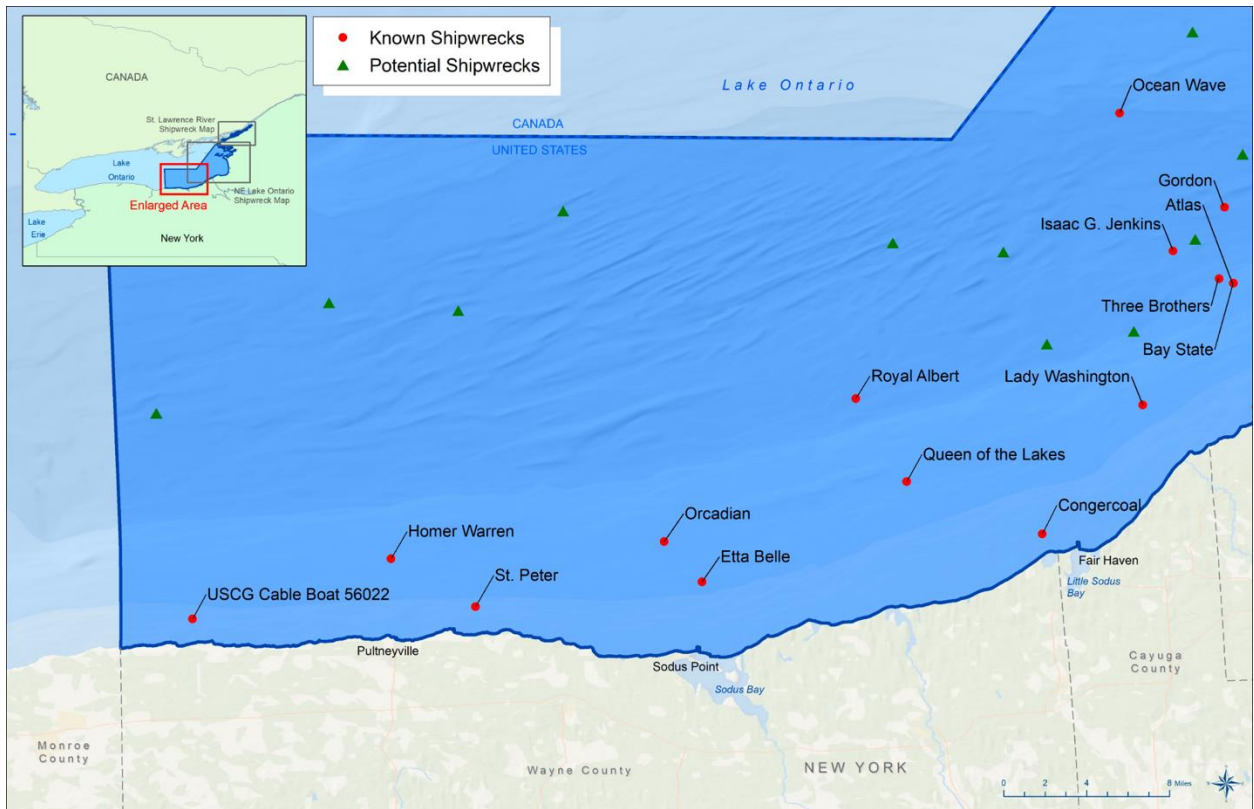


Figure 4.8. Map of known and potential shipwreck and aircraft locations off the coast of Wayne and Cayuga counties. Image: NOAA

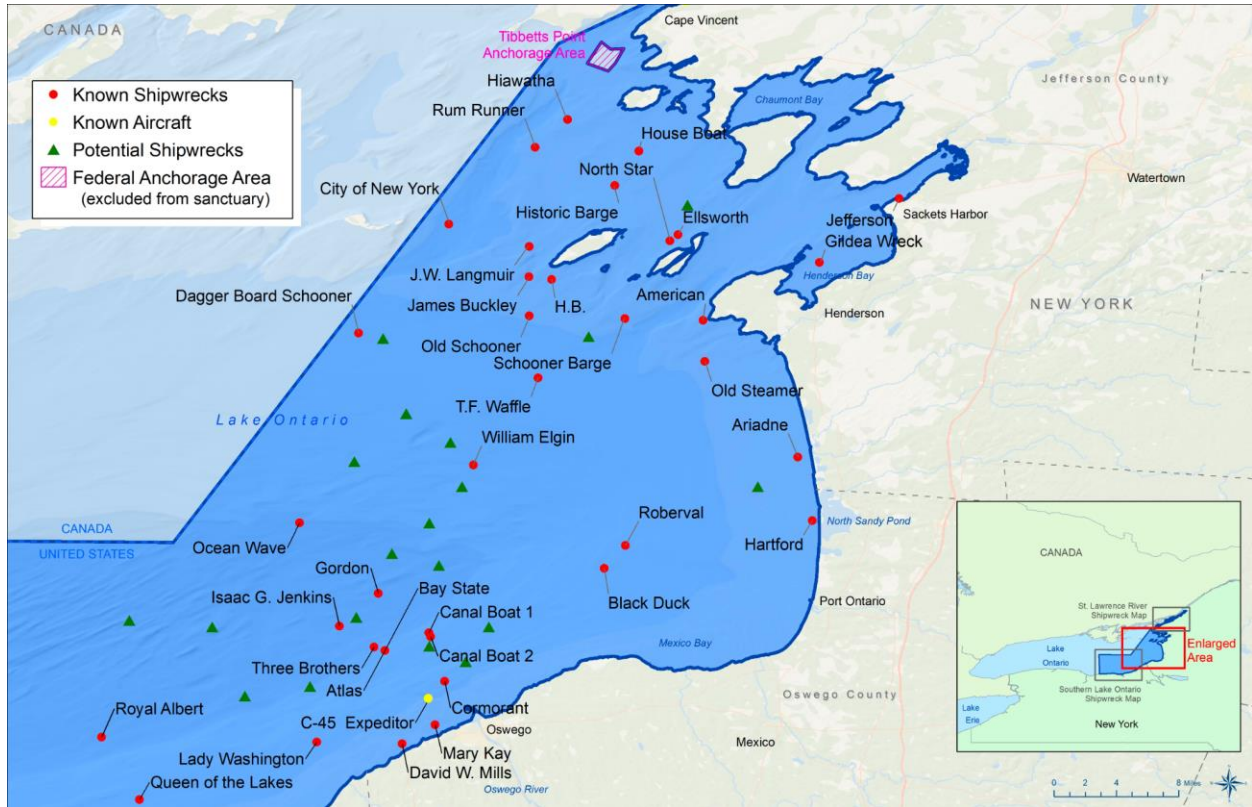


Figure 4.9. Map of known and potential shipwreck and aircraft locations off the coast of Oswego and Jefferson counties. Image: NOAA

***Lady Washington* (1797-1803)**

The earliest known shipwreck in the proposed Lake Ontario boundary is *Lady Washington*, a Pennsylvania-built sloop (Figure 4.10). Purchased for use on the lake in 1801, the sloop brought goods between Canadian and American ports. During a trip across the lake in 1803, the sloop disappeared and was presumed lost with all on board. For the next two hundred years, the vessel sat undiscovered on the lakebed. Using a remotely operated vehicle to obtain video, local shipwreck explorers discovered the site in 2016. The discovery team believes the *Washington* to be the oldest confirmed commercial sailing ship to be discovered in the Great Lakes. The wreck is largely intact with masts still standing. Given its state of preservation and age, the shipwreck has significant archaeological potential.



Figure 4.10. Model of an Early American sailing sloop, ca. late 18th Century. Model crafted by Arthur G. Henning Inc., New York. Photo: Division of Work and Industry, National Museum of American History/Smithsonian Institution.

USS Jefferson (1814-1825)

Built by the Americans at Sackets Harbor in 1814, the brig *USS Jefferson* is an important link to the War of 1812. Following the war, the vessel was used for local regional transport until it was laid up in storage at Sackets Harbor. As time passed, *USS Jefferson* fell into disrepair and was never raised or refitted. Archaeologist Kevin Crisman investigated the site and it remains a significant resource to understanding American shipbuilding during the War of 1812. Unfortunately, due to the shallow water and harbor development, only the lower portion of *USS Jefferson's* hull remains on the lakebed.

Three Brothers (1827-1833)

One of the early locally built commercial vessels on Lake Ontario is *Three Brothers*, built at Henderson, New York in 1827. Captain John Stevenson of Williamson, New York, commanded the new dagger-board schooner. *Three Brothers* disappeared in a storm while en route to Oswego from Pultneyville with a cargo of apples, cider, and wheat. Local residents assumed the worst when the tiller and a barrel of apples were found on shore. Local shipwreck explorers located the wreck in 2014, using the clearly-visible dagger-board to help confirm the wreck's identity. To date, it is the oldest commercial schooner discovered in the Great Lakes. The shipwreck is remarkably well-preserved given its age and has significant archaeological potential.

Bay State (1852-1862)

An early 19th century steamer, *Bay State* operated on Lakes Erie, Michigan, and Ontario. Built at Buffalo, New York, the steamer operated as part of the Northern Transportation Company, carrying passengers and cargo throughout New York and the Midwest. *Bay State* wrecked during a strong storm off Oswego while en route to Lake Erie. The entire crew was lost, including five Oswego residents. Discovered by local shipwreck hunters in 2015, the wreck of

Bay State lies in technical diving depths. The hull of *Bay State* remains upright but shows some natural deterioration.

***Queen of the Lakes* (1858-1906)**

Built as a Canadian schooner for Great Lakes commerce, *Queen of the Lakes* operated throughout Lakes Michigan, Erie, Huron, and Ontario for nearly fifty years, an exceptional length of time for a schooner. During its lifespan, repairs were required every 15-20 years to ensure that the hull and machinery remained seaworthy. Despite these efforts, the schooner sprang a leak during a November storm in 1906 while returning to Kingston, Ontario, with a cargo of coal. The hull began to roll and soon foundered, leaving the crew to row their small yawl boat in the midst of a gale 15 miles to shore in the middle of the night. *Queen of the Lakes* remained preserved and undisturbed in the deep cold waters of the lake for another century until it was discovered in 2011 by local shipwreck explorers. Technical divers visited the schooner, and reported a remarkable state of preservation (Figure 4.11).



Figure 4.11. The stern of the schooner *Queen of the Lakes*. Photo: Jill Heinerth

***Ellsworth* (1869-1877)**

Built at Seneca Lake, New York, as a sailing vessel, *Ellsworth* was later outfitted as a steam vessel that traversed both the Great Lakes and inland river systems around New York. After catching fire in 1877, the vessel settled close to shore at Stony Island in 20 feet of water. The following year, the owner returned to the site with a wrecking expedition to raise the hull. While divers successfully recovered the engine, the vessel, badly burned, broke in two at the surface

and returned to the lakebed. Recently, a side-scan sonar survey conducted off Stony Island located the remains of *Ellsworth*. Due to the machinery salvage and partial raising, the hull remains split and partially collapsed. The shipwreck has important historical ties to the area's history of salvage and commercial diving.

***American* (1870-1894)**

Over the course of its 24-year career, the schooner *American* saw four owners as it operated throughout Lake Ontario and Lake Erie. Converted as a barge towards the end of its career, the vessel gave additional assistance to ships that required tug boats. In the fall of 1894, *American* headed for Prescott, Ontario, from Oswego began to sink off the Galloo Island light. The crew escaped to the steamer *Hall*; however, *American* was a complete loss. During a remote sensing survey in 2008, remains were potentially identified but not visited until 2014. Much of the wreck remains intact today, making it an excellent dive site in recreational depths.

***St. Peter* (1873-1898)**

The schooner *St. Peter* foundered in a gale in 1898 with only the captain surviving. The site was actively salvaged in 1899 and rediscovered by divers in 1971. The site is listed on the National Register of Historic Places, which recognizes its historic and cultural significance (Figure 4.12). The Williamson-Pultneyville Historical Society displays artifacts from the wreck. Located in 120 feet of water, the well-intact hull of the wreck makes for an excellent recreational dive.



Figure 4.12. Divers inspect the well-preserved schooner *St. Peter*, located in 120 feet of water. Photo: NOAA.

Hartford (1873-1894)

William Linn and John Craig built the schooner *Hartford* at Gibraltar, Michigan. Designed for commercial trade in the Great Lakes, the three-masted schooner was soon registered in Oswego, New York, carrying bulk cargoes of agricultural products and coal. In October 1894, *Hartford* traveled from Detroit, Michigan, to Cape Vincent, New York, when it was caught in an October storm off Mexico Bay. A lookout at the Big Sandy Life Saving Station noticed the vessel drifting towards shore and roused the station crew. As they watched the vessel, it began to roll violently in the water. Parts of the masts and rigging broke off and washed ashore, followed by larger fragments of the vessel. Over the next few days, all the attempts to reach *Hartford* were unsuccessful and the hull was abandoned where it sank offshore, claiming the lives of the entire crew, including the captain, his wife, and their infant daughter. The wreck drew huge crowds to the beach, many of whom wanted a glimpse of the ill-fated vessel.

Months after the initial wrecking, *Hartford* continued to inspire the local community who published poetry or memories of the vessel and lost crew members. The following spring, divers relocated the wreck and began salvaging its cargo of wheat. Today, *Hartford* is one of the most accessible sites within the proposed sanctuary (Figure 4.13). In March 2020, a portion of *Hartford* washed ashore near Sandy Creek and is currently visible in the surf zone. Due to the dynamic nearshore environment, this section will soon be likely covered entirely with sand, but may re-emerge with future storms and seasonal changes. The site is considered an archaeological resource protected by New York state law; while visitation is encouraged, visitors should refrain from touching, moving, or removing any part of the wreckage.



Figure 4.13. Photograph of *Hartford*, ca. 1890, taken above Blake's Point, Lake Ontario. Image: Thousand Islands Museum

David W. Mills (1874-1919)

Built in Cleveland, Ohio, the propeller *David W. Mills* operated for an incredible 45 years as a bulk cargo carrier on the Great Lakes and St. Lawrence River (Figure 4.14). In August 1919, as *David W. Mills* traveled from Montreal to Sodus, New York, heavy smoke from nearby forest fires obscured the Oswego light and the vessel struck Ford Shoal at full speed. Given the severity of the damage to the wooden steamer, the captain and crew remained on board until insurance underwriters could visit the wreck. Two wrecking companies visited the scene; however, the damage was fatal. Ultimately, the vessel broke in two with the hull coming ashore. Local community members were encouraged to recycle the beached portion into lumber. A Cleveland wrecking company eventually returned to the water-logged portion to remove parts of the steam machinery. Today, the remains of *David W. Mills* are still located next to Ford Shoal. The state of New York designated the site in 2000 a Submerged Cultural Preserve and Dive Site.



Figure 4.14. Photograph of *David W. Mills* taken by Louis Pesha, ca.1910. Image: Great Lakes Maritime Collection, Alpena County George Fletcher Public Library

Beechcraft C-45 Expeditor (1952)

The Beechcraft C-45 Expeditor aircraft (Figure 4.15) was an American training aircraft model used during and after World War II. While on a training run in 1952 from Rome, New York, this twin-engine C-45 Expeditor experienced a single engine failure, but reportedly flew for another 65 miles on the remaining engine. The crew and passengers on board bailed out while the aircraft itself crashed into Lake Ontario. The aircraft, located by local shipwreck explorers during a remote sensing survey in 2014, sits within recreational diving limits.



Figure 4.15. A C-45 in flight. Image: U.S. Air Force

4.2.2.2 Known Shipwrecks in the Thousand Islands Region of the St. Lawrence River

This section describes the known underwater cultural resources found within the Thousand Islands portion of the St. Lawrence River. Twenty-four known historic shipwreck sites are located in this area and span a range of 210 years (Table 4.2). A select number of shipwrecks are discussed below.

Table 4.2. Known Shipwrecks in the Thousand Islands Region of the St. Lawrence River. The column “site access” denotes the minimum depth required to access the site firsthand. For the purposes of this research, snorkel depths are those less than 15 feet, recreational diving limits are set to 130 feet, and technical diving limits extend from 130 feet to 330 feet. Any depth beyond 330 feet is considered outside diver limits.

Vessel Name	Vessel Type	Dates of Use	Site Access
<i>America</i>	Drill Barge	1908-1932	Recreational Diving
<i>A.E. Vickery</i>	Schooner	1861-1889	Recreational Diving
Box Stove Wreck	Sloop	Late 19th Century	Recreational Diving
Calumet Island Wreck	Lifeboat	20th Century	Recreational Diving
<i>Catherine</i>	Steam Yacht	1882-1890	Recreational Diving
<i>Dauntless</i>	Yacht	1906-Post-1921	Recreational Diving
<i>Elk</i>	Schooner	Sank 1874	Snorkeling/ Recreational Diving
<i>General Hancock</i>	Ferry	1890s	Shorebased/ Snorkeling/ Recreational Diving
<i>Giggle</i>	Powerboat	Early 20th Century- 1929	Technical Diving
<i>Grand View</i>	Steamer	1899-1906	Recreational Diving
<i>Iroquoise/HMS Anson</i>	Bark (re-rigged as Brig)	1759-1761	Recreational Diving
<i>Islander</i>	Steamer	1871-1909	Recreational Diving
<i>Keystorm</i>	Steamer	1908-1912	Recreational Diving
<i>Maggie L.</i>	Schooner	1889-1929	Recreational Diving
<i>Oconto</i>	Steam Propeller	1872-1886	Technical Diving
<i>Raymond</i>	Yacht	Sank 1925	Recreational Diving
<i>Roy A. Jodrey</i>	Freighter	1965-1974	Technical Diving
<i>Sir Robert Peel</i>	Steamer	1837-1838	Recreational Diving/ Technical Diving
Wooden Work Boat	Motorboat	Post-1910	Recreational Diving
<i>St. Louis</i>	Barge	1864-1914	Snorkeling/ Recreational Diving
Steam Launch	Steam Launch	Unknown	Recreational Diving

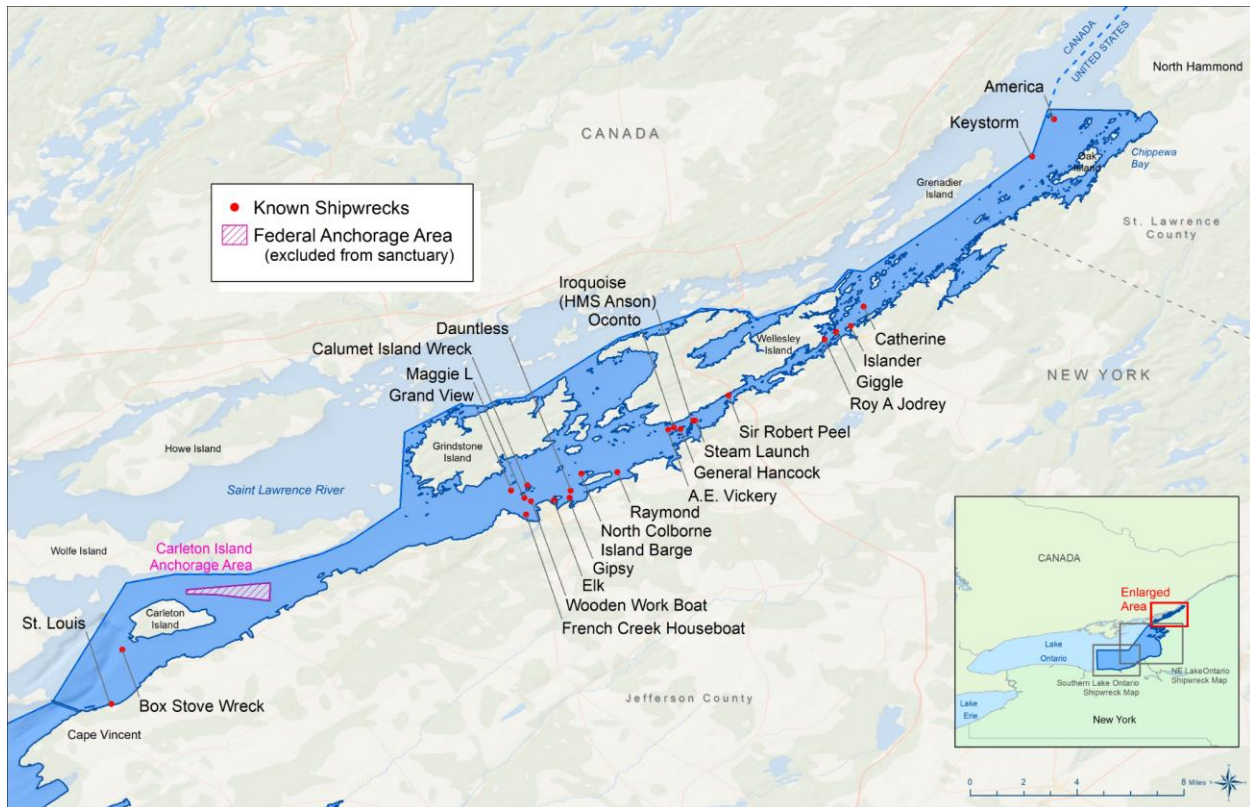


Figure 4.16. Map of known shipwreck locations in the Thousand Islands region of the St. Lawrence River. Image: NOAA

Iroquoise/HMS Anson (1759-1761)

Built by the French during the Seven Years' War, the 75-foot sailing vessel *Iroquoise* served on Lake Ontario following the fall of Fort Frontenac in 1758. Damaged in February 1760, the French abandoned the vessel, and British forces repurposed and renamed it *Anson* six months later. While traveling on the St. Lawrence River, *HMS Anson* struck Niagara Shoal and could not be saved. The British salvaged what they could and burned the wreck to the water line. Today, the site is the oldest known shipwreck in the Thousand Islands region and is located in 80 feet of water. Volunteers for the St. Lawrence River Historical Foundation documented the wreck in the late 1990s.

Sir Robert Peel (1837-1838)

Built as a steamer in Brockville, Ontario, *Sir Robert Peel* operated between the St. Lawrence River and Lake Ontario. After only a year of service, an angry mob that was retaliating for the loss of a Canadian vessel, seized the steamer at an American dock. The mob stripped the vessel, escorted passengers to shore, and then burned it to the waterline. The act, part of ongoing hostilities between British Canada and New York, occurred during a period known as the 'Patriot Wars.' While the hull is located in 125 feet of water, the boiler is located at a depth of 70 feet. Given the fire that occurred on board, only the bottom of the hull remains today.

A.E. Vickery (1861-1889)

Built as a bulk cargo carrier by local shipbuilder Asa Wilcox at Three Mile Bay, New York, the schooner *A.E. Vickery* launched as the *J.B. Penfield* in 1861. Following a successful career, *A.E. Vickery* went ashore near Alexandria Bay in 1889 carrying a cargo of corn bound for Chicago. Although the hull reportedly filled quickly with water, the crew were able to escape to the nearby Rock Island Lighthouse. Unable to raise the wreck, a local diver salvaged it. The diver, who required a U.S. marshall to “seize” the wreck so it could be salvaged, outfitted the marshall in a dive suit in order for him to make the seizure “in true naval style” (Daily British Whig, 1890). *A.E. Vickery* is an advanced dive site located in 115 feet of water. While much of the site is still intact, the deck and hull are very fragile.

Oconto (1872-1886)

Built at Manitowoc, Wisconsin, in 1872, the steamer *Oconto* sailed out of Detroit, Michigan, where it carried packaged goods throughout the Great Lakes (Figure 4.17). While traveling along the St. Lawrence River, *Oconto* struck Granite Shoal and sank. Contemporary newspaper clippings cite the shoal as treacherous, as it caused at least two other accidents. The sinking itself took several hours, and all passengers and crew were evacuated. Over the next decade, salvors returned to the site on many occasions to recover the cargo of silk cloth and the ship’s vessel fittings. In 1900, an attempt was made to recover the hull. During the recovery process, the hull slid further down the shoal and today sits in over 140 feet of water. Today, there are two primary portions of the wreck with easily distinguishable features, such as the bow and anchor.

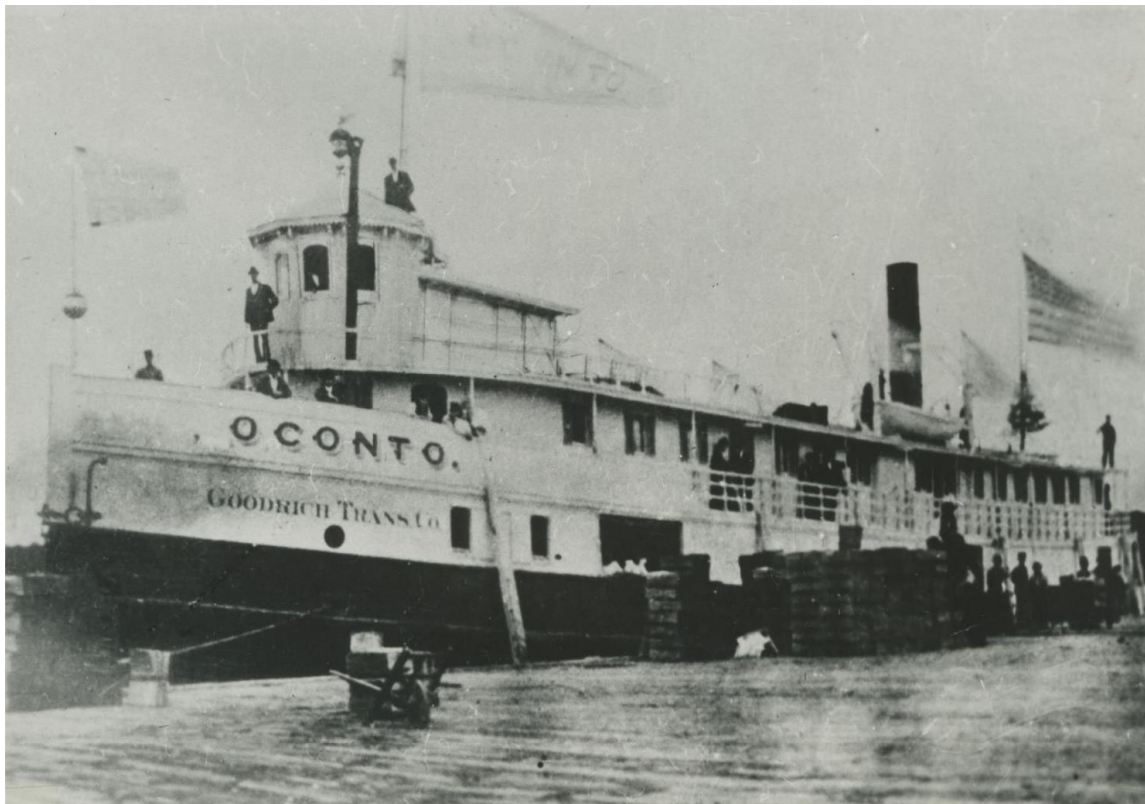


Figure 4.17. The steamer *Oconto* at dock in 1872. Image: Great Lakes Maritime Collection, Alpena County George Fletcher Public Library

Grand View (1899-1906)

Registered as a passenger steamer, *Grand View*, built in 1899 at Clayton, New York, operated on the St. Lawrence River. In late October 1906, the steamer's anchor began to drag, resulting in *Grand View* sinking offshore of Little Clumet Island. Only the boiler and deck machinery could be salvaged from the wreck, and the hull was left in place where it remains today in 35 feet of water. Some deterioration is evident; however, the lower hull is still largely intact.

Keystorm (1908-1912)

Built in England, the 250-foot steel-hulled *Keystorm* operated out of Canada carrying coal for the Keystone Transportation Company. In October 1912, the steamer struck Black Spar Shoal in the early morning hours. Finding themselves aground, the crew came ashore to contact the company offices. However, while awaiting response, *Keystorm* slipped off the shoal and rolled, taking on water in the process. The hull filled quickly, sinking the vessel in 100 feet of water. Salvage divers soon found the wreck and began to strip the hull of valuable materials. Today, the wreck is one of the most popular dive locations in the St. Lawrence River due to its high state of preservation and range of depths. *Keystorm* lies on the sloping river bottom at a depth of 25 to 115 feet.

America (1908-1932)

Constant development and maintenance of shipping infrastructure was key to successful commerce and transportation along the St. Lawrence River. In 1932, the H.C. Huffman Construction Company brought in the drillboat *America* to deepen the channel near Dark Island. While preparing dynamite charges, a premature explosion occurred on the boat, killing seven of the crew on board. Passing vessels rendered assistance to crew members in the water, but the drillboat was a total loss. Salvage divers located the wreck but did not recover or refloat the hull. Today, the wreckage sits within recreational dive limits and is a popular dive site.

Roy A. Jodrey (1965-1974)

The 640-foot freighter *Roy A. Jodrey* carried iron ore for just nine years before it sank. While traveling through the St. Lawrence River in 1974, *Roy A. Jodrey* struck Pullman Shoal. Members of the Wellesley Island Coast Guard station successfully rescued the crew. However, *Jodrey*, fatally damaged, settled on the sloping riverbed in 150-250 feet of water. Salvage operations to retrieve the iron ore cargo were conducted the following year, leading to a commercial diver's death. In the early 2000s, the site became popular among technical divers due to its relatively intact structure and depth (Figure 4.18).



Figure 4.18. A diver explores the wreck of the 640-foot steamer *Roy A. Jodrey*, located in the St. Lawrence River. Resting on the sloping river bottom from 150 to 250 feet of water, the site is popular among technical divers. Photo: NOAA

4.2.2.3 Potential Shipwrecks, Aircraft, and Other Underwater Cultural Resources in Eastern Lake Ontario

Twenty shipwreck sites and three aircraft sites are potentially located in eastern Lake Ontario, waiting to be rediscovered (Table 4.3). Due to the lake’s long history of settlement, transportation, and recreation, additional types of archaeological sites may also be located on the lakebed. These may include prehistoric sites, historic battlefields, debris fields from wrecking and salvage events, and aids to navigation, such as buoys, lighthouse foundations, and channel markers. As these types of archaeological sites can be more difficult to locate and identify than shipwrecks, targeted survey operations are required to supplement historical and archival research.

The shipwrecks and aircraft discussed below are a representation of the potential shipwreck sites within the boundary. For the purposes of this section, “potential shipwrecks and aircraft” includes those sites that have not yet been located, but according to historical records likely occurred within the proposed sanctuary.

Table 4.3. Potential Shipwrecks and Aircraft in Eastern Lake Ontario. The column “site access” denotes the minimum depth required to access the site firsthand. For the purposes of this research, snorkel depths are those less than 15 feet, recreational diving limits are set to 130 feet, and technical diving limits extend from 130 feet to 330 feet. Any depth beyond 330 feet is considered outside diver limits.

Vessel Name	Vessel Type	Use Dates	Site Access
<i>Algie O. Thayer</i>	Propeller tug	1872-1879	Outside Diver Limits
<i>Annie M. Foster</i>	Schooner	1875-1889	Presumed Outside Diver Limits
<i>Appelona</i>	Schooner	1814-1822	Presumed Outside Diver Limits
<i>Avro Anson</i>	Aircraft	Lost 1942	Presumed Outside Diver Limits
<i>Commodore Perry</i>	Schooner	1815-1820	Presumed Outside Diver Limits
<i>E. Hall</i>	Schooner	1863-1879	Presumed Outside Diver Limits
<i>E.J. Vickery</i>	Canal boat	1868-1874	Presumed Outside Diver Limits
<i>E.B. Gannett</i>	Schooner	1864-1870	Presumed Outside Diver Limits
<i>Getaway Gertie (B-24)</i>	Aircraft	1943-1944	Presumed Outside Diver Limits
<i>Iona</i>	Propeller	1892-1912	Presumed Outside Diver Limits
<i>Jeska</i>	Propeller	1909-1926	Presumed Outside Diver Limits
<i>Lady of the Lake</i>	Schooner	1813-1826	Presumed Outside Diver Limits
<i>Maggie Hunter</i>	Schooner	1862-1876	Presumed Outside Diver Limits
<i>Napoleon</i>	Schooner	1833-1835	Presumed Recreational Diving
<i>Neptune</i>	Schooner	1842-1850	Presumed Outside Diver Limits
<i>Perseverance</i>	Propeller	1864-1868	Presumed Outside Diver Limits
<i>Philip Becker</i>	Steam tug	1876-1879	Presumed Outside Diver Limits
S/N 42-24120 (C-47)	Aircraft	1944-1944	Presumed within Recreational Limits
<i>Shannon</i>	Scow-schooner	1867-1874	Presumed Outside Diver Limits
<i>Tornado</i>	Steam tug	1862-1870	Presumed Technical Dive or Outside Diver Limits
<i>Twilight</i>	Scow-schooner	1858-1859	Presumed Outside Diver Limits
<i>W. T. Sherman</i>	Sloop	1869-1877	Presumed Recreational Diving
<i>William John</i>	Schooner	1865-1872	Presumed Outside Diver Limits

USS *Lady of Lake* (1813-1826)

USS *Lady of the Lake* was built at Sackets Harbor as a U.S. revenue enforcer, with a design similar to revenue cutters. Armed with five guns (or cannons) during the War of 1812, USS *Lady of the Lake* served as a merchant vessel after the war. The vessel left Niagara, New York, in 1826 for Oswego but never arrived. It was later determined that the vessel sank in deep water off Oswego. Given its location in deep water, this site may be intact.

***Sophia* (1826-1827)**

Built by Horatio N. Throop at the age of 19, *Sophia* operated as a cargo schooner on Lake Ontario, hauling bulk goods between New York and Canada. While returning to New York in 1827, the schooner's cargo of corn swelled from water in the hold and the vessel sprang a leak, sinking four miles from shore. Throop, the sole survivor of the wreck, swam the four miles to shore and proceeded on foot to the closest town for help.

***Neptune* (1842-1850)**

Asa Wilcox, a master shipwright and blacksmith, operated his own shipyard at Three Mile Bay, New York, from 1835-1853. During this period, he built a number of vessels including the schooner *Neptune*. During its career, *Neptune* sailed out of Sackets Harbor. In 1850, after eight years of service, *Neptune*, traveling north from Oswego, encountered a severe storm that arose over the lake. The crew of the schooner *D.W. Church* recalled *Neptune* leaving port shortly before *D.W. Church* itself set out. Offshore of Oswego, those on board *D.W. Church* caught a brief glimpse of a small yawl-boat that might belong to a schooner. As *D.W. Church* maneuvered itself into a better position to approach the yawl-boat, the small boat disappeared entirely from view. Piecing accounts of the storm together, it was later decided that *Neptune* had likely capsized and sank during the storm. The crew, escaping to the yawl boat, was lost in the rough weather. Although not found, the remains of *Neptune* are thought to exist in deep water off Oswego.

***Tug Tornado* (1862-1870)**

Andrew Miller with Willard Kitts and Thomas Moore built the steam tug *Tornado* at Oswego, New York, in 1862. During its career, *Tornado* aided several shipwrecked crews and is frequently cited in newspapers as providing assistance to stranded vessels. Tragedy for the vessel and crew struck in the summer of 1870. While waiting to tow vessels into Oswego Harbor, the crew on board *Tornado* stopped the tug's steam engine to save fuel. When the engine was restarted, the boiler malfunctioned and exploded, destroying the vessel's bow and engine room and killing three of the crew. While not found, the reported wrecking location suggests that *Tornado's* stern may lie within the proposed sanctuary.

***Getaway Gertie*, USAAF Consolidated B-24 Liberator Bomber (1942)**

During World War II, the U.S. Army Air Force (USAAF) used the Consolidated B-24 Liberator bomber stateside as a training aircraft (Figure 4.19). While on a routine flight from Massachusetts to Syracuse, New York, a winter storm enveloped the B-24 *Getaway Gertie*. Unable to see the airstrip, the aircraft stayed aloft over Syracuse. With fuel running low, the pilot ordered the crew to bail over Lake Ontario. While a wing segment later washed up outside Oswego, the aircraft and crew have never been found.



Figure 4.19. B-24 Liberator in flight. Image: U.S. Air Force.

4.2.2.4 Potential Underwater Cultural Resources in the Thousand Islands Region of the St. Lawrence River

Ten historic archaeological sites are potentially located within the Thousand Islands region of the St. Lawrence River. Many of these sites relate to the Victorian era and are small pleasure craft (many of which were not recorded as lost or sunk), submerged middens (dump sites) associated with shoreline development, and associated artifacts. Additionally, prehistoric cultural resources, such as middens and shoreline features, are reported within the Thousand Islands region. Documented in the historic record or by divers, these wrecks and archaeological sites require further verification (see Chapter 3).

4.2.3 Historic Properties

Historic property, as defined under the NHPA, means any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the NRHP maintained by the Secretary of the Interior. This term includes artifacts, records, and material remains that are related to and located within such properties. Properties of traditional religious and cultural importance to an Indigenous nation or tribe or Native Hawaiian organization may be determined eligible for inclusion in the National Register (36 CFR 800.16(l)(1)).

The wreck of *St. Peter* is the only NRHP listed property within the proposed sanctuary. Many of the other shipwreck sites that are in the affected environment (described above) would likely be eligible for NRHP listing due to their historical and archaeological significance.

4.3 Human Uses and Socioeconomics

4.3.1 Overview

The natural, recreational, historical, and cultural resources located in eastern Lake Ontario and the Thousand Islands Region contribute to its economy, support a vibrant quality of life, and create a unique sense of place. This section describes the socioeconomic characteristics of this area, including human uses in the area. NOAA uses these data to help illustrate how the human uses, including recreational and commercial uses and the local economy, may be affected by the designation of a new national marine sanctuary (see Chapter 5 for a discussion of impacts to these sectors).

NOAA examined the socioeconomic resources and economic effects in a study area that includes both primary and secondary counties. “Primary” denotes counties that lie adjacent to the boundaries of the proposed sanctuary. “Secondary” generally denotes counties that have more than 10% of their workforce commuting to or from a primary county. The primary counties in this analysis are Jefferson, Oswego, Wayne, and Cayuga, and the secondary counties are Onondaga, Ontario, and St. Lawrence Counties (Figure 4.25). While St. Lawrence County would ordinarily qualify as a primary county because it borders the proposed sanctuary, NOAA categorized it as a secondary county in this analysis because the sanctuary boundary would only overlap with one mile of the county.

4.3.2 Human Uses

4.3.2.1 Tourism and Recreation

The Lake Ontario coast attracts tourists, who come for the area’s fishing, boating, and natural beauty, and to visit the network of historic lighthouses and dive the many shipwrecks. An important factor in determining the economic contribution of an existing or proposed sanctuary to a region is visitation. If people are visiting the sanctuary, it means they are also contributing to the regional economy by spending money within the region on food, accommodations, travel, and other commodities. The more people that visit the sanctuary, the more economically dependent the region may be on the resources of the sanctuary, and the more important it becomes to manage the sanctuary carefully. Trends in visitation can also give information about trends in the quality of sanctuary resources and their interpretation. If resource quality is improving, visitation is likely to increase; if resource quality is declining, fewer people are likely to visit. Additionally, as name recognition of a place increases, the sanctuary is likely to attract more visitors.

In a designated sanctuary, NOAA would collect visitor use data to understand how many people visit the sanctuary, what types of people visit the sanctuary, where they came from, and what activities they participate in while visiting the sanctuary (e.g., scuba diving, boating, or fishing). However, this information does not currently exist for the study area, as there is no sanctuary in eastern Lake Ontario and the Thousand Islands region. If a sanctuary is designated in this area, NOAA would collect visitor use data.

While there are no direct visitation numbers available for the proposed sanctuary, there are parks on the coast adjacent to the proposed sanctuary that track annual visitation to their sites.

In this section, visitation numbers for these parks are used as a proxy for the potential number of visitors to the proposed sanctuary and the type of direct reach the proposed sanctuary may have through signage, visitor centers, and interactive exhibits. However, it is not accurate to assume that all visitors to the parks referenced below would be visitors to the proposed sanctuary. Instead, this information can be viewed as an indicator of potential trends in use.

There are 57 state parks in the study area, which attracted an average of 3.6 million visits annually from 2003 to 2018. The parks with the highest average levels of visitation were Green Lakes State Park, Hamlin Beach State Park, and Fair Haven Beach State Park. While not all are along the shoreline of Lake Ontario, all of these parks have both an outdoor recreation and water element similar to Lake Ontario. Annual park visitation increased from 2003-2018, with the highest number of annual visits occurring in 2018 with 4.1 million (New York Office of Parks, Recreation, and Historic Preservation, n.d.). The number of annual visits to these state parks does not represent the number of unique people who visited them, as it is possible for the same person to visit a park more than once. The data does not differentiate between residents of the study area and visitors to the study area.

Another way to measure the study area's potential economic dependence on a sanctuary is by looking at the number of landmarks and museums that are related to underwater cultural resources and maritime heritage. The region includes several lighthouses and maritime museums (refer to Table 5.2 on pg. 142).

Fort Ontario State Historic Park in Oswego is one of the most recognized historic sites in the area and is being considered for inclusion in the National Park System¹⁷. The Fort Ontario Military Complex dates back to the early 1840s and is built on the ruins of three earlier fortifications from the French and Indian War, Revolutionary War, and War of 1812. This complex also includes the Safe Haven Holocaust Refugee Shelter Museum, which commemorates the 982 European refugees who were sheltered at Fort Ontario in 1944.

4.3.2.2 Recreational Fishing

Recreational fishing is one of the most popular recreational activities in Lake Ontario and the Thousand Islands region. Trout and salmon are the most sought-after fish in Lake Ontario, followed by smallmouth bass, yellow perch, and walleye (New York State Department of Environmental Conservation (NYSDEC), 2019). Smallmouth bass are the primary targets for recreational fishermen in the New York Thousand Islands fishery, in addition to northern pike, yellow perch, walleye, and muskellunge (NYSDEC, 2019).

In 2008 and 2009, boaters spent an average of 337,000 angler-hours in the U.S. portion of the St. Lawrence River (New York State Department of Environmental Conservation, 2010). Around 80% of fishing effort was focused in the Thousand Island region. About 72% of anglers were New York residents and over 51% of these anglers lived within the study area. In 2009, anglers on the St. Lawrence River caught 1.3 million yellow perch, 97,000 smallmouth bass, 27,000 pan fish, 19,000 largemouth bass, 18,000 northern pike, and 16,000 walleye. NYSDEC compared

¹⁷ The *Fort Ontario Study Act* (2018) authorizes the National Park Service (NPS) to conduct a study to assess the feasibility of incorporating Fort Ontario and the Safe Haven Holocaust Refugee Shelter Museum in Oswego County as a unit of the National Park Service.

these results to surveys conducted in the 1980s and found few differences between them, which suggests that the fishery has not changed much in the past 25 years.

In 2018, there were almost 55,000 recreational fishing trips taken in Lake Ontario by approximately 168,000 anglers (NYSDEC, 2019). Approximately 33,000 of the fishing trips in Lake Ontario took place in the eastern half of the lake, representing about 60% of all recreational fishing trips in the lake (NYSDEC, 2019). Charter boats accounted for about 12,000 of the recreational fishing trips, or 21% of all trips (NYSDEC, 2019). In Sodus Bay Harbor alone there are about 50 charter boats, which take around 1,445 trips annually (U.S. Army Corps of Engineers, 2019).

The NYSDEC divides its recreational fisheries data collection into four statistical areas (NYSDEC, 2019). As the two eastern statistical areas align closely with the proposed sanctuary, we can use them as a proxy for how many fish are caught there. The top species caught in Lake Ontario in 2018 were Chinook salmon, brown trout, smallmouth bass, rainbow trout, lake trout, and yellow perch. From 2009 to 2018, Chinook salmon accounted for the most catch with 879,000 caught, followed by yellow perch with 366,000 caught, brown trout with 326,000 caught, rainbow trout with 317,000 caught, and lake trout with 254,000 caught. Total catch for these species has generally declined from 2009 to 2018 (NYSDEC, 2019).

Fishermen on Lake Ontario tend not to fish on wrecks because their target species do not aggregate reliably around them (Recreational charter boat captain, personal communication, Dec. 3, 2020). In the main body of Lake Ontario, many of the wrecks are too deep for recreational fishing gear to interact with them. In shallower depths, such as along the shoreline and in the St. Lawrence River, there is a chance that fishing lines can get entangled in a wreck. However, the tensile strength of the fishing line used for the main target species listed above is low enough that the line will break if caught on a solid structure instead of pulling and breaking off part of a wreck. Abandoned fishing line has been observed by divers (Recreational charter boat captain, Dec. 3, 2020) on wrecks in the study area. This debris may threaten the integrity of the wreck, pose an entanglement threat to wildlife, and is unsightly.

4.3.2.3 Recreational Scuba Diving

The St. Lawrence River has long been recognized as one of the premier destinations for freshwater shipwreck diving in the United States. Wreck sites, such as *Keystorm* and *A. E. Vickery*, continue to draw visitors due to both their level of preservation and ease of access. While significantly less developed than the St. Lawrence River, recreational diving in eastern Lake Ontario does occur. The most popular wreck to dive in Lake Ontario is *St. Peter* (Figure 4.20).

Scuba divers represent an economic impact of more than \$108 million to New York's Great Lakes region (New York Sea Grant, 1999). There are a total of 18 dive shops that are known to dive on shipwrecks in eastern Lake Ontario and the St. Lawrence River. The number of dive shops was determined based upon correspondence with locals with knowledge of dive operations in the region near the proposed sanctuary. Four of these dive shops are located in Canada and 14 are in the United States. According to prices posted on dive operator websites,

dive charters to Lake Ontario can range between \$30 and \$140¹⁸. Of the 18 dive shops, 15 offer dive courses and dive charters.



Figure 4.20. Divers take photos of *St. Peter*. Photo: NOAA

4.3.2.4 Recreational Boating

Few studies have been conducted to look at the economic contributions and status of recreational boating in the study area (Figure 4.21). A study conducted using 2003 United States Coast Guard registration data found that nearly one-third of all recreational boats in the country are registered in and around the Great Lakes (U.S. Army Corps of Engineers, 2008). The 2008 study also found that there are roughly 18,000 Great Lakes marina slips in New York, which includes all slips on Lake Erie and Lake Ontario. Of these, 16,423 slips are seasonal slips and 15,273 are occupied. Additionally, there are eight active recreational harbors on Lake Ontario. The U.S. Army Corps of Engineers evaluated Great Sodus Bay Harbor for its economic benefits generated from recreational boating and fishing activities in 2019 (U.S. Army Corps of Engineers, 2019). The study found that from six marinas (not an inclusive list) located in the harbor, roughly 27,000 boat trips are taken annually in the harbor and that over 21,000 boat owners spend leisure time at marina facilities enjoying the waterfront and social events. The

¹⁸ Prices in Canadian dive shops were converted to U.S. dollars.

study also found that boat trip spending and annual craft spending from marinas surveyed at Great Sodus Bay Harbor generated \$9.5 million in revenue, supported 103 full-time equivalent jobs, and generated \$11.8 million in output in the local study area (U.S. Army Corps of Engineers, 2019).



Figure 4.21. Sailboats sail on the St. Lawrence River. Photo: 1000 Islands International Tourism Council

4.3.3 Commercial Activities

4.3.3.1 Commercial Fishing

Commercial fishing in eastern Lake Ontario is very limited; it is concentrated in the embayments and nearshore open waters of the eastern basin. Commercial fishing gear includes gill nets, trap nets, and fyke nets; however, only gill nets were actively fished in 2018. Commercial fishermen generally target yellow perch (*Perca flavescens*); however, harvest of cisco (*Coregonus artedii*) was also reported in 2018 (NYSDEC, 2019). Data from NYSDEC shows that in 2018 there were two active licenses for fishermen in eastern Lake Ontario. Yellow perch accounted for the highest amount of commercial catch with 38,987 pounds caught in 2018 for a value of \$71,134 (NYSDEC, 2019).

4.3.3.2 Shipping

The Great Lakes-St. Lawrence River waterway, which runs from the mouth of the St. Lawrence River in the Atlantic Ocean to the western side of Lake Superior, connects more than 110 commercial ports in Canada and the United States. The waterway is the longest inland deep-draft navigation system in the world (Figure 4.22).

The proposed sanctuary would overlap with a portion of the Great Lakes-St. Lawrence River waterway in the waters of eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. Administration of the Great Lakes-St. Lawrence Seaway System is shared by the U.S. Department of Transportation's St. Lawrence Seaway Management Corporation and the Canadian St. Lawrence Seaway Management Corporation.



Figure 4.22. A merchant freighter moves through the St. Lawrence River. Photo: Matt McIntosh/NOAA

Commercial shipping on the Great Lakes carries the raw materials that drive the nation's economy. The Economic Impacts of Maritime Shipping in the Great Lakes-St. Lawrence Region Report (Martin and Associates, 2018) stated that:

In 2017, a total of 143.5 million metric tons (158.3 million short tons) of cargo valued at US\$15.2 billion (Cdn\$19.8 billion) moved through the Great Lakes-Seaway system. A majority of the domestic cargo moving on Canadian and U.S. flag vessels remains in the Great Lakes-Seaway system, creating economic impacts at the loading port, as well as the port of discharge. With this accounted for, the actual tons handled at the ports on the Great Lakes-Seaway system is 284.8 million metric tons (314.0 million short tons).

The report also indicates that 2017 marine cargo and vessel activity in the Great Lakes-Seaway system generated a total of US\$35.0 billion (Cdn\$45.4 billion) in economic activity in the United States and Canada, and that this commerce supported 27,868 U.S. and Canadian jobs, including 78,400 direct jobs (Martin and Associates, 2018).

The Port of Oswego, New York, is the first U.S. port of call and deepwater port on the Great Lakes from the St. Lawrence Seaway. The Port of Oswego can receive vessel traffic year-round, with deep draft vessels arriving from the north shore of Lake Ontario even when the St. Lawrence Seaway is closed to navigation. This port supported 209 jobs and generated business

revenue of \$19 million in 2017 (Martin and Associates, 2018). It should be noted that both alternatives 1 and 2 exclude the Port of Oswego and the federally authorized areas (channel) leading to the port. Federally authorized areas adjacent to the ports and harbors are periodically dredged by the U.S. Army Corps of Engineers. As the lanes are excluded from the boundaries, dredging activities to support commercial shipping are not discussed further here.

4.3.3.3 Energy Generation and Transmission

The Energy Policy Act of 2005 (PL 109-58, 386) instituted a permanent ban on oil and gas development in the Great Lakes. Specifically, the provision enacts a permanent ban on the issuance of federal or state permits for new directional, slant, or offshore drilling in or under the Great Lakes. Therefore, there are no current or planned oil and gas development projects in the area.

New York State Energy Research and Development Authority (NYSERDA) is planning to conduct a study of the feasibility of developing offshore wind energy in the Great Lakes adjacent to New York state. The study was commissioned as part of the state's effort to meet the 70% renewable energy by 2030 requirements of New York's Climate Leadership and Community Protection Act. The Great Lakes Wind Feasibility Study will focus on Lake Erie and Lake Ontario and will consist of data and information synthesis, technical analysis, and a policy options analysis to explore viable paths forward for wind energy in the Great Lakes. The study will consider existing and emerging technologies for fixed and floating turbines, new technology development timelines, geospatial conditions, resource assessment, regulatory processes, permitting requirements and risks, potential conflicts, costs and economic opportunities, electrical infrastructure, and overall cost-reduction pathways (NYSERDA, n.d.). NOAA is not aware of any current offshore wind energy projects in the area.

There are several submarine cables that connect the numerous islands in eastern Lake Ontario and the St. Lawrence River to shore (U.S. Bureau of Ocean Energy Management & National Oceanic and Atmospheric Administration, n.d.). Existing submarine cables are routinely maintained and upgraded, and occasionally new cables are installed. The number of new fiber optic cables proposed state-wide has increased substantially in the past few years, although none have been proposed in the proposed sanctuary boundary and there are no existing fiber optic cables in that area.

4.3.4 Military Activities

4.3.4.1 U.S. Army

Fort Drum is a U.S. Army military installation in Jefferson County, New York. Fort Drum is home to the 10th Mountain Division (Light Infantry), and about 15,000 military service members and about 3,700 civilian personnel work there. Fort Drum provides full-spectrum training and base operations support to all of the service branches, 11 states, and parts of Canada. Annually, Fort Drum offers training and base operations support to more than 26,500 Reserve and National Guard members as well as personnel from other federal, state, and local agencies (U.S. Army, n.d.; U.S. Army Garrison Fort Drum, 2011).

In terms of activities that the Army conducts on Lake Ontario, there are Active, Reserve and National Guard units that are trained and qualified to respond and execute water bucket operations in the event of a state or national emergency. Using helicopters, some of these training exercises could take place over Lake Ontario with coordination and cooperation of federal and state agencies and local municipalities. In addition to water bucket training, U.S. soldiers from Fort Drum have conducted training exercises jumping from a helicopter into a bay off of Lake Ontario in order to train soldiers on waterborne operations/combat water insertions, and conduct engineer beachhead reconnaissance activities. In 2018, soldiers conducted this exercise in Black River Bay at Sackets Harbor.

4.3.4.2 U.S. Coast Guard

U.S. Coast Guard District 9 is responsible for all Coast Guard operations throughout the Great Lakes, the St. Lawrence Seaway, and along 6,700 miles of shoreline and 1,500 miles of the international border with Canada (U.S. Coast Guard, n.d.). The U.S. Coast Guard District 9, Sector Buffalo, operates in the waters of the proposed sanctuary. The two main Coast Guard stations adjacent to the proposed sanctuary are Station Oswego and Station Alexandria Bay. Station Sodus Point and Station Sackets Harbor are seasonal sub-stations.

The Ninth District's primary missions in the Great Lakes are search and rescue, maritime safety and security, environmental protection, maritime law enforcement, aids to navigation, and icebreaking. The U.S. Coast Guard would also assist NOAA with surveillance efforts and actions related to enforcing regulations in the proposed sanctuary (Figure 4.23).



Figure 4.23. U.S. Coast Guard 45-foot response boat docks in Oswego, New York. Photo: U.S. Coast Guard

4.2.4.3 New York Air National Guard

The southwest portion of the proposed sanctuary would overlap with a 925 square mile military exercise area in the southern half of Lake Ontario (see NOAA nautical chart 14800). The coordinates of the rectangular area are approximately 43°37'N, 76°45'W; 43°24'N, 76°45'W; 43°24'N, 78°00'W; and 43°37'N, 78°00'W (Figure 4.24). The southern boundary begins at the southeast corner, which is roughly 4.5 miles northwest of the mouth of Little Sodus Bay and continues for approximately 62 miles, approaching the county boundary between Orleans and Monroe counties. The military exercise area's boundary comes within 2 miles of the shoreline at its southwest corner and is roughly 11 miles from the shoreline at Rochester. The training area is approximately 15 miles wide from north to south and comes within one mile of the international border between the U.S. and Canada. The proposed sanctuary would overlap with approximately 470 square miles of the exercise area.

This military exercise area is generally used for aircraft training by the New York Air National Guard, 174th Operations Group, which operates from Hancock Airfield in Syracuse, New York. The 174th Attack Wing (ATKW) primarily performs the Remotely Piloted Aircraft mission.

In order to meet increasing training requirements, the 174th ATKW plans to perform live-fire exercises in R5203 over Lake Ontario. The National Guard Bureau (NGB) has begun the process of reactivating R5203, along with the other Great Lake ranges, including a proposal for R5203 – Lake Ontario. They will use processes and procedures from the Alpena Range (R4207) and duplicate in R5203. The NGB estimates two to four exercises per year, depending on training requirements, with an estimated date in FY22. Their intent is to choose a standard set of static locations for targets based on the advice of all concerned parties.

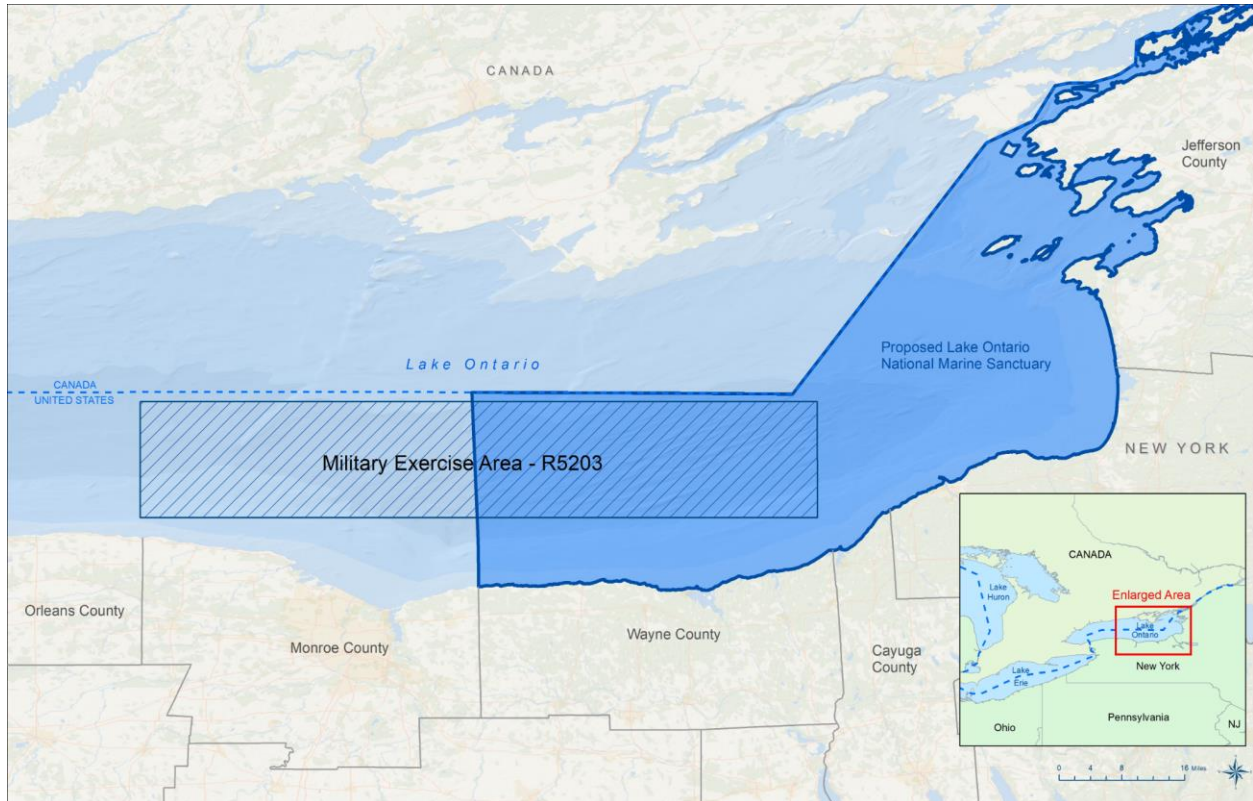


Figure 4.24. NOAA's proposed sanctuary overlaps with the R5203 military training area (hatched black) in Lake Ontario. Image: NOAA

4.3.5 Socioeconomics

NOAA analyzed local economic data to determine how dependent the local economy may be on sanctuary resources and how designating a sanctuary may impact the local economy. NOAA analyzed population metrics to indicate the local pressures on resources and demographic data to predict sanctuary visitation, as well as to inform future management measures. Population size, population growth rate, and population density can indicate the levels of current and future human use of, and pressure on, natural and cultural resources in the study area. NOAA also uses population data to decide where to locate visitor centers, exhibits, and signage based upon desired reach, existing infrastructure, and resources. NOAA prepared a detailed socioeconomic profile to characterize recent demographic and economic conditions and to determine the baseline statistics to be used in the impact analysis of the alternatives (see [NOAA's Proposed Lake Ontario National Marine Sanctuary Study Area Profile](#)¹⁹).

4.3.5.1 Study Area for Socioeconomic Data

NOAA examined the socioeconomic resources and economic effects in a study area that includes both primary and secondary counties. "Primary" denotes counties that lie adjacent to the boundaries of the proposed sanctuary. "Secondary" generally denotes counties that have more

¹⁹ <https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/docs/20210520-lake-ontario-study.pdf>

than 10% of their workforce commuting to or from a primary county. The primary counties in this analysis are Jefferson, Oswego, Wayne, and Cayuga, and the secondary counties are Onondaga, Ontario, and St. Lawrence Counties (Figure 4.25). While St. Lawrence County would ordinarily qualify as a primary county due to it bordering the proposed sanctuary, NOAA categorized it as a secondary county in this analysis because the sanctuary boundary would only overlap with one mile of the county. Monroe County, while having a large population, does not meet the definition of secondary county, as less than 10% of its workforce commutes to a primary county.

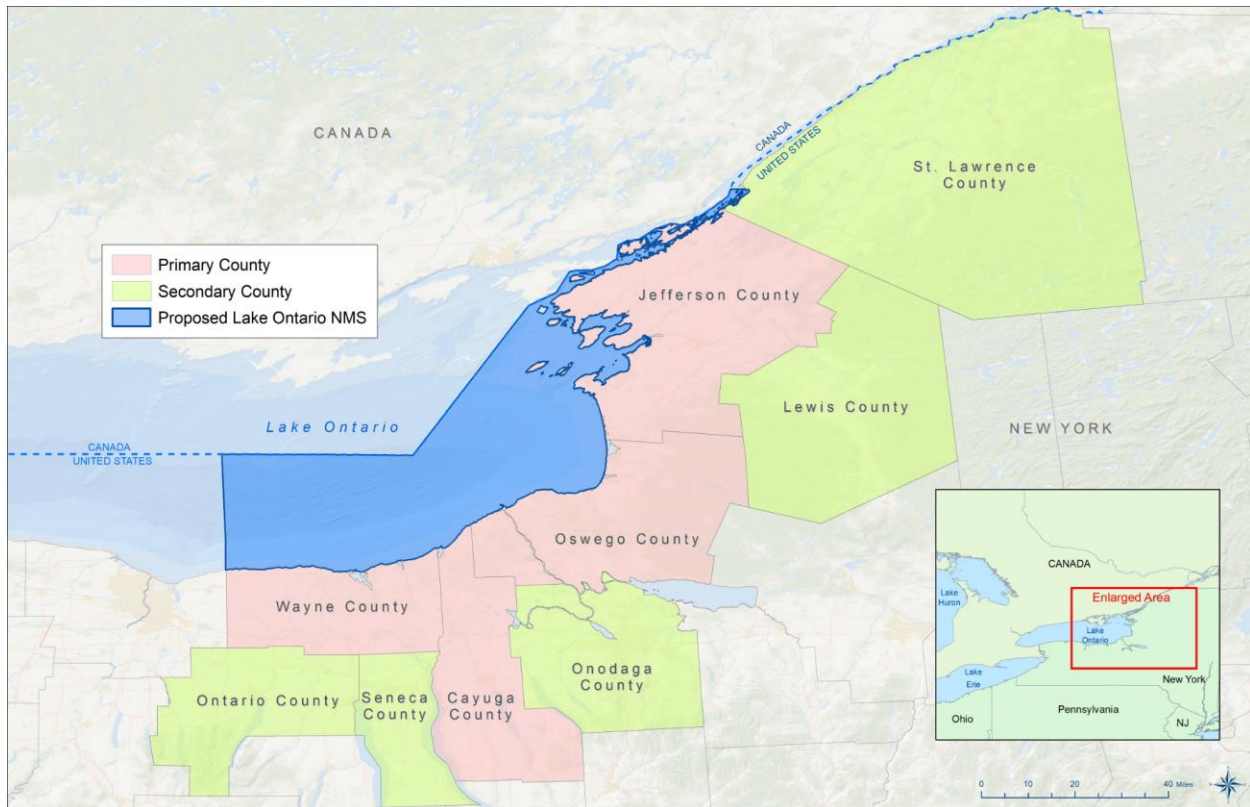


Figure 4.25. Proposed Lake Ontario National Marine Sanctuary study area counties. Image: NOAA

4.3.5.2 Population and Demographic Trends in the Study Area

The study area had a population of over 1.1 million in 2018, which is approximately 5.8% of New York's total population. Onondaga County has the largest population in the study area, with a population of over 464,000 people. The least populated county in the study area is Lewis County, with a population of approximately 27,000 people (Table 4.4). The total population in the study area declined from 2010-2018. There is some variation in population density among counties in the study area. Onondaga County is the most densely populated, with 596.41 people per square mile (Table 4.4). Lewis County is the least densely populated, with 20.96 people per square mile. The total population density in the study area is lower than in New York state but higher than in the United States.

Table 4.4. Population statistics in the study area. Image: NOAA; Source: U.S. Census Bureau <https://data.census.gov/cedsci/> and U.S. Bureau of Labor Statistics <https://www.bls.gov/>

New York County	2018 Population	Population Change (%) 2010-2018	Population Density¹ 2018
Cayuga	77,868	-3.20%	112.59
Jefferson	114,448	-0.50%	90.22
Oswego	119,104	-2.50%	125.16
Wayne	90,856	-3.00%	150.47
Lewis	26,719	-1.10%	20.96
Onondaga	464,242	0.10%	596.41
Ontario	109,472	3.00%	169.97
St. Lawrence	109,558	-2.00%	40.87
Seneca	34,612	-2.00%	106.92
Study Area Total	1,146,879	-0.70%	124.43
New York	19,618,453	2.00%	416.29
USA	322,903,030	6.20%	91.42

¹: Number of people per square mile of land area.

4.3.5.3 Gender, Race, Ethnicity, and Age

Gender, race, ethnicity, and age can indicate how visitors may use the sanctuary. NOAA also uses this information to increase accessibility to sanctuaries and to direct its education and outreach efforts to reach a wide variety of audiences.

Gender

The gender distribution in the study area has remained relatively constant from 2010-2018, with the population in the study area being about 50% males and 50% females.

Race and Ethnicity

84.7% of the population self-identified as “white;” 6.2% as “Black;” 4.3% as “Hispanic;” 0.4% as “American Indian;” 2.1% as “Asian;” 0% as “Pacific Islander;” and 0.1% as “other.” In 2018, the proportion of the study area population self-identified as “white” was higher than that of the United States and New York. The percentage of people self-identified as “Black” was lower in the study area than that in the United States and the state of New York. The study area had a lower percentage of those who identified as “Hispanic” and “Asian” than both New York and the United States in 2018 (U.S. Census Bureau, n.d.; Figure 4.26). Minority populations are not predominant in the study area.

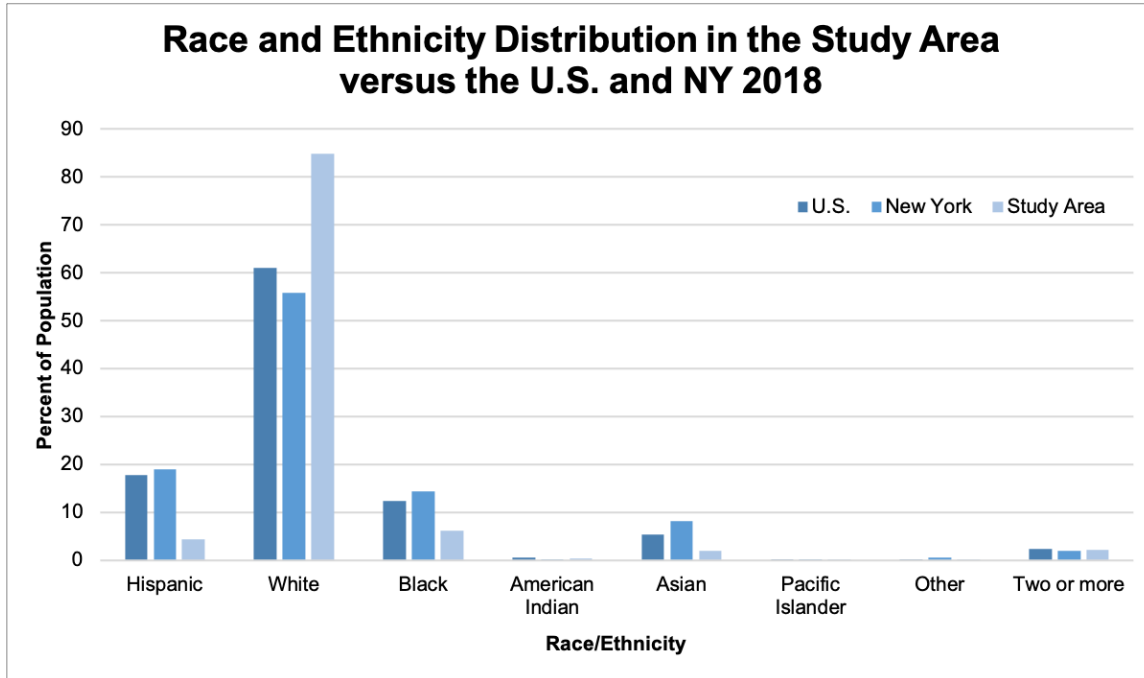


Figure 4.26. Race and ethnicity in the study area versus the U.S. and New York, 2018. Image: NOAA; Source: U.S. Census Bureau (2018) <https://data.census.gov/cedsci/>

Age distribution

Approximately 51% of the population is between the ages of 25 and 65. The age distribution in the study area is similar to the distribution in New York state and the United States (U.S. Census Bureau, n.d.; Figure 4.27).

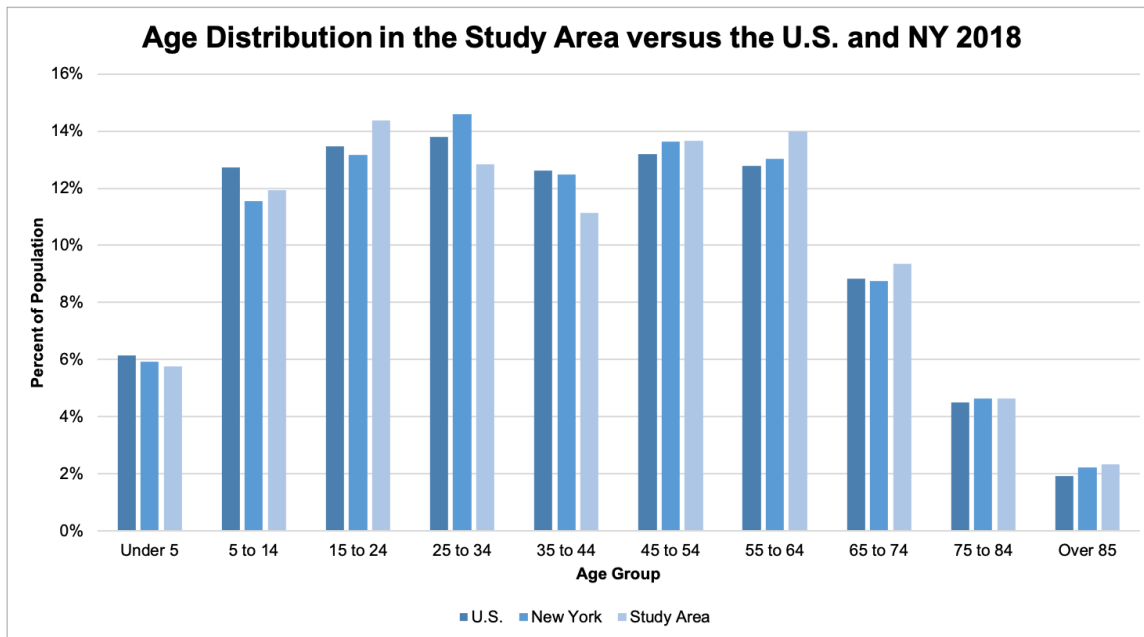


Figure 4.27. Age distributions in the study area versus the U.S. and New York. 2018. Image: NOAA; Source: U.S. Census Bureau (2018) <https://data.census.gov/cedsci/>

4.3.5.3 Income, Labor Force and Employment in the Study Area

This section describes sources of income and the status of the labor force in the study area. The labor force, total employment, and their respective growth rates are indicators of the health of the local economy and opportunities for employment. NOAA also analyzes economic measures related to proprietors (small business owners), including proprietors' income, proprietors' employment, and the proportion of the study area's income and employment accounted for by proprietors. This can be an indicator of the importance of small businesses in their communities, which are often connected to resource use in national marine sanctuaries (e.g., recreation and tourism-related businesses, such as dive shops or recreational fishing charters).

Income

Real per capita income measures the average income earned per person in a given area in a specified year. Per capita income is an indicator for the health and economic status of a community. Per capita income in the study area in 2018 was \$47,359 compared to the state's per capita income of \$68,688 and the U.S. per capita income of \$54,446 (U.S. Bureau of Economic Analysis, n.d.). From 2010 to 2018 per capita income in the study area rose, which is a similar trend to both New York state and the United States; however, it has been consistently lower than the United States and New York (U.S. Bureau of Economic Analysis, n.d.). The majority of the population is above the poverty line.

Labor Force and Employment

In 2019, there were over 523,000 persons in the study area labor force, which is approximately 5.5% of the New York state labor force (U.S. Bureau of Labor Statistics, n.d.). From 2010-2018 the size of the labor force in the study area and in New York declined (U.S. Bureau of Labor Statistics, n.d.).

The unemployment rate in the study area was 4.4% in 2019 (U.S. Bureau of Labor Statistics, n.d.; Table 4.5). The unemployment rate has fallen in the study area since 2011, but has been higher than in New York state and the U.S. during that period (U.S. Bureau of Labor Statistics, n.d.).

Table 4.5 Per capita income, percent of the population in poverty, and unemployment rate for the counties in the study area, the state of New York, and the United States in 2018. Image: NOAA; Source: U.S. Census Bureau, Small Area Income and Poverty Estimates <https://www.census.gov/programs-surveys/saipe.html>; U.S. Bureau of Economic Analysis <https://www.bea.gov/data/economic-accounts/regional>; U.S. Bureau of Labor Statistics <https://www.bls.gov/>.

New York Counties	Per Capita Income (2018)	Percent in Poverty (2018)	Unemployment Rate (2019)
Cayuga	\$42,231	13.7%	4.3%
Jefferson	\$46,924	16.7%	5.6%
Oswego	\$40,538	8.5%	5.4%
Wayne	\$46,048	12.6%	4.0%
Lewis	\$43,971	12.3%	5.5%

New York Counties	Per Capita Income (2018)	Percent in Poverty (2018)	Unemployment Rate (2019)
Onondaga	\$52,886	12.2%	3.9%
Ontario	\$53,498	13.7%	3.9%
St. Lawrence	\$37,940	16.1%	5.5%
Seneca	\$38,593	15.1%	3.8%
Study Area Total	\$47,359	13.0%	4.4%
New York State	\$68,668	13.7%	4.0%
U.S.	\$54,446	13.1%	3.6%

In 2018, the highest percentages of people in the study area were employed by the government and government enterprises (19.01%) and the healthcare and retail trade sector (12.20%) (U.S. Bureau of Economic Analysis, n.d.; Figure 25).

As mentioned previously, NOAA analyzes economic measures related to proprietors²⁰ because these metrics are good indicators of the importance of small businesses in their communities. Most marine recreation businesses are small businesses and would be classified as such. In 2018, proprietors in the study area employed 121,000 people, which made up 24.2% of total employment in the study area. Proprietors earned almost \$3.6 billion in 2018, which is 9.7% of income by place of work in the study area.

The study area had a consistently lower percentage of both employment and income from proprietors from 2010-2018 than New York state as a whole. In the study area, proprietors' employment as a percentage of total employment slowly rose from 2010-2018 (U.S. Bureau of Economic Analysis, n.d.). This means that over the study period, the number of people employed by small businesses increased relative to other sources of employment (larger businesses and government, for example).

²⁰ Current-production income of sole proprietorships, partnerships, and tax-exempt cooperatives. Excludes [dividends](#), monetary interest received by non-financial business, and rental income received by [persons](#) not primarily engaged in the real estate business. BEA, 2020. https://www.bea.gov/help/glossary?title_1=All&title=proprietor

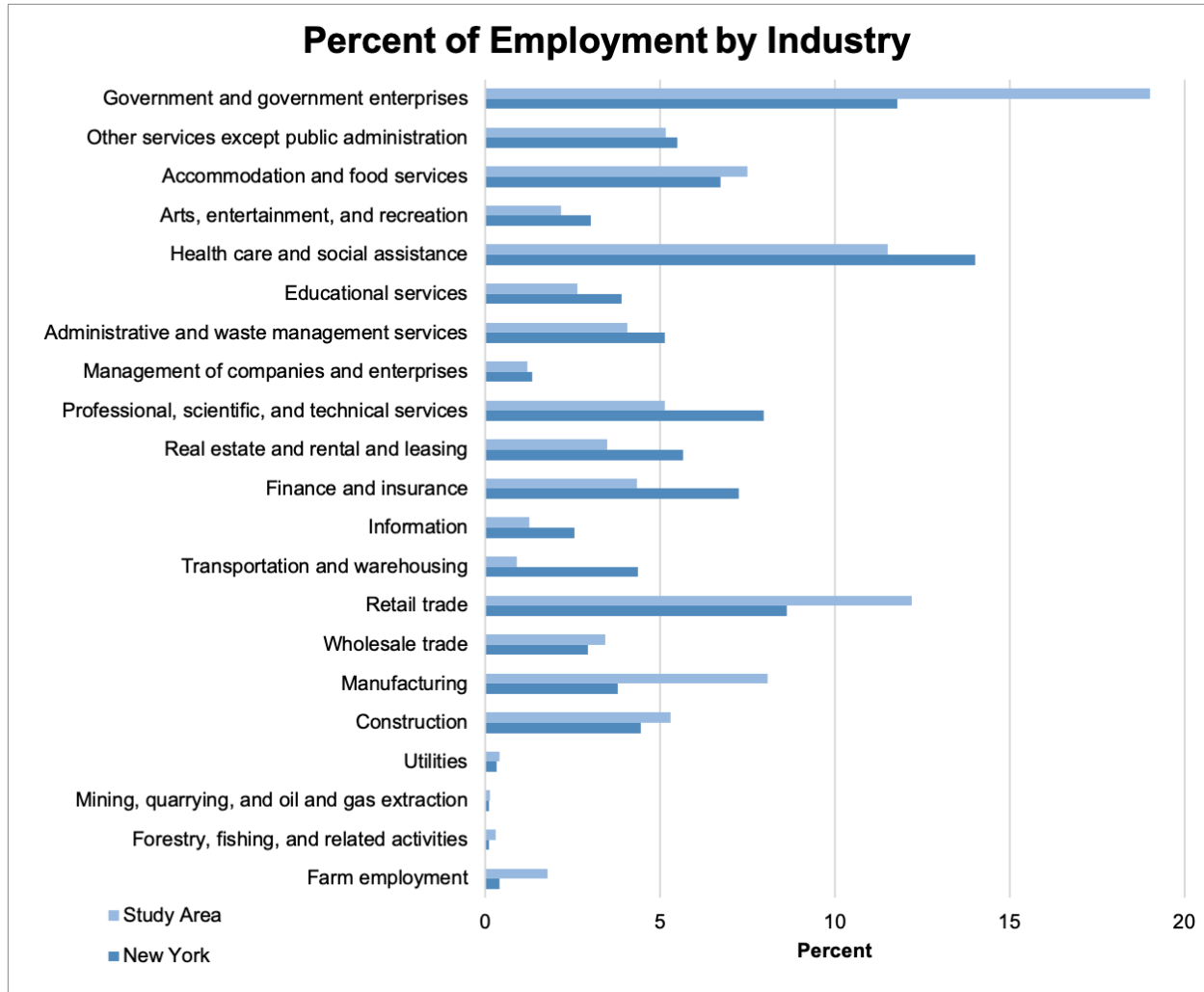


Figure 4.28. Percent of employment by industry for the study area versus New York state in 2018. Image: NOAA; Source: U.S. Bureau of Economic Analysis <https://www.bea.gov/data/economic-accounts/regional>

New York Potential Environmental Justice Areas

The New York State Department of Environmental Conservation has established a [policy on Environmental Justice](#) (EJ)²¹ and permitting, stating “Environmental Justice is the fair and meaningful treatment of all people, regardless of race, income, national origin or color, with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Environmental Justice allows for disproportionately impacted residents to access the tools to address environmental concerns across all of DEC's operations.” The Office of Environmental Justice (OEJ) works to address environmental issues and concerns that affect primarily low income and minority communities through grant opportunities, enforcement of environmental laws and regulations, consultation, guidance, and enhanced public participation.

²¹ <https://www.dec.ny.gov/public/333.html>

In the DEC Commissioner Policy 29 on Environmental Justice and Permitting (CP-29), Potential EJ Areas are U.S. Census block groups of 250 to 500 households each that, in the U.S. Census, had populations that met or exceeded at least one of the following statistical thresholds:

1. At least 51.1% of the population in an urban area reported themselves to be members of minority groups; or
2. At least 33.8% of the population in a rural area reported themselves to be members of minority groups; or
3. At least 23.59% of the population in an urban or rural area had household incomes below the federal poverty level.

[NYSDEC maps](#) indicate areas in the study area that are considered to be EJ areas. Each county in the study area has some areas identified²².

4.4 Physical Environment

This section describes the physical environment within the proposed sanctuary, including the geology, climate, and water quality within eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. The natural resources of this area contribute significantly to industry, shipping, fishing, and recreation, as well as to a rich and diverse ecosystem.

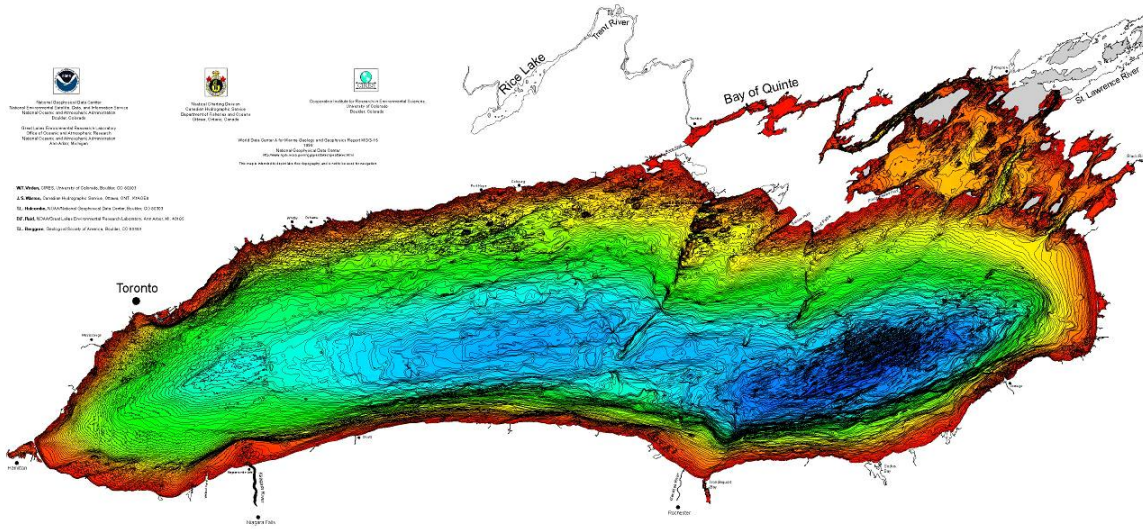
4.4.1 Physical Resources within Lake Ontario

Lake Ontario is the 12th largest freshwater lake in the world, by area and by volume. It is the smallest of the Laurentian Great Lakes of North America but is the second deepest with an average depth of 283 feet; only Lake Superior is deeper (Waples et al., 2008).

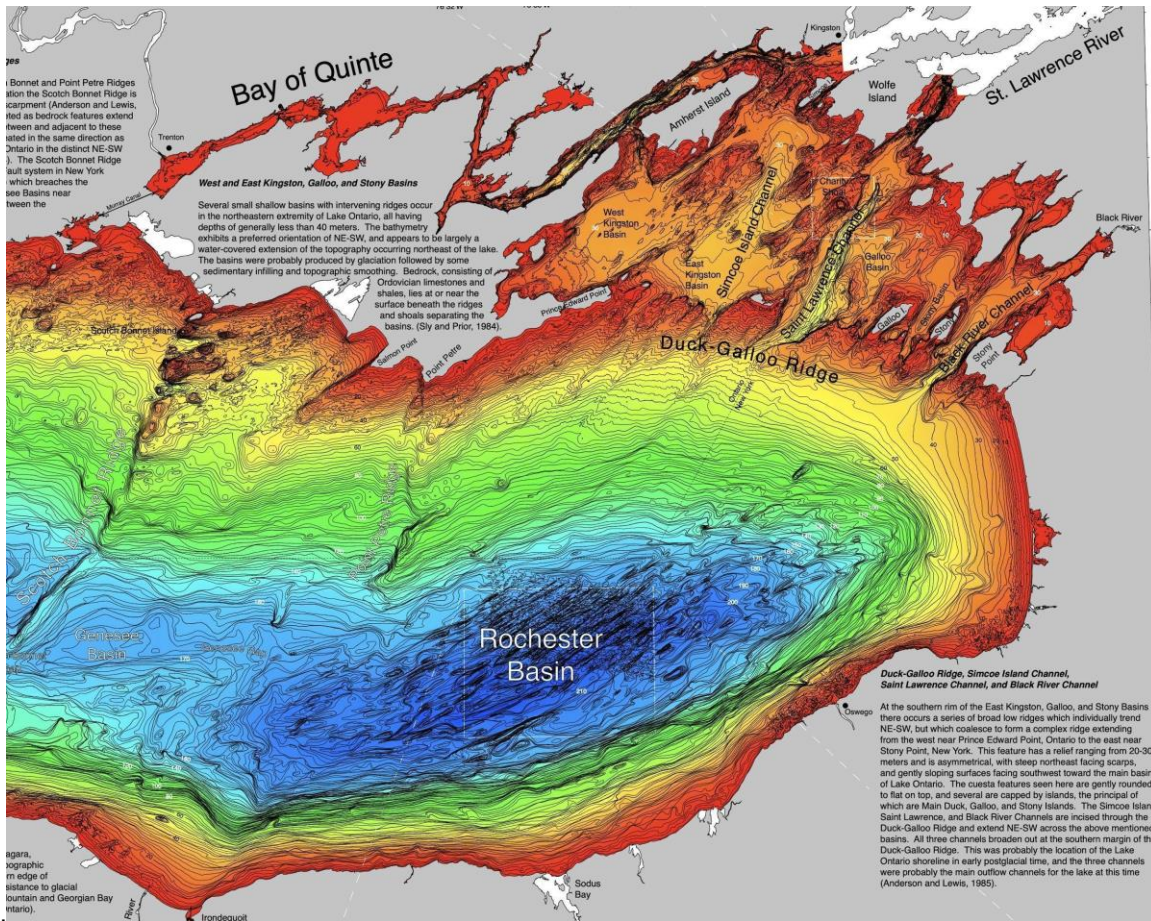
4.4.1.1 Geology (Lake Ontario)

The character of the lakebed differs by how the last glacial period eroded the bedrock. The movement of glaciers eroded the shales and redbeds in the north more easily than the limestones in the south, leaving asymmetrical slopes to the basin sides. As can be seen in the bathymetry map (Figure 4.29A) produced by NOAA's National Centers for Environmental Information, the Mississauga, Genesee, and Rochester are the basins partially or wholly within the proposed sanctuary (NOAA National Centers for Environmental Information, n.d.). The Rochester Basin in the eastern side of the lake within the proposed sanctuary holds the deepest point of the lake, at greater than 820.2 feet (NOAA National Centers for Environmental Information, n.d.). These three basins are deeper near the southern shore, with a more gradual slope to the northern shore. The most extreme slope is in the Rochester Basin offshore of Oswego, New York, where the depth drops to 656 feet within 2.5 miles from shore.

²² <https://www.dec.ny.gov/public/911.html>.



A.



B.

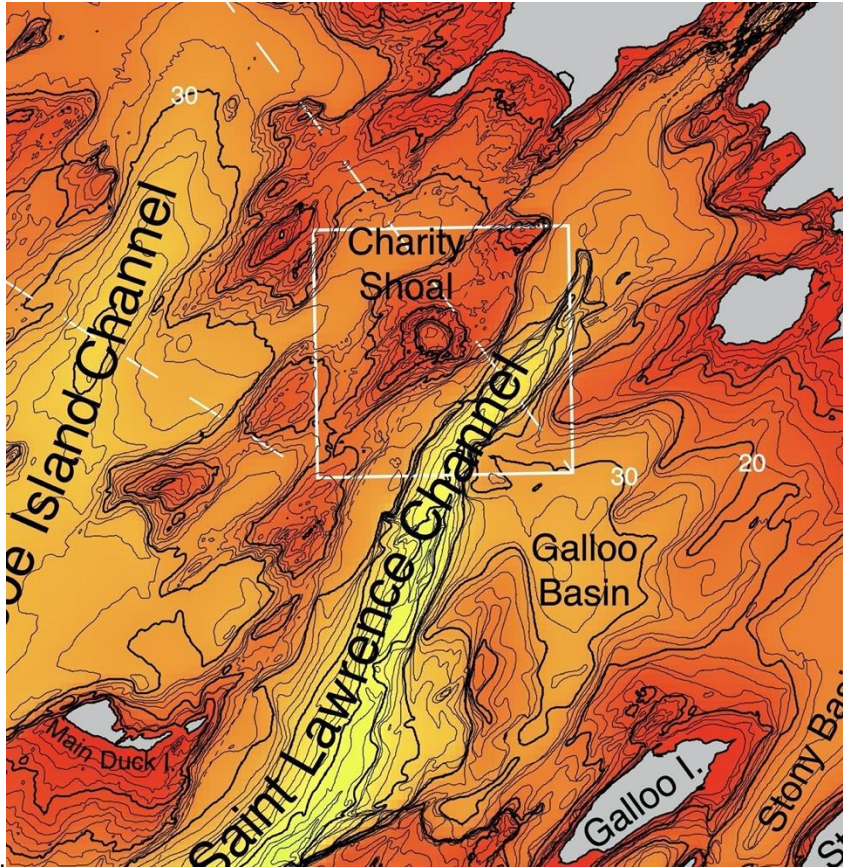


Figure 4.29 A-C. Bathymetry of Lake Ontario. A. The bathymetry of Lake Ontario. B. A close up of the bathymetry of the eastern half of Lake Ontario. C. A close up of the bathymetry of the Charity Shoal crater in northeastern Lake Ontario. Images: NOAA National Centers for Environmental Information <https://www.ngdc.noaa.gov/mgg/greatlakes/ontario.html>

Ridges running from the northeast to southwest that may have been formed by glacial processes, break up much of the lake bottom within the proposed sanctuary area. These ridges have a relief of 65 feet (20 meters) and spacing of 820 - 3,281 feet and also rise above the water surface to form the Galloo and Stony Islands in the east of the lake. Due to wave and current disturbance and a history of glacial erosion, sediments are not very deep near the lake shoreline, and bedrock exposures are common (NOAA National Centers for Environmental Information, n.d.). The sediments in the depths of the basins are mostly muds, with more clays, sands, and hard bedrock nearer to shore (Great Lakes Aquatic Habitat Framework, 2012).

Another interesting feature of the northeastern lakebed is the Charity Shoal crater (Figure 4.29C). This formation straddles the international border with Canada. The center of this depression is 65.6 feet deep with a 3,937 to 4,921-foot diameter rim, which rises to less than 16.4 feet below the water surface (Holcombe et al., 2013). In 1877 the shoal was marked for navigational safety by the Charity Shoal Light constructed on the U.S. side (Figure 4.30). Researchers have more recently suggested that the crater is the possible result of a meteorite impact more than 540 million years ago with an original crater depth of more than 1,968.5 feet, which filled in with sediments over time (Suttak, 2013).



Figure 4.30. East Charity Shoal Light. Image: U.S. Coast Guard Historian's Office, 2019

The Canadian shoreline on the north shore of Lake Ontario is more urbanized and developed than the south shore and includes the urban areas of Hamilton and Toronto (Waples et al., 2008). Oswego and Rochester are the largest urban areas on the south side of the lake in New York state. The southern and eastern shorelines of the lake are subject to strong winds and wind-driven waves, which have piled eroded sands into dunes. NYSDEC identified an area in this region as the Eastern Lake Ontario Barrier Beach and Wetland Complex, a 17-mile long, 5,800-acre area made up of multiple barrier beaches, embayments, dunes, and wetlands. It contains the world's largest collection of freshwater sand dunes, along with many wetlands and prairies and provides important habitat to a great diversity of life (NYSDEC, 2007).

4.4.1.2 Climate (Lake Ontario)

As mentioned above, the southern and eastern shorelines of the lake are subject to strong winds and wind-driven waves, which erode the shoreline. These westerly winds draw moisture from the lake surface onto the southeast shore causing lake-effect precipitation on the New York shore and areas upland.

The timing of winter ice formation on the lake surface can affect the amount of lake-effect precipitation, as early season ice blocks the lake surface from winds and reduces moisture available for precipitation onto the land (Di Liberto, 2017).

Another important dynamic in the lake system is seasonal vertical water mixing. During warm months, less dense warm water rises to the surface, and denser cold water sinks. In winter, colder air cools the surface water, which then becomes more dense and sinks. This vertical movement continues until the water cools to 39.16° F. Fresh water is the most dense at this

temperature, therefore the bottom of the lake never gets colder than this. Water colder than 39.16°F (including ice) is less dense and stays at the surface. This allows organisms to survive the winter in liquid water at the lake bottom and also cycles water-soluble nutrients through the water column as this process repeats at the start of the next spring.

Lake Levels

Lake level variations affect a wide variety of uses and resources, such as coastal property, commercial shipping, hydropower production, ecological structure and function, recreational activities, and aesthetic enjoyment of the lake, in complex and varied ways. For example, certain high water levels can have beneficial outcomes like increasing hydropower production, improving ecological functions, and allowing deeper drafts for shipping, while also increasing the risk of flooding for vulnerable properties and limiting access to recreation activities and lake-based businesses.

Weather patterns within the Lake Ontario watershed and across the entire Great Lakes system are a strong driver of lake levels. Warm water temperatures, dry air, and strong winds can increase evaporation and lower lake levels, while higher precipitation levels and overwinter ice cover help to maintain or increase lake levels. While lake levels demonstrate multiyear, periodic cycles of relatively high and low water, changes in weather can also lead to variations in lake levels on a short-term and seasonal basis. The predominance of northerly and westerly wind-driven wave action can exacerbate high water levels and lead to a relatively greater effect on Lake Ontario's southern and eastern shores, along the proposed sanctuary boundary, than may be experienced on the northern shore.

Because Lake Ontario is at the downstream end of the Great Lakes Basin, water levels in the Lake are predominantly affected by the water supply in the upper Great Lakes and resultant inflows from Lake Erie. Lake Ontario outflow rates are regulated at the Moses-Saunders dam near Massena, New York, and Cornwall, Ontario, according to international agreement. This provides some ability to address impacts from extreme high and low water levels by increasing or decreasing outflow rates. However, the ability to adjust for seasonal variations requires significant releases over extended time periods to achieve an appreciable effect on water levels; this is constrained by multiple factors including the water supply upstream in the rest of the basin, weather patterns within the Lake Ontario watershed, and conditions downstream of the dam in the St. Lawrence River (Figure 4.31).

The shipping industry is significantly affected by lake water level, which may affect vessel draft and load capacity, port access, and transit through locks. Lake levels are influenced by many factors, including precipitation, snowmelt runoff, drought, evaporation rates, and withdrawals for urban and agricultural uses. Lake levels may also affect nearshore shipwrecks, coastal erosion, hydropower production, recreation activities, stormwater removal, flooding, and property damage. Management controls through actions of the Moses-Saunders dam on the St. Lawrence River at Cornwall, Ontario, may well be able to maintain current levels (Gronewold & R.B., 2019).

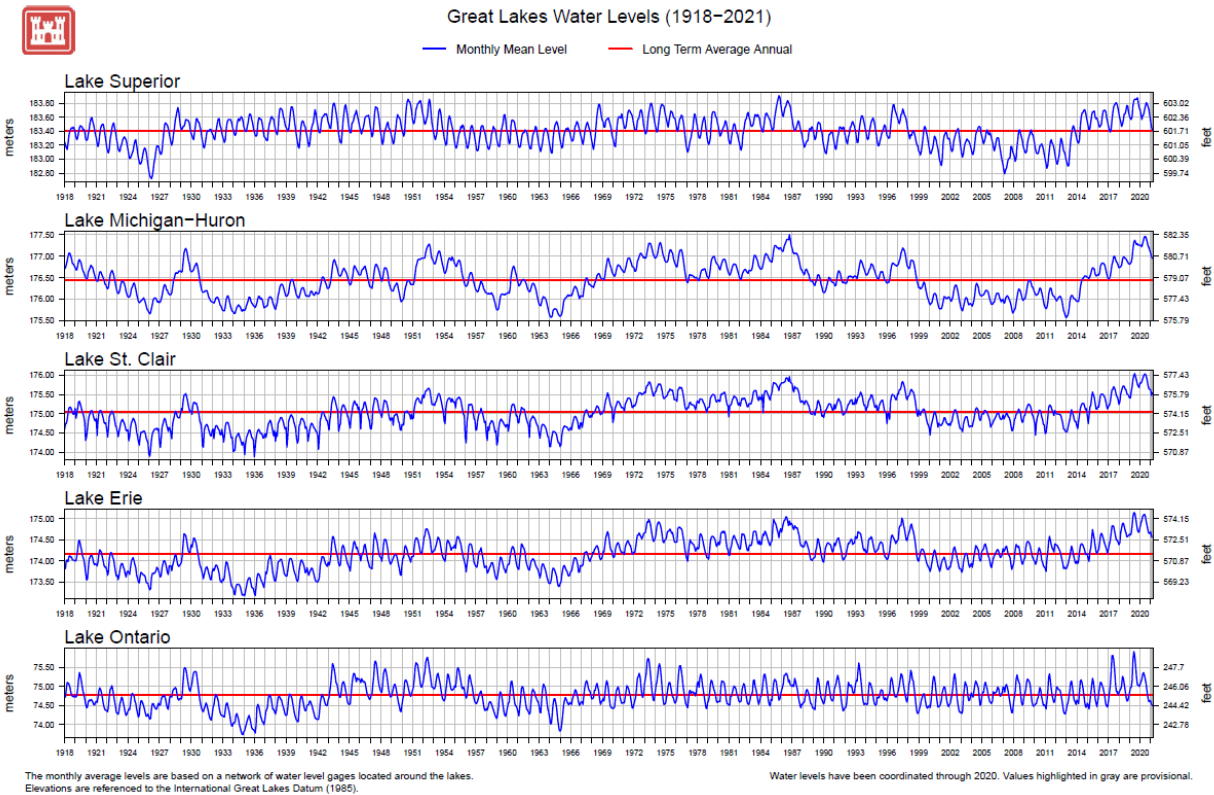


Figure 4.31. Great Lakes water levels. Image: U.S. Army Corps of Engineers

4.4.1.3 Water Quality (Lake Ontario)

The waters of Lake Ontario support both human activities and health and ecological systems necessary for fish and other wildlife. The water provides the opportunity for human recreation activities, such as boating, fishing, and swimming, as well as water-borne transportation, trade, and commerce. As noted by Environment and Climate Change Canada (ECCC) and the U.S. Environmental Protection Agency (EPA) in their joint Lake Ontario Lakewide Action and Management Plan (LAMP), the lake also provides drinking water for millions of people in the U.S. and Canada (Environment and Climate Change Canada and the U.S. Environmental Protection Agency, 2018).

In the latest triennial report on Great Lakes water quality, the International Joint Commission (IJC) finds that drinking water quality sourced from the Great Lakes, including Lake Ontario, and connected river systems is generally good, but local governments should make more progress in expanding information gathered by regular water quality monitoring programs (IJC, 2017). Conditions for safe swimming and recreational use of Lake Ontario public beaches are fair to good, with few closures due to health risks from sewage, agricultural runoff, or toxic algal blooms.

The IJC report assesses that levels of contaminants in edible fish that may threaten lake ecology and human health are fair (but showing improvement), with polychlorinated biphenyls (PCBs), mercury, and dioxins from past pollution still remaining in the watershed (IJC, 2017). Mirex,

PCBs, and dioxin are listed as fish contaminants by the New York Department of Health (New York Department of Health, n.d.).

Levels of nutrient pollution and harmful algal blooms (HABs) in Lake Ontario are at levels that cause experts some concern. The IJC report reviews nutrients in Lake Ontario and finds that excess phosphorus in runoff from both agricultural lands and urban areas is contributing to the growth of the nuisance macroalgae, *Cladophora* spp., on shorelines and beaches. Water further from shore has lower nutrients than ideal, possibly due to sequestration by non-native aquatic species, such as the quagga mussel (*Dreissena bugensis*, see Section 4.5.1.3). This condition may be disruptive to the natural lake ecology. Other native species rely on these nutrients, which are now not as readily available. The report finds that relative to target levels, these nutrient conditions are fair and deteriorating.

The IJC created a binational water quality management plan for Lake Ontario and the Niagara and St. Lawrence rivers. The plan is implemented by U.S. and Canadian federal agencies coordinating with governments of nations and tribes and state and provincial governments. In the U.S., NYSDEC is responsible for much of the water monitoring in the southern part of the watershed. The New York State Office of Parks, Recreation and Historic Preservation (OPRHP) monitors OPRHP beaches weekly for bacterial indicators of impaired water quality, [providing beach condition results](#)²³ throughout the swimming season. USGS also provides [water quality monitoring results](#)²⁴ for lake tributaries.

4.4.2 Physical Resources in the Thousand Islands Region of the St. Lawrence River

Lake Ontario discharges into the St. Lawrence River on its eastern side at Cape Vincent, New York, through the Thousand Islands, and then flows 744 miles into the Gulf of St. Lawrence, the largest estuary in the world. The river drains the 254.5-million-acre watershed of all the Great Lakes and discharges 2.7 million gallons per second into the North Atlantic Ocean (Waples et al., 2008).

²³ <https://parks.ny.gov/recreation/swimming/beach-results/>

²⁴ <https://waterdata.usgs.gov/ny/nwis/qw>



Figure 4.32. St. Lawrence River islands. Photo: Thousand Islands International Tourism Council

4.4.2.1 Geology (St. Lawrence River)

The most obvious features of this area are the many islands. The total count depends on the definition of an island. The 1000 Islands International Tourism Council (TI Council) puts the count at 1,864 using the standard that an island would be above water 365 days a year and support at least one living tree (1000 Islands International Tourism Council, n.d.).

The geology of the Thousand Islands area of the St. Lawrence upriver of Alexandria Bay is made of the same formations that make up the Adirondack Mountains and the Canadian Shield. Their base is billion-year-old metamorphic gneiss under layers of sedimentary sandstones and limestones eroded by glacial processes. This bedrock is exposed in many places throughout the Thousand Islands and the eastern shore of Lake Ontario (Potsdam Public Museum, n.d.).

The depth of the main navigational channels of the St. Lawrence Seaway is maintained by dredging to 27 feet but is much deeper in some areas, such as through the American Narrows off Wellesley Island, where it reaches 239 feet (Figure 4.33). Current velocity and water levels through the Thousand Islands region varies due to season and weather, with levels rising from spring snowmelt runoff and strong winds. The current is usually less than 0.7 miles per hour with water levels varying about 2 feet in height from low to high (NOAA United States Coast Pilot, 2019).



Figure 4.33. St. Lawrence shipping channel. Photo: U.S. Department of Transportation

4.4.2.2 Climate (St. Lawrence River)

The Thousand Islands area of the St. Lawrence River has climate conditions similar to those of the eastern side of Lake Ontario and shares the same lake level controlled by the Moses-Saunders dam at Cornwall, Ontario (see Section 4.4.1.2).

4.4.2.3 Water Quality (St. Lawrence River)

The main source of water to the upper St. Lawrence River is Lake Ontario. Therefore, water quality in this area is heavily influenced by the quality of the water flowing from the lake (see Section 4.4.1.3).

4.5 Biological Resources

This section describes the biological resources within the proposed sanctuary within eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River, including the aquatic ecosystem, terrestrial wildlife and birds, invasive species, and protected species and habitats.

4.5.1 Biological Resources Within Lake Ontario

The natural resources and ecological qualities found within eastern Lake Ontario and its coastline contribute significantly to the ecological system of the lake and its terrestrial interface. The proposed sanctuary area features significant biodiversity in fish and wildlife habitats, including fish spawning shoals critical for supporting native fish populations, which support the region's outstanding recreational fisheries. Lake Ontario waters and coastal habitats support federally and state-listed species, which are discussed in Section 4.5.4.

There are numerous bird conservation areas and significant fish and wildlife habitat areas along the shoreline of eastern Lake Ontario and the St. Lawrence River. For example, the state of New York designated several Significant Coastal Fish and Wildlife Habitats along the shoreline of eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. These areas protect a variety of wildlife. Some of those areas extend into lake and river waters, such as at the mouth of the Oswego River, Stony Island, Stony Point, Little Galloo Island, Fox Island, Calf Island, Point Peninsula Marsh, Carlton Island, Grindstone Island, Wellesley Island, and Oak Island (New York Department of State, n.d.). There are seven Bird Conservation Areas designated by New York state along the shoreline and on the islands in the action area (NYSDEC, n.d.-b).

In 2007, New York state identified the ‘Eastern Lake Ontario Barrier Beach and Wetland Complex,’ a 17-mile long, 5,800-acre area made up of multiple barrier beaches, embayments, dunes, and wetlands. Eastern Lake Ontario marshes and various embayments are important because of their filtering capacity that improves the lake’s water quality and ability to offer structural protection for spawning fish and small prey fish before they venture out into the open lake. The area represents the remains of one of the largest inland dune systems in the eastern Great Lakes and contains some of the highest quality freshwater marshes in New York state. The New York Department of State deemed the area a “Significant Coastal Fish and Wildlife Habitat.”



Figure 4.34. Black Pond Wildlife Management Area on eastern shore of Lake Ontario. Photo: Geoff Steadman and Tom Hart, New York Sea Grant

4.5.1.1 Aquatic Species (Lake Ontario)

Lake Ontario contains a rare, deep, and cold freshwater ecosystem. As noted in Section 4.4.1.1, lakebed habitats range from bare bedrock, clays, and sands in the shallows to muds in the depths. Although it is not a pristine system with many non-native species disrupting native species interactions, restoration is underway for at-risk native species, such as lake trout (*Salvelinus namaycush*), lake sturgeon (*Acipenser fulvescens*), and deepwater cisco (*Coregonus johanna*). Improvement in Lake Ontario’s water quality and associated prey species population health over the last 40 years is evidenced by the successful restoration of the American bald eagle to New York state.

The area supports a large and thriving recreational fishery for native lake trout, smallmouth bass (*Micropterus dolomieu*), and walleye (*Sander vitreus*), and for introduced species, such as Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*Oncorhynchus kisutch*), brown trout (*Salmo trutta*), and rainbow trout (*Oncorhynchus mykiss*) (see Section 4.3.2.2). Yellow perch (*Perca flavescens*) are also targeted by both recreational and commercial fishers (Section 4.3.3.1).

Along with lake trout, deepwater cisco, and Atlantic salmon, the native deepwater sculpin (*Myoxocephalus thompsoni*) and spoonhead sculpin (*Cottus ricei*) were once common throughout the deeper areas of the lake. Both sculpin are now very rare in Lake Ontario with the spoonhead considered extirpated. Non-native alewives may also occur at depth and are prey for lake trout and other gamefish (NYSDEC, 2015).

Other non-native aquatic species are discussed more below in Section 4.5.1.3, Invasive Species.

4.5.1.2 Terrestrial and Coastal Resources (Lake Ontario)

Areas of natural significance contiguous to the proposed sanctuary include: Chimney Bluffs State Park, sculpted by the lake's unique weather; Derby Hill Bird Observatory, one of the premier locations in North America to observe migrating birds of prey; Lake Shore Marshes; Sterling Nature Center; Stony Point - Lyme Barrel Shoals; and Little Galloo Island, which is listed as an Important Bird Area by the Audubon Society (Audubon Society, n.d.).

Much of the lake shoreline is agricultural or developed as urban areas, but there are some remaining wetlands, other natural areas, and uninhabited islands that provide important habitat for terrestrial species and protect water quality in the lake watershed. Shorelines are stabilized by dune vegetation, emergent wetland vegetation, or a mixed deciduous forest of oak (*Quercus* sp.), hickory (*Carya* sp.), maple (*Acer* sp.), beech (*Fagus* sp.), and birch (*Betula* sp.) (U.S. Geological Survey, 1992; U.S. Geological Survey, 2018).

4.5.1.3 Aquatic Invasive Species (Lake Ontario)

Invasive species are non-native species that persist and cause harm to an area. Invasive species are a serious problem in the Great Lakes. More than 180 invasive and non-native species have severely damaged the Great Lakes ecosystem. Species, such as the zebra mussel (*Dreissena polymorpha*), quagga mussel (*Dreissena bugensis*), round goby (*Neogobius melanostomus*), sea lamprey (*Petromyzon marinus*), and alewife (*Alosa pseudoharengus*) reproduce and spread, ultimately degrading habitat, outcompeting native species, and short-circuiting food webs. Invasive zebra and quagga mussels have had an exceptionally significant impact on shipwrecks and maritime heritage resources, as they have an affinity for hard substrates and are commonly found attached to these sites. When first introduced into the Great Lakes in the 1980s via ballast water discharge from transoceanic ships, zebra and quagga mussels first colonized shallow, well-lit archaeological sites (O'Neill & Dextrase, 1994). However, to date, archaeologists and divers have observed significant zebra and quagga mussel infestation on shipwreck sites as deep as 300 feet).



Figure 4.35. Invasive mussels covering a submerged light beacon. Photo: Tim Caza

These adverse effects occur in Lake Ontario. New York state with USFWS has an active restoration program to restock native lake trout. Sea lamprey prey on lake trout and alewives displaced their native cisco prey (USFWS, 2019). Both sea lamprey and alewives are native to the Atlantic Ocean and most likely introduced to Lake Ontario through the construction of the Erie Canal in the early 1800s. Sea lamprey inhabit a variety of habitats in Lake Ontario and are parasitic on lake trout and ciscos. They attach to a host with a sucker-shaped jawless mouth and feed on body fluid and flesh (Kottelat & Freyhof, 2007).

4.5.1.4 Protected Species and Habitats (Lake Ontario)

These adverse effects occur in Lake Ontario. New York state with USFWS has an active restoration program to restock native lake trout. Sea lamprey prey on lake trout and alewives displaced their native cisco prey (USFWS, 2019). Both sea lamprey and alewives are native to the Atlantic Ocean and most likely introduced to Lake Ontario through the construction of the Erie Canal in the early 1800s. Sea lamprey inhabit a variety of habitats in Lake Ontario and are parasitic on lake trout and ciscos. They attach to a host with a sucker-shaped jawless mouth and feed on body fluid and flesh (Kottelat & Freyhof, 2007).

4.5.1.4.1 Endangered Species Act Listed Species and Designated Critical Habitat (Lake Ontario)

The USFWS and the National Marine Fisheries Service (NMFS) jointly administer the ESA of 1973, as amended (16 USC 1531 *et seq.*). The USFWS manages the protection of, and recovery effort for, listed terrestrial and freshwater species, and NMFS manages the protection of and recovery effort for listed marine and anadromous species.

The ESA protects plant, fish, and wildlife species (and their habitats) listed as endangered and threatened. A species is defined as endangered if it is at risk of extinction throughout all, or a significant part of its range. A threatened species is one that is likely to become endangered in the near future.

When USFWS or NMFS lists a species under the ESA, they are required to designate critical habitat for the species to the maximum extent prudent and determinable (16 USC 1533(a)(3)). Critical habitat is defined as (1) specific areas within the geographical area occupied by the species at the time of listing that contain physical or biological features essential to conservation of the species and that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation of the species (16 USC 1532(5)). Section 7(a)(2) of the ESA requires federal agencies to consult with the USFWS and/or NMFS, as applicable, before initiating any action that may affect a listed species or designated critical habitat (16 USC 1536(a)(2)).

Action Area for ESA Analysis (Lake Ontario)

The implementing regulations for section 7(a)(2) of the ESA (50 CFR 402.02) state that the “action area means all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action.” The action area effectively bounds the analysis of ESA-protected species and habitats, because only species or designated critical habitat that occur within the action area may be affected by the federal action.

For the purposes of the ESA analysis for the proposed sanctuary, NOAA defines the action area as:

1. the proposed boundary of the sanctuary, the main routes vessels would travel to operate within the sanctuary; and
2. shorelines, wetlands, and inland bays immediately adjacent to the proposed sanctuary where noise from activities would be audible to birds and other wildlife.

NOAA expects all direct and indirect effects of the proposed action to be contained within the action area as defined above. NOAA recognizes that while the action area is stationary, ESA-listed species can move in and out of the action area. For instance, a migratory bird species could occur in the action area seasonally as it forages or travels at or near the proposed sanctuary. Thus, in its analysis, NOAA considers not only those species known to occur directly within the action area, but also those species that may passively or actively move into the action area for limited periods of time. NOAA then considers whether the life history of each species makes the species likely to move into the action area where it could then be affected by the proposed action.

Species and Habitat Under NMFS Jurisdiction (Lake Ontario)

NOAA has ascertained that no listed, proposed, or candidate species, or proposed or designated critical habitat under NMFS jurisdiction are known to occur within the action area.

Species and Habitat Under FWS Jurisdiction (Lake Ontario)

NOAA used the USFWS's Environmental Conservation Online System (ECOS) Information for Planning and Conservation (IPaC) tool to search for ESA-listed endangered or threatened species that may be present in the action area. The ECOS IPaC tool identified four species (Table 4.6) listed as endangered or threatened under USFWS jurisdiction that could occur in the action area (Consultation Code: 05E1NY00-2020-SLI-2428, April 23, 2021). Designated critical habitat for one species, the piping plover (*Charadrius melodus*), occurs within the action area (USFWS, 2021a). No proposed or candidate species, or proposed designated critical habitat under USFWS jurisdiction occur within the action area.

As summarized in Table 4.6, NOAA evaluated the species' habitat requirements and habitat availability within the action area and determined that all four of the listed species may occur in the action area.

Table 4.6. ESA-Listed Species under USFWS Jurisdiction Potentially Found in the Action Area (Lake Ontario). Source: U.S. Fish and Wildlife Service <https://ecos.fws.gov/ipac/>

Common Name	<i>Latin Name</i>	Status	Habitat Requirements	Likelihood to occur within the Action Area
Indiana bat	<i>Myotis sodalis</i>	Endangered	May be found hibernating during winter in caves or, occasionally, in abandoned mines. During summer, they roost under the peeling bark of dead and dying trees. Indiana bats eat a variety of flying insects found along rivers or lakes and in uplands.	May infrequently roost, travel, or forage within riparian forests that are adjacent to the proposed sanctuary.
Northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened	May be found in a variety of forested and wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitat, as well as linear features, such as fence rows, riparian forests, and other wooded corridors. Suitable winter habitat includes caves and cave-like structures (e.g., abandoned or active mines, railroad tunnels).	May infrequently roost, travel, or forage within riparian forests that are adjacent to the proposed sanctuary.

Common Name	Latin Name	Status	Habitat Requirements	Likelihood to occur within the Action Area
Piping plover	<i>Charadrius melodus</i>	Endangered	May nest on shoreline and island sandy beaches with sparse vegetation and the presence of small stones (greater than 1.3 cm [0.5 inch]). Piping plovers spend three to four months a year on the breeding ground during the summer. They may prey upon invertebrates that are 1 cm (0.4 inch) or less below the surface, including insects, worms, crustaceans, and mollusks, as well as eggs and larvae of flies and beetles.	May infrequently nest or forage along shoreline and sandy beaches during three to four months of the summer.
Bog turtle	<i>Glyptemys muhlenbergii</i>	Endangered	May be found in small, discrete populations, generally occupying open-canopy, herbaceous sedge meadows and fens bordered by wooded areas. (USFWS, 2001)	May occur in wetlands and wooded areas near Lake Ontario and St. Lawrence River.

USFWS designated critical habitat for the Great Lakes breeding population of the piping plover that covers approximately 201.9 miles of Great Lakes shorelines (66 FR 22938 (May 7, 2001)). The piping plover may infrequently occur within the action area during the limited portions of the year that they breed, forage, or migrate through Lake Ontario. One designated critical habitat unit occurs in Lake Ontario encompassing approximately 17 miles of shoreline in Jefferson and Oswego Counties, New York, from the mouth of the Salmon River to the Eldorado Road (Stony Point). The primary constituent elements required to sustain the Great Lakes breeding population of the piping plover are found on Great Lakes islands and mainland shorelines that support open, sparsely vegetated sandy habitats, such as sand spits or sand beaches, that are associated with wide, unforested systems of dunes and inter-dune wetlands (66 FR 22938).

4.5.1.4.2 Migratory Bird Treaty Act (Lake Ontario)

USFWS administers the MBTA (16 USC 701 *et seq.*), which prohibits anyone from taking native migratory birds or their eggs, feathers, or nests. Regulations under the MBTA define “take” as “to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to” carry out these activities (50 CFR 10.12). The act protects a total of 1,007 migratory bird species (75 FR 9282 (March 1, 2010)).

NOAA used the USFWS’s ECOSIPaC tool to search for migratory bird species that may be present in the proposed sanctuary area. The ECOS IPaC tool identified 22 migratory birds of concern that may occur in or near the area (Consultation Code: 05E1NY00-2020-SLI-2428, April 23, 2021; R. Niver, personal communication, April 7, 2020). These 22 bird species may be found transiting through the sanctuary and resting or foraging within the action area (see Table B.1 in Appendix B.3 for a full list).

4.5.1.4.3 State Listed Species (Lake Ontario)

NYSDEC manages a list of Endangered, Threatened, and Special Concern animal species found in the state (6 CRR-NY Part 182). The mission of the program is “To perpetuate and restore native animal life within New York state for the use and benefit of current and future generations, based upon sound scientific practices and in consideration of social values, so as not to foreclose these opportunities to future generations” (NYSDEC, 2020). Species of Special Concern are those that warrant attention and consideration, but current information does not justify listing these species as either Endangered or Threatened. The state list includes several species that may occur in the proposed sanctuary area: one Endangered and one Threatened mammal species; five Endangered, eight Threatened, and four Special Concern bird species; four Endangered, four Threatened, and one Special Concern fish species; one Endangered, one Threatened, and one Special Concern reptile species; and one Endangered and one Special Concern insect species. New York state also lists one Endangered plant species (slender bulrush, *scoenoplectus heterochaetus*) as occurring in the area. The potential occurrence of these species in the area was confirmed in discussion with the New York Natural Heritage Program (N. Conrad, personal communication, Dec. 21, 2020). These species (listed in Appendix B.4) may occur in terrestrial, wetland, and near shore habitats in the proposed sanctuary. A complete list of species that are considered Endangered, Threatened, or of Special Concern by New York State can be found on NYSDEC’s [website](#).²⁵

4.5.2 Biological Resources in the Thousand Islands Region of the St. Lawrence River

4.5.2.1 Aquatic Species (St. Lawrence River)

The upper St. Lawrence River consists of a complex array of habitats including over 1,800 islands, 2,000 shoals, and thousands of acres of nearshore freshwater littoral habitats and coastal emergent wetlands. The aquatic biological resources of the St. Lawrence River are similar to those found in eastern Lake Ontario (Section 4.5.1.1). Both areas contain diverse aquatic habitats ranging from shallow, riverine habitat with submerged aquatic vegetation beds to deeper pools. The St. Lawrence River fish community contains a diverse array of fishes with nearly 50 species observed annually in surveys and around 85 species documented by Thousand Islands Biological Station and NYSDEC. The St. Lawrence River is home to several popular sportfish including: muskellunge, northern pike, walleye, largemouth bass and smallmouth bass. Popular panfish species include yellow perch, rock bass, black crappie, and pumpkinseed and bluegill sunfish (SUNY College of Environmental Science and Forestry, n.d.).

²⁵ <https://www.dec.ny.gov/animals/7494.html>

4.5.2.2 Terrestrial and Coastal Resources (St. Lawrence River)

The terrestrial and coastal biological resources of the St. Lawrence are similar to those found in eastern Lake Ontario (Section 4.5.1.2). As with Lake Ontario, much of the river shoreline is agricultural or developed as urban areas. The remaining wetlands, other natural areas, and uninhabited islands provide important habitat for terrestrial species and protect water quality in the watershed.

4.5.2.3 Aquatic Invasive Species (St. Lawrence River)

The invasive species of the St. Lawrence River are similar to those found in eastern Lake Ontario (Section 4.5.1.3).

4.5.2.4 Protected Species and Habitats (St. Lawrence River)

This section provides an overview of the protected species and habitats that may occur in or near the upper St. Lawrence River, included in Alternative 1, including species and habitats protected under the ESA and the MBTA. No Essential Fish Habitat as defined under the MSA occurs within the St. Lawrence River.

4.5.2.4.1 Endangered Species Act Listed Species and Designated Critical Habitat (St. Lawrence River)

NOAA performed the ESA analysis of the area of the St. Lawrence River in Alternative 1 of the proposed sanctuary in the same way as that for the Lake Ontario area (see Section 4.5.1.4.1). A separate query in the USFWS ECoS IPaC system (Consultation Code: 05E1NY00-2020-SLI-2242, April 23, 2021) identified only two species (Indiana bat and northern long-eared bat) as possibly occurring in the St. Lawrence River portion of the action area and no designated critical habitat (USGS, 2021b). See Table 4.6 for a summary of the habitat requirements and likelihood of occurrence in the action area for the Indiana bat and northern long-eared bat.

4.5.2.4.2 Migratory Bird Treaty Act (St. Lawrence River)

The ECOS IPaC tool identified 17 migratory bird species, which may be found in the St. Lawrence River portion of the proposed sanctuary (Consultation Code:05E1NY00-2020-SLI-2242, April 23, 2021; see Appendix B.3 for a full list).

4.5.2.4.3 State Listed Species (St. Lawrence River)

The waters of the St. Lawrence River and nearby shoreline habitats within the boundaries of the proposed sanctuary may contain many of the same state-listed species as in Lake Ontario (see Section 4.5.1.4.3 and Appendix B.4).

Chapter 5: Analysis of Environmental Consequences of Alternatives

5.1 Introduction

This chapter evaluates the anticipated environmental effects on cultural and historical resources, human uses and socioeconomic resources, physical resources, and biological resources associated with the range of alternatives as described in Chapter 3.

Analysis of the environmental consequences of the alternatives is based on review of existing literature and studies, information provided by experts, and the best professional judgment of NOAA staff. Potential impacts fall under three types: direct, indirect, and cumulative. These types of impacts are defined in regulations issued by the Council on Environmental Quality (CEQ)²⁶ as follows:

Direct Impact: A known or potential impact caused by the proposed action or project that occurs at the time and place of the action (40 CFR 1508.8 (1978)²⁷).

Indirect Impact: A known or potential impact caused or induced by the proposed action or project that occurs later than the action or is removed in distance from it but is still reasonably expected to occur (40 CFR 1508.8 (1978)).

Cumulative Impact: A known or potential impact resulting from the incremental effect of the proposed action added to other past, present, or reasonably foreseeable future actions (40 CFR 1508.7 (1978)).

5.1.1 Significance of Potential Impacts

To determine whether an impact is significant, the CEQ regulations (40 CFR 1508.27 (1978)) and NOAA guidance (NAO 216-6A) require the consideration of context and intensity of potential impacts.

Context is the setting within which an impact is analyzed, such as the affected region or locality and the affected interests. In this Environmental Impact Statement (EIS), the direct and indirect impacts are evaluated within a local context, primarily examining how each alternative would affect the human environment within the proposed sanctuary and whether those effects would be short term or long term. The geographic area of interest for cumulative impacts is a slightly broader regional context in order to consider overlapping and compound effects with other past, present, or reasonably foreseeable future actions.

²⁶While the Council on Environmental Quality (CEQ) regulations implementing NEPA were revised as of September 14, 2020 (85 FR 43304, Jul. 16, 2020), NOAA prepared this DEIS using the 1978 CEQ regulations because this environmental review began on April 17, 2019, when NOAA published a Notice of Intent to conduct scoping and prepare a Draft Environmental Impact Statement (DEIS) for designating the proposed sanctuary (80 FR 5699).

²⁷The definition of effects or impacts was modified and relocated to 40 CFR 1508.1(g) by the 2020 CEQ regulations.

Level of **intensity** refers to the severity of the impact. The various levels of impact used in this analysis are:

Negligible: Impacts on a resource can barely be detected (whether beneficial or adverse) and are therefore discountable.

Moderate: Minor impacts that do not rise to the level of significance as defined below.

Significant: An impact resulting in an alteration in the state of a resource. Long-term or permanent impacts or impacts with a high intensity or frequency of alteration to a resource, whether beneficial or adverse, would be considered significant. The significance threshold is evaluated on a case-by-case basis, taking into consideration the context and intensity of each action.

5.1.2 Quality of Potential Impacts

Potential impacts are described as either beneficial or adverse as follows:

Beneficial impact: Impacts that promote favorable conditions for the resource.

Adverse impact: Impacts that are contrary to the goals, objectives, management policies, and practices of NOAA and the public interest or welfare. Impacts that are likely to be damaging, harmful, or unfavorable to one or more of the resources.

5.1.3 Approach to Environmental Consequences Analysis

NOAA evaluated the impacts on each resource area in the context of each of the components of the alternatives: sanctuary boundary, sanctuary regulations, and the sanctuary management plan and field activities. In evaluating impacts, NOAA considered the following questions:

Boundary: How does the amount of area within the proposed sanctuary affect the resources, natural environment, and human uses in and around the proposed sanctuary?

Regulations: How do the type and amount of proposed regulations to protect sanctuary resources affect the resources, natural environment, and human uses in and around the proposed sanctuary?

Management plan and field activities: How do the activities to manage and operate the proposed sanctuary affect the level of protection of the sanctuary's resources and public stewardship of those resources?

The environmental consequences analysis is organized as follows:

Impacts from the No Action Alternative: Section 5.2 describes the impacts from the No Action Alternative where NOAA would not designate a sanctuary.

Impacts from Alternative 1 (eastern Lake Ontario and Thousand Islands region): Section 5.3 describes the impacts from Alternative 1, which would include:

- Designating a national marine sanctuary within eastern Lake Ontario and the Thousand Islands region (see Section 3.4.1)

- Implementing proposed sanctuary-wide regulations (see Section 3.4.2)
- Implementing the proposed management plan and associated field activities (see Section 3.5.3)

Impacts from Alternative 2 (eastern Lake Ontario only): Section 5.4 describes the impacts specific to Alternative 2, which would include:

- Designating a national marine sanctuary within eastern Lake Ontario (see Section 3.5.1)
- Implementing proposed sanctuary-wide regulations (see Section 3.5.2)
- Implementing the proposed management plan and associated field activities (see Section 3.5.3)

Cumulative Impacts: Section 5.5 analyzes the impact on the environment, which results from the incremental impact of the alternatives when added to other past, present, and reasonably foreseeable future actions.

5.2 Impacts of the No Action Alternative

Under the No Action Alternative, NOAA would not designate a national marine sanctuary. NOAA expects that implementation of the No Action Alternative would not result in any change in the existing management of the cultural and historical resources in eastern Lake Ontario and the St. Lawrence River or any change in the existing uses of the study area. Based on this assumption, NOAA determined that the No Action Alternative would forgo the beneficial and adverse impacts of implementing Alternative 1 (see Section 5.3) and Alternative 2 (see Section 5.4) on the resources and human uses in and around the proposed sanctuary. Generally, these impacts would be the forgone benefit of implementing regulations and a management plan to provide comprehensive, long-term management of cultural and historical resources located within the proposed sanctuary.

5.3 Impacts of Alternative 1

This section describes the beneficial and adverse impacts from implementing Alternative 1, which includes the following components, described in detail in Chapter 3:

- **Boundary:** 1,786 square miles of eastern Lake Ontario from the border of Wayne County, extending lakeward to the Canadian border and into the St. Lawrence River, from the mouth of the river to Chippewa Bay northeast of Oak Island.
- **Proposed Regulatory Concepts²⁸:**
 - Prohibit damage to sanctuary resources
 - Prohibit anchoring or grappling on shipwreck sites
 - Prohibit the use of tethered systems at shipwreck sites without a permit

²⁸ This DEIS does not include specific regulatory text. Proposed regulations will be released separately following public comment on this DEIS. At that time, a detailed discussion of the regulatory text will be included in the notice of proposed rulemaking and published in the Federal Register for public comment.

- Prohibit possessing, selling, purchasing, transporting, importing, or exporting, any sanctuary resource within or outside of the sanctuary
- **Proposed management plan and associated field activities:** The management plan describes all of the actions and strategies that NOAA intends to implement to protect the nationally significant resources within the proposed sanctuary, to help conserve and promote the shipwrecks that have been located and those that await discovery, and to foster sustainable use of the proposed sanctuary (see Appendix A for the draft management plan.)

5.3.1 Impacts on Cultural and Historical Resources (Alternative 1)

Beneficial Impacts on Cultural and Historical Resources

Implementing Alternative 1 would have the following types of beneficial impacts on cultural and historical resources in the study area:

- Direct protection of sanctuary resources through regulations (precise wording of the regulations will be forthcoming and based on the public review of this DEIS) and components of the management plan that would directly protect underwater cultural resources from disturbance and physical damage,
- Enhanced management of underwater cultural resources from information gained through research and monitoring activities, and
- Increased stewardship of underwater cultural resources by conducting community outreach activities that help foster awareness of these resources.

Direct Protection of Underwater Cultural Resources

Under Alternative 1, NOAA would directly protect underwater cultural resources in the proposed sanctuary from injury and disturbances by developing regulations and implementing a long-term, comprehensive management plan. The regulations would protect underwater cultural resources by prohibiting moving, removing, recovering, altering, destroying, possessing, or otherwise injuring a sanctuary resource; prohibiting the use of anchors and grappling hooks at shipwreck sites; and requiring a permit for the operation of tethered equipment (e.g., remotely-operated vehicles [ROV]). NOAA's proposed regulations would complement existing federal and state regulations to increase preservation and provide uniform protection for all underwater cultural resources throughout the sanctuary. These regulations enforce the principles of *in situ* preservation of underwater cultural resources in the sanctuary to maintain their long-term integrity.

NOAA would also directly protect underwater cultural resources by developing a mooring program to prevent potential damage that may be caused by anchoring on or grappling directly into the structure of a shipwreck. The use of anchors and grappling hooks can damage shipwrecks due to entangling, tearing, breaking, or other physical disturbances of the shipwrecks. A mooring program would prevent such damage by installing U.S. Coast Guard approved moorings that provide a secure and convenient anchoring point for users to access shipwreck sites. This would eliminate the need for grappling to locate shipwrecks and for

anchoring directly into a shipwreck site. In addition, the moorings would provide clear notice to boaters of the presence of a known shipwreck site.

The installation of mooring buoys would be phased in following sanctuary designation. To help prevent damage and ensure compliance with the prohibition in areas where moorings are not yet present, NOAA would publish guidelines to promote the use of best practices for anchoring near shipwreck sites. An example of a best practice could include instructions on using a weighted line and surface float (shot line) to mark a wreck for divers to descend and ascend that is removed before the dive boat leaves the area. These activities would increase recreational and aesthetic value through long-term preservation/stabilization of underwater cultural resources.

NOAA is proposing to require a permit for the use of tethered ROV systems at shipwreck sites. ROVs pose incidental threats to shipwreck sites via entanglement and also have the capability to injure a sanctuary resource. Likewise, many such systems have sacrificial ballast systems that, once jettisoned, can diminish the aesthetic properties of a site. By managing these activities through a permitting process, NOAA would be able to reduce potential impacts by requiring that such activities follow best practices to reduce likelihood of damage.

While NOAA would not regulate towed systems, such as side-scan sonar, NOAA would publish best practices that would help users conduct activities in a manner that would decrease possible impacts.

Enhanced Management of Underwater Cultural Resources through Research and Monitoring

Under Alternative 1, NOAA's designation of a sanctuary would enhance the management of underwater cultural resources through collection of data and information to support informed management decisions. For example, NOAA would conduct research and monitoring programs that would fill important gaps in archaeological knowledge and historical context of these shipwrecks. As part of its resource protection action plan under Alternative 1, NOAA would conduct research to assess and collate baseline data on the 64 known shipwrecks and one aircraft, and their associated artifacts. NOAA or its partners may also survey for the 20 possible shipwrecks and three aircraft reported as lost within the sanctuary boundary. NOAA would collect data addressing eligibility for the National Register of Historic Places and the condition of the sites using various methodologies, including such activities as scuba, ROV, and towed instrument or remote sensing surveys. NOAA would use this information to identify shipwrecks for protective measures, such as installing mooring buoys to prevent anchor damage. In order to assess changes to the resource's stability over time, NOAA would develop and implement a monitoring program for underwater cultural resources in the sanctuary. These proposed research and monitoring activities would inform long-term management of the underwater cultural resources.

Enhanced Stewardship through Education and Outreach Activities

Under Alternative 1, NOAA's implementation of education, outreach, and community engagement programs would enhance protection of underwater cultural resources in the sanctuary by fostering awareness and stewardship of these resources. The proposed sanctuary's draft management plan includes strategies for promoting public education about sustainable

and responsible use of underwater cultural resources. NOAA anticipates that under Alternative 1, its education and outreach efforts would enhance public appreciation of the historical significance of the proposed sanctuary's resources and encourage public stewardship of the area. For example, NOAA would promote marine technology with educators and develop outreach programs that endorse sanctuary resource protection, such as publicizing best management practices for scuba divers to minimize their impacts while wreck diving.

Summary of Beneficial Impacts on Underwater Cultural Resources (Alternative 1)

Overall, NOAA determined that the beneficial impacts on underwater cultural resources from implementing Alternative 1 would be **significant** due to the direct and permanent protections to these historically significant resources that would be provided by implementing regulations to prohibit harm or injury to shipwrecks, conducting research and monitoring activities to inform long-term management, and enhancing stewardship through outreach initiatives.

Adverse Impacts on Underwater Cultural Resources

Implementing Alternative 1 would have the following minor adverse impacts on cultural and historical resources in the study area due to increased site visitation. NOAA-led field activities to support management of the proposed sanctuary include vessel operations and maintenance; scuba operations; deployment of autonomous underwater vehicles (AUVs), ROVs, gliders, and drifters; archaeological site investigation; and deployment of equipment on the lakebed (i.e., installing mooring buoys). These activities have the potential to cause adverse impacts.

Deploying AUVs, ROVs, and remote sensing equipment to better document underwater cultural resources within the proposed sanctuary carries a slight risk of entanglement or accidental contact with a wreck. However, NOAA operators are highly trained, deploy these types of vehicles regularly, and follow NHPA protocols that describe how to avoid harm to sanctuary resources.

Scuba diving during field activities can injure sanctuary resources if divers use improper diving techniques and make physical contact with a wreck. Under Alternative 1, NOAA would conduct scuba diving operations as part of its research efforts to study known and possible shipwrecks within the proposed sanctuary. NOAA divers would adhere to the established NOAA guidelines for diving and any invasive archaeological site work would be permitted following NOAA protocols in coordination with the state of New York.

While recreational diving has occurred for decades and most divers responsibly follow best management practices, poorly trained or careless recreational divers could damage underwater cultural resources by using improper diving techniques. Designating the national marine sanctuary may increase non-NOAA dive traffic on the wrecks, and installing mooring buoys at wreck sites may concentrate diving activity on certain wrecks. However, implementing the proposed sanctuary regulations, mooring program, and permitting system would help minimize any direct impacts to the shipwrecks. Similarly, NOAA's education and outreach efforts would promote responsible diving practices and increase public appreciation and stewardship of these sanctuary resources.

Overall, NOAA determined that any adverse impacts on underwater cultural resources from implementing Alternative 1 would be **negligible** due to best management practices NOAA would follow during research and other field activities, the mooring program that would limit direct interactions with shipwrecks by recreational divers, regulations to prohibit harm or injury to shipwrecks, and outreach programs that would encourage public stewardship.

5.3.2 Impacts on Socioeconomic Resources and Human Uses (Alternative 1)

Under Alternative 1, NOAA would bring resources and national visibility to provide coordinated promotion of regional recreational activities and human uses within the designated sanctuary area.

Beneficial Impacts on Socioeconomic Resources and Human Uses

Implementing Alternative 1 would have the following types of beneficial impacts on socioeconomic resources and human uses in the study area:

- Increased spending and positive contribution to the local economy from increased tourism and recreational experiences
- Increased non-market value of sanctuary designation
- Reduced entanglement of fishing gear and related costs to commercial and recreational fishing
- Increased investment from research activities

Increased Spending and Positive Contribution to the Local Economy from Increased Tourism and Recreational Experiences

The natural, recreational, and underwater cultural resources located in eastern Lake Ontario and the Thousand Islands region are integral to the region's current economy, support a vibrant quality of life, and create a unique sense of place. An increase in the number of tourists visiting the proposed sanctuary could continue to benefit the local economy in many ways. The increase in tourism may result in an associated increase in potential revenue if tourists stay at hotels, eat at restaurants, purchase supplies from dive shops, and visit other local businesses. Such business may be newly established or enhanced from the increased visitation.

Although the proposed sanctuary is solely in the water, NOAA would work with state and local partners to create more public exhibits, improve outreach, and raise awareness and knowledge to enhance the visitor experience. While the specific efforts and partners would be determined as part of implementing the sanctuary management plan, NOAA's top priority would be creating opportunities for people to learn about and visit the proposed sanctuary. Implementing these outreach programs could provide additional tourism and recreational opportunities onshore related to the proposed sanctuary. NOAA anticipates that the research, education, interpretation, and outreach activities associated with implementing Alternative 1 would have a positive impact on tourism by heightening public awareness of, and interest in, the underwater cultural resources found in eastern Lake Ontario and the Thousand Islands region.

Implementing Alternative 1 would result in improved recreational experiences for the public. Installing mooring buoys and distributing maps of the proposed sanctuary would provide a clear indication of where specific shipwrecks are located, which would make it easier for divers to locate the shipwrecks. As appropriate, NOAA would update the maps as new shipwreck sites are located, increasing the number of known sites for divers to visit.

The Canadian side of Lake Ontario currently has many more mooring buoys and other infrastructure conducive to diving than the U.S. side. Therefore, some divers interested in Lake Ontario and Thousand Islands shipwreck sites choose to spend their money in Canada as opposed to the study area, which is located in the U.S. Implementing Alternative 1 has the potential to attract more recreational divers to the U.S side of Lake Ontario by making it easier to access the shipwrecks.

Although NOAA expects that the proposed sanctuary designation would have positive impacts on the local economy, given an absence of baseline data specific to the proposed Lake Ontario designation and region, NOAA is unable to state that the impacts would be significant with certainty. The designation and management of Thunder Bay National Marine Sanctuary in Alpena, Michigan, has had positive impacts in the northeastern Michigan region. For example, a 2018 study in Thunder Bay National Marine Sanctuary found that spending in the study area by those who used the Great Lakes Maritime Heritage Center and Alpena Shipwreck Tours, totaled \$32.4 million and supported nearly 500 jobs and \$40.0 million in output. Visitors to the region accounted for 88% of the total spending (Schwarzmann et al., 2019). The study also found that 17.2% of people visiting the Alpena region for the first time stated that the primary reason for their trip was the Great Lakes Maritime Heritage Center, and 14.1% reported it was because of the Alpena Shipwreck Tours. Based upon the ability of Thunder Bay National Marine Sanctuary to attract new visitors to the relevant study area, NOAA expects that the proposed designation of a national marine sanctuary in Lake Ontario would also attract new visitors to its relevant study area. In the short run, this expected increase in visitation would be small but in the long run, this change is likely to increase.

In the short term, NOAA determined that the immediate **beneficial impacts** on tourism and local economies from implementing Alternative 1 would be **negligible** due to the minor anticipated increase in visitation and associated potential revenue and positive contributions to the local economy from tourists staying at hotels, eating at restaurants, purchasing supplies from dive shops, and visiting other local businesses. This change in spending would be driven by an immediate negligible beneficial impact on land-based tourism, recreational diving, snorkeling, and recreational fishing. However, in the long run as infrastructure is built and brand recognition increases, NOAA determined that the **beneficial impacts** on tourism and local economies from implementing Alternative 1 would be **moderate**, primarily driven by the expected increase in land-based tourism. National visibility and regional coordination of sanctuary messaging and promotion of regional visitor opportunities would likely attract more tourists, especially divers interested in viewing shipwrecks.

Increased Nonmarket Value from Sanctuary Designation

Many of the goods and services provided by cultural and heritage resources do not require market transactions to derive benefit. Even if a person must spend money to access the resource, such as an entrance fee to a park, the price of admission does not reflect their true value. The difference between the price a person pays and the most they would be willing to pay for the good or service is what economists refer to as consumer surplus. This consumer surplus is a person's non-market value and does not require a person to actually use the resource. A study to evaluate willingness to pay for the protection of cultural and heritage resources completed for the proposed expansion of Monitor National Marine Sanctuary found that people's willingness to pay for maritime heritage increased with: expansion of the number of shipwrecks protected; the level of investments in museum exhibits; maritime heritage trails, including virtual trails using video and mobile phone technology; and educational workshops on maritime heritage and training in maritime archaeology²⁹. Specifically, North Carolina households were willing to make a one-time payment of \$67.62 for a moderate investment in the development of museum exhibits, workshops and training; \$42.70 for the design and implementation of virtual trails; and \$63.31 for the development of walking trails. Aggregating across all households in North Carolina, this yields consumer surplus of millions of dollars (Mires, 2014).

Additionally, there are examples across the National Marine Sanctuary System of film documentaries being developed to educate the general public, both within and outside the United States, about sanctuaries and sanctuary resources. Further, education and outreach programs conducted by the proposed sanctuary, such as social media campaigns, have the potential to reach tens of thousands of people annually. Advertising and education would create value to the proposed sanctuary and sanctuary community by not only increasing name recognition of the sanctuary but also increasing name recognition of the surrounding communities.

NOAA determined that the **beneficial impacts** to the general public from increased non-market value and name recognition provided by the community from a sanctuary designation would be **significant**. The significant beneficial impact can be attributed to the fact that to receive consumer surplus from the sanctuary designation, a person does not have to actually use the resource, they only must value the protections. Consequently, unlike the previous sections on human use and the local economy, this section accounts for the benefits received by both users and nonusers of a sanctuary designation.

Reduced Entanglement of Fishing Gear and Related Costs to Commercial and Recreational Fishing

Implementing sanctuary management activities under Alternative 1 could indirectly benefit commercial and recreational fishing by reducing the likelihood of fishing gear entanglement with shipwrecks or other lake bottom structures that could tear, damage, or otherwise destroy

²⁹ Mires, C.H., 2014. The value of maritime archaeological heritage: an exploratory study of the cultural capital of shipwrecks in the Graveyard of the Atlantic. Doctoral dissertation. East Carolina University, Greenville, North Carolina.

fishing gear. For example, the proposed sanctuary management plan includes efforts to better characterize the lake bottom, including the location of structures that could damage fishing gear, installing buoys to clearly identify shipwreck locations, and disseminating information to the public through maps, websites, signage, etc. These activities would benefit commercial and recreational fishing by helping fishers avoid these known shipwreck locations, limiting entanglement of fishing gear, and avoiding user conflict between fishers and divers near shipwrecks. The proposed action does not include any regulations specific to fishing activities. NOAA determined that the **beneficial impacts** on commercial and recreational fishing from implementing Alternative 1 would be **negligible** due to the small reduction in the likelihood of fishing gear entanglement with shipwrecks or other lake bottom structures that could tear, damage, or otherwise destroy fishing gear from improving public knowledge of shipwreck locations. NOAA does not anticipate any adverse impacts on recreational or commercial fishing.

Increased Investment from Research Activities

Under Alternative 1, designating a national marine sanctuary would support collaboration with local partners on research and resource protection goals. These partnerships could result in increases in vessel operations for research; scuba operations for research and monitoring; deployment of moorings and research equipment on the lakebed; the use of AUVs, ROVs and similar equipment for research and monitoring; use of uncrewed aerial systems; and the use of active acoustic equipment. Conducting these activities would have beneficial impacts on the sanctuary's resources and would also result in increased spending in the study area. NOAA determined that these **beneficial impacts** from increased spending due to increased research activity would be **negligible**.

Adverse Impacts on Human Uses and Socioeconomic Resources

Implementing Alternative 1 would have the following minor adverse impacts on human uses in the study area due to increased site visitation. The number of boats operating within the proposed sanctuary would likely increase under Alternative 1. This small projected increase in boats could potentially cause conflicts among users. Given that the increase in boating tourists would be relatively small compared to overall boating activity in eastern Lake Ontario and the Thousand Islands region, and tourists would remain within the proposed sanctuary for a limited amount of time, NOAA does not expect this increase in boats to be on a scale that would cause persistent user conflicts. The mooring buoy program and NOAA-issued maps would also help minimize the likelihood of user conflicts because industry and recreational boaters would be aware of, and avoid, popular dive locations and shipwrecks. NOAA determined that any **adverse impacts** on human uses in the study area from implementing Alternative 1 would be **negligible** in both the short and long run based on the relatively small expected increase in boats on the lake, the implementation of the mooring buoy program, and distribution of maps to clearly mark popular diving locations, which reduces potential for user conflicts.

Human Uses of the Proposed Sanctuary that Would not be Impacted

Implementing Alternative 1 would have **no impact** on commercial shipping in the study area because commercial vessels would not be affected by the proposed sanctuary regulatory concepts for the following reasons:

- Sanctuary regulations would apply only to protection of underwater cultural resources, so these regulations would not impede the operation of vessels.
- The Port of Oswego and federal anchorage areas would be excluded from the sanctuary boundaries, so sanctuary regulations would not impose any restrictions on vessels in these areas.
- Due to the U.S. Coast Guard Authorization Bill of 2015³⁰, the U.S. Coast Guard and U.S. Environmental Protection Agency regulations that prohibit ballast water exchange in national marine sanctuaries would not apply to this proposed sanctuary, since this is a Great Lakes sanctuary that would protect maritime heritage resources.

Implementing Alternative 1 would have **no impact** on military activities because the sanctuary regulations would not limit military activities, such as pilot training in the military restricted area (R-5203) and water bucket training from Fort Drum and the NYANG.

The proposed sanctuary designation would likely have **no impact** on energy generation or transmission because the proposed sanctuary regulations would not limit responsibly sited development. Energy generation and transmission projects are typically subject to rigorous federal and state review to minimize impacts to historic resources and are therefore unlikely to directly affect sanctuary resources. In addition, education and public outreach would foster greater awareness of sanctuary resources and lead to impact avoidance during project planning.

5.3.3 Impacts on Physical Resources (Alternative 1)

Under Alternative 1, proposed regulations and management plan objectives would be designed to protect underwater cultural resources in the proposed sanctuary. NOAA would conduct management activities to further these objectives, which may increase some negative effects on physical resources in the action area. The proposed sanctuary designation may also attract more public users to the area, resulting in increased boat traffic.

Beneficial Impacts on Physical Resources

Implementing Alternative 1 would benefit physical resources in the action area by reducing the potential for disturbance of the lakebed and shorelines through proposed regulatory provisions for underwater cultural resources.

Under Alternative 1, NOAA would prohibit anchoring and the use of grappling hooks on a shipwreck site. Although the purpose of the proposed prohibition is to protect underwater cultural resources, the prohibition could also have beneficial impacts on physical resources by reducing disturbance of the lakebed surrounding sanctuary resources. Anchoring can result in gouging depressions into sediment or creating new holes in substrate if anchors are dragged along the lakebed or dropped in soft sediments. Altering the lakebed structure and other physical interactions between the anchor and the lakebed could stir up or resuspend sediments, causing localized increases in turbidity. Especially in the Thousand Islands area, users accessing sites close to shore may anchor vessels near shore and tie stabilizing lines to island trees or other

³⁰ (16 USC 1431 note, as amended by Pub. L. No. 114–120, 120 Stat. 27 (2016))

vegetation or anchor on shore. This activity may damage and displace vegetation and ground cover, increasing erosion and degrading water quality.

Installing mooring buoys at popular shipwreck sites would provide users a means of anchoring their vessels close to shipwrecks and would eliminate most disruption of sediments, shorelines, and possible water quality degradation that may be caused by anchoring to islands or the lakebed. Therefore, prohibiting anchoring near shipwrecks and encouraging the use of mooring buoys would limit lakebed disturbance, thereby resulting in a beneficial impact on islands, lakebed, and water quality. Additionally, management plan activities focused on research, education, and protection of underwater cultural resources would include promoting best practices for accessing shipwreck sites, which may protect sites and the physical surroundings from anchor damage.

Regulations that prohibit moving, removing, recovering, or otherwise injuring underwater cultural resources, such as shipwrecks, would also indirectly protect the lakebed below and near the shipwreck. Recreational divers would not be allowed to cause any injury or take any underwater cultural resources; therefore, if damage to these resources were restricted, damage to the adjacent and underlying lakebed would be less likely to occur because less activity would be concentrated near the shipwreck sites.

Overall, NOAA determined that implementing Alternative 1 would have **negligible beneficial impacts** on physical resources due to the small area of lakebed or shoreline that would be protected from disturbance by proposed regulatory provisions for underwater cultural resources.

Adverse Impacts on Physical Resources

Implementing Alternative 1 would have the following minor adverse impacts on physical resources in the action area from increased site visitation:

- Minor disturbance of the lakebed through conducting sanctuary management activities (incidental or intentional)
- Localized, temporary decline in water quality
- Generation of air emissions from increased tourism, recreation, and on-water sanctuary management activities

Minor Disturbance of the Lakebed and Shorelines in Small Areas

Under Alternative 1, NOAA would implement management activities to protect underwater cultural resources, such as installing and maintaining mooring buoys and other equipment on the lakebed, which could result in direct, localized disturbances to the physical properties of the lakebed. Installation of a mooring system may require placing a steel block (typically a train wheel) on the lakebed or other similar installation technique. This activity could very minimally change the structural properties of the lakebed. However, adverse impacts from installation and maintenance of mooring buoys and lakefloor equipment would be minor due to the very small area that would be directly disturbed (less than 21 square feet). NOAA would implement best management practices, such as selecting installation sites that avoid important lakefloor structures, in order to minimize adverse impacts to the lakebed.

Under Alternative 1, anticipated increased visitor vessel use and anchoring near shore to visit shipwreck locations could cause increased erosion to shoreline soils and exposed rocks, which may also cause localized water quality degradation. There are only a few areas of shoreline with shipwreck sites nearby that would be affected, and these effects could be avoided by implementing future mooring installations and educational outreach for responsible access to shipwrecks for diving and vessels. Proportionally, there are more shipwreck sites near shore in the St. Lawrence River area than eastern Lake Ontario, so shoreline physical effects from dive site access and mitigating effects from sanctuary management activities may be greater there.

Potential for Localized, Temporary Decline in Water Quality

Under Alternative 1, NOAA-led and recreational vessel operations, including the installation and maintenance of mooring buoys, could result in a localized, temporary degradation of water quality during certain activities. Turbidity could temporarily increase during the installation and maintenance of mooring buoys when NOAA would use drills or other tools to anchor equipment to the lakebed. Vessel operations could result in minimal adverse impacts to water quality due to the small potential for a localized decline in water quality from unintended pollution spills from sanctuary vessels. NOAA must comply with relevant federal statutes, NOAA Small Boat Program guidelines, and NOAA ONMS vessel best management practices and standing orders to minimize the likelihood of a spill and limit the impacts if a spill were to occur. Any localized decline in water quality associated with placement of equipment on the lakebed would dissipate quickly because the extent of disturbance to the lakebed would be very small.

Low Generation of Air Emissions

Under Alternative 1, NOAA-authorized vessel operations and a potential increase in recreational boating activity could have adverse effects on air quality from the generation of emissions. However, NOAA anticipates a relatively low number of field activities involving vessel operations in the proposed sanctuary (see Section 3.4.3.2). In addition, as part of its larger stewardship mission in the marine environment, NOAA has converted its research vessels in the Great Lakes from petroleum-based fuels and lubricants to renewable and environmentally-friendly products that reduce fossil fuel emissions (NOAA Great Lakes Research Laboratory, 2020). NOAA would also minimize impacts of air emissions from NOAA-authorized vessel activity by complying with relevant federal regulations, NOAA Small Boat Program guidelines, and NOAA ONMS best management practices. Education and outreach efforts would help promote responsible use of the sanctuary by recreational boaters and increase public appreciation and stewardship of these resources.

Summary of Adverse Impacts on Physical Resources

Overall, NOAA determined that adverse impacts on the lakebed, water quality, or air quality from implementing Alternative 1 would be **negligible** due to best management practices NOAA would follow during research and other field activities, and the small level of field activities NOAA would implement compared to existing vessel activities occurring in the action area.

5.3.4 Impacts on Biological Resources (Alternative 1)

Under Alternative 1, proposed regulations and management plan objectives would be designed to protect underwater cultural resources in the proposed sanctuary. NOAA would conduct management activities to further these objectives, which may increase some negative effects on biological resources in the action area. The proposed sanctuary designation may also attract more public users to the area, resulting in increased boat traffic.

Beneficial Impacts on Biological Resources

Implementing Alternative 1 would benefit biological resources in the action area by reducing the potential for disturbance of the lakebed and shorelines through proposed regulatory provisions for underwater cultural resources.

Any disturbance of underwater cultural resources not only jeopardizes the preservation of these resources but could also disturb associated habitat for aquatic biota. Regulations that prohibit moving, removing, recovering, or otherwise injuring underwater cultural resources, such as shipwrecks, would therefore indirectly protect biological habitat for aquatic organisms. Disturbance of underwater cultural resources could stir up sediments and cause localized declines in water quality. Similarly, benthic habitat would be indirectly protected because recreational vessel operators would be required to use mooring buoys in place of anchoring on the lakebed. The use of mooring buoys would protect benthic habitat by providing boaters an option to remain near shipwrecks without damaging habitat by dropping anchors or stirring up sediments that could result in a localized decline in water quality. Education and outreach efforts promoting best practices for accessing shipwreck sites would also protect associated biological resources from damage, disturbance, and water quality degradation.

Overall, NOAA determined that the **beneficial impacts** on biological resources from implementing Alternative 1 would be **negligible** due to the small area of lakebed or shorelines that would be protected from disturbance by proposed regulatory provisions for underwater cultural resources.

Adverse Impacts on Biological Resources

Implementing Alternative 1 has the potential for the following minor impacts on biological resources in the action area from increased site visitation:

- Temporary displacement or disturbance of fish, birds, and other wildlife
- Minor direct disturbance of benthic habitat and shorelines in small areas
- Localized decline in water quality
- Potential for exacerbating the spread of invasive species

Temporary Displacement or Disturbance of Fish, Birds, and Other Wildlife

Under Alternative 1, when vessels transit within the proposed sanctuary, minor acoustic disturbance from engine noise could impact fish, birds, or other wildlife in the area of vessel activity. Scuba divers visiting shipwreck sites, whether recreational or for management or research purposes, may also disturb and displace fish, birds, or other wildlife through their physical movements or noise. If any species were to be within close enough proximity to a NOAA

authorized vessel, recreational boater, or scuba divers, the interaction could result in a response ranging from no reaction to a startled reaction that leads to a rapid fleeing from the area. In such cases, these organisms would be able to move to nearby suitable habitats. For sonar surveys, sound detection by the majority of freshwater fishes, and hence behavioral disturbance and hearing impairment, is unlikely to occur due to the much higher frequencies of these instruments relative to fish hearing capabilities. For those species capable of detecting the frequencies of sonar equipment, the greatest potential for adverse impacts as a result of active underwater acoustic sound sources would be related to changes in behavior. Fish usually avoid human activity. As a result, the most likely effect on fish from interactions with vessels, scuba divers, or sonar equipment would be a moderate to high energy avoidance behavior resulting in the animal temporarily leaving the immediate area unharmed. This disturbance would be brief and is not likely to significantly impact the organism's ability to feed, reproduce, or avoid predators. Species occurring near popular docks or shipwrecks would likely be familiar with the current levels of recreational diving that occurs. Therefore, these activities would be unlikely to cause species to avoid or abandon habitat within the proposed sanctuary.

Disturbance from vessel activities would be minimized because of the low level of NOAA-authorized vessel trips likely to occur within a year, and the relatively short duration of each trip. Disturbance from research activities such as diving would be minimized because staff are highly trained and would follow NOAA best management practices to protect biological resources and to avoid, or minimize, disturbing species.

NOAA determined that any disturbance of fish, birds, or other wildlife associated with sanctuary management activities would be minor and temporary and would not result in any harm or injury to individuals or populations. This action would not result in the take of any protected species, including New York state-listed Endangered, Threatened and species of Special Concern (see Appendix B.4 for full species list).

Minor Direct Disturbance of Benthic Habitat and Shorelines in Small Areas

Under Alternative 1, NOAA would implement management activities to protect underwater cultural resources, such as installing and maintaining mooring buoys and other equipment on the lakebed, which could result in direct, localized disturbances to the lakebed. Installation of a mooring system requires placing a steel block (typically a train wheel) on the lakebed. This activity could very minimally change the structural properties of the lakebed. However, adverse impacts from installation and maintenance of mooring buoys and lakefloor equipment would be negligible due to the very small amount of area that would be directly disturbed (less than 21 square feet). NOAA would implement best management practices, such as selecting sites that avoid important lakefloor structures, in order to minimize adverse impacts to the lakebed.

Under Alternative 1, anticipated increased visitor vessel use and anchoring near shore to visit shipwreck locations could cause increased damage to shoreline trees and other plants and erosion to soils and exposed rocks, which may also cause localized water quality degradation. There are only a few areas of shoreline with shipwreck sites nearby that would be affected. These effects could be avoided by implementing future mooring installations and promoting responsible access to shipwrecks for diving and vessels. Proportionally, there are more shipwreck sites near shore in the St. Lawrence River area than in eastern Lake Ontario, so

shoreline biological effects from dive site access and mitigating effects from sanctuary management activities may also be greater there.

Localized, Temporary Decline in Water Quality

Under Alternative 1, installation and maintenance of mooring buoys and vessel operations could result in a localized, temporary degradation of water quality and pelagic habitat. Turbidity could temporarily increase during the installation and maintenance of mooring buoys when NOAA may use drills or other tools and equipment to anchor equipment to the lakebed. Vessel operations could result in minimal adverse impacts to water quality due to the small potential for a localized decline in water quality from unintended pollution spills from sanctuary vessels. NOAA must comply with relevant federal statutes, NOAA Small Boat Program guidelines, and NOAA ONMS vessel best management practices and standing orders to minimize the likelihood of a spill and limit the impacts if a spill were to occur. Any localized decline in water quality associated with placement of equipment on the lakebed would dissipate quickly because the extent of disturbance to the lakebed would be very small.

Potential for Exacerbating the Spread of Invasive Species

Under Alternative 1, there could be an increased risk of introducing and spreading invasive species due to the increased number of recreational vessels and NOAA vessels visiting the sanctuary. However, New York state has several programs in place to address the spread of invasive species, including regulations (NYSDEC, n.d.-a) and published best practices for boaters to mitigate their chances of contributing to the problem. NYSDEC's best practices include using available boat wash stations and draining and cleaning vessels before using them at another location (NYSDEC n.d.-c). NOAA vessels also follow best management practices to eliminate the potential spread of invasive species, as well as minimize impact to the marine environment and marine species.

Summary of Adverse Impacts on Biological Resources

Overall, NOAA determined that **adverse impacts** on biological resources from implementing Alternative 1 would be **negligible** due to best management practices NOAA would follow during research and other field activities; the small level of field activities NOAA would implement compared to existing vessel activities occurring in the action area; the regulations and best management practices that both the state of New York and NOAA have in place to mitigate the spread of invasive species; and in the event of disturbance, organisms could move to adequate suitable habitat nearby.

5.3.4.1 Effect Determination for Endangered Species Act Listed Species and Designated Critical Habitat (Alternative 1)

As noted in Section 4.5.1.4, NOAA determined that four species listed as Endangered or Threatened under the ESA under USFWS jurisdiction could occur in the action area: Indiana bat (*Myotis sodalis*), northern long-eared bat (*Myotis septentrionalis*), piping plover (*Charadrius melodus*), and bog turtle (*Glyptemys mühlenbergii*). In addition, designated critical habitat for the piping plover occurs within the action area. No proposed or candidate species or proposed designated critical habitat occur within the action area. NOAA analyzed the potential impacts of

implementing Alternative 1 on these four listed species and designated critical habitat for the piping plover, as discussed below.

The piping plover may infrequently occur within the action area during the limited portions of the year that they breed, forage, or migrate through Lake Ontario. NOAA determined that implementing Alternative 1 would result in **no effect** to these four listed species for the following reasons:

- Low intensity of activities that would occur within the sanctuary, especially along the shoreline where these species would be most likely to occur
- Short duration and rarely observed nesting period and infrequent observations of piping plovers along the shoreline within the action area
- Potential habitat for the Indiana bat, northern long-eared bat, and bog turtle does not exist near shorelines where they may be disturbed by sanctuary activities
- Types of management activities that would occur in the proposed sanctuary would not be disruptive to roosting bats (R. Niver, personal communication, April 7, 2020)

As noted in Section 4.5.4.1, designated critical habitat for the piping plover occurs along sandy beaches adjacent to the proposed sanctuary. Field activities to implement the proposed sanctuary management plan would primarily occur within buildings or on the water and would not include any ground disturbing activities within the designated critical habitat unit (66 FR 22938). Therefore, NOAA determined that implementing Alternative 1 would have no effect on designated critical habitat for the piping plover because it would not result in a direct or indirect alteration in any of the essential features of designated critical habitat that would appreciably diminish the value of critical habitat for both the survival and recovery of the piping plover.

Table 5.1. Effect Determination for Endangered Species Act Listed Species under USFWS Jurisdiction Potentially Found in the Action Area

Species Common Name	Species Name	Status	Effect of NOAA's Proposed Action
Northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened	No effect
Indiana bat	<i>Myotis sodalis</i>	Endangered	No effect
Piping plover	<i>Charadrius melodus</i>	Endangered	No effect
Bog turtle	<i>Glyptemys muhlenbergii</i>	Endangered	No effect

5.3.4.2 Effect Determination for Migratory Birds (Alternative 1)

Section 4.5.4.2 describes the 22 bird species protected under the MBTA that may be found transiting, resting, or foraging within the sanctuary (Appendix B.3). The MBTA prohibits pursuing, hunting, taking, capturing, or killing migratory birds, their nests, or their eggs.

Consistent with the analysis of impacts to biological resources in Section 5.3.4 above, NOAA determined that any impacts to migratory birds from implementing Alternative 1 would be **negligible and incidental**, such as minor disturbances from vessel traffic, noise from

recreational activities in the proposed sanctuary, or from other sanctuary management activities. NOAA determined that any minor disturbance of migratory birds associated with implementing Alternative 1 would have negligible impacts and would **not result in the take** of migratory birds protected under the MBTA.

5.4 Impacts of Alternative 2

This section describes the beneficial and adverse impacts from implementing Alternative 2. Alternative 2 includes only eastern Lake Ontario. The major differences between Alternative 1 and Alternative 2 are:

- Under Alternative 2, the sanctuary boundary would be smaller and NOAA would protect and manage 43 known shipwrecks and one aircraft (versus 64 shipwrecks and one aircraft in Alternative 1). In addition, the archaeological sites in the St. Lawrence River would not be protected or managed by NOAA.

Under Alternative 2, the proposed regulations and management plan for the proposed sanctuary would be the same as Alternative 1. Implementing Alternative 2 would generally have the same beneficial and adverse impacts on the cultural and historical resources, socioeconomic resources and human uses, and physical and biological resources as described in Alternative 1, except they would occur over a smaller geographic area (see Section 5.3). Impacts to each of these resource areas that are specific to Alternative 2 are described below.

5.4.1 Impacts on Cultural and Historical Resources (Alternative 2)

Under Alternative 2, NOAA would focus research and monitoring activities on fewer underwater cultural resources, which would reduce the amount of new archaeological information available for the research community and the public. Alternative 2 would represent a significantly smaller number of shipwreck sites within recreational and technical diving limits resulting in fewer opportunities for visitor engagement and enjoyment. In addition, NOAA and partner interpretive activities would be narrower in scope than in Alternative 1 due to the reduced geographic scope of the proposed sanctuary.

Nonetheless, both action alternatives would protect a substantial number of nationally significant shipwrecks. While Alternative 2 would not protect as many historical and cultural resources as Alternative 1, NOAA determined that the **beneficial impacts** on underwater cultural resources from implementing Alternative 2 would be **significant** due to the direct and permanent protections to these historically significant resources that would be provided by implementing regulations to prohibit harm or injury to shipwrecks, research and monitoring activities to inform long-term management, and enhanced stewardship through outreach initiatives.

5.4.2 Impacts on Socioeconomic Resources and Human Uses (Alternative 2)

Implementing Alternative 2 would have the same types of beneficial impacts on socioeconomic resources and human uses in the study area as described in Section 5.3.1 under Alternative 1, but to a lesser extent because the Thousand Islands region of the St. Lawrence River would not be

part of the sanctuary. For example, NOAA anticipates that Alternative 2 may not draw as many visitors as Alternative 1 due to there being fewer diveable shipwrecks within recreational scuba diving depth limits, its smaller geographic extent, and a narrower scope of interpretive and outreach opportunities for NOAA and its partner museums. Alternative 2 would include a smaller concentration of accessible shipwrecks afforded greater visibility, protection, and promotion as a national marine sanctuary for the dive community than Alternative 1, and it does not include the Thousand Islands region. Therefore, water-based tourism, specifically the dive industry, would see fewer benefits under Alternative 2 than Alternative 1.

Nonetheless, as described in Section 5.3.2, the national visibility of a national marine sanctuary under Alternative 2 would likely attract more tourists to the sanctuary and local region and result in **negligible beneficial impacts** in the short run and **moderate beneficial impacts** in the long run to human uses and socioeconomic resources in the study area. These benefits would be driven primarily by anticipated use benefits from land-based tourism, which is expected to be similar across the two alternatives. Further, it is expected that the sanctuary designation would have positive impacts on human uses, but given an absence of baseline data, NOAA is unable to state the impacts would be significant with certainty.

Similar to Alternative 1, implementing Alternative 2 would have **no effect** on commercial shipping and military activities because they would not be impacted by the proposed sanctuary regulatory concepts. The proposed sanctuary designation would likely have **no impact** on energy generation or transmission because the proposed sanctuary regulatory concepts would not limit responsibly sited development. Education and public outreach would foster greater awareness of sanctuary resources and lead to impact avoidance during project planning for energy development projects. In addition, energy generation and transmission projects are typically subject to rigorous federal and state review to minimize impacts to historic resources and are therefore unlikely to directly affect sanctuary resources.

5.4.3 Impacts on Physical Resources (Alternative 2)

Under Alternative 2, NOAA anticipates that the type and intensity of activities that affect physical resources would be the same as Alternative 1 but would occur over a smaller geographic area. Proportionally, there are more shipwreck sites near shore in the St. Lawrence River area than eastern Lake Ontario, so shoreline physical effects from dive site access and effects from sanctuary management activities may be smaller under Alternative 2, as those nearshore sites in the St. Lawrence River would not be included.

5.4.4 Impacts on Biological Resources (Alternative 2)

Under Alternative 2, NOAA anticipates that the type and intensity of activities that affect biological resources would be the same as Alternative 1 but would occur over a smaller geographic area. Proportionally, there are more shipwreck sites near shore in the St. Lawrence River area than eastern Lake Ontario, so shoreline biological effects from dive site access and mitigating effects from sanctuary management activities may be smaller under Alternative 2, as those nearshore sites in the St. Lawrence River would not be included.

5.4.4.1 Effect Determination for Endangered Species Act Listed Species and Designated Critical Habitat (Alternative 2)

As described in Section 4.5.1.4.1, four species listed as Threatened or Endangered under the ESA under USFWS jurisdiction could occur in the action area. Based on the similar activities and action area among both action alternatives, NOAA determined that implementing Alternative 2 would result in **no effect** to these four listed species and designated critical habitat for the piping plover. See Section 5.3.4.1.

5.4.4.2 Effect Determination for Migratory Birds (Alternative 2)

Based on the similar activities and action area among both action alternatives, NOAA determined that implementing Alternative 2 would result in **no take** of migratory bird species protected under the MBTA (see Appendix B.3).

5.5 Cumulative Impacts

The CEQ regulations for implementing the provisions of NEPA define cumulative impacts as “the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7). The regulations further define cumulative impacts as those that can result from individually minor but collectively significant actions that take place over a period of time. The CEQ guidance for considering cumulative effects states that NEPA documents “should compare the cumulative effects of multiple actions with appropriate national, regional, state, or community goals to determine whether the total effect is significant” (CEQ, 1997).

This section presents the methods used to evaluate cumulative impacts, lists projects that may contribute to cumulative effects when combined with the impacts of the proposed action or alternatives discussed in this EIS, and describes the potential cumulative impacts of the proposed action.

5.5.1 Cumulative Impact Assessment Methods

CEQ’s cumulative effects guidance identifies several different methods for assessment of cumulative impacts, such as checklists, modeling, forecasting, and economic impact assessment, where changes in employment, income, and population are evaluated.³¹ In general, past, present, and future foreseeable projects are assessed by topic area. Cumulative effects may arise from single or multiple actions and may result in additive or interactive effects. Interactive effects may be countervailing, where the adverse cumulative effect is less than the sum of the individual effects, or synergistic, where the net adverse effect is greater than the sum of the individual effects.³² For the purposes of this analysis, NOAA considered cumulative effects to be significant if they exceed the capacity of a resource to sustain itself and remain productive. The geographic scope and time frame for the cumulative effects analysis are the boundaries of the

³¹ CEQ 1997

³² CEQ 1997

proposed sanctuary under each action alternative, shorelines immediately adjacent to the proposed sanctuary boundaries, and a five to ten year time frame for implementation of the proposed sanctuary regulations and management plan.

The projects in Table 5.2 are currently occurring or are anticipated to occur in the reasonably foreseeable future within the study area. NOAA considered the effects of these actions in combination with the impacts of the proposed action to determine the overall cumulative impact on the resources described in Chapter 4.

5.5.2 Past, Present, and Reasonably Foreseeable Future Projects

Table 5.2 lists the other federal and non-federal actions in the study area that could contribute to cumulative impacts. This list was compiled based on NOAA staff knowledge of other existing or planned activities occurring in and around the proposed sanctuary. Some of the activities listed in Table 5.2 are generally similar in scope and type to the proposed action. Many of these other federal and non-federal actions relate to management and research of shoreline habitat and resources in Lake Ontario. The projects expected to contribute to cumulative impacts are likely to have similar types of impacts on the resources within the study area, would affect similar resources to those that are affected by the proposed action, or are large enough to have far-reaching effects on a resource.

Table 5.2. Other Federal and Non-Federal Actions with Potential to Contribute to Cumulative Impacts.

Project Title	Location	Project Lead	Project description	Estimated Completion Timeline
Fort Ontario proposal as a national park	Fort Ontario Historic Site	National Park Service	Assess the feasibility of incorporating Fort Ontario and the Safe Haven Holocaust Refugee Shelter Museum as a unit of the National Park Service	2-3 years
State Park Management	State parks bordering Lake Ontario in Cayuga, Wayne, Oswego, Jefferson, Monroe, Onondaga, and Ontario counties	New York State Parks, Recreation, and Historic Preservation	Parks management	Ongoing
Critical Environmental Area management	Sandy Pond	New York State Department of Environmental Conservation	Natural area management	Ongoing

Project Title	Location	Project Lead	Project description	Estimated Completion Timeline
Great Lakes Seaway Trail	518-mile driving route starting in Pennsylvania and ending in Rooseveltown, New York; runs along the eastern shore of Lake Ontario and the St. Lawrence River in the proposed action area	Great Lakes Seaway Trail Inc. and U.S. Department of Transportation	Driving route with markers for notable sightseeing spots	Ongoing
Saint Lawrence Seaway development	St. Lawrence River in New York	Saint Lawrence Seaway Development Corporation (DOT)	Regulate commerce on the Seaway	Ongoing
Dredging and maintenance of shorelines and harbors	Lake Ontario and St. Lawrence River in New York	U.S. Army Corps of Engineers	Construction, dredging, and maintenance activities for harbors and shorelines	Ongoing
Museums, visitor centers, and historical societies	Antique Boat Museum, Erie Canal Museum, H. Lee White Maritime Museum, Williamson-Pultneyville Historical Society, and Boldt Castle	Nonprofit organization	Heritage interpretation/tourism	Ongoing
Lighthouses	Tibbetts Point Lighthouse, Charlotte-Genesee Lighthouse, and Sodus Bay Lighthouse Museum	Managed by historical societies	Heritage interpretation/tourism and parks management	Ongoing
Fisheries management	Rivers and Lake Ontario	NYSDEC, USGS	Fisheries management, hatcheries/stocking, and regulations	Ongoing
Watercraft regulations	Rivers and Lake Ontario	NYSDEC and U.S. Coast Guard	Watercraft regulations	Ongoing

Project Title	Location	Project Lead	Project description	Estimated Completion Timeline
Waterfront development/coastal management	Rochester, Fair Haven, Sodus Point, Oswego, Sackets Harbor, Cape Vincent, Clayton, Fisher Landing, Swan Bay, and Alexandria Bay	New York coastal county management, New York State Coastal Management Program, and St. Lawrence Seaway Development Corporation	Continued growth and development in waterfront communities	Ongoing
Cultural resources, New York state regulations	Coastal New York, Lake Ontario, and St. Lawrence River	New York State Parks, Recreation and Historic Preservation, NYSDEC, and New York State Museum	Cultural resource protection	Ongoing
Native and Indigenous governance/development	Lake Ontario, St. Lawrence River, and Salmon River	Onondaga, Seneca, Cayuga, Oneida, Mohawk, and Tuscarora	Governance and historic preservation	Ongoing
Marine transportation infrastructure management	Lake Ontario and St. Lawrence River	USCG, NYSDEC, Port of Oswego Authority, St. Lawrence Seaway Development Corporation, DOT, and USACE Buffalo District	Navigational and vessel regulations, transportation infrastructure management, dredging	Ongoing
Water level and water quantity management	Lake Ontario and St. Lawrence River watersheds	International Joint Commission, NYSDEC, and USGS	Water level and quantity management	Ongoing
Power stations	Nine Mile Point, Ginna, Fitzpatrick Nuclear Power Stations, and over 51 others within 20 miles of the coastline along the study area ¹	New York state, counties, utilities, and federal agencies	Power plant operations	Ongoing

Project Title	Location	Project Lead	Project description	Estimated Completion Timeline
NYSDEC State Pollutant Discharge Elimination System (SPDES) Permit Program	New York power and utilities and five wastewater sites on St. Lawrence and 21 on Lake Ontario	NYSDEC and International Joint Commission	Multiple permits for many types of waste discharges with low pollutant content and with no likely adverse effect on water quality, including, industrial production, stormwater, power generation, and wastewater treatment facilities	Ongoing
Great Lakes federal agency research	Throughout Great Lakes	NOAA, USGS, partner universities, municipalities, state, federal, international agencies, non-governmental institutions, etc.	Regional environmental research	Ongoing
Potential offshore wind development	Lake Ontario	Private developers	No active proposals	NA
Submerged cable replacement	Eastern Lake Ontario and St. Lawrence River	Varies, typically private landowners or utilities	Electric transmission cables connecting islands to the mainland	Ongoing
Local or state tourism boards/agencies		New York state and local governments	Advertising for the local area or state to attract tourists	Ongoing
Dive shops/operators	Small businesses	Small businesses	Advertising and marketing to attract new clients to the region	Ongoing

¹Source: U.S. Bureau of Ocean Energy Management & National Oceanic and Atmospheric Administration, <https://marinecadastre.gov/oceanreports/> and U.S. Energy Information Administration, <https://www.eia.gov/state/?sid=NY#tabs-4>

As the proposed action for the designation of Lake Ontario National Marine Sanctuary is a regulatory and management action rather than a specific development action, the cumulative effects described below are related primarily to local and regional management of cultural and historical resources in the study area. For the purposes of this cumulative effects analysis, NOAA assumed that any of the actions in Table 5.2 that have not already been implemented would be approved and implemented within the time period for this analysis.

As described in detail in the subsections below, NOAA found that the combination of implementation of the alternatives with the actions in Table 5.2 would result in cumulative beneficial impacts to cultural and historical resources and human uses and socioeconomic resources in the study area. The proposed action's contribution to any adverse cumulative effects to these resources would be **negligible**, due to the implementation of best management practices and mitigation measures to minimize or avoid any adverse impacts.

5.5.3 Cumulative Impacts on Cultural and Historical Resources

The proposed action would not contribute to any significant adverse impacts on cultural and historical resources. Cumulative effects that could impact cultural and historical resources may include disturbance and physical impacts from increased visitation to historic shipwrecks resulting from public use and management activities. However, NOAA would mitigate the intensity of these human use effects through public outreach and regulatory prohibitions, which would lower the risk of damage to the sanctuary's shipwrecks. Further impacts to cultural and historical resources includes potential destruction of underwater cultural resources and sites from dredging and construction activities, including shoreline maintenance, dock and harbor infrastructure, and waterfront revitalization projects. These impacts would be mitigated through compliance with the proposed sanctuary regulations, collaboration with New York state officials and compliance with the NHPA for any potential impacts to historic properties.

5.5.4 Cumulative Impacts on Human Uses and Socioeconomic Resources

Table 5.2 includes several local and state parks and maritime museums that conduct similar activities as the proposed sanctuary and also draw visitors to the coastal communities in the study area. These sites' efforts to attract tourism, in conjunction with efforts to attract tourists to the proposed sanctuary, would have overlapping beneficial impacts on the tourism industry in the coastal communities next to the proposed sanctuary. Designating the proposed Lake Ontario National Marine Sanctuary would add a major water-based attraction to the region that would encourage both land-based tourism (e.g., visitor centers and museums) and water-based tourism (e.g., scuba diving, recreational boating).

Increased tourism from these other activities could also increase the number of recreational users within the proposed sanctuary, potentially resulting in densely used local areas. As part of the management plan review process, NOAA would regularly review the sanctuary's management plan and regulations and make revisions as necessary to respond to changing threats to sanctuary resources. Thus, although the actions listed in Table 5.2 would have positive, beneficial impacts, the proposed action can be estimated with high confidence, to at a minimum, have **negligible, beneficial cumulative impacts** on human uses or socioeconomic resources in the proposed sanctuary. Baseline monitoring and future monitoring of the proposed area would help to determine if the actual impacts from designation rise to the level of significant impacts.

5.5.5 Cumulative Impacts on Biological and Physical Resources

The proposed action would not contribute to any significant adverse impacts on habitats, wildlife, protected species, climate, air, or water. NOAA's implementation of the proposed action is expected to result in minor increases in public use and management activities occurring within the study area. These activities may cause minor local adverse cumulative effects on biological and physical resources. However, these minor adverse impacts would be mitigated by NOAA's implementation of best management practices and other regulatory and management activities that would protect lakebed habitats and substrate near shipwreck sites from physical disturbance.

Several other organizations, including federal, state, and local government entities, are involved in the protection of biological and physical resources in the Great Lakes. These organizations conduct research activities and regulate activities occurring in this region (see Table 5.2). Threats to aquatic and physical resources from other activities within the proposed sanctuary include the negative effects of invasive species, climate change, and pollution from point and nonpoint sources. Over many decades, the cumulative effects of chemical contamination, nutrient pollution that results in eutrophication and low dissolved oxygen levels, and invasive species destabilized the Great Lakes aquatic ecosystem. Lake Ontario and the St. Lawrence River have undergone cycles of degradation and remediation, and these watershed effects affect the aquatic resources within the proposed sanctuary. Continued releases of nutrients, particularly from nonpoint sources; continued persistence of invasive species; and continued changes in temperature and rainfall due to climate change will prevent a stable natural environment over the next decade. While the proposed sanctuary would not directly protect biological or physical resources, the adverse impacts from field activities would be negligible, and therefore, would not significantly contribute to cumulative impacts on physical and biological resources.

5.6 Comparison of Impacts of the Alternatives

Under the No Action Alternative, NOAA would not designate a national marine sanctuary in eastern Lake Ontario. Under Alternative 1, the proposed sanctuary would cover 1,786 square miles and protect and manage 64 known shipwrecks and one aircraft (as well as 20 reported historic vessels and three aircraft losses). Under Alternative 2, the sanctuary boundary would be smaller, and NOAA would protect and manage 43 known shipwrecks and one known aircraft (as well as 20 reported historic vessels and three aircraft losses).

NOAA's analysis finds that implementing either alternative 1 or 2 would have **significant** beneficial impacts on underwater cultural resources due to the direct and permanent protections to these historically significant resources that would be provided by implementing regulations to prohibit harm or injury to shipwrecks, conducting research and monitoring activities to inform long-term management, and enhancing stewardship through outreach initiatives. While Alternative 2 would not protect as many historical and cultural resources as Alternative 1, both action alternatives would protect a substantial number of nationally significant shipwrecks. Under Alternative 2, the beneficial impacts on underwater cultural resources would be smaller than under Alternative 1 because NOAA would focus research and monitoring activities on fewer underwater cultural resources. Research on fewer sites would

mean a smaller amount of new archaeological information available for the research community and the public compared to Alternative 1, a smaller number of shipwreck sites within recreational and technical diving limits, and a narrower scope of interpretive activities due to the smaller geographic scope of the proposed sanctuary.

Implementing either Alternative 1 or Alternative 2 would bring resources and national visibility to provide coordinated promotion of regional recreational activities and human uses within the designated sanctuary area. Specific benefits expected under either action alternative would include:

- increased spending and positive contribution to the local economy from increased tourism and recreational experiences,
- increased non-market value of sanctuary designation,
- reduced entanglement of fishing gear and related costs to commercial and recreational fishing, and
- increased investment from research activities.

NOAA's analysis finds that the beneficial impacts to socioeconomic resources and human uses would be greater under Alternative 1 because the proposed sanctuary would cover a larger geographic area.

Under either action alternative, the proposed regulations and management plan objectives would be designed to protect underwater cultural resources in the proposed sanctuary. Implementing proposed regulatory provisions to protect underwater cultural resources from disturbance could have minor benefits to physical and biological resources in the action area by reducing the potential for disturbance of the lakebed, shorelines, and any living resources in these areas.

NOAA's analysis finds that implementing the action alternatives would not result in any significant adverse impacts. However, designating the proposed sanctuary under Alternative 1 or Alternative 2 could have minor adverse impacts on some resource areas due to increased site visitation associated with increased name recognition of the area through national marine sanctuary designation. The proposed sanctuary designation may also attract more public users to the area, resulting in increased boat traffic. NOAA-led activities to support management of the proposed sanctuary as well as recreational activities, such as vessel operations and maintenance; scuba operations; deployment of AUVs, ROVs, gliders, and drifters; archaeological site investigation; and deployment of equipment on the lakebed (i.e., installing mooring buoys) could cause minor disturbance of underwater cultural resources, the lakebed, and any fish species present in the area. NOAA's analysis finds that any adverse impacts on these resources from implementing Alternative 1 or Alternative 2 would be negligible or minor due to best management practices NOAA would follow during research and other field activities; the mooring program that would limit direct interactions with shipwrecks by recreational divers; regulations to prohibit harm or injury to shipwrecks; and outreach programs that would encourage public stewardship.

Overall, NOAA's analysis finds that implementing either Alternative 1 or Alternative 2 would generally have the same types of beneficial and adverse impacts on the cultural and historical

resources, socioeconomic resources and human uses, and physical and biological resources. Under Alternative 2, these impacts would occur over a smaller geographic area and would be smaller in scope and intensity because fewer underwater cultural resources would be protected under sanctuary regulations. When compared to the No Action Alternative, NOAA finds that implementing the No Action Alternative would forgo the benefit of implementing regulations and a management plan to provide comprehensive, long-term management of cultural and historical resources located within the proposed sanctuary under either action alternative.

Chapter 6: Conclusions

6.1 Unavoidable Adverse Impacts

Pursuant to NEPA, an environmental impact statement (EIS) must describe any adverse environmental effects which cannot be avoided should the proposal be implemented (42 USC 4332). The environmental impacts of the alternatives are described in Chapter 5. NOAA's analysis found that implementing the action alternatives would not result in any unavoidable significant adverse impacts.

6.2 Relationship of Short-term and Long-term Productivity

NEPA also requires that federal agencies consider the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity (42 USC 4332). The short-term uses of the environment relating to each of the action alternatives may increase the number of visitors to the study area, while at the same time improving the health and quality of the environment by protecting the maritime cultural heritage resources that provide habitat for living resources through: (1) regulations that prohibit damaging the underwater cultural resources, (2) providing a mechanism through the National Marine Sanctuaries Act to respond to hazardous spills that damage the underwater cultural resources, and (3) monitoring human activities through regulations and nonregulatory programs that incorporate community involvement in the stewardship of the proposed sanctuary's underwater cultural resources.

Long-term productivity derived from the action alternatives is based on the goals of the proposed sanctuary and the proposed management actions to achieve the goal of long-term protection of the underwater cultural resources. These proposed actions include action plans related to resource protection, recreation and tourism, education, science and research, and infrastructure and operations. Benefits to both short-term uses and long-term productivity based on designation of the proposed Lake Ontario National Marine Sanctuary are proportional to the number of underwater cultural resources that provide habitat encompassed within the area of each alternative. NOAA anticipates any growth inducing impacts from the proposed action to be negligible or moderate, and therefore would not rise to the level of significant.

6.3 Irreversible and Irretrievable Commitment of Resources

NEPA requires an analysis of the extent to which the proposed project's primary and secondary effects would commit nonrenewable resources to uses that future generations would be unable to reverse (42 USC 4332(C)(v); 40 CFR 1502.16). The mission of a national marine sanctuary is to conserve resources for future users, but implementing routine management activities and protective regulations may require some irreversible and irretrievable commitments of resources.

Irreversible commitments of natural resources include the consumption or destruction of nonrenewable resources or degradation of renewable resources over long periods of time. The proposed action would result in the following irreversible commitments of natural resources:

- Nonrenewable resources that would be consumed during management and research activities include fuel, water, power, and other resources necessary to maintain and operate the sanctuary's research vessels and potential future sanctuary offices.
- Electricity to power sanctuary facilities would be an irreversible use of resources, if derived from a nonrenewable electrical power source (e.g., natural gas or nuclear energy).

Irretrievable commitments of resources include opportunities foregone, expenditure of funds, loss of production, and restrictions on resource use. The proposed action would result in the following irretrievable commitments of natural resources:

- Monetary funds would be expended to support management activities in the purchase of fuels, electricity, water, and other nonrenewable supplies, for wages and rents, and for potential construction of facilities
- Natural resources may be used in construction of sanctuary facilities and structures, such as buildings, signs, navigational markers, and mooring buoys
- Benthic habitat would be physically altered in the installation of mooring buoy anchors, navigational markers, and other permanently fixed informational and regulatory signs

The irreversible and irretrievable commitment of resources would be minimized and mitigated by best management practices, staff training, and sustainability goals and procedures documented in the proposed sanctuary's management plan.

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Index

- Commercial fishing 64, 102
- Energy generation and transmission 66, 103, 111
- Haudenosaunee Confederacy 31, 33-35, 137
- Invasive species vii, xii, 12, 84, 86-87, 92, 106, 108, 118, 132, 135, 141
- Management plan i, iii, vii-viii, xi, 1, 5, 9-11, 15-18, 24-26, 29, 81-82, 94-97, 99, 102-104, 106, 109-110, 113, 117, 119-120, 122, 129-130, 136, 143-144, 146
- Maritime cultural landscape vii, 31, 133-134, 136
- Military activities xi, 66, 103, 111
- National Historic Preservation Act (NHPA) v, 8, 9, 13, 30, 59, 98, 117, 131, 133, 170, 175
- National Marine Sanctuaries Act (NMSA) i, iii, v-vii, 2-6, 10-14, 17, 23-24, 30, 121, 143, 145, 168, 170, 173-174
- National Register of Historic Places (NRHP) v-vi, viii, ix, 4, 8, 13, 17, 20, 22, 28, 47, 59, 97, 133, 168, 170, 175
- Onondaga Nation 8-9, 31, 33-34, 145
- Public scoping iii, vii, xi, 6-8, 16-18
- Recreational fishing vii, 7, 61-62, 73, 99-102, 119
- Sanctuary Advisory Council vii, xi, 7, 16-18, 22, 129-131, 142-144
- Sanctuary nomination iii, vi, 3-4, 6, 10, 16, 144
- Shipping 17, 20, 22, 27, 29, 35-36, 38, 55, 64-66, 76, 80, 84, 102, 111
- Socioeconomics i, xi-xii, 30, 60, 69, 93, 99, 102, 110-111, 117, 119-120, 140
- Tourism iii, vi-vii, xi, 1, 5, 7, 9, 11, 14, 16, 18, 25, 41, 60, 73, 83, 99-100, 104, 111, 114, 116-117, 119, 121, 129-130, 138-140, 144
- U.S. Coast Guard (USCG) v, vii, 7, 43, 63, 67, 96, 103, 114-115, 142, 145, 172-173
- U.S. Army 19, 36, 58, 63, 66, 114, 145
- Water quality xi, 76, 81-82, 84-86, 92, 104-108, 116, 135

Appendix A:

Draft Management Plan for Proposed Lake Ontario National Marine Sanctuary

Management plans are sanctuary-specific planning and management documents used by all national marine sanctuaries. They identify immediate, midrange, and long-term challenges and opportunities, and outline future activities. A management plan describes resource protection; research; education and outreach programs that guide sanctuary operations; specifies how a sanctuary should best protect its resources; and describes sanctuary regulations if appropriate. The draft management plan for the proposed Lake Ontario National Marine Sanctuary outlines the goals and range of activities that would be necessary to achieve the vision of the sanctuary.

NOAA's first management plans developed for new sanctuaries typically consist of broad goals and strategies. While the following draft management plan includes significantly more detail than what was included in the initial management plans for other national marine sanctuaries, NOAA recognizes that it takes several years to integrate the sanctuary into communities, explore opportunities for partnerships, and determine more specific priorities. The management plan is intended to adapt over time as the sanctuary implements elements of the plan. Management plans are created with input from the Sanctuary Advisory Council, the general public, local governments, state and federal agencies, other stakeholders, and in consultation with Indigenous nations and tribes who have interest in the management and operation of the proposed sanctuary.

The proposed Lake Ontario National Marine Sanctuary draft management plan consists of five action plans:

1. Sanctuary Operations
2. Research and Monitoring
3. Education and Outreach
4. Tourism and Economic Development
5. Resource Protection

Requirements

For each of the action plans, NOAA's ability to fully implement the management plan would be dependent on the realities of funding and other resources over the initial five-year period. For each of these action plans, implementation would also be dependent on continued collaboration with the state of New York, as well as federal funding, grants, donations, staffing, and contributions from partners.

Action Plans

Sanctuary Operations Action Plan

Description

The purpose of this action plan is to create sanctuary infrastructure and program support to ensure effective implementation of the management plan. Managing nationally significant resources requires appropriate facilities and vessels; trained personnel and volunteers; funding and partnerships; and specialized equipment. NOAA's priority after designation would be to develop effective and sustainable infrastructure.

NOAA's Office of National Marine Sanctuaries (ONMS), the state of New York, and local communities would work together to support the functions of the sanctuary. NOAA and New York state would enter into a Memorandum of Agreement (MOA). The purpose of the MOA is to provide a mechanism for coordinating the efforts of NOAA and the state to meet the common commitment to protect and manage sanctuary resources.

The Sanctuary Advisory Council is also an essential component of the management plan. Advisory council members represent the sanctuary community's different interests, including local government, education, maritime history and interpretation, fishing, diving, tourism, economic development, industry, and the community-at-large. Advisory council members serve as liaisons between their constituents and sanctuary leadership, keeping sanctuary staff informed of issues and concerns while performing outreach to their respective constituents on the sanctuary's behalf.

All national marine sanctuaries benefit greatly from partnerships between NOAA and nongovernmental organizations, private businesses, education and cultural institutions, community groups, private citizens, tribal governments, and local, state, and federal agencies. NOAA would develop these partnerships at Lake Ontario National Marine Sanctuary to create or improve upon a number of essential capacities, including research vessels and equipment, administrative space, law enforcement, and education and outreach programs.

Goal

Ensure sanctuary operations and administrative capabilities are sufficient to effectively, efficiently, and safely implement the sanctuary's mission.

Objectives

- Ensure necessary sanctuary infrastructure (e.g., office space, research vessels), staffing, and administration.
- Create a "NOAA presence" within sanctuary communities.
- Secure resources to support sanctuary operations and programs.
- Enhance program support through partnerships and volunteers.
- Create a "Friends" group as a partner to the sanctuary.

Strategies

STRATEGY SO-1: Identify staff and office needs to support sanctuary operations, resource protection, education and outreach, and research programs.

Activity 1.1: Identify and fill appropriate staffing requirements at the sanctuary.

Activity 1.2: Provide staff with opportunities and resources for professional development and training.

STRATEGY SO-2: Develop infrastructure and a “NOAA presence” within communities that supports the sanctuary’s mission and programs.

Activity 2.1: Conduct an infrastructure needs study for the sanctuary.

- a. Gather input from communities, the state, and other stakeholders that recognizes, leverages, and complements local and statewide assets, including office and community meeting spaces.
- b. Ensure that the study includes creating a “NOAA presence” in each community, to include infrastructure, research, education, outreach, exhibits, and engagement opportunities.

STRATEGY SO-3: Maintain the Lake Ontario National Marine Sanctuary Advisory Council.

Activity 3.1: Provide support, resources, and guidance to help the advisory council engage and educate the public about sanctuary management issues and ensure they are a respected voice in the community.

STRATEGY SO-4: Establish a sanctuary volunteer program.

Activity 4.1: Attract, train, use, recognize, and retain volunteers to support and enhance sanctuary programs, including the development of a volunteer diving program.

Activity 4.2: Develop a volunteer handbook, consistent with national guidance, that outlines policies and opportunities for volunteers to help support the goals and purposes of the sanctuary.

Research and Monitoring Action Plan

Description

The purpose of this action plan is to outline the sanctuary’s research and monitoring objectives and priorities. Sanctuary research is conducted in support of resource protection, resource management, and education initiatives. The action plan is intended to guide the sanctuary, as well as encourage and guide archaeological and multidisciplinary research by sanctuary partners. The process of inventorying, assessing, and monitoring directly meets mandates for federal agencies under Section 110 of the National Historic Preservation Act (NHPA).

Background

Research and monitoring programs are integral to documenting, characterizing, managing, and protecting national marine sanctuary resources. Sanctuary staff will conduct, support, promote, and coordinate all research with an aim toward sanctuary characterization and resource

management. Characterization is the process through which sanctuary resources are inventoried, located, documented, analyzed, and ultimately interpreted within a broader cultural, historical, and archaeological context. Management is an active process involving identification of threats and disturbances to a resource and implementation of strategies that ameliorate or negate these processes. The ultimate goal of cultural resource management is resource preservation for both current and future generations. Knowledge acquired through research is used to evaluate existing management practices, identify emerging threats, and inform future management decisions. Research products will also form the foundation of outreach materials aimed at educating the public about the importance of the Great Lakes and their history.

Characterization and monitoring of sanctuary resources will continue with historical research to build on the inventory of known and potential underwater cultural resources located in and around the sanctuary. Physically locating underwater cultural resource sites is the next step in sanctuary characterization. Resource documentation is then conducted to provide baseline data that evaluate the current state of preservation and identify threats and disturbances present to sites, such as invasive mussels, ice and anchor damage, looting, and other intentional and unintentional human impacts. Finally, a monitoring program will be implemented to periodically assess resource change and implement mitigation or stabilization strategies, as well as drive research questions and inform management actions and regulatory review over time.

Goal

Protect the sanctuary resources and maritime landscape by inventorying, locating, documenting, assessing, managing, and interpreting the sanctuary's archaeological, historical, and cultural resources.

Objectives

- Characterize the sanctuary's underwater cultural resources.
- Study the relationship between the underwater resources, the culture, and activities of the area.
- Develop and encourage collaborative research programs to meet the sanctuary's ongoing management needs.
- Develop a monitoring program and site database to take inventory of and understand resources and threats, and feed information into system-wide databases.
- Consistent with the Sanctuary Use, Characterization, Assessment and Research (SUCAR) program, develop estimates of human use by activity within sanctuary waters.
- Use research findings to inform sanctuary condition reports.

Strategies

STRATEGY R-1: Characterize the sanctuary's underwater cultural resources and cultural landscape features.

Activity 1.1: Conduct historical and archival research on underwater cultural resources and cultural landscape features in the sanctuary.

- a. Continue to compile historical documentation relevant to sanctuary resources, including primary and secondary historical documents, ethnographic resources, folklore, vessel

enrollment and registration documents, court records, insurance files, and regional newspapers.

- b. Assess the condition of underwater cultural resources, including human or environmental factors that influence this condition to inform decision-making and resource protection strategies.
- c. Maintain records and databases on known and potential shipwrecks and other underwater cultural resources within the sanctuary.
- d. Coordinate archival research and databases with private and public entities and individuals with an interest in studying sanctuary resources.
- e. Complete and publish a maritime cultural landscape survey.
- f. Coordinate and consult with Indigenous nations and communities to identify potential research priorities and identify historic properties, including cultural landscapes.
- g. Submit National Register of Historic Places nominations; explore a National Register of Historic Places district or multiple property nomination.

Activity 1.2: Conduct systematic archaeological surveys to locate and identify underwater cultural resources and landscape features in the sanctuary.

- a. Define survey requirements for site characterization in compliance with the Federal Archaeology Program (FAP), NHPA, and ONMS guidance.
- b. Conduct surveys and mapping using remote sensing, divers, ROVs, and video as required; leverage NOAA network and other partners for vessel, equipment, and personnel.
- c. Encourage and facilitate partner participation in survey work.
- d. Disseminate research results to professional and public audiences following guidance on release of sensitive information.

Activity 1.3: Prioritize archaeological documentation of identified underwater cultural resources to establish baseline data for long-term monitoring.

- a. In collaboration with stakeholders, determine priorities for archaeological research and documentation.
- b. Complete baseline documentation of underwater cultural resources, including site plans, underwater video, still imagery, and photomosaics.
- c. Partner with citizen science groups for training in monitoring initiatives.
- d. Disseminate research results to professional and public audiences in a timely and accessible manner.

Activity 1.4: Develop and implement a long-term monitoring plan to assess and potentially mitigate natural and human impacts on maritime heritage sites, including climate change impacts.

- a. Collect and evaluate existing data to establish baseline data sets.
- b. Establish site-specific requirements for monitoring.
- c. Collect and analyze monitoring data to develop and implement resource stabilization or threat mitigation measures; continue to evaluate monitoring requirements.
- d. Make monitoring results publicly accessible.

- e. Structure monitoring approach with trackable metrics to evaluate efficacy and support 10-year regulatory review process.

Activity 1.5: Develop and maintain a sanctuary geographic information system (GIS).

- a. Build and continue to enhance GIS for archaeological, historical, cultural and geographical data management; use GIS for sanctuary resource management; and to increase data sharing among sanctuary co-managers and facilitate public dissemination of information. GIS should integrate with the state of New York's Cultural Resource Information System.

Activity 1.6: Monitor use of sanctuary resources in order to better understand user groups being served, patterns of use, (e.g., cultural, commercial, recreation, science, and education), and the effects of use on the resources.

- a. Develop a plan and implement monitoring programs to inventory and assess baseline conditions and human use, and to track changes over time.
- b. Work with outfitters, dive charters, recreational divers and clubs, and state partners, local businesses, and government agencies to document visitation to the sanctuary and use of the resources.
- c. Develop procedures for users to voluntarily report visitation to the sanctuary and use of the resources.
- d. Explore the use of technologies (e.g., website links, social media, on-site QR codes) to facilitate monitoring and reporting of visitors and uses.

STRATEGY R-2: Study the relationship between, and context of, underwater resources and regional culture and history, including Indigenous culture and activities; describe the maritime cultural landscape and heritage of shipwrecks

Activity 2.1: Conduct historical and archival research on the connection between sanctuary resources and the culture and activities of the area.

- a. Study and compile historical documentation relevant to sanctuary resources, emphasizing the relationship of cultural resources, natural resources, and local communities.
- b. Inventory, catalogue, and coordinate the compilation of existing heritage knowledge and research from private and public groups and individuals interested in partnering with sanctuary research efforts; identify and fill gaps in this knowledge; establish a central location where communities can access this research.
- c. Evaluate connections to places like the Erie Canalway Heritage Corridor (part of the National Park System) and other areas that have a strong focus on maritime heritage.

STRATEGY R-3: Develop partnerships with local, state, national, Indigenous nations, and international researchers and organizations to enhance sanctuary research programs and support broader Great Lakes conservation efforts.

Activity 3.1: Develop partnerships that accelerate characterization of the sanctuary's underwater cultural resources using new technologies.

Activity 3.2: Develop partnerships with multidisciplinary researchers and organizations to facilitate characterization of the sanctuary’s natural environment and accelerate broader conservation efforts.

Activity 3.3: In support of sanctuary condition reports and the National Marine Sanctuary Sentinel Site initiative:

- a. Develop observation infrastructure and capabilities to have the new sanctuary serve as a National Marine Sanctuary Sentinel Site
- b. Facilitate the study of Great Lakes ecology, including the study of climate change, invasive species, lake biology, geology, and water quality; and
- c. Study and track the social and economic impact of the sanctuary and its resources and the services they provide to the public.

Activity 3.4: Establish partnerships with local educational institutions to establish underwater research programs and curriculums that build capacity and encourage the next generation of researchers and conservationists.

Activity 3.5: Consult with Indigenous communities to conduct collaborative research.

Activity 3.6: Build international relationships and investigate partnership opportunities for United States-Canada collaboration on preservation initiatives.

Activity 3.7: Build relationships with archival institutions and repositories to preserve historical and archival Lake Ontario materials.

- a. Seek out opportunities to acquire historical and archival materials following establishment of collections and accession guidance.
- b. Partner with archival institutions and repositories to store these materials and make them accessible to the public.

STRATEGY R-4: Develop citizen science research programs and educational opportunities.

Activity 4.1: Establish citizen science research programs for research, monitoring, and resource characterization.

- a. Recruit and train volunteers to assist sanctuary staff with research projects.
- b. Establish a training program or adopt an existing maritime archaeology training course to provide local training opportunities for certified divers.
- c. Train volunteer teams to undertake periodic monitoring of beaches to look for shipwrecks washing up on shore or becoming exposed on beaches due to flooding.
- d. Develop assessment protocols for newly located shipwrecks.

Activity 4.2: Work with partner institutions, organizations, and Indigenous communities to establish research opportunities for students.

Education and Outreach Action Plan

Description

The purpose of this action plan is to enhance public awareness, understanding, and stewardship of sanctuary resources, Lake Ontario, the St. Lawrence River, the Great Lakes, and the ocean. Education and outreach activities would focus on the historical significance of these underwater resources on culture and activities in the area, including Indigenous cultures and activities.

Background

Sanctuary education and outreach programs are designed to raise public awareness about the sanctuary; to inspire stewardship of the resources and surrounding environment; to increase knowledge about Lake Ontario and Great Lakes maritime heritage; and to promote Great Lakes and ocean literacy. Education and outreach includes both formal and informal programs for learners of all ages, including students, teachers, local residents (both full-time and seasonal), visitors, and other constituents.

The sanctuary will use education and outreach efforts to address specific priority issues identified in the management plan. Education is essential to achieving the sanctuary's management objectives and will be used to both complement and promote resource protection and research programs.

Goal

Provide innovative, technology-driven, authentic and place-based educational and outreach opportunities that promote learning, understanding, appreciation, and involvement in the protection and stewardship of sanctuary resources, Lake Ontario, the Great Lakes, and the ocean.

Objectives

- Provide leadership in assessing educational interests of residents, visitors, K-12 schools and higher education, including local, regional, statewide, national, and international educational institutions.
- Develop and integrate existing ONMS education and outreach programs that complement and promote sanctuary resource protection, research, and stewardship.
- In collaboration with key partners, develop and implement education programs that promote awareness and understanding of sanctuary resources, Lake Ontario's maritime heritage, and the maritime cultural landscape.
- Develop and implement education programs and partnerships that promote awareness and interaction with the National Marine Sanctuary System and NOAA.
- Encourage the involvement of volunteers to foster understanding and participation in the protection and stewardship of sanctuary resources.
- Engage and provide educational opportunities to all communities surrounding the sanctuary, including underserved communities and Indigenous nations and tribes.

Strategies

STRATEGY ED-OUTREACH 1: Increase awareness and knowledge of sanctuary resources, Lake Ontario, the Great Lakes, and the ocean through education programs.

Activity 1.1: Conduct an inventory of local, state, and regional educational institutions to identify opportunities for partnerships.

Activity 1.2: Develop a plan to offer sanctuary and maritime heritage content to educators, community members, and students.

- a. Work with education and outreach partners and with state and local historical societies to develop a plan that identifies areas to integrate NOAA and sanctuary content into school curricula.
- b. Promote and coordinate consistency of sanctuary education materials with local, county, and state organizations that find an interest in sanctuary programs-
- c. Leverage NOAA's resources to facilitate training sessions and workshops for educators, community members, and students.
- d. Conduct sanctuary-related educational programs for regional schools.

Activity 1.3: Facilitate distance and virtual learning with Lake Ontario museums and other locations statewide and nationwide.

- a. Work with ONMS distance learning programs and social media campaigns (e.g., Earth Is Blue) to create, showcase, and distribute curriculum and multimedia content from around NOAA, the sanctuary system, and partner expeditions worldwide (e.g., Nautilus Live).
- b. Collaborate with Thunder Bay and Wisconsin Shipwreck Coast national marine sanctuaries, New York Sea Grant, the State University of New York (SUNY) campuses, New York Coastal Management Program, and other partners on joint distance learning projects.

Activity 1.4: Collaborate with nations and tribes, including the Indigenous nations and tribes in the Haudenosaunee Confederacy, to ensure that content on the Haudenosaunee and other Indigenous cultures in upstate New York is incorporated into educational and outreach materials.

Activity 1.5: Promote marine technology as a way to enhance STEAMS education (science, technology, engineering, arts, mathematics, and social studies) and possible entrepreneurial economic development opportunities in the region.

- a. Leverage experience and assistance from Thunder Bay and Wisconsin Shipwreck Coast national marine sanctuaries and other marine sanctuaries; foster awareness and participation in the Marine Advanced Technology Education (MATE) Center's remotely operated vehicle competition.
- b. Collaborate with local educators to develop a strategy for engaging mentors and students in the MATE competition and other relevant marine technology learning initiatives.

- c. Work with partners, such as New York Sea Grant and SUNY Oswego, to identify multidisciplinary STEAMS initiatives that would support NOAA science initiatives.

STRATEGY ED-OUTREACH 2: Increase awareness and knowledge of sanctuary resources, Lake Ontario, the Great Lakes, and the ocean through outreach programs.

Activity 2.1: Develop new or adopt existing maritime heritage education programs, outreach materials, and exhibits for use in museums, visitor centers, and outdoor venues.

- a. Identify areas of collaboration between NOAA, educational and outreach institutions, museums, and visitor centers in sanctuary communities.
- b. Identify funding opportunities that will help establish a sanctuary interpretive presence in local partner venues.
- c. Conduct sanctuary-related presentations at museums, visitor centers, national parks, schools and community colleges, Boys and Girls Clubs, neighborhood centers, chambers of commerce, and other relevant locations within sanctuary communities.
- d. Identify programs and exhibits about ecosystem topics of relevance to the sanctuary and its resources (e.g., SUNY Oswego Meteorology, SUNY College of Environmental Science and Forestry, SUNY Cayuga Community College, Cornell University).

Activity 2.2: Develop different types of outreach materials for a variety of users.

- a. Develop interpretive materials for visitors to H. Lee White Museum, historical societies, Fort Ontario State Historic Site, Safe Haven Museum & Education Center, Lighthouse of Lake Ontario, Seaway Trail, Erie Canalway National Heritage Corridor, Port of Oswego, county and state tourism offices, SUNY Oswego, and other institutions of higher learning.
- b. Create interpretive materials for recreational users (e.g., divers, snorkelers, kayakers, fishers, boaters) that encourage the sustainable stewardship of sanctuary resources.
- c. Create virtual 360 dives and related remote experiences in the sanctuary. This virtual reality experience is made possible through technology that produces 360-degree images that are "stitched" together from a series of underwater photos.

STRATEGY ED-OUTREACH 3: Enhance sanctuary communications to create greater awareness.

Activity 3.1: Develop a communications/implementation master plan for the sanctuary communities.

Activity 3.2: Explore potential partnerships with university broadcasting programs and local public broadcast television and radio stations.

Activity 3.3: Create and leverage local, regional, and national media contacts to increase awareness about the sanctuary and its programs.

Activity 3.4: Develop content for the Lake Ontario National Marine Sanctuary website and social media to provide quality, up-to-date information about the sanctuary.

Activity 3.5: Sponsor, organize, and participate in outreach opportunities that promote the sanctuary’s mission and that allow for dissemination of sanctuary information.

- a. Participate in local community events, such as festivals and open houses.
- b. Present at local, regional, and national trade shows, workshops, and conferences targeted at specific impact groups, including divers, resource managers, and maritime history and archaeology professionals.
- c. Hold periodic public roundtables or meetings in each partner county to maintain open communication.

Tourism and Economic Development Action Plan

Description

The purpose of this action plan is to promote tourism and economic development initiatives in Lake Ontario communities.

Background

National marine sanctuaries attract visitors who seek places to experience these special underwater treasures and the adjacent coastal communities. Sanctuaries also offer an opportunity for local businesses to support the tourism industry and invest in initiatives that directly or indirectly support the sanctuary.

Goal

Create an environment that will promote tourism opportunities and support business growth through collaboration with the region’s various cultural and historic resources.

Objectives

- Engage with local hospitality, tourism, and other related businesses on potential business opportunities associated with the sanctuary.
- Encourage local, county, regional, state, and federal economic development agencies, tourism and outdoor recreation offices, and chambers of commerce to use the sanctuary as an economic development asset and to bring people to the region.
- Ensure, through close and meaningful consultation, that tourism and economic development activities involving the sanctuary are identified and conducted in a way that respects and acknowledges the lands and waters of the Indigenous nations and tribes.

Strategies

STRATEGY ECON-1: Identify hospitality, tourism, and other business groups within the region and establish communications and partnership building opportunities.

Activity 1.1 Provide training opportunities on how businesses might incorporate the responsible use of the sanctuary into their business plans.

Activity 1.2 Provide in-person and remote opportunities for local business owners to learn firsthand about the sanctuary.

Activity 1.3 Help identify opportunities and methods for businesses to include their proximity to the sanctuary in their marketing and branding.

Activity 1.4: Provide connections with the NOAA Business Advisory Council and the Business Recognition Program.

STRATEGY ECON-2: Establish working relationships with economic development agencies and collaborate on strategies to use the sanctuary as a development asset.

Activity 2.1 Identify and contact local, county, regional, and state economic development agencies to provide training on what the sanctuary is and the role it can and will play in the region.

Activity 2.2 Encourage agencies to incorporate the responsible use of the sanctuary into economic development strategies as a tool for development.

Activity 2.3 Work with economic development agencies to identify potential tools available to assist businesses interested in growing their operations using the sanctuary as an asset, or assisting new business startups resulting from the sanctuary.

Activity 2.4 Provide communication materials of socioeconomic research of the sanctuary that economic development agencies may use to improve awareness of the sanctuary with local developers, financial institutions, venture capitalists, and others who may assist with business development and startup.

STRATEGY ECON-3: Establish working relationships with local, regional, and state tourism agencies and chambers of commerce to develop strategies and assets to enhance sustainable tourism opportunities surrounding the sanctuary.

Activity 3.1 Contact tourism agencies and chambers of commerce to provide training on the sanctuary and how it will enhance regional marine resources.

Activity 3.2 Work with the tourism industry and chambers of commerce to see how local tourism businesses might use the sanctuary as a tool to attract more visitors to the region.

Activity 3.3 Partner with local, regional, and state tourism agencies and chambers of commerce to increase awareness about the sanctuary and promote regional sustainable tourism and economic development strategies.

Activity 3.4 Partner with New York state to enhance welcome/visitor centers through the addition of interpretive materials and exhibits about the sanctuary.

Activity 3.5 Encourage sustainable tourism by focusing on places that are authentic, specialized, unique, and homegrown, with unspoiled scenery, locally owned business, historic small towns, and walkable downtowns.

Resource Protection Action Plan

Description

The purpose of this action plan is to strengthen resource protection by promoting responsible use of sanctuary resources, developing resource protection-focused outreach and education initiatives, conducting on-water resource protection activities, and enhancing enforcement efforts.

Background

The sanctuary encourages public access to its resources and strives to balance increased visitation with resource management and preservation. Natural and human processes can threaten the long-term sustainability of New York's maritime heritage resources, including Indigenous cultural heritage resources, shipwrecks and other underwater cultural resources. While the effects of natural and human-caused processes, such as ice or invasive mussel damage on shipwrecks, will be studied using strategies found in the Research and Monitoring Action Plan, the Resource Protection Action Plan is designed to assess and reduce human impacts on sanctuary resources. In practice, the two plans will be highly integrated. Human activities have the greatest potential for harming shipwrecks and other underwater cultural resources. These activities include improper anchoring, inadvertent and intentional diving practices that damage resources, and artifact removal. The two plans will also address longer term impacts, such as understanding, mitigating, and adapting to the effects of climate change on sanctuary resources.

Goal

Strengthen resource protection in the proposed sanctuary through resource-specific initiatives and compliance with sanctuary regulations, while increasing public access.

Objectives

- Improve understanding of use patterns and the effects of these uses on the resources.
- Develop a robust shipwreck mooring program and other methods to mitigate anchor impacts and allow for exploration.
- Increase public access and awareness of sanctuary resources while promoting and facilitating responsible use.
- Establish interagency collaboration for enforcement, including on-water and interpretive enforcement, as a resource protection tool.

Strategies

STRATEGY RP-1: Establish a shipwreck mooring program/system within the sanctuary.

Activity 1.1: Develop a five-year mooring plan that addresses mooring design and prioritizes mooring deployment with operational plans for installation, redeployment, and maintenance of mooring buoys. These moorings would include buoys and other types of access infrastructure for sites where buoy placement is not advisable, such as in ship traffic lanes.

Activity 1.2: Develop best practices for anchoring at sites where moorings are not yet installed or are not feasible, and develop a companion public awareness plan.

Activity 1.3: Gather input from the Sanctuary Advisory Council and diver working groups on plans outlined above.

Activity 1.4: Work with local dive charter operators and dive clubs to monitor moorings throughout the dive season.

STRATEGY RP-2: Ensure compliance with sanctuary regulations and other applicable state and federal laws.

Activity 2.1: Ensure sufficient enforcement presence in the sanctuary through partnerships and applicable interagency coordination.

- a. Develop agreements with the U.S. Coast Guard, NOAA Office of Law Enforcement, state agencies, and county and local agencies.
- b. Develop an interagency communication and emergency response plan.
- c. Host workshops on law enforcement as related to maritime heritage resources.
- d. Explore feasibility of using various technologies to monitor the sanctuary.

Activity 2.2: Use interpretive enforcement as a tool to inform users about sanctuary regulations.

- a. Provide information to law enforcement personnel on interpretive enforcement and guidelines; develop outreach materials for enforcement officers to distribute while patrolling the sanctuary.
- b. Integrate interpretive enforcement into shoreside signs throughout the sanctuary.
- c. Include informational inserts about the sanctuary in New York boat registration and renewal packets.
- d. Provide U.S. Coast Guard Auxiliary members, marina employees, and other appropriate individuals and organizations with information about sanctuary regulations.

STRATEGY RP-3: Increase and encourage access and responsible use of sanctuary resources by fostering greater awareness among recreational users.

Activity 3.1: Build capacity for access and responsible use of sanctuary resources by fostering greater awareness among user groups.

Activity 3.2: Provide practical information for users, such as shipwreck identification maps and information, access points, regulations, and contact information.

- a. Develop outreach materials and web-based information for users of sanctuary resources.
- b. Explore the use of cell phones and podcasting as a means of providing users interpretive materials at shipwreck sites.
- c. Investigate implementing “certification programs” for local outfitters, businesses, and local activities that actively promote recreational etiquette and stewardship of sanctuary resources (e.g., Florida Keys National Marine Sanctuary’s Blue Star Program).
- d. Provide information to the public about the shipwrecks, sanctuary regulations, and enforcement/emergency contact information at marinas, boat ramps, dive shops, fishing and diving charter operators, dive clubs, recreation activity shows (i.e., Beneath the Sea, Syracuse boat show) parks, other access points, and venues like visitor centers.
- e. Explore and improve public access to sanctuary resources for kayakers and snorkelers.

- f. Evaluate the effectiveness of approaches taken.

STRATEGY RP-4: Evaluate approaches to protect the wreck of HMS *Ontario* under the National Marine Sanctuaries Act.

Activity 4.1: Develop a plan and feasibility study that outlines a process to include the site of HMS *Ontario* as part of Lake Ontario National Marine Sanctuary at a future time.

- a. Explore developing specific zoning and regulations that might be considered to effectively manage and protect the site of HMS *Ontario*.

Activity 4.2: Pursue locating the site of HMS *Ontario*

- a. Coordinate with community stakeholders and independent researchers to collate and manage data associated with HMS *Ontario*.
- b. Develop a research design and proposed survey methodology to locate and characterize HMS *Ontario*.

Potential Operating Budget

The potential operating budget below is an estimate to show options for activities that can be implemented at varying levels of Congressional appropriations. These scenarios envision the reality of NOAA and its partners increasing sanctuary activities over time; however, NOAA cannot guarantee either of these funding scenarios given the federal appropriations process. The budget for the sanctuary will be contingent on several factors, including the overall operational and construction budgets for ONMS as determined by Congress, and spending priorities determined by ONMS and NOAA.

\$250,000 to \$500,000 annually

NOAA would establish an administrative office, hire a sanctuary superintendent, and support the operation of the Sanctuary Advisory Council. NOAA would provide staff to support programmatic priorities, which may include new hires. The first hires would likely be staff to manage sanctuary operations, develop public outreach and education programs, and conduct maritime archaeology documentation.

NOAA would work with partners to develop a strategic plan for creating a NOAA presence that could include exhibits, education, and outreach. NOAA would start implementing the highest priority elements of the resource protection, education, and research programs as identified in this management plan, focusing on identifying partnerships and evaluating opportunities.

NOAA would facilitate the establishment of a local sanctuary foundation or “Friends” group. NOAA would evaluate the specifications for a sanctuary research vessel and options for how to acquire such a vessel.

\$600,000 to \$1 million annually

At a higher level of funding, NOAA expects to have core staff in place but may need to hire or bring in additional staff to support programmatic priorities. NOAA would expand the research program with additional mapping, characterization, archaeological documentation of known shipwrecks and searching for potential shipwrecks, and enhancing Geographic Information

System capabilities. NOAA would continue to implement the interpretation, recreation, and tourism aspects of the management plan. For the education and outreach program, NOAA and its partners would create more programming for partner venues and pursue science, technology, engineering, art, mathematics, and social studies (STEAMS) and MATE remotely operated vehicle initiatives. NOAA would expand resource protection by installing additional moorings and access as well as establishing a monitoring program. NOAA would initiate a review of the management plan with partners, community, and Sanctuary Advisory Council and begin the sanctuary condition report.

As indicated in the sanctuary nomination, the counties, the state of New York, and a number of local and regional partners demonstrated their interest in contributing to the sanctuary reaching its full potential. Areas of collaboration that will supplement and complement federal funding include research, resource protection, law enforcement, cowriting and obtaining grant funding, marketing, and tourism.

Appendix B:

Compliance with Additional Regulatory Requirements

This section summarizes NOAA's compliance with additional statutory or regulatory requirements that apply to the proposed action.

B.1 Consultations under the National Marine Sanctuaries Act (NMSA)

Under section 303(b)(2) of the NMSA, NOAA is required to conduct a series of consultations with Congress, federal and state agencies, and other interested agencies. Per this requirement, upon publication of this DEIS, NOAA will send consultation letters with a copy of the DEIS to the following parties:

- U.S. House of Representatives Natural Resources Committee
- U.S. Senate Committee on Commerce, Science, and Transportation
- Department of Defense
- Department of State
- Department of Transportation
- Department of the Interior

NOAA will also send copies of this DEIS to the following agencies and organizations, consistent with NEPA requirements for inviting comments (40 CFR 1503.1):

- Cayuga Nation
- Oneida Nation
- Onondaga Nation
- Seneca Nation of Indians
- Saint Regis Mohawk Tribe
- Tonawanda Seneca Nation
- Tuscarora Nation of New York
- Department of Transportation St. Lawrence Seaway Development Corporation
- State of New York
- U.S. Environmental Protection Agency
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- U.S. Coast Guard
- U.S. Navy, Naval History and Heritage Command

B.2 Endangered Species Act (16 USC 1531 et seq.)

Section 7 of the Endangered Species Act (ESA) requires all federal agencies, in consultation with U.S. Fish and Wildlife Service or National Marine Fisheries Service (NMFS), to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of such species. In

fulfilling these requirements, each agency must use the best scientific and commercial data available. The regulations promulgated at 50 CFR Part 402 govern the consultation process.

In section 4.5.4.1 of this DEIS, NOAA identified four ESA-listed species under USFWS jurisdiction potentially present in the action area and one designated critical habitat unit for piping plover in the action area. NOAA then evaluated which of these species and habitat would likely be present in the action area and affected by the implementing either of the action alternatives and described any potential impacts in section 5.3.4.1. There are no listed species or designated critical habitat under NMFS jurisdiction found in the action area.

NOAA evaluated the habitat requirements and habitat availability for these four species under USFWS jurisdiction within the action area and determined that implementing either of the alternatives would have **no effect** on these species for the following reasons:

- Low intensity of activities that would occur within the sanctuary, especially along the shoreline where these species would most likely occur
- Short duration and rarely observed nesting period and infrequent observations of piping plovers along the shoreline within the action area
- Potential habitat for the Indiana bat, northern long-eared bat, and bog turtle does not exist near shorelines where they may be disturbed by sanctuary activities
- Types of management activities that would occur in the proposed sanctuary would not be disruptive to roosting bats (R. Niver, personal communication, April 7, 2020)

In addition, NOAA determined that implementing either of the action alternatives would have **no effect on designated critical habitat** for the piping plover because field activities to implement the proposed sanctuary management plan would primarily occur within buildings or on the water and would not include any ground-disturbing activities within the designated critical habitat unit along the shoreline of Lake Ontario. Therefore, NOAA's action would not result in a direct or indirect alteration in any of the essential features of designated critical habitat that would appreciably diminish the value of critical habitat for both the survival and recovery of the piping plover (see Section 5.3.4.1).

NOAA concludes that implementing either of the action alternatives would have no effect on ESA-listed species or designated critical habitat. Therefore, NOAA is not required to consult with USFWS under Section 7 of the ESA.



United States Department of the Interior

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<http://www.fws.gov/northeast/nyfo/es/section7.htm>



In Reply Refer To:

April 23, 2021

Consultation Code: 05E1NY00-2020-SLI-2428

Event Code: 05E1NY00-2021-E-07474

Project Name: Proposed Designation of Lake Ontario National Marine Sanctuary

Subject: Updated list of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). This list can also be used to determine whether listed species may be present for projects without federal agency involvement. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list.

Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list. If listed, proposed, or candidate species were identified as potentially occurring in the project area, coordination with our office is encouraged. Information on the steps involved with assessing potential impacts from projects can be found at: <http://www.fws.gov/northeast/nyfo/es/section7.htm>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the Services wind

04/23/2021

Event Code: 05E1NY00-2021-E-07474

2

energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New York Ecological Services Field Office

3817 Luker Road

Cortland, NY 13045-9385

(607) 753-9334

04/23/2021

Event Code: 05E1NY00-2021-E-07474

2

Project Summary

Consultation Code: 05E1NY00-2020-SLI-2428

Event Code: 05E1NY00-2021-E-07474

Project Name: Proposed Designation of Lake Ontario National Marine Sanctuary

Project Type: ** OTHER **

Project Description: The National Oceanic and Atmospheric Administration's (NOAA's) Office of National Marine Sanctuaries (ONMS) proposes to designate a national marine sanctuary in New York's eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. The proposed sanctuary would protect a collection of nationally significant maritime heritage resources, including historic shipwrecks.

In establishing the proposed sanctuary, NOAA would:

- 1) Set a boundary to protect these nationally significant shipwrecks and other underwater cultural resources and to interpret the maritime cultural landscape that surrounds them;
- 2) Develop and implement a management plan to provide a comprehensive, long-term plan to manage the sanctuary; and
- 3) Create and implement regulations to protect underwater cultural resources.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@43.64875449262665,-76.46032641933303,14z>



Counties: New York

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Indiana Bat <i>Myotis sodalis</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Piping Plover <i>Charadrius melodus</i> Population: [Great Lakes watershed DPS] - Great Lakes, watershed in States of IL, IN, MI, MN, NY, OH, PA, and WI and Canada (Ont.) There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Endangered

Reptiles

NAME	STATUS
Bog Turtle <i>Clemmys muhlenbergii</i> Population: Wherever found, except GA, NC, SC, TN, VA No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6962	Threatened

04/23/2021

Event Code: 05E1NY00-2021-E-07474

4

Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Piping Plover <i>Charadrius melodus</i> https://ecos.fws.gov/ecp/species/6039#crithab	Final



United States Department of the Interior



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<http://www.fws.gov/northeast/nyfo/es/section7.htm>

In Reply Refer To:
 Consultation Code: 05E1NY00-2020-SLI-2242
 Event Code: 05E1NY00-2021-E-07476
 Project Name: Proposed Designation of Lake Ontario NMS - Area 2

April 23, 2021

Subject: Updated list of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). This list can also be used to determine whether listed species may be present for projects without federal agency involvement. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list.

Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list. If listed, proposed, or candidate species were identified as potentially occurring in the project area, coordination with our office is encouraged. Information on the steps involved with assessing potential impacts from projects can be found at: <http://www.fws.gov/northeast/nyfo/es/section7.htm>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the Services wind

04/23/2021

Event Code: 05E1NY00-2021-E-07476

2

energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

04/23/2021

Event Code: 05E1NY00-2021-E-07476

1

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New York Ecological Services Field Office

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Cortland, NY 13045-9385

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04/23/2021

Event Code: 05E1NY00-2021-E-07476

2

Project Summary

Consultation Code: 05E1NY00-2020-SLI-2242

Event Code: 05E1NY00-2021-E-07476

Project Name: Proposed Designation of Lake Ontario NMS - Area 2

Project Type: ** OTHER **

Project Description: The National Oceanic and Atmospheric Administration's (NOAA's) Office of National Marine Sanctuaries (ONMS) proposes to designate a national marine sanctuary in New York's eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. The proposed sanctuary would protect a collection of nationally significant maritime heritage resources, including historic shipwrecks.

In establishing the proposed sanctuary, NOAA would:

- 1) Set a boundary to protect these nationally significant shipwrecks and other underwater cultural resources and to interpret the maritime cultural landscape that surrounds them;
- 2) Develop and implement a management plan to provide a comprehensive, long-term plan to manage the sanctuary; and
- 3) Create and implement regulations to protect underwater cultural resources.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@44.2974799321849,-76.03967932205273,14z>



Counties: Jefferson and St. Lawrence counties, New York

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Indiana Bat <i>Myotis sodalis</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

B.3 Migratory Bird Treaty Act (16 USC 703 et seq.)

The Migratory Bird Treaty Act (MBTA) implements the United States’ commitment to bilateral treaties, or conventions, with Great Britain, Canada, Japan, Russia, and Mexico for the protection of shared migratory bird resources. The MBTA establishes that it is unlawful to pursue, hunt, take, capture, kill, or sell migratory birds, unless authorized by a permit issued by the Secretary of the Interior. The MBTA protects over 800 bird species, a list of which is maintained at 50 CFR 10.13. The statute does not discriminate between live or dead birds and gives full protection to any bird parts, including feathers, eggs, and nests.

NOAA used the USFWS’s ECOS IPaC tool to search for migratory bird species that may be present in the proposed sanctuary area. The ECOS IPaC tool identified 22 migratory birds of concern that may occur in or near the area (Consultation Codes: 05E1NY00-2020-SLI-2242 & -2428, April 23, 2021; R. Niver, personal communication, April 7, 2020). These 22 bird species may occasionally be found transiting through the proposed sanctuary area and resting or foraging within the action area (see Table B.1). As discussed in sections 5.3.4.2 and 5.4.4.2, NOAA has determined that implementing either of the action alternatives would not result in the take of migratory birds.

Table B.1. U.S. Fish and Wildlife Service Migratory Birds in the Proposed Sanctuary Action Area. Source: <https://ecos.fws.gov/ipac/>

*Status Types
 BCC Bird of conservation concern
 BCR BCC only in Bird Conservation Region
 CON BCC throughout range
 non-BCC Vulnerable not BCC but warrants attention due to Eagle Act or from potential offshore activities

Common Name	Species	Status*	Breeding Season	Onsite Habitat Use	Could Occur in Eastern Lake Ontario	Could Occur in Thousand Islands Region in St. Lawrence River
American golden-plover	<i>Pluvialis dominica</i>	BCC Rangewide (CON)	Breeds elsewhere	Resting, foraging	✓	×
Bald eagle	<i>Haliaeetus leucocephalus</i>	Non-BCC Vulnerable	Breeds Dec 1 to Aug 31	Resting, foraging	✓	✓
Black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>	BCC Rangewide (CON)	Breeds May 15 to Oct 10	Resting, foraging	✓	✓
Bobolink	<i>Dolichonyx oryzivorus</i>	BCC Rangewide (CON)	Breeds May 20 to Jul 31	Resting, foraging	✓	✓
Buff-breasted sandpiper	<i>Calidris subruficollis</i>	BCC Rangewide (CON)	Breeds elsewhere	Resting, foraging	✓	×

Common Name	Species	Status*	Breeding Season	Onsite Habitat Use	Could Occur in Eastern Lake Ontario	Could Occur in Thousand Islands Region in St. Lawrence River
Canada warbler	<i>Cardellina canadensis</i>	BCC Rangewide (CON)	Breeds May 20 to Aug 10	Resting, foraging	✓	✓
Cerulean warbler	<i>Dendroica cerulea</i>	BCC Rangewide (CON)	Breeds Apr 22 to Jul 20	Resting, foraging	✓	✓
Dunlin	<i>Calidris alpina arctica</i>	BCC - BCR	Breeds elsewhere	Resting, foraging	✓	✓
Eastern whip-poor-will	<i>Antrostomus vociferus</i>	BCC Rangewide (CON)	Breeds May 1 to Aug 20	Resting, foraging	✓	✓
Golden eagle	<i>Aquila chrysaetos</i>	Non-BCC Vulnerable	Breeds elsewhere	Resting, foraging	✓	✓
Golden-winged warbler	<i>Vermivora chrysoptera</i>	BCC Rangewide (CON)	Breeds May 1 to Jul 20	Resting, foraging	✓	✓
Henslow's sparrow	<i>Ammodramus henslowii</i>	BCC Rangewide (CON)	Breeds May 1 to Aug 31	Resting, foraging	✓	x
King rail	<i>Rallus elegans</i>	BCC Rangewide (CON)	Breeds May 1 to Sep 5	Resting, foraging	✓	x
Lesser yellowlegs	<i>Tringa flavipes</i>	BCC Rangewide (CON)	Breeds elsewhere	Resting, foraging	✓	✓
Long-eared owl	<i>Asio otus</i>	BCC Rangewide (CON)	Breeds Mar 1 to Jul 15	Resting, foraging	✓	✓
Prairie warbler	<i>Dendroica discolor</i>	BCC Rangewide (CON)	Breeds May 1 to Jul 31	Resting, foraging	✓	✓
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	BCC Rangewide (CON)	Breeds May 10 to Sep 10	Resting, foraging	✓	✓
Ruddy turnstone	<i>Arenaria interpres morinella</i>	BCC - BCR	Breeds elsewhere	Resting, foraging	✓	x

Common Name	Species	Status*	Breeding Season	Onsite Habitat Use	Could Occur in Eastern Lake Ontario	Could Occur in Thousand Islands Region in St. Lawrence River
Semipalmated sandpiper	<i>Calidris pusilla</i>	BCC Rangewide (CON)	Breeds elsewhere	Resting, foraging	✓	✓
Short-billed dowitcher	<i>Limnodromus griseus</i>	BCC Rangewide (CON)	Breeds elsewhere	Resting, foraging	✓	✓
Snowy owl	<i>Bubo scandiacus</i>	BCC Rangewide (CON)	Breeds elsewhere	Resting, foraging	✓	✓
Wood thrush	<i>Hylocichla mustelina</i>	BCC Rangewide (CON)	Breeds May 10 to Aug 31	Resting, foraging	✓	✓

B.4 New York State Listed Endangered, Threatened, and Special Fish & Wildlife Species of Concern

NYSDEC manages a list of Endangered, Threatened, and Special Concern animal species found in the state. The list includes several species that may occur in the proposed sanctuary area: one Endangered and one Threatened mammal species; five Endangered, eight Threatened, and four Special Concern bird species; four Endangered, four Threatened, and one Special Concern fish species; one Endangered, one Threatened, and one Special Concern reptile species; and one Endangered and one Special Concern insect species (N. Conrad, personal communication, Dec. 21, 2020). A discussion with the New York Natural Heritage program confirmed the potential occurrence of these species in the area (N. Conrad, personal communication, Dec. 21, 2020). A complete list of animal species that are considered Endangered, Threatened, or of Special Concern by New York state can be found on this webpage, <https://www.dec.ny.gov/animals/7494.html>.

Table B.2. Table B.2 New York State Listed Species in the Proposed Sanctuary Action Area. Source: New York State Department of Environmental Conservation <https://www.dec.ny.gov/animals/7494.html>

*Status Types

- E State Endangered
- T State Threatened
- SC State Species of Special Concern

Common Name	Species	Status*	Life History	Occurrence	Could Occur in Eastern Lake Ontario	Could Occur in Thousand Islands Region in St. Lawrence River
Pugnose shiner	<i>Notropis anogenus</i>	E	Sensitive to change in specialized near-shore habitats where submerged aquatic vegetation dominates	Numbers are declining in Lake Ontario / expanding in St. Lawrence	✓	✓
Spoonhead sculpin	<i>Cottus ricei</i>	E	Found in moderately deep (shore to 450 feet) lakes, larger rivers, and swift streams	No known current occurrence - historic only	✓	x
Deepwater sculpin	<i>Myoxocephalus thompsoni</i>	E	This species lives offshore in deep (82-1,200 feet) bottom areas of Lake Ontario	Uncommon	✓	x
Round whitefish	<i>Prosopium cylindraceum</i>	E	Historically found in Lake Ontario	Possibly extirpated	✓	x
Lake sturgeon	<i>Acipenser fulvescens</i>	T	Found in lakes and large rivers with mud, sand, and gravel substrate at depths of 16-33ft; larger fish occasionally taken at depths up to 141ft; in rivers, it prefers habitat in deep midriver areas and pools, where water depths vary between 13- 30ft; populations are stable in Lake Ontario; species are not found in this part of the St. Lawrence River	Uncommon	✓	x

Common Name	Species	Status*	Life History	Occurrence	Could Occur in Eastern Lake Ontario	Could Occur in Thousand Islands Region in St. Lawrence River
Mooneye	<i>Hiodon tergisus</i>	T	Prefers clear water habitat of large streams, rivers, and lakes, including deep pools and backwaters	Extirpated in Lake Ontario / no records in this part of St. Lawrence	x	x
Lake chubsucker	<i>Erimyzon sucetta</i>	T		Possibly extirpated	x	x
Northern sunfish	<i>Lepomis peltastes</i>	T	Documented record (2004) of this species in a tributary at its mouth on the south side of Lake Ontario	Uncommon	✓	x
Redfin shiner	<i>Lythrurus umbratilis</i>	SC	Documented in tributary at south side of Lake Ontario	Uncommon	✓	x
Bog turtle	<i>Glyptemys muhlenbergii</i>	E	Occupies open-canopy, herbaceous sedge meadows and fens bordered by wooded areas	Uncommon	✓	x
Blanding's turtle	<i>Emydoidea blandingii</i>	T	Documented in wetlands in both Lake Ontario and St. Lawrence shore areas	Uncommon	✓	✓
Spiny softshell turtle	<i>Apalone spinifera</i>	SC	Documented in bays on the south side of Lake Ontario	Uncommon	✓	x
Piping plover	<i>Charadrius melodus</i>	E	Forages and breeds on sandy beaches	Uncommon	✓	x
Black tern	<i>Chlidonias niger</i>	E	Uses semi-secluded freshwater marshes and forages in nearby open bodies of water	Uncommon	✓	✓
Peregrine falcon	<i>Falco peregrinus</i>	E	Uses a wide variety of habitats that provide avian prey; no known nesting in the area	Uncommon	✓	✓

Common Name	Species	Status*	Life History	Occurrence	Could Occur in Eastern Lake Ontario	Could Occur in Thousand Islands Region in St. Lawrence River
Short-eared owl	<i>Asio flammeus</i>	E	Preys upon small mammals in open areas; breeds in the area but is more common in winter	Uncommon	✓	×
Loggerhead shrike	<i>Lanius ludovicianus</i>	E	Prefers open landscapes, roadsides, golf courses, riparian areas, steppes, deserts, savannahs, prairies, and occasionally, suburban areas; no known nesting in the area	Uncommon	✓	✓
Upland sandpiper	<i>Bartramia longicauda</i>	T	Breeds in open areas with a mixture of short grass areas for feeding and courtship, interspersed with taller grasses and forbs for nesting and brood cover	Uncommon	✓	✓
Pied-billed grebe	<i>Podilymbus podiceps</i>	T	Nests in freshwater wetlands with open shallow water and an abundance of aquatic emergent vegetation; uncommon local breeder; fairly common migrant, though more numerous in fall, and a rare but regular winter visitor	Uncommon	✓	✓
Least bittern	<i>Ixobrychus exilis</i>	T	Breeds in freshwater marshes with tall emergent vegetation, such as cattail, interspersed with open water	Uncommon	✓	✓

Common Name	Species	Status*	Life History	Occurrence	Could Occur in Eastern Lake Ontario	Could Occur in Thousand Islands Region in St. Lawrence River
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Breeds in undisturbed forested areas, near lakes, rivers, or wetlands, especially in complex forested habitats with variable structure; during winter, congregates at larger rivers where water remains open and food resources are abundant and accessible	Uncommon	✓	✓
Northern harrier	<i>Circus cyaneus</i>	T	Breeds and winters in open wetlands, marshy meadows, wet, lightly grazed pastures, old fields, freshwater and brackish marshes, upland prairies, mesic grasslands, drained marshlands, croplands, and riparian woodland	Uncommon	✓	✓
Common tern	<i>Sterna hirundo</i>	T	Uses a variety of habitats and may be found on coastal beaches or barrier islands, marshes, or inland lakes; nests on sand, gravel, shell, or cobble in open areas with some scattered vegetation or other cover in which chicks can find shelter; on the St. Lawrence River, most nest sites are on manmade structures, including break waters, water intake structures, and navigation cells	Uncommon	✓	✓

Common Name	Species	Status*	Life History	Occurrence	Could Occur in Eastern Lake Ontario	Could Occur in Thousand Islands Region in St. Lawrence River
Sedge wren	<i>Cistothorus platensis</i>	T	Breeds in a variety of wetlands with dense, tall sedges and grasses, avoiding areas with standing water and cattails; areas include wet meadows, hayfields, marshes, upland edges of ponds, and sphagnum bogs	Uncommon	✓	×
Henslow's sparrow	<i>Ammodramus henslowii</i>	T	Prefers tall, dense grassy fields with no woody plants, some standing dead vegetation, and a thick litter layer; found largely in pastures, both active and inactive, and tolerates wet conditions	Uncommon	✓	×
Common loon	<i>Gavia immer</i>	SC	Breeds in freshwater habitats, nesting on bog mats, logs, large rocks, and along shorelines of both islands and the mainland; no known nesting on Lake Ontario	Uncommon	×	✓
American bittern	<i>Botaurus lentiginosus</i>	SC	Breeds in freshwater wetlands with tall emergent vegetation, especially larger wetlands with abundant amphibian populations	Uncommon	✓	✓

Common Name	Species	Status*	Life History	Occurrence	Could Occur in Eastern Lake Ontario	Could Occur in Thousand Islands Region in St. Lawrence River
Osprey	<i>Pandion haliaetus</i>	SC	Breeds along coastal and inland shorelines where shallow water makes their fish prey more easily accessible	Uncommon	✓	✓
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	SC	Documented in Lake Ontario shore areas	Uncommon	✓	×
Indiana bat	<i>Myotis sodalis</i>	E	Hibernates during winter in caves, or occasionally, in abandoned mines; roosts in summer under the peeling bark of dead and dying trees; eats a variety of flying insects found along rivers or lakes and in uplands	Uncommon	✓	✓
Northern long-eared bat	<i>Myotis septentrionalis</i>	T	May be found in a variety of forested and wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitat, as well as linear features, such as fence rows, riparian forests, and other wooded corridors; suitable winter habitat includes caves and cave-like structures (e.g., abandoned or active mines, railroad tunnels)	Uncommon	✓	✓
Bogbean buckmoth	<i>Hemileuca sp.</i>	E	Documented in wetlands adjacent to eastern Lake Ontario	Uncommon	✓	×

Common Name	Species	Status*	Life History	Occurrence	Could Occur in Eastern Lake Ontario	Could Occur in Thousand Islands Region in St. Lawrence River
Olympia marble (butterfly)	<i>Euchloe Olympia</i>	SC	Documented in Lake Ontario shore area; habitat is limestone pavement barrens and alvar grassland	Uncommon	✓	×
Slender bulrush	<i>Schoenoplectus heterochaetus</i>	E	Documented in Black River Bay and Muskellunge Bay wetlands in northeastern Lake Ontario	Uncommon	✓	×

B.5 Executive Order 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 directs that the programs of federal agencies identify and avoid disproportionately high and adverse effects on human health and the environment of minority or low-income populations. The designation of national marine sanctuaries by NOAA helps to ensure the enhancement of environmental quality for all populations in the United States. The alternatives described in this document would not result in disproportionate negative impacts on any minority or low-income population. In addition, many of the potential impacts from designating the proposed sanctuary would result in long-term or permanent beneficial impacts by protecting underwater cultural resources, which may have a positive impact on communities by providing employment and educational opportunities, and potentially result in improved ecosystem services.

Appendix C:

Analysis of Relevant Federal and State Statutes

Without adequate legal protection and enforcement, underwater archaeological sites are extremely vulnerable to human disturbance. Even when there are legal protections, gaps in the law, or in application of the law, can still result in damage and irreparable loss to underwater cultural resources. There are laws already in place that can be employed to help protect the archaeological and cultural treasures of Lake Ontario, however, the following offers some examples of specific relevant federal and state laws and of the gaps in protection that remain, even where such laws are vigorously implemented. By designating the area as a national marine sanctuary under the National Marine Sanctuaries Act, NOAA would complement and supplement the existing resource-specific statutes and fill legal gaps to ensure this area of special national significance is managed, researched, interpreted, and publicly accessible in a coordinated and comprehensive manner that emphasizes resource protection.

C.1 Federal Statutes

Submerged Lands Act, 43 USC 1301 et seq.

Under the Submerged Lands Act, title to and ownership of the lands beneath navigable waters within the boundaries of the respective states, and the natural resources within such lands and waters, together with the right and power to manage, administer, lease, develop, and use the said lands and natural resources is recognized, confirmed, established, and vested in and assigned to the respective states. Thus, with certain exceptions, the United States relinquished to the states all right, title, and interest to all said lands, improvements, and natural resources generally out to three nautical miles from the coast line, or in the Great Lakes, out to the international boundary between the United States and Canada (43 USC 1311(a)-(b), 1312). The United States retains the right to regulate offshore activities in these areas for the constitutional purposes of navigation, national defense, international affairs, and commerce (*Id.* 1314(a)). In Lake Ontario, New York holds title to the majority of coastal waters and bottomland seaward from the low water datum (243.3 feet IGLD 1985) to the international boundary with Canada. This differs in the St. Lawrence River where New York holdings of coastal bottomlands generally begin at ordinary high water.

Abandoned Shipwreck Act of 1987, 43 USC 2101, et seq.

Under the Abandoned Shipwreck Act (ASA), the United States asserted title to abandoned shipwrecks that are embedded in the submerged lands of a state, embedded in coralline formations protected by a state on its submerged lands, or on a state's submerged lands and included in or determined to be eligible for listing on the National Register of Historic Places (43 USC 2105(a)). The United States also simultaneously transferred its title to the state government that owns the submerged lands on which the wrecks are located (*Id.* 2105(c)). Therefore, the shipwrecks in the area being considered for designation as a national marine sanctuary in eastern Lake Ontario and the St. Lawrence River are owned by the state. The United States continues to hold title to wrecks (vessels as well as aircraft) that are entitled to sovereign immunity no matter where they are located. Abandoned shipwrecks that are in or on public

lands of the United States continue to be the property of the United States, and any abandoned shipwreck on or in Indian lands is the property of the Indian tribe owning such lands (*Id.* 2105(d)). Although the ASA confers title to most abandoned shipwrecks in state waters to the relevant state, it does not provide long-term comprehensive management of these resources.

Abandoned shipwrecks and their cargo are not to be treated as commodities lost at sea and subject to salvage. The law of finds and the law of salvage (and thus federal Admiralty jurisdiction) no longer applies to abandoned shipwrecks as contemplated in the ASA (43 USC 2106). If they have historical or cultural significance, they can be treated as an archeological or historical site. However, the Act relies on the states to develop appropriate and consistent policies to protect such resources, to guarantee recreational exploration of shipwreck sites, and to allow appropriate public and private sector recovery of shipwrecks consistent with the protection of historical values and environmental integrity of the shipwrecks (*Id.* 2103).

The Act applies to shipwrecks that are “abandoned” and that are “embedded in the submerged lands of a State.” While the term “embedded” is defined in the Act, the term “abandoned” is not, *see* 43 USC 2102, which has led to differing interpretations by the courts and some confusion as to what the state has to show in order to assert ownership.³³

Archaeological Resources Protection Act, 16 USC 470aa, et seq.

The purpose of the Archaeological Resources Protection Act (ARPA) is to secure the protection of archeological resources and sites which are on public lands and Indian lands. “Public lands” is defined as lands owned and administered by the United States as part of the national park system, the national wildlife refuge system, or the national forest system, and all other lands the fee title to which is held by the United States, except for those on the outer continental shelf or under the jurisdiction of the Smithsonian (16 USC 470bb(3)(A)). “Indian Lands” means lands of Indian tribes, or Indian individuals, which are either held in trust by the U.S or subject to a restriction against alienation imposed by the U.S. 16 USC 470bb(4). “Archaeological resources” as defined by ARPA are limited to resources that are at least 100 years of age (16 USC 470bb(1)). No person may or may attempt to excavate, remove, damage, or otherwise alter or deface any archeological resource located on public lands or Indian lands unless such activity is pursuant to a permit issued under the act (16 USC 470ee(a)). ARPA also prohibits the sale, purchase, exchange, transport, or receipt of any archeological resource that was excavated or removed in violation of the Act (16 USC 470ee(b)).

Though significant with respect to the preservation of shipwrecks, this statute does not apply to the wrecks in the area of the proposed sanctuary. The bottomlands, which would comprise the proposed Lake Ontario National Marine Sanctuary are not owned by the United States and instead are owned by the state of New York.

³³ See, e.g., *Sea Hunt, Inc. v. Unidentified Shipwrecked Vessel or Vessels*, 221 F.3d 634, 641-42 (4th Cir. 2000); *Martha’s Vineyard Scuba Headquarters, Inc. v. Unidentified, Wrecked & Abandoned Steam Vessel*, 833 F.2d 1059, 1065 (1st Cir. 1987); *Treasure Salvors, Inc. v. Unidentified Wrecked & Abandoned Sailing Vessel*, 569 F.2d 330, 336 (5th Cir. 1978); *Klein v. Unidentified Wrecked & Abandoned Sailing Vessel*, 758 F.2d 1511, 1514 (11th Cir. 1985).

Section 6(c) of the act more generally bans interstate trafficking in archeological resources. It states that no person may sell, purchase, exchange, transport, receive, or offer in interstate and foreign commerce any archeological resource received “in violation of any provision, rule, regulation, ordinance, or permit in effect under state or local law” (16 USC 470ee(c)). Such a prohibition will be covered under NMSA and will not need this separate statutory underpinning. In addition, Section 6(c) only applies in cases where an existing provision of state or local law is violated, which is not the case with NMSA. By contrast, the NMSA makes it unlawful for any person to destroy, cause the loss of, or injure any sanctuary resource managed under the law or regulations for that sanctuary, or to possess, sell, offer for sale, purchase, import, export, deliver, carry, transport, or ship by any means any sanctuary resource taken in violation of the act (*Id.* 1436).

The National Historic Preservation Act, as amended, 54 USC 300101 et seq.

The National Historic Preservation Act declares it to be the policy of the Federal Government, in cooperation with other nations and in partnership with states, local governments, Indian tribes, and others to use measures, including financial and technical assistance, to foster conditions under which our modern society and our historic property can exist in productive harmony and fulfill the social, economic, and other requirements of present and future generations. It is, moreover, to provide leadership in the preservation of the historic property of the United States, and to assist state and local governments, native peoples, and the National Trust in expanding and accelerating their historic preservation programs and activities. The act established the National Register of Historic Places and provided for the creation of State Historic Preservation Offices (*Id.* 302101 *et seq.*). It is the responsibility of the State Historic Preservation Officer to cooperate with federal and state agencies, local governments, and others in conducting and maintaining comprehensive inventories of historic properties and to consult with appropriate federal agencies on the content and sufficiency of any plans developed to protect, manage, reduce or mitigate harm to that property (*Id.* 302301 *et seq.*).

Among the responsibilities of federal agencies under the act is the obligation to assess the effect of any agency undertaking on historic properties. Section 306108 (formerly section 106) of the act provides that “any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally-assisted undertaking in any State, and the head of any Federal department or independent agency having authority to license any undertaking, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, shall take into account the effect of the undertaking on any historic property.” The federal agency must provide the Advisory Council on Historic Preservation the opportunity to comment on the agency’s undertaking (54 USC 306108). In addition, the NHPA does not apply to activities conducted by private persons not subject to a federal agency license or permit system. As such, the NHPA cannot be relied upon to protect the historic and cultural resources within the proposed designation area because the NHPA does not regulate non-governmental activities directed at such wrecks (e.g., looting, salvage, and treasure-hunting activities) unless such activities otherwise require some type of federal permit or authorization. The sanctuary would provide for comprehensive protection and management of these historically significant and nonrenewable resources, many of which would otherwise be left unprotected.

Sunken Military Craft Act, 10 USC 113 note

The Sunken Military Craft Act states that the right, title, and interest of the United States to any U.S. sunken military craft cannot be extinguished except by express divestiture and cannot be extinguished by the passage of time. No person may engage in or attempt any activity that disturbs, removes, or injures any sunken military craft unless authorized by permit, by regulations, or otherwise by law. No person may possess, disturb, remove, or injure any sunken military craft in violation of this section or any prohibition, rule, or regulation. This section does not apply to action taken by or at the direction of the United States (Section 1402).

Permits may be issued, pursuant to regulations, allowing a person to engage in a prohibited activity for archeological, historical, or educational purposes. Activities must be consistent with all requirements that apply under any other provision of federal law. The Secretary of the Navy shall consult with each federal agency having authority with respect to the activities. At the request of a foreign state, the Secretary of Navy may carry out this section with respect to any foreign sunken military craft in U.S. waters. The Secretary may seek relief to abate the risk or actual disturbance or injury and to restore the sunken military craft. District courts have jurisdiction. There is an eight-year statute of limitations (Section 1404).

The Law of Finds does not apply to any U.S. sunken military craft wherever located or any foreign military craft located in U.S. waters. No salvage rights will be granted in either case without the permission of the flag state. Nothing prevents the U.S. from pursuing criminal penalties for plundering of wrecks, theft of government property, or violation of any applicable criminal law (Section 1406).

Sunken Military Craft means all or any portion of any sunken warship, naval auxiliary, or other vessel or sunken military aircraft or military spacecraft that was owned by a government when it sank (Section 1408).

This act applies only to submerged military vessels and aircraft, and therefore, does not apply to the vast majority of abandoned shipwrecks and craft in the proposed sanctuary.

Coastal Zone Management Act (CZMA), 16 USC 1451-1467

The Coastal Zone Management Act declares it to be national policy to protect, develop, preserve for beneficial use and where possible, to restore or enhance, the land and water resources of the nation's coastal zone for this and succeeding generations (*Id.* 1451(a)). The coastal zone means coastal waters, including the submerged lands (and the adjacent shore lands), extending seaward to the outer limit of state title and ownership under the Submerged Lands Act. The New York Coastal Management Program, which is administered by the New York State Department of State (DOS), has four Coastal Areas: Long Island, New York City, the Hudson River Valley, and the Great Lakes-St. Lawrence River region. In the Great Lakes, the New York State Coastal Area extends to the international boundary with Canada (*Id.* 1453(1)).

The act helps states develop federally approved coastal zone management programs (CZMPs) to manage and balance competing uses of the coastal zone. Federal actions that may have reasonably foreseeable effects on coastal uses and resources must be consistent with the enforceable policies of a state's approved program. Federal agencies and those performing

federal actions, including applicants for federal licenses or permits, must submit a “consistency determination” or “consistency certification” (as applicable) to the potentially affected state to allow consideration of whether the action is consistent with enforceable state coastal policies (16 USC 1456).

A CZMP may, among other things, include enforceable shipwreck management regulations, policies and procedures. However, CZMA does not require states to include shipwreck management regulations or enforceable shipwreck policies in their CZMP. The New York Coastal Management Program does not specifically include shipwrecks in its enforceable policies, although there are several policies that can be used in protecting historical resources. Policy 23 states, “Protect, enhance and restore structures, districts, areas or sites that are of significance in the history, architecture, archeology or culture of the state, its communities, or the Nation.” Moreover, CZMA does not apply to activities conducted by private persons unless they are performing federal action (e.g., they are applicants for a federal license or permit). The sanctuary would provide for explicit, comprehensive protection and management of these historically significant and nonrenewable resources.

Antiquities Act, 54 USC 320301-320303

Under the Antiquities Act, the president may declare by public proclamation historic landmarks, historic or prehistoric structures, and other objects of historic or scientific interest that are situated on land owned or controlled by the federal government to be national monuments (54 USC 320301(a)). The president may reserve parcels of land as part of a national monument (54 USC 320301(b)). When an object is situated on a parcel covered by a bona fide unperfected claim or held in private ownership, the parcel, or so much of the parcel as may be necessary for the proper care and management of the object, may be relinquished to the federal government and the Secretary of the Interior may accept the relinquishment of the parcel on behalf of the federal government (54 USC 320301(c)). There are no national monuments within the area being considered for sanctuary designation.

Vessel Incidental Discharge Act (VIDA), 33 USC 1322(p)

The VIDA, passed by Congress in 2018, amended section 1322 of the Clean Water Act (CWA) by adding a new subsection (p) titled “Uniform National Standards for Discharges Incidental to Normal Operation of Vessels.” Subsection (p) required the Environmental Protection Agency (EPA) and the United States Coast Guard (USCG) to develop new regulations for incidental discharges from regulated vessels into waters of the United States and waters of the contiguous zone.

On October 26, 2020, the EPA proposed regulations to establish national standards of performance for vessel incidental discharges into waters of the United States or waters of the contiguous zone (85 FR 67818 - 67903). EPA's regulations are not yet final. Within two years from the time that EPA's regulations become final, the U.S. Coast Guard is required to develop implementing regulations. EPA's new requirements will apply once U.S. Coast Guard's regulations take effect. The following **interim requirements** continue to apply until EPA publishes final standards **and** the USCG publishes corresponding implementing regulations (anticipated in 2022):

- **For large commercial vessels (≥ 79 feet in length), except fishing vessels:** The existing vessel discharge requirements established through the EPA 2013 Vessel General Permit (VGP) and the USCG ballast water regulations, and any applicable state and local government requirements.
- **For small vessels (<79 feet in length) and fishing vessels of any size:** The existing discharge requirements for ballast water only established through the EPA 2013 VGP and the USCG ballast water regulations, and any applicable state and local government requirements (<https://www.epa.gov/vessels-marinas-and-ports/vessel-incident-discharge-act-vida>).

Additionally, EPA's proposed regulations allow states to petition EPA to: 1) issue an emergency order or review any standard of performance, regulation, or policy; 2) establish a proposed standard of performance or requirement with respect to any discharge subject to regulation in the Great Lakes System; 3) establish a state no-discharge zone.

C.2 State Statutes

New York Education Law, NY Educ L 233 (2017)

The New York Education Law provides that “[a]ll scientific specimens and collections, works of art, objects of historical interest and similar property appropriate to a general museum, if owned by the state and not placed in other custody by other specific law, shall constitute the collections of the state museum.” The museum shall be the custodian of the collections and shall perform standard curatorial, research and educational activities (NY Educ L. 233(1)). The state Commissioner of Education is empowered and directed to promulgate joint regulations and to make agreements with NYSDEC, the Office of General Services (OGS), and the Office of Parks, Recreation and Historic Preservation (OPRHP) relating to the salvage of archaeological or paleontological objects, including ruins, historic sites, burial grounds, buildings, artifacts, fossils, or other objects of antiquity having national significance (*Id.* 233(3)). The New York State Museum generally manages archeological resources on public lands for the benefit of the people of New York.

Historic shipwrecks in New York are protected by Section 233 of the State Education Law, which makes it unlawful for any person to “investigate, excavate, remove, injure, appropriate or destroy any object of archaeological, historical, cultural, social, scientific, or paleontological interest situated on, in or under lands owned by the state of New York without written permission of the commissioner of education” (NY Educ L 233.4). However, the program is largely focused on permitting terrestrial resources, rather than submerged resources. A violation of this prohibition is identified as a Class A misdemeanor, and would thus be of a criminal nature. There are no civil penalties prescribed.

Section 307 of the NMSA authorizes NOAA to assess civil penalties for violations of sanctuary regulations as an alternative to any criminal penalties authorized under state law. The sanctuary regulations also authorize criminal penalties for resisting or interfering with an authorized officer or knowingly and willfully submitting false information to an officer. A vessel used in violating any regulation or permit issued under NMSA shall be liable in rem for any penalty assessed for that violation (16 USC 1437). In addition, any person who destroys, causes the loss

of, or injures any sanctuary resources will be liable for response costs and damages resulting from such loss (Id. 1443(a)). Education and outreach are also important factors in protecting sanctuary resources as they emphasize sustainable use and encourage public stewardship of the resources.

The sanctuary program would assist state and local governments with implementation and enforcement of their regulations through regulatory and nonregulatory programs that address behavioral change through outreach and education, enforcement, and interpretive enforcement. All of this requires a comprehensive and coordinated agency presence which Congress clearly envisions when it enacted the NMSA.

New York Public Lands Law, NY Pub Lands L 75 (2015)

The New York Public Lands Law places the bed of numerous bodies of water, which is held in trust for the people of New York, under the jurisdiction of the Office of General Service (OGS). Structures and utilities, including fill, located in, on, or above state-owned land now or formerly underwater are regulated under the Public Lands Law. OGS has the authority to convey certain property rights, in, on, or above state-owned lands underwater for the purposes of navigation, commerce, fishing, bathing, recreation, and environmental protection. OGS issues residential and commercial guidelines for a license, easement, or permit for construction and operation of docks, retaining walls, marinas, etc., on or over state-owned waterbodies. Applications are processed jointly by OGS, DEC, ACOE, and DOS. Easements in lands underwater for conduits, cables, pipelines, fiber lines, and electric lines are conveyed pursuant to Section 3(2) of the Public Lands Law. Easements conveyed pursuant to Section 75(7)(b) of the Public Lands Law are limited to structures that break the surface of the water, such as docks, piers, wharfs, and other above the water structures. The emphasis is on general property management. There is only one such preserve in Lake Ontario, but the State Environmental Quality Review Act (SEQRA), referenced below, together with DEC's role in processing applications necessitates that impacts to underwater preserves be evaluated.

New York State Historic Preservation Act of 1980 (which enacted Article 14 of the Parks, Recreation and Historic Preservation Law)

The New York State Historic Preservation Act declares it to be “the public policy and in the public interest of this State to engage in a comprehensive program of historic preservation” (NY Pks, Rec & Hist Pres L 14.01). It authorizes the Commissioner of Parks, Recreation and Historic Preservation, in consultation with the State Board for Historic Preservation, “to establish the New York State Register of Historic Places, consisting of sites, districts, structures, buildings, areas or objects above or below the surface of the earth whether on land or in the waters of the State, . . . significant in the history, architecture, archeology, or culture of the State, its communities or the nation” (Id. 14.07(1)(a)).

The Commissioner of OPRHP is also the State Historic Preservation Officer who administers the National and State Registers of Historic Places. Registered properties and properties determined eligible for listing on the registers receive a measure of protection from the effects of federal and state agency sponsored, licensed, or assisted projects through a notice, review, and consultation

process. State agencies are required to consult with the commissioner “if it appears that any project which is being planned may or will cause any change, beneficial or adverse, in the quality of any historic, architectural, archeological or cultural property that is listed on the National Register of Historic Places or property listed on the State Register of Historic Places or that is determined by the commissioner to be eligible for listing on the State Register of Historic Places.” It requires state agencies, to the fullest extent practicable, to avoid or mitigate adverse impacts to such properties, to fully explore all feasible and prudent alternatives and to give due consideration to feasible and prudent plans which would avoid or mitigate adverse impacts to such property, and it establishes agency preservation officers for the purpose of implementing these provisions (9 CRR-NY 426.1 (c)-(e)). There is only one shipwreck in Lake Ontario and the St. Lawrence River that is listed on the National Register of Historic Places, the wreck of the Great Lakes schooner *St. Peter*. *St. Peter* shipwrecked in Lake Ontario in October 1898, and the National Register of Historic Places listed it in 2004.

As with the NHPA, this act provides protection against adverse effects of government activities, not the activities of private entities. Properties listed or eligible for listing in the state and national registers receive a measure of protection from the effects of federal or state agency-sponsored, licensed, or assisted projects through a process of notice, review, and consultation (9 CRR-NY 426.1).

New York Environmental Conservation Law, NY Env Cons L, Article 45, 4 & 8

Under Article XIV of the New York State Constitution, the state legislature was directed to provide for the acquisition of lands and waters, including improvements thereon and any interests therein, which because of their natural beauty, wilderness character, or geological, ecological, or historical significance, shall be preserved and administered for the use and enjoyment of the people. Properties so dedicated shall constitute “the state nature and historical preserve,” and they shall not be taken or otherwise disposed of except by law enacted by two successive regular sessions of the legislature.

Article 45 of the New York Environmental Conservation Law provides for the creation of a state Nature and Historical Preserve for the preservation of such “irreplaceable” lands that future generations may share their ecological, educational, and recreational value (NY Env Cons L 45-0101). The NYSDEC is authorized to manage and exercise custody and control over lands dedicated pursuant to this article or to contract with any city, county, town, or any state agency for the management, custody, and control of such property. Lands dedicated to the preserve are declared to be put to their highest, best, and most important use, including as places of natural and historical interest and beauty, which provide the public with passive recreational opportunities. The NYSDEC or other state or local agency exercising control over the site shall develop a written stewardship plan for each site. Such plan shall include a description of stewardship activities required to monitor, protect, enhance, and where appropriate actively manage the ecological, scenic, wilderness, geological, or historic resources that merited dedication of the site to the preserve (NY Env Cons L 45-0117(1), (3)(d), (4)).

There is only one Submerged Cultural Preserve in Lake Ontario and the St. Lawrence River. The David W. Mills Submerged Cultural Preserve protects *David W. Mills*, a 19th century cargo vessel that ran aground in the lake in 1919 and subsequently broke apart in a storm.

Article 8 of the New York Environmental Conservation Law is also known as the State Environmental Quality Review Act (SEQRA). It requires that all state and local governments must assess the environmental consequences of all actions they have discretion to approve, fund, or directly undertake. If an action is likely to have significant adverse impacts, an Environmental Impact Statement (EIS) must be prepared to explore ways to avoid or reduce any adverse environmental impacts or to identify potentially less damaging alternatives. Throughout development of the EIS, there are opportunities for the public and for other agencies to provide input to the planning and review process. SEQRA is modeled on the National Environmental Policy Act (NEPA). SEQRA defines the term “Environment” as the physical conditions that will be affected by a proposed action, including “objects of historic or aesthetic significance” (ECL 8-0105(6)). The regulations implementing SEQRA include the term “archeological” significance as well (6 CRR-NY 617.2(l)). Thus, shipwreck sites that have significance in the history, architecture and culture of the nation and the state are among the resources SEQRA is intended to protect (NYSDEC The SEQRA Handbook, 4th Edition (2020) at 188).

In addition to the articles mentioned above, there are other provisions of the Environmental Conservation Law and its implementing regulations that are not directly related to a national marine sanctuary, but could potentially apply.

New York Executive Law, NY Exec L, Article 42

The Waterfront Revitalization of Coastal Areas and Inland Waterways law is one of the main instruments for implementing the 44 coastal policies of the New York State Coastal Management Program. It declares New York’s coastal area and coastal waters to be unique with a variety of natural, recreational, industrial, commercial, ecological, cultural, aesthetic, and energy resources of statewide and national significance and to be increasingly subject to the pressures of population growth and economic development (NY Exec L 910). It was the intention of the legislature to provide coordinated and comprehensive policy and planning for the preservation, enhancement, protection, development and use of New York’s coastal and inland waterway resources. “Coastal waters” is defined to include Lakes Erie and Ontario, as well as the St. Lawrence River. Id. 911(1), (3). The New York Secretary of State is directed to advise the governor and state agencies concerning planning, programs, and policies for the achievement of wise use of water resources of coastal areas and inland waterways giving full consideration to ecological, cultural, historic, and aesthetic values; to evaluate and make recommendations on federal, state, and local programs relating to coastal and inland waterways; and to adopt such rules and regulations as may be necessary and convenient (Id. 913(1), (2), (6)).

It is the intention of this article to offer the fullest possible support by the state and its agencies to those local governments that desire to revitalize their waterfronts. The New York Secretary of State may provide technical and financial assistance to such local government or governments and shall prepare and distribute guidelines for such local governments. (Id. 915). The local government shall include in its Local Waterfront Revitalization Program (LWRP) the

boundaries of the waterfront area, an inventory of natural and historic resources to be protected, a statement of the goals and objectives of the program, identification of the uses and projects to be accommodated in the area, a description of the proposed means of long-term management and maintenance, and a description of the necessary and appropriate state actions for successful implementation of the program (*Id.*). The state's Coastal Zone Management Program incorporates the requirements of this section (*Id.* 921).

Appendix D: List of Document Preparers

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