

Integrated Monitoring in Bird Conservation Regions (IMBCR):

2020 Field Season Report



March 2021



Connecting People, Birds and Land

Bird Conservancy of the Rockies

14500 Lark Bunting Lane

Brighton, CO 80603

303-659-4348

www.birdconservancy.org

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Bird Conservancy of the Rockies

Connecting people, birds and land

Mission: Conserving birds and their habitats through science, education and land stewardship

Vision: Native bird populations are sustained in healthy ecosystems

Bird Conservancy of the Rockies conserves birds and their habitats through an integrated approach of science, education, and land stewardship. Our work radiates from the Rockies to the Great Plains, Mexico and beyond. Our mission is advanced through sound science, achieved through empowering people, realized through stewardship, and sustained through partnerships. Together, we are improving native bird populations, the land, and the lives of people.

Core Values:

1. **Science** provides the foundation for effective bird conservation.
2. **Education** is critical to the success of bird conservation.
3. **Stewardship** of birds and their habitats is a shared responsibility.

Goals:

1. Guide conservation action where it is needed most by conducting scientifically rigorous monitoring and research on birds and their habitats within the context of their full annual cycle.
2. Inspire conservation action in people by developing relationships through community outreach and science-based, experiential education programs.
3. Contribute to bird population viability and help sustain working lands by partnering with landowners and managers to enhance wildlife habitat.
4. Promote conservation and inform land management decisions by disseminating scientific knowledge and developing tools and recommendations.

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Contact Information:

Matthew McLaren

matthew.mclaren@birdconservancy.org

Bird Conservancy of the Rockies

14500 Lark Bunting Lane

Brighton, CO 80603

970-482-1707

Executive Summary

Bird Conservancy of the Rockies (Bird Conservancy), in conjunction with its partners, conducted the 13th consecutive year of landbird monitoring for the Integrated Monitoring in Bird Conservation Regions (IMBCR) program. IMBCR is based on a spatially balanced sampling design which provides inference to avian populations at various scales, from local management units to entire states or BCRs, facilitating conservation at local and national levels. The hierarchical design also provides a consistent and flexible framework for understanding and comparing the status and annual changes of bird populations at multiple scales. Collaboration across organizations and spatial scales increases sample sizes and improves the accuracy and precision of population estimates. Analyzing the data collectively allows us to estimate detection probabilities for species that would otherwise have insufficient numbers of detections at local scales. For these reasons, the IMBCR program is well-positioned to address conservation and management needs for a wide range of stakeholders, encouraging an interdisciplinary approach to bird conservation that combines monitoring, research, and management.

In 2020, the IMBCR program's area of inference encompassed four entire states (Colorado, Montana, Utah, and Wyoming) and portions of 12 additional states (Arizona, California, Idaho, Kansas, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, and Texas). We surveyed across US Forest Service (USFS) Regions 1, 2, and 4 and in portions of Region 3; all of the Badlands and Prairies Bird Conservation Region (BCR 17), all of the Shortgrass Prairie Bird Conservation Region (BCR 18), and portions of eight other BCRs: Great Basin (9), Northern Rockies (10), Prairie Potholes (11), Sierra Nevada (15), Southern Rockies/Colorado Plateau (16), Central Mixed Grass Prairie (19), Sonoran and Mojave Deserts (33), and Sierra Madre Occidental (34). Observers conducted 16,167 point counts within 1,403 sampling units between April 30 and July 19, 2020. They detected 208,731 individual birds representing 340 species.

This report summarizes the results of the 2020 field season. To view interactive maps illustrating survey and detection locations, species counts and density, population and occupancy results, please visit Bird Conservancy's Rocky Mountain Avian Data Center (RMADC) at <http://rmbo.org/v3/avian/ExploredtheData.aspx>. Instructions for using the RMADC are included in Appendix A of this report and are available on the RMADC itself (hover over the "Explore the Data" tab for tutorials). Each stratum or combination of strata presented in this report's Results section contains a web link that leads directly to the RMADC with the appropriate queries already populated. Please note that not every stratum or conceivable combination of strata is summarized in this report. All individual strata and all biologically meaningful combinations of strata, or "superstrata", can be found on the RMADC.

In spite of a global pandemic, Bird Conservancy and partners completed 99% of the 2020 sampling effort. Crew leaders and field technicians followed a Covid-19 safety protocol based on local and national guidelines and partner input. Weather was also challenging at the start of the season with cold, wet conditions in the northern region. The baseline IMBCR effort was mostly consistent between 2019 and 2020, with the addition of a new overlay project to understand the contribution of conservation easements and rotational grazing for grassland birds in the Great Plains. In 2020, IMBCR partners or data requestors published five peer-reviewed papers using IMBCR data to address specific management, theoretical, or conservation questions. We also received 10 IMBCR data requests for the raw bird and/or vegetation data in 2020 for the purposes of conducting additional analyses.

Acknowledgements

Many individuals helped make the 2020 field season a success. Stratification and allocation of survey efforts were determined in collaboration with partner agencies and organizations, each of which provided funding or in-kind assistance: Colorado Parks and Wildlife; Department of Defense; Knobloch Family Foundation; Montana Fish, Wildlife and Parks; National Fish and Wildlife Foundation; US Bureau of Land Management; US Forest Service; US National Park Service; and Wyoming Game and Fish Department. We thank Playa Lakes Joint Venture for building a collaborative partnership and acquiring funding across the states within their boundary to allow for the addition of IMBCR for PLJV. Funding for surveys in the PLJV region was provided by Colorado Parks & Wildlife; Kansas Department of Wildlife, Parks & Tourism; Nebraska Game & Parks Commission; Oklahoma Department of Wildlife Conservation; Texas Parks & Wildlife Department; Farm Service Agency (USDA); and US Forest Service. We thank Department of Defense, Great Basin Bird Observatory, Intermountain Bird Observatory, Klamath Bird Observatory, Utah Division of Wildlife Resources, and Wyoming Natural Diversity Database for planning and implementing field work in their study areas. Bird Conservancy of the Rockies' landowner liaison, Erin Youngberg with help from Tiffany Peeken, contacted county assessors to determine land ownership of survey locations. We thank Mevin Hooten at Colorado State University and Elise Zipkin at Michigan State University for input during model development. We also thank the many field observers who collected avian and vegetation point count data and contacted private landowners to obtain access to survey locations and establish working relationships for the future. Without the efforts of these observers and the cooperation of numerous private landowners, IMBCR partners would have been unable to conduct avian monitoring across private and public lands. Finally, this report benefited greatly from review by Bird Conservancy staff and IMBCR partners.

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Introduction

Monitoring is an essential component of wildlife management and conservation science (Marsh & Trenham, 2008; Witmer, 2005). Common goals of population monitoring are to estimate the population status of target species and to detect changes in populations over time (Sauer & Knutson, 2008; Thompson, White, & Gowan, 1998). In addition to providing basic information on species distributions, effective monitoring programs can identify species that are at-risk because of small or declining populations (Dreitz, Lukacs, & Knopf, 2006); provide an understanding of how management actions affect populations (Alexander, Stephens, Geupel, & Will, 2008; Lyons, Runge, Laskowski, & Kendall, 2008); and evaluate population responses to landscape alteration and climate change (Baron et al., 2008; Lindenmayer & Likens, 2009).

While monitoring at local scales remains critical, there is an increasing need to monitor the consequences of environmental change over large spatial and temporal scales and address questions much larger than those that can be answered within individual management units (Dreitz, Stinson, Hahn, Tack, & Lukacs, 2017; Lindenmayer & Likens, 2009). Reconciling disparities between the geographic scale of management actions and the scale of ecological and species-specific responses is a persistent challenge for natural resource management agencies (Ruggiero, Hayward, & Squires, 1994). Population monitoring of eco-regional landscapes provides an important context for evaluating population change at local and regional scales, with the potential to identify causal factors and management actions for species recovery (Manley, Schlesinger, Roth, & Van Horne, 2005; Sauer & Knutson, 2008).

Before monitoring can be used by land managers to guide conservation efforts, sound program designs and analytical methods are necessary to produce unbiased population estimates (Sauer & Knutson, 2008). At the most fundamental level, reliable knowledge about the status of avian populations requires accounting for spatial variation and incomplete detection of the target species (Pollock et al., 2002; Rosenstock, Anderson, Giesen, Leukering, & Carter, 2002; Thompson, 2002). Addressing spatial variation entails the use of probabilistic sampling designs, which allows population estimates to be extended over the entire area of interest (Thompson et al., 1998). Accounting for incomplete detection involves the use of appropriate sampling and analytical methods to address the fact that few, if any, species are so conspicuous that they are detected with certainty when present during a survey. Accounting for these two sources of variation ensures that observed trends reflect true population changes rather than artifacts of the sampling and observation processes (Pollock et al., 2002; Thompson, 2002).

The apparent large-scale declines of avian populations and the loss, fragmentation and degradation of native habitats highlight the need for extensive and rigorous landbird monitoring programs (Rich et al., 2004; US North American Bird Conservation Initiative Monitoring Subcommittee, 2007). The US North American Bird Conservation Initiative's (NABCI) "Opportunities for Improving Avian Monitoring" (NABCI Monitoring Subcommittee, 2007) provided goals for avian monitoring programs, including:

Goal 1: Fully integrate monitoring into bird management and conservation practices and ensure that monitoring is aligned with management and conservation priorities.

Goal 2: Coordinate monitoring programs among organizations and integrate them across spatial scales to solve conservation or management problems effectively.

Goal 3: Increase the value of monitoring information by improving statistical design.

Goal 4: Maintain bird population monitoring data in modern data management systems.

Recognize legal, institutional, proprietary, and other constraints while still providing greater availability of raw data, associated metadata, and summary data for bird monitoring programs.

With the NABCI Monitoring Subcommittee (2007) guidelines in mind, Bird Conservancy of the Rockies and partners initiated a broad-scale collaborative bird monitoring program in 2008, entitled “Integrated Monitoring in Bird Conservation Regions” (IMBCR) (Blakesley & Hanni, 2009). See Appendix B: IMBCR Program and Stratification History for a complete history of this program. The monitoring objectives of the IMBCR partnership are to:

1. provide robust density, population and occupancy estimates that account for incomplete detection and are comparable at different geographic extents;
2. provide long-term status and trend data for all regularly occurring breeding landbird species throughout the study area;
3. provide a design framework to spatially integrate existing bird monitoring efforts in the region to provide better information on distribution and abundance of breeding landbirds, especially for high priority species;
4. provide basic habitat association data for most bird species to address habitat management issues;
5. maintain a high-quality database that effectively merges records between regional data nodes and is accessible to all of our collaborators as well as to the public over the internet, in the form of raw and summarized data; and
6. generate decision support tools that help guide conservation efforts and provide a better measure of conservation success.

The IMBCR design uses Bird Conservation Regions (BCRs) as sampling frames (Figure 1), stratified by land ownership inside each BCR (NABCI Monitoring Subcommittee, 2007). BCRs provide a spatially consistent framework for bird conservation in North America. Each BCR represents a distinct ecological region with similar bird communities, vegetation types, and resource management interests (NABCI, 2000). Population monitoring within BCRs can be implemented with a flexible hierarchical framework of nested units, where information on bird populations can be partitioned into smaller units for small-scale conservation planning, or aggregated to support large-scale conservation efforts throughout a species’ geographic range. By focusing on scales relevant to management and conservation, information obtained from monitoring in BCRs can be integrated into research and management objectives at various scales applicable to managers (Pavlacky et al., 2017; Ruth et al., 2003).

Important properties of the IMBCR design are:

- all areas are available for sampling, including all vegetation types and private land;
- strata are based on fixed attributes, which allows us to relate changes in bird populations to changes on the landscape through time;
- each state’s portion of a BCR can be stratified differently depending upon local needs and areas to which one wants to make inference;
- aggregation of stratum-wide estimates to BCR- or state-wide estimates is built into the design;
- local population trends are directly comparable to regional trends; and
- coordination among partners reduces the costs and increases efficiencies of monitoring per partner.

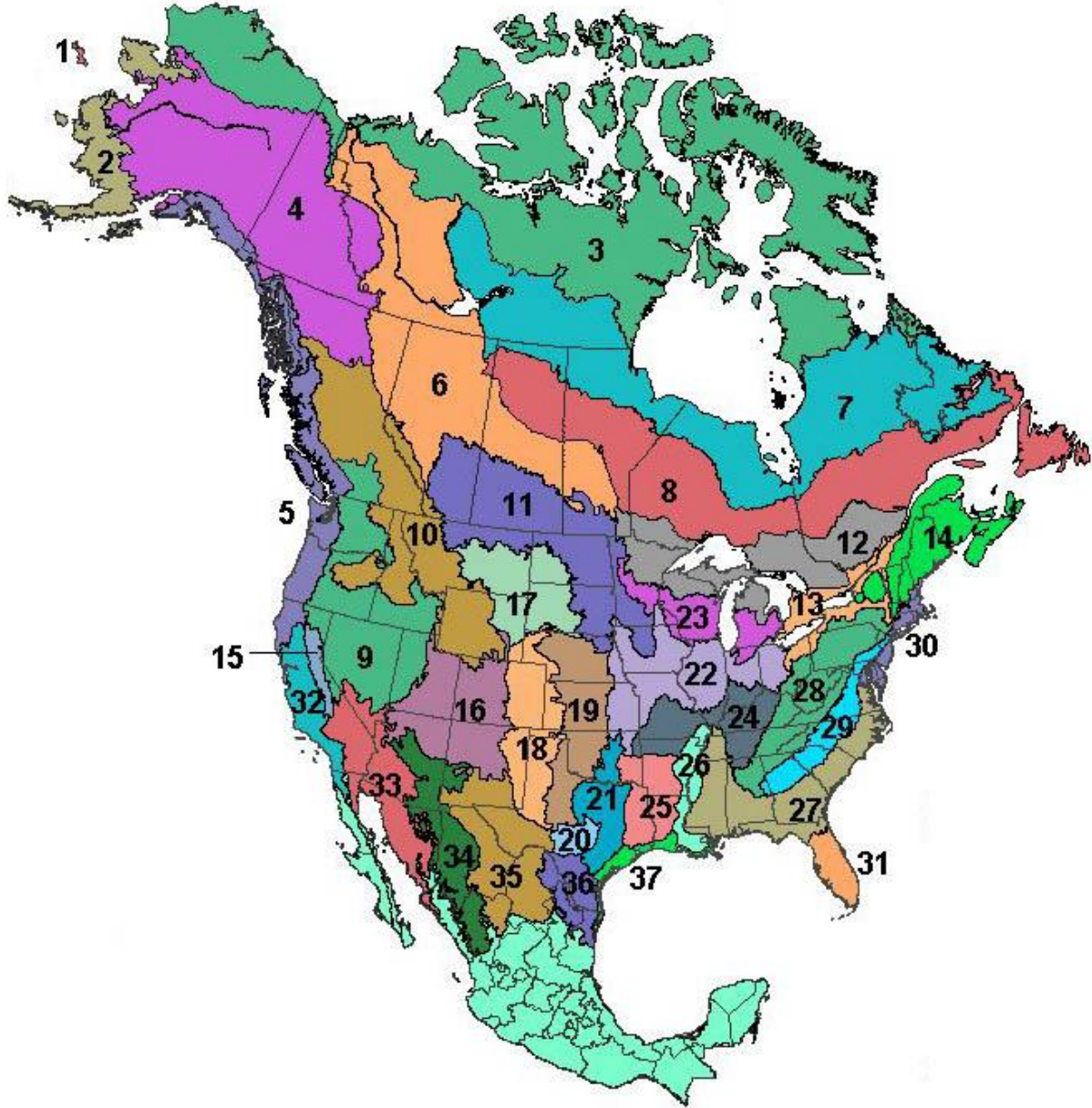


Figure 1. Bird Conservation Regions throughout North America, excluding Hawaii and Mexico (Source: <http://nabci-us.org/resources/bird-conservation-regions-map/>).

Methods

Study Area

In 2020, the IMBCR program’s area of inference encompassed four entire states (Colorado, Montana, Utah, and Wyoming) and portions of 12 additional states (Arizona, California, Idaho, Kansas, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, and Texas). We surveyed across US Forest Service (USFS) Regions 1, 2, and 4 and in portions of Region 3; all of the Badlands and Prairies Bird Conservation Region (BCR 17), all of the Shortgrass Prairie Bird Conservation Region (BCR 18), and portions of seven other BCRs: Great Basin (9), Northern Rockies (10), Prairie Potholes (11), Sierra Nevada (15), Southern Rockies/Colorado Plateau (16), Central Mixed Grass Prairie (19), and Sonoran and Mojave Deserts (33) (Figure 2).

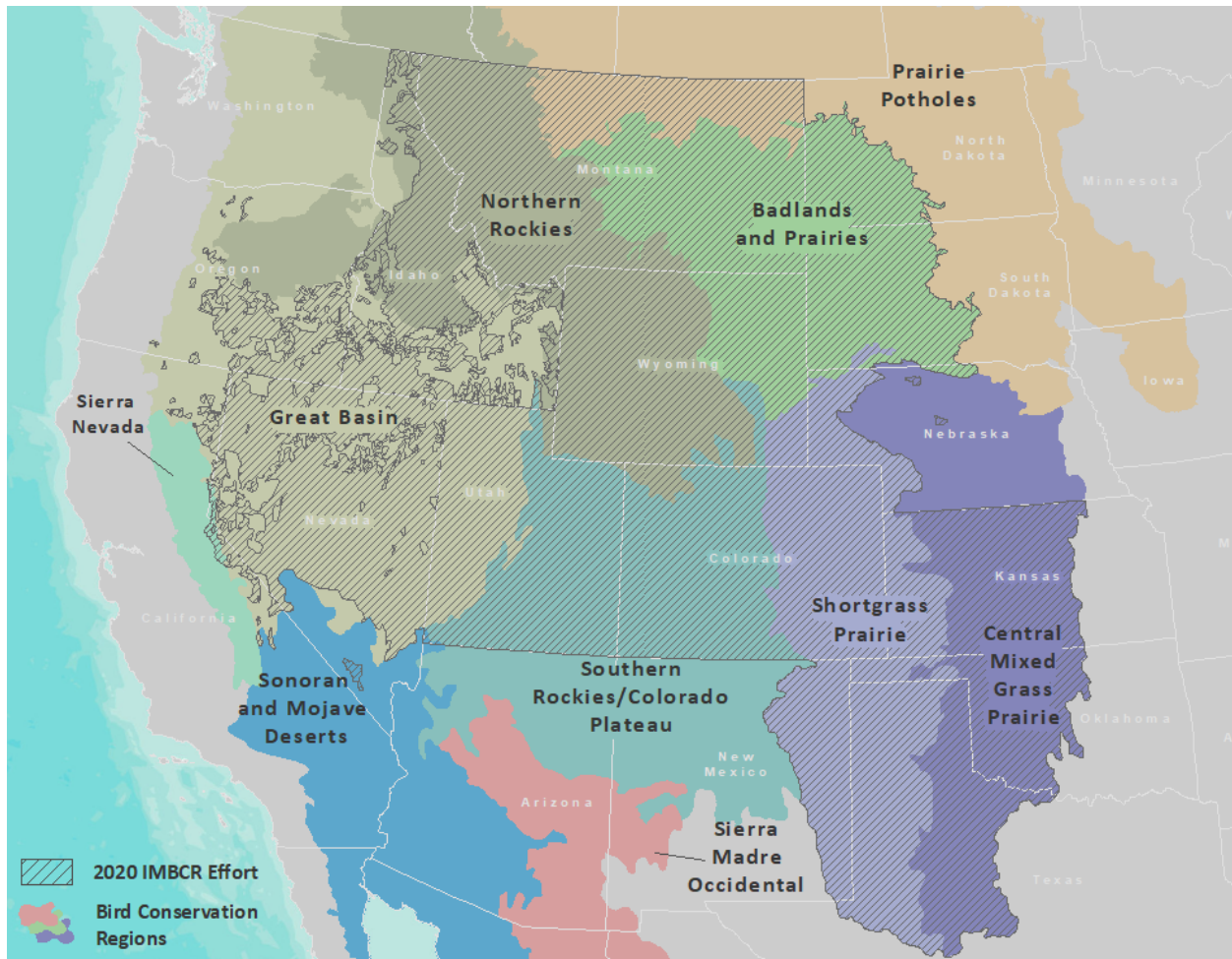


Figure 2. Spatial extent of sampled Bird Conservation Regions using the IMBCR design, 2020.

Sampling Design

Sampling Frame and Stratification

A key component of the IMBCR design is the ability to infer about bird populations across spatial scales, from small management units, such as individual national forests or field offices, to entire states and BCRs. This is accomplished through hierarchical (nested) stratification, which allows data from smaller-

order strata to be combined to make inferences about higher-order strata. For example, data from each individual national forest stratum in USFS Region 2 are combined to produce Region-wide population estimates; data from each individual stratum in Montana are combined to produce statewide estimates; and data from each individual stratum in BCR 17 are combined to produce BCR-wide estimates.

We define strata based on areas to which IMBCR partners wanted to make inferences. We defined the largest sampling frame as the intersection of state and BCR boundaries (e.g., Wyoming-BCR 10). We base the strata within the state-BCR sampling frames on fixed attributes, such as land ownership boundaries, elevation zones, major river systems and wilderness/roadless designations.

Sampling Units

We define sampling units as 1 km² cells, each containing 16 evenly spaced sample points, 250 meters apart (Figure 3). We define potential sampling units by superimposing a uniform grid of cells over each state in the study area. We then assign each cell to a stratum using ArcGIS version 10.X and higher (Environmental Systems Research Institute, 2017). For all stratifications developed after 2012, we use the United States National Grid (USNG), a nonproprietary alphanumeric referencing system derived from the Military Grid Reference System that was created by the Federal Geographic Data Committee.

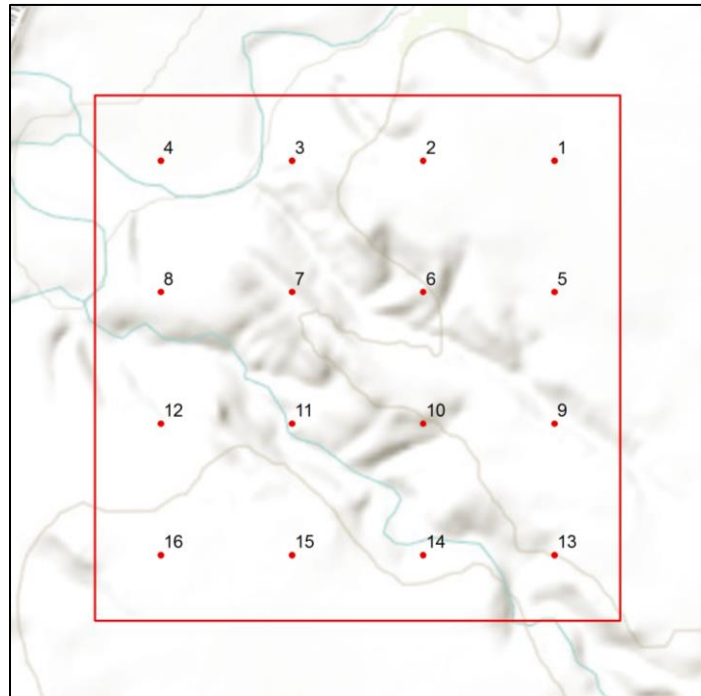


Figure 3. Example 1 km² sampling unit in the IMBCR design.

Sample Selection

Within each stratum, we use generalized random-tessellation stratification (GRTS), a spatially balanced sampling algorithm, to select sampling units (Stevens Jr. & Olsen, 2004). The GRTS design has useful properties with respect to long-term monitoring of birds at large spatial scales including:

- Spatially balanced sampling is generally more efficient than simple random sampling of natural resources (Stevens Jr. & Olsen, 2004). Incorporating information about spatial autocorrelation in the data can increase precision in density estimates.

- All sampling units in the sampling frame are ordered, such that any set of consecutively numbered units is a spatially well-balanced sample (Stevens Jr. & Olsen, 2004). In the case of fluctuating budgets, IMBCR partners can adjust the sampling effort among years within each stratum while still preserving a random, spatially balanced sampling design.

A minimum of two sampling units within each stratum are required to estimate the variances of population parameters. However, reliable stratum-level occupancy estimates require larger sample sizes, with a minimum of approximately 8-10 samples per stratum. Additional samples may be required for strata comprising large geographic areas. Because we estimate regional density and occupancy using an area weighted mean, adding more samples to a particular stratum does not bias the overall estimate, it simply increases the precision. After the initial two sampling units were selected, the remaining allocation of sampling effort among strata was based on the priorities of the funding partners.

Sampling Methods

IMBCR observers with excellent aural and visual bird-identification skills conducted field work in 2020. Prior to conducting surveys, observers completed an intensive training program that was largely virtual to ensure full understanding of the field protocol and review bird and plant identification. Observers were also shadowed by a crew leader at the start of the field season to ensure they understood the protocol and could identify all birds within a region.

Observers conducted point counts (Buckland et al., 2001) following protocols established by IMBCR partners (Hanni, White, Birek, Van Lanen, & McLaren, 2012). Observers conducted surveys in the morning, beginning one-half hour before sunrise and concluding no later than five hours after sunrise. Observers recorded the start time for every point count conducted. For every bird detected during the six-minute period, observers recorded species, sex, horizontal distance from the observer, minute, type of detection (e.g., call, song, visual), whether the bird was thought to be a migrant, and whether the observer was able to visually identify each record.

Observers measured distances to each bird using laser rangefinders when possible. When it was not possible, observers estimated the distance by measuring to some object near the bird using a laser rangefinder. In addition to recording all bird species detected in the area during point counts, observers recorded birds flying over but not using the immediate surrounding landscape. Observers also recorded Abert's squirrel (*Sciurus aberti*), American red squirrel (*Tamiasciurus hudsonicus*), and American pika (*Ochotona princeps*). While observers traveled between points within a sampling unit, they recorded the presence of any species not recorded during a point count. The opportunistic detections of these species are used for distribution purposes only.

Observers considered all non-independent detections of birds (i.e., flocks or pairs of conspecific birds together in close proximity) as part of a "cluster" rather than as independent observations. Observers recorded the number of birds detected within each cluster along with a letter code to distinguish between multiple clusters.

At the start and end of each survey, observers recorded time, ambient temperature, cloud cover, precipitation, and wind speed. Observers navigated to each point using hand-held Global Positioning System units. Before beginning each six-minute count, surveyors recorded vegetation data within a 50m radius of the point via ocular estimation. Vegetation data included the dominant habitat type and relative abundance, percent cover and mean height of trees and shrubs by species, grass height, and ground cover. Observers recorded vegetation data quietly to allow birds time to return to their normal habits prior to beginning each count.

For more detailed information about survey methods and vegetation data collection protocols, refer to Bird Conservancy's Field Protocol for Spatially Balanced Sampling of Landbird Populations on our Rocky Mountain Avian Data Center website at <http://rmbo.org/v3/avian/DataProtocolsDdatasheets.aspx>. You will also find links to past and current protocols and data sheets.

Data Analysis

Distance Analysis Assumptions

Distance sampling theory was developed to account for the decreasing probability of detecting an object of interest (e.g., a bird) with increasing distance from the observer to the object (Buckland et al., 2001). The detection probability is used to adjust the count of birds to account for birds that were present but undetected. Application of distance theory requires that five critical assumptions be met: 1) all birds at and near the sampling location (distance = 0) are detected; 2) distances to birds are measured accurately; 3) birds do not move in response to the observer's presence (Buckland et al., 2001; Thomas et al., 2010); 4) cluster sizes are recorded without error; and 5) the sampling units are representative of the entire survey region (Buckland, Marsden, & Green, 2008).

Density Estimation

We developed a Bayesian, zero-inflated N-mixture model (Royle 2004, Sillett et al. 2011) to estimate density and abundance for all strata and superstrata across all species with sufficient data. We used distance sampling to estimate detection probabilities and adjust counts accordingly. For a detailed description of statistical analyses performed, see ([Appendix D](#)).

Bayesian approaches to density estimation provide several benefits over traditional distance sampling analyses, while providing similar and unbiased estimates of density and abundance. First, with the nested design of IMBCR, point count locations within a 1-km² grid cell are not independent. Therefore, with traditional methods, it is necessary to treat each point as a spatial replicate within the grid cell (i.e., average counts across points). However, it is unlikely that bird densities are uniform within a grid cell, and a better solution would be to estimate density at the point count location. Bayesian models provide the flexibility to do this, while correctly accounting for the lack of independence among points. The second benefit, also provided by this flexibility, is the ability to include covariates to explain changes in density. This allows us to explicitly estimate the response of bird density to variables, such as vegetation, management actions, or time (i.e., trend). Finally, Bayesian approaches allow for sharing of information across parameters. This can assist in obtaining estimates at sites with little data or provide measures of uncertainty when no birds were detected, such as at low densities and/or small sample sizes.

We fit a series of models to the data from each species that had the same model structure describing density estimation but varied in detection structure (see *Observation process* section below). We used zero-inflation to account for excess zeros in the data, where abundance at a point count location (N) is conditional on the point's true occupancy state (z) of a species at the point count location. We modeled the mean abundance within a 1-km² grid cell as a function of year to estimate stratum-specific trends.

All points within a grid cell shared a mean abundance to account for the lack of independence of those points, but abundance was allowed to vary spatially within a grid cell (i.e., by point) through Poisson variation. To avoid predicting species occurrence outside of observed ranges, we fixed occupancy probabilities to 0 for all strata in which the species was never observed and used a prior informed by the observed proportion of grid-year combinations in a stratum in which the species was detected.

We derived density at the point count location by dividing the estimated abundance by the area of the point count circle (see *Observation process* section below) and multiplying by cluster size. We derived

stratum-level density estimates by averaging all point-level density estimates within each stratum, and taking the area-weighted average of strata estimates to obtain superstratum estimates.

Observation process

We estimated the probability of detecting an independent cluster of individuals by fitting distance functions to the distance data collected during surveys (Buckland et al. 2001). We fit four detection models including: 1) half-normal constant (HN(.)), 2) hazard rate constant (Haz(.)), 3) half-normal year (HN(t)), and 4) hazard rate year (Haz(t)).

We removed the furthest 10% of observed detection distances from the data set and binned the remaining detections into 10 evenly spaced distance classes. The furthest remaining detection distance became the radius of the point count circle with which we estimated density.

Detection model selection

To minimize computing time but find the most parsimonious detection function, we fit detection-only models to the distance data, using the four model structures described above. We used the Watanabe-Akaike Information Criterion (WAIC; Watanabe 2010, Hooten and Hobbs 2015) to select the most parsimonious detection structure and then used that structure for detection probabilities in the full model to estimate density and abundance.

Trend Estimates

We estimated trends for individual strata by calculating the least-squares regression mean and standard errors for the intercept and slope of the log densities across the monitoring period. We calculated these parameters for every Bayesian iteration to account for uncertainty around density estimates.

We developed a post-hoc approach to estimate trends for superstrata. Using the rolled-up estimates of density for a superstratum, we fit a general linear model (GLM) to the samples from each Bayesian iteration. Fitting a GLM across iterations allowed us to incorporate uncertainty in superstratum trends due to uncertainty around density estimates, but it did not account for temporal variation. To incorporate this second form of variation, we sampled a random intercept and slope for each iteration using the mean and standard error estimated using the GLM and made inference on the distribution of the resampled values.

Occupancy Analysis

Occupancy estimation is most commonly used to quantify the proportion of sample units (i.e., 1 km² cells) occupied by an organism (MacKenzie et al., 2002). The application of occupancy modeling requires multiple surveys of the sample unit in space or time to estimate a detection probability (MacKenzie et al., 2006). The detection probability adjusts the proportion of sites occupied to account for species that were present but undetected (MacKenzie et al., 2002). We used a removal design (MacKenzie et al., 2006), to estimate a detection probability for each species, in which we binned minutes one and two, minutes three and four and minutes five and six to meet the assumption of a monotonic decline in the detection rates through time. After the target species was detected at a point, we set all subsequent sampling intervals at that point to “missing data” (MacKenzie et al., 2006).

The 16 points in each sampling unit served as spatial replicates for estimating the proportion of points occupied within the sampled sampling units. We used a Bayesian, multi-scale occupancy model (Nichols et al. 2008, Mordecai et al. 2011, Green et al. 2019) to estimate 1) the probability of detecting a species given presence (p), 2) the proportion of points occupied by a species given presence within sampled sampling units (θ , Theta) and 3) the proportion of sampling units occupied by a species (ψ , Psi).

We truncated the data, using only detections <125 m from the sample points, except for Accipitriformes, Anseriformes, Falconiformes, Galliformes, Gruiformes, Pelecaniformes, Podicipediformes, and Suliformes for which we used the maximum observed distance for each species. Truncating the data allowed us to use bird detections over a consistent plot size and ensured that the points were independent (points were spread 250 m apart), which in turn allowed us to estimate θ (the proportion of points occupied within each sampling unit) (Pavlacky Jr., Blakesley, White, Hanni, & Lukacs, 2012). The interpretation of θ for species for which we used maximum distances changes from occupancy to use because point count buffers overlap, but we chose this approach to provide estimates for a larger number of species.

We expected regional differences in the behavior, habitat use, and local abundance of species would correspond to regional variation in detection and the fraction of occupied points. Therefore, we estimated the proportion of sampling units occupied (ψ) for each stratum by estimating BCR-by-year specific estimates of detection (p) and point-level occupancy (θ). We fixed p and θ to 0 for BCRs in which a particular species was never detected.

We fixed ψ to 0 for all strata in which the species was never detected. As with density, we took an area-weighted mean of stratum-level occupancy estimates (i.e., ψ) to estimate superstratum-level occupancy probabilities. The true point-level occupancy state was conditional on the grid-cell-level occupancy state (i.e., occupied or unoccupied), such that a point could only be occupied if the grid cell was occupied. Finally, we modeled the observation process conditional on the point being occupied using removal modeling.

Our application of the multi-scale model was analogous to a within-season robust design (Pollock, 1982) where the two-minute intervals at each point were the secondary samples for estimating p and the points were the primary samples for estimating θ (Nichols et al., 2008; Pavlacky Jr. et al., 2012). We considered both p and θ to be nuisance variables that were important for generating unbiased estimates of ψ . θ can be considered an availability parameter or the probability a species was present and available for sampling at the points (Nichols et al., 2008; Pavlacky Jr. et al., 2012).

Automated Analysis

We recently updated our analytical methods and are using Bayesian hierarchical models specifically designed for analysis of IMBCR data. We performed all data and output manipulation in R (R Core Team, 2019) and model fitting in JAGS (Plummer 2003, 2017) using the R package jagsUI (Kellner 2018). The R code called the raw data from the IMBCR Structured Query Language (SQL) server database and reformatted the data into a form usable with the JAGS code. We allowed the input of all data collected in a manner consistent with the IMBCR design to increase the number of detections available for estimating global detection rates for population density and site occupancy. The R code provided an automated framework for combining stratum-level estimates of population density and site occupancy at multiple spatial scales, as well as estimating the standard deviations and credible intervals for the combined estimates.

We fit initial models to all species with at least 30 detections for density estimation and 10 detections for occupancy estimation. For density estimation, we fit the full model after determining whether there were enough detections based on results from the detection-only model fits. In some cases for both density and occupancy estimation, it was necessary to use a less parsimonious detection structure or simplified model structure to facilitate model convergence. We currently maintain version control of the automated analysis code in the Bird Conservancy repository (Atlassian Stash, version 3.6.1).

Results

I. Summary

In 2020, field observers completed 1,388 of 1,398 (99.3%) planned surveys throughout all or portions of BCRs 9, 10, 11, 15, 16, 17, 18, 19, and 33 using the IMBCR design (Table 1, Figure 2). Reasons surveys were not completed are summarized in Table 2. Observers conducted 16,167 point counts within the 1,403 surveyed sampling units between April 30 and July 19, 2020. They detected 208,731 individual birds representing 340 species.

Please note that not every stratum or superstratum is summarized in this report. We include details of specific strata or superstrata for which our partners are most interested. However, results from all strata and all biologically meaningful superstrata can be found on the Rocky Mountain Avian Data Center (RMADC) (<http://rmbo.org/v3/avian/ExploretheData.aspx>). This online database contains species counts, density, abundance, and occupancy results per strata, and also interactive maps showing approximate survey and detection locations. Instructions for using the RMADC are included in Appendix A of this report and are available on the RMADC website (hover over the “Explore the Data” tab for tutorials). Each stratum or superstratum presented in the Results section contains a web link that leads directly to the RMADC with the appropriate queries already populated.

Unless otherwise specified, all bird species names listed in this report are from the 58th supplement to the American Ornithologists’ Union Check-list of North and Middle American Birds (Chesser et al., 2017).

II. Trend Estimates

We estimated species population trends for data collected through 2020. Results can be found [here](#). Individual stratum estimates are compiled by state. To find superstratum estimates, select a spreadsheet for any state included in the superstratum. For example, to find estimates for the Badlands and Prairies Bird Conservation Region (BCR 17), select the spreadsheet for Montana, Wyoming, Nebraska, North Dakota, or South Dakota. Given the size of each state’s spreadsheet, it will likely be useful to filter estimates by stratum or bird species. Also, we do not include trend estimates for species with zero detections in a given stratum, and use caution when interpreting trends for low-density species at the superstratum (regional) level when there were zero detections in a given year. In these cases, we add a very small number to the estimate (i.e., half the minimum non-zero estimate) in order to take the log of the estimate. This increases uncertainty around the trend estimates.

Explanation of the columns in the trend estimates spreadsheets are as follows:

Stratum: the abbreviated code for an individual stratum or the name of a superstratum (i.e., contains 2 or more individual strata)

Stratum Name: full name for an individual stratum (note, this column will contain NA for superstrata as the name is contained in the “stratum” column for superstrata)

Species: full name of bird species. Note that we record a few mammals detected on surveys, such as red and Abert’s squirrels and pika

ScientificName: scientific name for each species

Mean: mean trend estimate per year based on all years a stratum was surveyed. A value of 1 indicates the population is stable, <1 indicates the population is declining and >1 is an increasing population

SD: standard deviation or amount of variation in the data

- CV:** coefficient of variation or ratio of the standard deviation to the mean (lower is better!)
- LCI 95:** lower 95% credible interval; the true estimate lies within the lower and upper 95% credible intervals with 95% probability
- UCI 95:** upper 95% credible interval; the true estimate lies within the lower and upper 95% credible intervals with 95% probability
- LCI 90:** same interpretation as 95% LCI but with 90% probability
- UCI 90:** same interpretation as 95% UCI but with 90% probability
- Median:** value that represents the midpoint of the distribution. We recommend reporting the median rather than the mean because some credible intervals have long tails so the means can be quite a bit higher than the medians, especially for estimates near zero. Medians are also more representative of the distributions
- f:** the probability the trend is in the direction of the mean. This is our confidence in the direction of the trend (not necessarily the magnitude). As 'f' approaches 1, our confidence increases (e.g., if the trend estimate is 1.16 and 'f' is 0.88, then we are 88% sure the population is increasing)
- N. Detect:** the number of detections used to estimate trend for each species-stratum combination
- N.Strata.Det:** the number of strata with a detection used to estimate regional (superstrata) trends. This column will contain an "NA" for individual strata.
- N.Strata:** the number of strata contained in a superstratum (minimum number of strata within a superstratum is 2). This column will contain an "NA" for individual strata.

III. Number of Species with Estimates

The way we present density and occupancy estimates in the final report has changed from years prior to 2018. In the past, if a species had been detected in a stratum in a previous year, but was not detected in the current year, we did not provide density or occupancy estimates for that species in that stratum. We now include estimates for these species. In these cases, the estimate for a given year is zero or very close to zero. We consider these to be legitimate estimates of zero occupancy or density because the species occurs in the area of interest, but was not detected in a particular year.

This change means that the number of species with density or occupancy estimates for a given stratum or superstratum in a given year is not comparable to the number of species with estimates for that stratum or superstratum and year in reports prior to 2018. The number of species in the current report will include species with zero, or near zero estimates, if that species has been detected in previous years, whereas reports before 2018 will not. Therefore, there may be more species with estimates for a given stratum in a final report for 2018 and later.

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Table 1. Planned and completed surveys by stratum, 2020.

BCR = Bird Conservancy of the Rockies; DoD = Department of Defense; GBBO = Great Basin Bird Observatory; IBO = Intermountain Bird Observatory; KBO = Klamath Bird Observatory; UDWR = Utah Division of Wildlife Resources; WYNDD = Wyoming Natural Diversity Database.

State	BCR	Stratum	Stratum Description	WhoCollected	Area (Km ²)	Planned	Completed	Percent Completed
CA	15	CA-BCR15-HT	CA-BCR15-HT: Humboldt-Toiyabe National Forest	GBBO	1,635	3	3	100%
CA	9	CA-BCR9-CC	CA-BCR9-CC: Bureau of Land Management - Carson City District	GBBO	118	3	3	100%
CA	9	CA-BCR9-CD	CA-BCR9-CD: Bureau of Land Management - California Desert District	GBBO	1,039	3	3	100%
CA	9	CA-BCR9-CN	CA-BCR9-CN: Bureau of Land Management - Central California District	GBBO	2,668	5	5	100%
CA	9	CA-BCR9-HT	CA-BCR9-HT: Humboldt-Toiyabe National Forest	GBBO	1,174	3	3	100%
CA	9	CA-BCR9-NC	CA-BCR9-NC: Bureau of Land Management - Northern California District	GBBO	5,468	4	4	100%
CO	10	CO-BCR10-AO	CO-BCR10-AO: All Other Lands	BCR	5,060	5	5	100%
CO	10	CO-BCR10-BL	CO-BCR10-BL: Bureau of Land Management	BCR	4,288	8	8	100%
CO	16	CO-BCR16-AO	CO-BCR16-AO: All Other Lands	BCR	51,214	20	20	100%
CO	16	CO-BCR16-BL	CO-BCR16-BL: Bureau of Land Management	BCR	27,825	24	24	100%
CO	16	CO-BCR16-GM	CO-BCR16-GM: Grand Mesa; Uncompahgre and Gunnison National Forests	BCR	13,630	7	7	100%
CO	16	CO-BCR16-MA	CO-BCR16-MA: Manti-La Sal National Forest	BCR	131	2	2	100%
CO	16	CO-BCR16-NC	CO-BCR16-NC: National Park Service - Northern Colorado Plateau Network	BCR	807	2	2	100%
CO	16	CO-BCR16-PC	CO-BCR16-PC: Pike and San Isabel National Forests Control	BCR	1,300	4	4	100%
CO	16	CO-BCR16-PO	CO-BCR16-PO: Pike and San Isabel National Forests All Other	BCR	9,650	5	5	100%
CO	16	CO-BCR16-RA	CO-BCR16-RA: Rio Grande National Forest - High Elevation	BCR	866	4	4	100%
CO	16	CO-BCR16-RC	CO-BCR16-RC: Arapaho and Roosevelt National Forests Control	BCR	780	4	4	100%
CO	16	CO-BCR16-RM	CO-BCR16-RM: National Park Service - Rocky Mountain Network	BCR	1,644	2	2	100%
CO	16	CO-BCR16-RO	CO-BCR16-RO: Routt National Forest	BCR	5,734	6	6	100%
CO	16	CO-BCR16-RP	CO-BCR16-RP: Rio Grande National Forest - Middle Elevation	BCR	5,410	3	3	100%
CO	16	CO-BCR16-RS	CO-BCR16-RS: Rio Grande National Forest - Low Elevation	BCR	1,896	3	3	100%
CO	16	CO-BCR16-SA	CO-BCR16-SA: San Juan National Forest	BCR	8,794	6	6	100%
CO	16	CO-BCR16-SC	CO-BCR16-SC: National Park Service - Southern Colorado Plateau Network	BCR	214	2	2	100%
CO	16	CO-BCR16-VO	CO-BCR16-VO: Arapaho and Roosevelt National Forests All Other	BCR	6,152	5	5	100%
CO	16	CO-BCR16-WA	CO-BCR16-WA: White River National Forest - High Elevation	BCR	2,138	4	4	100%
CO	16	CO-BCR16-WF	CO-BCR16-WF: USFS - Williams Fork Management Unit	BCR	551	3	3	100%
CO	16	CO-BCR16-WP	CO-BCR16-WP: White River National Forest - Middle Elevation	BCR	5,443	3	3	100%

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CO	16	CO-BCR16-WS	CO-BCR16-WS: White River National Forest - Low Elevation	BCR	2,786	3	3	100%
CO	18	CO-BCR18-AR	CO-BCR18-AR: Arkansas River and Tributaries	BCR	1,127	6	6	100%
CO	18	CO-BCR18-CO	CO-BCR18-CO: Comanche National Grassland	BCR	4,836	5	5	100%
CO	18	CO-BCR18-DO	CO-BCR18-DO: Department of Defense	BCR	1,647	2	2	100%
CO	18	CO-BCR18-IA	CO-BCR18-IA: Area between I-70 and the Arkansas River	BCR	34,755	12	12	100%
CO	18	CO-BCR18-NP	CO-BCR18-NP: Area North of the Platte River	BCR	11,457	8	8	100%
CO	18	CO-BCR18-PC	CO-BCR18-PC: Pawnee National Grassland - Private Lands	BCR	2,458	3	3	100%
CO	18	CO-BCR18-PG	CO-BCR18-PG: Pawnee National Grassland - Public Lands	BCR	810	4	4	100%
CO	18	CO-BCR18-PI	CO-BCR18-PI: Area between the Platte River and I-70	BCR	30,365	12	12	100%
CO	18	CO-BCR18-PT	CO-BCR18-PT: Platte River and Tributaries	BCR	970	6	6	100%
CO	18	CO-BCR18-SA	CO-BCR18-SA: Area South of the Arkansas River	BCR	24,985	12	11	92%
ID	10	ID-BCR10-BI	ID-BCR10-BI: Bitterroot National Forest	IBO	1,916	2	2	100%
ID	10	ID-BCR10-BO	ID-BCR10-BO: Boise National Forest	IBO	8,778	8	8	100%
ID	10	ID-BCR10-CA	ID-BCR10-CA: Bureau of Land Management - Coeur d'Alene Field Office	IBO	287	10	10	100%
ID	10	ID-BCR10-CH	ID-BCR10-CH: Bureau of Land Management - Challis Field Office	IBO	1,350	4	4	100%
ID	10	ID-BCR10-CL	ID-BCR10-CL: Clearwater National Forest - Roaded/Managed	IBO	1,946	7	7	100%
ID	10	ID-BCR10-CO	ID-BCR10-CO: Bureau of Land Management - Cottonwood Field Office	IBO	222	6	6	100%
ID	10	ID-BCR10-CR	ID-BCR10-CR: Clearwater National Forest - Roadless/Wilderness	IBO	5,036	2	2	100%
ID	10	ID-BCR10-CT	ID-BCR10-CT: Caribou-Targhee National Forest	BCR	7,752	3	3	100%
ID	10	ID-BCR10-FR	ID-BCR10-FR: Bureau of Land Management - Four Rivers Field Office	IBO	1,269	5	5	100%
ID	10	ID-BCR10-IP	ID-BCR10-IP: Idaho Panhandle National Forest - Roaded/Managed	IBO	8,660	22	22	100%
ID	10	ID-BCR10-IR	ID-BCR10-IR: Idaho Panhandle National Forest - Roadless/Wilderness	IBO	3,155	6	6	100%
ID	10	ID-BCR10-KO	ID-BCR10-KO: Kootenai National Forest	IBO	169	2	2	100%
ID	10	ID-BCR10-NP	ID-BCR10-NP: Nez Perce National Forest - Roaded/Managed	IBO	2,864	7	7	100%
ID	10	ID-BCR10-NR	ID-BCR10-NR: Nez Perce National Forest - Roadless/Wilderness	IBO	6,370	2	2	100%
ID	10	ID-BCR10-PA	ID-BCR10-PA: Payette National Forest	IBO	9,857	10	10	100%
ID	10	ID-BCR10-PO	ID-BCR10-PO: Bureau of Land Management - Pocatello Field Office	IBO	227	3	2	67%
ID	10	ID-BCR10-SA	ID-BCR10-SA: Salmon-Challis National Forest	IBO	13,563	8	9	113%
ID	10	ID-BCR10-SH	ID-BCR10-SH: Bureau of Land Management - Shoshone Field Office	IBO	507	3	3	100%
ID	10	ID-BCR10-SM	ID-BCR10-SM: Bureau of Land Management - Salmon Field Office	IBO	637	3	3	100%
ID	10	ID-BCR10-SW	ID-BCR10-SW: Sawtooth National Forest	IBO	6,302	5	6	120%

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State	BCR	Stratum	Stratum Description	WhoCollected	Area (Km ²)	Planned	Completed	Percent Completed
ID	10	ID-BCR10-US	ID-BCR10-US: Bureau of Land Management - Upper Snake Field Office	IBO	652	3	3	100%
ID	16	ID-BCR16-CT	ID-BCR16-CT: Caribou-Targhee National Forest	BCR	831	2	2	100%
ID	16	ID-BCR16-PO	ID-BCR16-PO: Bureau of Land Management - Pocatello Field Office	IBO	10	3	3	100%
ID	9	ID-BCR9-BO	ID-BCR9-BO: Boise National Forest	IBO	1,710	2	2	100%
ID	9	ID-BCR9-BR	ID-BCR9-BR: Bureau of Land Management - Bruneau Field Office	IBO	5,953	10	10	100%
ID	9	ID-BCR9-BU	ID-BCR9-BU: Bureau of Land Management - Burley Field Office	IBO	3,334	10	10	100%
ID	9	ID-BCR9-CH	ID-BCR9-CH: Bureau of Land Management - Challis Field Office	IBO	1,862	6	6	100%
ID	9	ID-BCR9-CO	ID-BCR9-CO: Bureau of Land Management - Cottonwood Field Office	IBO	138	5	5	100%
ID	9	ID-BCR9-CT	ID-BCR9-CT: Caribou-Targhee National Forest	BCR	1,940	2	2	100%
ID	9	ID-BCR9-CU	ID-BCR9-CU: Curlew National Grassland	BCR	300	5	5	100%
ID	9	ID-BCR9-FO	ID-BCR9-FO: Bureau of Land Management - Four Rivers Field Office	IBO	1,720	5	5	100%
ID	9	ID-BCR9-JA	ID-BCR9-JA: Bureau of Land Management - Jarbidge Field Office	IBO	5,386	10	10	100%
ID	9	ID-BCR9-MN	ID-BCR9-MN: Morley Nelson Birds of Prey National Conservation Area	IBO	1,904	10	10	100%
ID	9	ID-BCR9-OW	ID-BCR9-OW: Bureau of Land Management - Owyhee Field Office	IBO	5,066	10	10	100%
ID	9	ID-BCR9-PO	ID-BCR9-PO: Bureau of Land Management - Pocatello Field Office	IBO	1,723	6	6	100%
ID	9	ID-BCR9-SA	ID-BCR9-SA: Salmon-Challis National Forest	IBO	3,857	2	2	100%
ID	9	ID-BCR9-SH	ID-BCR9-SH: Bureau of Land Management - Shoshone Field Office	IBO	5,288	8	8	100%
ID	9	ID-BCR9-SM	ID-BCR9-SM: Bureau of Land Management - Salmon Field Office	IBO	1,340	7	7	100%
ID	9	ID-BCR9-SW	ID-BCR9-SW: Sawtooth National Forest	IBO	2,175	3	3	100%
ID	9	ID-BCR9-US	ID-BCR9-US: Bureau of Land Management - Upper Snake Field Office	IBO	6,473	8	8	100%
KS	18	KS-BCR18-AO	KS-BCR18-AO: All Other Lands	BCR	34,794	5	5	100%
KS	18	KS-BCR18-CM	KS-BCR18-CM: Cimarron National Grassland	BCR	430	3	3	100%
KS	18	KS-BCR18-PL	KS-BCR18-PL: Playas	BCR	370	5	5	100%
KS	18	KS-BCR18-RV	KS-BCR18-RV: Rivers	BCR	1,409	4	3	75%
KS	19	KS-BCR19-AO	KS-BCR19-AO: All Other Lands	BCR	98,649	5	5	100%
KS	19	KS-BCR19-PL	KS-BCR19-PL: Playas	BCR	176	5	5	100%
KS	19	KS-BCR19-RV	KS-BCR19-RV: Rivers	BCR	10,523	4	5	125%
MT	10	MT-BCR10-BE	MT-BCR10-BE: Beaverhead-Deerlodge National Forest - Roaded/Managed	IBO	7,697	8	8	100%
MT	10	MT-BCR10-BI	MT-BCR10-BI: Bitterroot National Forest - Roaded/Managed	IBO	2,324	7	7	100%
MT	10	MT-BCR10-BM	MT-BCR10-BM: Bureau of Land Management - Missoula/Butte	IBO	1,356	4	3	75%
MT	10	MT-BCR10-BR	MT-BCR10-BR: Beaverhead-Deerlodge National Forest - Roadless/Wilderness	IBO	8,236	2	2	100%

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MT	10	MT-BCR10-BS	MT-BCR10-BS: Bureau of Land Management - southwestern Montana	IBO	3,447	3	3	100%
MT	10	MT-BCR10-BW	MT-BCR10-BW: Bitterroot National Forest - Roadless/Wilderness	IBO	2,763	2	2	100%
MT	10	MT-BCR10-CR	MT-BCR10-CR: Custer National Forest - Roadless/Wilderness	IBO	1,783	3	3	100%
MT	10	MT-BCR10-CU	MT-BCR10-CU: Custer National Forest - Roaded/Managed	IBO	779	3	2	67%
MT	10	MT-BCR10-FL	MT-BCR10-FL: Flathead National Forest - Roaded/Managed	IBO	4,945	8	8	100%
MT	10	MT-BCR10-FR	MT-BCR10-FR: Flathead National Forest - Roadless/Wilderness	IBO	6,410	2	2	100%
MT	10	MT-BCR10-GA	MT-BCR10-GA: Gallatin National Forest - Roaded/Managed	IBO	3,479	7	7	100%
MT	10	MT-BCR10-GR	MT-BCR10-GR: Gallatin National Forest - Roadless/Wilderness	IBO	5,787	2	2	100%
MT	10	MT-BCR10-HE	MT-BCR10-HE: Helena National Forest - Roaded/Managed	IBO	3,024	7	7	100%
MT	10	MT-BCR10-HR	MT-BCR10-HR: Helena National Forest - Roadless/Wilderness	IBO	2,248	2	2	100%
MT	10	MT-BCR10-KO	MT-BCR10-KO: Kootenai National Forest - Roaded/Managed	IBO	7,239	24	24	100%
MT	10	MT-BCR10-KR	MT-BCR10-KR: Kootenai National Forest - Roadless/Wilderness	IBO	1,887	7	6	86%
MT	10	MT-BCR10-LC	MT-BCR10-LC: Lewis and Clark National Forest - Roaded/Managed	IBO	2,778	7	7	100%
MT	10	MT-BCR10-LO	MT-BCR10-LO: Lolo National Forest - Roaded/Managed	IBO	7,742	8	8	100%
MT	10	MT-BCR10-LR	MT-BCR10-LR: Lewis and Clark National Forest - Roadless/Wilderness	IBO	5,007	2	2	100%
MT	10	MT-BCR10-LW	MT-BCR10-LW: Lolo National Forest - Roadless/Wilderness	IBO	3,859	2	2	100%
MT	10	MT-BCR10-ON	MT-BCR10-ON: All Other Lands	IBO	75,417	2	2	100%
MT	11	MT-BCR11-AO	MT-BCR11-AO: All Other Lands	IBO	62,631	5	5	100%
MT	11	MT-BCR11-BN	MT-BCR11-BN: Bureau of Land Management - North Valley	IBO	1,588	10	8	80%
MT	11	MT-BCR11-BO	MT-BCR11-BO: Bureau of Land Management - Other	IBO	6,826	10	10	100%
MT	11	MT-BCR11-FT	Mt-BCR11-FT: USFWS and Tribal Lands in BCR11	IBO	12,370	3	2	67%
MT	17	MT-BCR17-AO	MT-BCR17-AO: All Other Lands	IBO	102,779	8	7	88%
MT	17	MT-BCR17-BL	MT-BCR17-BL: Bureau of Land Management	IBO	25,013	10	10	100%
MT	17	MT-BCR17-CU	MT-BCR17-CU: Custer National Forest	IBO	2,649	4	4	100%
MT	17	MT-BCR17-LC	MT-BCR17-LC: Lewis and Clark National Forest	IBO	867	2	2	100%
MT	17	MT-BCR17-RF	MT-BCR17-RF: USFWS and River Lands in BCR17	IBO	8,610	3	3	100%
ND	17	ND-BCR17-AT	ND-BCR17-AT: All Other Lands	BCR	50,236	5	5	100%
ND	17	ND-BCR17-BM	ND-BCR17-BM: Bureau of Land Management	BCR	165	7	7	100%
ND	17	ND-BCR17-KR	ND-BCR17-KR: Knife River Indian Villages National Historic Site	BCR	5	2	2	100%
ND	17	ND-BCR17-MG	ND-BCR17-MG: Little Missouri National Grassland	BCR	4,133	6	6	100%
ND	17	ND-BCR17-RG	ND-BCR17-RG: Cedar River National Grassland	BCR	20	6	6	100%

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ND	17	ND-BCR17-TN	ND-BCR17-TN: Theodore Roosevelt National Park - North Unit	BCR	100	4	4	100%
ND	17	ND-BCR17-TS	ND-BCR17-TS: Theodore Roosevelt National Park - South Unit	BCR	193	4	4	100%
ND	17	MR-NFPIM-FM	Missouri National Recreational River - 59 Mile District	BCR	243	4	4	100%
ND	17	MR-NFPIM-TM	Missouri National Recreational River - 39 Mile District	BCR	248	4	4	100%
NE	17	NE-BCR17-LG	NE-BCR17-LG: Oglala National Grassland	BCR	350	3	3	100%
NE	17	NE-BCR17-ON	NE-BCR17-ON: All Other Lands	BCR	4,553	2	2	100%
NE	17	NE-NGPIM-NI	Niobrara National Scenic River	BCR	64	7	7	
NE	18	NE-BCR18-AF	NE-BCR18-AF: Agate Fossil Beds National Monument	BCR	12	2	2	100%
NE	18	NE-BCR18-GG	NE-BCR18-GG: Oglala National Grassland	BCR	31	2	2	100%
NE	18	NE-BCR18-ON	NE-BCR18-ON: All Other Lands	BCR	34,896	6	6	100%
NE	18	NE-BCR18-RD	NE-BCR18-RD: Nebraska National Forest - Pine Ridge	BCR	200	2	2	100%
NE	18	NE-BCR18-SB	NE-BCR18-SB: Scotts Bluff National Monument	BCR	13	2	2	100%
NE	19	NE-BCR19-BE	NE-BCR19-BE: Nebraska National Forest - Bessey District	BCR	361	3	3	100%
NE	19	NE-BCR19-SG	NE-BCR19-SG: Samuel R. McKelvie National Forest	BCR	468	3	3	100%
NM	18	NM-BCR18-AO	NM-BCR18-AO: All Other Lands	BCR	65,011	8	8	100%
NM	18	NM-BCR18-KW	NM-BCR18-KW: Kiowa National Grassland	BCR	553	3	3	100%
NM	18	NM-BCR18-PL	NM-BCR18-PL: Playas	BCR	244	6	6	100%
NM	18	NM-BCR18-RV	NM-BCR18-RV: Rivers	BCR	2,206	2	2	100%
NV	15	NV-BCR15-HT	NV-BCR15-HT: Humboldt-Toiyabe National Forest	GBBO	616	3	3	100%
NV	33	NV-BCR33-HT	NV-BCR33-HT: Humboldt-Toiyabe National Forest	GBBO	1,313	3	3	100%
NV	9	NV-BCR9-BM	NV-BCR9-BM: Bureau of Land Management - Battle Mountain District	GBBO	35,811	16	16	100%
NV	9	NV-BCR9-CC	NV-BCR9-CC: Bureau of Land Management - Carson City District	GBBO	19,269	8	8	100%
NV	9	NV-BCR9-EK	NV-BCR9-EK: Bureau of Land Management - Elko, Twin Falls, and Boise Districts	GBBO	30,072	15	15	100%
NV	9	NV-BCR9-EY	NV-BCR9-EY: Bureau of Land Management - Ely District	GBBO	45,375	15	16	107%
NV	9	NV-BCR9-HT	NV-BCR9-HT: Humboldt-Toiyabe National Forest	GBBO	22,324	7	7	100%
NV	9	NV-BCR9-NC	NV-BCR9-NC: Bureau of Land Management - Northern California District	GBBO	5,566	4	4	100%
NV	9	NV-BCR9-SN	NV-BCR9-SN: Bureau of Land Management - Southern Nevada District	GBBO	659	3	3	100%
NV	9	NV-BCR9-WI	NV-BCR9-WI: Bureau of Land Management - Winnemucca District	GBBO	33,881	17	17	100%
OK	18	OK-BCR18-AO	OK-BCR18-AO: All Other Lands	BCR	10,556	4	4	100%
OK	18	OK-BCR18-PL	OK-BCR18-PL: Playas	BCR	105	4	4	100%
OK	18	OK-BCR18-RB	OK-BCR18-RB: Rita Blanca National Grassland	BCR	57	3	3	100%

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State	BCR	Stratum	Stratum Description	WhoCollected	Area (Km ²)	Planned	Completed	Percent Completed
OK	18	OK-BCR18-RV	OK-BCR18-RV: Rivers	BCR	533	2	2	100%
OK	19	OK-BCR19-AO	OK-BCR19-AO: All Other Lands	BCR	68,616	5	5	100%
OK	19	OK-BCR19-PL	OK-BCR19-PL: Playas	BCR	14	4	4	100%
OK	19	OK-BCR19-RV	OK-BCR19-RV: Rivers	BCR	6,531	2	2	100%
OR	9	OR-BCR9-BU	OR-BCR9-BU: Bureau of Land Management - Burns District	KBO	12,137	4	4	100%
OR	9	OR-BCR9-LA	OR-BCR9-LA: Bureau of Land Management - Lakeview and Medford Districts	KBO	13,783	4	4	100%
OR	9	OR-BCR9-PR	OR-BCR9-PR: Bureau of Land Management - Prineville District	KBO	3,617	4	4	100%
OR	9	OR-BCR9-VA	OR-BCR9-VA: Bureau of Land Management - Vale District	KBO	18,002	4	4	100%
SD	17	SD-BCR17-AT	SD-BCR17-AT: All Other Lands	BCR	92,764	8	6	75%
SD	17	SD-BCR17-BF	SD-BCR17-BF: Black Hills National Forest - All other Watersheds	BCR	5,009	5	5	100%
SD	17	SD-BCR17-BM	SD-BCR17-BM: Bureau of Land Management	BCR	831	7	7	100%
SD	17	SD-BCR17-BN	SD-BCR17-BN: Badlands National Park - North Unit	BCR	399	7	7	100%
SD	17	SD-BCR17-GG	SD-BCR17-GG: Buffalo Gap National Grassland	BCR	2,346	4	4	100%
SD	17	SD-BCR17-HU	SD-BCR17-HU: Black Hills National Forest - Hydrologic Code 7 Watersheds	BCR	376	3	3	100%
SD	17	SD-BCR17-JC	SD-BCR17-JC: Jewel Cave National Monument	BCR	5	2	2	100%
SD	17	SD-BCR17-MR	SD-BCR17-MR: Mount Rushmore National Monument	BCR	6	2	2	100%
SD	17	SD-BCR17-PG	SD-BCR17-PG: Fort Pierre National Grassland	BCR	482	3	3	100%
SD	17	SD-BCR17-RG	SD-BCR17-RG: Grand River National Grassland	BCR	613	6	6	100%
SD	17	SD-BCR17-UF	SD-BCR17-UF: Custer National Forest	BCR	326	5	5	100%
SD	17	SD-BCR17-WC	SD-BCR17-WC: Wind Cave National Park	BCR	136	8	8	100%
SD	18	SD-BCR18-AO	SD-BCR18-AO: All Other Lands	BCR	2,415	2	0	0%
TX	18	TX-BCR18-AO	TX-BCR18-AO: All Other Lands	BCR	98,186	4	4	100%
TX	18	TX-BCR18-PL	TX-BCR18-PL: Playas	BCR	4,507	16	16	100%
TX	18	TX-BCR18-RB	TX-BCR18-RB: Rita Blanca National Grassland	BCR	305	4	4	100%
TX	18	TX-BCR18-RV	TX-BCR18-RV: Rivers	BCR	1,200	2	2	100%
TX	19	TX-BCR19-AO	TX-BCR19-AO: All Other Lands	BCR	84,131	4	4	100%
TX	19	TX-BCR19-PL	TX-BCR19-PL: Playas	BCR	327	9	9	100%
TX	19	TX-BCR19-RV	TX-BCR19-RV: Rivers	BCR	4,787	2	2	100%
UT	10	UT-BCR10-AO	UT-BCR10-AO: All Other Lands	UDWR	1,968	15	15	100%
UT	10	UT-BCR10-AS	UT-BCR10-AS: Ashley National Forest	BCR	96	3	3	100%
UT	10	UT-BCR10-SL	UT-BCR10-SL: Bureau of Land Management - Salt Lake Field Office	BCR	642	3	3	100%

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State	BCR	Stratum	Stratum Description	WhoCollected	Area (Km ²)	Planned	Completed	Percent Completed
UT	10	UT-BCR10-VE	UT-BCR10-VE: Bureau of Land Management - Vernal Field Office	BCR	268	2	2	100%
UT	10	UT-BCR10-WA	UT-BCR10-WA: Uinta-Wasatch-Cache National Forest	BCR	49	3	3	100%
UT	16	UT-BCR16-AH	UT-BCR16-AH: Ashley National Forest	BCR	5,166	5	5	100%
UT	16	UT-BCR16-AO	UT-BCR16-AO: All Other Lands	UDWR	45,439	39	39	100%
UT	16	UT-BCR16-CC	UT-BCR16-CC: Bureau of Land Management - Cedar City Field Office	IBO	450	2	2	100%
UT	16	UT-BCR16-DI	UT-BCR16-DI: Dixie National Forest	IBO	5,934	8	8	100%
UT	16	UT-BCR16-FI	UT-BCR16-FI: Bureau of Land Management - Fillmore Field Office	BCR	40	2	2	100%
UT	16	UT-BCR16-FL	UT-BCR16-FL: Fishlake National Forest	IBO	6,670	8	8	100%
UT	16	UT-BCR16-GS	UT-BCR16-GS: Bureau of Land Management - Grand Staircase-Escalante National Monument	IBO	7,564	4	4	100%
UT	16	UT-BCR16-KA	UT-BCR16-KA: Bureau of Land Management - Kanab Field Office	IBO	2,267	3	3	100%
UT	16	UT-BCR16-MA	UT-BCR16-MA: Manti-La Sal National Forest	IBO	5,280	9	9	100%
UT	16	UT-BCR16-MN	UT-BCR16-MN: Bureau of Land Management - Monticello Field Office	IBO	7,321	4	4	100%
UT	16	UT-BCR16-MO	UT-BCR16-MO: Bureau of Land Management - Moab Field Office	BCR	7,725	4	4	100%
UT	16	UT-BCR16-PR	UT-BCR16-PR: Bureau of Land Management - Price Field Office	IBO	10,216	5	5	100%
UT	16	UT-BCR16-RI	UT-BCR16-RI: Bureau of Land Management - Richfield Field Office	IBO	8,068	4	4	100%
UT	16	UT-BCR16-SA	UT-BCR16-SA: Manti-La Sal National Forest - Sanpitch	IBO	307	3	3	100%
UT	16	UT-BCR16-SG	UT-BCR16-SG: Bureau of Land Management - Saint George Field Office	IBO	1,904	3	3	100%
UT	16	UT-BCR16-SL	UT-BCR16-SL: Bureau of Land Management - Salt Lake Field Office	BCR	87	2	2	100%
UT	16	UT-BCR16-VE	UT-BCR16-VE: Bureau of Land Management - Vernal Field Office	BCR	6,612	3	3	100%
UT	16	UT-BCR16-WA	UT-BCR16-WA: Uinta-Wasatch-Cache National Forest	BCR	9,913	3	3	100%
UT	33	UT-BCR33-AO	UT-BCR33-AO: All Other Lands	UDWR	65	15	15	100%
UT	33	UT-BCR33-SG	UT-BCR33-SG: Bureau of Land Management - Saint George Field Office	IBO	388	2	2	100%
UT	9	UT-BCR9-AO	UT-BCR9-AO: All Other Lands	UDWR	34,037	41	41	100%
UT	9	UT-BCR9-AP	UT-BCR9-AP: Department of Defense - APG Impact Area	DoD	70	6	6	100%
UT	9	UT-BCR9-CC	UT-BCR9-CC: Bureau of Land Management - Cedar City Field Office	IBO	8,046	4	4	100%
UT	9	UT-BCR9-CT	UT-BCR9-CT: Caribou-Targhee National Forest	BCR	54	2	2	100%
UT	9	UT-BCR9-DD	UT-BCR9-DD: Department of Defense - Other Lands	DoD	1,986	7	7	117%
UT	9	UT-BCR9-DI	UT-BCR9-DI: Dixie National Forest	IBO	1,008	2	2	100%
UT	9	UT-BCR9-FI	UT-BCR9-FI: Bureau of Land Management - Fillmore Field Office	BCR	18,326	6	6	100%
UT	9	UT-BCR9-FL	UT-BCR9-FL: Fishlake National Forest	IBO	590	2	2	100%
UT	9	UT-BCR9-MU	UT-BCR9-MU: Department of Defense - Mudflats	DoD	1,162	2	2	100%

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State	BCR	Stratum	Stratum Description	WhoCollected	Area (Km ²)	Planned	Completed	Percent Completed
UT	9	UT-BCR9-RI	UT-BCR9-RI: Bureau of Land Management - Richfield Field Office	IBO	617	3	3	100%
UT	9	UT-BCR9-SG	UT-BCR9-SG: Bureau of Land Management - Saint George Field Office	IBO	232	2	2	100%
UT	9	UT-BCR9-SL	UT-BCR9-SL: Bureau of Land Management - Salt Lake Field Office	BCR	12,340	6	6	100%
UT	9	UT-BCR9-SW	UT-BCR9-SW: Sawtooth National Forest	IBO	364	3	3	100%
UT	9	UT-BCR9-TS	UT-BCR9-TS: Department of Defense - Target S Impact Area	DoD	128	6	6	100%
UT	9	UT-BCR9-UR	UT-BCR9-UR: Department of Defense - UTG Impact Area	BCR	126	6	6	100%
UT	9	UT-BCR9-UT	UT-BCR9-UT: Department of Defense - UTTR Impact Areas	DoD	522	5	5	100%
UT	9	UT-BCR9-WA	UT-BCR9-WA: Uinta-Wasatch-Cache National Forest	BCR	1,648	3	3	100%
WY	10	WY-BCR10-AO	WY-BCR10-AO: All Other Lands	BCR	52,161	15	15	100%
WY	10	WY-BCR10-AS	WY-BCR10-AS: Ashley National Forest	BCR	540	2	2	100%
WY	10	WY-BCR10-BE	WY-BCR10-BE: Bridger-Teton National Forest - Roaded/Managed	BCR	3,034	8	8	100%
WY	10	WY-BCR10-BH	WY-BCR10-BH: Bighorn Canyon National Recreation Area	BCR	57	2	2	100%
WY	10	WY-BCR10-BI	WY-BCR10-BI: Bighorn National Forest	WYNDD	4,712	8	8	100%
WY	10	WY-BCR10-BR	WY-BCR10-BR: Bridger-Teton National Forest - Roadless/Wilderness	BCR	11,364	2	2	100%
WY	10	WY-BCR10-BU	WY-BCR10-BU: Bureau of Land Management - Buffalo Field Office	BCR	547	2	2	100%
WY	10	WY-BCR10-CA	WY-BCR10-CA: Bureau of Land Management - Casper Field Office	BCR	2,509	2	2	100%
WY	10	WY-BCR10-CO	WY-BCR10-CO: Bureau of Land Management - Cody Field Office	BCR	4,704	2	2	100%
WY	10	WY-BCR10-CT	WY-BCR10-CT: Caribou-Targhee National Forest	BCR	1,397	2	2	100%
WY	10	WY-BCR10-GR	WY-BCR10-GR: Grand Teton National Park	BCR	856	2	2	100%
WY	10	WY-BCR10-KE	WY-BCR10-KE: Bureau of Land Management - Kemmerer Field Office	BCR	5,733	2	2	100%
WY	10	WY-BCR10-LA	WY-BCR10-LA: Bureau of Land Management - Lander Field Office	BCR	9,829	6	6	100%
WY	10	WY-BCR10-MB	WY-BCR10-MB: Medicine Bow National Forest	WYNDD	773	3	3	100%
WY	10	WY-BCR10-PI	WY-BCR10-PI: Bureau of Land Management - Pinedale Field Office	BCR	3,687	8	8	100%
WY	10	WY-BCR10-RA	WY-BCR10-RA: Bureau of Land Management - Rawlins Field Office	BCR	13,954	8	8	100%
WY	10	WY-BCR10-RO	WY-BCR10-RO: Bureau of Land Management - Rock Springs Field Office	BCR	15,152	8	8	100%
WY	10	WY-BCR10-SE	WY-BCR10-SE: Shoshone National Forest - Roaded/Managed	BCR	2,101	3	3	100%
WY	10	WY-BCR10-SR	WY-BCR10-SR: Shoshone National Forest - Roadless/Wilderness	BCR	8,311	4	4	100%
WY	10	WY-BCR10-WA	WY-BCR10-WA: Wasatch National Forest	BCR	33	3	3	100%
WY	10	WY-BCR10-WO	WY-BCR10-WO: Bureau of Land Management - Worland Field Office	BCR	8,467	6	6	100%
WY	10	WY-BCR10-WR	WY-BCR10-WR: Wind River Reservation	BCR	7,819	4	4	100%
WY	10	WY-BCR10-YE	WY-BCR10-YE: Yellowstone National Park	BCR	7,592	4	4	100%

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State	BCR	Stratum	Stratum Description	WhoCollected	Area (Km ²)	Planned	Completed	Percent Completed
WY	16	WY-BCR16-AO	WY-BCR16-AO: All Other Lands	BCR	5,438	5	5	100%
WY	16	WY-BCR16-BL	WY-BCR16-BL: Bureau of Land Management	BCR	647	2	2	100%
WY	16	WY-BCR16-MB	WY-BCR16-MB: Medicine Bow National Forest	WYNDD	5,329	13	13	100%
WY	16	WY-BCR16-WA	WY-BCR16-WA: Wasatch National Forest	BCR	180	3	3	100%
WY	17	WY-BCR17-AO	WY-BCR17-AO: All Other Lands	BCR	52,186	12	12	100%
WY	17	WY-BCR17-BH	WY-BCR17-BH: Black Hills National Forest	BCR	1,085	3	3	100%
WY	17	WY-BCR17-BU	WY-BCR17-BU: Bureau of Land Management - Buffalo Field Office	BCR	2,653	2	2	100%
WY	17	WY-BCR17-CA	WY-BCR17-CA: Bureau of Land Management - Casper Field Office	BCR	2,695	2	2	100%
WY	17	WY-BCR17-NE	WY-BCR17-NE: Bureau of Land Management - Newcastle Field Office	BCR	1,025	2	2	100%
WY	17	WY-BCR17-TB	WY-BCR17-TB: Thunder Basin National Grassland	WYNDD	4,520	9	9	100%
WY	18	WY-BCR18-AO	WY-BCR18-AO: All Other Lands	BCR	12,064	12	12	100%
WY	18	WY-BCR18-BL	WY-BCR18-BL: Bureau of Land Management	BCR	171	2	2	100%
WY	18	WY-BCR18-DO	WY-BCR18-DO: Department of Defense	BCR	23	2	2	100%
WY	9	WY-BCR9-WY	WY-BCR9-WY: Caribou-Targhee National Forest	BCR	119	2	2	100%

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Table 2. Reasons planned surveys were not completed, 2020

Stratum	# Not Completed	Reason
CO-BCR18-SA	1	Unable to secure permission to survey on time
ID-BCR10-PO	1	Vehicle breakdown and end of season
KS-BCR18-RV	1	Planning error
MT-BCR10-BM	1	Sampling plan error
MT-BCR10-CU	1	Unable to hear due to high runoff on surveys in stratum
MT-BCR10-KR	1	Unable to survey due to tech feeling sick
MT-BCR11-BN	2	Consistently wet muddy roads
MT-BCR11-FT	1	Consistently wet muddy roads
MT-BCR17-AO	1	Planning error
SD-BCR17-AT	2	Access challenges due to COVID-19
SD-BCR18-AO	2	Unable to access Pine Ridge Reservation due to COVID-19 protocols

IV. Land Ownership

A. US Forest Service

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1. Region 1

a) Region 1 National Forests

Within this sampling design each national forest in Region 1 was stratified separately. In this section of the report, we summarize results for all Region 1 Forests combined, followed by summaries for each individual national forest.

(1) Region 1 National Forests: Total

We obtained results for USFS-Region 1 National Forests by compiling and jointly analyzing data from 29 strata in three states.

Field technicians completed 162 of 164 planned surveys (98.8%) in 2020. Technicians conducted 1,676 point counts within the 162 surveyed grid cells between May 21 and July 11. They detected 177 bird species, including ten priority species ([Appendix H](#)).

Bird Conservancy estimated densities and population sizes for 194 species that were detected in any year during which surveys were conducted, nine of which are priority species. The data yielded robust density estimates (CV < 50%) for 88 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout USFS-Region 1 National Forests for 200 species that were detected in any year during which surveys were conducted, eight of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 132 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within USFS-Region 1 National Forests across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[USFS-Region 1 National Forests Results](#)

(2) Beaverhead-Deerlodge National Forest

We obtained results for Beaverhead-Deerlodge National Forest by compiling and jointly analyzing data from two strata: front-country/managed areas and designated roadless/wilderness areas. This forest-level stratification distinction was made because of field implementation cost considerations and the desire to focus monitoring on the more highly managed areas while maintaining inference to the entire management unit.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 80 point counts within the ten surveyed grid cells between May 22 and July 2. They detected 62 bird species, including zero priority species ([Appendix H](#)).

Bird Conservancy estimated densities and population sizes for 114 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 31 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Ψ_i) throughout Beaverhead-Deerlodge National Forest for 109 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 39 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Beaverhead-Deerlodge National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Beaverhead-Deerlodge National Forest Results](#)

(3) Bitterroot National Forest

We obtained results for Bitterroot National Forest by compiling and jointly analyzing data from three strata in two states: Montana front-country/managed areas, Montana designated roadless/wilderness areas, and Idaho. This forest-level stratification distinction in Montana was made because of field implementation cost considerations and the desire to focus monitoring on the more highly managed areas while maintaining inference to the entire management unit. The stratification distinction between states is made to allow for the summation of the data for individual states involved.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 106 point counts within the 11 surveyed grid cells between May 23 and July 4. They detected 73 bird species, including two priority species ([Appendix H](#)).

Bird Conservancy estimated densities and population sizes for 98 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust density estimates (CV < 50%) for 34 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Ψ_i) throughout Bitterroot National Forest for 114 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 54 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Bitterroot National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Bitterroot National Forest Results](#)

(4) Clearwater National Forest

We obtained results for Clearwater National Forest by compiling and jointly analyzing data from two strata: front-country/managed areas and designated roadless/wilderness areas. This forest-level stratification distinction was made because of field implementation cost considerations and the desire to focus monitoring on the more highly managed areas while maintaining inference to the entire management unit.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 85 point counts within the nine surveyed grid cells between June 12 and July 9. They detected 70 bird species, including one priority species ([Appendix H](#)).

Bird Conservancy estimated densities and population sizes for 105 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust density estimates (CV < 50%) for 32 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Clearwater National Forest for 105 species that were detected in any year during which surveys were conducted, five of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 50 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Clearwater National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Clearwater National Forest Results](#)

(5) Custer National Forest

We obtained results for Custer National Forest by compiling and jointly analyzing data from four strata across two states (Montana and South Dakota) and two BCRs (10 and 17). Within Montana BCR 10, Custer National Forest is further split into front-country/managed areas and designated roadless/wilderness areas. This forest-level stratification distinction was made because of field implementation cost considerations and the desire to focus monitoring on the more highly managed areas while maintaining inference to the entire management unit. The state-level stratification distinction is made for the benefit of the state partners to allow for the summation of the data for individual states. Likewise, the BCR-level stratification distinction is made to allow for the summation of the data for individual BCRs.

Field technicians completed 14 of 15 planned surveys (93.3%) in 2020. Technicians conducted 128 point counts within the 14 surveyed grid cells between May 25 and July 3. They detected 99 bird species, including eight priority species ([Appendix H](#)).

Bird Conservancy estimated densities and population sizes for 148 species that were detected in any year during which surveys were conducted, 14 of which are priority species. The data yielded robust density estimates (CV < 50%) for 41 of the species for which we estimated densities.

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Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Ψ_i) throughout Custer National Forest for 149 species that were detected in any year during which surveys were conducted, 14 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 56 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Custer National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Custer National Forest Results](#)

(6) Flathead National Forest

We obtained results for Flathead National Forest by compiling and jointly analyzing data from two strata: front-country/managed areas and designated roadless/wilderness areas. This forest-level stratification distinction was made because of field implementation cost considerations and the desire to focus monitoring on the more highly managed areas while maintaining inference to the entire management unit.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 97 point counts within the ten surveyed grid cells between June 6 and July 5. They detected 77 bird species, including one priority species ([Appendix H](#)).

Bird Conservancy estimated densities and population sizes for 108 species that were detected in any year during which surveys were conducted, three of which are priority species. The data yielded robust density estimates (CV < 50%) for 37 of the species for which we estimated densities

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Ψ_i) throughout Flathead National Forest for 109 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 55 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Flathead National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Flathead National Forest Results](#)

(7) Gallatin National Forest

We obtained results for Gallatin National Forest by compiling and jointly analyzing data from two strata: front-country/managed areas and designated roadless/wilderness areas. This forest-level stratification distinction was made because of field implementation cost considerations and the desire to focus monitoring on the more highly managed areas while maintaining inference to the entire management unit.

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Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 101 point counts within the nine surveyed grid cells between June 15 and July 10. They detected 60 bird species, including zero priority species ([Appendix H](#)).

Bird Conservancy estimated densities and population sizes for 118 species that were detected in any year during which surveys were conducted, three of which are priority species. The data yielded robust density estimates (CV < 50%) for 28 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Gallatin National Forest for 118 species that were detected in any year during which surveys were conducted, three of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 38 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Gallatin National Forest across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Gallatin National Forest Results](#)

(8) Helena National Forest

We obtained results for Helena National Forest by compiling and jointly analyzing data from two strata: front-country/managed areas and designated roadless/wilderness areas. This forest-level stratification distinction was made because of field implementation cost considerations and the desire to focus monitoring on the more highly managed areas while maintaining inference to the entire management unit.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 107 point counts within the nine surveyed grid cells between May 21 and July 3. They detected 68 bird species, including two priority species ([Appendix H](#)).

Bird Conservancy estimated densities and population sizes for 122 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust density estimates (CV < 50%) for 32 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Helena National Forest for 123 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 45 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Helena National Forest across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Helena National Forest Results](#)

(9) Idaho Panhandle National Forest

We obtained results for Idaho Panhandle National Forest by compiling and jointly analyzing data from two strata: front-country/managed areas and designated roadless/wilderness areas. This forest-level stratification distinction was made because of field implementation cost considerations and the desire to focus monitoring on the more highly managed areas while maintaining inference to the entire management unit.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 312 point counts within the 28 surveyed grid cells between May 29 and July 8. They detected 94 bird species, including seven priority species ([Appendix H](#)).

Bird Conservancy estimated densities and population sizes for 116 species that were detected in any year during which surveys were conducted, eight of which are priority species. The data yielded robust density estimates (CV < 50%) for 52 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Idaho Panhandle National Forest for 116 species that were detected in any year during which surveys were conducted, eight of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 65 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Idaho Panhandle National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Idaho Panhandle National Forest Results](#)

(10) Kootenai National Forest

We obtained results for Kootenai National Forest by compiling and jointly analyzing data from three strata: Montana front-country/managed areas, Montana designated roadless/wilderness areas and Idaho. This forest-level stratification distinction in Montana was made because of field implementation cost considerations and the desire to focus monitoring on the more highly managed areas while maintaining inference to the entire management unit. The stratification distinction between states is made to allow for the summation of the data for individual states involved.

Field technicians completed 32 of 33 planned surveys (97%) in 2020. Technicians conducted 324 point counts within the 32 surveyed grid cells between May 21 and July 11. They detected 107 bird species, including eight priority species ([Appendix H](#)).

Bird Conservancy estimated densities and population sizes for 123 species that were detected in any year during which surveys were conducted, eight of which are priority species. The data yielded robust density estimates (CV < 50%) for 52 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Kootenai National Forest for 134 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data

yielded robust occupancy estimates (CV < 50%) for 61 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Kootenai National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Kootenai National Forest Results](#)

(11) Lewis and Clark National Forest

We obtained results for Lewis and Clark National Forest by compiling and jointly analyzing data from three strata: one in BCR 17 and two in BCR 10. Within BCR 10, the Forest is split into front-country/managed areas and designated roadless/wilderness areas because of field implementation cost considerations and the desire to focus monitoring on the more highly managed areas while maintaining inference to the entire management unit. The BCR-level stratification distinction is made to allow for the summation of the data for individual BCRs.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 120 point counts within the 11 surveyed grid cells between June 10 and July 4. They detected 69 bird species, including three priority species ([Appendix H](#)).

Bird Conservancy estimated densities and population sizes for 123 species that were detected in any year during which surveys were conducted, five of which are priority species. The data yielded robust density estimates (CV < 50%) for 30 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Lewis and Clark National Forest for 124 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 41 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Lewis and Clark National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Lewis and Clark National Forest Results](#)

(12) Lolo National Forest

We obtained results for Lolo National Forest by compiling and jointly analyzing data from two strata: front-country/managed areas and designated roadless/wilderness areas. This forest-level stratification distinction was made because of field implementation cost considerations and the desire to focus monitoring on the more highly managed areas while maintaining inference to the entire management unit.

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Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 101 point counts within the ten surveyed grid cells between May 24 and June 22. They detected 84 bird species, including two priority species ([Appendix H](#)).

Bird Conservancy estimated densities and population sizes for 128 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust density estimates (CV < 50%) for 37 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Ψ_i) throughout Lolo National Forest for 129 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 60 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Lolo National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Lolo National Forest Results](#)

(13) Nez Perce National Forest

We obtained results for Nez Perce National Forest by compiling and jointly analyzing data from two strata: front-country/managed areas and designated roadless/wilderness areas. This forest-level stratification distinction was made because of field implementation cost considerations and the desire to focus monitoring on the more highly managed areas while maintaining inference to the entire management unit.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 115 point counts within the nine surveyed grid cells between July 3 and July 8. They detected 62 bird species, including one priority species ([Appendix H](#))

Bird Conservancy estimated densities and population sizes for 108 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust density estimates (CV < 50%) for 32 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Ψ_i) throughout Nez Perce National Forest for 108 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 44 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Nez Perce National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map

[Nez Perce National Forest Results](#)

b. Region 1 National Grasslands

Within this sampling design each national grassland in Region 1 was stratified separately. In this section of the report, we summarize results for all Region 1 grasslands combined, followed by summaries for each individual national forest.

(1) Region 1 National Grasslands: Total

We obtained results for Region 1 National Grasslands by compiling and jointly analyzing data from three strata in North Dakota and South Dakota: Cedar River, Grand River and Little Missouri National Grasslands. This grassland-level stratification is made so we can produce results for each grassland individually as well as for all three of them as a whole. All of the national grasslands in USFS Region 1 fall within the Dakota Prairie Grasslands administrative unit. We did not survey one national grassland within Region 1 – Sheyenne National Grassland. We have collected data from this grassland using a different study design in the past. For more information on this, refer to the ‘Monitoring of Grassland Birds on Little Missouri, Sheyenne and Grand River National Grasslands’ report (Sparks & Hanni, 2013).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 182 point counts within the 18 surveyed grid cells between June 1 and July 6. They detected 97 bird species, including four priority species ([Appendix H](#)).

Bird Conservancy estimated densities and population sizes for 125 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust density estimates (CV < 50%) for 29 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout USFS-Region 1 National Grasslands for 126 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 54 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within USFS-Region 1 National Grasslands across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[USFS-Region 1 National Grasslands Results](#)

(2) Little Missouri National Grassland

We obtained results for Little Missouri National Grassland by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 62 point counts within the six surveyed grid cells between June 17 and July 1. They detected 61 bird species, including 13 priority species ([Appendix H](#)).

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Bird Conservancy estimated densities and population sizes for 95 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 25 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Ψ_i) throughout ND-BCR17-MG for 87 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 36 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ND-BCR17-MG across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ND-BCR17-MG Results](#)

(3) Cedar River National Grassland

We obtained results for Cedar River National Grassland by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 53 point counts within the six surveyed grid cells between June 4 and July 6. They detected 65 bird species, including 17 priority species ([Appendix H](#)).

Bird Conservancy estimated densities and population sizes for 68 species that were detected in any year during which surveys were conducted, three of which are priority species. The data yielded robust density estimates (CV < 50%) for 15 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Ψ_i) throughout ND-BCR17-RG for 69 species that were detected in any year during which surveys were conducted, three of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 30 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ND-BCR17-RG across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ND-BCR17-RG Results](#)

(4) Grand River National Grassland

We obtained results for Grand River National Grassland by analyzing data from one stratum.

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Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 67 point counts within the six surveyed grid cells between June 1 and June 11. They detected 48 bird species, including six priority species ([Appendix H](#)).

Bird Conservancy estimated densities and population sizes for 69 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 13 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout SD-BCR17-RG for 64 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 18 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within SD-BCR17-RG across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[SD-BCR17-RG Results](#)

2. Region 2

a) Region 2 National Forests

Within this sampling design each national forest in Region 2 is stratified separately. In this section of the report, we summarize results for all Region 2 Forests combined, followed by summaries for each individual Forest.

(1) Region 2 National Forests: Total

We obtained results for Region 2 National Forests by compiling and jointly analyzing data from 25 strata in four states. This forest-level stratification distinction is made to allow for the summation of the data for individual Forests, BCRs and States.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 1295 point counts within the 110 surveyed grid cells between May 28 and July 18. They detected 181 bird species, including 13 priority species ([Appendix I](#)).

Bird Conservancy estimated densities and population sizes for 214 species that were detected in any year during which surveys were conducted, 17 of which are priority species. The data yielded robust density estimates (CV < 50%) for 87 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout USFS-Region 2 National Forests for 218 species that were detected in any year during which surveys were conducted, 19 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 126 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within USFS-Region 2 National Forests across all years of the project, follow the web link

below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[USFS-Region 2 National Forests Results](#)

(2) Arapaho and Roosevelt National Forests

We obtained results for Arapaho and Roosevelt National Forests by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 102 point counts within the nine surveyed grid cells between June 10 and July 2. They detected 54 bird species, including four priority species ([Appendix I](#)).

Bird Conservancy estimated densities and population sizes for 116 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust density estimates (CV < 50%) for 34 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Arapaho and Roosevelt National Forests for 117 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 48 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Arapaho and Roosevelt National Forests across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Arapaho and Roosevelt National Forests Results](#)

(3) Bighorn National Forest

We obtained results for Bighorn National Forest by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 90 point counts within the eight surveyed grid cells between June 18 and June 25. They detected 62 bird species, including ten priority species ([Appendix I](#)).

Bird Conservancy estimated densities and population sizes for 98 species that were detected in any year during which surveys were conducted, five of which are priority species. The data yielded robust density estimates (CV < 50%) for 29 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BCR10-BI for 98 species that were detected in any year during which surveys were conducted, five of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 34 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR10-BI across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR10-BI Results](#)

(4) Black Hills National Forest

We obtained results for the Black Hills National Forest by compiling and jointly analyzing data from three strata spanning two states. This forest-level stratification distinction is made to allow for the summation of the data for individual states. In 2011, the South Dakota Black Hills National Forest stratum was split into two strata based on watersheds in the Forest: Hydrologic Code 7 Watersheds and all other watersheds. This stratification by watershed allows for adjusting sampling intensity to target Management Indicator Species on the Forest.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 105 point counts within the 11 surveyed grid cells between June 1 and July 18. They detected 82 bird species, including five priority species ([Appendix I](#)).

Bird Conservancy estimated densities and population sizes for 139 species that were detected in any year during which surveys were conducted, ten of which are priority species. The data yielded robust density estimates (CV < 50%) for 45 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Black Hills National Forest for 136 species that were detected in any year during which surveys were conducted, 11 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 58 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Black Hills National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Black Hills National Forest Results](#)

(5) Grand Mesa, Uncompahgre and Gunnison National Forests

We obtained results for Grand Mesa, Uncompahgre and Gunnison National Forests by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 90 point counts within the seven surveyed grid cells between June 16 and July 12. They detected 62 bird species, including three priority species ([Appendix I](#)).

Bird Conservancy estimated densities and population sizes for 104 species that were detected in any year during which surveys were conducted, seven of which are priority

species. The data yielded robust density estimates (CV < 50%) for 36 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CO-BCR16-GM for 104 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 45 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CO-BCR16-GM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CO-BCR16-GM Results](#)

(6) Medicine Bow National Forest

We obtained results for Medicine Bow National Forest by compiling and jointly analyzing data from two strata. This forest-level stratification distinction is made to allow for the summation of the data for individual BCRs.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 203 point counts within the 16 surveyed grid cells between June 5 and July 10. They detected 99 bird species, including four priority species ([Appendix I](#)).

Bird Conservancy estimated densities and population sizes for 135 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust density estimates (CV < 50%) for 55 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Medicine Bow National Forest for 135 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 66 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Medicine Bow National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Medicine Bow National Forest Results](#)

(7) Nebraska National Forests

We obtained results for Nebraska National Forests by compiling and jointly analyzing data from three strata: Nebraska National Forest Pine Ridge and Bessey Ranger Districts and Samuel R. McKelvie National Forest. This district-level stratification distinction is made to allow for the summation of the data for individual BCRs and Ranger Districts.

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Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 82 point counts within the eight surveyed grid cells between May 28 and July 1. They detected 82 bird species, including two priority species ([Appendix I](#)).

Bird Conservancy estimated densities and population sizes for 126 species that were detected in any year during which surveys were conducted, three of which are priority species. The data yielded robust density estimates (CV < 50%) for 30 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Nebraska National Forests for 120 species that were detected in any year during which surveys were conducted, three of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 54 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Nebraska National Forests across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Nebraska National Forests Results](#)

(8) Pike and San Isabel National Forests

We obtained results for Pike and San Isabel National Forests by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 116 point counts within the nine surveyed grid cells between June 10 and July 1. They detected 69 bird species, including zero priority species ([Appendix I](#)).

Bird Conservancy estimated densities and population sizes for 130 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 37 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Pike and San Isabel National Forests for 128 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 53 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Pike and San Isabel National Forests across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Pike and San Isabel National Forests Results](#)

(9) Rio Grande National Forest

We obtained results for Rio Grande National Forest by compiling and jointly analyzing data from three strata: low, medium and high elevations. From 2008-2010, the Rio Grande National Forest was contained within one forest-wide stratum. The stratum was split into three strata based on elevation prior to the 2011 field season. The new stratification by elevation allows for adjusting sampling intensity to target Management Indicator Species on the Forest. There was a land acquisition within Great Sand Dunes National Monument so during the re-stratification some samples were removed from Rio Grande National Forest and added to the RMNW stratum; 16 km² were added to the area of the RMNW strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 136 point counts within the ten surveyed grid cells between June 20 and July 12. They detected 74 bird species, including five priority species ([Appendix I](#)).

Bird Conservancy estimated densities and population sizes for 127 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust density estimates (CV < 50%) for 39 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Rio Grande National Forest for 125 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 62 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Rio Grande National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map

[Rio Grande National Forest Results](#)

(10) Routt National Forest

We obtained results for Routt National Forest by compiling and jointly analyzing data from two strata: Routt National Forest and the Williams Fork Management Unit. In 2011, the Routt National Forest and Arapaho and Roosevelt National Forests strata were reorganized and a third stratum, the Williams Fork Area, was created from the two. The Williams Fork Area is a portion of the Arapaho and Roosevelt National Forests that is included in the Routt National Forest land management plan but administered by the Arapaho and Roosevelt National Forests. This stratum allows data to be rolled-up to meet multiple needs of these two units.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 105 point counts within the nine surveyed grid cells between June 16 and July 9. They detected 65 bird species, including two priority species ([Appendix I](#)).

Bird Conservancy estimated densities and population sizes for 117 species that were detected in any year during which surveys were conducted, four of which are priority

species. The data yielded robust density estimates (CV < 50%) for 35 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Routt National Forest for 115 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 46 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Routt National Forest across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Routt National Forest Results](#)

(11) San Juan National Forest

We obtained results for San Juan National Forest by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 79 point counts within the six surveyed grid cells between June 17 and July 12. They detected 70 bird species, including eight priority species ([Appendix I](#)).

Bird Conservancy estimated densities and population sizes for 121 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust density estimates (CV < 50%) for 39 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CO-BCR16-SA for 121 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 49 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CO-BCR16-SA across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CO-BCR16-SA Results](#)

(12) Shoshone National Forest

We obtained results for Shoshone National Forest by analyzing data from two strata; front-country/managed areas and designated roadless/wilderness areas. This forest-level stratification distinction was made because of field implementation cost considerations and the desire to focus monitoring on the more highly managed areas while maintaining inference to the entire management unit.

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Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 93 point counts within the seven surveyed grid cells between July 2 and July 10. They detected 80 bird species, including three priority species ([Appendix I](#)).

Bird Conservancy estimated densities and population sizes for 141 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust density estimates (CV < 50%) for 33 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Shoshone National Forest for 143 species that were detected in any year during which surveys were conducted, five of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 45 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Shoshone National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Shoshone National Forest Results](#)

(13) White River National Forest

We obtained results for White River National Forest by compiling and jointly analyzing data from three strata: low, medium and high elevations. From 2008-2010, the White River National Forest was contained within one forest-wide stratum. The stratum was split into three strata based on elevation prior to the 2011 field season. The new stratification by elevation allows us to adjust sampling intensity to target Management Indicator Species on the Forest.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 94 point counts within the ten surveyed grid cells between June 8 and July 11. They detected 71 bird species, including three priority species ([Appendix I](#)).

Bird Conservancy estimated densities and population sizes for 118 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust density estimates (CV < 50%) for 36 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout White River National Forest for 116 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 55 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within White River National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

White River National Forest Results

b) Region 2 National Grasslands

Within this sampling design, each national grassland in Region 2 is stratified separately. This grassland-level stratification distinction is made so we can analyze the data separately for each grassland, or together as a whole. In this section of the report, we summarize results for all Region 2 grasslands combined, followed by summaries for each individual grassland.

(1) Region 2 National Grasslands: Total

We obtained results for Region 2 National Grasslands by compiling and jointly analyzing data from eight strata in five states. This grassland-level stratification distinction is made to allow for the summation of the data for individual Grasslands, BCRs, and States.

Field technicians completed 33 of 32 planned surveys (103.1%) in 2020. Technicians conducted 416 point counts within the 33 surveyed grid cells between April 30 and July 6. They detected 126 bird species, including 17 priority species ([Appendix I](#)).

Bird Conservancy estimated densities and population sizes for 169 species that were detected in any year during which surveys were conducted, 20 of which are priority species. The data yielded robust density estimates (CV < 50%) for 46 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout USFS-Region 2 National Grasslands for 181 species that were detected in any year during which surveys were conducted, 21 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 62 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within USFS-Region 2 National Grasslands across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

USFS-Region 2 National Grasslands Results

(2) Nebraska National Grasslands (Buffalo Gap, Fort Pierre and Oglala)

We obtained results for Nebraska National Grasslands by analyzing data from four strata in two states; Buffalo Gap National Grassland, Fort Pierre National Grassland, Oglala National Grassland in BCR 17 and Oglala National Grassland in BCR 18. This grassland-level stratification distinction is made so we can analyze the data separately for each grassland, or together as a whole. The BCR-level stratification distinction in Oglala National Grassland is made to allow for the summation of the data for individual BCRs.

Field technicians completed 12 of 11 planned surveys (109.1%) in 2020. Technicians conducted 142 point counts within the 12 surveyed grid cells between May 25 and July 6. They detected 86 bird species, including ten priority species ([Appendix I](#)).

Bird Conservancy estimated densities and population sizes for 132 species that were detected in any year during which surveys were conducted, 13 of which are priority

species. The data yielded robust density estimates (CV < 50%) for 20 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Nebraska National Grasslands for 132 species that were detected in any year during which surveys were conducted, 14 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 48 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Nebraska National Grasslands across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Nebraska National Grasslands Results](#)

(3) Cimarron National Grassland

We obtained results for Cimarron National Grassland by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 41 point counts within the three surveyed grid cells between April 30 and June 28. They detected 20 bird species, including 11 priority species ([Appendix I](#)).

Bird Conservancy estimated densities and population sizes for 37 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust density estimates (CV < 50%) for six of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout KS-BCR18-CM for 35 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for ten of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within KS-BCR18-CM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[KS-BCR18-CM Results](#)

(4) Comanche National Grassland

We obtained results for Comanche National Grassland by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 58 point counts within the five surveyed grid cells between May 18 and May 29. They detected 41 bird species, including seven priority species ([Appendix I](#)).

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Bird Conservancy estimated densities and population sizes for 94 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust density estimates (CV < 50%) for 18 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CO-BCR18-CO for 93 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 12 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CO-BCR18-CO across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CO-BCR18-CO Results](#)

(5) Public Lands on Pawnee National Grassland

We obtained results for Public Lands on Pawnee National Grassland by analyzing data from one stratum. In 2013, Pawnee National Grasslands was split into two strata – public lands and private lands – because Pawnee National Grasslands contains a large amount of private land within its borders. This allowed the USFS to concentrate more survey effort on public lands. We only present estimates for the public lands portion of Pawnee National Grasslands in this report.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 63 point counts within the four surveyed grid cells between May 24 and June 8. They detected 21 bird species, including ten priority species ([Appendix I](#)).

Bird Conservancy estimated densities and population sizes for 37 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust density estimates (CV < 50%) for eight of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CO-BCR18-PG for 34 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for eight of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CO-BCR18-PG across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CO-BCR18-PG Results](#)

(6) Thunder Basin National Grassland

We obtained results for Thunder Basin National Grassland by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 112 point counts within the nine surveyed grid cells between May 21 and May 30. They detected 70 bird species, including 23 priority species ([Appendix I](#)).

Bird Conservancy estimated densities and population sizes for 101 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust density estimates (CV < 50%) for 18 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BCR17-TB for 106 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 25 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR17-TB across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR17-TB Results](#)

3. Region 3

- a) In this section, we summarize results for two national grasslands in Region 3: Kiowa National Grassland and Rita Blanca National Grassland.

(1) Kiowa National Grassland

We obtained results for Kiowa National Grassland by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 39 point counts within the three surveyed grid cells between April 30 and May 21. They detected 21 bird species, including eight priority species ([Appendix J](#)).

Bird Conservancy estimated densities and population sizes for 34 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for six of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout NM-BCR18-KW for 34 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for ten of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within NM-BCR18-KW across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button

highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[NM-BCR18-KW Results](#)

(2) Rita Blanca National Grassland

We obtained results for Rita Blanca National Grassland by analyzing data from two strata corresponding to the portions of the Rita Blanca National Grassland that lie within Texas and Oklahoma. This state-level stratification distinction is made to allow for the summation of the data for individual states.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 92 point counts within the seven surveyed grid cells between May 1 and June 1. They detected 33 bird species, including one priority species ([Appendix J](#)).

Bird Conservancy estimated densities and population sizes for 54 species that were detected in any year during which surveys were conducted, one of which are priority species. The data yielded robust density estimates (CV < 50%) for 11 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Rita Blanca National Grassland for 53 species that were detected in any year during which surveys were conducted, one of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 32 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Rita Blanca National Grassland across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Rita Blanca National Grassland Results](#)

4. Region 4

- a) Within this sampling design each national forest in Region 4 is stratified separately. In this section of the report, we summarize results for all Region 4 Forests combined, followed by summaries for each individual Forest.

(1) Region 4 National Forest Total

We obtained results for USFS-Region 4 National Forests by compiling and jointly analyzing data from 36 strata in six states. In 2010, the USFS Region 4 stratum in Wyoming BCR 10 was re-stratified into three separate strata: Bridger-Teton National Forest front-country/managed areas, Bridger-Teton National Forest designated roadless/wilderness areas and the remainder of USFS Region 4 lands in Wyoming BCR 10. This ratification was done to allow for density and occupancy estimation at the national forest level for the Bridger-Teton National Forest. Similarly, in 2013 the remaining USFS Region 4 stratum was re-stratified by forest (Caribou-Targhee, Ashley, and Wasatch National Forests), allowing for forest-wide estimates within Caribou-Targhee National Forest. There were some significant stratification changes made to the BCR 10 portion of Idaho between the 2013 and 2014 field seasons. The boundary between USFS Regions 1 and 4 runs through Idaho and was taken into account when re-stratifying so that estimates could be generated at the USFS Region level. The new USFS Region 4 strata created in Idaho BCR 10 included Boise National Forest, Payette National Forest, Salmon-Challis National Forest, and Sawtooth National Forest. The Utah portion of Manti-La Sal National Forest was stratified in 2015 to provide forest-wide estimates and the BCR 16 portion of Ashley National Forest in Utah was added to the sampling frame in 2016. In 2017, we obtained region-wide estimates by completely stratifying Ashley, Boise, Dixie, Fishlake, Humboldt-Toiyabe, Salmon-Challis, Sawtooth, and Uinta-Wasatch-Cache National Forests.

Field technicians completed 144 out of 142 planned surveys (101.4%) in 2020. Technicians conducted 1689 point counts within the 144 surveyed grid cells between May 6 and July 16. They detected 177 bird species, including nine priority species ([Appendix K](#)).

Bird Conservancy estimated densities and population sizes for 188 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust density estimates (CV < 50%) for 92 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout USFS-Region 4 National Forests for 201 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 144 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within USFS-Region 4 National Forests across all years of the project, follow the web link below. Hit "Ok" on the Rocky Mountain Avian Data Center Disclaimer and hit the "Run Query" button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[USFS-Region 4 National Forests Results](#)

(2) Ashley National Forest

We obtained results for Ashley National Forest from three strata in two states. The state-level stratification distinction is made to allow for the summation of the data for individual states. Likewise, the BCR-level stratification distinction is made to allow for

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the summation of the data for individual BCRs. In 2017, the BCR 16 portion of Ashley National Forest in Utah was restratified to include private inholdings and maintain consistency with other forests in the state.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 144 point counts within the ten surveyed grid cells between May 28 and July 9. They detected 79 bird species, including four priority species ([Appendix K](#)).

Bird Conservancy estimated densities and population sizes for 110 species that were detected in any year during which surveys were conducted, five of which are priority species. The data yielded robust density estimates (CV < 50%) for 25 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Ashley National Forest for 111 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 30 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Ashley National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Ashley National Forest Results](#)

(3) Boise National Forest

We obtained results for Boise National Forest by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 111 point counts within the ten surveyed grid cells between June 15 and July 2. They detected 75 bird species, including five priority species ([Appendix K](#)).

Bird Conservancy estimated densities and population sizes for 98 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust density estimates (CV < 50%) for 39 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Boise National Forest for 98 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 48 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Boise National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

Boise National Forest Results

(4) Bridger-Teton National Forest

In 2010, the USFS Region 4 stratum in Wyoming was re-stratified into three separate strata: Bridger-Teton National Forest front-country/managed areas, Bridger-Teton National Forest designated roadless/wilderness areas and the remainder of USFS Region 4 lands in Wyoming BCR 10. We separated this forest from the rest of the Region 4 USFS lands to estimate density and occupancy at the National Forest level for the Bridger-Teton National Forest. We obtained results for Bridger-Teton National Forest by analyzing data from the front-country/managed stratum and the designated roadless/wilderness stratum. We stratified at the forest-level because of field implementation cost considerations and the desire to focus monitoring on the more highly managed areas while maintaining inference to the entire management unit.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 119 point counts within the ten surveyed grid cells between June 19 and July 9. They detected 71 bird species, including one priority species ([Appendix K](#)).

Bird Conservancy estimated densities and population sizes for 125 species that were detected in any year during which surveys were conducted, three of which are priority species. The data yielded robust density estimates (CV < 50%) for 34 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Bridger-Teton National Forest for 122 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 39 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Bridger-Teton National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

Bridger-Teton National Forest Results

(5) Caribou-Targhee National Forest

We obtained results for Caribou-Targhee National Forest by compiling and jointly analyzing data from six strata in three states. The state-level stratification distinction is made to allow for the summation of the data for individual states. Likewise, the BCR-level stratification distinction is made to allow for the summation of the data for individual BCRs.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 149 point counts within the 13 surveyed grid cells between June 2 and July 16. They detected 85 bird species, including one priority species ([Appendix K](#)).

Bird Conservancy estimated densities and population sizes for 149 species that were detected in any year during which surveys were conducted, three of which are priority species. The data yielded robust density estimates (CV < 50%) for 35 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Ψ_i) throughout Caribou-Targhee National Forest for 149 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 56 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Caribou-Targhee National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Caribou-Targhee National Forest Results](#)

(6) Dixie National Forest

We obtained results for Dixie National Forest by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 139 point counts within the ten surveyed grid cells between May 6 and June 25. They detected 90 bird species, including zero priority species ([Appendix K](#)).

Bird Conservancy estimated densities and population sizes for 101 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 49 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Ψ_i) throughout Dixie National Forest for 99 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 59 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Dixie National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Dixie National Forest Results](#)

(7) Fishlake National Forest

We obtained results for Fishlake National Forest by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 145 point counts within the ten surveyed grid cells between May 28 and June 23. They detected 81 bird species, including zero priority species ([Appendix K](#)).

Bird Conservancy estimated densities and population sizes for 88 species that were detected in any year during which surveys were conducted, zero of which are priority

species. The data yielded robust density estimates (CV < 50%) for 43 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Fishlake National Forest for 86 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 42 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Fishlake National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Fishlake National Forest Results](#)

(8) Humboldt-Toiyabe National Forest

We obtained results for Humboldt-Toiyabe National Forest by compiling and jointly analyzing data from five strata in two states.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 188 point counts within the 19 surveyed grid cells between May 17 and July 6. They detected 110 bird species, including five priority species ([Appendix K](#)).

Bird Conservancy estimated densities and population sizes for 121 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust density estimates (CV < 50%) for 47 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Humboldt-Toiyabe National Forest for 121 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 64 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Humboldt-Toiyabe National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Humboldt-Toiyabe National Forest Results](#)

(9) Manti-La Sal National Forest

We obtained results for Manti-La Sal National Forest by compiling and jointly analyzing data from three strata across two states. In 2014, a new stratum was created for Manti-La Sal National Forest in Utah. Previously, only the Colorado portion of Manti-La Sal was stratified and surveyed. In 2015, Sanpitch Recreation Area was added as an additional stratum and incorporated into forest-wide estimates for Manti-La Sal National Forest. This area is part of Uinta National Forest but administered by Manti-La Sal National

Forest. The additional Utah strata allow for the generation of forest-wide estimates for Manti-La Sal National Forest. The state-level stratification distinction is made to allow for the summation of the data for individual states.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 159 point counts within the 14 surveyed grid cells between June 1 and June 23. They detected 84 bird species, including two priority species ([Appendix K](#)).

Bird Conservancy estimated densities and population sizes for 135 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust density estimates (CV < 50%) for 43 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Manti-La Sal National Forest for 137 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 51 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Manti-La Sal National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Manti-La Sal National Forest Results](#)

(10) Payette National Forest

We obtained results for Payette National Forest by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 106 point counts within the ten surveyed grid cells between June 27 and July 6. They detected 78 bird species, including five priority species ([Appendix K](#)).

Bird Conservancy estimated densities and population sizes for 103 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust density estimates (CV < 50%) for 46 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout ID-BCR10-PA for 100 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 46 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ID-BCR10-PA across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ID-BCR10-PA Results](#)

(11) Salmon-Challis National Forest

We obtained results for Salmon-Challis National Forest by compiling and jointly analyzing data from two strata.

Field technicians completed 11 of ten planned surveys (110%) in 2020. Technicians conducted 119 point counts within the 11 surveyed grid cells between June 27 and July 10. They detected 67 bird species, including seven priority species ([Appendix K](#)).

Bird Conservancy estimated densities and population sizes for 111 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust density estimates (CV < 50%) for 38 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Salmon-Challis National Forest for 105 species that were detected in any year during which surveys were conducted, eight of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 39 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Salmon-Challis National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Salmon-Challis National Forest Results](#)

(12) Sawtooth National Forest

We obtained results for Sawtooth National Forest by compiling and jointly analyzing data from three strata in two states.

Field technicians completed 12 of 11 planned surveys (109%) in 2020. Technicians conducted 159 point counts within the 12 surveyed grid cells between June 24 and July 11. They detected 81 bird species, including two priority species ([Appendix K](#)).

Bird Conservancy estimated densities and population sizes for 109 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust density estimates (CV < 50%) for 45 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Sawtooth National Forest for 108 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 47 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Sawtooth National Forest across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

Sawtooth National Forest Results

(13) Uinta-Wasatch-Cache National Forest

We obtained results for Uinta-Wasatch-Cache National Forest from five strata in two states. The state-level stratification distinction is made to allow for the summation of the data for individual states. Likewise, the BCR-level stratification distinction is made to allow for the summation of the data for individual BCRs.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 151 point counts within the 15 surveyed grid cells between May 25 and July 13. They detected 91 bird species, including two priority species ([Appendix K](#)).

Bird Conservancy estimated densities and population sizes for 109 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust density estimates (CV < 50%) for 33 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Ψ_i) throughout Uinta-Wasatch-Cache National Forest for 110 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 44 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Uinta-Wasatch-Cache National Forest across all years of the project, follow the web link below. Hit "Ok" on the Rocky Mountain Avian Data Center Disclaimer and hit the "Run Query" button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

Uinta-Wasatch-Cache National Forest Results

b) Curlew National Grassland

Within this sampling design each national grassland in Region 4 is stratified separately. In this section of the report, we summarize results for Curlew National grassland which is the only grassland in Region 4.

(1) Curlew National Grassland

We obtained results for Curlew National Grassland BCR 17 by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 61 point counts within the five surveyed grid cells between May 24 and May 28. They detected 40 bird species, including six priority species ([Appendix K](#)).

Bird Conservancy estimated densities and population sizes for 73 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 12 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Ψ_i) throughout ID-BCR9-CU for 72 species that were detected in any year during which

surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 18 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ID-BCR9-CU across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ID-BCR9-CU Results](#)

B. Bureau of Land Management

Jump to:

[BLM in California](#)

[BLM in Colorado](#)

[BLM in Idaho](#)

[BLM in Montana](#)

[BLM in North Dakota](#)

[BLM in Nevada](#)

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[BLM South Dakota](#)

[BLM in Utah](#)

[BLM in Wyoming](#)

1. BLM in California BCR 9

a) California BCR9 BLM

We obtained results for CA-BCR9 BLM by compiling and jointly analyzing data from four strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 158 point counts within the 15 surveyed grid cells between June 13 and July 9. They detected 66 bird species, including zero priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 77 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 26 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CA-BCR9 BLM for 73 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 21 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CA-BCR9 BLM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CA-BCR9 BLM Results](#)

b) Carson City District

We obtained results for BLM Carson City District by analyzing data from one stratum.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 30 point counts within the three surveyed grid cells between June 13 and June 23. They detected 31 bird species, including zero priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 39 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 12 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CA-BCR9-CC for 37 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 15 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CA-BCR9-CC across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CA-BCR9-CC Results](#)

c) California Desert District

We obtained results for BLM California Desert District by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 26 point counts within the three surveyed grid cells between June 16 and June 18. They detected 21 bird species, including zero priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 33 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for four of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CA-BCR9-CD for 30 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for three of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CA-BCR9-CD across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CA-BCR9-CD Results](#)

d) Central California District

We obtained results for BLM Central California District by analyzing data from one stratum.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 55 point counts within the five surveyed grid cells between June 14 and July 6. They detected 24 bird species, including zero priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 30 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for four of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CA-BCR9-CN for 28 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for five of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CA-BCR9-CN across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CA-BCR9-CN Results](#)

e) Northern California District

We obtained results for BLM Northern California by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 47 point counts within the four surveyed grid cells between June 25 and July 9. They detected 51 bird species, including zero priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 54 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 22 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CA-BCR9-NC for 52 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 11 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CA-BCR9-NC across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CA-BCR9-NC Results](#)

2. BLM in Colorado

a) BLM in Colorado: Total

We obtained results for all BLM lands in Colorado by compiling and jointly analyzing data from two strata.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 384 point counts within the 32 surveyed grid cells between May 16 and July 8. They detected 102 bird species, including three priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 147 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust density estimates (CV < 50%) for 57 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CO-BLM for 159 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 74 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CO-BLM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CO-BLM Results](#)

b) BLM in Colorado BCR 10

We obtained results for BLM lands in Colorado BCR 10 by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 86 point counts within the eight surveyed grid cells between May 27 and June 10. They detected 48 bird species, including eight priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 101 species that were detected in any year during which surveys were conducted, five of which are priority species. The data yielded robust density estimates (CV < 50%) for 21 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CO-BCR10-BL for 97 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 27 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CO-BCR10-BL across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CO-BCR10-BL Results](#)

c) BLM in Colorado BCR 16

We obtained results for BLM lands in Colorado BCR 16 by analyzing data from one stratum.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 298 point counts within the 24 surveyed grid cells between May 16 and July 8. They detected 97 bird species, including eight priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 154 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust density estimates (CV < 50%) for 55 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CO-BCR16-BL for 151 species that were detected in any year during which surveys were conducted, five of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 70 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CO-BCR16-BL across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CO-BCR16-BL Results](#)

3. BLM in Idaho

a) BLM in Idaho: Total

We obtained results for all BLM lands in Idaho by compiling and jointly analyzing data from 21 strata.

Field technicians completed 134 of 135 planned surveys (99.3%) in 2020. Technicians conducted 1749 point counts within the 134 surveyed grid cells between May 28 and July 9. They detected 174 bird species, including 19 priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 182 species that were detected in any year during which surveys were conducted, 21 of which are priority species. The data yielded robust density estimates (CV < 50%) for 82 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout ID-BLM for 189 species that were detected in any year during which surveys were conducted, 21 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 126 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ID-BLM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ID-BLM Results](#)

b) BLM in Idaho BCR 9

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

We obtained results for BLM lands in Idaho BCR 9 by compiling and jointly analyzing data from 12 strata

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 1302 point counts within the 95 surveyed grid cells between May 28 and July 6. They detected 143 bird species, including 17 priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 163 species that were detected in any year during which surveys were conducted, 19 of which are priority species. The data yielded robust density estimates (CV < 50%) for 69 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout ID-BCR9-BLM for 165 species that were detected in any year during which surveys were conducted, 19 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 89 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ID-BCR9-BLM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ID-BCR9-BLM Results](#)

c) BLM in Idaho BCR 10

We obtained results for BLM lands in Idaho BCR 10 by compiling and jointly analyzing data from eight strata.

Field technicians completed 36 of 37 planned surveys (97.3%) in 2020. Technicians conducted 418 point counts within the 36 surveyed grid cells between May 29 and July 9. They detected 131 bird species, including 13 priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 144 species that were detected in any year during which surveys were conducted, 17 of which are priority species. The data yielded robust density estimates (CV < 50%) for 61 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout ID-BCR10-BLM for 147 species that were detected in any year during which surveys were conducted, 16 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 98 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ID-BCR10-BLM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ID-BCR10-BLM Results](#)

d) Challis Field Office

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

We obtained results for the BLM Challis Field Office lands by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 118 point counts within the ten surveyed grid cells between June 6 and July 1. They detected 68 bird species, including six priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 88 species that were detected in any year during which surveys were conducted, nine of which are priority species. The data yielded robust density estimates (CV < 50%) for 28 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout ID-BLM - Challis Field Office for 89 species that were detected in any year during which surveys were conducted, nine of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 35 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ID-BLM - Challis Field Office across all years of the project, follow the web link below. Hit "OK" on the Rocky Mountain Avian Data Center Disclaimer and hit the "Run Query" button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ID-BLM - Challis Field Office Results](#)

e) Cottonwood Field Office

We obtained results for BLM Cottonwood Field Office by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 121 point counts within the 11 surveyed grid cells between June 22 and July 9. They detected 79 bird species, including six priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 85 species that were detected in any year during which surveys were conducted, five of which are priority species. The data yielded robust density estimates (CV < 50%) for 46 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout ID-BLM - Cottonwood Field Office for 82 species that were detected in any year during which surveys were conducted, five of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 51 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ID-BLM - Cottonwood Field Office across all years of the project, follow the web link below. Hit "OK" on the Rocky Mountain Avian Data Center Disclaimer and hit the "Run Query" button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ID-BLM - Cottonwood Field Office Results](#)

f) Coeur d'Alene Field Office

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

We obtained results for BLM Coeur d'Alene Field Office by analyzing data from one stratum. Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 117 point counts within the ten surveyed grid cells between May 30 and July 3. They detected 69 bird species, including three priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 81 species that were detected in any year during which surveys were conducted, five of which are priority species. The data yielded robust density estimates (CV < 50%) for 40 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout ID-BCR10-CA for 83 species that were detected in any year during which surveys were conducted, five of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 47 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ID-BCR10-CA across all years of the project, follow the web link below. Hit "Ok" on the Rocky Mountain Avian Data Center Disclaimer and hit the "Run Query" button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ID-BCR10-CA Results](#)

g) Four Rivers Field Office

We obtained results for BLM Four Rivers Field Office by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 52 point counts within the five surveyed grid cells between June 12 and June 19. They detected 56 bird species, including ten priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 69 species that were detected in any year during which surveys were conducted, ten of which are priority species. The data yielded robust density estimates (CV < 50%) for 22 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout ID-BCR10-FR for 67 species that were detected in any year during which surveys were conducted, nine of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 19 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ID-BCR10-FR across all years of the project, follow the web link below. Hit "Ok" on the Rocky Mountain Avian Data Center Disclaimer and hit the "Run Query" button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ID-BCR10-FR Results](#)

h) Pocatello Field Office

We obtained results for BLM Pocatello Field Office by compiling and jointly analyzing data from three strata.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed 11 of 12 planned surveys (91.7%) in 2020. Technicians conducted 126 point counts within the 11 surveyed grid cells between June 10 and July 6. They detected 83 bird species, including six priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 97 species that were detected in any year during which surveys were conducted, nine of which are priority species. The data yielded robust density estimates (CV < 50%) for 37 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout ID-BLM - Pocatello Field Office for 97 species that were detected in any year during which surveys were conducted, nine of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 38 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ID-BLM - Pocatello Field Office across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ID-BLM - Pocatello Field Office Results](#)

i) Salmon Field Office

We obtained results for BLM Salmon Field Office lands by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 127 point counts within the ten surveyed grid cells between June 23 and July 5. They detected 69 bird species, including six priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 90 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust density estimates (CV < 50%) for 30 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout ID-BLM - Salmon Field Office for 87 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 44 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ID-BLM - Salmon Field Office across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ID-BLM - Salmon Field Office Results](#)

j) Shoshone Field Office

We obtained results for BLM Shoshone Field Office by compiling and jointly analyzing data from two strata.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 149 point counts within the 11 surveyed grid cells between May 28 and June 22. They detected 58 bird species, including eight priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 79 species that were detected in any year during which surveys were conducted, nine of which are priority species. The data yielded robust density estimates (CV < 50%) for 20 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout ID-BLM - Shoshone Field Office for 90 species that were detected in any year during which surveys were conducted, 12 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 24 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ID-BLM - Shoshone Field Office across all years of the project, follow the web link below. Hit "Ok" on the Rocky Mountain Avian Data Center Disclaimer and hit the "Run Query" button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ID-BLM - Shoshone Field Office Results](#)

k) Upper Snake Field Office

We obtained results for BLM Upper Snake Field Office lands by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 147 point counts within the 11 surveyed grid cells between June 1 and June 29. They detected 49 bird species, including eight priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 75 species that were detected in any year during which surveys were conducted, 11 of which are priority species. The data yielded robust density estimates (CV < 50%) for 23 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout ID-BLM - Upper Snake Field Office for 75 species that were detected in any year during which surveys were conducted, 12 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 16 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ID-BLM - Upper Snake Field Office across all years of the project, follow the web link below. Hit "Ok" on the Rocky Mountain Avian Data Center Disclaimer and hit the "Run Query" button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ID-BLM - Upper Snake Field Office Results](#)

l) Bruneau Field Office

We obtained results for BLM Bruneau Field Office by analyzing data from one stratum.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 156 point counts within the ten surveyed grid cells between May 29 and June 24. They detected 52 bird species, including eight priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 86 species that were detected in any year during which surveys were conducted, ten of which are priority species. The data yielded robust density estimates (CV < 50%) for 22 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout ID-BCR9-BR for 78 species that were detected in any year during which surveys were conducted, nine of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 16 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ID-BCR9-BR across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ID-BCR9-BR Results](#)

m) Burley Field Office

We obtained results for BLM Burley Field Office by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 152 point counts within the ten surveyed grid cells between May 31 and June 23. They detected 53 bird species, including eight priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 66 species that were detected in any year during which surveys were conducted, 14 of which are priority species. The data yielded robust density estimates (CV < 50%) for 19 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout ID-BCR9-BU for 67 species that were detected in any year during which surveys were conducted, 14 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 21 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ID-BCR9-BU across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ID-BCR9-BU Results](#)

n) Jarbidge Field Office

We obtained results for BLM Jarbidge Field Office by analyzing data from one stratum.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 139 point counts within the ten surveyed grid cells between June 5 and June 25. They detected 22 bird species, including seven priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 34 species that were detected in any year during which surveys were conducted, ten of which are priority species. The data yielded robust density estimates (CV < 50%) for nine of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout ID-BCR9-JA for 34 species that were detected in any year during which surveys were conducted, ten of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for nine of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ID-BCR9-JA across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ID-BCR9-JA Results](#)

o) Owyhee Field Office

We obtained results for BLM Owyhee Field Office by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 154 point counts within the ten surveyed grid cells between June 7 and June 27. They detected 59 bird species, including ten priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 78 species that were detected in any year during which surveys were conducted, 11 of which are priority species. The data yielded robust density estimates (CV < 50%) for 28 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout ID-BCR9-OW for 78 species that were detected in any year during which surveys were conducted, 11 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 22 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ID-BCR9-OW across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ID-BCR9-OW Results](#)

4. BLM in Montana

a) BLM in Montana: Total

We obtained results for all BLM lands in Montana by compiling and jointly analyzing data from five strata.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed 34 of 37 planned surveys (91.9%) in 2020. Technicians conducted 396 point counts within the 34 surveyed grid cells between May 21 and July 6. They detected 136 bird species, including 12 priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 172 species that were detected in any year during which surveys were conducted, 16 of which are priority species. The data yielded robust density estimates (CV < 50%) for 55 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout MT-BLM for 173 species that were detected in any year during which surveys were conducted, 15 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 84 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within MT-BLM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[MT-BLM Results](#)

b) BLM in Montana BCR 10

We obtained results for BLM lands in Montana BCR 10 by compiling and jointly analyzing data from two strata.

Field technicians completed six of seven planned surveys (85.7%) in 2020. Technicians conducted 72 point counts within the six surveyed grid cells between May 27 and July 5. They detected 75 bird species, including five priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 123 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust density estimates (CV < 50%) for 34 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout MT-BCR10-BLM for 122 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 37 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within MT-BCR10-BLM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[MT-BCR10-BLM Results](#)

c) BLM in Montana BCR 11

We obtained results for BLM lands in Montana BCR 11 by compiling and jointly analyzing data from two strata.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed 18 of 20 planned surveys (90%) in 2020. Technicians conducted 203 point counts within the 18 surveyed grid cells between June 9 and July 6. They detected 76 bird species, including 11 priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 106 species that were detected in any year during which surveys were conducted, 13 of which are priority species. The data yielded robust density estimates (CV < 50%) for 25 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout MT-BCR11-BLM for 106 species that were detected in any year during which surveys were conducted, 13 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 41 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within MT-BCR11-BLM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[MT-BCR11-BLM Results](#)

d) BLM in Montana BCR 17

We obtained results for BLM lands in Montana BCR 17 by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 121 point counts within the ten surveyed grid cells between May 21 and June 22. They detected 62 bird species, including 15 priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 105 species that were detected in any year during which surveys were conducted, 12 of which are priority species. The data yielded robust density estimates (CV < 50%) for 22 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout MT-BCR17-BL for 104 species that were detected in any year during which surveys were conducted, 11 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 25 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within MT-BCR17-BL across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[MT-BCR17-BL Results](#)

5. BLM Nevada BCR 9

a) Nevada BCR9 BLM

We obtained results for NV-BCR9 BLM by compiling and jointly analyzing data from seven strata.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 952 point counts within the 79 surveyed grid cells between May 13 and July 9. They detected 96 bird species, including zero priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 97 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 36 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout NV-BCR9 BLM for 95 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 40 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within NV-BCR9 BLM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[NV-BCR9 BLM Results](#)

b) Battle Mountain District

We obtained results for BLM Battle Mountain District by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 189 point counts within the 15 surveyed grid cells between June 1 and June 29. They detected 41 bird species, including zero priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 52 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 14 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout NV-BCR9-BM for 47 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for six of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within NV-BCR9-BM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[NV-BCR9-BM Results](#)

c) Carson City District

We obtained results for BLM Carson City District Office by analyzing data from one stratum.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 98 point counts within the eight surveyed grid cells between June 10 and June 23. They detected 30 bird species, including zero priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 45 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for seven of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout NV-BCR9-CC for 39 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for seven of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within NV-BCR9-CC across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[NV-BCR9-CC Results](#)

d) Elko, Twin Falls, and Boise Districts

We obtained results for BLM Elko, Twin Falls, and Boise District Offices by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 170 point counts within the 15 surveyed grid cells between June 23 and July 1. They detected 31 bird species, including zero priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 36 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 14 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout NV-BCR9-EK for 35 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for eight of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within NV-BCR9-EK across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[NV-BCR9-EK Results](#)

e) Ely District

We obtained results for BLM Ely District by analyzing data from one stratum.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (106.7%) in 2020. Technicians conducted 221 point counts within the 16 surveyed grid cells between May 13 and June 27. They detected 56 bird species, including zero priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 56 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 21 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout NV-BCR9-EY for 57 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 14 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within NV-BCR9-EY across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[NV-BCR9-EY Results](#)

f) Northern California District

We obtained results for BLM Northern California District by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 46 point counts within the four surveyed grid cells between July 2 and July 9. They detected 29 bird species, including zero priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 38 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 12 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout NV-BCR9-NC for 36 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for six of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within NV-BCR9-NC across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[NV-BCR9-NC Results](#)

g) Southern Nevada District

We obtained results for BLM Southern Nevada District by analyzing data from one stratum.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 33 point counts within the three surveyed grid cells between May 14 and May 16. They detected 18 bird species, including zero priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 21 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for five of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout NV-BCR9-SN for 19 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for nine of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within NV-BCR9-SN across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[NV-BCR9-SN Results](#)

h) Winnemucca District

We obtained results for BLM Winnemucca District by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 195 point counts within the 17 surveyed grid cells between June 27 and July 9. They detected 48 bird species, including zero priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 48 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 17 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout NV-BCR9-WI for 48 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for ten of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within NV-BCR9-WI across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[NV-BCR9-WI Results](#)

6. BLM in Oregon BCR 9

a) OR-BCR9 BLM

We obtained results for OR-BCR9 BLM by compiling and jointly analyzing data from four strata.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 244 point counts within the 16 surveyed grid cells between June 1 and June 22. They detected 63 bird species, including nine priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 93 species that were detected in any year during which surveys were conducted, 11 of which are priority species. The data yielded robust density estimates (CV < 50%) for 32 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout OR-BCR9 BLM for 95 species that were detected in any year during which surveys were conducted, eight of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 36 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within OR-BCR9 BLM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[OR-BCR9 BLM Results](#)

b) Burns District

We obtained results for BLM Burns District by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 62 point counts within the four surveyed grid cells between June 9 and June 22. They detected 32 bird species, including seven priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 59 species that were detected in any year during which surveys were conducted, nine of which are priority species. The data yielded robust density estimates (CV < 50%) for 14 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout OR-BCR9-BU for 57 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 11 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within OR-BCR9-BU across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[OR-BCR9-BU Results](#)

c) Lakeview and Medford Districts

We obtained results for BLM Lakeview and Medford Districts by analyzing data from one stratum.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 64 point counts within the four surveyed grid cells between June 1 and June 4. They detected 33 bird species, including seven priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 54 species that were detected in any year during which surveys were conducted, eight of which are priority species. The data yielded robust density estimates (CV < 50%) for 12 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout OR-BCR9-LA for 53 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 13 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within OR-BCR9-LA across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[OR-BCR9-LA Results](#)

d) Prineville District

We obtained results for BLM Prineville District by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 57 point counts within the four surveyed grid cells between June 5 and June 8. They detected 43 bird species, including six priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 60 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust density estimates (CV < 50%) for 23 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout OR-BCR9-PR for 59 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 21 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within OR-BCR9-PR across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[OR-BCR9-PR Results](#)

e) Vale District

We obtained results for BLM Vale District by analyzing data from one stratum.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 61 point counts within the four surveyed grid cells between June 13 and June 18. They detected 23 bird species, including seven priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 29 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust density estimates (CV < 50%) for ten of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout OR-BCR9-VA for 27 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 14 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within OR-BCR9-VA across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[OR-BCR9-VA Results](#)

7. BLM in North Dakota BCR 17

We obtained results for BLM lands in North Dakota BCR 17 by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 75 point counts within the seven surveyed grid cells between June 1 and July 2. They detected 82 bird species, including 25 priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 104 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust density estimates (CV < 50%) for 32 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout ND-BCR17-BM for 98 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 31 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ND-BCR17-BM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ND-BCR17-BM Results](#)

8. BLM in South Dakota BCR 17

We obtained results for BLM lands in South Dakota BCR 17 by analyzing data from one stratum.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 76 point counts within the seven surveyed grid cells between June 14 and July 19. They detected 72 bird species, including 11 priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 129 species that were detected in any year during which surveys were conducted, 15 of which are priority species. The data yielded robust density estimates (CV < 50%) for 26 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout SD-BCR17-BM for 125 species that were detected in any year during which surveys were conducted, 15 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 25 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within SD-BCR17-BM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[SD-BCR17-BM Results](#)

9. BLM in Utah

a) BLM in Utah: Total

We obtained results for all BLM lands in Utah by compiling and jointly analyzing data from 19 strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 841 point counts within the 64 surveyed grid cells between May 3 and July 5. They detected 114 bird species, including 19 priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 147 species that were detected in any year during which surveys were conducted, 26 of which are priority species. The data yielded robust density estimates (CV < 50%) for 63 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BLM for 148 species that were detected in any year during which surveys were conducted, 25 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 80 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BLM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BLM Results](#)

b) BLM in Utah BCR 9

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

We obtained results for BLM lands in Utah BCR 9 by compiling and jointly analyzing data from five strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 286 point counts within the 21 surveyed grid cells between May 9 and June 17. They detected 80 bird species, including 15 priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 126 species that were detected in any year during which surveys were conducted, 24 of which are priority species. The data yielded robust density estimates (CV < 50%) for 33 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR9 BLM for 119 species that were detected in any year during which surveys were conducted, 21 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 33 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR9 BLM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR9 BLM Results](#)

c) BLM in Utah BCR 10

We obtained results for BLM lands in Utah BCR 10 by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 72 point counts within the five surveyed grid cells between May 29 and July 5. They detected 40 bird species, including eight priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 56 species that were detected in any year during which surveys were conducted, ten of which are priority species. The data yielded robust density estimates (CV < 50%) for 18 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR10 BLM for 73 species that were detected in any year during which surveys were conducted, 12 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 27 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR10 BLM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR10 BLM Results](#)

d) BLM in Utah BCR 16

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We obtained results for BLM lands in Utah BCR 16 by compiling and jointly analyzing data from 11 strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 451 point counts within the 36 surveyed grid cells between May 7 and June 25. They detected 98 bird species, including 16 priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 127 species that were detected in any year during which surveys were conducted, 19 of which are priority species. The data yielded robust density estimates (CV < 50%) for 56 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR16 BLM for 124 species that were detected in any year during which surveys were conducted, 18 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 70 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR16 BLM across all years of the project, follow the web link below. Hit "Ok" on the Rocky Mountain Avian Data Center Disclaimer and hit the "Run Query" button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR16 BLM Results](#)

e) Cedar City Field Office

We obtained results for BLM Cedar City Field Office lands by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 82 point counts within the six surveyed grid cells between May 8 and June 17. They detected 55 bird species, including nine priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 77 species that were detected in any year during which surveys were conducted, 12 of which are priority species. The data yielded robust density estimates (CV < 50%) for 23 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BLM - Cedar City Field Office for 85 species that were detected in any year during which surveys were conducted, 13 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 18 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BLM - Cedar City Field Office across all years of the project, follow the web link below. Hit "Ok" on the Rocky Mountain Avian Data Center Disclaimer and hit the "Run Query" button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BLM - Cedar City Field Office Results](#)

f) Fillmore Field Office

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We obtained results for BLM Fillmore Field Office lands by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 115 point counts within the eight surveyed grid cells between May 9 and May 17. They detected 44 bird species, including eight priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 72 species that were detected in any year during which surveys were conducted, 13 of which are priority species. The data yielded robust density estimates (CV < 50%) for 15 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BLM - Fillmore Field Office for 70 species that were detected in any year during which surveys were conducted, 11 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 13 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BLM - Fillmore Field Office across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BLM - Fillmore Field Office Results](#)

g) Kanab Field Office

We obtained results for BLM Kanab Field Office lands by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 46 point counts within the three surveyed grid cells between May 23 and May 26. They detected 45 bird species, including seven priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 67 species that were detected in any year during which surveys were conducted, ten of which are priority species. The data yielded robust density estimates (CV < 50%) for 22 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR16-KA for 66 species that were detected in any year during which surveys were conducted, ten of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 18 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR16-KA across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR16-KA Results](#)

h) Moab Field Office

We obtained results for BLM Moab Field Office lands by analyzing data from one stratum.

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Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 36 point counts within the four surveyed grid cells between May 7 and June 6. They detected 41 bird species, including six priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 62 species that were detected in any year during which surveys were conducted, eight of which are priority species. The data yielded robust density estimates (CV < 50%) for 16 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR16-MO for 57 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 19 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR16-MO across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR16-MO Results](#)

i) Monticello Field Office

We obtained results for BLM Monticello Field Office lands by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 55 point counts within the four surveyed grid cells between June 14 and June 17. They detected 26 bird species, including three priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 51 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust density estimates (CV < 50%) for 12 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR16-MN for 49 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 18 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR16-MN across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR16-MN Results](#)

j) Price Field Office

We obtained results for BLM Price Field Office lands by analyzing data from one stratum.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 68 point counts within the five surveyed grid cells between May 13 and June 5. They detected 48 bird species, including five priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 79 species that were detected in any year during which surveys were conducted, nine of which are priority species. The data yielded robust density estimates (CV < 50%) for 20 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR16-PR for 74 species that were detected in any year during which surveys were conducted, nine of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for six of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR16-PR across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR16-PR Results](#)

k) Richfield Field Office

We obtained results for BLM Richfield Field Office lands by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 86 point counts within the seven surveyed grid cells between May 14 and June 1. They detected 51 bird species, including eight priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 67 species that were detected in any year during which surveys were conducted, 14 of which are priority species. The data yielded robust density estimates (CV < 50%) for 19 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BLM - Richfield Field Office for 77 species that were detected in any year during which surveys were conducted, 13 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 15 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BLM - Richfield Field Office across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BLM - Richfield Field Office Results](#)

l) Saint George Field Office

We obtained results for BLM Saint George Field Office lands by compiling and jointly analyzing data from three strata.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 97 point counts within the seven surveyed grid cells between May 3 and May 13. They detected 66 bird species, including eight priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 88 species that were detected in any year during which surveys were conducted, 14 of which are priority species. The data yielded robust density estimates (CV < 50%) for 28 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BLM - Saint George Field Office for 88 species that were detected in any year during which surveys were conducted, 14 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 27 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BLM - Saint George Field Office across all years of the project, follow the web link below. Hit "OK" on the Rocky Mountain Avian Data Center Disclaimer and hit the "Run Query" button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BLM - Saint George Field Office Results](#)

m) Salt Lake Field Office

We obtained results for BLM Salt Lake Field Office lands by compiling and jointly analyzing data from three strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 139 point counts within the 11 surveyed grid cells between May 19 and June 25. They detected 59 bird species, including 12 priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 107 species that were detected in any year during which surveys were conducted, 21 of which are priority species. The data yielded robust density estimates (CV < 50%) for 19 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BLM - Salt Lake Field Office for 99 species that were detected in any year during which surveys were conducted, 18 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 11 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BLM - Salt Lake Field Office across all years of the project, follow the web link below. Hit "OK" on the Rocky Mountain Avian Data Center Disclaimer and hit the "Run Query" button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BLM - Salt Lake Field Office Results](#)

n) Vernal Field Office

We obtained results for BLM Vernal Field Office lands by compiling and jointly analyzing data from two strata.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 63 point counts within the five surveyed grid cells between May 27 and July 5. They detected 41 bird species, including eight priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 78 species that were detected in any year during which surveys were conducted, 11 of which are priority species. The data yielded robust density estimates (CV < 50%) for 15 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BLM - Vernal Field Office for 79 species that were detected in any year during which surveys were conducted, 11 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 15 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BLM - Vernal Field Office across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BLM - Vernal Field Office Results](#)

10. BLM in Wyoming

a) BLM in Wyoming: Total

We obtained results for BLM lands in Wyoming by compiling and jointly analyzing data from 14 strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 666 point counts within the 54 surveyed grid cells between May 22 and July 14. They detected 133 bird species, including nine priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 176 species that were detected in any year during which surveys were conducted, 13 of which are priority species. The data yielded robust density estimates (CV < 50%) for 55 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BLM for 170 species that were detected in any year during which surveys were conducted, 12 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 77 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-BLM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BLM Results](#)

b) BLM in Wyoming BCR 16

We obtained results for BLM lands in Wyoming BCR 16 by analyzing data from one stratum.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 14 point counts within the two surveyed grid cells between June 11 and June 12. They detected 37 bird species, including five priority species ([Appendix G](#)).

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR16-BL across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR16-BL Results](#)

c) BLM in Wyoming BCR 18

We obtained results for BLM lands in Wyoming BCR 18 by analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 17 point counts within the two surveyed grid cells between June 2 and June 8. They detected 18 bird species, including nine priority species ([Appendix G](#)).

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR18-BL across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR18-BL Results](#)

d) Buffalo Field Office

We obtained results for BLM Buffalo Field Office lands by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 53 point counts within the four surveyed grid cells between May 26 and July 14. They detected 69 bird species, including one priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 107 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust density estimates (CV < 50%) for 23 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BLM-Buffer for 101 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 27 of the species for which we estimated occupancies.

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To view a map of survey locations, density and occupancy results and species counts within WY-BLM-Buffer across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BLM-Buffer Results](#)

e) Casper Field Office

We obtained results for BLM Casper Field Office lands by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 37 point counts within the four surveyed grid cells between June 6 and June 16. They detected 36 bird species, including two priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 89 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust density estimates (CV < 50%) for 16 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BLM-Casper for 85 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 17 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-BLM-Casper across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BLM-Casper Results](#)

f) Cody Field Office

We obtained results for BLM Cody Field Office lands by analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 26 point counts within the two surveyed grid cells between May 22 and May 30. They detected 33 bird species, including six priority species ([Appendix G](#)).

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR10-CO across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

WY-BCR10-CO Results

g) Kemmerer Field Office

We obtained results for BLM Kemmerer Field Office lands by analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 28 point counts within the two surveyed grid cells between May 25 and June 11. They detected 27 bird species, including six priority species ([Appendix G](#)).

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR10-KE across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

WY-BCR10-KE Results

h) Lander Field Office

We obtained results for BLM Lander Field Office lands by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 73 point counts within the six surveyed grid cells between June 10 and June 17. They detected 52 bird species, including 11 priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 84 species that were detected in any year during which surveys were conducted, eight of which are priority species. The data yielded robust density estimates (CV < 50%) for 21 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BCR10-LA for 80 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 18 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR10-LA across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

WY-BCR10-LA Results

i) Newcastle Field Office

We obtained results for BLM Newcastle Field Office lands by analyzing data from one stratum.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 18 point counts within the two surveyed grid cells between May 25 and June 9. They detected 25 bird species, including eight priority species ([Appendix G](#)).

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR17-NE across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR17-NE Results](#)

j) Pinedale Field Office

We obtained results for BLM Pinedale Field Office lands by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 112 point counts within the eight surveyed grid cells between May 30 and June 18. They detected 54 bird species, including nine priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 90 species that were detected in any year during which surveys were conducted, five of which are priority species. The data yielded robust density estimates (CV < 50%) for 20 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BCR10-PI for 91 species that were detected in any year during which surveys were conducted, five of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 14 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR10-PI across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR10-PI Results](#)

k) Rawlins Field Office

We obtained results for BLM Rawlins Field Office lands by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 100 point counts within the eight surveyed grid cells between June 1 and June 17. They detected 33 bird species, including nine priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 70 species that were detected in any year during which surveys were conducted, nine of which are priority species. The data yielded robust density estimates (CV < 50%) for 12 of the species for which we estimated densities.

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Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BCR10-RA for 66 species that were detected in any year during which surveys were conducted, eight of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 15 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR10-RA across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR10-RA Results](#)

l) Rock Springs Field Office

We obtained results for BLM Rock Springs Field Office lands by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 104 point counts within the eight surveyed grid cells between May 27 and June 20. They detected 53 bird species, including 12 priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 82 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust density estimates (CV < 50%) for 16 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BCR10-RO for 80 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 17 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR10-RO across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR10-RO Results](#)

m) Worland Field Office

We obtained results for BLM Worland Field Office by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 84 point counts within the six surveyed grid cells between May 25 and July 1. They detected 43 bird species, including nine priority species ([Appendix G](#)).

Bird Conservancy estimated densities and population sizes for 67 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust density estimates (CV < 50%) for 14 of the species for which we estimated densities.

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Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BCR10-WO for 64 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 19 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR10-WO across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR10-WO Results](#)

C. Department of Defense

Jump to:

[DOD Lands in Colorado BCR 18](#)

[DOD Lands in Utah BCR 9](#)

[DOD Lands in Wyoming BCR 18](#)

1. DOD Lands in Colorado BCR 18

We obtained results for DOD lands in Colorado BCR 18 by analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 21 point counts within the two surveyed grid cells between May 23 and May 30. They detected 45 bird species, including six priority species ([Appendix E](#)).

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within CO-BCR18-DO across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CO-BCR18-DO Results](#)

2. DOD Lands in Utah BCR 9

We obtained results for DOD lands in Utah BCR 9 by compiling and jointly analyzing data from six strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 444 point counts within the 32 surveyed grid cells between May 11 and June 18. They detected 43 bird species, including four priority species ([Appendix E](#)).

Bird Conservancy estimated densities and population sizes for 53 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust density estimates (CV < 50%) for 14 of the species for which we estimated densities.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR9 Department of Defense lands for 46 species that were detected in any year during which surveys were conducted, one of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 11 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR9 Department of Defense lands across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR9 Department of Defense lands Results](#)

3. All Other DOD Lands in Utah BCR 9

We obtained results for all other DOD lands in Utah BCR 9 by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 86 point counts within the seven surveyed grid cells between May 26 and June 10. They detected 32 bird species, including zero priority species ([Appendix E](#)).

Bird Conservancy estimated densities and population sizes for 44 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 11 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR9-DD for 41 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for seven of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR9-DD across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR9-DD Results](#)

4. DOD Lands in Utah BCR 9 - Mudflats

We obtained results for mudflats in DOD lands of Utah BCR 9 by analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 24 point counts within the two surveyed grid cells between June 2 and June 8. They detected two bird species, including zero priority species ([Appendix E](#)).

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR9-MU across all years of the project, follow the web link below. Hit “Ok” on the Rocky

Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

UT-BCR9-MU Results

5. DOD Lands in Utah BCR 9 – APG Impact Areas

We obtained results for APG Impact Areas in DOD lands of Utah BCR 9 by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 96 point counts within the six surveyed grid cells between May 11 and May 13. They detected 12 bird species, including zero priority species ([Appendix E](#)).

Bird Conservancy estimated densities and population sizes for 14 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for four of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR9-AP for 13 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for four of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR9-AP across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

UT-BCR9-AP Results

6. DOD Lands in Utah BCR 9 – Target S Impact Areas

We obtained results for Target S Impact Areas in DOD lands of Utah BCR 9 by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 81 point counts within the six surveyed grid cells between May 14 and May 20. They detected 13 bird species, including two priority species ([Appendix E](#)).

Bird Conservancy estimated densities and population sizes for 16 species that were detected in any year during which surveys were conducted, one of which are priority species. The data yielded robust density estimates (CV < 50%) for six of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR9-TS for 12 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for eight of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR9-TS across all years of the project, follow the web link below. Hit “Ok” on the Rocky

Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR9-TS Results](#)

7. DOD Lands in Utah BCR 9 – UTG Impact Areas

We obtained results for UTG Impact Areas in DOD lands of Utah BCR 9 by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 96 point counts within the six surveyed grid cells between May 21 and May 28. They detected three bird species, including zero priority species ([Appendix E](#)).

Bird Conservancy estimated densities and population sizes for four species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for zero of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR9-UR for three species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for one of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR9-UR across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR9-UR Results](#)

8. DOD Lands in Utah BCR 9 – UTTR Impact Areas

We obtained results for UTTR Impact Areas in DOD lands of Utah BCR 9 by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 60 point counts within the five surveyed grid cells between June 4 and June 18. They detected 20 bird species, including two priority species ([Appendix E](#)).

Bird Conservancy estimated densities and population sizes for 19 species that were detected in any year during which surveys were conducted, one of which are priority species. The data yielded robust density estimates (CV < 50%) for four of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR9-UT for 18 species that were detected in any year during which surveys were conducted, one of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for nine of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR9-UT across all years of the project, follow the web link below. Hit “Ok” on the Rocky

Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR9-UT Results](#)

9. DOD Lands in Wyoming BCR 18

We obtained results for DOD lands in Wyoming BCR 18 by analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 22 point counts within the two surveyed grid cells between June 2 and June 3. They detected 26 bird species, including five priority species ([Appendix E](#)).

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR18-DO across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR18-DO Results](#)

D. National Park Service

Jump to:

[Greater Yellowstone Network](#)

[Northern Colorado Plateau Network in Colorado](#)

[Northern Great Plains Network](#)

[Rocky Mountain Network in Colorado](#)

[Southern Colorado Plateau Network in Colorado](#)

1. Greater Yellowstone Network

a) Greater Yellowstone Network: Total

We obtained results for the Greater Yellowstone Network by compiling and jointly analyzing data from three strata.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 112 point counts within the eight surveyed grid cells between May 29 and July 11. They detected 78 bird species, including zero priority species.

Bird Conservancy estimated densities and population sizes for 125 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 30 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout NPS-Greater Yellowstone Network for 124 species that were detected in any year during

which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates ($CV < 50\%$) for 34 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within NPS-Greater Yellowstone Network across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[NPS-Greater Yellowstone Network Results](#)

b) Bighorn Canyon National Recreation Area

We obtained results for Bighorn Canyon National Recreation Area by analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 25 point counts within the two surveyed grid cells between May 29 and May 30. They detected 31 bird species, including eight priority species.

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR10-BH across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR10-BH Results](#)

c) Grand Teton National Park

We obtained results for Grand Teton National Park by analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 26 point counts within the two surveyed grid cells between May 31 and July 1. They detected 39 bird species, including seven priority species.

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR10-GR across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR10-GR Results](#)

d) Yellowstone National Park

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We obtained results for Yellowstone National Park by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 61 point counts within the four surveyed grid cells between July 7 and July 11. They detected 39 bird species, including four priority species.

Bird Conservancy estimated densities and population sizes for 84 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 21 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BCR10-YE for 83 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 24 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR10-YE across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR10-YE Results](#)

2. Northern Colorado Plateau Network in Colorado

We obtained results for the Northern Colorado Plateau Network by analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 22 point counts within the two surveyed grid cells between May 17 and June 9. They detected 36 bird species, including five priority species.

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within CO-BCR16-NC across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CO-BCR16-NC Results](#)

3. Northern Great Plains Network

a) Agate Fossil Beds National Monument

We obtained results for Agate Fossil Beds National Monument by analyzing data from one stratum.

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Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 25 point counts within the two surveyed grid cells between June 29 and July 1. They detected 34 bird species, including five priority species.

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within NE-BCR18-AF across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[NE-BCR18-AF Results](#)

b) Badlands National Park - North Unit

We obtained results for the North Unit of Badlands National Park by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 62 point counts within the seven surveyed grid cells between June 4 and June 10. They detected 52 bird species, including six priority species.

Bird Conservancy estimated densities and population sizes for 98 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 16 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout SD-BCR17-BN for 96 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 26 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within SD-BCR17-BN across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[SD-BCR17-BN Results](#)

c) Jewel Cave National Monument

We obtained results for Jewel Cave National Monument by analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 16 point counts within the two surveyed grid cells between July 12 and July 13. They detected 47 bird species, including three priority species.

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We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within SD-BCR17-JC across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[SD-BCR17-JC Results](#)

d) Knife River Indian Villages National Historic Site

We obtained results for Knife River Indian Villages National Historic Site by analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 20 point counts within the two surveyed grid cells between June 11 and June 12. They detected 68 bird species, including 11 priority species.

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within ND-BCR17-KR across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ND-BCR17-KR Results](#)

e) Missouri National Recreational River

We obtained results for Missouri National Recreational River by compiling and jointly analyzing data from two strata in two states.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 61 point counts within the eight surveyed grid cells between June 11 and June 18. They detected 95 bird species, including zero priority species.

Bird Conservancy estimated densities and population sizes for 113 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 46 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Missouri National Recreational River for 112 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 71 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Missouri National Recreational River across all years of the project, follow the web link

below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map

[Missouri National Recreational River Results](#)

(1) Missouri National Recreational River - 59 Mile District

We obtained results for Missouri National Recreational River - 59 Mile District by analyzing data from one stratum in two states.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 31 point counts within the four surveyed grid cells between June 11 and June 18. They detected 76 bird species, including zero priority species.

Bird Conservancy estimated densities and population sizes for 97 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 38 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout MR-NGPIM-FM for 93 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 55 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within MR-NGPIM-FM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[MR-NGPIM-FM Results](#)

(2) Missouri National Recreational River - 39 Mile District

We obtained results for Missouri National Recreational River - 39 Mile District by analyzing data from one stratum in two states.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 30 point counts within the four surveyed grid cells between June 13 and June 15. They detected 83 bird species, including zero priority species.

Bird Conservancy estimated densities and population sizes for 107 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 39 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout MR-NGPIM-TM for 107 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 64 of the species for which we estimated occupancies.

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To view a map of survey locations, density and occupancy results and species counts within MR-NGPIM-TM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[MR-NGPIM-TM Results](#)

f) Mount Rushmore National Monument

We obtained results for Mount Rushmore National Monument by analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 16 point counts within the two surveyed grid cells between July 14 and July 15. They detected 28 bird species, including two priority species.

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within SD-BCR17-MR across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[SD-BCR17-MR Results](#)

g) Niobrara National Scenic River

We obtained results for Niobrara National Scenic River by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 68 point counts within the seven surveyed grid cells between June 11 and June 19. They detected 84 bird species, including zero priority species.

Bird Conservancy estimated densities and population sizes for 109 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 44 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout NE-NGPIM-NI for 104 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 62 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within NE-NGPIM-NI across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[NE-NGPIM-NI Results](#)

h) Scotts Bluff National Monument

We obtained results for Scotts Bluff National Monument by analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 16 point counts within the two surveyed grid cells between June 25 and June 26. They detected 33 bird species, including six priority species.

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within NE-BCR18-SB across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[NE-BCR18-SB Results](#)

i) Theodore Roosevelt National Park

We obtained results for Theodore Roosevelt National Park by compiling and jointly analyzing data from two strata: the North Unit and the South Unit.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 72 point counts within the eight surveyed grid cells between June 24 and July 3. They detected 71 bird species, including zero priority species.

Bird Conservancy estimated densities and population sizes for 115 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 33 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout Theodore Roosevelt National Park for 109 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 41 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Theodore Roosevelt National Park across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[Theodore Roosevelt National Park Results](#)

j) Wind Cave National Park

We obtained results for Wind Cave National Park by analyzing data from one stratum.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 77 point counts within the eight surveyed grid cells between June 22 and July 13. They detected 70 bird species, including four priority species.

Bird Conservancy estimated densities and population sizes for 118 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 34 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout SD-BCR17-WC for 116 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 35 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within SD-BCR17-WC across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[SD-BCR17-WC Results](#)

4. Rocky Mountain Network in Colorado

We obtained results for the Rocky Mountain Network in Colorado by analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 26 point counts within the two surveyed grid cells between June 14 and July 2. They detected 35 bird species, including zero priority species.

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within CO-BCR16-RM across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CO-BCR16-RM Results](#)

5. Southern Colorado Plateau Network in Colorado

We obtained results for the Southern Colorado Plateau Network by analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 26 point counts within the two surveyed grid cells between June 3 and June 10. They detected 38 bird species, including four priority species.

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within CO-BCR16-SC across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CO-BCR16-SC Results](#)

E. Tribal Lands

1. Wind River Tribal Lands in Wyoming BCR 10

We obtained results for Wind River Tribal Lands in Wyoming BCR 10 by analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 54 point counts within the four surveyed grid cells between June 1 and June 5. They detected 64 bird species, including 11 priority species.

Bird Conservancy estimated densities and population sizes for 88 species that were detected in any year during which surveys were conducted, 16 of which are priority species. The data yielded robust density estimates (CV < 50%) for 26 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BCR10-WR for 83 species that were detected in any year during which surveys were conducted, 16 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 34 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR10-WR across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR10-WR Results](#)

F. All Other Lands

This section contains results for All Other Lands sampled in states that do not have full IMBCR coverage across the entire state. Results for All Other Lands strata within Colorado, Montana, Utah and Wyoming are reported in Section II: States.

Jump to:

[All Other Lands in Nebraska BCR 17](#)

[All Other Lands in Nebraska BCR 18](#)

[All Other Lands in North Dakota BCR17](#)

[All Other Lands in South Dakota BCR 17](#)

1. All Other Lands in Nebraska BCR 17

We obtained results for all other lands in Nebraska BCR 17 by analyzing data from one stratum. Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 12 point counts within the two surveyed grid cells between June 16 and July 5. They detected 35 bird species, including one priority species ([Appendix F](#)).

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within NE-BCR17-ON across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[NE-BCR17-ON Results](#)

2. All Other Lands in Nebraska BCR 18

We obtained results for all other lands in Nebraska BCR 18 by analyzing data from one stratum. Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 71 point counts within the six surveyed grid cells between June 11 and June 25. They detected 39 bird species, including nine priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 37 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust density estimates (CV < 50%) for nine of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout NE-BCR18-ON for 33 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 11 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within NE-BCR18-ON across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[NE-BCR18-ON Results](#)

3. All Other Lands in North Dakota BCR 17

We obtained results for ND-BCR17-AT by analyzing data from one stratum.

Integrated Monitoring in Bird Conservation Regions: 2019 Annual Report

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 40 point counts within the five surveyed grid cells between June 2 and June 16. They detected 80 bird species, including 16 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 59 species that were detected in any year during which surveys were conducted, nine of which are priority species. The data yielded robust density estimates (CV < 50%) for 26 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout ND-BCR17-AT for 58 species that were detected in any year during which surveys were conducted, nine of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 39 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within ND-BCR17-AT across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[ND-BCR17-AT Results](#)

4. All Other Lands in South Dakota BCR 17

We obtained results for SD-BCR17-AT by analyzing data from one stratum.

Field technicians completed six of eight planned surveys (75%) in 2020. Technicians conducted 51 point counts within the six surveyed grid cells between May 31 and July 5. They detected 49 bird species, including 11 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 39 species that were detected in any year during which surveys were conducted, four of which are priority species. The data yielded robust density estimates (CV < 50%) for ten of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout SD-BCR17-AT for 34 species that were detected in any year during which surveys were conducted, three of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 21 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within SD-BCR17-AT across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[SD-BCR17-AT Results](#)

V. Joint Ventures

Playa Lakes Joint Venture

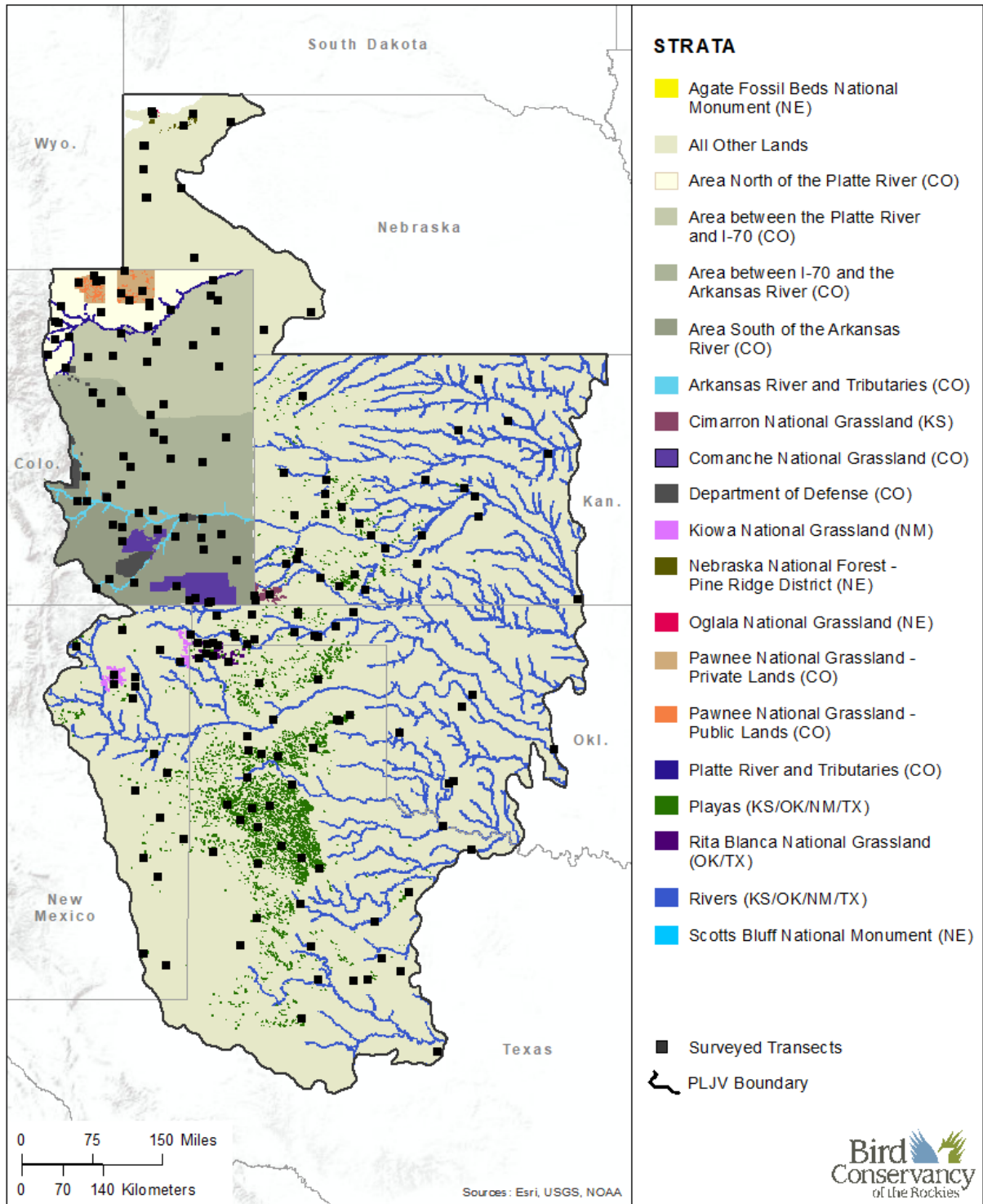


Figure 4. Survey locations and strata in the Playa Lakes Joint Venture area in 2020.

1. Playa Lakes Joint Venture Total

We obtained results for the Playa Lakes Joint Venture area by compiling and jointly analyzing data from 20 strata in six states (Figure 4).

Field technicians completed 197 of 199 planned surveys (99%) in 2020. Technicians conducted 2029 point counts within the 198 surveyed grid cells between April 30 and July 6. They detected 224 bird species, including zero priority species ([Appendix E](#)).

Bird Conservancy estimated densities and population sizes for 217 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 77 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout PLJV area for 236 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 117 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within PLJV area across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[PLJV area Results](#)

2. Playas

a) Playas in BCR 18

We obtained results for playas in BCR 18 by compiling and jointly analyzing data from four strata in four states (Figure 4).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 300 point counts within the 31 surveyed grid cells between May 1 and June 29. They detected 71 bird species, including ten priority species ([Appendix E](#)).

Bird Conservancy estimated densities and population sizes for 104 species that were detected in any year during which surveys were conducted, 16 of which are priority species. The data yielded robust density estimates (CV < 50%) for 17 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout PLJV BCR18-Playas for 98 species that were detected in any year during which surveys were conducted, 15 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 25 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within PLJV BCR18-Playas across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[PLJV BCR18-Playas Results](#)

b) Playas in BCR 19

We obtained results for playas in BCR 19 by compiling and jointly analyzing data from three strata in three states (Figure 4).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 131 point counts within the 18 surveyed grid cells between May 2 and June 26. They detected 97 bird species, including 17 priority species ([Appendix E](#)).

Bird Conservancy estimated densities and population sizes for 87 species that were detected in any year during which surveys were conducted, 19 of which are priority species. The data yielded robust density estimates (CV < 50%) for 27 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout PLJV BCR19-Playas for 86 species that were detected in any year during which surveys were conducted, 17 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 32 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within PLJV BCR19-Playas across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[PLJV BCR19-Playas Results](#)

3. Rivers

a) Rivers in BCR 18

We obtained results for Rivers in BCR 18 by compiling and jointly analyzing data from six strata in five states (Figure 4).

Field technicians completed 21 of 22 planned surveys (95.5%) in 2020. Technicians conducted 204 point counts within the 21 surveyed grid cells between May 1 and June 15. They detected 117 bird species, including 12 priority species ([Appendix E](#)).

Bird Conservancy estimated densities and population sizes for 170 species that were detected in any year during which surveys were conducted, 15 of which are priority species. The data yielded robust density estimates (CV < 50%) for 44 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout PLJV BCR18-Rivers for 193 species that were detected in any year during which surveys were conducted, 17 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 87 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within PLJV BCR18-Rivers across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view

occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[PLJV BCR18-Rivers Results](#)

b) Rivers in BCR 19

We obtained results for Rivers in BCR 19 by compiling and jointly analyzing data from three strata in three states (Figure 4).

Field technicians completed nine of eight planned surveys (112.5%) in 2020. Technicians conducted 64 point counts within the nine surveyed grid cells between May 6 and June 27. They detected 96 bird species, including 20 priority species ([Appendix E](#)).

Bird Conservancy estimated densities and population sizes for 124 species that were detected in any year during which surveys were conducted, 24 of which are priority species. The data yielded robust density estimates (CV < 50%) for 47 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout PLJV BCR19-Rivers for 124 species that were detected in any year during which surveys were conducted, 23 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 69 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within PLJV BCR19-Rivers across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[PLJV BCR19-Rivers Results](#)

4. All Other Lands

a) All Other Lands in BCR 18

We obtained results for All Other Lands in BCR 18 by compiling and jointly analyzing data from four strata in four states (Figure 4).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 234 point counts within the 21 surveyed grid cells between April 30 and June 29. They detected 102 bird species, including 13 priority species ([Appendix E](#)).

Bird Conservancy estimated densities and population sizes for 123 species that were detected in any year during which surveys were conducted, 14 of which are priority species. The data yielded robust density estimates (CV < 50%) for 30 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout PLJV BCR18-All Other Lands for 119 species that were detected in any year during which surveys were conducted, 14 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 41 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within PLJV BCR18-All Other Lands across all years of the project, follow the web link below. Hit

“Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[PLJV BCR18-All Other Lands Results](#)

b) All Other Lands in BCR 19

We obtained results for PLJV All Other Lands in BCR 19 by compiling and jointly analyzing data from three strata in three states (Figure 4).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 109 point counts within the 14 surveyed grid cells between May 5 and June 12. They detected 108 bird species, including 18 priority species ([Appendix E](#)).

Bird Conservancy estimated densities and population sizes for 117 species that were detected in any year during which surveys were conducted, 26 of which are priority species. The data yielded robust density estimates (CV < 50%) for 60 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout PLJV BCR19-All Other Lands for 116 species that were detected in any year during which surveys were conducted, 25 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 69 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within PLJV BCR19-All Other Lands across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[PLJV BCR19-All Other Lands Results](#)

VI. States

Jump to: [Colorado](#) [Montana](#) [Utah](#) [Wyoming](#)

A. Colorado

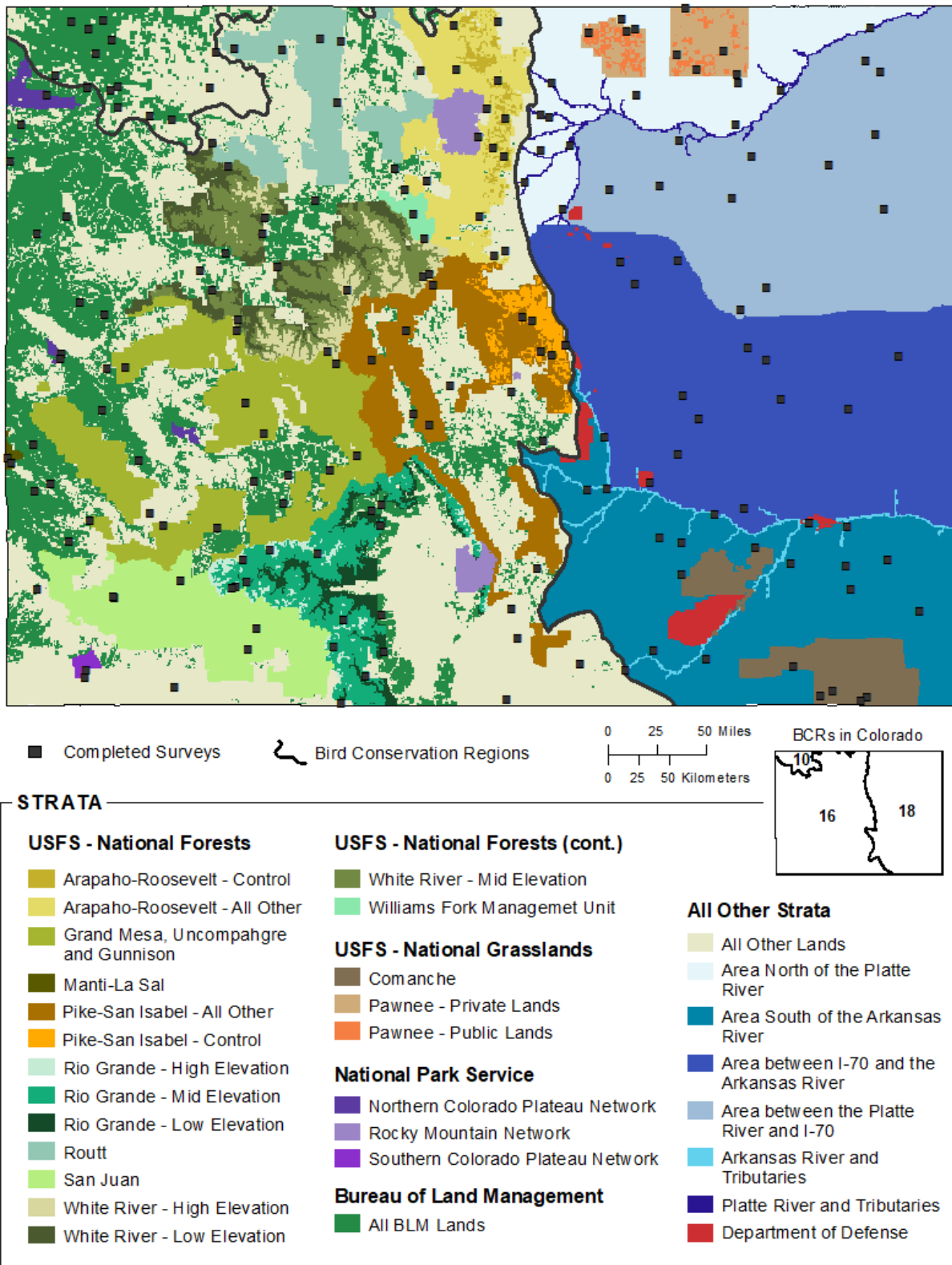


Figure 5. Survey locations and strata in Colorado, 2020.

1. Colorado Statewide

a) Colorado Statewide: Total

We obtained results for Colorado by compiling and jointly analyzing data from 32 strata (Figure 5). For results on specific lands within Colorado, refer to section IV: Land Ownership.

Field technicians completed 194 of 195 planned surveys (99.5%) in 2020. Technicians conducted 2253 point counts within the 194 surveyed grid cells between May 15 and July 12. They detected 205 bird species, including 41 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 236 species that were detected in any year during which surveys were conducted, 46 of which are priority species. The data yielded robust density estimates (CV < 50%) for 101 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CO for 240 species that were detected in any year during which surveys were conducted, 44 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 154 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CO across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CO Results](#)

b) All Other Lands in Colorado

We obtained results for All Other Lands in Colorado by compiling and jointly analyzing data from seven strata (Figure 5).

Field technicians completed 71 of 72 planned surveys (98.6%) in 2020. Technicians conducted 785 point counts within the 71 surveyed grid cells between May 15 and July 11. They detected 161 bird species, including 29 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 201 species that were detected in any year during which surveys were conducted, 40 of which are priority species. The data yielded robust density estimates (CV < 50%) for 86 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CO-All Other for 199 species that were detected in any year during which surveys were conducted, 41 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 112 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CO-All Other across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

CO-All Other Results

2. Colorado BCR 10

a) Colorado BCR 10: Total

We obtained results for Colorado BCR 10 by compiling and jointly analyzing data from two strata (Figure 5).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 143 point counts within the 13 surveyed grid cells between May 27 and June 12. They detected 75 bird species, including 15 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 123 species that were detected in any year during which surveys were conducted, 24 of which are priority species. The data yielded robust density estimates (CV < 50%) for 35 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CO-BCR10 for 120 species that were detected in any year during which surveys were conducted, 21 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 50 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CO-BCR10 across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

CO-BCR10 Results

b) All Other Lands in Colorado BCR 10

We obtained results for All Other Lands in Colorado BCR 10 by analyzing data from one stratum (Figure 5).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 57 point counts within the five surveyed grid cells between May 28 and June 12. They detected 63 bird species, including 12 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 101 species that were detected in any year during which surveys were conducted, 18 of which are priority species. The data yielded robust density estimates (CV < 50%) for 28 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CO-BCR10-AO for 103 species that were detected in any year during which surveys were conducted, 17 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 36 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CO-BCR10-AO across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view

occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CO-BCR10-AO Results](#)

3. Colorado BCR 16

a) Colorado BCR 16: Total

We obtained results for Colorado BCR 16 by compiling and jointly analyzing data from 20 strata (Figure 5).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 1314 point counts within the 112 surveyed grid cells between May 15 and July 12. They detected 156 bird species, including 23 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 195 species that were detected in any year during which surveys were conducted, 35 of which are priority species. The data yielded robust density estimates (CV < 50%) for 85 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CO-BCR16 for 193 species that were detected in any year during which surveys were conducted, 33 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 120 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CO-BCR16 across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CO-BCR16 Results](#)

b) All Other Lands in Colorado BCR 16

We obtained results for All Other Lands in Colorado BCR 16 by analyzing data from one stratum (Figure 5).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 200 point counts within the 20 surveyed grid cells between May 15 and July 11. They detected 125 bird species, including nine priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 176 species that were detected in any year during which surveys were conducted, 33 of which are priority species. The data yielded robust density estimates (CV < 50%) for 73 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CO-BCR16-AO for 170 species that were detected in any year during which surveys were conducted, 31 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 85 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CO-BCR16-AO across all years of the project, follow the web link below. Hit “Ok” on the

Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CO-BCR16-AO Results](#)

4. Colorado BCR 18

a) Colorado BCR 18: Total

We obtained results for Colorado BCR 18 by compiling and jointly analyzing data from five strata (Figure 5).

Field technicians completed 46 of 47 planned surveys (97.9%) in 2020. Technicians conducted 528 point counts within the 46 surveyed grid cells between May 15 and June 12. They detected 83 bird species, including 18 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 127 species that were detected in any year during which surveys were conducted, 23 of which are priority species. The data yielded robust density estimates (CV < 50%) for 27 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CO-BCR18-All Other for 124 species that were detected in any year during which surveys were conducted, 22 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 43 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CO-BCR18-All Other across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CO-BCR18-All Other Results](#)

b) Colorado BCR 18 Rivers

We obtained results for Colorado BCR 18 Rivers by compiling and jointly analyzing data from two strata (Figure 5).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 126 point counts within the 12 surveyed grid cells between May 17 and June 11. They detected 103 bird species, including nine priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 172 species that were detected in any year during which surveys were conducted, 24 of which are priority species. The data yielded robust density estimates (CV < 50%) for 42 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CO-Rivers for 172 species that were detected in any year during which surveys were conducted, 22 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 66 of the species for which we estimated occupancies.

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To view a map of survey locations, density and occupancy results and species counts within CO-Rivers across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CO-Rivers Results](#)

c) Non-river Lands in Colorado BCR 18

We obtained results for Non-river Lands in Colorado BCR 18 by compiling and jointly analyzing data from eight strata (Figure 5).

Field technicians completed 57 of 58 planned surveys (98.3%) in 2020. Technicians conducted 670 point counts within the 57 surveyed grid cells between May 15 and June 12. They detected 107 bird species, including 20 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 166 species that were detected in any year during which surveys were conducted, 28 of which are priority species. The data yielded robust density estimates (CV < 50%) for 40 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout CO-BCR18-Nonrivers for 164 species that were detected in any year during which surveys were conducted, 27 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 56 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within CO-BCR18-Nonrivers across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[CO-BCR18-Nonrivers Results](#)

B. Montana

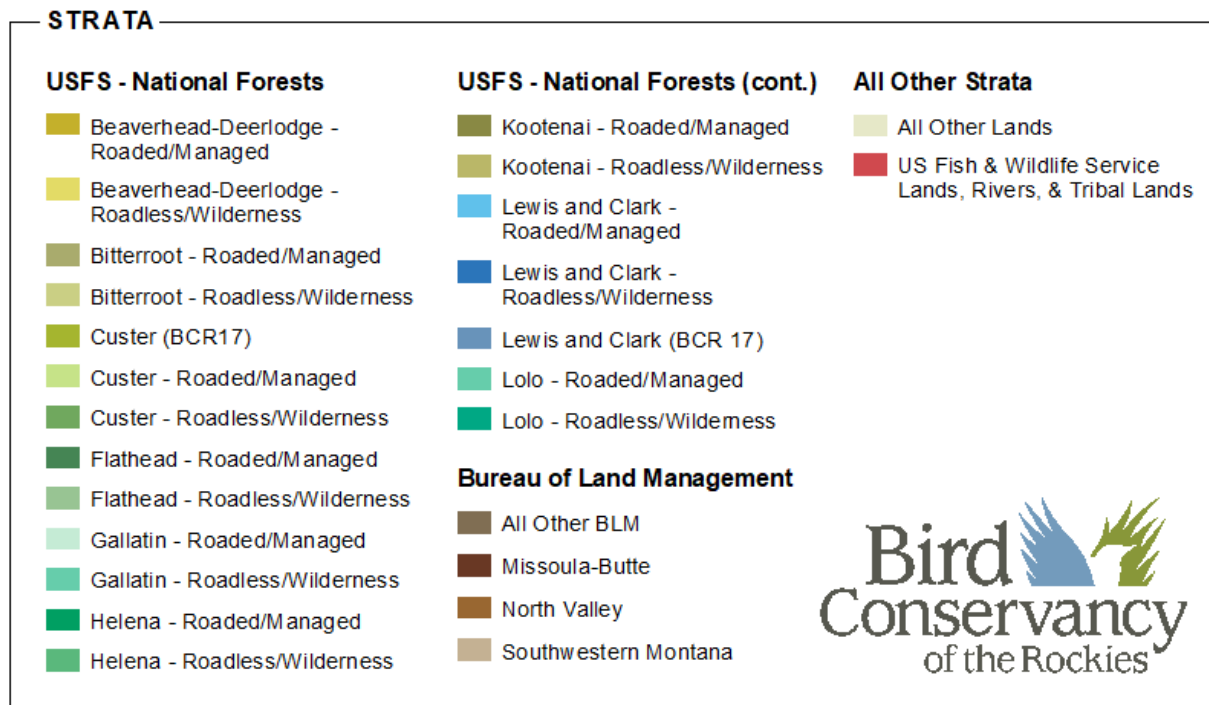
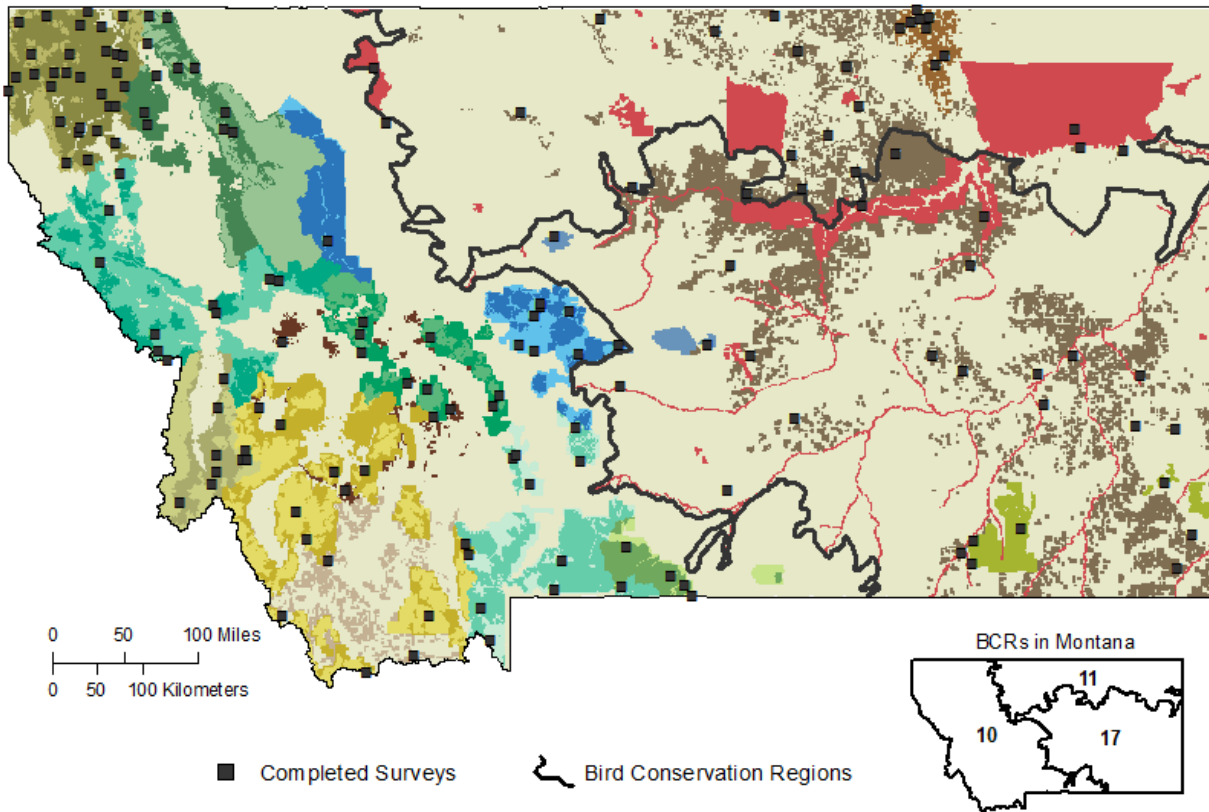


Figure 6. Survey locations and strata in Montana, 2020.

1. Montana Statewide

a) Montana Statewide: Total

We obtained results for Montana by compiling and jointly analyzing data from 30 strata (Figure 6). For results on specific lands within Montana, refer to section IV: Land Ownership.

Field technicians completed 160 of 167 planned surveys (95.8%) in 2020. Technicians conducted 1667 point counts within the 160 surveyed grid cells between May 19 and July 11. They detected 198 bird species, including 36 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 217 species that were detected in any year during which surveys were conducted, 40 of which are priority species. The data yielded robust density estimates (CV < 50%) for 91 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout MT for 225 species that were detected in any year during which surveys were conducted, 40 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 159 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within MT across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[MT Results](#)

b) All Other Lands in Montana

We obtained results for All Other Lands in Montana by compiling and jointly analyzing data from three strata (Figure 6).

Field technicians completed 14 of 15 planned surveys (93.3%) in 2020. Technicians conducted 149 point counts within the 14 surveyed grid cells between May 19 and July 5. They detected 119 bird species, including 15 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 180 species that were detected in any year during which surveys were conducted, 28 of which are priority species. The data yielded robust density estimates (CV < 50%) for 47 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout MT-All Other for 189 species that were detected in any year during which surveys were conducted, 32 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 105 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within MT-All Other across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[MT-All Other Results](#)

2. **Montana BCR 10**

a) Montana BCR 10: Total

We obtained results for Montana BCR 10 by compiling and jointly analyzing data from 21 strata (Figure 6).

Field technicians completed 109 of 112 planned surveys (97.3%) in 2020. Technicians conducted 1113 point counts within the 109 surveyed grid cells between May 21 and July 11. They detected 154 bird species, including 23 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 197 species that were detected in any year during which surveys were conducted, 33 of which are priority species. The data yielded robust density estimates (CV < 50%) for 69 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout MT-BCR10 for 204 species that were detected in any year during which surveys were conducted, 33 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 124 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within MT-BCR10 across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[MT-BCR10 Results](#)

b) All Other Lands in Montana BCR 10

We obtained results for All Other Lands in Montana BCR 10 by analyzing data from one stratum (Figure 6).

Field technicians completed both planned surveys (100%) in 2020. Technicians conducted 28 point counts within the two surveyed grid cells between May 25 and June 16. They detected 58 bird species, including four priority species ([Appendix F](#)).

We did not generate density or occupancy results for this stratum because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations, density and occupancy results and species counts within MT-BCR10-ON across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[MT-BCR10-ON Results](#)

3. Montana BCR 11

a) Montana BCR 11: Total

We obtained results for Montana BCR 11 by compiling and jointly analyzing data from four strata (Figure 6).

Field technicians completed 25 of 28 planned surveys (89.3%) in 2020. Technicians conducted 273 point counts within the 25 surveyed grid cells between May 19 and July 6. They detected 86 bird species, including 14 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 140 species that were detected in any year during which surveys were conducted, 22 of which are priority species. The data yielded robust density estimates (CV < 50%) for 21 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout MT-BCR11 for 141 species that were detected in any year during which surveys were conducted, 22 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 58 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within MT-BCR11 across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[MT-BCR11 Results](#)

b) All Other Lands in Montana BCR 11

We obtained results for All Other Lands in Montana BCR 11 by analyzing data from one stratum (Figure 6).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 49 point counts within the five surveyed grid cells between May 19 and July 5. They detected 56 bird species, including five priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 113 species that were detected in any year during which surveys were conducted, 16 of which are priority species. The data yielded robust density estimates (CV < 50%) for 15 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout MT-BCR11-AO for 112 species that were detected in any year during which surveys were conducted, 17 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 36 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within MT-BCR11-AO across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

MT-BCR11-AO Results

4. Montana BCR 17

a) Montana BCR 17: Total

We obtained results for Montana BCR 17 by compiling and jointly analyzing data from five strata (Figure 6).

Field technicians completed 26 of 27 planned surveys (96.3%) in 2020. Technicians conducted 281 point counts within the 26 surveyed grid cells between May 20 and July 7. They detected 123 bird species, including 16 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 189 species that were detected in any year during which surveys were conducted, 31 of which are priority species. The data yielded robust density estimates (CV < 50%) for 46 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout MT-BCR17 for 190 species that were detected in any year during which surveys were conducted, 30 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 80 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within MT-BCR17 across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

MT-BCR17 Results

b) All Other Lands in Montana BCR 17

We obtained results for All Other Lands in Montana BCR 17 by analyzing data from one stratum (Figure 6).

Field technicians completed seven of eight planned surveys (87.5%) in 2020. Technicians conducted 72 point counts within the seven surveyed grid cells between May 20 and July 3. They detected 73 bird species, including 16 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 130 species that were detected in any year during which surveys were conducted, 18 of which are priority species. The data yielded robust density estimates (CV < 50%) for 25 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout MT-BCR17-AO for 126 species that were detected in any year during which surveys were conducted, 17 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 38 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within MT-BCR17-AO across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view

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occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[MT-BCR17-AO Results](#)

C. Utah

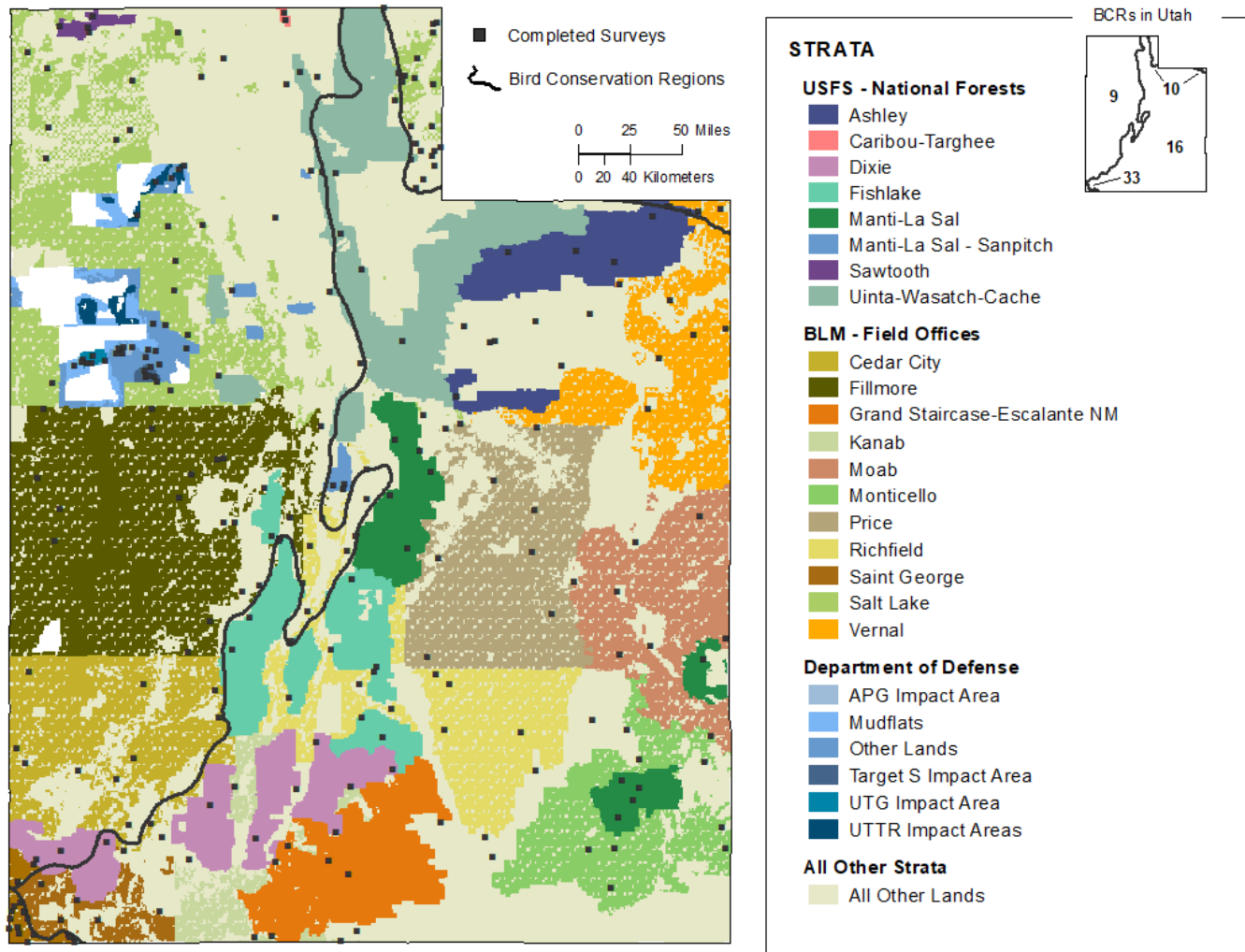


Figure 7. Survey locations and strata in Utah, 2020.

1. Utah Statewide

a) Utah Statewide: Total

We obtained results for Utah by compiling and jointly analyzing data from 42 strata (Figure 7). For results on specific lands within Utah, refer to section IV: Land Ownership.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 3316 point counts within the 260 surveyed grid cells between May 3 and July 10. They detected 186 bird species, including ten priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 206 species that were detected in any year during which surveys were conducted, 13 of which are priority species. The data yielded robust density estimates (CV < 50%) for 100 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT for 210 species that were detected in any year during which surveys were conducted, 13 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 137 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT Results](#)

b) All Other Lands in Utah

We obtained results for All Other Lands in Utah by compiling and jointly analyzing data from four strata (Figure 7).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 1330 point counts within the 110 surveyed grid cells between May 10 and July 10. They detected 155 bird species, including six priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 185 species that were detected in any year during which surveys were conducted, ten of which are priority species. The data yielded robust density estimates (CV < 50%) for 76 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-All Other Lands for 186 species that were detected in any year during which surveys were conducted, nine of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 91 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-All Other Lands across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

UT-All Other Lands Results

2. Utah BCR 9

a) Utah BCR 9: Total

We obtained results for Utah BCR 9 by compiling and jointly analyzing data from 17 strata (Figure 7).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 1,331 point counts within the 106 surveyed grid cells between May 9 and July 3. They detected 128 bird species, including eight priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 148 species that were detected in any year during which surveys were conducted, nine of which are priority species. The data yielded robust density estimates (CV < 50%) for 64 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR9 for 159 species that were detected in any year during which surveys were conducted, 11 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 84 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR9 across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

UT-BCR9 Results

b) All Other Lands in Utah BCR 9

We obtained results for All Other Lands in Utah BCR 9 by analyzing data from one stratum (Figure 7).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 465 point counts within the 41 surveyed grid cells between May 14 and July 3. They detected 98 bird species, including four priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 124 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust density estimates (CV < 50%) for 45 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR9-AO for 123 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 50 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR9-AO across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view

occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR9-AO Results](#)

3. **Utah BCR 10**

a) Utah BCR 10: Total

We obtained results for Utah BCR 10 by compiling and jointly analyzing data from five strata (Figure 7).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 327 point counts within the 26 surveyed grid cells between May 29 and July 10. They detected 92 bird species, including three priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 117 species that were detected in any year during which surveys were conducted, three of which are priority species. The data yielded robust density estimates (CV < 50%) for 40 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR10 for 117 species that were detected in any year during which surveys were conducted, three of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 50 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR10 across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR10 Results](#)

b) All Other Lands in Utah BCR 10

We obtained results for All Other Lands in Utah BCR 10 by analyzing data from one stratum (Figure 7).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 173 point counts within the 15 surveyed grid cells between June 4 and July 10. They detected 53 bird species, including two priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 82 species that were detected in any year during which surveys were conducted, two of which are priority species. The data yielded robust density estimates (CV < 50%) for 16 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR10-AO for 77 species that were detected in any year during which surveys were conducted, one of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 22 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR10-AO across all years of the project, follow the web link below. Hit “Ok” on the

Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR10-AO Results](#)

4. **Utah BCR 16**

c) Utah BCR 16: Total

We obtained results for Utah BCR 16 by compiling and jointly analyzing data from 18 strata (Figure 7).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 1394 point counts within the 111 surveyed grid cells between May 6 and July 9. They detected 154 bird species, including six priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 183 species that were detected in any year during which surveys were conducted, nine of which are priority species. The data yielded robust density estimates (CV < 50%) for 88 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR16 for 180 species that were detected in any year during which surveys were conducted, eight of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 115 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR16 across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR16 Results](#)

d) All Other Lands in Utah BCR 16

We obtained results for All Other Lands in Utah BCR 16 by analyzing data from one stratum (Figure 7).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 453 point counts within the 39 surveyed grid cells between May 10 and July 9. They detected 122 bird species, including three priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 156 species that were detected in any year during which surveys were conducted, seven of which are priority species. The data yielded robust density estimates (CV < 50%) for 65 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR16-AO for 151 species that were detected in any year during which surveys were conducted, six of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 67 of the species for which we estimated occupancies.

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To view a map of survey locations, density and occupancy results and species counts within UT-BCR16-AO across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR16-AO Results](#)

5. Utah BCR 33

a) Utah BCR 33: Total

We obtained results for Utah BCR 33 by compiling and jointly analyzing data from two strata (Figure 7).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 263 point counts within the 17 surveyed grid cells between May 3 and May 22. They detected 77 bird species, including zero priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 103 species that were detected in any year during which surveys were conducted, one of which are priority species. The data yielded robust density estimates (CV < 50%) for 14 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR33 for 102 species that were detected in any year during which surveys were conducted, one of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 22 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR33 across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR33 Results](#)

b) All Other Lands in Utah BCR 33

We obtained results for All Other Lands in Utah BCR 33 by analyzing data from one stratum (Figure 7).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 232 point counts within the 15 surveyed grid cells between May 12 and May 22. They detected 69 bird species, including zero priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 96 species that were detected in any year during which surveys were conducted, zero of which are priority species. The data yielded robust density estimates (CV < 50%) for 21 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout UT-BCR33-AO for 93 species that were detected in any year during which surveys were

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conducted, zero of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 25 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within UT-BCR33-AO across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[UT-BCR33-AO Results](#)

D. Wyoming

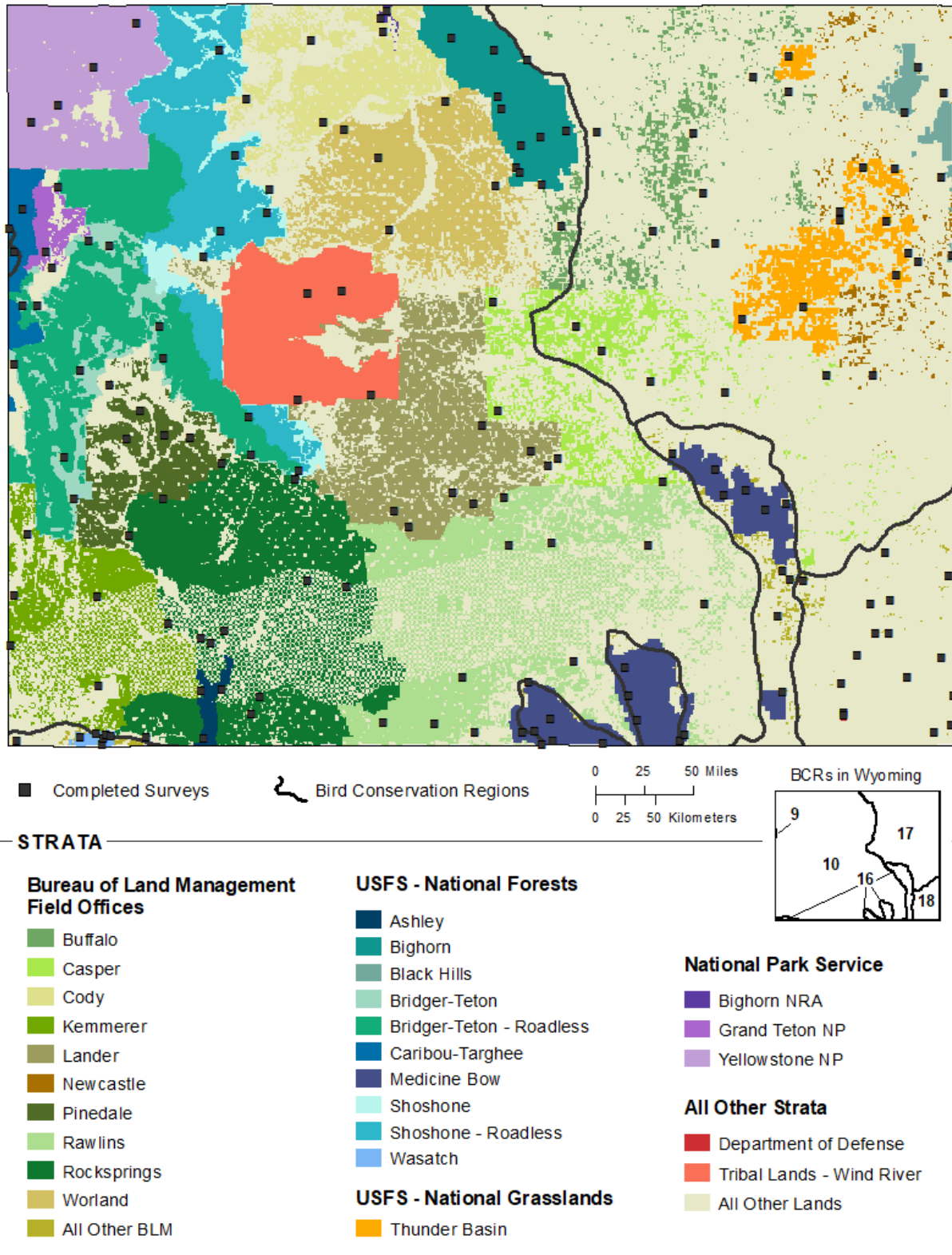


Figure 8. Survey locations and strata in Wyoming, 2020.

1. Wyoming Statewide

a) Wyoming Statewide: Total

We obtained results for Wyoming by compiling and jointly analyzing data from 37 strata (Figure 8). For results on specific lands within Wyoming, see section IV. Land Ownership.

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 2112 point counts within the 177 surveyed grid cells between May 21 and July 16. They detected 200 bird species, including 50 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 213 species that were detected in any year during which surveys were conducted, 58 of which are priority species. The data yielded robust density estimates (CV < 50%) for 94 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY for 222 species that were detected in any year during which surveys were conducted, 61 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 138 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within Wyoming across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY Results](#)

b) All Other Lands in Wyoming

We obtained results for All Other Lands in Wyoming by compiling and jointly analyzing data from four strata (Figure 8).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 479 point counts within the 44 surveyed grid cells between May 24 and June 19. They detected 143 bird species, including 30 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 185 species that were detected in any year during which surveys were conducted, 48 of which are priority species. The data yielded robust density estimates (CV < 50%) for 60 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-All Other for 188 species that were detected in any year during which surveys were conducted, 50 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 85 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-All Other across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

WY-All Other Results

2. Wyoming BCR 10

a) Wyoming BCR 10: Total

We obtained results for Wyoming BCR 10 by compiling and jointly analyzing data from 23 strata (Figure 8).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 1320 point counts within the 106 surveyed grid cells between May 22 and July 16. They detected 175 bird species, including 41 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 198 species that were detected in any year during which surveys were conducted, 54 of which are priority species. The data yielded robust density estimates (CV < 50%) for 80 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BCR10 for 200 species that were detected in any year during which surveys were conducted, 54 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 125 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR10 across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

WY-BCR10 Results

b) All Other Lands in Wyoming BCR 10

We obtained results for All Other Lands in Wyoming BCR 10 by analyzing data from one stratum (Figure 8).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 165 point counts within the 15 surveyed grid cells between May 29 and June 19. They detected 111 bird species, including 21 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 160 species that were detected in any year during which surveys were conducted, 34 of which are priority species. The data yielded robust density estimates (CV < 50%) for 43 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BCR10-AO for 158 species that were detected in any year during which surveys were conducted, 35 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 65 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR10-AO across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view

occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR10-AO Results](#)

3. Wyoming BCR 16

a) Wyoming BCR 16: Total

We obtained results for Wyoming BCR 16 by compiling and jointly analyzing data from four strata (Figure 8).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 253 point counts within the 23 surveyed grid cells between May 25 and July 11. They detected 105 bird species, including 17 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 161 species that were detected in any year during which surveys were conducted, 35 of which are priority species. The data yielded robust density estimates (CV < 50%) for 55 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BCR16 for 156 species that were detected in any year during which surveys were conducted, 33 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 77 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR16 across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR16 Results](#)

b) All Other Lands in Wyoming BCR 16

We obtained results for All Other Lands in Wyoming BCR 16 by analyzing data from one stratum (Figure 8).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 49 point counts within the five surveyed grid cells between May 25 and June 12. They detected 51 bird species, including eight priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 110 species that were detected in any year during which surveys were conducted, 21 of which are priority species. The data yielded robust density estimates (CV < 50%) for 13 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BCR16-AO for 105 species that were detected in any year during which surveys were conducted, 20 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 19 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR16-AO across all years of the project, follow the web link below. Hit “Ok” on the

Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR16-AO Results](#)

4. Wyoming BCR 17

a) Wyoming BCR 17: Total

We obtained results for Wyoming BCR 17 by compiling and jointly analyzing data from six strata (Figure 8).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 339 point counts within the 30 surveyed grid cells between May 21 and June 15. They detected 127 bird species, including 30 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 169 species that were detected in any year during which surveys were conducted, 41 of which are priority species. The data yielded robust density estimates (CV < 50%) for 43 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BCR17 for 174 species that were detected in any year during which surveys were conducted, 42 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 54 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR17 across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR17 Results](#)

b) All Other Lands in Wyoming BCR 17

We obtained results for All Other Lands in Wyoming BCR 17 by analyzing data from one stratum (Figure 8).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 127 point counts within the 12 surveyed grid cells between May 26 and June 15. They detected 92 bird species, including 25 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 138 species that were detected in any year during which surveys were conducted, 29 of which are priority species. The data yielded robust density estimates (CV < 50%) for 33 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BCR17-AO for 137 species that were detected in any year during which surveys were conducted, 27 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 39 of the species for which we estimated occupancies.

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To view a map of survey locations, density and occupancy results and species counts within WY-BCR17-AO across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR17-AO Results](#)

5. Wyoming BCR 18

a) Wyoming BCR 18: Total

We obtained results for Wyoming BCR 18 by compiling and jointly analyzing data from three strata (Figure 8).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 177 point counts within the 16 surveyed grid cells between May 24 and June 8. They detected 74 bird species, including 14 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 102 species that were detected in any year during which surveys were conducted, 26 of which are priority species. The data yielded robust density estimates (CV < 50%) for 24 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BCR18 for 99 species that were detected in any year during which surveys were conducted, 25 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 32 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR18 across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR18 Results](#)

b) All Other Lands in Wyoming BCR 18

We obtained results for All Other Lands in Wyoming BCR 18 by analyzing data from one stratum (Figure 8).

Field technicians completed all planned surveys (100%) in 2020. Technicians conducted 138 point counts within the 12 surveyed grid cells between May 24 and June 6. They detected 68 bird species, including 20 priority species ([Appendix F](#)).

Bird Conservancy estimated densities and population sizes for 97 species that were detected in any year during which surveys were conducted, 24 of which are priority species. The data yielded robust density estimates (CV < 50%) for 24 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout WY-BCR18-AO for 91 species that were detected in any year during which surveys were

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conducted, 23 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 30 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within WY-BCR18-AO across all years of the project, follow the web link below. Hit “OK” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[WY-BCR18-AO Results](#)

VII. Bird Conservation Regions

Jump to: [Bird Conservation Region 17](#)

[Bird Conservation Region 18](#)

A. Bird Conservation Region 17

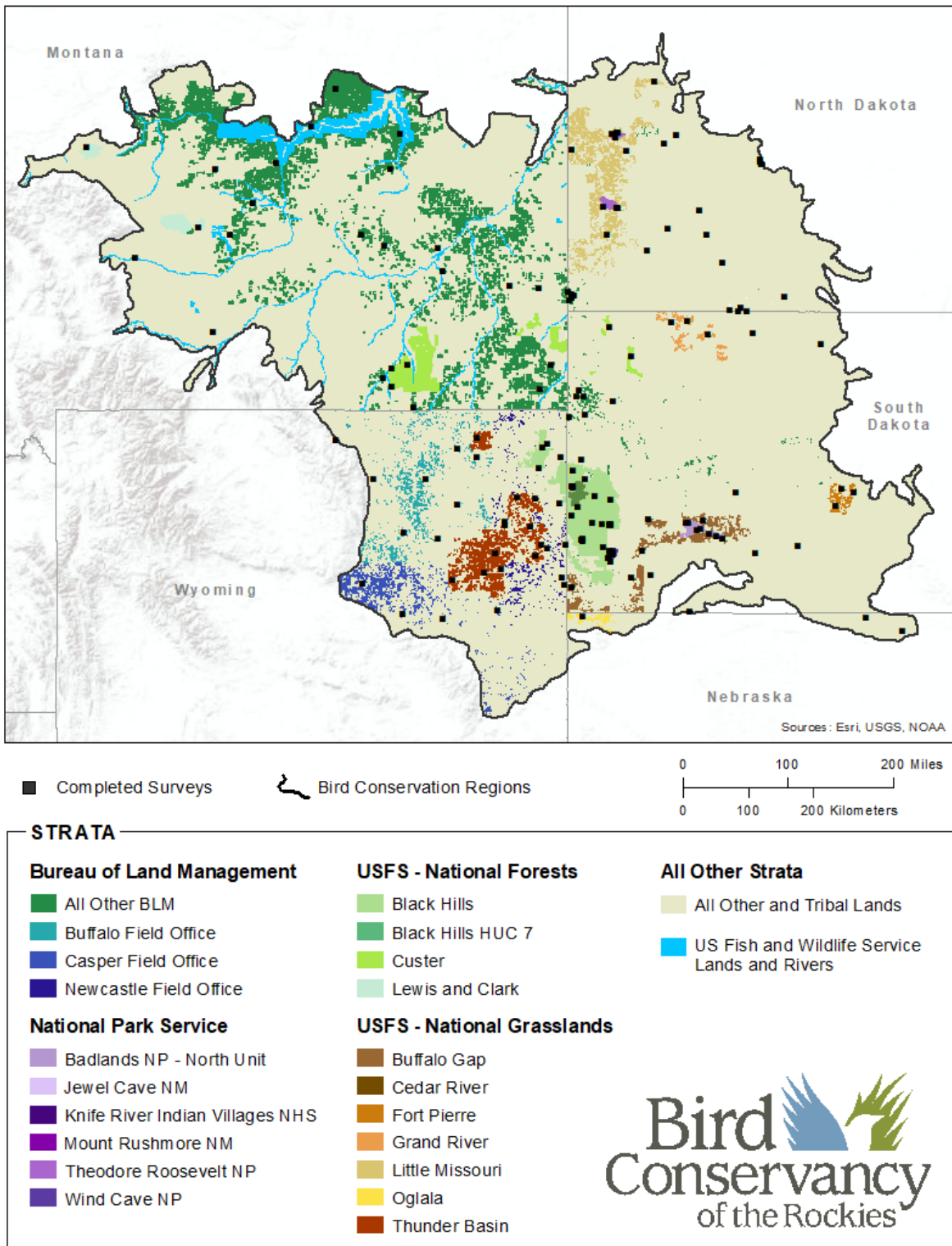


Figure 9. Survey locations and strata in the Badlands and Prairies Bird Conservation Region (BCR 17), 2020.

BCR 17: Total

We obtained results for BCR 17 by compiling and jointly analyzing data from 32 strata in five states (Figure 9).

Field technicians completed 152 of 155 planned surveys (98.1%) in 2020. Technicians conducted 1569 point counts within the 153 surveyed grid cells between May 20 and July 19. They detected 195 bird species, including 50 priority species ([Appendix E](#)).

Bird Conservancy estimated densities and population sizes for 226 species that were detected in any year during which surveys were conducted, 60 of which are priority species. The data yielded robust density estimates (CV < 50%) for 75 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout BCR17 for 228 species that were detected in any year during which surveys were conducted, 59 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 126 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within BCR17 across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[BCR17 Results](#)

B. Bird Conservation Region 18

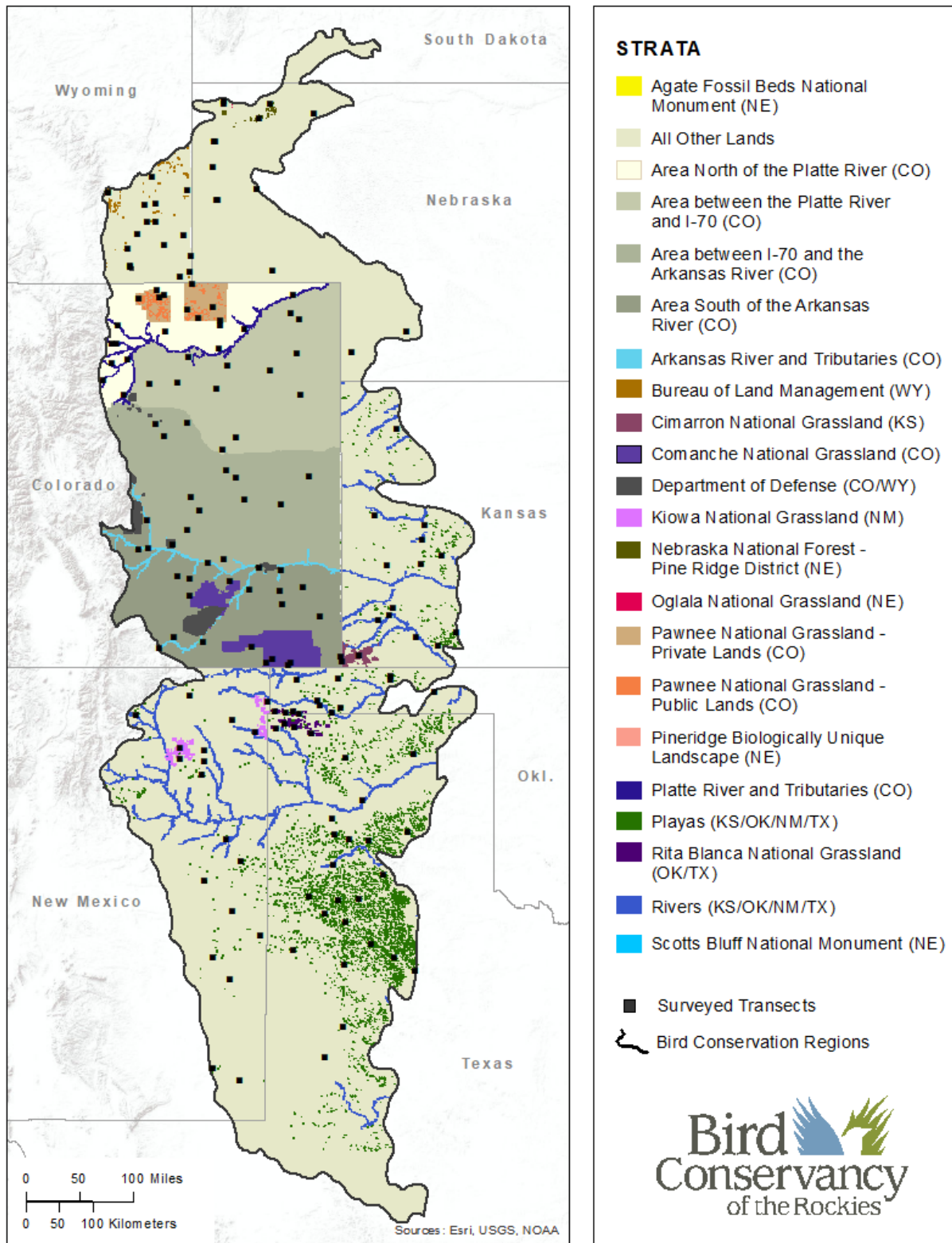


Figure 10. Survey locations and strata in the Shortgrass Prairie Bird Conservation Region (BCR 18), 2020.

BCR 18 Total

We obtained results for BCR 18 by compiling and jointly analyzing data from 33 strata in seven states (Figure 10).

In 2020 the two planned surveys in South Dakota BCR 18 were not surveyed because we were unable to access tribal lands due to COVID-19. We decided to provide a BCR 18 estimate because we feel it is useful, but for 2020 the BCR 18 estimates apply to BCR 18 not including the portion of BCR 18 in South Dakota.

Field technicians completed 173 of 177 planned surveys (97.7%) in 2020. Technicians conducted 1905 point counts within the 173 surveyed grid cells between April 30 and July 6. They detected 176 bird species, including 26 priority species ([Appendix E](#)).

Bird Conservancy estimated densities and population sizes for 201 species that were detected in any year during which surveys were conducted, 31 of which are priority species. The data yielded robust density estimates (CV < 50%) for 53 of the species for which we estimated densities.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ , Psi) throughout BCR18 for 229 species that were detected in any year during which surveys were conducted, 32 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 88 of the species for which we estimated occupancies.

To view a map of survey locations, density and occupancy results and species counts within BCR18 across all years of the project, follow the web link below. Hit “Ok” on the Rocky Mountain Avian Data Center Disclaimer and hit the “Run Query” button highlighted in red located near the top of the page (the map will zoom to the area of interest). To view occupancy, density, or species counts results, click on the respective occupancy, density, or species counts tab in the upper left above the map.

[BCR18 Results](#)

Discussion

Applications of IMBCR Data

We collected breeding bird information in the Great Plains, Rocky Mountains, and Intermountain West each year and estimated occupancy, density, abundance, and population trend at a variety of spatial scales. This information is used in a variety of ways by IMBCR partners and their biologists to inform avian conservation and management decisions including:

1. Compare bird population estimates across space. The hierarchical design of the IMBCR program is critical for understanding bird populations because avian responses to biotic and abiotic features are often scale-dependent (Johnson, 1980; Wiens, Rotenberry, & Van Horne, 1987). The hierarchical framework is useful for partitioning bird population estimates according to management units and aggregating bird population estimates at various scales to support both local and landscape-level conservation efforts.
 - At the management unit scale, IMBCR population estimates are used to support local management efforts. Bird population monitoring is necessary to determine if management actions implemented in previous management cycles are achieving

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conservation objectives. Population estimates within management units are compared to estimates in the surrounding region or state to determine whether local populations are above or below regional estimates and to evaluate the effectiveness of management actions.

- The large-scale context provides biological information for conservation planning and landscape prioritization. Population estimates help determine where to focus conservation efforts, such as targeting areas with larger populations for conservation easements and prioritizing areas with lower populations for habitat restoration.
 - The large-scale context also allows an assessment of conservation responsibility. By comparing stratum with state or BCR-level abundance estimates, a biologist can determine what proportion of a species' regional population resides on their unit during the breeding season. If a significant proportion of the regional population spends time on the management unit during the breeding season, it might warrant additional conservation or protection measures.
2. Compare bird population estimates over time. Monitoring at regional and BCR-wide scales provides land managers with dependable knowledge about the status and change of bird populations at ecologically relevant scales (NABCI, 2009).
 - Annual estimates of density and occupancy are compared over time to determine if population changes are a result of population growth or decline and/or range expansion or contraction. For example, if population densities of a species declined over time, but the occupancy rates remained constant, then the population change was likely driven by declines in local abundance. In contrast, if both density and occupancy rates of a species decline over time, then population change was likely the result of reduced distribution on the landscape.
 - Land managers and conservation organizations use IMBCR population estimates to better understand annual fluctuations and long-term trends in landbird populations (NABCI, 2009). Population trends inform management plans, such as State Wildlife Action Plans and show which species should be of regional conservation concern. Managers can also set thresholds to trigger management action when populations decline above a certain rate and be informed when populations are increasing.
 - Sampling units surveyed every year provide information on dynamic processes (e.g., colonization and extinction) that give rise to the patterns of abundance, occupancy, and species richness over time. This information helps generate hypotheses for potential drivers of change on the landscape that could be influencing site occupancy over time.
 3. Model habitat relationships to predict species' responses to changes on the landscape. Although we do not stratify sampling frames by vegetation, the monitoring data can be post-stratified to estimate density within primary habitat types (e.g., sagebrush shrubland).
 - Because IMBCR strata are based on fixed attributes rather than existing vegetation types, we can connect changes in bird populations to changes in vegetation (or other dynamic variables) at multiple scales. The hierarchical stratification scheme is well-suited for linking bird population responses to climate and landscape change at biogeographical scales (Opdam & Wascher, 2004).

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- Monitoring data are useful for evaluating competing hypotheses about how bird populations respond to system dynamics. Understanding regional bird population dynamics should help land managers predict species' responses to landscape change and local or large-scale conservation efforts (Jones, 2011; Noon, Bailey, Sisk, & McKelvey, 2012).
 - For project-level planning in specific strata (e.g., National Forest), the monitoring data inform potential population impacts from proposed activities. If the project is occurring in specific habitat(s) within the stratum, we can use the habitat-specific density estimates to calculate the number of individual birds that could be impacted within the project area and compare this to the regional population estimate for context.
4. The IMBCR design provides a legitimate way to extend population estimates to un-sampled regions because the population estimates are corrected for incomplete detection. The data also provide a source for tool development to help land managers and resource professionals address important conservation issues and make more defensible decisions.
- Species distribution maps based on relationships between the monitoring data and environmental features (e.g., Sparks et al. 2016, Correll et al. 2016) provide an objective means for landscape prioritization to direct conservation efforts (Brooks et al. 2004). Large-scale species distribution maps combined with the local habitat relationships are useful for answering the “where” and “what to do” questions in conservation planning (Wilson et al., 2007).
 - The foundation of decision support tools (DSTs) are bird-habitat relationships used to evaluate the effectiveness of conservation practices. DSTs that integrate biological, social, and economic objectives are important for cost-effective conservation outcomes in working landscapes with multiple management objectives.
5. Overlay or targeted projects are a growing component of the IMBCR program, and are designed to address specific management questions. Overlay projects utilize the IMBCR sampling design and field methods but are not integrated into the nested stratification of the IMBCR program. These projects benefit from IMBCR detection data from relevant IMBCR surveys in their analyses. In this way, the collaborative efficiency of the IMBCR program is extended to overlay projects by improving the accuracy and precision of population estimates for infrequently detected species, and providing regional context for project area estimates. Some example overlay projects include:
- Monitor birds in the Atlantic Rim Natural Gas area (south-central Wyoming) to determine energy development impacts on birds, and set management triggers to determine when a threshold is met for sagebrush songbird occupancy in the project area compared to surrounding BLM lands (download project factsheet [here](#));
 - Examine community-level effects and bird species relationships with restoration treatments under the US Forest Service's Collaborative Forest Landscape Restoration Program implemented across the Front Range in Colorado (download publication [here](#)); and
 - Compare population estimates on private ranches in the Great Plains to estimates in the surrounding region to see if participating Audubon Conservation Ranches provide

breeding habitat for grassland birds and can market beef on these ranches as bird-friendly (view publication [here](#)).

6. Monitoring is a key part of adaptive management, providing the means for assessing the impacts of management changes and improving system understanding (Lyons et al., 2008; Nichols & Williams, 2006). The IMBCR program accommodates the principles of adaptive monitoring (Lindenmayer & Likens, 2009) because it: 1) addresses well-defined and tractable questions; 2) is underpinned by rigorous science; 3) is based on a conceptual model of how bird populations function; and 4) is relevant to the management of natural resources (Pavlacky et al., 2017).
 - Under the adaptive monitoring framework, the objectives, sampling design, data collection, analysis, and interpretation are iterative, allowing the program to evolve and develop in response to new information or new management questions. The IMBCR program allows for different stratification schemes across state and regions and the re-stratification of local management units to better address partner management objectives or new questions.
 - The flexible hierarchical design also accommodates annual fluctuation of sampling intensity without compromising regional population estimates. In addition, overlay projects can address specific management questions or hypotheses without affecting the integrity of the overall IMBCR framework.

In 2020, IMBCR partners or data requestors published five peer-reviewed papers using IMBCR data to address specific management, theoretical, or conservation questions. For example, Adam Green and co-authors found [little evidence for displacement](#) of a native gamebird, mourning dove, by an invasive species, Eurasian collared-dove, in the western Great Plains. Nicole Michel and co-authors developed the [Bird-Friendliness Index](#) to identify ecologically significant areas for grassland birds, and evaluate the effects of simulated conservation practices on these bird communities. In 2020, we received 10 new IMBCR data requests for the raw bird and/or vegetation data for the purposes of conducting additional analyses. For one request, Canadian Wildlife Service and collaborators plan to develop open-source species-specific detectability offsets and create range-wide species density models for breeding birds in the Great Plains.

Bird Conservancy completed one overlay project in 2020 in collaboration with the US Forest Service Intermountain Region to examine livestock grazing impacts on breeding songbirds in high altitude riparian areas in the Bridger-Teton National Forest. We found that reductions in grass cover and herbaceous height from grazing could negatively impact habitat quality for savannah, vesper, and Lincoln's sparrow (download project factsheet [here](#)). In 2020, Bird Conservancy also started a new overlay project to understand the contribution of private lands conservation practices, such as conservation easements and rotational grazing, for grassland birds in the Great Plains. We will monitor birds on ranches enrolled in these conservation practices for at least two years to determine if they are having a positive impact on grassland bird populations. We also started a stakeholder grazing group to understand the different objectives producers must balance when managing their land, like making a profit, promoting grass cover, providing habitat for wildlife, or passing on a legacy to their families. Through a formal decision process and several meetings, we plan to create a tool or plan that allows producers to choose the decision that best maximizes all of their different objectives.

To see IMBCR-related resources, such as publications, annual reports, factsheets, and past newsletters, please visit our [website](#). To view a spreadsheet and description of past and current overlay projects, data applications, and additional analyses by Bird Conservancy and IMBCR partners, please visit this [link](#).

Conclusion

The availability of consistent monitoring data at multiple scales is an important challenge for avian conservation (Ruth et al., 2003). The IMBCR program meets this challenge through its probabilistic, hierarchical design, which allows for inference to multiple strata of interest, from National Grasslands to states to BCRs (Pavlacky et al., 2017). With this design, we can model habitat relationships to evaluate species' responses to local management actions and predict species' distributions for landscape prioritization. Stratification based on eco-regional boundaries and other fixed attributes is also a critical feature of the IMBCR program because it allows for the evaluation of long-term avian responses to landscape and climate change (Metzger et al., 2013; Pavlacky et al., 2017).

The importance of long-term population monitoring at larger spatial scales is well known (Jones, 2011; Thompson et al., 1998), but it is expensive and often cost-prohibitive. The IMBCR design reduces expenses through cooperation with multiple partners, one of the stated goals of effective collaboration and coordinated bird monitoring (NABCI Monitoring Subcommittee, 2007). Partners can investigate priority species and management questions with slight modifications to the IMBCR design, further reducing costs associated with developing new studies and monitoring programs. These cost savings allow for an increased sampling effort and/or for the development of decision support tools to aid land managers and conservation practitioners on the ground. Based on the spatially balanced design, the IMBCR program can also accommodate a shortage of monitoring funds in certain years or strata without reducing the overall rigor of the program (Stevens Jr. & Olsen, 2004).

The IMBCR program is well-positioned to address the conservation and management needs of a wide range of stakeholders due to its rigorous, hierarchical design and the strength of the IMBCR partnership. This partnership is an ongoing collaboration between multiple entities from state and federal agencies to non-governmental organizations, and was created to address management and conservation objectives of larger avian programs like NABCI (NABCI Monitoring Subcommittee, 2007). Through the IMBCR partnership, monitoring resources are pooled among separate management entities, promoting a more efficient use of resources and allowing for inference to larger landscapes (Pavlacky et al., 2017). By providing essential knowledge of bird populations at multiple scales relevant to management and conservation, the IMBCR program informs prioritization of management actions and facilitates a collaborative approach to bird conservation (Ruth et al., 2003, Pavlacky et al., 2017).

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Appendix A: Rocky Mountain Avian Data Center Tips

Overview

All results, including parameter estimates, distribution maps, raw count data and effort, are available online. To view interactive maps showing survey and detection locations, as well as species counts, and density, population and occupancy results using the IMBCR study design please visit the [Rocky Mountain Avian Data Center](#). Click on the “Explore the Data” tab to view IMBCR results.

The Rocky Mountain Avian Data Center has been designed to provide information for specific questions and therefore works best when users select multiple filters for a query. To run a query, click the arrow for the drop down “Filter” menu (located in the extreme upper left corner of the screen) and select one of the following filter types: Study Design, BCR, State, County, Management Entity, Priority Species List, Species, Year, Superstratum, or Individual Stratum. After selecting the filter type, click the “Add” button immediately to the right of the drop down menu. A box will appear with options for the filter that you may select. Use the drop down menu in the box to select the specific filter and then click “Add filter”. The selected filter will appear near the top of the screen. Users may add multiple filter types to view results for a very specific inquiry (e.g., to view IMBCR results for BRSP in CO you would apply the following filters: Study Design = IMBCR, Species = Brewer’s Sparrow and State = CO) or to view multiple outputs at once (e.g., to view data and results for Brewer’s Sparrow and Vesper Sparrow at the same time select Species = Brewer’s Sparrow and Species = Vesper Sparrow). Below is an explanation of the different filter types you may choose from.

Study Design: This filter will allow users to select data and results for IMBCR, GRTS, Migration Phenology, NEON, or NPS study designs.

- Selecting the GRTS filter will display data and results for monitoring efforts which used the IMBCR design but do NOT contribute to statewide and regional estimates (also known as “overlays”).
- The IMBCR filter will select data and results collected under the IMBCR protocol that contribute to state and BCR-wide estimates.
- The Migration Phenology filter will select data and results for the Migration Phenology project.
- The NEON study design is a specific study design developed by NEON and Bird Conservancy for surveys conducted at NEON research locations.
- The NPS study designs are a mixture of study designs specifically designed for individual national parks. Please note that we are still working on adding some of the historic data to the Avian Data Center so not all study designs are currently available.

BCR: This filter will allow users to select data and results for a particular Bird Conservation Region. Selecting this filter will provide you with results for all strata and superstrata within a particular BCR.

State: This filter will allow users to select data and results for all study designs for a particular state. Selecting this filter will supply the user with data and results for all strata and superstrata within a particular state.

County: This filter will allow users to select data for a particular county. Please note that only raw count data and survey locations are available at the county level.

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Management Entity: This filter will allow users to select data and results for All Other Lands, Colorado State Land Board, The Nature Conservancy (TNC), US Bureau of Indian Affairs (BIA), US Bureau of Land Management (BLM), US Department of Defense (DOD), US Fish and Wildlife Service (USFWS), US Forest Service (USFS), or National Park Service (NPS). Once a management entity is chosen, users may notice that additional filter types are available in the filters drop down list. These additional filter types, listed from most general to most specific, are management regions (e.g., USFS Region 1), management units (e.g., Dakota Prairie Grasslands), management forests (e.g., Shoshone National Forest), or management districts (e.g., North Kaibab district within Kaibab National Forest). Below is the filter hierarchy for the different management entities.

Priority Species List: This filter will allow users to select data and results for multiple species at once. The query will display data and results for all species included on the selected management indicator list, species of conservation concern list, etc.

Species: This filter allows users to select data and results for a particular species.

Year: This filter will allow users to select all data and results for a particular year.

Superstratum: This filter allows users to select IMBCR data and results for multiple strata that were analyzed jointly (e.g., the entire Bridger-Teton National Forest which was broken up into 2 strata or the entire state of Colorado which was broken up into 30 strata).

Individual Stratum: This filter allows users to select data and results for a particular stratum.

Hierarchy for the different management entities

All Other Lands:

- Tier One – Management Entity – All Other Lands
- Tier Two – Management Region – Not applicable
- Tier Three – Management Unit – Not applicable
- Tier Four – National Forest or Grassland – Not applicable
- Tier Five – Management District – Not applicable

Colorado State Land Board:

- Tier One – Management Entity – Colorado State Land Board
- Tier Two – Management Region – Lowry Range
- Tier Three – Management Unit – Not applicable
- Tier Four – National Forest or Grassland – Not applicable
- Tier Five – Management District – Not applicable

TNC:

- Tier One – Management Entity – The Nature Conservancy
- Tier Two – Management Region – Cherry Creek
- Tier Three – Management Unit – Not applicable
- Tier Four – National Forest or Grassland – Not applicable
- Tier Five – Management District – Not applicable

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Tribal Lands:

- Tier One – Management Entity – US Bureau of Indian Affairs
- Tier Two – Management Region – Reservation
- Tier Three – Management Unit – Not applicable
- Tier Four – National Forest or Grassland – Not applicable
- Tier Five – Management District – Not applicable

BLM:

- Tier One – Management Entity – Bureau of Land Management
- Tier Two – Management Region – BLM Field Office
- Tier Three – Management Unit – Not applicable
- Tier Four – National Forest or Grassland – Not applicable
- Tier Five – Management District – Not applicable

DOD:

- Tier One – Management Entity – US Department of Defense
- Tier Two – Management Region – US DoD Installation
- Tier Three – Management Unit – Not applicable
- Tier Four – National Forest or Grassland – Not applicable
- Tier Five – Management District – Not applicable

USFWS:

- Tier One – Management Entity – US Fish and Wildlife Service
- Tier Two – Management Region – USFWS Region
- Tier Three – Management Unit – USFWS Management Unit, Refuge, etc.
- Tier Four – National Forest or Grassland – Not applicable
- Tier Five – Management District – Not applicable

USFS:

- Tier One – Management Entity – US Forest Service
- Tier Two – Management Region – USFS Regions
- Tier Three – Management Unit – National Forest (NF) or National Grassland (NG) management units
(used to represent situations where multiple forests are managed jointly)
- Tier Four – National Forest or Grassland – NF or NG
- Tier Five – Management District – NF or NG Ranger Districts

NPS:

- Tier One – Management Entity – National Park Service
- Tier Two – Management Region – Inventory and Monitoring Network
- Tier Three – Management Unit – Individual NPS Parks, Monuments, Memorials, Recreation Areas, and
Historic Sites
- Tier Four – Management Forest – Not applicable
- Tier Five – Management District – Not applicable

Clearing Filters

Filters can be cleared in one of two ways. You may click on the circled “X” to the left of an individual filter at the top of the screen to remove it or you may click the “clear all filters” button at the top of the screen to start building a new query.

Running Queries

Once you have selected your desired filters, please click on the “Run Query” button located at the top of the screen. The amount of time it takes for the desired data and results to be displayed will depend on how specific your query is.

Comparing Multiple Queries

Users may view results of multiple queries at once. To do this, run the first query as described above and then click the button “New Query Window” (located at the top of the screen). A new window will appear where a separate query can be run. The two windows can then be viewed side by side.

Share a Created Query with a Colleague

It is possible to create a link to the Avian Data Center/ Explore the Data screen with a pre-loaded set of filters for a query. To do this, add the custom set of filters for your query per the instructions above and then click the “Generate URL” button near the top right corner of the screen. A pop-up box will appear with a highlighted URL address. Once you copy the highlighted text, you may paste the URL address into an email or document using conventional means. Please note that whoever receives the URL address will need to run the query after clicking on the link to see the survey locations, results, and raw count statistics for the set of filters of interest.

Viewing Maps (Map Tab)

What is displayed?

By default, the map tab is the initial start-up page. After clicking the “Run Query” button, the ADC will display a map of all survey locations corresponding to your set of filters (surveyed sampling units are represented by blue semi-transparent circles) using Google Maps. If you have filtered by species, blue circles represent survey locations where that species was not detected and blue circles with a pink dot in the center represent survey locations where that species was detected. To see the specific name of a survey location, hover the mouse arrow over the blue circle. After a moment the name of the surveyed sampling unit will appear. You may view the bird detection information for a sampling unit and the survey dates by left clicking your mouse on the blue circle.

By default, the zoom capability of the maps page is restricted to protect the privacy of private landowners. Funding and/or implementation partners wishing for more precise location information to be displayed should request a password from Bird Conservancy IT staff via email. Once a user has a password, click on the “View Options” button at the top of the screen, enter the password in the “Password for Bird Conservancy staff and partners” field, and click “Save”. If you have run a query prior to entering the password, you will need to click the “Run Query” button again in order to utilize the enhanced zooming features now available to you.

Adding map layers

You may add the following layers to the map: Bird Conservation Region boundaries, BIA boundaries, DoD boundaries, NPS boundaries, USFS boundaries and BLM Field Office boundaries. To do this, left click on the drop down menu at the top left corner of the map, select the desired layer, and click the “add layer” button. It is possible to add multiple layers to the map by repeating this process. The top-most feature’s name will appear if you left click your mouse inside the layer’s boundaries.

Viewing Occupancy/Density Results (Occupancy and Density Tabs)

Viewing Tables

You may view occupancy or density results table and a chart for all appropriate strata (based on the set of filters) for which we have results, by clicking on the tabs labeled “Occupancy” or “Density”. These tabs are located just below the drop down filter menu in the upper left corner of the screen. The occupancy tables display species, stratum, year, Psi (proportion of sampling units expected to be occupied), number of sampling units the species was detected on, standard error (SE) of the estimate, the percent coefficient of variation (% CV). The density tables will display species, stratum, year, number of birds estimated per km² (D), total number of individuals estimated within the stratum (N), percent coefficient of variation (% CV), and the number of independent detections used in analyses (*n*). You may view a description of the column headings by moving the cursor over the column heading.

Viewing the Charts

When viewing the occupancy and density charts, the point estimate of Psi or D is indicated with a dot. Additionally, short horizontal dashes above and below the point estimate represent values one standard error away from the point estimate. To view the species, stratum and year that correspond to an estimate on the chart, simply move your mouse arrow over the point estimate or standard error bar. A message will pop up with the appropriate information. If you have queried out multiple years of data, the point estimates for each year will be connected with a solid line. You may remove an individual estimate from the chart by clicking on the corresponding row of the table on the left side of the screen. Estimates that are not displayed on the chart will turn a peach color in the table. You may add the estimate back onto the chart by clicking on the peach colored row in the table.

Knowing which species have estimates

To restrict the species filter to display only those species for which occupancy and/or density estimates have been produced, click on the “View Options” button on the very top of the screen and then check the box next to “Only show species for which occupancy/density results are available”. This will prevent you from querying out numerous species for which occupancy or density estimates are not available.

Saving results of your query

You may easily save the results of your query by clicking the “Copy to clipboard” button and pasting the results into another program such as excel or by clicking the “Save to CSV” button. Similarly, to save a chart click on the “View Image” button below the chart, right click on anywhere on the image and select “Copy image” or “Save image as”.

Functionality

Please keep in mind that queries with very generic filters will result in long wait times and may not function optimally (your browser may end up crashing). For instance, if a user selects only the IMBCR filter, occupancy results will be displayed for every species and strata/superstrata combination for which

there are occupancy and/or density results. If your query is not specific enough, the chart on the right side of the screen will not be displayed or a pop-up box will appear asking if you would like to continue. This pop-up box is designed to prevent your web browser from crashing while the RMADC attempts to create a chart that would be extremely difficult to interpret. We recommend that you cancel the proposed query and add additional filters to make your query less generic.

Viewing Raw Count Statistics (Species Counts Tab)

You may view the raw count of detections for each species and the effort (expressed as the number of point count stations surveyed) for your query by clicking on the “Species Counts” tab located just below the drop down filter menu in the upper left corner of the screen. Both the counts (left table) and effort tables (right table) may be sorted by clicking on the row header. Additionally, you may view the counts and effort by BCR, State, County, Stratum, or Management Entity by clicking on the “Count by” drop down menu located above the counts table. If you have filtered using “Superstrata”, viewing counts by Stratum is an excellent way of getting a list of all the strata that comprise a Superstratum. If you would prefer to view effort expressed as the number of sampling units surveyed, click on the “View Options” button located at the top of the screen and check the box labeled “Show effort by number of sampling units instead of by point”.

Appendix B: IMBCR Program and Stratification History

In 1995, Bird Conservancy of the Rockies (Bird Conservancy; formerly Rocky Mountain Bird Observatory), in partnership with Colorado Parks and Wildlife (CPW; formerly Colorado Division of Wildlife), the United States Forest Service (USFS), the Bureau of Land Management (BLM) and the National Park Service (NPS), began efforts to create and conduct a Colorado-wide program to monitor breeding bird populations. This was the first attempt in the nation to develop and implement a statewide landbird monitoring program. After a successful pilot year in 1998, Bird Conservancy implemented the protocol in 13 habitats in Colorado in 1999. Bird Conservancy and its partners used this methodology for 10 years and expanded the effort to include parts of Arizona, New Mexico, North Dakota, South Dakota, Utah, and Wyoming.

In 2007, the NABCI Monitoring Subcommittee published “Opportunities for Improving Avian Monitoring” (NABCI Monitoring Subcommittee, 2007) which offered recommendations for improving the efficiency and effectiveness of avian monitoring in North America. After taking NABCI’s recommendations into consideration, IMBCR partners developed a new study design and protocol for statewide bird monitoring in Colorado. The new study design used BCRs as the sampling frame and further stratified by land ownership within each BCR.

2008: IMBCR partners stratified and surveyed the Southern Rockies/Colorado Plateau BCR (BCR 16) and the Shortgrass Prairie BCR (BCR 18) portions of Colorado, as well as the BCR 16 portion of Wyoming. Furthermore, in Colorado BCR 16, we used cell weighting to target high order rivers and streams (based on Strahler stream order) and higher elevation habitats (e.g. alpine tundra), which occur in a small proportion of the landscape (Blakesley & Hanni, 2009).

2009: After the 2008 season, IMBCR partners determined the cell weighting had caused middle-elevations in Colorado to be under-sampled. To correct this, all strata in the Colorado and Wyoming portions of BCR 16 were re-stratified without cell weighting. Additionally, the All Other Lands stratum in Wyoming BCR 16 was split into two strata: All Other Lands and BLM Lands.

Based on the overall success of the pilot implementation, IMBCR expanded to include the Colorado and Wyoming portions of the Northern Rockies (BCR 10); the Great Basin (BCR 9) and BCR 18 portions of Wyoming; all of the Badlands and Prairies (BCR 17); the USFS National Forests and Grasslands within BCR 18; and Coconino and Prescott National Forests in the Sierra Madre Occidental (BCR 34).

2010: The program expanded to include the BCR 10 and the Prairie Potholes BCR (BCR 11) portions of Montana, three national forests in the Idaho portion of BCR 10 and Kaibab National Forest in BCRs 16 and 34. Additionally, there were several re-stratifications done in Colorado BCRs 10 and 16 between 2009 and 2010. The Colorado BCR 10 stratum was re-stratified to include the small easternmost portion of BCR 10 that dips into Colorado so all Colorado BCR 10 lands are represented. The “NPS Rocky Mountain Inventory and Monitoring Network (RMNW)” and “Northern Colorado Plateau Inventory and Monitoring Network (NCPN)” were re-stratified because some NCPN park units were initially misclassified into the RMNW stratum. In Wyoming, the USFS Region 4 stratum was re-stratified into three separate strata: “Bridger-Teton National Forest front-country/managed areas”, “Bridger-Teton National Forest designated roadless/wilderness areas” and “the remainder of USFS Region 4 lands in Wyoming BCR 10”. This re-stratification was done to allow for density and occupancy estimation specifically for the Bridger-Teton National Forest.

2011: The geographic extent of the IMBCR program expanded to the Nebraska portion of the Central Mixed Grass Prairie (BCR 19) and included all of the national forests and grasslands in Nebraska. Additionally, there were several re-stratifications done in Colorado. The Colorado BCR 10 stratum was split into two strata: BLM Lands and All Other Lands. This was done to facilitate improved tracking of

priority species on BLM lands throughout Colorado. Rio Grande National Forest and White River National Forest strata were each split into three strata: low, medium, and high elevations. This stratification by elevation allowed sampling intensity changes to target Management Indicator Species on the forests. The Routt National Forest and Arapaho and Roosevelt National Forests strata were reorganized and a third stratum, the Williams Fork Area, was created from the two because it had mixed administration between the Routt National Forest and the Arapahoe and Roosevelt National Forests. The RMNW stratum was re-stratified to accurately reflect land ownership. There was a land acquisition within Great Sand Dunes National Monument and some samples were removed from Rio Grande National Forest and added to the RMNW stratum; 16 km² were added to the area of the RMNW strata. In South Dakota, the Black Hills National Forest stratum was split into two strata based on watersheds in the Forest: Hydrologic Code 7 Watersheds and all other watersheds. Stratification by watershed allows for adjusting sampling intensity to target Management Indicator Species on the Forest.

2012: In 2012, we added four strata in Idaho to account for all of BCR10 within the state. We took into account the boundary between USFS Regions 1 and 4, which runs through Idaho, when stratifying so estimates could be generated at the USFS Region level. The new strata include “All Other Lands in the Region 1 portion of Idaho BCR 10” (all lands outside of national forest boundaries), “All Other Lands in the Region 4 portion of Idaho BCR 10” (all lands outside of national forest boundaries), “other USFS lands in the Region 1 portion of Idaho BCR 10” and “USFS designated roadless/wilderness areas within the Region 4 portion of Idaho BCR 10”. In Arizona, Tonto National Forest became a part of the IMBCR survey effort. The forest was stratified into two strata based on elevation to allow sampling intensity changes to target Management Indicator Species on the Forests. Kaibab National Forest was re-stratified into two strata based on elevation for the same reason. In Montana, several strata were re-stratified and combined within BCR 17. The three “All Other Lands” strata were combined with the “Tribal Lands” stratum into one “All Other Lands” stratum. The four BLM strata within Montana BCR 17 were combined into one BLM stratum. These strata were collapsed into larger strata to maximize the number of samples conducted within two strata rather than spread them out amongst eight strata.

2013: 2013 brought significant changes to the program’s overall stratification methods. The original IMBCR sampling grids were created at the state scale and as the program expanded, additional sampling grids were created at the BCR scale. In response to a rapidly growing monitoring program, the partnership acknowledged the need for a standard national grid system to promote the coordination and application of monitoring data in conservation. The group proposed the use of the United States National Grid (USNG), a national grid system created by the Federal Geographic Data Committee, as its standard. There are three advantages to using the USNG. First, the use of standard grids allows for the integration of datasets and subsequent identification of areas where sampling should or has not occurred. Second, it provides a means to identify sampled areas in a consistent manner so results of monitoring projects can be evaluated in a spatially comparable way. Lastly, it facilitates regional and national-level avian distribution modeling and the development of broad-scale avian distribution maps. This standard was approved by the NABCI committee. Bird Conservancy started using the USNG for new stratification and re-stratification schemes in 2013.

We added several USFS strata to the sampling frame for the 2013 field season – Coronado National Forest in southern Arizona, Carson National Forest in north-central New Mexico, and Caribou-Targhee National Forest in southeastern Idaho. Coronado and Carson National Forests were stratified into two strata based on elevation to allow for adjusting sampling intensity to target Management Indicator Species on the Forests. Because Caribou-Targhee National Forest spans three states and three BCRs, it was necessary to divide the forest into four strata. The state and BCR-level stratification distinctions allowed the summation of the data for individual states or BCRs. The four new strata in Idaho and Utah join a preexisting Caribou-Targhee stratum in west-central Wyoming as a part of Wyoming’s statewide

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effort. In addition, Pawnee National Grassland was split into two strata – public lands and private lands – since Pawnee National Grassland contains a large amount of private land within its administrative boundary. This allowed the USFS to concentrate more survey effort specifically on public lands. In Wyoming, the preexisting stratum in BCR 10 containing all USFS Region 4 lands (other than Bridger-Teton National Forest) was re-stratified into three separate strata, one for each Forest (Caribou-Targhee, Ashley, and Wasatch). This allows for forest-wide estimates within Caribou-Targhee National Forest. If, in the future, Ashley and Wasatch National Forests are completely sampled, this will also allow for forest-wide estimates in each of those forests.

The North Dakota, South Dakota, and Nebraska portions of BCR 17 underwent a complete re-stratification to incorporate several NPS Northern Great Plains Inventory and Monitoring Network (NGPN) strata. All of the non-NPS strata in these states were retained, but renamed to avoid confusion. The NPS strata were stratified by NPS unit to allow the NGPN to monitor birds on each of its units separately. New strata included Knife River Indian Villages National Historic Site, Theodore Roosevelt National Park, Badlands National Park, Jewel Cave National Monument, Mount Rushmore National Monument, and Wind Cave National Park.

Nebraska BCR 18 also underwent a complete re-stratification to allow for the individual stratification of Agate Fossil Beds and Scotts Bluff National Monuments. We also added an additional stratum for Cherry Ranch, a property owned by The Nature Conservancy (TNC).

2014: In Colorado, the Arapaho and Roosevelt and the Pike and San Isabel National Forests were re-stratified to allow these forests to monitor treatments intended to mitigate fire hazard and improve forest health. We divided each forest into two strata: a control stratum and the remainder of the forest. The control portion of the Arapaho and Roosevelt National Forests consists of lands ranging in elevation from 6,000 ft. (1,829 m) to 9,000 ft. (2,743 m) and excludes treatment areas and areas burned between 1998 and 2013. The Pike and San Isabel control stratum ranges from 6,000 ft. (1,829 m) to 9,500 ft. (2,896 m) and excludes treatment areas and areas burned between 1998 and 2013. We created a single experiment overlay stratum for all of Arapaho and Roosevelt and Pike and San Isabel National Forests consisting of actual treatment areas (areas with >30% treatment). Since this stratum spans multiple forests, it is not considered to be a part of the IMBCR design; however, detections from this stratum do contribute to the number of detections used in analyses.

Significant stratification changes were made to the BCR 10 portion of Idaho. The four strata defined in the 2012 field season were further subdivided into nine strata. The boundary between USFS Regions 1 and 4 runs through Idaho and was taken into account when re-stratifying so that estimates could be generated at the USFS Region level. The new strata created in Idaho BCR 10 include the “Idaho portion of Bitterroot National Forest”, “BLM Lands within Idaho BCR10”, “Boise National Forest”, “the Idaho portion of Kootenai National Forest”, “Payette National Forest”, “Salmon-Challis National Forest”, “Sawtooth National Forest”, “All other Lands within Idaho BCR 10 and USFS Region 1” (all lands outside of national forest and BLM boundaries) and “All Other Lands within Idaho BCR 10 and USFS Region 4” (all lands outside of national forest and BLM boundaries). Since Bitterroot and Kootenai National Forests span Idaho and Montana, 2014 density and occupancy estimates for those forests included strata from both states. In the past, “forest-wide” estimates have only represented the Montana portion of these forests.

We subdivided the US Fish and Wildlife Service (USFWS) strata in Montana BCRs 11 and 17 to allow density and occupancy estimation specifically within the Charles M. Russell National Wildlife Refuge. Previously, we grouped all USFWS lands together in these BCRs, limiting estimates for individual refuges. In each BCR, we created two new strata – a Charles M. Russell NWR stratum and an “All Other USFWS Lands” stratum.

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In addition to re-stratification, we added a few new strata to the IMBCR program in 2014. In Nebraska, NGPN began monitoring on the Niobrara National Scenic River spanning BCRs 17 and 19. In Utah, we created a new stratum for Manti-La Sal National Forest. Previously, only the Colorado portion of Manti-La Sal was stratified and surveyed. The additional Utah portion allows for the generation of forest-wide estimates for Manti-La Sal.

2015: In 2015, the Department of Defense (DoD) stratum in Colorado BCR 18 was completely re-stratified as part of a DoD Legacy Resource Management Program Grant to represent six individual military installations: US Air Force Academy, Fort Carson, Pueblo Chemical Depot, Piñon Canyon, and All Other DoD Lands. This DoD installation-level stratification allows for the generation of density and occupancy estimates for each installation. Fort Carson and Piñon Canyon were further stratified by areas within range fans (training zones) and areas outside of range fans to allow the DoD to assess the effects of military training on bird species.

The Rocky Mountain Arsenal National Wildlife Refuge stratum also came out of the 2015 re-stratification. During WWII, the Rocky Mountain Arsenal, as it was originally known, was a chemical weapons manufacturing facility. At the time of the 2008 IMBCR stratification in the state Colorado, it was still partially owned by the US Army and was included in the DoD stratum. The refuge is now in its own individual stratum.

The IMBCR program expanded to include the Missouri National Recreational River (MNRR), part of the NPS NGPN in Nebraska and South Dakota. There are two strata for MNRR representing the 39 Mile District and the 59 Mile District. In Utah, an additional stratum was added for Sanpitch Recreation Area. This area is part of Uinta National Forest but administered by Manti-La Sal National Forest and will be incorporated into forest-wide estimates for Manti-La Sal National.

2016: In 2016, the Playa Lakes Joint Venture (PLJV) coordinated a partnership between several state wildlife agencies and Bird Conservancy to expand sampling in five of the joint venture's six states: Nebraska, Kansas, New Mexico, Oklahoma, and Texas. PLJV's sixth state, Colorado, was already included in the IMBCR program starting in 2008. This expansion now provides the program with nearly complete coverage of two BCRs that were only sparsely covered in past years: Shortgrass Prairie (BCR 18) and Central Mixed Grass Prairie (BCR 19). The BCR 18 and 19 portions of these 5 states were divided into several strata, including, playas, rivers, biologically unique landscapes in Nebraska, and all other lands.

The IMBCR program also underwent a major expansion into the state of Utah in 2016. The entire state was stratified into BLM, USFS, DoD, and All Other Lands strata. This year was somewhat of a pilot year, with select BLM, USFS, DoD, and all other lands strata sampled across the state. In future years, sampling will be increased to a statewide level.

In addition to new strata, some existing strata were re-stratified for a variety of reasons. In North and South Dakota, we re-stratified the Tribal and All Other Lands strata to ensure all tribal lands were only included in the tribal lands strata. In the past, some tribal lands could still be found within the All Other Lands strata. We also re-stratified Cimarron, Kiowa, and Rita Blanca National Grasslands in Kansas, Oklahoma, New Mexico, and Texas. With the expansion of IMBCR throughout the PLJV region, these strata needed to be fit to the US National Grid to make them consistent with the rest of the IMBCR program in the region. In addition, we determined that the portion of Rita Blanca National Grassland that fell in New Mexico was actually managed by Kiowa National Grassland, so that portion was moved to the Kiowa National Grasslands stratum. All DoD lands in Colorado BCR18 were combined into one stratum. This was the same stratification used prior to 2015.

2017: In 2017, the IMBCR program expanded to include Humboldt-Toiyabe National Forest in two new states, Nevada and California. This, coupled with an expansion into national forests in Idaho BCR 9 and

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Utah yielded complete coverage of USFS lands at the regional level for USFS Region 4. Idaho also experienced a significant expansion with statewide coverage of BLM lands. In a concerted effort from several implementation partners, Utah sampling included statewide coverage, including several new BLM Field Offices, All Other Lands in BCR 10, and remaining Region 4 National Forests. We also obtained complete coverage of BCR 18 for the first time by expanding into the BCR 18 portion of South Dakota.

USFWS strata in Montana BCR 11 and BCR 17 were re-combined in 2017 and reverted back to their pre-2014 areas. In Idaho, BLM Four Rivers Field Office in BCR 9 was split into two strata, incorporating the boundaries of Morley Nelson Snake River Birds of Prey National Conservation Area into the design. Additionally, we resampled All Other Lands in Nebraska BCR 17 to include eastern areas not included in the sampling frame from 2013-2016.

2018: In 2018, several Montana strata were combined to help produce statewide estimates. In BCR 10, the All Other Lands, Fish and Wildlife Service, National Park Service, Rivers, Blackfeet and Crow Reservations, and Flathead Reservation strata were combined into a single All Other Lands Stratum. In Montana BCR 11, we collapsed the Fish and Wildlife Service and Tribal Lands strata into a single Fish and Wildlife Service and Tribal Lands stratum. Two strata in Montana BCR 17, Fish and Wildlife Service and Rivers, were combined into a single Fish and Wildlife Service and Rivers stratum.

Additionally, Agate Fossil Beds National Monument and Scotts Bluff National Monument in Nebraska BCR 18 were combined into a single National Park Service Lands Stratum. In South Dakota BCR 17, the Badlands National Park - South Unit and Tribal Lands strata were combined into a single, new Tribal stratum, and Jewel Cave National Monument and Mount Rushmore were also collapsed into one National Park Service lands stratum.

Finally, Department of Defense strata in Utah were completely re-stratified to better assess the effects of military training on bird species.

2019: In 2019, the IMBCR program expanded to include all BLM lands in BCR 9 in California, Nevada, and Oregon. Great Basin Bird Observatory, Klamath Bird Observatory, and Point Blue conducted the field work in these new areas. This expansion improved coverage of sagebrush-steppe habitat.

The National parks strata in Nebraska and South Dakota that were collapsed in 2018 were separated into individual park units again in 2019 as they were in years previous to 2018. The individual park strata are Agate Fossil Beds National Monument and Scotts Bluff National Monument in Nebraska and Jewel Cave National Monument and Mount Rushmore in South Dakota.

2020: In 2020, several strata were combined in North Dakota and South Dakota to maintain BCR 17-wide estimates. In North Dakota, the Tribal Lands stratum and the All Other Lands stratum were collapsed into a single All Other Lands stratum. Similarly, in South Dakota, the Tribal Lands stratum and the All Other Lands stratum were collapsed into a single All Other Lands stratum.

In Nebraska, the BCR 18 All Other Lands stratum, Pineridge Biologically Unique Landscape stratum, Sandsage Prairie Biologically Unique Landscape stratum, and Wildcat Hills Biologically Unique Landscape stratum were combined into a single Nebraska BCR 18 All Other Lands stratum. We changed this stratification because those specific Biologically Unique Landscape strata were no longer of interest to the Nebraska partners.

Appendix C: Protocol Changes Over Time

The original protocol implemented in 2008 has changed and evolved over time to better facilitate analysis and meet partner needs. In 2009, observers began recording the primary habitat type at each sample point from a list of habitat options. We added categorical habitat options to facilitate data proofing, to incorporate habitat in analysis and to link the IMBCR data and results with the older habitat-based monitoring program. Observers also began recording the presence of water and snow within 50 m of each point as a type of ground cover.

Beginning in 2010, the point count duration was increased from five minutes to six minutes to facilitate occupancy estimation, which is easier to analyze using equal time intervals (in this case, two minutes each). Observers began recording juvenile birds detected during point counts. Observers placed a “J” in the sex column for these detections. Previously, juvenile birds were not recorded because this study focuses on recording breeding birds. Juvenile bird detections are used for distribution mapping purposes only and are not factored into data analysis. A minute column was added to the bird datasheet so observers could record the actual minute of each bird detection during a point count. Previously, observers used tick marks to separate minute intervals. We added a “visual” checkbox to the bird datasheet for observers to check if they visually observed and identified any of the species recorded. This reminds observers that they need to look for birds in addition to listening for them and helps crew leaders make decisions regarding unusual or rare bird detections while proofing data. We provided observers with an additional datasheet to record the reasons points were not surveyed (e.g., weather issues, unsafe terrain, denied permission by landowner, etc.). This sheet also provided space to record additional landowner information as needed. Lastly, observers began recording horizontal distance to each flyover detection. In the past, we did not record distances because we do not use flyover detections in analysis. However, observers sometimes incorrectly distinguish flyovers from birds using the surrounding habitat while foraging on the wing (e.g., swallows, swifts, and raptors). Therefore, if we find an incorrectly recorded flyover, we can still use the detection data in analysis.

In 2012, observers began recording the start time for every point count conducted so we could use temporal information as a variable in analyses. Start times for the entire transect and for individual points were all recorded in Mountain Daylight Time for consistency across the region. Prior to 2012, observers were allowed to conduct point counts until 11:00 AM local time each day. In order to account for variability across study areas from Arizona to Montana, crew leaders instructed observers to survey no later than five hours after sunrise in 2012. Observers also began noting migrant detections on surveys. After the field season, we thoroughly review the migrant records; if those records are verified, they are not included in analysis. Previously, crew leaders instructed observers to record a bird as a male if 1) it was a singing warbler or sparrow, or 2) it was singing repeatedly and emphatically. In 2012, we instructed observers to only identify the sex of a visually observed bird of a sexually dimorphic species. We instructed observers to record subspecies only if they visually identified a bird as such. In the past, we used geographic range to assume a bird was of a particular subspecies. Up until the 2012 field season, we provided observers with a list of rare or difficult to detect species to record while traveling between points within a sampling unit. In 2012, in order to simplify the protocol and collect more useful information, we eliminated the list and observers recorded any species they came across while traveling between points they had not documented during a point count. That way all species encountered within the sampling unit would be documented for distribution mapping purposes.

Also in 2012, several changes were made to the vegetation datasheet. First, we removed distance to the nearest road, forest structural stage and human structures from the data sheet. We no longer collect these types of data in the field because they can be obtained through remote sensing. Second, we modified the datasheet to simply record whether a mid-story was present. In the past, if mid-story

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vegetation was present, observers would record the species found in that layer. Data analysis found mid-story vegetation data to be extremely variable from year to year. Third, we added a ground cover category for residual grass. Finally, we limited acceptable overstory, understory, and ground cover relative abundance values to 1%, 5%, or increments of 10%. In the past, observers estimated cover to the nearest percent for all categories where percent cover or relative abundance was recorded. We made the change to improve the consistency of cover and relative abundance estimates and to decrease the amount of time observers spend estimating these values.

In 2012, crew leaders provided observers with two additional data sheets to facilitate working on private lands. The first contained specific information about the land ownership of each point located within a given sampling unit. In cases where a point fell on private property, the data sheet contained the name, contact information and any pertinent notes about the landowner. The second data sheet was a contact log where observers recorded all contacts or attempted contacts they had with landowners. This information was later entered into the landowner database when the observer had internet access.

In 2015, we began recording American pika, similarly to the way we record Abert's and American red squirrels. In 2017, we added a checkbox onto the vegetation data sheet to mark the presence/absence of invasive cheatgrass.

In 2018, we made one change to the ground cover section of the vegetation protocol to collect more specific data on ground cover types. We split the bare/litter ground cover category into bare ground and litter cover so that future analyses could treat these categories separately.

Appendix D: Data Analysis

Distance Analysis

Density and Abundance Estimation

State process

We developed a zero-inflated N-mixture model (Royle 2004, Sillett et al. 2011) to estimate density and abundance for all strata and superstrata across all species with sufficient data. For a given species, the true occupancy state of point count location k in grid j , stratum i , and year t is distributed

$$z_{ijkt} \sim \text{Bern}(\psi_i).$$

The number of independent clusters of individuals, N , of a given species at point count location k in grid j , stratum i , and year t came from a Poisson distribution

$$N_{ijkt} \sim \text{Poisson}(\lambda_{ijt} \times z_{ijkt})$$

with mean λ_{ijt} . Abundances at all points within a grid came from a distribution with the same mean to account for the lack of independence between points, and we modeled λ as a function of time to estimate trend for each stratum:

$$\log(\lambda_{ijt}) = \alpha_i + r_i(t - 1) + \varepsilon_j,$$

where α and r are stratum-specific intercepts and trends, respectively, and ε is a grid-specific random effect.

To avoid predicting species occurrence outside of observed ranges, we fixed ψ to 0 for all strata in which the species was never observed and used a prior informed by the observed proportion of grid-year combinations in a stratum in which the species was detected

$$\text{logit}(\psi_i) \sim \text{Normal}(\mu_{\psi_i}, \sigma_{\psi}^2),$$

where μ_{ψ_i} is the stratum-specific naïve occupancy and σ_{ψ}^2 is the annual variation in occupancy probabilities shared across strata. All other parameters had vague priors:

$$\alpha \sim \text{Normal}(0, 4),$$

$$\exp(\mathbf{r}) \sim \text{Uniform}(0.25, 1.75),$$

$$\varepsilon \sim \text{Normal}(0, \sigma_{\varepsilon}^2),$$

and

$$\sigma_{\varepsilon}^2 \sim \text{Uniform}(0, 5).$$

We derived density, D , at the point count location as

$$D_{ijkt} = \frac{N_{ijkt} \times s}{A_c},$$

where A_c is the area of the point count circle (see *Observation process* section below) and s is the cluster size, which was sampled from the distribution

$$s \sim \text{Gamma}(k, \theta) + 1,$$

where k and θ were derived from the mean and variance of observed cluster sizes. We subtracted 1 from the mean when calculating k and θ and added 1 to the random variable to ensure cluster sizes were ≥ 1 . We derived stratum-level density estimates by averaging all point-level density estimates within each stratum, and we took the area-weighted average of strata estimates to obtain superstrata estimates. We required a minimum of 30 detections across the IMBCR effort to estimate density for each species.

Observation process

We estimated the probability of detecting an independent cluster of individuals by fitting distance functions to the distance data collected during surveys (Buckland et al. 2001). We fit four detection models including: 1) half-normal constant (HN(.)), 2) hazard rate constant (Haz(.)), 3) half-normal year (HN(t)), and 4) hazard rate year (Haz(t)).

We removed the furthest 10% of observed detection distances from the data set and binned the remaining detections into 10 evenly spaced distance classes. For half-normal functions, we calculated the detection probability, p , for each distance class, l , as:

$$p_l = \frac{2\pi \int_{c=b_l}^{c=b_{l+1}} \exp\left(-\left(\frac{c^2}{2\theta^2}\right)\right) c \, dc}{A_l},$$

where b_l and b_{l+1} are the cutpoints for l , θ is the half-normal shape parameter, and A_l is the area of l . Because of the lack of an analytical solution to the integral of the hazard rate function, we calculated p at the midpoint, m , of each distance class

$$p_l = 1 - \exp\left(-\left(\frac{m_l}{a}\right)^b\right).$$

To allow detection probabilities to vary by year, we sampled year-specific shape parameters from hyperdistributions:

$$\theta_t \sim \text{Normal}(\mu_\theta, \sigma_\theta^2),$$

$$a_t \sim \text{Normal}(\mu_a, \sigma_a^2),$$

and

$$b_t \sim \text{Normal}(\mu_b, \sigma_b^2),$$

with priors of

$$\mu_\theta \sim \text{Unif}(0,1000),$$

$$\mu_a \sim \text{Unif}(0,500),$$

$$\sigma_\theta, \sigma_a, \mu_b \sim \text{Unif}(0,100),$$

and

$$\sigma_b \sim \text{Unif}(0,25).$$

We then multiplied p_l by the proportional area of l to account for the probability that a cluster is within distance class l and obtain π_l , the probability a cluster is present within distance class l and is detected,

$$\pi_{lt} = \frac{p_{lt} A_l}{\sum_{l=1}^L A_l}.$$

We calculated the overall capture probability, p_{cap} , as

$$p_{cap} = \sum_{l=1}^L \pi_l,$$

and modeled the number of detections in each distance class at each point count location in year t as

$$y_{ijkt} \sim \text{Multinom}(\boldsymbol{\pi}_t, N_{ijkt}).$$

Detection model selection

To find the most parsimonious detection function while minimizing computing time, we fit detection-only models to the distance data, using the four model structures described above. We used the Watanabe-Akaike Information Criterion (WAIC; Watanabe 2010, Hooten and Hobbs 2015) to select the most parsimonious detection structure and then used that structure for detection probabilities in the full model to estimate density and abundance.

Superstratum trends

We developed a post-hoc approach to estimate trends for superstrata. Using the rolled-up estimates of density for superstratum, i , we fit a general linear model (GLM) to the samples from each Bayesian iteration, m ,

$$\log(\hat{D}_{itm}) \sim \alpha_{im} + r_{im}(t - 1).$$

Fitting a GLM across iterations allowed us to incorporate uncertainty in trends due to uncertainty around density estimates, but it did not account for temporal variation. To incorporate this second form of variation, we sampled a random intercept ($\tilde{\alpha}_{im}$) and slope (\tilde{r}_{im}) for each iteration using the mean and standard error estimated using the GLM and made inference on the distribution of the resampled values,

$$\tilde{\alpha}_{im} \sim \text{Normal}(\mu_{\alpha_{im}}, SE_{\alpha_{im}})$$

and

$$\tilde{r}_{im} \sim \text{Normal}(\mu_{r_{im}}, SE_{r_{im}}).$$

Occupancy Estimation

Occupancy estimation is most commonly used to quantify the proportion of sample units (i.e., 1 km² cells) occupied by an organism (MacKenzie et al., 2002). The application of occupancy modeling requires multiple surveys of the sample unit in space or time to estimate a detection probability (MacKenzie et al., 2006). The detection probability adjusts the proportion of sites occupied to account for species that were present but undetected (MacKenzie et al., 2002). We used a removal design (MacKenzie et al., 2006) to estimate a detection probability for each species, in which we binned minutes one and two, minutes three and four, and minutes five and six to meet the assumption of a monotonic decline in the detection rates through time. After the target species was detected at a point, we set all subsequent sampling intervals at that point to “missing data” (MacKenzie et al., 2006). We required a minimum of ≥ 1 detection on 10 different transects across the IMBCR effort to estimate occupancy for each species.

The 16 points in each sampling unit served as spatial replicates for estimating the proportion of points occupied within the sampled sampling units. We used a Bayesian, multi-scale occupancy model (Nichols et al. 2008, Mordecai et al. 2011, Green et al. 2019) to estimate 1) the probability of detecting a species given presence (p), 2) the proportion of points occupied by a species given presence within sampled sampling units (θ), and 3) the proportion of sampling units occupied by a species (ψ).

We truncated the data, using only detections <125 m from the sampled points, except for species in Accipitriformes, Anseriformes, Falconiformes, Galliformes, Gruiformes, Pelecaniformes, Podicipediformes, and Suliformes for which we used the maximum observed distance for each species. Truncating the data allowed us to use bird detections over a consistent plot size and ensured that the points were independent (points were spread 250 m apart), which in turn allowed us to estimate θ (the proportion of points occupied within each sampling unit) (Pavlacky Jr., Blakesley, White, Hanni, & Lukacs, 2012). The interpretation of θ for species for which we used maximum distances changes from occupancy to use because point count buffers overlap, but we chose this approach to provide estimates for a larger number of species.

We expected regional differences in the behavior, habitat use, and local abundance of species would correspond to regional variation in detection and the fraction of occupied points. Therefore, we estimated the proportion of sampling units occupied (ψ) for each stratum by estimating BCR-by-year specific estimates of detection (p) and point-level occupancy (θ). We fixed p and θ to 0 for BCRs in which a particular species was never detected. Otherwise these parameters came from hyperdistributions

$$\text{logit}(p_{BCR,t}) \sim \text{Normal}(\mu_{p_{BCR}}, \sigma_p^2)$$

and

$$\text{logit}(\theta_{BCR,t}) \sim \text{Normal}(\mu_{\theta_{BCR}}, \sigma_\theta^2),$$

where μ_p and μ_θ are BCR-specific means for detection and point-level occupancy, respectively, and σ_p^2 and σ_θ^2 are the annual variances shared across BCRs.

We fixed ψ to 0 for all strata in which the species was never detected. Otherwise, the true occupancy state ($z_{i,t}$) of a 1-km² grid cell, j , in a given year, t , in stratum i was modeled as

$$z_{ijt} \sim \text{Bernoulli}(\psi_{it})$$

and

$$\text{logit}(\psi_{it}) \sim \text{Normal}(\mu_{\psi_i}, \sigma_\psi^2),$$

where μ_{ψ_i} is the stratum-specific mean occupancy rate on the logit scale and σ_ψ^2 is the annual variance shared across all strata. As with density, we took an area-weighted mean of stratum-level occupancy estimates (i.e., ψ) to estimate superstratum-level occupancy probabilities.

The true point-level occupancy state (u) was conditional on the grid-cell-level occupancy state (i.e., $z = 1$, occupied; $z = 0$, unoccupied), such that a point could only be occupied if the grid cell was occupied,

$$u_{ijkt} \sim \text{Bernoulli}(\theta_{BCR,t} \times z_{ijt}).$$

Finally, we modeled the observation process conditional on the point being occupied (i.e., $u = 1$) as

$$y_{ijkt} \sim \text{Binomial}(p_{BCR,t} \times u_{ijkt}, J_{ijkt}),$$

where y_{ijkt} are the observation data at point k in year t ($y = 1$, observed; $y = 0$, not observed) and J_{ijkt} is the 2-minute interval in which the species was first detected (i.e., $J = 1$, 1-2 minutes, $J = 2$, 3-4 minutes, $J = 3$, 5-6 minutes or not detected).

Our application of the multi-scale model was analogous to a within-season robust design (Pollock, 1982) where the two-minute intervals at each point were the secondary samples for estimating p and the points were the primary samples for estimating θ (Nichols et al., 2008; Pavlacky Jr. et al., 2012). We considered both p and θ to be nuisance variables that were important for generating unbiased

estimates of ψ . θ can be considered an availability parameter or the probability a species was present and available for sampling at the points (Nichols et al., 2008; Pavlacky Jr. et al., 2012).

Automated Analysis

We updated our analytical methods and are using Bayesian hierarchical models specifically designed for analysis of IMBCR data. We performed all data and output manipulation in R (R Core Team, 2019) and model fitting in JAGS (Plummer 2003, 2017) using the R package jagsUI (Kellner 2018). The R code called the raw data from the IMBCR Structured Query Language (SQL) server database and reformatted the data into a form usable with the JAGS code. We allowed the input of all data collected in a manner consistent with the IMBCR design to increase the number of detections available for estimating global detection rates for population density and site occupancy. The R code provided an automated framework for combining stratum-level estimates of population density and site occupancy at multiple spatial scales, as well as estimating the standard deviations and credible intervals for the combined estimates.

We fit initial models to all species with at least 30 detections for density estimation and 10 detections for occupancy estimation. For density estimation, we fit the full model after determining whether there were enough detections based on results from the detection-only model fits. In some cases, for both density and occupancy estimation, it was necessary to use a less parsimonious detection structure or simplified model structure to facilitate model convergence. We currently maintain version control of the automated analysis code in the Bird Conservancy repository (Atlassian Stash, version 3.6.1).

Appendix E: Priority Species Designations by Partners in Flight

Priority species detected in Bird Conservation Regions (BCRs) surveyed in 2020, as designated by Partners in Flight. BCRs include BCR 9 (Great Basin), BCR 10 (Northern Rockies), BCR 11 (Prairie Potholes), BCR 15 (Sierra Nevada) and BCR 16 (Southern Rockies and Colorado Plateau), BCR 17 (Badlands and Prairies), BCR 18 (Shortgrass Prairie), BCR 19 (Central Mixed Grass Prairie), and BCR 33 (Sonoran and Mojave Deserts). An “X” in the Occupancy or Density Estimated column indicates that occupancy or density estimates were generated for the priority species at some level in one or more of the BCRs where it holds a priority designation.

Species	Partners in Flight									Occupancy Estimate	Density Estimate
	BCR 9	BCR 10	BCR 11	BCR 15	BCR 16	BCR 17	BCR 18	BCR 19	BCR 33		
Abert's Towhee									RS	X	X
American Avocet	RC,RS				RC					X	X
American Coot	RC		RS							X	X
American Dipper		RS		RC	RC	RC				X	X
American Kestrel	RC	RC			RC					X	X
American White Pelican	RC		RC,RS							X	X
American Wigeon						RC				X	X
Baird's Sparrow		RC	RC,RS			RC				X	X
Baltimore Oriole								RC		X	X
Band-tailed Pigeon				RC	RC					X	X
Bank Swallow			RC							X	X
Bewick's Wren								RC		X	X
Black Rosy-Finch	RC	RS,RC			RC					X	X
Black-billed Cuckoo			RC			RC		RC		X	X
Black-billed Magpie						RC				X	X
Black-chinned Sparrow	RC									X	X
Black-crowned Night-Heron	RC		RC		RC						X
Black-tailed Gnatcatcher									RS,RC	X	X
Black-throated Gray Warbler	RC			RC	RC					X	X
Blue-winged Teal			RS							X	X
Bobolink	RC	RC	RS							X	X

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Species	Partners in Flight									Occupancy Estimate	Density Estimate
	BCR 9	BCR 10	BCR 11	BCR 15	BCR 16	BCR 17	BCR 18	BCR 19	BCR 33		
Brewer's Blackbird	RS									X	X
Brewer's Sparrow	RS,RC	RC		RC	RC	RC				X	X
Brown Creeper				RC						X	X
Brown Thrasher			RC					RC		X	X
Brown-capped Rosy-Finch					RS,RC					X	X
Bullock's Oriole				RC				RC	RC	X	X
Burrowing Owl						RC		RC		X	X
Cactus Wren									RC	X	X
California Gull	RS			RC						X	X
California Quail	RS									X	X
Calliope Hummingbird	RS	RS								X	X
Cassin's Finch	RS	RC,RS		RC	RC					X	X
Cassin's Sparrow							RC,RS	RC		X	X
Cassin's Vireo		RS								X	X
Chestnut-collared Longspur		RC	RC,RS			RC	RC			X	X
Chimney Swift								RC		X	X
Chipping Sparrow		RC								X	X
Cinnamon Teal	RS	RC						RC		X	X
Clark's Nutcracker		RS			RC,RS					X	X
Clay-colored Sparrow			RS							X	X
Common Goldeneye		RC								X	
Common Nighthawk	RC	RC			RC					X	X
Common Poorwill	RC									X	X
Costa's Hummingbird									RS,RC	X	X
Dickcissel								RS		X	X
Dusky Flycatcher		RS								X	X
Dusky Grouse		RS								X	X
Eastern Kingbird			RC					RC		X	X
Eastern Meadowlark								RC		X	X

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Species	Partners in Flight									Occupancy Estimate	Density Estimate
	BCR 9	BCR 10	BCR 11	BCR 15	BCR 16	BCR 17	BCR 18	BCR 19	BCR 33		
Evening Grosbeak		RC		RC	RC					X	X
Ferruginous Hawk	RC	RC	RS			RC	RC	RC		X	X
Franklin's Gull	RC	RC	RC,RS			RC		RC		X	X
Gambel's Quail									RS	X	X
Golden Eagle				RC	RC	RC				X	X
Golden-crowned Kinglet		RC								X	X
Grace's Warbler					RS,RC					X	X
Grasshopper Sparrow			RC			RC	RC	RC		X	X
Gray Flycatcher	RS									X	X
Gray Vireo					RS				RC	X	X
Greater Prairie-Chicken			RC			RC	RC	RC,RS		X	X
Greater Sage-Grouse	RC	RS,RC	RC	RC	RC	RC				X	X
Green-tailed Towhee	RS,RC				RS					X	X
Green-winged Teal		RC								X	X
Hammond's Flycatcher		RS								X	X
Hooded Oriole									RC	X	X
Juniper Titmouse					RS					X	X
Killdeer	RC		RC							X	X
Lark Bunting		RC	RC			RS,RC	RC,RS	RC		X	X
Lark Sparrow								RC		X	X
Lazuli Bunting	RS	RS			RC					X	X
Lesser Prairie-Chicken							RC,RS	RC,RS		X	X
Lesser Scaup			RS							X	X
Lewis's Woodpecker	RS,RC	RC,RS		RC	RC	RC	RC			X	X
Loggerhead Shrike						RC	RC	RC	RC	X	X
Long-billed Curlew	RC		RC	RC	RC	RC	RC	RC		X	X
Long-eared Owl	RC									X	X
Lucy's Warbler									RC	X	X
MacGillivray's Warbler	RC	RS								X	X

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Species	Partners in Flight									Occupancy Estimate	Density Estimate
	BCR 9	BCR 10	BCR 11	BCR 15	BCR 16	BCR 17	BCR 18	BCR 19	BCR 33		
Marbled Godwit		RC	RC,RS			RC				X	X
Marsh Wren			RS							X	X
Mississippi Kite								RS		X	X
Mountain Bluebird		RS			RS,RC					X	X
Mountain Chickadee	RC	RS			RC					X	X
Mountain Plover	RC	RC	RC		RC	RC	RC,RS			X	X
Mountain Quail				RS						X	X
Northern Bobwhite								RC		X	X
Northern Goshawk		RC				RC				X	X
Northern Harrier	RC		RC,RS		RC	RC	RC	RC		X	X
Northern Pintail		RC	RC		RC	RC	RC			X	X
Northern Rough-winged Swallow	RC									X	X
Olive-sided Flycatcher	RC	RC		RC	RC					X	X
Pine Siskin	RC	RS								X	X
Pinyon Jay	RS,RC	RC		RC	RS,RC	RC	RC		RC	X	X
Plumbeous Vireo		RC			RS					X	X
Prairie Falcon					RC	RC	RC			X	X
Pygmy Nuthatch				RC	RS					X	X
Red Crossbill		RC								X	X
Red-breasted Nuthatch		RS								X	X
Red-headed Woodpecker			RC			RC	RC	RC		X	X
Red-naped Sapsucker	RC	RS			RC					X	X
Rock Wren	RS						RC			X	X
Rufous Hummingbird		RC								X	X
Sage Thrasher	RC,RS	RS,RC			RC					X	X
Sagebrush Sparrow	RS				RC					X	X
Scaled Quail					RC		RC	RC		X	X
Scissor-tailed Flycatcher								RC		X	X
Scott's Oriole	RC								RC	X	X

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Species	Partners in Flight									Occupancy Estimate	Density Estimate	
	BCR 9	BCR 10	BCR 11	BCR 15	BCR 16	BCR 17	BCR 18	BCR 19	BCR 33			
Sharp-tailed Grouse	RC										X	X
Short-eared Owl	RC		RC		RC		RC				X	X
Sprague's Pipit			RS,RC			RC					X	X
Swainson's Hawk			RS					RC			X	X
Thick-billed Longspur		RC	RS,RC		RC	RC	RC				X	X
Townsend's Solitaire		RS									X	X
Townsend's Warbler	RC	RS,RC									X	X
Upland Sandpiper		RC	RC				RC	RC			X	X
Varied Thrush	RC	RC									X	X
Vaux's Swift		RC		RC							X	X
Veery	RC	RC									X	X
Verdin										RC	X	X
Vesper Sparrow	RC	RC	RS		RC	RC					X	X
Violet-green Swallow					RC						X	X
Virginia's Warbler	RC				RS,RC						X	X
Warbling Vireo		RS		RC							X	X
Western Bluebird					RS						X	X
Western Kingbird							RS				X	X
Western Meadowlark			RC				RC	RC			X	X
Western Tanager		RS									X	X
Western Wood-Pewee		RC,RS		RC							X	X
White-tailed Ptarmigan		RC			RC						X	X
White-throated Swift					RC						X	X
Willet		RC	RC,RS		RC			RC			X	X
Williamson's Sapsucker		RS,RC			RS,RC						X	X
Willow Flycatcher	RC	RC,RS			RC						X	X
Wilson's Phalarope	RC	RC	RS		RC						X	X
Woodhouse's Scrub-Jay					RS						X	X
Yellow-billed Cuckoo								RC				X

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Species	Partners in Flight									Occupancy Estimate	Density Estimate
	BCR 9	BCR 10	BCR 11	BCR 15	BCR 16	BCR 17	BCR 18	BCR 19	BCR 33		
Yellow-headed Blackbird	RC,RS		RS		RC					X	X

*RC = Regional Concern Species; RS = Regional Stewardship Species (Partners in Flight 2019).

Appendix F: Priority Species Designations by State Agency

Priority species detected in 2020, by state, with management designations by state agencies. Agencies include Arizona Game and Fish Department (AZGF), Colorado Parks and Wildlife (CPW), Idaho Fish and Game Department (IDFG), Kansas Department of Wildlife, Parks and Tourism (KDWPT), Montana Fish, Wildlife and Parks (MTFWP), Nebraska Game and Parks Commission (NGPC), and New Mexico Department of Game and Fish (NMDGF). An “X” in the Occupancy or Density Estimated columns indicates estimates were generated for that species at some level in one or more of the states where it holds a priority designation.

Species	State Agencies						Occupancy Estimate	Density Estimate
	CPW	IDFG	KDWPT	MTFWP	NGPC	NMDGF		
American Bittern	T2	T2	T2	S3B		SGCN	X	X
American White Pelican	T2	T2	T2	S3B			X	X
Baird's Sparrow			T2	S3B	T1	SGCN,ST	X	X
Bald Eagle	SSC,T2		T2		T2	SGCN,ST	X	X
Baltimore Oriole			T2				X	X
Band-tailed Pigeon	T2						X	X
Bell's Vireo			T2			SGCN,ST	X	X
Black Rosy-Finch	T2	T3		S2			X	X
Black Tern	T2	T2	T2	S3B	T1		X	
Black-backed Woodpecker				S3			X	X
Black-billed Cuckoo			T2	S3B	T1		X	X
Black-billed Magpie					T1		X	X
Black-throated Gray Warbler						SGCN	X	X
Blue-gray Gnatcatcher				S2B			X	X
Bobolink	T2	T2	T2	S3B			X	X
Boreal Chickadee				S3			X	X
Brewer's Sparrow	T2			S3B	T1		X	X
Brown Creeper				S3	T2		X	X
Brown-capped Rosy-Finch	T1					SGCN	X	X
Bullock's Oriole			T2		T2		X	X
Burrowing Owl	ST,T1	T2	T2	S3B		SGCN	X	X
California Gull		T2					X	X

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Species	State Agencies						Occupancy Estimate	Density Estimate
	CPW	IDFG	KDWPT	MTFWP	NGPC	NMDGF		
Cassin's Finch	T2			S3		SGCN	X	X
Cassin's Sparrow	T2		T2		T2	SGCN	X	X
Chestnut-collared Longspur	T2		T2	S2B	T1	SGCN	X	X
Chuck-will's-widow			T2		T2			
Clark's Grebe		T2		S3B	T2	SGCN		
Clark's Nutcracker		T3		S3		SGCN	X	X
Common Loon		T2		S3B				
Common Nighthawk		T3	T2			SGCN	X	X
Cordilleran Flycatcher					T2		X	X
Dickcissel			T2				X	X
Eastern Kingbird			T2				X	X
Eastern Meadowlark			T2		T2		X	X
Eastern Wood-Pewee			T2				X	X
Evening Grosbeak				S3		SGCN	X	X
Ferruginous Hawk	SSC,T2	T2	T2	S3B	T1		X	X
Flammulated Owl	T2			S3B		SGCN		
Franklin's Gull		T3		S3B			X	X
Golden Eagle	T1	T2	T2	S3	T2		X	X
Grace's Warbler	T2					SGCN	X	X
Grasshopper Sparrow	T2	T3	T2			SGCN,SE	X	X
Gray Vireo	T2					SGCN,ST	X	X
Great Blue Heron				S3			X	X
Great Gray Owl		T3		S3				
Greater Prairie-Chicken	T2		T2		T2		X	X
Greater Sage-Grouse	SSC,T1	T1		S2			X	X
Green-tailed Towhee				S3B			X	X
Juniper Titmouse	T2					SGCN	X	X
Lark Bunting	T2		T2				X	X
Lark Sparrow			T2				X	X

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Species	State Agencies						Occupancy Estimate	Density Estimate
	CPW	IDFG	KDWPT	MTFWP	NGPC	NMDGF		
Lazuli Bunting	T2						X	X
Lesser Prairie-Chicken	ST,T1		T1			SGCN	X	X
Lesser Scaup					T2		X	X
Lewis's Woodpecker	T2	T2		S2B	T2	SGCN	X	X
Loggerhead Shrike	T2		T2	S3B	T1	SGCN	X	X
Long-billed Curlew	SSC,T2	T2	T2	S3B	T1	SGCN	X	X
Marbled Godwit			T2				X	X
Mississippi Kite			T2		T2		X	X
Mountain Plover	SSC,T1		T2	S2B	T1	SGCN	X	X
Northern Bobwhite	T2		T2				X	X
Northern Goshawk	T2			S3			X	X
Northern Harrier	T2						X	X
Northern Pintail			T2		T2		X	X
Olive-sided Flycatcher	T2	T3				SGCN	X	X
Pacific Wren				S3			X	X
Painted Bunting			T2				X	X
Peregrine Falcon	SSC,T2		T2	S3	T2	SGCN,ST		X
Pied-billed Grebe					T2		X	X
Pileated Woodpecker				S3	T2		X	X
Pine Siskin					T2		X	X
Pinyon Jay	T2	T2		S3	T1	SGCN	X	X
Prairie Falcon	T2				T2		X	X
Purple Martin	T2						X	X
Pygmy Nuthatch					T2	SGCN	X	X
Red-headed Woodpecker			T2	S3B		SGCN	X	X
Ring-billed Gull		T3					X	X
Rufous Hummingbird	T2						X	X
Sage Thrasher		T2		S3B			X	X
Sagebrush Sparrow	T2	T2		S3B		SGCN	X	X

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Species	State Agencies						Occupancy Estimate	Density Estimate
	CPW	IDFG	KDWPT	MTFWP	NGPC	NMDGF		
Sandhill Crane	SSC,T1	T3			T2		X	X
Scaled Quail			T2				X	X
Scissor-tailed Flycatcher			T2		T2		X	X
Sharp-tailed Grouse	SSC,SE,T1	T2		S1,S4			X	X
Short-eared Owl	T2	T3	T2		T1		X	X
Spotted Towhee			T2				X	X
Sprague's Pipit			T2	S3B	T1	SGCN	X	X
Stilt Sandpiper			T2					
Summer Tanager					T2		X	X
Swainson's Hawk	T2		T2				X	X
Thick-billed Longspur	T2		T2	S3B	T1	SGCN	X	X
Trumpeter Swan		T2		S3	T2			
Upland Sandpiper	T2		T2				X	X
Varied Thrush				S3B			X	X
Veery	T2			S3B			X	X
Vesper Sparrow						SGCN	X	X
Violet-green Swallow					T2		X	X
Virginia's Warbler	T2					SGCN	X	X
Western Kingbird			T2				X	X
White-faced Ibis	T2	T2		S3B			X	X
White-tailed Ptarmigan	T1			S3		SGCN,SE	X	X
White-throated Swift					T2		X	X
Wild Turkey						SGCN,ST	X	X
Williamson's Sapsucker						SGCN	X	X
Willow Flycatcher	SE,T1					SGCN,SE	X	X
Wilson's Phalarope			T2				X	X
Yellow-billed Cuckoo	SSC,T1	T1		S3B	T2	SGCN		X

* **CPW:** T1 = species of highest conservation priority in the state; T2 = important in light of forestalling population trends or habitat conditions; SSC = State Special Concern; SE = State Endangered; ST = State Threatened (Colorado Parks and Wildlife, 2015); **IDFG:** T1 = Tier 1 priority species; T2 = Tier 2 priority species; T3 = Tier 3

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priority species (J. Halka, personal communication, 2018); **KDWPT**: T1 = Tier 1 priority species; T2 = Tier 2 priority species (C. Berens, personal communication, 2018); **MTFWP**: S1 = at high risk; S1B = at high risk, breeding; S1M = at high risk, migratory; S2 = at risk; S2B = at risk, breeding; S3 = potentially at risk; S3B = potentially at risk, breeding; S4 = apparently secure; S5N = common, nonbreeding (Montana Fish Wildlife and Parks, 2015); **NGPC**: T1 = Tier I: Globally or nationally most at-risk of extinction; T2 = Tier II: State Critically Imperiled, State Imperiled or State Vulnerable (Schneider et al, 2018); **NMDGF**: SGCN = Species of Greatest Conservation Need; ST = State Threatened; SE = State Endangered (New Mexico Department of Game and Fish, 2016).

Appendix F Continued. Priority species detected in 2020, by state, with management designations by state agencies. Agencies include North Dakota Game and Fish (NDGF), Oklahoma Department of Wildlife Conservation (ODWC), South Dakota Game, Fish and Parks (SDGFP), Texas Parks and Wildlife (TPWD), Utah Division of Wildlife Resources (UDWR) and Wyoming Game and Fish Department (WYGF). An “X” in the Occupancy or Density Estimated columns indicates estimates were generated for that species at some level in one or more of the states where it holds a priority designation.

Species	State Agencies						Occupancy Estimate	Density Estimate
	NDGF	ODWC	SDGFP	TPWD	UDWR	WYGF		
American Bittern	L1				S3,S3N,S4B	T2	X	X
American Kestrel	L2			S4B		T3	X	X
American Pipit						T3	X	X
American White Pelican	L2		2B	S2B,S3N	S3B	T2	X	X
Ash-throated Flycatcher						T2	X	X
Baird's Sparrow	L1	Tier 3	2A	S2		T2	X	X
Bald Eagle	L2	Tier 3	1	S3B,S3N	S2B,S4N	T2	X	X
Band-tailed Pigeon					S3B		X	X
Bell's Vireo		Tier 2		S3B			X	X
Bewick's Wren				S5B		T3	X	X
Black Rosy-Finch					S1	T2	X	X
Black Tern	L1		2A	S3		T2	X	
Black-backed Woodpecker			3			T2	X	X
Black-billed Cuckoo	L1					T2	X	X
Black-capped Vireo		Tier 1		S2B				
Black-throated Gray Warbler						T2	X	X
Blue Grosbeak						T3	X	X
Blue-gray Gnatcatcher						T3	X	X
Bobolink	L2					T2	X	X

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Species	State Agencies						Occupancy Estimate	Density Estimate
	NDGF	ODWC	SDGFP	TPWD	UDWR	WYGF		
Brewer's Sparrow	L3					T2	X	X
Brown-capped Rosy-Finch						T2	X	X
Bullock's Oriole		Tier 3					X	X
Burrowing Owl	L2	Tier 2	3	S3B	S3B	T1	X	X
Calliope Hummingbird						T2	X	X
Canyon Wren						T3	X	X
Carolina Chickadee				S5B			X	X
Cassin's Sparrow		Tier 2		S4B			X	X
Chestnut-collared Longspur	L1	Tier 2	2A			T2	X	X
Chuck-will's-widow				S3S4B				
Clark's Grebe						T2		
Clark's Nutcracker						T2	X	X
Common Loon						T1		
Common Nighthawk						T3	X	X
Common Yellowthroat				S5B		T3	X	X
Dickcissel	L2			S4B		T2	X	X
Eastern Meadowlark				S5B			X	X
Ferruginous Hawk	L1	Tier 3	3	S2B,S4N	S3B	T2	X	X
Field Sparrow				S5B			X	X
Flammulated Owl					S3,S4B	T3		
Franklin's Gull	L1			S2		T2	X	X
Golden Eagle	L2	Tier 3		S3B	S4	T2	X	X
Golden-fronted Woodpecker		Tier 3					X	X
Grasshopper Sparrow	L1			S3B		T2	X	X
Gray Vireo						T2	X	X
Great Blue Heron						T2	X	X
Great Gray Owl						T2		
Greater Prairie-Chicken	L2	Tier 3	2A	S1B			X	X
Greater Sage-Grouse	L1		3		S3	T2	X	X

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Species	State Agencies						Occupancy Estimate	Density Estimate
	NDGF	ODWC	SDGFP	TPWD	UDWR	WYGF		
Green Heron				S5B			X	
Juniper Titmouse		Tier 3				T2	X	X
Lark Bunting	L1		2A				X	X
Lark Sparrow				S4B			X	X
Lesser Prairie-Chicken		Tier 2		S2B			X	X
Lesser Scaup	L2	Tier 3					X	X
Lewis's Woodpecker			3		S3	T2	X	X
Little Blue Heron		Tier 2		S5B				
Loggerhead Shrike	L2	Tier 1		S4B		T2	X	X
Long-billed Curlew	L1	Tier 2	2A	S3B,S5N		T2	X	X
MacGillivray's Warbler						T2	X	X
Marbled Godwit	L1		2A				X	X
Mississippi Kite				S4B			X	X
Mountain Plover		Tier 1		S2		T1	X	X
Northern Bobwhite		Tier 3		S4B			X	X
Northern Goshawk			3			T1	X	X
Northern Harrier	L2			S2B,S3N			X	X
Northern Pintail	L2	Tier 3		S3B,S5N			X	X
Olive-sided Flycatcher					S3,S4B		X	X
Orchard Oriole				S4B			X	X
Painted Bunting		Tier 2		S4B			X	X
Peregrine Falcon	L3	Tier 3	1,SE	S3	S3B	T2		X
Pileated Woodpecker				S4B			X	X
Pinyon Jay		Tier 3					X	X
Prairie Falcon	L2	Tier 3					X	X
Purple Martin						T3	X	X
Pygmy Nuthatch						T2	X	X
Red Crossbill						T2	X	X
Red-eyed Vireo						T2	X	X

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Species	State Agencies						Occupancy Estimate	Density Estimate
	NDGF	ODWC	SDGFP	TPWD	UDWR	WYGF		
Red-headed Woodpecker	L1	Tier 2		S3B		T2	X	X
Rufous Hummingbird						T2	X	X
Rufous-crowned Sparrow				S4B			X	X
Sage Thrasher						T2	X	X
Sagebrush Sparrow						T2	X	X
Scaled Quail		Tier 3		S4B			X	X
Scissor-tailed Flycatcher				S3B			X	X
Sharp-tailed Grouse	L2				S2	T2	X	X
Short-eared Owl	L2	Tier 3		S4N		T2	X	X
Snowy Egret		Tier 3		S5B		T2	X	
Sprague's Pipit	L1	Tier 3	2A	S3N			X	X
Stilt Sandpiper				S3				
Summer Tanager				S5B			X	X
Swainson's Hawk	L1	Tier 2		S4B		T2	X	X
Thick-billed Longspur	L3	Tier 2		S4		T2	X	X
Trumpeter Swan		Tier 3	2B			T2		
Upland Sandpiper	L2	Tier 3				T2	X	X
Virginia's Warbler						T2	X	X
Western Meadowlark	L2						X	X
White-faced Ibis				S4B	S2,S3B	T2	X	X
Wild Turkey				S5B			X	X
Willet	L2		2B				X	X
Williamson's Sapsucker						T2	X	X
Willow Flycatcher		Tier 3			S1B	T3	X	X
Wilson's Phalarope	L1	Tier 3	2B				X	X
Woodhouse's Scrub-Jay						T2	X	X
Yellow-billed Cuckoo				S4,S5B	S2B	T2		X

* **NDGF:** L1 = Level 1: species having a high level of conservation priority because of declining status either here or across their range or a high rate of occurrence in North Dakota constituting the core of the species breeding range (i.e. "responsibility" species) but are at-risk range wide; L2 = Level 2: Species having a moderate level Bird Conservancy of the Rockies

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of conservation priority or a high level of conservation priority but a substantial level of non-SWG funding is available to them; L3 = Level 3: species having a moderate level of conservation priority but are believed to be peripheral or non-breeding in North Dakota (Dyke et al, 2015); **ODWC**: Tier 1 = Species receiving a combined score of 13 to 15 on Oklahoma's Species of Greatest Conservation Need Selection and Scoring Criteria; Tier 2 = Species receiving a combined score of 11 or 12 on Oklahoma's Species of Greatest Conservation Need Selection and Scoring Criteria; Tier 3 = Species receiving a combined score of 6 to 10 on Oklahoma's Species of Greatest Conservation Need Selection and Scoring Criteria (Oklahoma Department of Wildlife Conservation, 2015); **SDGFP**: 1 = State or federally listed species for which the state has a mandate for recovery 2A = Species that are regionally or globally imperiled and for which South Dakota represents an important portion of their remaining range; 2B = Species that are regionally or globally secure* and for which South Dakota represents an important portion of their remaining range; 3 = Species with characteristics that make them vulnerable (E. Dowd, personal communication; 2018); **TPWD**: S1 = Critically Imperiled; S1B = Critically Imperiled Breeding; S2 = Imperiled; S2B = Imperiled Breeding; S3 = Vulnerable; S3B = Vulnerable Breeding; S3N = Vulnerable Nonbreeding; S4 = Apparently Secure; S4B = Apparently Secure Breeding; S5 = Secure; S5B = Secure Breeding; SHB = Possibly Extirpated Breeding; SXB = Presumed Extirpated Breeding (Texas Parks and Wildlife Department, 2012); **UDWR**: S1 = Critically Imperiled; S1B = Critically Imperiled Breeding; S2 = Imperiled; S2B = Imperiled Breeding; S3 = Vulnerable; S3B = Vulnerable Breeding; S3N = Vulnerable Nonbreeding; S4 = Apparently secure; S4B = Apparently secure Breeding; S4N = Apparently secure Nonbreeding; SU = Unrankable, due to conflicting or inadequate information; (Utah Wildlife Action Plan Joint Team, 2015); **WYGF**: T1 = Species scoring 37-54 on WYGFD's ranking matrix; T2 = Species scoring 19-36 on WYGFD's ranking matrix; T3 = Species scoring 1-88 on the WYGFD's ranking matrix (Wyoming Game and Fish Department, 2016).

Appendix G: Priority Species Designations for the Bureau of Land Management

Priority species detected on Bureau of Land Management lands in 2020, with management designations by state. An “X” in the Occupancy or Density Estimated columns indicates estimates were generated for that species in at least one BLM stratum in one or more of the states where it holds a priority designation.

Species	Bureau of Land Management					Occupancy Estimate	Density Estimate
	California	Colorado	Idaho	Montana	Nevada		
Baird's Sparrow				SS		X	X
Bald Eagle	SS	SS	T2	SS	SS	X	X
Black-throated Sparrow			T2			X	X
Brewer's Sparrow		SS	T2	SS	SS	X	X
Burrowing Owl	SS	SS	T2	SS	SS	X	X
Cassin's Finch			T2			X	X
Chestnut-collared Longspur				SS		X	X
Crissal Thrasher					SS	X	X
Ferruginous Hawk		SS	T2	SS	SS	X	X
Franklin's Gull				SS		X	X
Golden Eagle	SS	SS	T2	SS	SS	X	X
Grasshopper Sparrow			T2			X	X
Gray Vireo	SS					X	X
Greater Sage-Grouse	SS	SS	T2	SS	SS	X	X
Green-tailed Towhee			T2			X	X
Le Conte's Thrasher	SS				SS		
Lewis's Woodpecker			T2	SS	SS	X	X
Loggerhead Shrike			T2	SS	SS	X	X
Long-billed Curlew		SS	T2	SS	SS	X	X
Olive-sided Flycatcher			T2			X	X
Peregrine Falcon		SS		SS	SS		X
Pinyon Jay			T2		SS	X	X
Sage Thrasher			T2	SS	SS	X	X

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Species	Bureau of Land Management					Occupancy Estimate	Density Estimate
	California	Colorado	Idaho	Montana	Nevada		
Sagebrush Sparrow			T2	SS		X	X
Sandhill Crane	SS				SS	X	X
Sharp-tailed Grouse		SS	T2		SS	X	X
Short-eared Owl			T2		SS	X	X
Sprague's Pipit				SS		X	X
Thick-billed Longspur				SS		X	X
Virginia's Warbler			T2			X	X
White-headed Woodpecker			T2				
Willow Flycatcher	SS		T2		SS	X	X

* SS = Sensitive Species; California (Bureau of Land Management, 2019); FT = Federally Threatened; SS = Sensitive Species; Colorado (R. Sell, personal communication, 2018); T1 – Includes species listed under the Endangered Species Act (ESA) as Endangered (E) or Threatened (T), Experimental Essential (XE) populations, and designated Critical Habitat (CH); T2 – Idaho BLM Sensitive Species: Includes State Director designated species as well as FWS Candidate Species (C), FWS Proposed species (P), FWS Experimental Nonessential Populations (XN), and species delisted from ESA Threatened or Endangered status within the past 5-years (D); Idaho (Bureau of Land Management, 2014); SS = Sensitive Species; Montana (Montana Natural Heritage Program, 2015); SS = Sensitive Species; Nevada (Bureau of Land Management, 2017)

Appendix G Continued. Priority species detected on Bureau of Land Management lands in 2020, with management designations by state. An “X” in the Occupancy or Density Estimated columns indicates estimates were generated for that species in at least one BLM stratum in one or more of the states where it holds a priority designation.

Species	Bureau of Land Management					Occupancy Estimate	Density Estimate
	North Dakota	Oregon	South Dakota	Utah	Wyoming		
American Bittern			SS				
Ash-throated Flycatcher		SS				X	X
Baird's Sparrow	SS		SS		SS	X	X
Bald Eagle	SS	SS	SS	SS	SS	X	X
Black-chinned Sparrow				SS		X	X
Black-throated Gray Warbler				SS		X	X
Black-throated Sparrow		SS				X	X
Brewer's Sparrow		SS	SS	SS	SS	X	X

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Species	Bureau of Land Management					Occupancy Estimate	Density Estimate
	North Dakota	Oregon	South Dakota	Utah	Wyoming		
Burrowing Owl	SS		SS	SS	SS	X	X
Cassin's Finch				SS		X	X
Chestnut-collared Longspur			SS	SS		X	X
Crissal Thrasher				SS		X	X
Ferruginous Hawk	SS	SS	SS	SS	SS	X	X
Franklin's Gull		SS	SS			X	X
Gambel's Quail				SS		X	X
Golden Eagle	SS		SS	SS		X	X
Grasshopper Sparrow		SS	SS	SS		X	X
Gray Flycatcher		SS				X	X
Gray Vireo				SS		X	X
Greater Sage-Grouse	SS	SS	SS	SS	SS	X	X
Green-tailed Towhee				SS		X	X
Lewis's Woodpecker			SS	SS		X	X
Loggerhead Shrike			SS	SS	SS	X	X
Long-billed Curlew	SS	SS	SS	SS	SS	X	X
Marbled Godwit			SS			X	X
Olive-sided Flycatcher				SS		X	X
Peregrine Falcon	SS		SS	SS	SS		X
Pinyon Jay				SS		X	X
Red-headed Woodpecker			SS				
Sage Thrasher		SS	SS	SS	SS	X	X
Sagebrush Sparrow		SS	SS	SS	SS	X	X
Sandhill Crane		SS				X	X
Sharp-tailed Grouse		SS		SS	SS	X	X
Short-eared Owl		SS		SS		X	X
Sprague's Pipit	SS		SS			X	X
Thick-billed Longspur			SS			X	X
Vesper Sparrow		SS				X	X

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Species	Bureau of Land Management					Occupancy Estimate	Density Estimate
	North Dakota	Oregon	South Dakota	Utah	Wyoming		
Virginia's Warbler				SS		X	X
White-headed Woodpecker		SS		SS			
Willow Flycatcher				SS		X	X

* SS = Sensitive Species; North Dakota, South Dakota (Bureau of Land Management, 2014); Oregon (Bureau of Land Management, 2019); Utah (G.D. Cook, personal communication, 2018); Wyoming (Bureau of Land Management, 2010).

Appendix H: Priority Species Designations for USFS Region 1

Priority species detected on US Forest Service lands in Region 1 in 2020, with management designations by region and unit. Codes for Units: Beaverhead-Deerlodge NF (BDNF), Bitterroot NF (BINF), Clearwater NF (CLNF), Custer NF (CUNF), Dakota Prairie NG (DPNG), Flathead NF (FLNF), Gallatin NF (GANF). An "X" in the Occupancy or Density Estimated columns indicates estimates were generated for that species in at least one USFS stratum where it holds a priority designation.

Species	USFS Region 1								Occupancy Estimate	Density Estimate
	Region-wide	BDNF	BINF	CLNF	CUNF	DPNG	FLNF	GANF		
Baird's Sparrow	R1SS				SS	SS			X	X
Bald Eagle	R1SS	SS	SS	MIS,SS	SS	SS	MIS,SS	SS,MIS	X	X
Black-backed Woodpecker	R1SS	SS	SS	SS	SS		SS,MIS	SS	X	X
Common Loon	R1SS						MIS,SS			
Flammulated Owl	R1SS	SS	SS	SS			MIS,SS	SS		
Greater Sage-Grouse	R1SS	SS			SS	MIS,SS			X	X
Loggerhead Shrike	R1SS				SS	SS			X	X
Long-billed Curlew	R1SS				SS	SS			X	X
Peregrine Falcon	R1SS	SS	SS		SS		MIS,SS	SS		X
Pileated Woodpecker			MIS	MIS					X	X
Pygmy Nuthatch	R1SS			SS					X	X
Ruffed Grouse					MIS				X	X
Sharp-tailed Grouse					MIS	MIS			X	X
Spotted Towhee					MIS				X	X

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Sprague's Pipit	R1SS	SS	X	X
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*R1SS = Region 1 Sensitive Species; MIS = Management Indicator Species; FS = Focal Species; FT = Federally Threatened; FE = Federally Endangered, SS = Sensitive Species (C. Staab, personal communication, 2018)

Appendix G continued. Priority species detected on US Forest Service lands in Region 1 in 2020, with management designations by region and unit. Codes for Units: Helena NF (HENF), Idaho Panhandle NF (IPNF), Kootenai NF (KONF), Lewis and Clark NF (LCNF), Lolo NF (LONF), Nez Perce NF (NPNF). An “X” in the Occupancy or Density Estimated columns indicates estimates were generated for that species in at least one USFS stratum where it holds a priority designation.

Species	USFS Region 1							Occupancy Estimate	Density Estimate
	Region-wide	HENF	IDNF	KONF	LCNF	LONF	NPNF		
American Three-toed Woodpecker					MIS			X	X
Baird's Sparrow	R1SS							X	X
Bald Eagle	R1SS	SS,MIS	SS	SS	MIS,SS	SS	MIS,SS	X	X
Black-backed Woodpecker	R1SS	SS	SS	SS	SS	SS	SS	X	X
Chipping Sparrow			FS	FS				X	X
Common Loon	R1SS		SS	SS		SS	SS		
Dusky Flycatcher			FS	FS				X	X
Dusky Grouse					MIS			X	X
Flammulated Owl	R1SS	SS	SS	SS	SS	SS	SS		
Greater Sage-Grouse	R1SS							X	X
Hairy Woodpecker		FS,MIS	FS	FS				X	X
Hammond's Flycatcher			FS	FS				X	X
Loggerhead Shrike	R1SS							X	X
Long-billed Curlew	R1SS						SS	X	X
Olive-sided Flycatcher			FS	FS				X	X
Peregrine Falcon	R1SS	SS,MIS		SS	MIS,SS	MIS,SS	MIS,SS		X
Pileated Woodpecker		MIS				MIS	MIS	X	X
Pygmy Nuthatch	R1SS		SS				SS	X	X
Sprague's Pipit	R1SS							X	X

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* R1SS = Region 1 Sensitive Species; MIS = Management Indicator Species; FS = Focal Species; FT = Federally Threatened; FE = Federally Endangered, SS = Sensitive Species (C. Staab, personal communication, 2018)

Appendix I: Priority Species Designations for USFS Region 2

Priority species detected on US Forest Service lands in Region 2 in 2020, with management designations by region and unit. Codes for Units: Arapaho and Roosevelt NF (ARNF), Bighorn NF (BINF), Black Hills NF (BHNF), Buffalo Gap NG (BGNG), Comanche NG (CONG), Fort Pierre NG (FPNG), Grand Mesa, Uncompaghre and Gunnison NF (GMUG), Medicine Bow NF (MBNF), Nebraska/Samuel R. McKelvie NF (NENF). An “X” in the Occupancy or Density Estimated columns indicates estimates were generated for that species in at least one USFS stratum where it holds a priority designation.

Species	USFS Region 2										Occupancy Density	
	Region-wide	ARNF	BINF	BHNF	BGNG	CONG	FPNG	GMUG	MBNF	NENF	Estimate	Estimate
American Bittern	R2SS										X	X
American Three-toed Woodpecker									MIS		X	X
Black Tern	R2SS										X	
Brewer's Sparrow	R2SS		MIS					MIS			X	X
Brown Creeper				MIS					SSC		X	X
Bullock's Oriole						MIS					X	X
Burrowing Owl	R2SS	MIS									X	X
Cassin's Sparrow	R2SS										X	X
Chestnut-collared Longspur	R2SS										X	X
Cooper's Hawk				SLC							X	X
Ferruginous Hawk	R2SS	MIS									X	X
Golden-crowned Kinglet		MIS	SLC	MIS					MIS		X	X
Greater Prairie-Chicken	R2SS						MIS			MIS	X	X
Greater Sage-Grouse	R2SS				MIS		MIS				X	X
Hairy Woodpecker		MIS						MIS			X	X
Lark Bunting		MIS									X	X
Lewis's Woodpecker	R2SS							MIS			X	X
Lincoln's Sparrow									MIS		X	X
Loggerhead Shrike	R2SS										X	X
Long-billed Curlew	R2SS					MIS					X	X
Mountain Bluebird		MIS									X	X

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Species	USFS Region 2										Occupancy Density	
	Region-wide	ARNF	BINF	BHNF	BGNG	CONG	FPNG	GMUG	MBNF	NENF	Estimate	Estimate
Northern Goshawk	R2SS							MIS	MIS		X	X
Northern Harrier	R2SS										X	X
Northern Saw-whet Owl				SLC								
Olive-sided Flycatcher	R2SS										X	X
Purple Martin	R2SS										X	X
Pygmy Nuthatch		MIS	SLC	SLC						MIS	X	X
Red Crossbill								MIS			X	X
Red-breasted Nuthatch			MIS								X	X
Ruffed Grouse				MIS							X	X
Sharp-tailed Grouse	R2SS				MIS		MIS			MIS	X	X
Short-eared Owl	R2SS										X	X
Song Sparrow				MIS							X	X
Thick-billed Longspur	R2SS										X	X
Trumpeter Swan	R2SS											
Warbling Vireo		MIS									X	X
White-tailed Ptarmigan	R2SS										X	X
Wilson's Warbler		MIS							MIS		X	X
Yellow-billed Cuckoo	FT											X

*R2SS = Region 2 Sensitive Species; MIS = Management Indicator Species; SI = Species of Interest; SLC = Species of Local Concern; SNI = Species Needing More Inventory; SC = Species of Concern; SVC = Species of Viability Concern; SSC = Species of Special Concern; FT = Federally Threatened; FE = Federally Endangered (US Forest Service, 2008).

Appendix H continued. Priority species detected on US Forest Service lands in Region 2 in 2020, with management designations by region and unit. Codes for Units: Oglala NG (OGNG), Pawnee NG (PANG), Rio Grande NF (RGNF), Routt NF (RONF), and San Juan NF (SJNF), Shoshone NF (SHNF), Thunder Basin NG (TBNG), and White River NF (WRNF). An “X” in the Occupancy or Density Estimated columns indicates estimates were generated for that species in at least one USFS stratum where it holds a priority designation.

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Species	USFS Region 2									Occupancy Estimate	Density Estimate
	Region-wide	OGNG	PANG	RGNF	RONF	SJNF	SHNF	TBNG	WRNF		
American Bittern	R2SS									X	X
American Pipit									MIS	X	X
Black Tern	R2SS									X	
Brewer's Sparrow	R2SS						MIS		MIS	X	X
Brown Creeper				MIS						X	X
Burrowing Owl	R2SS		MIS							X	X
Cassin's Sparrow	R2SS									X	X
Chestnut-collared Longspur	R2SS									X	X
Ferruginous Hawk	R2SS		MIS							X	X
Golden-crowned Kinglet			MIS		MIS					X	X
Greater Prairie-Chicken	R2SS									X	X
Greater Sage-Grouse	R2SS	MIS						MIS		X	X
Green-tailed Towhee						MIS				X	X
Hairy Woodpecker			MIS			MIS	MIS			X	X
Hermit Thrush				MIS						X	X
Lark Bunting			MIS							X	X
Lewis's Woodpecker	R2SS									X	X
Lincoln's Sparrow				MIS						X	X
Loggerhead Shrike	R2SS									X	X
Long-billed Curlew	R2SS									X	X
Mountain Bluebird			MIS			MIS				X	X
Northern Goshawk	R2SS					MIS	MIS	MIS		X	X
Northern Harrier	R2SS									X	X
Olive-sided Flycatcher	R2SS									X	X
Purple Martin	R2SS									X	X
Pygmy Nuthatch			MIS	MIS					SVC	X	X
Ruffed Grouse							MIS			X	X

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Species	USFS Region 2									Occupancy Estimate	Density Estimate
	Region-wide	OGNG	PANG	RGNF	RONF	SJNF	SHNF	TBNG	WRNF		
Sharp-tailed Grouse	R2SS	MIS				MIS		MIS		X	X
Short-eared Owl	R2SS									X	X
Thick-billed Longspur	R2SS									X	X
Trumpeter Swan	R2SS										
Vesper Sparrow				MIS	MIS					X	X
Virginia's Warbler									MIS	X	X
Warbling Vireo			MIS							X	X
White-tailed Ptarmigan	R2SS									X	X
Wilson's Warbler			MIS	MIS	MIS					X	X
Yellow-billed Cuckoo	FT										X

*R2SS = Region 2 Sensitive Species; MIS = Management Indicator Species; SI = Species of Interest, SLC = Species of Local Concern; SNI = Species Needing More Inventory; SC = Species of Concern; SVC = Species of Viability Concern; SSC = Species of Special Concern; FT = Federally Threatened; FE = Federally Endangered (US Forest Service, 2008)

Appendix J: Priority Species Designations for USFS Region 3

Priority species detected on US Forest Service lands in Region 3 in 2020, with management designations by region and unit. An “X” in the Occupancy or Density Estimated columns indicates estimates were generated for that species in at least one USFS stratum where it holds a priority designation.

Species	USFS Region 3		Occupancy Estimate	Density Estimate
	Region-wide	Kiowa and Rita Blanca NG		
Burrowing Owl	R3SS	MIS	X	X
Grasshopper Sparrow	R3SS		X	X

*R3SS = USFS Region 3 Sensitive Species; MIS = Management Indicator Species; SC = Species of Concern; FS = Focal Species (S. R. Plunkett and N. Kline, personal communication, 2018).

Appendix K: Priority Species Designations for USFS Region 4

Priority species detected on US Forest Service lands in Region 4 in 2020, with management designations by region and unit. Codes for Units: Ashley NF (ASNF), Boise NF (BONF), Bridger-Teton NF (BTNF), Caribou-Targhee NF (CTNF), Humboldt-Toiyabe NF (HTNF). An “X” in the Occupancy or Density Estimated columns indicates estimates were generated for that species in at least one USFS stratum where it holds a priority designation.

Species	USFS Region 4											Occupancy Estimate	Density Estimate
	Region-wide	ASNF	BONF	BTNF	CTNF	HTNF	MLNF	PANF	SCNF	SANF	UWNF		
American Three-toed Woodpecker	SS	SS	SS	SS		SS						X	X
Bald Eagle	SS	SS	SS	SS	MIS	SS						X	X
Brewer's Sparrow								MIS		SI		X	X
Brown Creeper									MIS			X	X
Cooper's Hawk							SS					X	X
Dusky Grouse							MIS					X	X
Flammulated Owl	SS	SS	SS	SS		SS							
Golden Eagle		MIS				EPA	MIS,SS					X	X
Greater Sage-Grouse	SS	MIS,SS	SS	SS,SC		SS		MIS	PMIS	MIS		X	X
Lincoln's Sparrow		MIS										X	X
Mountain Bluebird									MIS			X	X
Mountain Chickadee								MIS				X	X
Mountain Quail	SS					SS						X	X
Northern Goshawk	SS	MIS,SS	SS	SS	MIS	SS			MIS	MIS	FS	X	X
Olive-sided Flycatcher										SI		X	X
Peregrine Falcon	SS	SS	SS	SS	MIS	SS							X
Pileated Woodpecker			MIS					MIS	MIS			X	X
Pinyon Jay						NVSC						X	X
Red-naped Sapsucker		MIS										X	X
Ruby-crowned Kinglet									MIS			X	X
Sharp-tailed Grouse	SS		SS			SS		MIS		SI		X	X
Song Sparrow		MIS										X	X
Vesper Sparrow								MIS	MIS			X	X

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Species	USFS Region 4											Occupancy Estimate	Density Estimate
	Region-wide	ASNF	BONF	BTNF	CTNF	HTNF	MLNF	PANF	SCNF	SANF	UWNF		
Warbling Vireo	MIS											X	X
White-headed Woodpecker	SS		MIS			SS		PMIS					
Williamson's Sapsucker								MIS				X	X
Willow Flycatcher	FE											X	X
Yellow Warbler								MIS	MIS			X	X

*CAS = Conservation Agreement Species; FE = Federally Endangered Species; FS = Focal Species; EPA = Eagle Protection Act; MIS = Management Indicator Species; NV SC = Nevada Species of Concern; PMIS = Proposed Management Indicator Species; R4SS = Region 4 Sensitive Species; SC = Species of Concern; SI = Species of Interest; SS = Sensitive Species (R. Sadak, personal communication, 2018)