Integrated Monitoring in Bird Conservation Regions

2022 Field Season Report

March 2023

Connecting People, Birds and Land

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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.

To learn more visit our website at www.birdconservancy.org.

Contact Information
Matthew McLaren
matthew.mclaren@birdconservancy.org
970-482-1707

Bird Conservancy of the Rockies
14500 Lark Bunting Lane
Brighton, CO 80603
303-659-4348
www.birdconservancy.org

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1. Executive Summary

Bird Conservancy of the Rockies (Bird Conservancy), in conjunction with our partners, conducted the 15th 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 Bird Conservation Regions, facilitating conservation at local and national levels. The nested design also provides a consistent and flexible framework for understanding and comparing the status and annual changes of bird populations with local and regional context.

Collaboration across organizations 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 2022, the IMBCR program's area of inference encompassed four entire states (Colorado, Montana, Utah, and Wyoming) and portions of 11 additional states (Arizona, California, Idaho, Kansas, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, and South Dakota). We surveyed across US Forest Service Regions 1, 2, and 4 and in portions of Region 3; all of the Badlands and Prairies Bird Conservation Region (BCR 17), and portions of nine other BCRs: Great Basin (9), Northern Rockies (10), Prairie Potholes (11), Sierra Nevada (15), Southern Rockies/Colorado Plateau (16), Shortgrass Prairie (18), Central Mixed Grass Prairie (19), Sonoran and Mojave Deserts (33), and Sierra Madre Occidental (34).

Observers conducted 15,137 point counts within the 1,348 surveyed sampling units between May 1 and July 25, 2022. They detected 176,954 individual birds representing 350 species. This report summarizes the results of the 2022 field season.

To view interactive maps illustrating survey and detection locations, and tables displaying species counts and population estimates (i.e., density and occupancy), please visit the Rocky Mountain Avian Data Center (RMADC).

Each stratum or combination of strata presented in this report's Results section contains a 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. However, all individual strata and all biologically meaningful combinations of strata, or "superstrata", can be found on the RMADC. 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).

Special Feature - Population Trends

In Chapter 17 we provide a few examples demonstrating the use of IMBCR population trends for tracking the status of designated species of concern and determining where specific populations may require management or conservation efforts.

Acknowledgements

2. 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 includes Bird Conservation Regions (BCRs) as sampling frames (Figure 2.1), 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 is 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. 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).

Terrestrial Bird Conservation Regions

1. Aleutian/Bering Sea Islands
2. Western Alaska
3. Arctic Plains And Mountains
4. Northwestern Interior Forest
5. Northern Pacific Rainforest
6. Boreal Taiga Plains
7. Taiga Shield And Hudson Plains
8. Boreal Softwood Shield
9. Great Basin
10. Northern Rockies
11. Prairie Potholes
12. Boreal Hardwood Transition
13. Lower Great Lakes/ St. Lawrence Plain
14. Atlantic Northern Forest
15. Sierra Nevada
16. Southern Rockies/Colorado Plateau
17. Badlands And Prairies
18. Shortgrass Prairie
19. Central Mixed Grass Prairie
20. Edwards Plateau
21. Oaks And Prairies
22. Eastern Tallgrass Prairie
23. Prairie Hardwood Transition
24. Central Hardwoods
25. West Gulf Coastal Plain/Ouachitas
26. Mississippi Alluvial Valley
27. Southeastern Coastal Plain
28. Appalachian Mountains
29. Piedmont
30. New England/Mid-Atlantic Coast
31. Peninsular Florida
32. Coastal California
33. Sonoran And Mojave Deserts
34. Sierra Madre Occidental
35. Chihuahuan Desert
36. Tamaulipan Brushlands
37. Gulf Coastal Prairie
38. Islas Marias
39. Sierras De Baja California
40. Desierto De Baja California
41. Islas Del Golfo De California
42. Sierras Y Planicies Del Cabo
43. Planicie Costera, Lomerios Y Canones De Occidente
44. Marismas Nacionales
45. Planicie Costera Y Lomerios Del Pacifico Sur
46. Sur Del Altiplano Mexicano
47. Eje Neovolcanico Transversal
48. Sierra Madre Oriental
49. Planicie Costera Y Lomerios Secos Del Golfo De Mexico
50. Cuenca Del Rio Balsar
51. Valle Tehuacan-Cuicatlan
52. Planicie Costera Y Lomerios Humedos Del Golfo De Mexico
53. Sierra Madre Del Sur
54. Sierra Norte De Puebla-Oaxaca
55. Planicie Noroccidental De Yucatan
56. Planicie De La Peninsula De Yucatan
57. Isla Cozumel
58. Altos De Chiapas
59. Depresiones Intermontanas
60. Sierra Madre De Chiapas
61. Planicie Costera Del Soconusco
62. Archipielago De Revillagigedo
63. Isla Guadalupe
64. Arrecife Alacranes
65. Los Tuxtlas
66. Pantanos De Centla-Laguna De Terminos

Map © National GIS Laboratory, Bird Studies Canada, January 2020

0   1,000   km

Figure 2.1.: Bird Conservation Regions throughout North America, excluding Hawaii and Mexico

3. Methods

3.1. Study Area

In 2022, the IMBCR program's area of inference encompassed four entire states (Colorado, Montana, Utah, and Wyoming) and portions of 11 additional states (Arizona, California, Idaho, Kansas, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, and South Dakota). 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), and portions of nine other BCRs: Great Basin (9), Northern Rockies (10), Prairie Potholes (11), Sierra Nevada (15), Southern Rockies/Colorado Plateau (16), Shortgrass Prairie (18), Central Mixed Grass Prairie (19), Sonoran and Mojave Deserts (33), and Sierra Madre Occidental (34).

3.2. Sampling Design

3.2.1. 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.

3.2.2. 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.
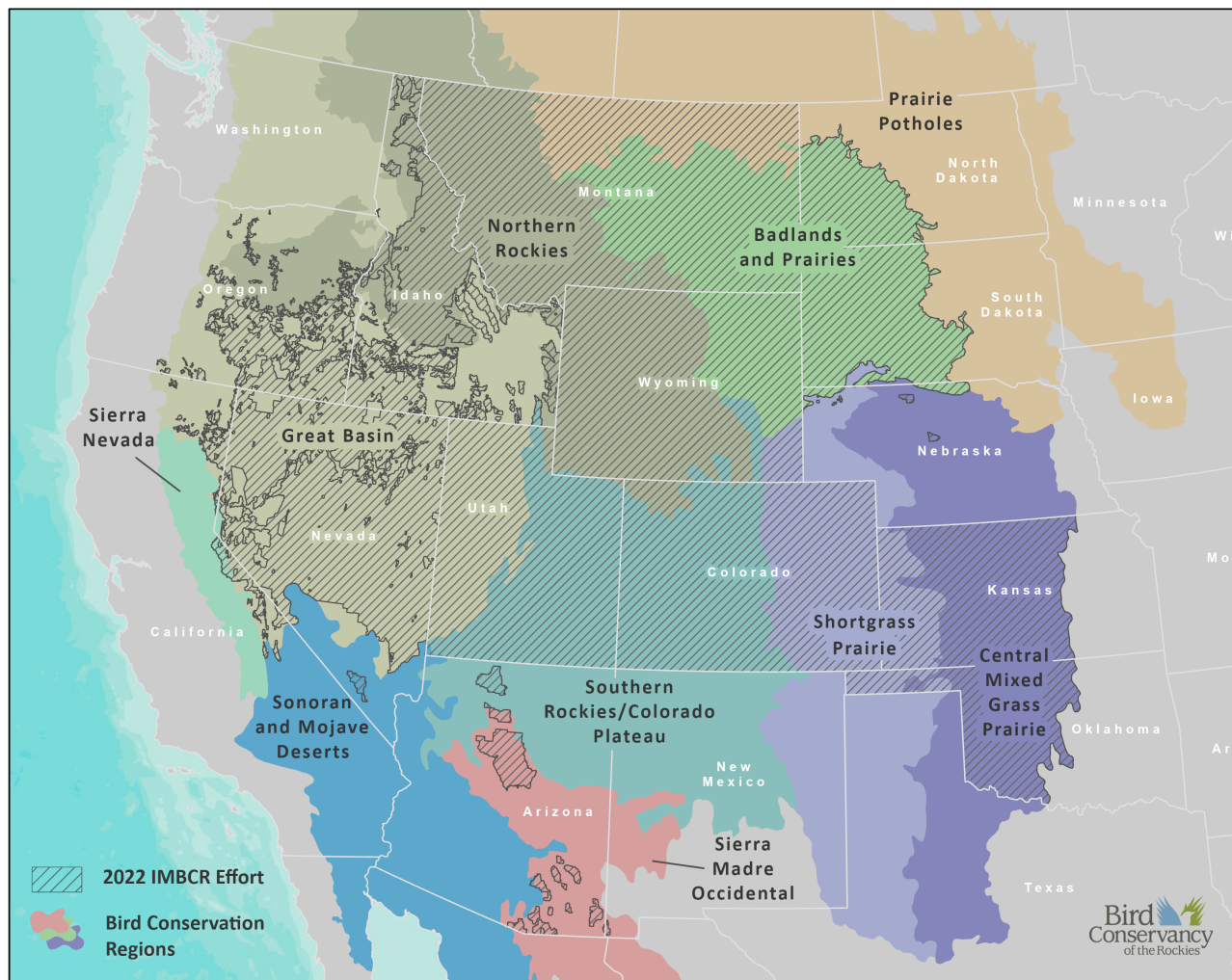
Figure 3.1.: Spatial extent of sampled Bird Conservation Regions using the IMBCR design, 2022

Figure 3.2.: Example 1 km² sampling unit in the IMBCR design.

3.2.3. 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.

3.3. Sampling Methods

IMBCR observers with excellent aural and visual bird-identification skills conducted field work in 2022. Prior to conducting surveys, observers completed an intensive training program 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 Avian Data Center. You will also find links to past and current protocols and data sheets.

3.4. Data Analysis

3.4.1. 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).

3.4.2. 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 habitat variables, 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, and the mean abundance within a 1-km2 grid cell was modeled 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 we took 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))
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.

3.4.3. 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 (, Theta) and 3) the proportion of sampling units occupied by a species (, Psi).

We truncated the data, using only detections <125 m from the sample points, except for Accipitriformes, Anseriformes, Falconiformes, Galliformes, Gruiformes, Pelecaniformes, Podicepidiformes, 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   (the proportion of points occupied within each sampling unit) (Pavlacky Jr., Blakesley, White, Hanni, & Lukacs, 2012). The interpretation of   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 ( ) for each stratum by estimating BCR-by-year specific estimates of detection (p) and point-level occupancy ( ). We fixed p and   to 0 for BCRs in which a particular species was never detected.

We fixed   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.,) 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   (Nichols et al., 2008; Pavlacky Jr. et al., 2012). We considered both p and   to be nuisance variables that were important for generating unbiased estimates of .   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).

3.4.4. Automated Analysis

In 2019, we updated our analytical methods to use Bayesian hierarchical models specifically designed for analysis of IMBCR data. We performed all data and output manipulation in R (R Core Team, 2022) 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 on www.github.com.

Part I.

Results

4. Summary

In 2022, field observers completed 1,348 of 1,415 (95.2%) planned surveys throughout all or portions of BCRs 9, 10, 11, 15, 16, 17, 18, 19, 33, and 34 using the IMBCR design (Table 4.1, Figure 3.1). Five surveys were completed above the funded sample effort in two strata. Reasons surveys were not completed are summarized in Table 4.2.

Observers conducted 15,137 point counts within the 1,348 surveyed sampling units between May 1 and July 25, 2022. They detected 176,954 individual birds representing 350 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). 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 63rd supplement to the American Ornithological Society's Check-list of North American Birds (Chesser et al., 2022).

Trend Estimates

We estimated species population trends for data collected through 2022. Results can be found in this Google Drive folder. Please see the associated Read Me document for an explanation of columns in the trend estimates spreadsheet. If you cannot access Google Drive, please contact Jennifer Timmer for a copy of the data.

Please 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.

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.

Planned and Completed Strata

Table 4.1.: Planned and completed surveys by strata, 2022.

State	BCR	Stratum	Stratum Description	Who Collected	Planned	Completed	% Completed	Area (km2)
AZ	34	AZ-BCR34-CF	AZ-BCR34-CF: Coconino National Forest	BCR	34	26	76	7426
AZ	34	AZ-CORONADO-RH	AZ-CORONADO-RH: Coronado National Forest - High Elevation	BCR	5	3	60	1652
AZ	34	AZ-CORONADO-RL	AZ-CORONADO-RL: Coronado National Forest - Low Elevation	BCR	15	14	93	5548
AZ	34	AZ-KAIBAB-KH	AZ-KAIBAB-KH: Kaibab National Forest - High Elevation	BCR	40	35	88	4319
AZ	34	AZ-KAIBAB-KL	AZ-KAIBAB-KL: Kaibab National Forest - Low Elevation	BCR	40	27	68	2182
CA	9	CA-BCR9-CC	CA-BCR9-CC: Bureau of Land Management - Carson City District	GBBO	3	3	100	118
CA	9	CA-BCR9-CD	CA-BCR9-CD: Bureau of Land Management - California Desert District	GBBO	3	3	100	1039
CA	9	CA-BCR9-CN	CA-BCR9-CN: Bureau of Land Management - Central California District	GBBO	4	4	100	2668
CA	9	CA-BCR9-HT	CA-BCR9-HT: Humboldt-Toiyabe National Forest	GBBO	3	3	100	1174
CA	9	CA-BCR9-NC	CA-BCR9-NC: Bureau of Land Management - Northern California District	GBBO	4	4	100	5468
CA	15	CA-BCR15-HT	CA-BCR15-HT: Humboldt-Toiyabe National Forest	GBBO	3	3	100	1635
CO	10	CO-BCR10-AO	CO-BCR10-AO: All Other Lands	BCR	5	5	100	5060

State	BCR	Stratum	Stratum Description	Who Col-lected	Planned	Completed	% Com-pleted	Area (km2)
CO	10	CO-BCR10-AO	CO-BCR10-AO: All Other Lands	BCR	5	5	100	9251
CO	10	CO-BCR10-AO	CO-BCR10-AO: All Other Lands	BCR	5	5	100	9348
CO	10	CO-BCR10-BL	CO-BCR10-BL: Bureau of Land Management	BCR	9	9	100	4288
CO	16	CO-BCR16-AO	CO-BCR16-AO: All Other Lands	BCR	25	23	92	51214
CO	16	CO-BCR16-AR	CO-BCR16-AR: Arapaho and Roosevelt National Forests	BCR	15	13	87	6932
CO	16	CO-BCR16-AR	CO-BCR16-AR: Arapaho and Roosevelt National Forests	BCR	15	13	87	9645
CO	16	CO-BCR16-BL	CO-BCR16-BL: Bureau of Land Management	BCR	24	23	96	27825
CO	16	CO-BCR16-GM	CO-BCR16-GM: Grand Mesa; Uncompahgre and Gunnison National Forests	BCR	5	4	80	13630
CO	16	CO-BCR16-MA	CO-BCR16-MA: Manti-La Sal National Forest	BCR	2	2	100	131
CO	16	CO-BCR16-NC	CO-BCR16-NC: National Park Service - Northern Colorado Plateau Network	BCR	2	2	100	692
CO	16	CO-BCR16-NC	CO-BCR16-NC: National Park Service - Northern Colorado Plateau Network	BCR	2	2	100	807
CO	16	CO-BCR16-PS	CO-BCR16-PS: Pike and San Isabel National Forests	BCR	5	4	80	10950
CO	16	CO-BCR16-PS	CO-BCR16-PS: Pike and San Isabel National Forests	BCR	5	4	80	10968
CO	16	CO-BCR16-RA	CO-BCR16-RA: Rio Grande National Forest - High Elevation	BCR	4	3	75	866
CO	16	CO-BCR16-RM	CO-BCR16-RM: National Park Service - Rocky Mountain Network	BCR	2	2	100	1628
CO	16	CO-BCR16-RM	CO-BCR16-RM: National Park Service - Rocky Mountain Network	BCR	2	2	100	1644
CO	16	CO-BCR16-RM	CO-BCR16-RM: National Park Service - Rocky Mountain Network	BCR	2	2	100	1743
CO	16	CO-BCR16-RO	CO-BCR16-RO: Routt National Forest	BCR	6	5	83	5123

State	BCR	Stratum	Stratum Description	Who Collected	Planned	Completed	% Completed	Area (km2)
CO	16	CO-BCR16-RO	CO-BCR16-RO: Routt National Forest	BCR	6	5	83	5734
CO	16	CO-BCR16-RP	CO-BCR16-RP: Rio Grande National Forest - Middle Elevation	BCR	4	4	100	5410
CO	16	CO-BCR16-RS	CO-BCR16-RS: Rio Grande National Forest - Low Elevation	BCR	4	4	100	1896
CO	16	CO-BCR16-SA	CO-BCR16-SA: San Juan National Forest	BCR	5	4	80	8794
CO	16	CO-BCR16-SC	CO-BCR16-SC: National Park Service - Southern Colorado Plateau Network	BCR	2	2	100	214
CO	16	CO-BCR16-WA	CO-BCR16-WA: White River National Forest - High Elevation	BCR	4	3	75	2138
CO	16	CO-BCR16-WF	CO-BCR16-WF: USFS - Williams Fork Management Unit	BCR	2	2	100	551
CO	16	CO-BCR16-WP	CO-BCR16-WP: White River National Forest - Middle Elevation	BCR	5	5	100	5443
CO	16	CO-BCR16-WS	CO-BCR16-WS: White River National Forest - Low Elevation	BCR	4	3	75	2786
CO	18	CO-BCR18-AR	CO-BCR18-AR: Arkansas River and Tributaries	BCR	6	6	100	1127
CO	18	CO-BCR18-CO	CO-BCR18-CO: Comanche National Grassland	BCR	5	5	100	4836
CO	18	CO-BCR18-DO	CO-BCR18-DO: Department of Defense	BCR	2	2	100	1647
CO	18	CO-BCR18-IA	CO-BCR18-IA: Area between I-70 and the Arkansas River	BCR	16	13	81	34755
CO	18	CO-BCR18-NP	CO-BCR18-NP: Area North of the Platte River	BCR	8	8	100	11457
CO	18	CO-BCR18-PC	CO-BCR18-PC: Pawnee National Grassland - Private Lands	BCR	2	2	100	2458
CO	18	CO-BCR18-PG	CO-BCR18-PG: Pawnee National Grassland - Public Lands	BCR	8	8	100	810
CO	18	CO-BCR18-PI	CO-BCR18-PI: Area between the Platte River and I-70	BCR	15	11	73	30365

State	BCR	Stratum	Stratum Description	Who Collected	Planned	Completed	% Completed	Area (km2)
CO	18	CO-BCR18-PT	CO-BCR18-PT: Platte River and Tributaries	BCR	5	5	100	970
CO	18	CO-BCR18-SA	CO-BCR18-SA: Area South of the Arkansas River	BCR	12	11	92	24985
ID	9	ID-BCR9-BO	ID-BCR9-BO: Boise National Forest	IBO	2	3	150	1710
ID	9	ID-BCR9-BR	ID-BCR9-BR: Bureau of Land Management - Bruneau Field Office	IBO	0	3	Inf	5953
ID	9	ID-BCR9-BU	ID-BCR9-BU: Bureau of Land Management - Burley Field Office	IBO	3	3	100	3334
ID	9	ID-BCR9-CT	ID-BCR9-CT: Caribou-Targhee National Forest	BCR	2	2	100	1940
ID	9	ID-BCR9-CU	ID-BCR9-CU: Curlew National Grassland	BCR	5	5	100	300
ID	9	ID-BCR9-JA	ID-BCR9-JA: Bureau of Land Management - Jarbidge Field Office	IBO	3	0	0	5386
ID	9	ID-BCR9-OW	ID-BCR9-OW: Bureau of Land Management - Owyhee Field Office	IBO	3	3	100	5066
ID	9	ID-BCR9-SA	ID-BCR9-SA: Salmon-Challis National Forest	IBO	2	2	100	3857
ID	9	ID-BCR9-SH	ID-BCR9-SH: Bureau of Land Management - Shoshone Field Office	IBO	3	3	100	5288
ID	9	ID-BCR9-SW	ID-BCR9-SW: Sawtooth National Forest	IBO	3	3	100	2175
ID	10	ID-BCR10-BI	ID-BCR10-BI: Bitterroot National Forest	IBO	2	2	100	1916
ID	10	ID-BCR10-BO	ID-BCR10-BO: Boise National Forest	IBO	8	9	112	8778
ID	10	ID-BCR10-CL	ID-BCR10-CL: Clearwater National Forest - Roaded/Managed	IBO	5	5	100	1946
ID	10	ID-BCR10-CR	ID-BCR10-CR: Clearwater National Forest - Roadless/Wilderness	IBO	2	2	100	5036
ID	10	ID-BCR10-CT	ID-BCR10-CT: Caribou-Targhee National Forest	BCR	3	3	100	7752

State	BCR	Stratum	Stratum Description	Who Collected	Planned	Completed	% Completed	Area (km2)
ID	10	ID-BCR10-IP	ID-BCR10-IP: Idaho Panhandle National Forest - Roaded/Managed	IBO	13	13	100	8660
ID	10	ID-BCR10-IR	ID-BCR10-IR: Idaho Panhandle National Forest - Roadless/Wilderness	IBO	2	2	100	3155
ID	10	ID-BCR10-KO	ID-BCR10-KO: Kootenai National Forest	IBO	2	2	100	169
ID	10	ID-BCR10-NP	ID-BCR10-NP: Nez Perce National Forest - Roaded/Managed	IBO	6	6	100	2864
ID	10	ID-BCR10-NR	ID-BCR10-NR: Nez Perce National Forest - Roadless/Wilderness	IBO	2	2	100	6370
ID	10	ID-BCR10-PA	ID-BCR10-PA: Payette National Forest	IBO	10	10	100	9857
ID	10	ID-BCR10-SA	ID-BCR10-SA: Salmon-Challis National Forest	IBO	9	9	100	13563
ID	10	ID-BCR10-SW	ID-BCR10-SW: Sawtooth National Forest	IBO	6	6	100	6302
ID	16	ID-BCR16-CT	ID-BCR16-CT: Caribou-Targhee National Forest	BCR	2	2	100	831
ID	16	ID-BCR16-CT	ID-BCR16-CT: Caribou-Targhee National Forest	BCR	2	2	100	909
KS	18	KS-BCR18-AO	KS-BCR18-AO: All Other Lands	BCR	11	11	100	34794
KS	18	KS-BCR18-CM	KS-BCR18-CM: Cimarron National Grassland	BCR	2	2	100	430
KS	18	KS-BCR18-PL	KS-BCR18-PL: Playas	BCR	11	11	100	370
KS	18	KS-BCR18-RV	KS-BCR18-RV: Rivers	BCR	11	11	100	1409
KS	19	KS-BCR19-AO	KS-BCR19-AO: All Other Lands	BCR	11	10	91	98649
KS	19	KS-BCR19-PL	KS-BCR19-PL: Playas	BCR	11	11	100	176
KS	19	KS-BCR19-RV	KS-BCR19-RV: Rivers	BCR	11	10	91	10523
MT	10	MT-BCR10-BE	MT-BCR10-BE: Beaverhead-Deerlodge National Forest - Roaded/Managed	IBO	7	7	100	7697

State	BCR	Stratum	Stratum Description	Who Collected	Planned	Completed	% Completed	Area (km2)
MT	10	MT-BCR10-BI	MT-BCR10-BI: Bitterroot National Forest - Roaded/Managed	IBO	6	6	100	2324
MT	10	MT-BCR10-BM	MT-BCR10-BM: Bureau of Land Management - Missoula/Butte	IBO	4	4	100	1356
MT	10	MT-BCR10-BR	MT-BCR10-BR: Beaverhead-Deerlodge National Forest - Roadless/Wilderness	IBO	3	3	100	8236
MT	10	MT-BCR10-BS	MT-BCR10-BS: Bureau of Land Management - southwestern Montana	IBO	3	3	100	3447
MT	10	MT-BCR10-BW	MT-BCR10-BW: Bitterroot National Forest - Roadless/Wilderness	IBO	2	2	100	2763
MT	10	MT-BCR10-CR	MT-BCR10-CR: Custer National Forest - Roadless/Wilderness	IBO	2	1	50	1783
MT	10	MT-BCR10-CU	MT-BCR10-CU: Custer National Forest - Roaded/Managed	IBO	3	3	100	779
MT	10	MT-BCR10-FL	MT-BCR10-FL: Flathead National Forest - Roaded/Managed	IBO	6	6	100	4945
MT	10	MT-BCR10-FR	MT-BCR10-FR: Flathead National Forest - Roadless/Wilderness	IBO	2	1	50	6410
MT	10	MT-BCR10-GA	MT-BCR10-GA: Gallatin National Forest - Roaded/Managed	IBO	6	6	100	3479
MT	10	MT-BCR10-GR	MT-BCR10-GR: Gallatin National Forest - Roadless/Wilderness	IBO	2	1	50	5787
MT	10	MT-BCR10-HE	MT-BCR10-HE: Helena National Forest - Roaded/Managed	IBO	6	6	100	3024
MT	10	MT-BCR10-HR	MT-BCR10-HR: Helena National Forest - Roadless/Wilderness	IBO	2	2	100	2248
MT	10	MT-BCR10-KO	MT-BCR10-KO: Kootenai National Forest - Roaded/Managed	IBO	23	23	100	7239
MT	10	MT-BCR10-KR	MT-BCR10-KR: Kootenai National Forest - Roadless/Wilderness	IBO	2	2	100	1887

State	BCR	Stratum	Stratum Description	Who Collected	Planned	Completed	% Completed	Area (km2)
MT	10	MT-BCR10-LC	MT-BCR10-LC: Lewis and Clark National Forest - Roaded/Managed	IBO	6	6	100	2778
MT	10	MT-BCR10-LO	MT-BCR10-LO: Lolo National Forest - Roaded/Managed	IBO	7	7	100	7742
MT	10	MT-BCR10-LR	MT-BCR10-LR: Lewis and Clark National Forest - Roadless/Wilderness	IBO	2	2	100	5007
MT	10	MT-BCR10-LW	MT-BCR10-LW: Lolo National Forest - Roadless/Wilderness	IBO	2	2	100	3859
MT	10	MT-BCR10-ON	MT-BCR10-ON: All Other Lands	IBO	6	6	100	75417
MT	11	MT-BCR11-AO	MT-BCR11-AO: All Other Lands	IBO	9	9	100	62631
MT	11	MT-BCR11-BN	MT-BCR11-BN: Bureau of Land Management - North Valley	IBO	9	9	100	1588
MT	11	MT-BCR11-BO	MT-BCR11-BO: Bureau of Land Management - Other	IBO	9	9	100	6826
MT	11	MT-BCR11-FT	Mt-BCR11-FT: USFWS and Tribal Lands in BCR11	IBO	2	2	100	12370
MT	17	MT-BCR17-AO	MT-BCR17-AO: All Other Lands	IBO	9	9	100	102779
MT	17	MT-BCR17-BL	MT-BCR17-BL: Bureau of Land Management	IBO	10	10	100	25013
MT	17	MT-BCR17-CU	MT-BCR17-CU: Custer National Forest	IBO	3	3	100	2649
MT	17	MT-BCR17-LC	MT-BCR17-LC: Lewis and Clark National Forest	IBO	4	4	100	867
MT	17	MT-BCR17-RF	MT-BCR17-RF: USFWS and River Lands in BCR17	IBO	2	2	100	8610
ND	17	ND-BCR17-AT	ND-BCR17-AT: All Other Lands	BCR	8	8	100	50236
ND	17	ND-BCR17-BM	ND-BCR17-BM: Bureau of Land Management	BCR	6	6	100	165
ND	17	ND-BCR17-KR	ND-BCR17-KR: Knife River Indian Villages National Historic Site	BCR	5	5	100	5
ND	17	ND-BCR17-MG	ND-BCR17-MG: Little Missouri National Grassland	BCR	5	5	100	4133
ND	17	ND-BCR17-RG	ND-BCR17-RG: Cedar River National Grassland	BCR	5	5	100	20

State	BCR	Stratum	Stratum Description	Who Collected	Planned	Completed	% Completed	Area (km2)
ND	17	ND-BCR17-TN	ND-BCR17-TN: Theodore Roosevelt National Park - North Unit	BCR	6	6	100	100
ND	17	ND-BCR17-TS	ND-BCR17-TS: Theodore Roosevelt National Park - South Unit	BCR	6	6	100	193
ND	18	NE-BCR18-GR	NE-BCR18-GR: All Other Lands With Grassland	BCR	15	15	100	34896
NE	17	NE-BCR17-LG	NE-BCR17-LG: Oglala National Grassland	BCR	2	2	100	350
NE	17	NE-BCR17-ON	NE-BCR17-ON: All Other Lands	BCR	3	3	100	4553
NE	18	NE-BCR18-AF	NE-BCR18-AF: Agate Fossil Beds National Monument	BCR	4	4	100	12
NE	18	NE-BCR18-GG	NE-BCR18-GG: Oglala National Grassland	BCR	2	2	100	31
NE	18	NE-BCR18-RD	NE-BCR18-RD: Nebraska National Forest - Pine Ridge	BCR	2	2	100	200
NE	18	NE-BCR18-SB	NE-BCR18-SB: Scotts Bluff National Monument	BCR	4	4	100	13
NE	19	NE-BCR19-BE	NE-BCR19-BE: Nebraska National Forest - Bessey District	BCR	2	2	100	361
NE	19	NE-BCR19-SG	NE-BCR19-SG: Samuel R. McKelvie National Forest	BCR	2	2	100	468
NV	9	NV-BCR9-BM	NV-BCR9-BM: Bureau of Land Management - Battle Mountain District	GBBO	15	15	100	35811
NV	9	NV-BCR9-CC	NV-BCR9-CC: Bureau of Land Management - Carson City District	GBBO	8	8	100	19269
NV	9	NV-BCR9-EK	NV-BCR9-EK: Bureau of Land Management - Elko, Twin Falls, and Boise Districts	GBBO	14	14	100	30072
NV	9	NV-BCR9-EY	NV-BCR9-EY: Bureau of Land Management - Ely District	GBBO	15	15	100	45375
NV	9	NV-BCR9-HT	NV-BCR9-HT: Humboldt-Toiyabe National Forest	GBBO	7	9	129	22324
NV	9	NV-BCR9-NC	NV-BCR9-NC: Bureau of Land Management - Northern California District	GBBO	4	4	100	5566

State	BCR	Stratum	Stratum Description	Who Collected	Planned	Completed	% Completed	Area (km2)
NV	9	NV-BCR9-SN	NV-BCR9-SN: Bureau of Land Management - Southern Nevada District	GBBO	3	3	100	659
NV	9	NV-BCR9-WI	NV-BCR9-WI: Bureau of Land Management - Winnemucca District	GBBO	15	15	100	33881
NV	15	NV-BCR15-HT	NV-BCR15-HT: Humboldt-Toiyabe National Forest	GBBO	3	3	100	616
NV	33	NV-BCR33-HT	NV-BCR33-HT: Humboldt-Toiyabe National Forest	GBBO	3	3	100	1313
OK	18	OK-BCR18-AO	OK-BCR18-AO: All Other Lands	BCR	6	6	100	10556
OK	18	OK-BCR18-PL	OK-BCR18-PL: Playas	BCR	2	2	100	105
OK	18	OK-BCR18-RV	OK-BCR18-RV: Rivers	BCR	2	2	100	533
OK	19	OK-BCR19-AO	OK-BCR19-AO: All Other Lands	BCR	8	8	100	68616
OK	19	OK-BCR19-PL	OK-BCR19-PL: Playas	BCR	2	2	100	14
OK	19	OK-BCR19-RV	OK-BCR19-RV: Rivers	BCR	2	2	100	6531
OR	9	OR-BCR9-BU	OR-BCR9-BU: Bureau of Land Management - Burns District	KBO	8	8	100	12137
OR	9	OR-BCR9-LA	OR-BCR9-LA: Bureau of Land Management - Lakeview and Medford Districts	KBO	8	8	100	13783
OR	9	OR-BCR9-PR	OR-BCR9-PR: Bureau of Land Management - Prineville District	KBO	8	8	100	3617
OR	9	OR-BCR9-VA	OR-BCR9-VA: Bureau of Land Management - Vale District	KBO	8	8	100	18002
OR	10	OR-BCR10-BU	OR-BCR10-BU: Bureau of Land Management- Burns District	KBO	8	8	100	1131
OR	10	OR-BCR10-PR	OR-BCR10-PR:Bureau of Land Management- Prineville District	KBO	8	8	100	2549
OR	10	OR-BCR10-VA	OR-BCR10-VA:Bureau of Land Management- Vale District	KBO	8	8	100	2457

State	BCR	Stratum	Stratum Description	Who Collected	Planned	Completed	% Completed	Area (km2)
SD	17	SD-BCR17-AT	SD-BCR17-AT: All Other Lands	BCR	12	12	100	92764
SD	17	SD-BCR17-BI	SD-BCR17-BI: Black Hills National Forest	BCR	3	3	100	5385
SD	17	SD-BCR17-BM	SD-BCR17-BM: Bureau of Land Management	BCR	7	7	100	831
SD	17	SD-BCR17-BN	SD-BCR17-BN: Badlands National Park - North Unit	BCR	6	6	100	399
SD	17	SD-BCR17-GG	SD-BCR17-GG: Buffalo Gap National Grassland	BCR	2	2	100	2346
SD	17	SD-BCR17-JC	SD-BCR17-JC: Jewel Cave National Monument	BCR	4	4	100	5
SD	17	SD-BCR17-MR	SD-BCR17-MR: Mount Rushmore National Monument	BCR	6	6	100	6
SD	17	SD-BCR17-PG	SD-BCR17-PG: Fort Pierre National Grassland	BCR	2	2	100	482
SD	17	SD-BCR17-RG	SD-BCR17-RG: Grand River National Grassland	BCR	5	5	100	613
SD	17	SD-BCR17-UF	SD-BCR17-UF: Custer National Forest	BCR	4	4	100	326
SD	17	SD-BCR17-WC	SD-BCR17-WC: Wind Cave National Park	BCR	6	6	100	136
UT	9	UT-BCR9-AO	UT-BCR9-AO: All Other Lands	UDWR	40	42	105	34037
UT	9	UT-BCR9-AO	UT-BCR9-AO: All Other Lands	UDWR	40	42	105	34636
UT	9	UT-BCR9-AP	UT-BCR9-AP: Department of Defense - APG Impact Area	DOD	6	6	100	70
UT	9	UT-BCR9-CC	UT-BCR9-CC: Bureau of Land Management - Cedar City Field Office	IBO	4	4	100	8046
UT	9	UT-BCR9-CT	UT-BCR9-CT: Caribou-Targhee National Forest	BCR	2	2	100	54
UT	9	UT-BCR9-DD	UT-BCR9-DD: Department of Defense - Other Lands	DOD	6	5	83	1986
UT	9	UT-BCR9-DI	UT-BCR9-DI: Dixie National Forest	IBO	2	2	100	1008
UT	9	UT-BCR9-FI	UT-BCR9-FI: Bureau of Land Management - Fillmore Field Office	BCR	5	5	100	18326
UT	9	UT-BCR9-FL	UT-BCR9-FL: Fishlake National Forest	IBO	2	2	100	590

State	BCR	Stratum	Stratum Description	Who Collected	Planned	Completed	% Completed	Area (km2)
UT	9	UT-BCR9-MU	UT-BCR9-MU: Department of Defense - Mudflats	DOD	2	2	100	1162
UT	9	UT-BCR9-RI	UT-BCR9-RI: Bureau of Land Management - Richfield Field Office	IBO	2	2	100	617
UT	9	UT-BCR9-SG	UT-BCR9-SG: Bureau of Land Management - Saint George Field Office	IBO	2	2	100	232
UT	9	UT-BCR9-SL	UT-BCR9-SL: Bureau of Land Management - Salt Lake Field Office	BCR	5	5	100	12340
UT	9	UT-BCR9-SW	UT-BCR9-SW: Sawtooth National Forest	IBO	3	3	100	364
UT	9	UT-BCR9-TS	UT-BCR9-TS: Department of Defense - Target S Impact Area	DOD	6	6	100	128
UT	9	UT-BCR9-UR	UT-BCR9-UR: Department of Defense - UTG Impact Area	DOD	6	6	100	126
UT	9	UT-BCR9-UT	UT-BCR9-UT: Department of Defense - UTTR Impact Areas	DOD	5	4	80	522
UT	9	UT-BCR9-WA	UT-BCR9-WA: Uinta-Wasatch-Cache National Forest	BCR	3	3	100	1648
UT	10	UT-BCR10-AO	UT-BCR10-AO: All Other Lands	UDWR	15	14	93	1968
UT	10	UT-BCR10-AS	UT-BCR10-AS: Ashley National Forest	BCR	3	3	100	96
UT	10	UT-BCR10-SL	UT-BCR10-SL: Bureau of Land Management - Salt Lake Field Office	BCR	3	3	100	642
UT	10	UT-BCR10-VE	UT-BCR10-VE: Bureau of Land Management - Vernal Field Office	BCR	2	2	100	268
UT	10	UT-BCR10-WA	UT-BCR10-WA: Uinta-Wasatch-Cache National Forest	BCR	3	3	100	49
UT	16	UT-BCR16-AH	UT-BCR16-AH: Ashley National Forest	BCR	5	5	100	5166
UT	16	UT-BCR16-AO	UT-BCR16-AO: All Other Lands	UDWR	40	40	100	45439
UT	16	UT-BCR16-AO	UT-BCR16-AO: All Other Lands	UDWR	40	40	100	48838

State	BCR	Stratum	Stratum Description	Who Collected	Planned	Completed	% Completed	Area (km2)
UT	16	UT-BCR16-CC	UT-BCR16-CC: Bureau of Land Management - Cedar City Field Office	IBO	2	2	100	450
UT	16	UT-BCR16-DI	UT-BCR16-DI: Dixie National Forest	IBO	8	8	100	5934
UT	16	UT-BCR16-FI	UT-BCR16-FI: Bureau of Land Management - Fillmore Field Office	BCR	2	2	100	40
UT	16	UT-BCR16-FL	UT-BCR16-FL: Fishlake National Forest	IBO	8	8	100	6670
UT	16	UT-BCR16-GS	UT-BCR16-GS: Bureau of Land Management - Grand Staircase-Escalante National Monument	IBO	3	3	100	7564
UT	16	UT-BCR16-KA	UT-BCR16-KA: Bureau of Land Management - Kanab Field Office	IBO	4	4	100	2267
UT	16	UT-BCR16-MA	UT-BCR16-MA: Manti-La Sal National Forest	IBO	9	9	100	5280
UT	16	UT-BCR16-MN	UT-BCR16-MN: Bureau of Land Management - Monticello Field Office	IBO	3	3	100	7321
UT	16	UT-BCR16-MO	UT-BCR16-MO: Bureau of Land Management - Moab Field Office	BCR	3	3	100	7725
UT	16	UT-BCR16-PR	UT-BCR16-PR: Bureau of Land Management - Price Field Office	IBO	3	3	100	10216
UT	16	UT-BCR16-RI	UT-BCR16-RI: Bureau of Land Management - Richfield Field Office	IBO	3	3	100	8068
UT	16	UT-BCR16-SA	UT-BCR16-SA: Manti-La Sal National Forest - Sanpitch	IBO	3	3	100	307
UT	16	UT-BCR16-SG	UT-BCR16-SG: Bureau of Land Management - Saint George Field Office	IBO	2	2	100	1904
UT	16	UT-BCR16-SL	UT-BCR16-SL: Bureau of Land Management - Salt Lake Field Office	BCR	2	2	100	87
UT	16	UT-BCR16-VE	UT-BCR16-VE: Bureau of Land Management - Vernal Field Office	BCR	4	4	100	6612
UT	16	UT-BCR16-VE	UT-BCR16-VE: Bureau of Land Management - Vernal Field Office	BCR	4	4	100	6704

State	BCR	Stratum	Stratum Description	Who Collected	Planned	Completed	% Completed	Area (km2)
UT	16	UT-BCR16-WA	UT-BCR16-WA: Uinta-Wasatch-Cache National Forest	BCR	3	3	100	9913
UT	33	UT-BCR33-AO	UT-BCR33-AO: All Other Lands	UDWR	15	15	100	65
UT	33	UT-BCR33-SG	UT-BCR33-SG: Bureau of Land Management - Saint George Field Office	IBO	2	2	100	388
WY	9	WY-BCR9-WY	WY-BCR9-WY: Caribou-Targhee National Forest	BCR	2	2	100	119
WY	10	WY-BCR10-AO	WY-BCR10-AO: All Other Lands	BCR	15	15	100	52161
WY	10	WY-BCR10-AS	WY-BCR10-AS: Ashley National Forest	BCR	2	2	100	540
WY	10	WY-BCR10-BE	WY-BCR10-BE: Bridger-Teton National Forest - Roaded/Managed	BCR	7	7	100	3034
WY	10	WY-BCR10-BH	WY-BCR10-BH: Bighorn Canyon National Recreation Area	BCR	2	2	100	57
WY	10	WY-BCR10-BI	WY-BCR10-BI: Bighorn National Forest	WYNDD	3	3	100	4712
WY	10	WY-BCR10-BR	WY-BCR10-BR: Bridger-Teton National Forest - Roadless/Wilderness	BCR	2	2	100	11364
WY	10	WY-BCR10-BU	WY-BCR10-BU: Bureau of Land Management - Buffalo Field Office	BCR	2	2	100	547
WY	10	WY-BCR10-CA	WY-BCR10-CA: Bureau of Land Management - Casper Field Office	BCR	3	3	100	2509
WY	10	WY-BCR10-CO	WY-BCR10-CO: Bureau of Land Management - Cody Field Office	BCR	4	4	100	4704
WY	10	WY-BCR10-CT	WY-BCR10-CT: Caribou-Targhee National Forest	BCR	2	2	100	1397
WY	10	WY-BCR10-GR	WY-BCR10-GR: Grand Teton National Park	BCR	2	2	100	856
WY	10	WY-BCR10-KE	WY-BCR10-KE: Bureau of Land Management - Kemmerer Field Office	BCR	5	5	100	5733

State	BCR	Stratum	Stratum Description	Who Collected	Planned	Completed	% Completed	Area (km2)
WY	10	WY-BCR10-LA	WY-BCR10-LA: Bureau of Land Management - Lander Field Office	BCR	7	7	100	9829
WY	10	WY-BCR10-MB	WY-BCR10-MB: Medicine Bow National Forest	WYNDD	2	2	100	773
WY	10	WY-BCR10-PI	WY-BCR10-PI: Bureau of Land Management - Pinedale Field Office	BCR	8	8	100	3687
WY	10	WY-BCR10-RA	WY-BCR10-RA: Bureau of Land Management - Rawlins Field Office	BCR	10	10	100	13954
WY	10	WY-BCR10-RO	WY-BCR10-RO: Bureau of Land Management - Rock Springs Field Office	BCR	9	9	100	15152
WY	10	WY-BCR10-SE	WY-BCR10-SE: Shoshone National Forest - Roaded/Managed	BCR	5	5	100	2101
WY	10	WY-BCR10-SR	WY-BCR10-SR: Shoshone National Forest - Roadless/Wilderness	BCR	4	4	100	8311
WY	10	WY-BCR10-WA	WY-BCR10-WA: Wasatch National Forest	BCR	3	3	100	33
WY	10	WY-BCR10-WO	WY-BCR10-WO: Bureau of Land Management - Worland Field Office	BCR	7	7	100	8467
WY	10	WY-BCR10-WR	WY-BCR10-WR: Wind River Reservation	BCR	4	4	100	7819
WY	10	WY-BCR10-YE	WY-BCR10-YE: Yellowstone National Park	BCR	4	4	100	7592
WY	16	WY-BCR16-AO	WY-BCR16-AO: All Other Lands	BCR	5	5	100	5438
WY	16	WY-BCR16-BL	WY-BCR16-BL: Bureau of Land Management	BCR	2	2	100	647
WY	16	WY-BCR16-MB	WY-BCR16-MB: Medicine Bow National Forest	WYNDD	4	4	100	5329
WY	16	WY-BCR16-WA	WY-BCR16-WA: Wasatch National Forest	BCR	3	3	100	180
WY	17	WY-BCR17-AO	WY-BCR17-AO: All Other Lands	BCR	12	12	100	52186
WY	17	WY-BCR17-BH	WY-BCR17-BH: Black Hills National Forest	BCR	3	3	100	1085
WY	17	WY-BCR17-BU	WY-BCR17-BU: Bureau of Land Management - Buffalo Field Office	BCR	3	3	100	2653

State	BCR	Stratum	Stratum Description	Who Collected	Planned	Completed	% Completed	Area (km2)
WY	17	WY-BCR17-CA	WY-BCR17-CA: Bureau of Land Management - Casper Field Office	BCR	3	3	100	2695
WY	17	WY-BCR17-NE	WY-BCR17-NE: Bureau of Land Management - Newcastle Field Office	BCR	2	2	100	1025
WY	17	WY-BCR17-TB	WY-BCR17-TB: Thunder Basin National Grassland	WYNDD	6	6	100	4520
WY	18	WY-BCR18-AO	WY-BCR18-AO: All Other Lands	BCR	12	12	100	12064
WY	18	WY-BCR18-BL	WY-BCR18-BL: Bureau of Land Management	BCR	2	2	100	171
WY	18	WY-BCR18-DO	WY-BCR18-DO: Department of Defense	BCR	2	2	100	23

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

Table 4.2.: Reasons planned surveys were not completed, 2022.

Stratum	Number not completed	Reason
AZ-BCR34-CF	8	Technician issue not discovered until end of season
AZ-CORONADO-RH	2	Technician issue not discovered until end of season
AZ-CORONADO-RL	1	Technician issue not discovered until end of season
AZ-KAIBAB-KH	5	Technician issue not discovered until end of season
AZ-KAIBAB-KL	13	Technician issue not discovered until end of season
CO-BCR16-AO	2	Technician quit so we did not have the necessary capacity
CO-BCR16-AR	2	Technician quit so we did not have the necessary capacity
CO-BCR16-BL	1	Technician quit so we did not have the necessary capacity
CO-BCR16-GM	1	Technician quit so we did not have the necessary capacity
CO-BCR16-PS	1	Technician quit so we did not have the necessary capacity
CO-BCR16-RA	1	Technician quit so we did not have the necessary capacity

Stratum	Number not completed	Reason
CO-BCR16-RO	1	Technician quit so we did not have the necessary capacity
CO-BCR16-SA	1	Technician quit so we did not have the necessary capacity
CO-BCR16-WA	1	Technician quit so we did not have the necessary capacity
CO-BCR16-WS	1	Technician quit so we did not have the necessary capacity
CO-BCR18-IA	3	Were not able to get landowner permission
CO-BCR18-PI	4	Were not able to get landowner permission
CO-BCR18-SA	1	Were not able to get landowner permission
KS-BCR19-AO	1	Technician was in an accident
KS-BCR19-RV	1	Technician was in an accident
MT-BCR10-CR	1	Miscommunication with technician
MT-BCR10-FR	1	Miscommunication with technician
MT-BCR10-GR	1	Miscommunication with technician
ID-BCR9-JA	3	Mistakenly completed 3 grids in the ID-BCR9-BR stratum instead

5. U.S. Forest Service

5.1. Region 1

5.1.1. Region 1 National Forests

5.1.1.1. Region 1 National Forests: Total

We obtained results for Region 1 National Forests: Total by compiling and jointly analyzing data from 29 strata.

Field technicians completed 132 of 134 planned surveys (99%) in 2022. Technicians conducted 1410 point counts within the 132 surveyed grid cells between May 28 and July 15. They detected 157 bird species, including 5 priority species.

Bird Conservancy estimated densities and population sizes for 196 species that were detected in any year during which surveys were conducted, 9 of which are priority species. The data yielded robust density estimates (CV < 50%) for 91 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Region 1 National Forests: Total for 203 species that were detected in any year during which surveys were conducted, 10 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 136 species.

To view a map of survey locations, density and occupancy results and species counts within Region 1 National Forests: Total 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 tab in the upper left above the map.

USFS-Region 1 National Forests

5.1.1.2. Beaverhead-Deerlodge National Forest

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 91 point counts within the 10 surveyed grid cells between June 5 and July 13. They detected 65 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 118 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 36 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Beaverhead-Deerlodge National Forest for 114 species that were detected in any year during which surveys were

conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 49 species.

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 tab in the upper left above the map.

Beaverhead-Deerlodge National Forest

5.1.1.3. Bitterroot National Forest

We obtained results for Bitterroot National Forest by compiling and jointly analyzing data from three strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 104 point counts within the 10 surveyed grid cells between June 14 and July 15. They detected 65 bird species, including 2 priority species.

Bird Conservancy estimated densities and population sizes for 104 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust density estimates (CV < 50%) for 35 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Bitterroot National Forest for 112 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 60 species.

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 tab in the upper left above the map.

Bitterroot National Forest

5.1.1.4. Clearwater National Forest

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 69 point counts within the 7 surveyed grid cells between June 20 and July 15. They detected 61 bird species, including 1 priority species.

Bird Conservancy estimated densities and population sizes for 106 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust density estimates (CV < 50%) for 32 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Clearwater National Forest for 104 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 51 species.

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 tab in the upper left above the map.

Clearwater National Forest

5.1.1.5. Custer National Forest

We obtained results for Custer National Forest by compiling and jointly analyzing data from four strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 116 point counts within the 12 surveyed grid cells between June 14 and July 9. They detected 98 bird species, including 9 priority species.

Bird Conservancy estimated densities and population sizes for 153 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 45 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Custer National Forest for 156 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 61 species.

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 tab in the upper left above the map.

Custer National Forest

5.1.1.6. Flathead National Forest

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

Field technicians completed 7 of 8 planned surveys (88%) in 2022. Technicians conducted 83 point counts within the 7 surveyed grid cells between June 9 and July 6. They detected 60 bird species, including 1 priority species.

Bird Conservancy estimated densities and population sizes for 109 species that were detected in any year during which surveys were conducted, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 27 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Flathead National Forest for 110 species that were detected in any year during which surveys were conducted, 3 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 54 species.

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 tab in the upper left above the map.

5.1.1.7. Gallatin National Forest

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

Field technicians completed 7 of 8 planned surveys (88%) in 2022. Technicians conducted 61 point counts within the 7 surveyed grid cells between June 9 and July 12. They detected 64 bird species, including 1 priority species.

Bird Conservancy estimated densities and population sizes for 119 species that were detected in any year during which surveys were conducted, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 31 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Gallatin National Forest for 117 species that were detected in any year during which surveys were conducted, 3 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 38 species.

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 tab in the upper left above the map.

5.1.1.8. Helena National Forest

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 95 point counts within the 8 surveyed grid cells between May 31 and July 11. They detected 79 bird species, including 4 priority species.

Bird Conservancy estimated densities and population sizes for 127 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust density estimates (CV < 50%) for 41 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Helena National Forest for 125 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 51 species.

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 tab in the upper left above the map.

5.1.1.9. Idaho Panhandle National Forest

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 145 point counts within the 15 surveyed grid cells between June 1 and July 5. They detected 81 bird species, including 7 priority species.

Bird Conservancy estimated densities and population sizes for 118 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust density estimates (CV < 50%) for 47 species.

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, 8 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 56 species.

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 tab in the upper left above the map.

Idaho Panhandle National Forest

5.1.1.10. Kootenai National Forest

We obtained results for Kootenai National Forest by compiling and jointly analyzing data from three strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 317 point counts within the 27 surveyed grid cells between May 28 and July 12. They detected 98 bird species, including 6 priority species.

Bird Conservancy estimated densities and population sizes for 130 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust density estimates (CV < 50%) for 54 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Kootenai National Forest for 136 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 68 species.

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 tab in the upper left above the map.

Kootenai National Forest

5.1.1.11. Lewis and Clark National Forest

We obtained results for Lewis and Clark National Forest by compiling and jointly analyzing data from three strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 152 point counts within the 12 surveyed grid cells between June 6 and July 10. They detected 78 bird species, including 2 priority species.

Bird Conservancy estimated densities and population sizes for 125 species that were detected in any year during which surveys were conducted, 5 of which are priority species. The data yielded robust density estimates (CV < 50%) for 36 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Lewis and Clark National Forest for 126 species that were detected in any year during which surveys were conducted, 5 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 41 species.

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 tab in the upper left above the map.

Lewis and Clark National Forest

5.1.1.12. Lolo National Forest

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 68 point counts within the 9 surveyed grid cells between May 30 and July 13. They detected 71 bird species, including 2 priority species.

Bird Conservancy estimated densities and population sizes for 131 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust density estimates (CV < 50%) for 35 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Lolo National Forest for 129 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 54 species.

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 tab in the upper left above the map.

Lolo National Forest

5.1.1.13. Nez Perce National Forest

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 109 point counts within the 8 surveyed grid cells between June 21 and June 26. They detected 77 bird species, including 3 priority species.

Bird Conservancy estimated densities and population sizes for 112 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 40 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Nez Perce National Forest for 109 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 46 species.

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 tab in the upper left above the map.

Nez Perce National Forest

5.1.2. Region 1 National Grasslands

5.1.2.1. Region 1 National Grasslands: Total

We obtained results for Region 1 National Grasslands: Total by compiling and jointly analyzing data from three strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 143 point counts within the 15 surveyed grid cells between June 5 and July 17. They detected 75 bird species, including 4 priority species.

Bird Conservancy estimated densities and population sizes for 131 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 25 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Region 1 National Grasslands: Total for 127 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 50 species.

To view a map of survey locations, density and occupancy results and species counts within Region 1 National Grasslands: Total 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 tab in the upper left above the map.

USFS-Region 1 National Grasslands

5.1.2.2. Little Missouri National Grassland

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 50 point counts within the 5 surveyed grid cells between June 7 and July 12. They detected 48 bird species, including 11 priority species.

Bird Conservancy estimated densities and population sizes for 100 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 22 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Little Missouri National Grassland for 90 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 34 species.

To view a map of survey locations, density and occupancy results and species counts within Little Missouri 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 tab in the upper left above the map.

ND-BCR17-MG

5.1.2.3. Cedar River National Grassland

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 55 point counts within the 5 surveyed grid cells between June 7 and July 17. They detected 42 bird species, including 15 priority species.

Bird Conservancy estimated densities and population sizes for 73 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust density estimates (CV < 50%) for 14 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Cedar River National Grassland for 73 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 24 species.

To view a map of survey locations, density and occupancy results and species counts within Cedar River 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 tab in the upper left above the map.

ND-BCR17-RG

5.1.2.4. Grand River National Grassland

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 38 point counts within the 5 surveyed grid cells between June 5 and July 15. They detected 26 bird species, including 7 priority species.

Bird Conservancy estimated densities and population sizes for 72 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 11 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Grand River National Grassland for 67 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 13 species.

To view a map of survey locations, density and occupancy results and species counts within Grand River 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 tab in the upper left above the map.

SD-BCR17-RG

5.2. Region 2

5.2.1. Region 2 National Forests

5.2.1.1. Region 2 National Forests: Total

We obtained results for Region 2 National Forests: Total by compiling and jointly analyzing data from 21 strata.

Field technicians completed 82 of 90 planned surveys (91%) in 2022. Technicians conducted 857 point counts within the 82 surveyed grid cells between May 25 and July 25. They detected 159 bird species, including 11 priority species.

Bird Conservancy estimated densities and population sizes for 217 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 80 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Region 2 National Forests: Total for 222 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 127 species.

To view a map of survey locations, density and occupancy results and species counts within Region 2 National Forests: Total 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 tab in the upper left above the map.

5.2.1.2. Arapaho and Roosevelt National Forests

We obtained results for Arapaho and Roosevelt National Forests by compiling and analyzing data from one stratum.

Field technicians completed 13 of 15 planned surveys (87%) in 2022. Technicians conducted 126 point counts within the 13 surveyed grid cells between May 25 and July 19. They detected 73 bird species, including 8 priority species.

Bird Conservancy estimated densities and population sizes for 103 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust density estimates (CV < 50%) for 30 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Arapaho and Roosevelt National Forests for 101 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 34 species.

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 tab in the upper left above the map.

CO-BCR16-AR

5.2.1.3. Bighorn National Forest

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 37 point counts within the 3 surveyed grid cells between July 13 and July 15. They detected 24 bird species, including 4 priority species.

Bird Conservancy estimated densities and population sizes for 99 species that were detected in any year during which surveys were conducted, 5 of which are priority species. The data yielded robust density estimates (CV < 50%) for 15 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Bighorn National Forest for 98 species that were detected in any year during which surveys were conducted, 5 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 26 species.

To view a map of survey locations, density and occupancy results and species counts within Bighorn 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 tab in the upper left above the map.

WY-BCR10-BI

5.2.1.4. Black Hills National Forest

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 52 point counts within the 6 surveyed grid cells between June 20 and July 19. They detected 51 bird species, including 3 priority species.

Bird Conservancy estimated densities and population sizes for 140 species that were detected in any year during which surveys were conducted, 10 of which are priority species. The data yielded robust density estimates (CV < 50%) for 22 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Black Hills National Forest for 137 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 85 species.

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 tab in the upper left above the map.

Black Hills National Forest

5.2.1.5. Grand Mesa, Uncompaghre and Gunnison National Forests

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

Field technicians completed 4 of 5 planned surveys (80%) in 2022. Technicians conducted 39 point counts within the 4 surveyed grid cells between June 28 and July 20. They detected 47 bird species, including 2 priority species.

Bird Conservancy estimated densities and population sizes for 105 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust density estimates (CV < 50%) for 27 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Grand Mesa, Uncompaghre and Gunnison National Forests for 105 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 40 species.

To view a map of survey locations, density and occupancy results and species counts within Grand Mesa, Uncompaghre and Gunnison 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 tab in the upper left above the map.

CO-BCR16-GM

5.2.1.6. Medicine Bow National Forest

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 75 point counts within the 6 surveyed grid cells between June 16 and July 8. They detected 61 bird species, including 2 priority species.

Bird Conservancy estimated densities and population sizes for 137 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 34 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Medicine Bow National Forest for 136 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 54 species.

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 tab in the upper left above the map.

Medicine Bow National Forest

5.2.1.7. Nebraska National Forests

We obtained results for Nebraska National Forests by compiling and jointly analyzing data from three strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 64 point counts within the 6 surveyed grid cells between May 31 and June 30. They detected 55 bird species, including 2 priority species.

Bird Conservancy estimated densities and population sizes for 130 species that were detected in any year during which surveys were conducted, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 27 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Nebraska National Forests for 121 species that were detected in any year during which surveys were conducted, 3 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 55 species.

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 tab in the upper left above the map.

Nebraska National Forests

5.2.1.8. Pike and San Isabel National Forests

We obtained results for Pike and San Isabel National Forests by compiling and analyzing data from one stratum.

Field technicians completed 4 of 5 planned surveys (80%) in 2022. Technicians conducted 36 point counts within the 4 surveyed grid cells between July 6 and July 15. They detected 40 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 97 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 21 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Pike and San Isabel National Forests for 92 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 34 species.

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 tab in the upper left above the map.

CO-BCR16-PS

5.2.1.9. Rio Grande National Forest

We obtained results for Rio Grande National Forest by compiling and jointly analyzing data from three strata.

Field technicians completed 11 of 12 planned surveys (92%) in 2022. Technicians conducted 118 point counts within the 11 surveyed grid cells between June 22 and July 19. They detected 79 bird species, including 5 priority species.

Bird Conservancy estimated densities and population sizes for 133 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 42 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Rio Grande National Forest for 129 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 66 species.

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 tab in the upper left above the map.

Rio Grande National Forest

5.2.1.10. Routt National Forest

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 80 point counts within the 8 surveyed grid cells between June 26 and July 21. They detected 53 bird species, including 3 priority species.

Bird Conservancy estimated densities and population sizes for 119 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust density estimates (CV < 50%) for 29 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Routt National Forest for 118 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 47 species.

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 tab in the upper left above the map.

Routt National Forest

5.2.1.11. San Juan National Forest

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

Field technicians completed 4 of 5 planned surveys (80%) in 2022. Technicians conducted 33 point counts within the 4 surveyed grid cells between June 27 and July 25. They detected 61 bird species, including 3 priority species.

Bird Conservancy estimated densities and population sizes for 122 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 29 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout San Juan National Forest for 121 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 48 species.

To view a map of survey locations, density and occupancy results and species counts within San Juan 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 tab in the upper left above the map.

CO-BCR16-SA

5.2.1.12. Shoshone National Forest

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 126 point counts within the 9 surveyed grid cells between June 22 and July 20. They detected 73 bird species, including 5 priority species.

Bird Conservancy estimated densities and population sizes for 141 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 39 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Shoshone National Forest for 144 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 45 species.

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 tab in the upper left above the map.

Shoshone National Forest

5.2.1.13. White River National Forest

We obtained results for White River National Forest by compiling and jointly analyzing data from three strata.

Field technicians completed 11 of 13 planned surveys (85%) in 2022. Technicians conducted 93 point counts within the 11 surveyed grid cells between June 22 and July 18. They detected 72 bird species, including 3 priority species.

Bird Conservancy estimated densities and population sizes for 121 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust density estimates (CV < 50%) for 42 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout White River National Forest for 118 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 59 species.

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 tab in the upper left above the map.

White River National Forest

5.2.2. Region 2 National Grasslands

5.2.2.1. Region 2 National Grasslands: Total

We obtained results for Region 2 National Grasslands: Total by compiling and jointly analyzing data from eight strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 353 point counts within the 29 surveyed grid cells between May 17 and July 1. They detected 102 bird species, including 11 priority species.

Bird Conservancy estimated densities and population sizes for 176 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 43 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Region 2 National Grasslands: Total for 182 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 63 species.

To view a map of survey locations, density and occupancy results and species counts within Region 2 National Grasslands: Total 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 tab in the upper left above the map.

USFS-Region 2 National Grasslands

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

We obtained results for Nebraska National Grasslands (Buffalo Gap, Fort Pierre and Oglala) by compiling and jointly analyzing data from four strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 99 point counts within the 8 surveyed grid cells between May 26 and July 1. They detected 56 bird species, including 5 priority species.

Bird Conservancy estimated densities and population sizes for 138 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 15 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Nebraska National Grasslands (Buffalo Gap, Fort Pierre and Oglala) for 135 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 39 species.

To view a map of survey locations, density and occupancy results and species counts within Nebraska National Grasslands (Buffalo Gap, Fort Pierre and Oglala) 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 tab in the upper left above the map.

Nebraska National Grasslands

5.2.2.3. Cimarron National Grassland

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

Field technicians completed both planned surveys (100%) in 2022. Technicians conducted 18 point counts within the 2 surveyed grid cells between May 26 and May 28. They detected 25 bird species, including 9 priority species.

Bird Conservancy estimated densities and population sizes for 42 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust density estimates (CV < 50%) for 6 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Cimarron National Grassland for 40 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 9 species.

To view a map of survey locations, density and occupancy results and species counts within Cimarron 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 tab in the upper left above the map.

KS-BCR18-CM

5.2.2.4. Comanche National Grassland

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 45 point counts within the 5 surveyed grid cells between May 25 and May 28. They detected 37 bird species, including 9 priority species.

Bird Conservancy estimated densities and population sizes for 94 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust density estimates (CV < 50%) for 18 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Comanche National Grassland for 92 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 19 species.

To view a map of survey locations, density and occupancy results and species counts within Comanche 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 tab in the upper left above the map.

CO-BCR18-CO

5.2.2.5. Public Lands on Pawnee National Grassland

We obtained results for Public Lands on Pawnee National Grassland by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 111 point counts within the 8 surveyed grid cells between May 17 and June 2. They detected 29 bird species, including 10 priority species.

Bird Conservancy estimated densities and population sizes for 41 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust density estimates (CV < 50%) for 10 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Public Lands on Pawnee National Grassland for 35 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 9 species.

To view a map of survey locations, density and occupancy results and species counts within Public Lands on Pawnee 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 tab in the upper left above the map.

CO-BCR18-PG

5.2.2.6. Thunder Basin National Grassland

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 80 point counts within the 6 surveyed grid cells between May 26 and June 4. They detected 53 bird species, including 19 priority species.

Bird Conservancy estimated densities and population sizes for 104 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust density estimates (CV < 50%) for 20 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Thunder Basin National Grassland for 106 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 26 species.

To view a map of survey locations, density and occupancy results and species counts within Thunder Basin 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 tab in the upper left above the map.

WY-BCR17-TB

5.3. Region 3

5.3.1. Region 3 National Forests

5.3.1.1. Coconino National Forest

We obtained results for Coconino National Forest by compiling and analyzing data from one stratum.

Field technicians completed 26 of 34 planned surveys (76%) in 2022. Technicians conducted 289 point counts within the 26 surveyed grid cells between May 1 and July 4. They detected 100 bird species, including 5 priority species.

Bird Conservancy estimated densities and population sizes for 154 species that were detected in any year during which surveys were conducted, 5 of which are priority species. The data yielded robust density estimates (CV < 50%) for 64 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Coconino National Forest for 154 species that were detected in any year during which surveys were conducted, 5 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 78 species.

To view a map of survey locations, density and occupancy results and species counts within Coconino 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 tab in the upper left above the map.

Coconino National Forest

5.3.1.2. Coronado National Forest

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

Field technicians completed 18 of 20 planned surveys (90%) in 2022. Technicians conducted 162 point counts within the 18 surveyed grid cells between May 2 and May 28. They detected 123 bird species, including 27 priority species.

Bird Conservancy estimated densities and population sizes for 124 species that were detected in any year during which surveys were conducted, 27 of which are priority species. The data yielded robust density estimates (CV < 50%) for 61 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Coronado National Forest for 126 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 69 species.

To view a map of survey locations, density and occupancy results and species counts within Coronado 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 tab in the upper left above the map.

Coronado National Forest

5.3.1.3. Kaibab National Forest

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

Field technicians completed 62 of 80 planned surveys (78%) in 2022. Technicians conducted 655 point counts within the 62 surveyed grid cells between May 5 and July 9. They detected 112 bird species, including 3 priority species.

Bird Conservancy estimated densities and population sizes for 130 species that were detected in any year during which surveys were conducted, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 65 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Kaibab National Forest for 130 species that were detected in any year during which surveys were conducted, 3 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 77 species.

To view a map of survey locations, density and occupancy results and species counts within Kaibab 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 tab in the upper left above the map.

Kaibab National Forest

5.4. Region 4

5.4.1. Region 4 National Forests

5.4.1.1. Region 4 National Forest Total

We obtained results for Region 4 National Forest Total by compiling and jointly analyzing data from 36 strata.

Field technicians completed 147 of 143 planned surveys (103%) in 2022. Technicians conducted 1556 point counts within the 147 surveyed grid cells between May 8 and July 20. They detected 170 bird species, including 6 priority species.

Bird Conservancy estimated densities and population sizes for 200 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust density estimates (CV < 50%) for 96 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Region 4 National Forest Total for 209 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 141 species.

To view a map of survey locations, density and occupancy results and species counts within Region 4 National Forest Total 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 tab in the upper left above the map.

USFS-Region 4 National Forests

5.4.1.2. Ashley National Forest

We obtained results for Ashley National Forest by compiling and jointly analyzing data from three strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 103 point counts within the 10 surveyed grid cells between May 23 and July 14. They detected 57 bird species, including 4 priority species.

Bird Conservancy estimated densities and population sizes for 118 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust density estimates (CV < 50%) for 24 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Ashley National Forest for 117 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 34 species.

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 tab in the upper left above the map.

Ashley National Forest

5.4.1.3. Boise National Forest

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

Field technicians completed 12 of 10 planned surveys (120%) in 2022. Technicians conducted 124 point counts within the 12 surveyed grid cells between June 23 and July 10. They detected 75 bird species, including 3 priority species.

Bird Conservancy estimated densities and population sizes for 111 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust density estimates (CV < 50%) for 43 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Boise National Forest for 107 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 51 species.

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 tab in the upper left above the map.

Boise National Forest

5.4.1.4. Bridger-Teton National Forest

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 134 point counts within the 9 surveyed grid cells between July 6 and July 20. They detected 77 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 129 species that were detected in any year during which surveys were conducted, 5 of which are priority species. The data yielded robust density estimates (CV < 50%) for 39 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Bridger-Teton National Forest for 125 species that were detected in any year during which surveys were conducted, 5 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 47 species.

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 tab in the upper left above the map.

Bridger-Teton National Forest

5.4.1.5. Caribou-Targhee National Forest

We obtained results for Caribou-Targhee National Forest by compiling and jointly analyzing data from six strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 147 point counts within the 13 surveyed grid cells between June 6 and July 18. They detected 91 bird species, including 1 priority species.

Bird Conservancy estimated densities and population sizes for 151 species that were detected in any year during which surveys were conducted, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 38 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Caribou-Targhee National Forest for 149 species that were detected in any year during which surveys were conducted, 3 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 67 species.

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 tab in the upper left above the map.

Caribou-Targhee National Forest

5.4.1.6. 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 2022. Technicians conducted 105 point counts within the 10 surveyed grid cells between May 8 and June 11. They detected 74 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 111 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 46 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Dixie National Forest for 108 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 58 species.

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 tab in the upper left above the map.

Dixie National Forest

5.4.1.7. 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 2022. Technicians conducted 115 point counts within the 10 surveyed grid cells between May 27 and July 1. They detected 68 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 107 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 40 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Fishlake National Forest for 104 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 43 species.

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 tab in the upper left above the map.

Fishlake National Forest

5.4.1.8. Humboldt-Toiyabe National Forest

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

Field technicians completed 21 of 19 planned surveys (111%) in 2022. Technicians conducted 173 point counts within the 21 surveyed grid cells between May 22 and July 6. They detected 99 bird species, including 3 priority species.

Bird Conservancy estimated densities and population sizes for 128 species that were detected in any year during which surveys were conducted, 5 of which are priority species. The data yielded robust density estimates (CV < 50%) for 44 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Humboldt-Toiyabe National Forest for 128 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 59 species.

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 tab in the upper left above the map.

Humboldt-Toiyabe National Forest

5.4.1.9. Manti-La Sal National Forest

We obtained results for Manti-La Sal National Forest by compiling and jointly analyzing data from three strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 148 point counts within the 14 surveyed grid cells between June 1 and July 10. They detected 86 bird species, including 2 priority species.

Bird Conservancy estimated densities and population sizes for 144 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust density estimates (CV < 50%) for 47 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Manti-La Sal National Forest for 141 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 53 species.

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 tab in the upper left above the map.

Manti-La Sal National Forest

5.4.1.10. Payette National Forest

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 101 point counts within the 10 surveyed grid cells between June 22 and July 6. They detected 77 bird species, including 7 priority species.

Bird Conservancy estimated densities and population sizes for 108 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust density estimates (CV < 50%) for 41 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Payette National Forest for 106 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 46 species.

To view a map of survey locations, density and occupancy results and species counts within Payette 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 tab in the upper left above the map.

ID-BCR10-PA

5.4.1.11. Salmon-Challis National Forest

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 122 point counts within the 11 surveyed grid cells between June 11 and June 26. They detected 76 bird species, including 6 priority species.

Bird Conservancy estimated densities and population sizes for 115 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust density estimates (CV < 50%) for 37 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Salmon-Challis National Forest for 113 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 48 species.

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 tab in the upper left above the map.

Salmon-Challis National Forest

5.4.1.12. Sawtooth National Forest

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 138 point counts within the 12 surveyed grid cells between June 5 and July 6. They detected 94 bird species, including 2 priority species.

Bird Conservancy estimated densities and population sizes for 126 species that were detected in any year during which surveys were conducted, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 46 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Sawtooth National Forest for 122 species that were detected in any year during which surveys were conducted, 3 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 56 species.

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 tab in the upper left above the map.

Sawtooth National Forest

5.4.1.13. Uinta-Wasatch-Cache National Forest

We obtained results for Uinta-Wasatch-Cache National Forest by compiling and jointly analyzing data from five strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 146 point counts within the 15 surveyed grid cells between May 26 and July 15. They detected 79 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 120 species that were detected in any year during which surveys were conducted, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 28 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Uinta-Wasatch-Cache National Forest for 120 species that were detected in any year during which surveys were conducted, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 39 species.

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 tab in the upper left above the map.

Uinta-Wasatch-Cache National Forest

5.4.2. Region 4 National Grasslands

5.4.2.1. Curlew National Grassland

We obtained results for Curlew National Grassland by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 64 point counts within the 5 surveyed grid cells between May 31 and June 4. They detected 49 bird species, including 9 priority species.

Bird Conservancy estimated densities and population sizes for 76 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 12 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Curlew National Grassland for 75 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 20 species.

To view a map of survey locations, density and occupancy results and species counts within Curlew 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 tab in the upper left above the map.

ID-BCR9-CU

6. Bureau of Land Management

6.1. BLM California

6.1.1. BLM in California BCR 9

6.1.1.1. California BCR9 BLM

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

Field technicians completed 13 of 14 planned surveys (93%) in 2022. Technicians conducted 104 point counts within the 13 surveyed grid cells between June 1 and June 25. They detected 47 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 82 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 18 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout California BCR9 BLM for 78 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 19 species.

To view a map of survey locations, density and occupancy results and species counts within California 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 tab in the upper left above the map.

CA-BCR9 BLM

6.1.1.2. Carson City District

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 27 point counts within the 3 surveyed grid cells between June 6 and June 25. They detected 33 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 42 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 13 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Carson City District for 41 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 13 species.

To view a map of survey locations, density and occupancy results and species counts within Carson City District 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 tab in the upper left above the map.

CA-BCR9-CC

6.1.1.3. California Desert District

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

Field technicians completed 2 of 3 planned surveys (67%) in 2022. Technicians conducted 6 point counts within the 2 surveyed grid cells between June 2 and June 2. They detected 5 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 34 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 1 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout California Desert District for 33 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 1 species.

To view a map of survey locations, density and occupancy results and species counts within California Desert District 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 tab in the upper left above the map.

CA-BCR9-CD

6.1.1.4. Central California District

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 34 point counts within the 4 surveyed grid cells between June 1 and June 17. They detected 13 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 35 species that were detected in any year during which surveys were conducted, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 5 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Central California District for 32 species that were detected in any year during which surveys were conducted, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 5 species.

To view a map of survey locations, density and occupancy results and species counts within Central California District 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 tab in the upper left above the map.

6.1.1.5. Northern California District

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 37 point counts within the 4 surveyed grid cells between June 19 and June 21. They detected 30 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 59 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust density estimates (CV < 50%) for 15 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Northern California District for 57 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 14 species.

To view a map of survey locations, density and occupancy results and species counts within Northern California District 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 tab in the upper left above the map.

6.2. BLM Colorado

6.2.1. BLM in Colorado

6.2.1.1. BLM in Colorado: Total

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

Field technicians completed 32 of 33 planned surveys (97%) in 2022. Technicians conducted 391 point counts within the 32 surveyed grid cells between May 18 and July 11. They detected 104 bird species, including 4 priority species.

Bird Conservancy estimated densities and population sizes for 157 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust density estimates (CV < 50%) for 58 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in Colorado: Total for 164 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 75 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Colorado: Total 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 tab in the upper left above the map.

6.2.2. BLM in Colorado BCR 10

6.2.2.1. BLM in Colorado BCR 10

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 127 point counts within the 9 surveyed grid cells between May 18 and June 12. They detected 50 bird species, including 12 priority species.

Bird Conservancy estimated densities and population sizes for 107 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 22 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in Colorado BCR 10 for 101 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 30 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Colorado BCR 10 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 tab in the upper left above the map.

6.2.3. BLM in Colorado BCR 9

6.2.3.1. BLM in Colorado BCR 16

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

Field technicians completed 23 of 24 planned surveys (96%) in 2022. Technicians conducted 264 point counts within the 23 surveyed grid cells between May 18 and July 11. They detected 97 bird species, including 9 priority species.

Bird Conservancy estimated densities and population sizes for 160 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 56 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in Colorado BCR 16 for 156 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 73 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Colorado BCR 16 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 tab in the upper left above the map.

6.3. BLM Idaho

6.3.0.1. Bruneau Field Office

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

Field technicians completed 3 of 0 planned surveys (Inf%) in 2022. Technicians conducted 48 point counts within the 3 surveyed grid cells between June 10 and June 18. They detected 43 bird species, including 5 priority species.

Bird Conservancy estimated densities and population sizes for 96 species that were detected in any year during which surveys were conducted, 10 of which are priority species. The data yielded robust density estimates (CV < 50%) for 16 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Bruneau Field Office for 87 species that were detected in any year during which surveys were conducted, 9 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 16 species.

To view a map of survey locations, density and occupancy results and species counts within Bruneau 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 tab in the upper left above the map.

ID-BCR9-BR

6.3.0.2. Burley Field Office

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 35 point counts within the 3 surveyed grid cells between June 24 and June 30. They detected 15 bird species, including 1 priority species.

Bird Conservancy estimated densities and population sizes for 72 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 8 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Burley Field Office for 71 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 13 species.

To view a map of survey locations, density and occupancy results and species counts within Burley 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 tab in the upper left above the map.

ID-BCR9-BU

6.3.0.3. Owyhee Field Office

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 47 point counts within the 3 surveyed grid cells between May 28 and June 21. They detected 34 bird species, including 3 priority species.

Bird Conservancy estimated densities and population sizes for 88 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 16 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Owyhee Field Office for 85 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 20 species.

To view a map of survey locations, density and occupancy results and species counts within Owyhee 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 tab in the upper left above the map.

ID-BCR9-OW

6.4. BLM Montana

6.4.0.1. BLM in Montana: Total

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 473 point counts within the 35 surveyed grid cells between May 28 and July 3. They detected 140 bird species, including 17 priority species.

Bird Conservancy estimated densities and population sizes for 178 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 63 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in Montana: Total for 180 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 93 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Montana: Total 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 tab in the upper left above the map.

MT-BLM

6.4.0.2. BLM in Montana BCR 10

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 75 point counts within the 7 surveyed grid cells between May 28 and June 8. They detected 89 bird species, including 5 priority species.

Bird Conservancy estimated densities and population sizes for 135 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust density estimates (CV < 50%) for 41 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in Montana BCR 10 for 134 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 50 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Montana BCR 10 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 tab in the upper left above the map.

MT-BCR10-BLM

6.4.0.3. BLM in Montana BCR 11

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 252 point counts within the 18 surveyed grid cells between May 29 and July 3. They detected 82 bird species, including 14 priority species.

Bird Conservancy estimated densities and population sizes for 108 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 29 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in Montana BCR 11 for 107 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 42 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Montana BCR 11 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 tab in the upper left above the map.

MT-BCR11-BLM

6.4.0.4. BLM in Montana BCR 17

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 146 point counts within the 10 surveyed grid cells between June 1 and June 26. They detected 59 bird species, including 14 priority species.

Bird Conservancy estimated densities and population sizes for 106 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 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in Montana BCR 17 for 105 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 28 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Montana BCR 17 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 tab in the upper left above the map.

MT-BCR17-BL

6.5. BLM Nevada

6.5.1. BLM in Nevada BCR 9

6.5.1.1. BLM in Nevada BCR 9

We obtained results for BLM in Nevada BCR 9 by compiling and jointly analyzing data from seven strata.

Field technicians completed 73 of 74 planned surveys (99%) in 2022. Technicians conducted 709 point counts within the 73 surveyed grid cells between May 22 and July 4. They detected 73 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 102 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 35 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in Nevada BCR 9 for 102 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 41 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Nevada BCR 9 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 tab in the upper left above the map.

NV-BCR9 BLM

6.5.1.2. Battle Mountain District

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

Field technicians completed 14 of 15 planned surveys (93%) in 2022. Technicians conducted 141 point counts within the 14 surveyed grid cells between June 3 and July 3. They detected 36 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 55 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust density estimates (CV < 50%) for 16 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Battle Mountain District for 51 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 5 species.

To view a map of survey locations, density and occupancy results and species counts within Battle Mountain District 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 tab in the upper left above the map.

NV-BCR9-BM

6.5.1.3. Carson City District

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 91 point counts within the 8 surveyed grid cells between May 31 and June 15. They detected 29 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 50 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 8 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Carson City District for 46 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 8 species.

To view a map of survey locations, density and occupancy results and species counts within Carson City District 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 tab in the upper left above the map.

NV-BCR9-CC

6.5.1.4. Elko, Twin Falls, and Boise Districts

We obtained results for Elko, Twin Falls, and Boise Districts by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 141 point counts within the 14 surveyed grid cells between June 14 and July 3. They detected 34 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 41 species that were detected in any year during which surveys were conducted, 5 of which are priority species. The data yielded robust density estimates (CV < 50%) for 12 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Elko, Twin Falls, and Boise Districts for 39 species that were detected in any year during which surveys were conducted, 5 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 11 species.

To view a map of survey locations, density and occupancy results and species counts within Elko, Twin Falls, and Boise Districts 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 tab in the upper left above the map.

NV-BCR9-EK

6.5.1.5. Ely District

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 140 point counts within the 15 surveyed grid cells between May 22 and July 4. They detected 45 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 63 species that were detected in any year during which surveys were conducted, 5 of which are priority species. The data yielded robust density estimates (CV < 50%) for 19 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Ely District for 61 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 16 species.

To view a map of survey locations, density and occupancy results and species counts within Ely District 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 tab in the upper left above the map.

NV-BCR9-EY

6.5.1.6. Northern California District

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 40 point counts within the 4 surveyed grid cells between June 27 and June 29. They detected 20 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 43 species that were detected in any year during which surveys were conducted, 5 of which are priority species. The data yielded robust density estimates (CV < 50%) for 7 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Northern California District for 42 species that were detected in any year during which surveys were conducted, 5 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 7 species.

To view a map of survey locations, density and occupancy results and species counts within Northern California District 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 tab in the upper left above the map.

NV-BCR9-NC

6.5.1.7. Southern Nevada District

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 14 point counts within the 3 surveyed grid cells between May 22 and May 22. They detected 3 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 22 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust density estimates (CV < 50%) for 2 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Southern Nevada District for 20 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 5 species.

To view a map of survey locations, density and occupancy results and species counts within Southern Nevada District 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 tab in the upper left above the map.

NV-BCR9-SN

6.5.1.8. Winnemucca District

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 142 point counts within the 15 surveyed grid cells between June 19 and July 3. They detected 33 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 52 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust density estimates (CV < 50%) for 12 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Winnemucca District for 54 species that were detected in any year during which surveys were conducted, 9 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 11 species.

To view a map of survey locations, density and occupancy results and species counts within Winnemucca District 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 tab in the upper left above the map.

NV-BCR9-WI

6.6. BLM Oregon

6.6.1. BLM in Oregon BCR 9

6.6.1.1. BLM in Oregon BCR 9

We obtained results for BLM in Oregon BCR 9 by compiling and jointly analyzing data from four strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 421 point counts within the 32 surveyed grid cells between May 17 and June 29. They detected 70 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 116 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 27 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in Oregon BCR 9 for 113 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 33 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Oregon BCR 9 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 tab in the upper left above the map.

OR-BCR9 BLM

6.6.1.2. Burns District: BCR9

We obtained results for Burns District: BCR9 by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 112 point counts within the 8 surveyed grid cells between May 31 and June 14. They detected 38 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 78 species that were detected in any year during which surveys were conducted, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 16 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Burns District: BCR9 for 74 species that were detected in any year during which surveys were conducted, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 12 species.

To view a map of survey locations, density and occupancy results and species counts within Burns District: 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 tab in the upper left above the map.

OR-BCR9-BU

6.6.1.3. Lakeview and Medford Districts: BCR9

We obtained results for Lakeview and Medford Districts: BCR9 by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 105 point counts within the 8 surveyed grid cells between May 17 and May 20. They detected 33 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 64 species that were detected in any year during which surveys were conducted, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 11 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Lakeview and Medford Districts: BCR9 for 63 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 12 species.

To view a map of survey locations, density and occupancy results and species counts within Lakeview and Medford Districts: 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 tab in the upper left above the map.

OR-BCR9-LA

6.6.1.4. Prineville District: BCR9

We obtained results for Prineville District: BCR9 by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 112 point counts within the 8 surveyed grid cells between May 23 and May 27. They detected 46 bird species, including 1 priority species.

Bird Conservancy estimated densities and population sizes for 79 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust density estimates (CV < 50%) for 22 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Prineville District: BCR9 for 77 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 24 species.

To view a map of survey locations, density and occupancy results and species counts within Prineville District: 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 tab in the upper left above the map.

OR-BCR9-PR

6.6.1.5. Vale District: BCR9

We obtained results for Vale District: BCR9 by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 92 point counts within the 8 surveyed grid cells between June 15 and June 29. They detected 23 bird species, including 1 priority species.

Bird Conservancy estimated densities and population sizes for 38 species that were detected in any year during which surveys were conducted, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 12 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Vale District: BCR9 for 37 species that were detected in any year during which surveys were conducted, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 13 species.

To view a map of survey locations, density and occupancy results and species counts within Vale District: 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 tab in the upper left above the map.

OR-BCR9-VA

6.6.2. BLM in Oregon BCR 10

6.6.2.1. BLM in Oregon BCR 10

We obtained results for BLM in Oregon BCR 10 by compiling and jointly analyzing data from three strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 293 point counts within the 24 surveyed grid cells between May 25 and June 30. They detected 75 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 101 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust density estimates (CV < 50%) for 42 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in Oregon BCR 10 for 96 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 49 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Oregon BCR 10 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 tab in the upper left above the map.

OR-BCR10 BLM

6.6.2.2. Burns District: BCR10

We obtained results for Burns District: BCR10 by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 97 point counts within the 8 surveyed grid cells between June 1 and June 16. They detected 53 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 74 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 28 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Burns District: BCR10 for 70 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 30 species.

To view a map of survey locations, density and occupancy results and species counts within Burns District: 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 tab in the upper left above the map.

OR-BCR10-BU

6.6.2.3. Prineville District: BCR10

We obtained results for Prineville District: BCR10 by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 100 point counts within the 8 surveyed grid cells between May 25 and June 21. They detected 57 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 77 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust density estimates (CV < 50%) for 25 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Prineville District: BCR10 for 72 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 25 species.

To view a map of survey locations, density and occupancy results and species counts within Prineville District: 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 tab in the upper left above the map.

OR-BCR10-PR

6.6.2.4. Vale District: BCR10

We obtained results for Vale District: BCR10 by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 96 point counts within the 8 surveyed grid cells between June 16 and June 30. They detected 42 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 55 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 25 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Vale District: BCR10 for 50 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 22 species.

To view a map of survey locations, density and occupancy results and species counts within Vale District: 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 tab in the upper left above the map.

OR-BCR10-VA

6.7. BLM North Dakota

6.7.0.1. BLM in North Dakota BCR 17

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 80 point counts within the 6 surveyed grid cells between June 19 and July 13. They detected 69 bird species, including 19 priority species.

Bird Conservancy estimated densities and population sizes for 108 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust density estimates (CV < 50%) for 25 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in North Dakota BCR 17 for 105 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 35 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in North Dakota BCR 17 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 tab in the upper left above the map.

ND-BCR17-BM

6.8. BLM South Dakota

6.8.0.1. BLM in South Dakota BCR 17

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 79 point counts within the 7 surveyed grid cells between May 30 and July 16. They detected 79 bird species, including 14 priority species.

Bird Conservancy estimated densities and population sizes for 137 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 34 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in South Dakota BCR 17 for 132 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 30 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in South Dakota BCR 17 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 tab in the upper left above the map.

SD-BCR17-BM

6.9. BLM Utah

6.9.0.1. BLM in Utah: Total

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 661 point counts within the 56 surveyed grid cells between May 7 and July 14. They detected 114 bird species, including 18 priority species.

Bird Conservancy estimated densities and population sizes for 152 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 48 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in Utah: Total for 154 species that were detected in any year during which surveys were conducted, 26 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 86 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Utah: Total 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 tab in the upper left above the map.

UT-BLM

6.9.0.2. BLM in Utah BCR 9

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 224 point counts within the 18 surveyed grid cells between May 9 and June 27. They detected 59 bird species, including 12 priority species.

Bird Conservancy estimated densities and population sizes for 130 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 22 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in Utah BCR 9 for 125 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 34 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Utah BCR 9 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 tab in the upper left above the map.

UT-BCR9 BLM

6.9.0.3. BLM in Utah BCR 10

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 54 point counts within the 5 surveyed grid cells between May 22 and July 14. They detected 37 bird species, including 7 priority species.

Bird Conservancy estimated densities and population sizes for 60 species that were detected in any year during which surveys were conducted, 10 of which are priority species. The data yielded robust density estimates (CV < 50%) for 14 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in Utah BCR 10 for 74 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 23 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Utah BCR 10 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 tab in the upper left above the map.

UT-BCR10 BLM

6.9.0.4. BLM in Utah BCR 16

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 357 point counts within the 31 surveyed grid cells between May 7 and July 9. They detected 92 bird species, including 11 priority species.

Bird Conservancy estimated densities and population sizes for 134 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 42 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in Utah BCR 16 for 131 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 68 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Utah BCR 16 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 tab in the upper left above the map.

UT-BCR16 BLM

6.9.0.5. Cedar City Field Office

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 73 point counts within the 6 surveyed grid cells between May 7 and June 12. They detected 44 bird species, including 8 priority species.

Bird Conservancy estimated densities and population sizes for 97 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 18 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Cedar City Field Office for 95 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 22 species.

To view a map of survey locations, density and occupancy results and species counts within 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 tab in the upper left above the map.

UT-BLM - Cedar City Field Office

6.9.0.6. Fillmore Field Office

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 93 point counts within the 7 surveyed grid cells between May 9 and May 16. They detected 40 bird species, including 9 priority species.

Bird Conservancy estimated densities and population sizes for 79 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 12 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Fillmore Field Office for 78 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 13 species.

To view a map of survey locations, density and occupancy results and species counts within 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 tab in the upper left above the map.

UT-BLM - Fillmore Field Office

6.9.0.7. Kanab Field Office

We obtained results for Kanab Field Office by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 47 point counts within the 4 surveyed grid cells between May 9 and June 7. They detected 32 bird species, including 7 priority species.

Bird Conservancy estimated densities and population sizes for 76 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 11 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Kanab Field Office for 74 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 18 species.

To view a map of survey locations, density and occupancy results and species counts within Kanab 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 tab in the upper left above the map.

UT-BCR16-KA

6.9.0.8. Moab Field Office

We obtained results for Moab Field Office by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 40 point counts within the 3 surveyed grid cells between May 29 and June 20. They detected 31 bird species, including 4 priority species.

Bird Conservancy estimated densities and population sizes for 67 species that were detected in any year during which surveys were conducted, 9 of which are priority species. The data yielded robust density estimates (CV < 50%) for 12 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Moab Field Office for 59 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 16 species.

To view a map of survey locations, density and occupancy results and species counts within Moab 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 tab in the upper left above the map.

UT-BCR16-MO

6.9.0.9. Monticello Field Office

We obtained results for Monticello Field Office by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 39 point counts within the 3 surveyed grid cells between May 20 and May 22. They detected 24 bird species, including 3 priority species.

Bird Conservancy estimated densities and population sizes for 55 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust density estimates (CV < 50%) for 10 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Monticello Field Office for 53 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 13 species.

To view a map of survey locations, density and occupancy results and species counts within Monticello 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 tab in the upper left above the map.

UT-BCR16-MN

6.9.0.10. Price Field Office

We obtained results for Price Field Office by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 28 point counts within the 3 surveyed grid cells between May 16 and July 3. They detected 35 bird species, including 2 priority species.

Bird Conservancy estimated densities and population sizes for 90 species that were detected in any year during which surveys were conducted, 10 of which are priority species. The data yielded robust density estimates (CV < 50%) for 16 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Price Field Office for 84 species that were detected in any year during which surveys were conducted, 10 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 9 species.

To view a map of survey locations, density and occupancy results and species counts within Price 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 tab in the upper left above the map.

UT-BCR16-PR

6.9.0.11. Richfield Field Office

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 48 point counts within the 5 surveyed grid cells between May 23 and June 27. They detected 31 bird species, including 4 priority species.

Bird Conservancy estimated densities and population sizes for 74 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 6 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Richfield Field Office for 82 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 10 species.

To view a map of survey locations, density and occupancy results and species counts within 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 tab in the upper left above the map.

UT-BLM - Richfield Field Office

6.9.0.12. Saint George Field Office

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 68 point counts within the 6 surveyed grid cells between May 13 and May 18. They detected 72 bird species, including 11 priority species.

Bird Conservancy estimated densities and population sizes for 92 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 24 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Saint George Field Office for 92 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 28 species.

To view a map of survey locations, density and occupancy results and species counts within 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 tab in the upper left above the map.

UT-BLM - Saint George Field Office

6.9.0.13. Salt Lake Field Office

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 111 point counts within the 10 surveyed grid cells between May 12 and June 30. They detected 45 bird species, including 8 priority species.

Bird Conservancy estimated densities and population sizes for 108 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 14 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Salt Lake Field Office for 101 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 13 species.

To view a map of survey locations, density and occupancy results and species counts within 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 tab in the upper left above the map.

UT-BLM - Salt Lake Field Office

6.9.0.14. Vernal Field Office

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 68 point counts within the 6 surveyed grid cells between May 12 and July 14. They detected 49 bird species, including 8 priority species.

Bird Conservancy estimated densities and population sizes for 81 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 18 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Vernal Field Office for 82 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 14 species.

To view a map of survey locations, density and occupancy results and species counts within 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 tab in the upper left above the map.

UT-BLM - Vernal Field Office

6.10. BLM Wyoming

6.10.0.1. BLM in Wyoming: Total

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 890 point counts within the 67 surveyed grid cells between May 24 and July 20. They detected 130 bird species, including 12 priority species.

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 58 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in Wyoming: Total for 174 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 85 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Wyoming: Total 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 tab in the upper left above the map.

WY-BLM

6.10.0.2. BLM in Wyoming BCR 16

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

Field technicians completed both planned surveys (100%) in 2022. Technicians conducted 17 point counts within the 2 surveyed grid cells between June 4 and June 9. They detected 37 bird species, including 6 priority species.

Bird Conservancy estimated densities and population sizes for 87 species that were detected in any year during which surveys were conducted, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 14 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in Wyoming BCR 16 for 85 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 19 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Wyoming BCR 16 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 tab in the upper left above the map.

WY-BCR16-BL

6.10.0.3. BLM in Wyoming BCR 18

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

Field technicians completed both planned surveys (100%) in 2022. Technicians conducted 22 point counts within the 2 surveyed grid cells between May 25 and June 3. They detected 14 bird species, including 5 priority species.

Bird Conservancy estimated densities and population sizes for 54 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 6 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout BLM in Wyoming BCR 18 for 46 species that were detected in any year during which surveys were conducted, 5 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 11 species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Wyoming BCR 18 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 tab in the upper left above the map.

WY-BCR18-BL

6.10.0.4. Buffalo Field Office

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 70 point counts within the 5 surveyed grid cells between May 26 and July 19. They detected 52 bird species, including 1 priority species.

Bird Conservancy estimated densities and population sizes for 110 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust density estimates (CV < 50%) for 22 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Buffalo Field Office for 105 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 32 species.

To view a map of survey locations, density and occupancy results and species counts within Buffalo 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 tab in the upper left above the map.

WY-BLM-Buffalo

6.10.0.5. Casper Field Office

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 88 point counts within the 6 surveyed grid cells between May 26 and June 19. They detected 51 bird species, including 4 priority species.

Bird Conservancy estimated densities and population sizes for 99 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust density estimates (CV < 50%) for 17 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Casper Field Office for 92 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 23 species.

To view a map of survey locations, density and occupancy results and species counts within Casper 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 tab in the upper left above the map.

WY-BLM-Casper

6.10.0.6. Cody Field Office

We obtained results for Cody Field Office by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 56 point counts within the 4 surveyed grid cells between May 26 and June 9. They detected 52 bird species, including 5 priority species.

Bird Conservancy estimated densities and population sizes for 66 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust density estimates (CV < 50%) for 12 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Cody Field Office for 56 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 12 species.

To view a map of survey locations, density and occupancy results and species counts within Cody 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 tab in the upper left above the map.

WY-BCR10-CO

6.10.0.7. Kemmerer Field Office

We obtained results for Kemmerer Field Office by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 73 point counts within the 5 surveyed grid cells between June 4 and July 7. They detected 47 bird species, including 8 priority species.

Bird Conservancy estimated densities and population sizes for 52 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 10 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Kemmerer Field Office for 45 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 11 species.

To view a map of survey locations, density and occupancy results and species counts within Kemmerer 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 tab in the upper left above the map.

WY-BCR10-KE

6.10.0.8. Lander Field Office

We obtained results for Lander Field Office by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 97 point counts within the 7 surveyed grid cells between May 24 and July 8. They detected 51 bird species, including 10 priority species.

Bird Conservancy estimated densities and population sizes for 86 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust density estimates (CV < 50%) for 26 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Lander Field Office for 82 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 23 species.

To view a map of survey locations, density and occupancy results and species counts within Lander 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 tab in the upper left above the map.

WY-BCR10-LA

6.10.0.9. Newcastle Field Office

We obtained results for Newcastle Field Office by compiling and analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2022. Technicians conducted 27 point counts within the 2 surveyed grid cells between May 24 and May 24. They detected 26 bird species, including 10 priority species.

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 9 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Newcastle Field Office for 92 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 16 species.

To view a map of survey locations, density and occupancy results and species counts within Newcastle 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 tab in the upper left above the map.

[WY-BCR17-NE](WY-BCR17-NE)

6.10.0.10. Pinedale Field Office

We obtained results for Pinedale Field Office by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 105 point counts within the 8 surveyed grid cells between June 7 and July 13. They detected 46 bird species, including 5 priority species.

Bird Conservancy estimated densities and population sizes for 95 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 20 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Pinedale Field Office for 97 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 16 species.

To view a map of survey locations, density and occupancy results and species counts within Pinedale 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 tab in the upper left above the map.

[WY-BCR10-PI](WY-BCR10-PI)

6.10.0.11. Rawlins Field Office

We obtained results for Rawlins Field Office by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 127 point counts within the 10 surveyed grid cells between May 26 and July 5. They detected 41 bird species, including 15 priority species.

Bird Conservancy estimated densities and population sizes for 74 species that were detected in any year during which surveys were conducted, 9 of which are priority species. The data yielded robust density estimates (CV < 50%) for 18 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Rawlins Field Office for 70 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 14 species.

To view a map of survey locations, density and occupancy results and species counts within Rawlins 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 tab in the upper left above the map.

WY-BCR10-RA

6.10.0.12. Rock Springs Field Office

We obtained results for Rock Springs Field Office by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 113 point counts within the 9 surveyed grid cells between June 1 and July 7. They detected 41 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, 8 of which are priority species. The data yielded robust density estimates (CV < 50%) for 15 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Rock Springs Field Office for 83 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 13 species.

To view a map of survey locations, density and occupancy results and species counts within Rock Springs 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 tab in the upper left above the map.

WY-BCR10-RO

6.10.0.13. Worland Field Office

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 95 point counts within the 7 surveyed grid cells between May 26 and July 20. They detected 54 bird species, including 8 priority species.

Bird Conservancy estimated densities and population sizes for 84 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust density estimates (CV < 50%) for 21 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Worland Field Office for 80 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 20 species.

To view a map of survey locations, density and occupancy results and species counts within Worland 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 tab in the upper left above the map.

[WY-BCR10-WO](WY-BCR10-WO)

7. Department of Defense

7.1. DOD Lands in Colorado

7.1.0.1. DOD Lands in Colorado BCR 18

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

Field technicians completed both planned surveys (100%) in 2022. Technicians conducted 25 point counts within the 2 surveyed grid cells between May 25 and June 14. They detected 41 bird species, including 6 priority species.

Bird Conservancy estimated densities and population sizes for 105 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 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout DOD Lands in Colorado BCR 18 for 101 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 29 species.

To view a map of survey locations, density and occupancy results and species counts within DOD Lands in Colorado BCR 18 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 tab in the upper left above the map.

CO-BCR18-DO

7.2. DOD Lands in Utah

7.2.0.1. 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 28 of 31 planned surveys (90%) in 2022. Technicians conducted 361 point counts within the 28 surveyed grid cells between May 17 and June 8. They detected 37 bird species, including 1 priority species.

Bird Conservancy estimated densities and population sizes for 59 species that were detected in any year during which surveys were conducted, 2 of which are priority species. The data yielded robust density estimates (CV < 50%) for 13 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout DOD Lands in Utah BCR 9 for 54 species that were detected in any year during which surveys were conducted, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 9 species.

To view a map of survey locations, density and occupancy results and species counts within DOD Lands in Utah BCR 9 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 tab in the upper left above the map.

UT-BCR9 Department of Defense lands

7.2.0.2. All Other DOD Lands in Utah BCR 9

We obtained results for All Other DOD Lands in Utah BCR 9 by compiling and analyzing data from one stratum.

Field technicians completed 5 of 6 planned surveys (83%) in 2022. Technicians conducted 73 point counts within the 5 surveyed grid cells between May 17 and June 8. They detected 24 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 48 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 12 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other DOD Lands in Utah BCR 9 for 46 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 7 species.

To view a map of survey locations, density and occupancy results and species counts within All Other DOD Lands in Utah BCR 9 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 tab in the upper left above the map.

UT-BCR9-DD

7.2.0.3. DOD Lands in Utah BCR 9 - Mudflats

We obtained results for DOD Lands in Utah BCR 9 - Mudflats by compiling and analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2022. Technicians conducted 16 point counts within the 2 surveyed grid cells between May 25 and June 6. They detected 1 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 2 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 1 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout DOD Lands in Utah BCR 9 - Mudflats for 1 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 1 species.

To view a map of survey locations, density and occupancy results and species counts within DOD Lands in Utah BCR 9 - Mudflats 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 tab in the upper left above the map.

UT-BCR9-MU

7.2.0.4. DOD Lands in Utah BCR 9 - APG Impact Areas

We obtained results for DOD Lands in Utah BCR 9 - APG Impact Areas by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 91 point counts within the 6 surveyed grid cells between May 19 and May 24. They detected 11 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 18 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 5 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout DOD Lands in Utah BCR 9 - APG Impact Areas for 18 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 4 species.

To view a map of survey locations, density and occupancy results and species counts within DOD Lands in Utah BCR 9 - APG Impact Areas 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 tab in the upper left above the map.

UT-BCR9-AP

7.2.0.5. DOD Lands in Utah BCR 9 - Target S Impact Areas

We obtained results for DOD Lands in Utah BCR 9 - Target S Impact Areas by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 96 point counts within the 6 surveyed grid cells between May 17 and May 23. They detected 12 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 19 species that were detected in any year during which surveys were conducted, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 7 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout DOD Lands in Utah BCR 9 - Target S Impact Areas for 16 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 6 species.

To view a map of survey locations, density and occupancy results and species counts within DOD Lands in Utah BCR 9 - Target S Impact Areas 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 tab in the upper left above the map.

UT-BCR9-TS

7.2.0.6. DOD Lands in Utah BCR 9 - UTG Impact Areas

We obtained results for DOD Lands in Utah BCR 9 - UTG Impact Areas by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 39 point counts within the 6 surveyed grid cells between May 25 and June 1. They detected 4 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 4 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 1 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout DOD Lands in Utah BCR 9 - UTG Impact Areas for 3 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 1 species.

To view a map of survey locations, density and occupancy results and species counts within DOD Lands in Utah BCR 9 - UTG Impact Areas 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 tab in the upper left above the map.

UT-BCR9-UR

7.2.0.7. DOD Lands in Utah BCR 9 - UTTR Impact Areas

We obtained results for DOD Lands in Utah BCR 9 - UTTR Impact Areas by compiling and analyzing data from one stratum.

Field technicians completed 3 of 5 planned surveys (60%) in 2022. Technicians conducted 46 point counts within the 3 surveyed grid cells between May 25 and June 1. They detected 19 bird species, including 1 priority species.

Bird Conservancy estimated densities and population sizes for 24 species that were detected in any year during which surveys were conducted, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 7 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout DOD Lands in Utah BCR 9 - UTTR Impact Areas for 22 species that were detected in any year during which surveys were conducted, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 7 species.

To view a map of survey locations, density and occupancy results and species counts within DOD Lands in Utah BCR 9 - UTTR Impact Areas 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 tab in the upper left above the map.

7.2.0.8. DOD Lands in Wyoming BCR 18

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

Field technicians completed both planned surveys (100%) in 2022. Technicians conducted 22 point counts within the 2 surveyed grid cells between May 31 and June 1. They detected 24 bird species, including 8 priority species.

Bird Conservancy estimated densities and population sizes for 60 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 7 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout DOD Lands in Wyoming BCR 18 for 62 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 16 species.

To view a map of survey locations, density and occupancy results and species counts within DOD Lands in Wyoming BCR 18 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 tab in the upper left above the map.

8. National Park Service

8.1. Greater Yellowstone Network

8.1.0.1. Greater Yellowstone Network: Total

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

Field technicians completed 7 of 8 planned surveys (88%) in 2022. Technicians conducted 101 point counts within the 7 surveyed grid cells between June 2 and July 18. They detected 74 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 127 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 36 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Greater Yellowstone Network: Total for 125 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 37 species.

To view a map of survey locations, density and occupancy results and species counts within Greater Yellowstone Network: Total 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 tab in the upper left above the map.

NPS-Greater Yellowstone Network

8.1.0.2. Bighorn Canyon National Recreation Area

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

Field technicians completed both planned surveys (100%) in 2022. Technicians conducted 25 point counts within the 2 surveyed grid cells between June 2 and June 3. They detected 27 bird species, including 7 priority species.

Bird Conservancy estimated densities and population sizes for 66 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 7 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Bighorn Canyon National Recreation Area for 60 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 15 species.

To view a map of survey locations, density and occupancy results and species counts within Bighorn Canyon National Recreation 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 tab in the upper left above the map.

WY-BCR10-BH

8.1.0.3. Grand Teton National Park

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

Field technicians completed both planned surveys (100%) in 2022. Technicians conducted 28 point counts within the 2 surveyed grid cells between June 8 and June 18. They detected 35 bird species, including 5 priority species.

Bird Conservancy estimated densities and population sizes for 82 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 21 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Grand Teton National Park for 80 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 26 species.

To view a map of survey locations, density and occupancy results and species counts within Grand Teton 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 tab in the upper left above the map.

WY-BCR10-GR

8.1.0.4. Yellowstone National Park

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

Field technicians completed 3 of 4 planned surveys (75%) in 2022. Technicians conducted 48 point counts within the 3 surveyed grid cells between July 2 and July 18. They detected 47 bird species, including 5 priority species.

Bird Conservancy estimated densities and population sizes for 86 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 25 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Yellowstone National Park for 84 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 25 species.

To view a map of survey locations, density and occupancy results and species counts within Yellowstone 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 tab in the upper left above the map.

8.2. Northern Colorado Plateau Network

8.2.0.1. Northern Colorado Plateau Network in Colorado

We obtained results for Northern Colorado Plateau Network in Colorado by compiling and analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2022. Technicians conducted 13 point counts within the 2 surveyed grid cells between May 29 and June 26. They detected 25 bird species, including 3 priority species.

Bird Conservancy estimated densities and population sizes for 74 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 8 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Northern Colorado Plateau Network in Colorado for 73 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 23 species.

To view a map of survey locations, density and occupancy results and species counts within Northern Colorado Plateau Network in Colorado 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 tab in the upper left above the map.

8.3. Northern Great Plains Network

8.3.0.1. Agate Fossil Beds National Monument

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 43 point counts within the 4 surveyed grid cells between June 18 and June 20. They detected 57 bird species, including 14 priority species.

Bird Conservancy estimated densities and population sizes for 91 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 22 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Agate Fossil Beds National Monument for 81 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 30 species.

To view a map of survey locations, density and occupancy results and species counts within Agate Fossil Beds National Monument 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 tab in the upper left above the map.

NE-BCR18-AF

8.3.0.2. Badlands National Park - North Unit

We obtained results for Badlands National Park - North Unit by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 70 point counts within the 6 surveyed grid cells between May 25 and May 26. They detected 35 bird species, including 5 priority species.

Bird Conservancy estimated densities and population sizes for 97 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 10 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Badlands National Park - North Unit for 96 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 22 species.

To view a map of survey locations, density and occupancy results and species counts within Badlands National Park - North Unit 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 tab in the upper left above the map.

SD-BCR17-BN

8.3.0.3. Jewel Cave National Monument

We obtained results for Jewel Cave National Monument by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 38 point counts within the 4 surveyed grid cells between July 16 and July 18. They detected 44 bird species, including 3 priority species.

Bird Conservancy estimated densities and population sizes for 86 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 17 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Jewel Cave National Monument for 80 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 29 species.

To view a map of survey locations, density and occupancy results and species counts within Jewel Cave National Monument 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 tab in the upper left above the map.

8.3.0.4. Knife River Indian Villages National Historic Site

We obtained results for Knife River Indian Villages National Historic Site by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 41 point counts within the 5 surveyed grid cells between June 15 and July 9. They detected 70 bird species, including 12 priority species.

Bird Conservancy estimated densities and population sizes for 112 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 28 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Knife River Indian Villages National Historic Site for 110 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 55 species.

To view a map of survey locations, density and occupancy results and species counts within Knife River Indian Villages National Historic Site 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 tab in the upper left above the map.

8.3.0.5. Missouri National Recreational River

We obtained results for Missouri National Recreational River by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 92 point counts within the 12 surveyed grid cells between May 31 and June 18. They detected 97 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 121 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 46 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Missouri National Recreational River for 116 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 75 species.

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 tab in the upper left above the map.

8.3.0.6. Mount Rushmore National Monument

We obtained results for Mount Rushmore National Monument by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 60 point counts within the 6 surveyed grid cells between June 28 and July 15. They detected 43 bird species, including 2 priority species.

Bird Conservancy estimated densities and population sizes for 77 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 23 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Mount Rushmore National Monument for 72 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 33 species.

To view a map of survey locations, density and occupancy results and species counts within Mount Rushmore National Monument 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 tab in the upper left above the map.

SD-BCR17-MR

8.3.0.7. Scotts Bluff National Monument

We obtained results for Scotts Bluff National Monument by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 42 point counts within the 4 surveyed grid cells between June 15 and June 18. They detected 40 bird species, including 6 priority species.

Bird Conservancy estimated densities and population sizes for 74 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 15 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Scotts Bluff National Monument for 72 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 27 species.

To view a map of survey locations, density and occupancy results and species counts within Scotts Bluff National Monument 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 tab in the upper left above the map.

NE-BCR18-SB

8.3.0.8. Theodore Roosevelt National Park

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

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 107 point counts within the 12 surveyed grid cells between June 8 and July 12. They detected 82 bird species, including 0 priority species.

Bird Conservancy estimated densities and population sizes for 118 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 30 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Theodore Roosevelt National Park for 110 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 45 species.

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 tab in the upper left above the map.

Theodore Roosevelt National Park

8.3.0.9. Wind Cave National Park

We obtained results for Wind Cave National Park by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 78 point counts within the 6 surveyed grid cells between June 19 and July 7. They detected 54 bird species, including 7 priority species.

Bird Conservancy estimated densities and population sizes for 125 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 23 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Wind Cave National Park for 118 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 32 species.

To view a map of survey locations, density and occupancy results and species counts within Wind Cave 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 tab in the upper left above the map.

SD-BCR17-WC

8.4. Rocky Mountain Network

8.4.0.1. Rocky Mountain Network in Colorado

We obtained results for Rocky Mountain Network in Colorado by compiling and analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2022. Technicians conducted 25 point counts within the 2 surveyed grid cells between July 6 and July 7. They detected 33 bird species, including 1 priority species.

Bird Conservancy estimated densities and population sizes for 86 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 19 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Rocky Mountain Network in Colorado for 85 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 29 species.

To view a map of survey locations, density and occupancy results and species counts within Rocky Mountain Network in Colorado 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 tab in the upper left above the map.

CO-BCR16-RM

8.5. Southern Colorado Plateau Network

8.5.0.1. Southern Colorado Plateau Network in Colorado

We obtained results for Southern Colorado Plateau Network in Colorado by compiling and analyzing data from one stratum.

Field technicians completed both planned surveys (100%) in 2022. Technicians conducted 15 point counts within the 2 surveyed grid cells between June 23 and June 24. They detected 34 bird species, including 3 priority species.

Bird Conservancy estimated densities and population sizes for 77 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust density estimates (CV < 50%) for 14 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Southern Colorado Plateau Network in Colorado for 74 species that were detected in any year during which surveys were conducted, 0 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 31 species.

To view a map of survey locations, density and occupancy results and species counts within Southern Colorado Plateau Network in Colorado 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 tab in the upper left above the map.

9. Tribal Lands

9.1. Wind River Tribal Lands

9.1.0.1. Wind River Tribal Lands in Wyoming BCR 10

We obtained results for Wind River Tribal Lands in Wyoming BCR 10 by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 47 point counts within the 4 surveyed grid cells between May 28 and June 15. They detected 52 bird species, including 9 priority species.

Bird Conservancy estimated densities and population sizes for 89 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 17 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Wind River Tribal Lands in Wyoming BCR 10 for 84 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 24 species.

To view a map of survey locations, density and occupancy results and species counts within Wind River Tribal Lands in Wyoming BCR 10 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 tab in the upper left above the map.

WY-BCR10-WR

10. All Other Lands

10.1. Nebraska

10.1.0.1. All Other Lands in Nebraska BCR 17

We obtained results for All Other Lands in Nebraska BCR 17 by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 23 point counts within the 3 surveyed grid cells between June 4 and July 15. They detected 20 bird species, including 3 priority species.

Bird Conservancy estimated densities and population sizes for 67 species that were detected in any year during which surveys were conducted, 5 of which are priority species. The data yielded robust density estimates (CV < 50%) for 5 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in Nebraska BCR 17 for 62 species that were detected in any year during which surveys were conducted, 5 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 9 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in Nebraska BCR 17 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 tab in the upper left above the map.

NE-BCR17-ON

10.2. North Dakota

10.2.0.1. All Other Lands in North Dakota BCR 17

We obtained results for All Other Lands in North Dakota BCR 17 by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 56 point counts within the 8 surveyed grid cells between June 14 and July 15. They detected 77 bird species, including 21 priority species.

Bird Conservancy estimated densities and population sizes for 82 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 28 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in North Dakota BCR 17 for 82 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 37 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in North Dakota BCR 17 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 tab in the upper left above the map.

ND-BCR17-AT

10.3. South Dakota

10.3.0.1. All Other Lands in South Dakota BCR 17

We obtained results for All Other Lands in South Dakota BCR 17 by compiling and analyzing data from one stratum.

Field technicians completed 13 of 12 planned surveys (108%) in 2022. Technicians conducted 134 point counts within the 13 surveyed grid cells between May 26 and July 15. They detected 66 bird species, including 16 priority species.

Bird Conservancy estimated densities and population sizes for 86 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 21 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in South Dakota BCR 17 for 79 species that were detected in any year during which surveys were conducted, 10 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 26 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in South Dakota BCR 17 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 tab in the upper left above the map.

SD-BCR17-AT

11. Bird Conservation Regions

11.0.0.1. Bird Conservation Region 17

We obtained results for Bird Conservation Region 17 by compiling and jointly analyzing data from 30 strata.

Field technicians completed 158 of 157 planned surveys (101%) in 2022. Technicians conducted 1778 point counts within the 158 surveyed grid cells between May 24 and July 18. They detected 187 bird species, including 45 priority species.

Bird Conservancy estimated densities and population sizes for 229 species that were detected in any year during which surveys were conducted, 61 of which are priority species. The data yielded robust density estimates (CV < 50%) for 69 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Bird Conservation Region 17 for 229 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 120 species.

To view a map of survey locations, density and occupancy results and species counts within Bird Conservation Region 17 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 tab in the upper left above the map.

BCR17
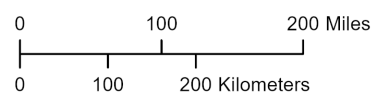
Figure 11.1.: Survey locations and strata in the Badlands and Prairies Bird Conservation Region (BCR 17), 2022

12. Colorado

12.0.0.1. Colorado Statewide: Total

We obtained results for Colorado Statewide: Total by compiling and jointly analyzing data from 30 strata.

Field technicians completed 193 of 213 planned surveys (91%) in 2022. Technicians conducted 2032 point counts within the 193 surveyed grid cells between May 16 and July 25. They detected 202 bird species, including 38 priority species.

Bird Conservancy estimated densities and population sizes for 237 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 107 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Colorado Statewide: Total for 238 species that were detected in any year during which surveys were conducted, 46 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 156 species.

To view a map of survey locations, density and occupancy results and species counts within Colorado Statewide: Total 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 tab in the upper left above the map.

CO

12.0.0.2. All Other Lands in Colorado

We obtained results for All Other Lands in Colorado by compiling and jointly analyzing data from seven strata.

Field technicians completed 72 of 83 planned surveys (87%) in 2022. Technicians conducted 763 point counts within the 72 surveyed grid cells between May 16 and July 21. They detected 152 bird species, including 28 priority species.

Bird Conservancy estimated densities and population sizes for 202 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 83 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in Colorado for 203 species that were detected in any year during which surveys were conducted, 43 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 111 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in Colorado 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

Completed Surveys ⎘ **Bird Conservation Regions**

0 25 50 Miles

0 25 50 Kilometers

BCRs in Colorado
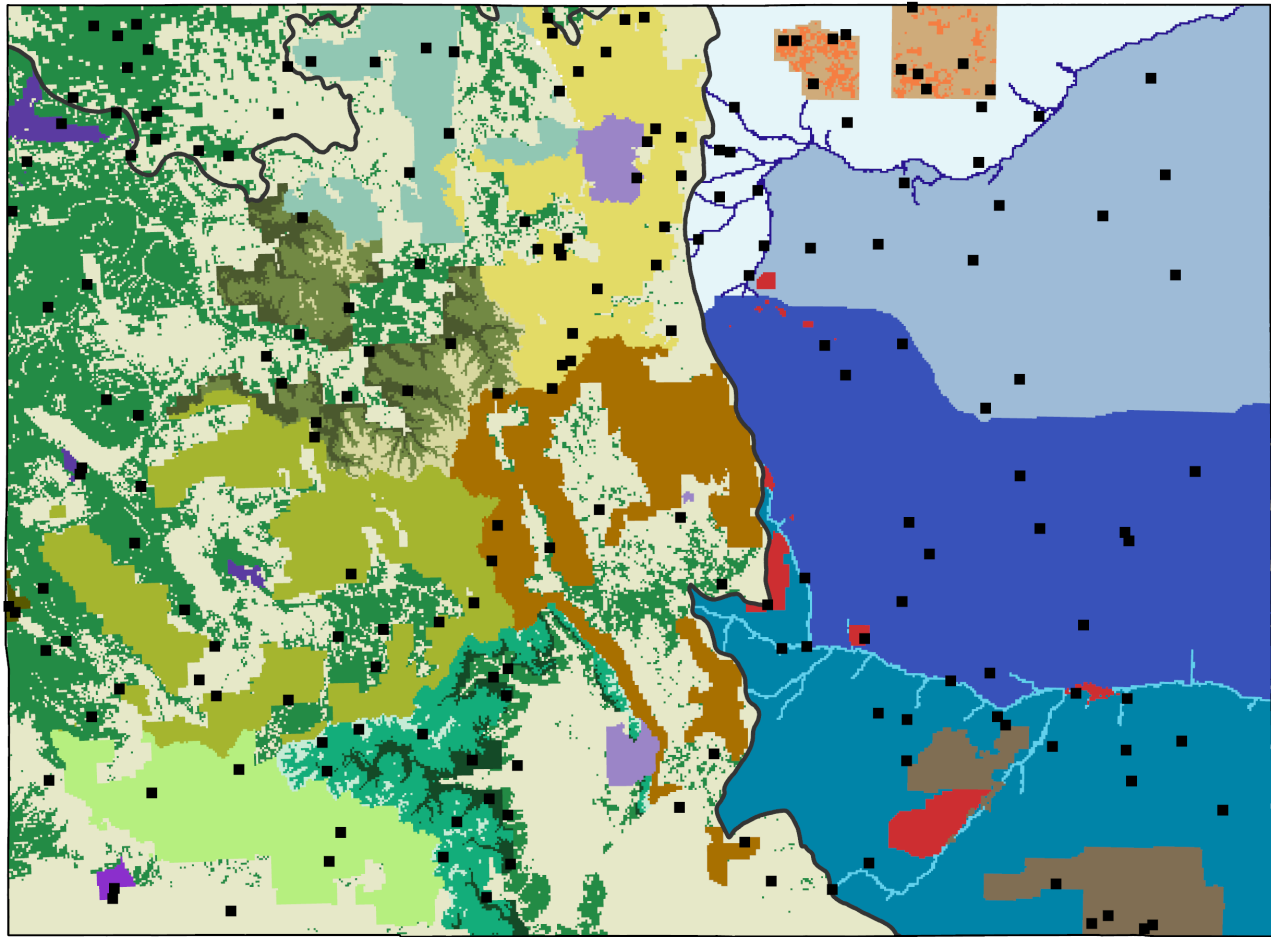
STRATA

USFS - National Forests

- Arapaho-Roosevelt
- Grand Mesa, Uncompahgre and Gunnison
- Manti-La Sal
- Pike-San Isabel
- Rio Grande - High Elevation
- Rio Grande - Mid Elevation
- Rio Grande - Low Elevation
- Routt
- San Juan
- White River - High Elevation
- White River - Low Elevation
- White River - Mid Elevation
- Williams Fork Management Unit

USFS - National Grasslands

- Comanche
- Pawnee - Private Lands
- Pawnee - Public Lands

National Park Service

- Northern Colorado Plateau Network
- Rocky Mountain Network
- Southern Colorado Plateau Network

Bureau of Land Management

- All BLM Lands

All Other Strata

- All Other Lands
- Area North of the Platte River
- Area South of the Arkansas River
- Area between I-70 and the Arkansas River
- Area between the Platte River and I-70
- Arkansas River and Tributaries
- Platte River and Tributaries
- Department of Defense

Figure 12.1.: Survey locations and strata in Colorado, 2022.

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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 tab in the upper left above the map.

CO-All Other

12.1. Colorado BCR 10

12.1.0.1. Colorado BCR 10: Total

We obtained results for Colorado BCR 10: Total by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 182 point counts within the 14 surveyed grid cells between May 18 and June 13. They detected 75 bird species, including 13 priority species.

Bird Conservancy estimated densities and population sizes for 127 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 32 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Colorado BCR 10: Total 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 50 species.

To view a map of survey locations, density and occupancy results and species counts within Colorado BCR 10: Total 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 tab in the upper left above the map.

CO-BCR10

12.1.0.2. All Other Lands in Colorado BCR 10

We obtained results for All Other Lands in Colorado BCR 10 by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 55 point counts within the 5 surveyed grid cells between May 21 and June 13. They detected 62 bird species, including 6 priority species.

Bird Conservancy estimated densities and population sizes for 111 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 25 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in Colorado BCR 10 for 110 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 38 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in Colorado BCR 10 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 tab in the upper left above the map.

12.2. Colorado BCR 16

12.2.0.1. Colorado BCR 16: Total

We obtained results for Colorado BCR 16: Total by compiling and jointly analyzing data from 18 strata.

Field technicians completed 108 of 120 planned surveys (90%) in 2022. Technicians conducted 1050 point counts within the 108 surveyed grid cells between May 17 and July 25. They detected 153 bird species, including 24 priority species.

Bird Conservancy estimated densities and population sizes for 200 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 86 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Colorado BCR 16: Total for 198 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 123 species.

To view a map of survey locations, density and occupancy results and species counts within Colorado BCR 16: Total 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 tab in the upper left above the map.

12.2.0.2. All Other Lands in Colorado BCR 16

We obtained results for All Other Lands in Colorado BCR 16 by compiling and analyzing data from one stratum.

Field technicians completed 22 of 25 planned surveys (88%) in 2022. Technicians conducted 190 point counts within the 22 surveyed grid cells between May 17 and July 21. They detected 116 bird species, including 16 priority species.

Bird Conservancy estimated densities and population sizes for 178 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 64 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in Colorado BCR 16 for 174 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 86 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in Colorado BCR 16 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 tab in the upper left above the map.

CO-BCR16-AO

12.3. Colorado BCR 18

12.3.0.1. Colorado BCR 18: Total

We obtained results for Colorado BCR 18: Total by compiling and jointly analyzing data from five strata.

Field technicians completed 45 of 53 planned surveys (85%) in 2022. Technicians conducted 518 point counts within the 45 surveyed grid cells between May 16 and June 15. They detected 84 bird species, including 14 priority species.

Bird Conservancy estimated densities and population sizes for 132 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 32 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Colorado BCR 18: Total for 131 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 49 species.

To view a map of survey locations, density and occupancy results and species counts within Colorado BCR 18: Total 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 tab in the upper left above the map.

CO-BCR18-All Other

12.3.0.2. Colorado BCR 18 Rivers

We obtained results for Colorado BCR 18 Rivers by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 101 point counts within the 11 surveyed grid cells between May 17 and June 22. They detected 90 bird species, including 7 priority species.

Bird Conservancy estimated densities and population sizes for 176 species that were detected in any year during which surveys were conducted, 25 of which are priority species. The data yielded robust density estimates (CV < 50%) for 35 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Colorado BCR 18 Rivers for 172 species that were detected in any year during which surveys were conducted, 24 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 72 species.

To view a map of survey locations, density and occupancy results and species counts within Colorado BCR 18 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 tab in the upper left above the map.

CO-Rivers

12.3.0.3. 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.

Field technicians completed 60 of 68 planned surveys (88%) in 2022. Technicians conducted 699 point counts within the 60 surveyed grid cells between May 16 and June 15. They detected 108 bird species, including 16 priority species.

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 44 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Non-river Lands in Colorado BCR 18 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 59 species.

To view a map of survey locations, density and occupancy results and species counts within Non-river Lands in Colorado BCR 18 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 tab in the upper left above the map.

CO-BCR18-Nonrivers

13. Montana

13.0.0.1. Montana Statewide: Total

We obtained results for Montana Statewide: Total by compiling and jointly analyzing data from 30 strata.

Field technicians completed 156 of 159 planned surveys (98%) in 2022. Technicians conducted 1850 point counts within the 156 surveyed grid cells between May 28 and July 15. They detected 196 bird species, including 34 priority species.

Bird Conservancy estimated densities and population sizes for 218 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 92 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Montana Statewide: Total for 223 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 153 species.

To view a map of survey locations, density and occupancy results and species counts within Montana Statewide: Total 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 tab in the upper left above the map.

MT

13.0.0.2. All Other Lands in Montana

We obtained results for All Other Lands in Montana by compiling and jointly analyzing data from three strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 330 point counts within the 24 surveyed grid cells between June 2 and July 14. They detected 140 bird species, including 23 priority species.

Bird Conservancy estimated densities and population sizes for 186 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 54 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in Montana for 192 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 105 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in Montana 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
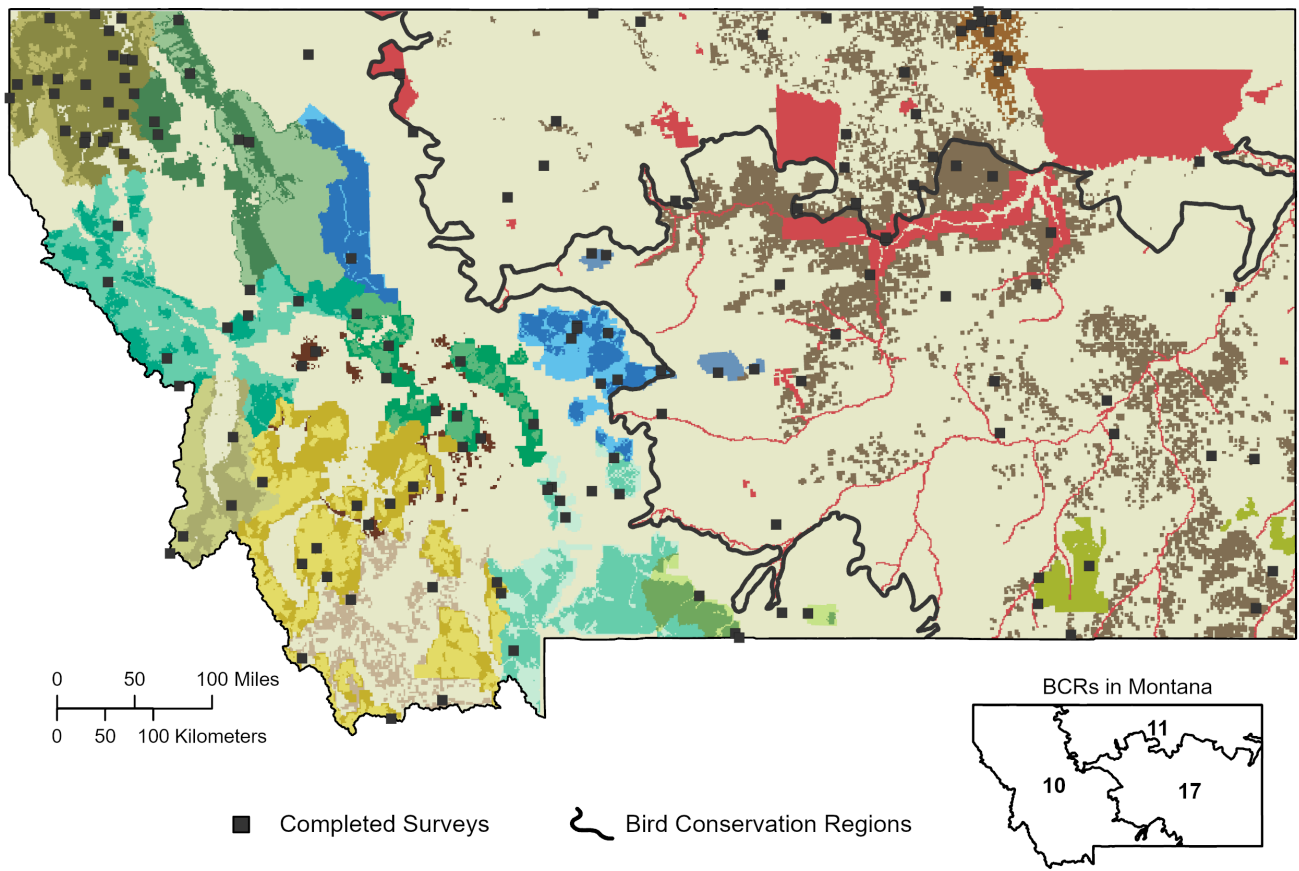
STRATA

USFS - National Forests

- Beaverhead-Deerlodge - Roaded/Managed
- Beaverhead-Deerlodge - Roadless/Wilderness
- Bitterroot - Roaded/Managed
- Bitterroot - Roadless/Wilderness
- Custer (BCR17)
- Custer - Roaded/Managed
- Custer - Roadless/Wilderness
- Flathead - Roaded/Managed
- Flathead - Roadless/Wilderness
- Gallatin - Roaded/Managed
- Gallatin - Roadless/Wilderness
- Helena - Roaded/Managed
- Helena - Roadless/Wilderness

USFS - National Forests (cont.)

- Kootenai - Roaded/Managed
- Kootenai - Roadless/Wilderness
- Lewis and Clark - Roaded/Managed
- Lewis and Clark - Roadless/Wilderness
- Lewis and Clark (BCR 17)
- Lolo - Roaded/Managed
- Lolo - Roadless/Wilderness

Bureau of Land Management

- All Other BLM
- Missoula-Butte
- North Valley
- Southwestern Montana

All Other Strata

- All Other Lands
- US Fish & Wildlife Service Lands, Rivers, & Tribal Lands

Figure 13.1.: Survey locations and strata in Montana, 2022.

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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 tab in the upper left above the map.

MT-All Other

13.1. Montana BCR 10

13.1.0.1. Montana BCR 10: Total

We obtained results for Montana BCR 10: Total by compiling and jointly analyzing data from 21 strata.

Field technicians completed 99 of 102 planned surveys (97%) in 2022. Technicians conducted 1054 point counts within the 99 surveyed grid cells between May 28 and July 15. They detected 147 bird species, including 19 priority species.

Bird Conservancy estimated densities and population sizes for 198 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 74 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Montana BCR 10: Total for 202 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 117 species.

To view a map of survey locations, density and occupancy results and species counts within Montana BCR 10: Total 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 tab in the upper left above the map.

MT-BCR10

13.1.0.2. All Other Lands in Montana BCR 10

We obtained results for All Other Lands in Montana BCR 10 by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 70 point counts within the 6 surveyed grid cells between June 3 and July 14. They detected 94 bird species, including 10 priority species.

Bird Conservancy estimated densities and population sizes for 126 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 35 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in Montana BCR 10 for 124 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 39 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in Montana BCR 10 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 tab in the upper left above the map.

MT-BCR10-ON

13.2. Montana BCR 11

13.2.0.1. Montana BCR 11: Total

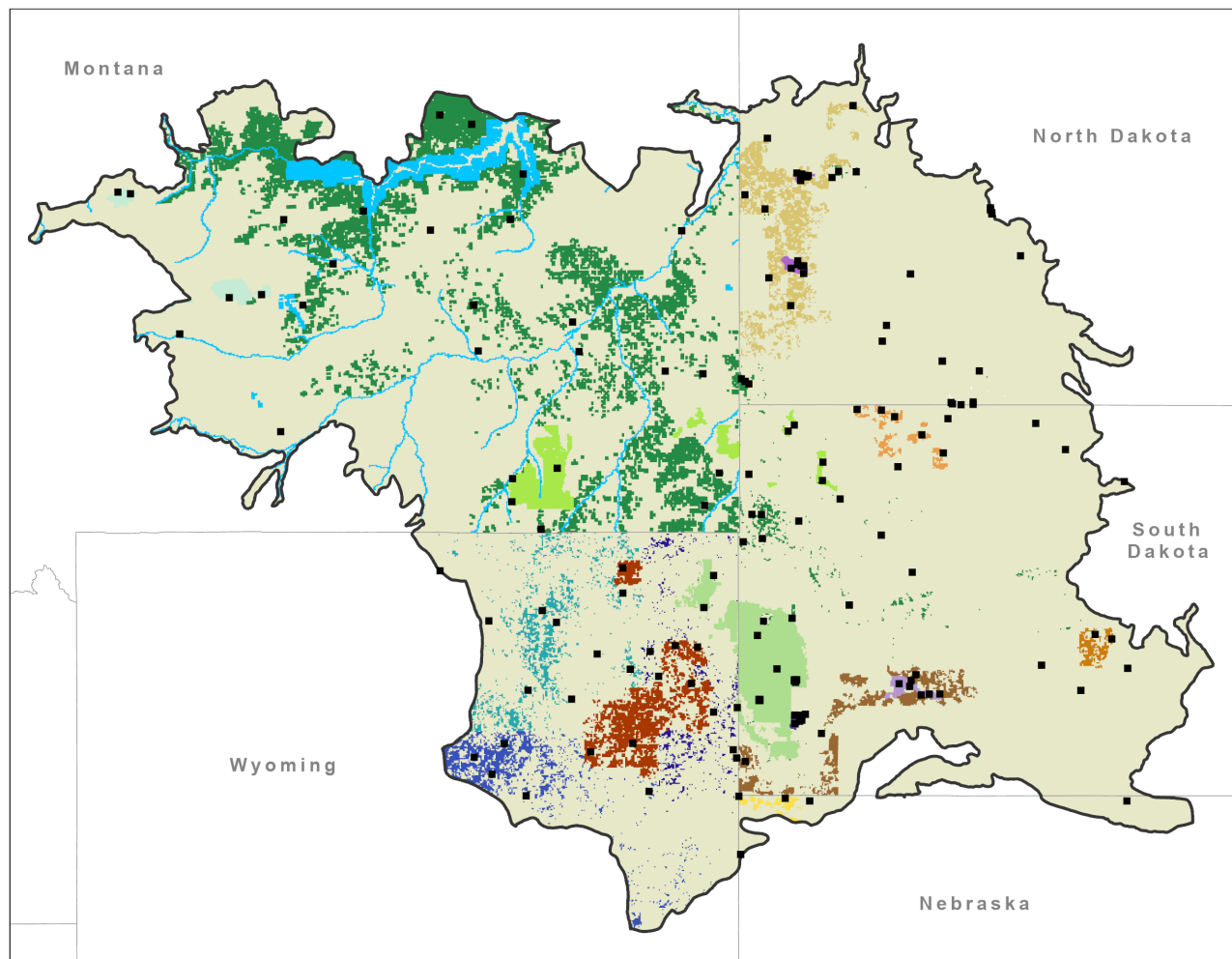We obtained results for Montana BCR 11: Total by compiling and jointly analyzing data from four strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 413 point counts within the 29 surveyed grid cells between May 29 and July 13. They detected 101 bird species, including 21 priority species.

Bird Conservancy estimated densities and population sizes for 142 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 33 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Montana BCR 11: Total for 141 species that were detected in any year during which surveys were conducted, 24 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 65 species.

To view a map of survey locations, density and occupancy results and species counts within Montana BCR 11: Total 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 tab in the upper left above the map.

MT-BCR11

13.2.0.2. All Other Lands in Montana BCR 11

We obtained results for All Other Lands in Montana BCR 11 by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 129 point counts within the 9 surveyed grid cells between June 11 and July 7. They detected 77 bird species, including 17 priority species.

Bird Conservancy estimated densities and population sizes for 116 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 26 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in Montana BCR 11 for 114 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 43 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in Montana BCR 11 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 tab in the upper left above the map.

MT-BCR11-AO

13.3. Montana BCR 17

13.3.0.1. Montana BCR 17: Total

We obtained results for Montana BCR 17: Total by compiling and jointly analyzing data from five strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 383 point counts within the 28 surveyed grid cells between June 1 and July 8. They detected 121 bird species, including 16 priority species.

Bird Conservancy estimated densities and population sizes for 192 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 50 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Montana BCR 17: Total 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 81 species.

To view a map of survey locations, density and occupancy results and species counts within Montana BCR 17: Total 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 tab in the upper left above the map.

MT-BCR17

13.3.0.2. All Other Lands in Montana BCR 17

We obtained results for All Other Lands in Montana BCR 17 by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 131 point counts within the 9 surveyed grid cells between June 2 and July 8. They detected 66 bird species, including 15 priority species.

Bird Conservancy estimated densities and population sizes for 131 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 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in Montana BCR 17 for 127 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 43 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in Montana BCR 17 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 tab in the upper left above the map.

MT-BCR17-AO

14. Utah
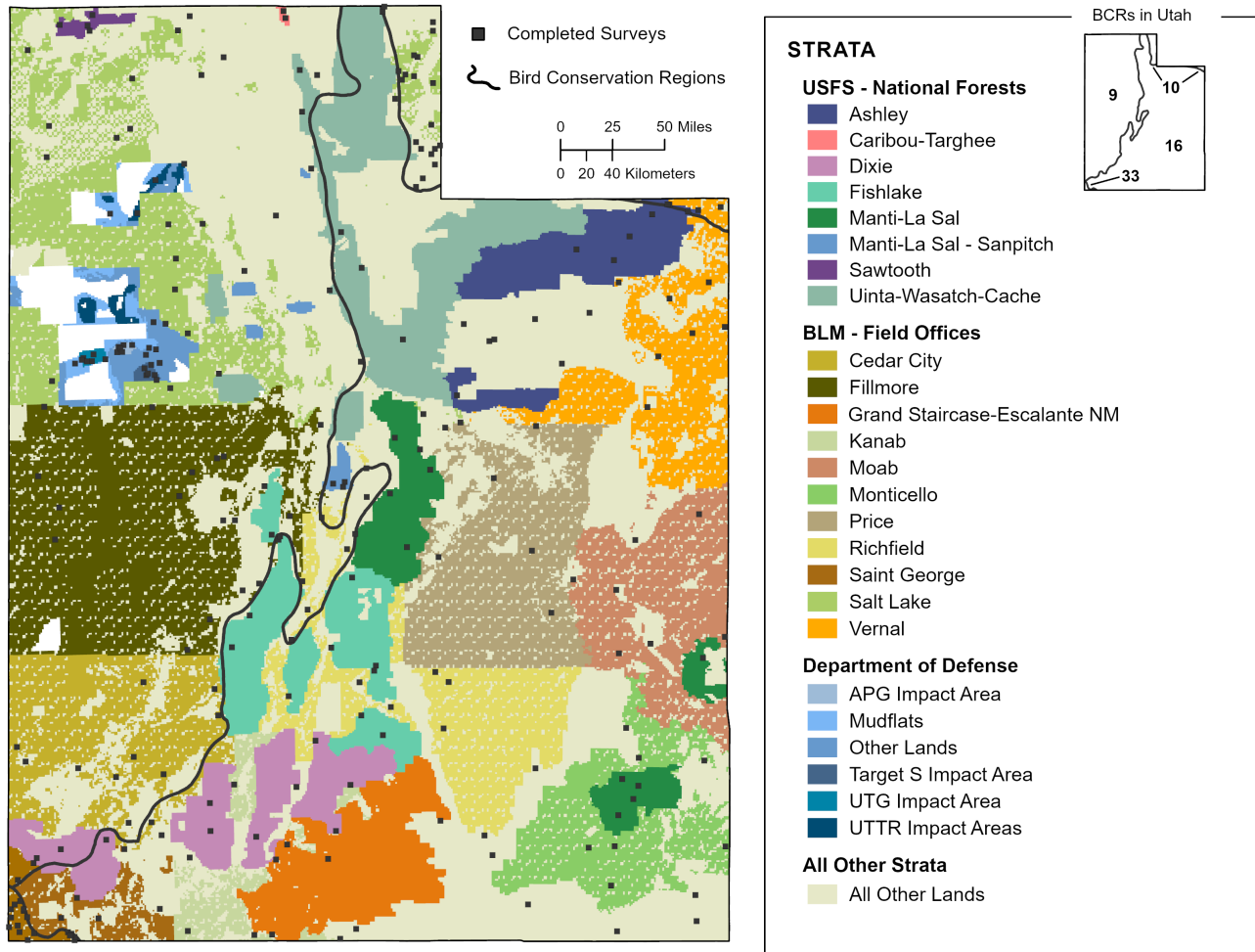
Figure 14.1.: Survey locations and strata in Utah, 2022.

14.0.0.1. Utah Statewide: Total

We obtained results for Utah Statewide: Total by compiling and jointly analyzing data from 42 strata.

Field technicians completed 249 of 251 planned surveys (99%) in 2022. Technicians conducted 2815 point counts within the 249 surveyed grid cells between May 2 and July 15. They detected 187 bird species, including 13 priority species.

Bird Conservancy estimated densities and population sizes for 214 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 93 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Utah Statewide: Total for 220 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 135 species.

To view a map of survey locations, density and occupancy results and species counts within Utah Statewide: Total 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 tab in the upper left above the map.

UT

14.0.0.2. All Other Lands in Utah

We obtained results for All Other Lands in Utah by compiling and jointly analyzing data from four strata.

Field technicians completed 111 of 110 planned surveys (101%) in 2022. Technicians conducted 1272 point counts within the 111 surveyed grid cells between May 2 and July 13. They detected 161 bird species, including 8 priority species.

Bird Conservancy estimated densities and population sizes for 192 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 85 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in Utah for 195 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 98 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in Utah 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 tab in the upper left above the map.

UT-All Other Lands

14.1. Utah BCR 9

14.1.0.1. Utah BCR 9: Total

We obtained results for Utah BCR 9: Total by compiling and jointly analyzing data from 17 strata.

Field technicians completed 99 of 101 planned surveys (98%) in 2022. Technicians conducted 1156 point counts within the 99 surveyed grid cells between May 7 and July 14. They detected 120 bird species, including 4 priority species.

Bird Conservancy estimated densities and population sizes for 160 species that were detected in any year during which surveys were conducted, 10 of which are priority species. The data yielded robust density estimates (CV < 50%) for 57 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Utah BCR 9: Total for 168 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 84 species.

To view a map of survey locations, density and occupancy results and species counts within Utah BCR 9: Total 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 tab in the upper left above the map.

UT-BCR9

14.1.0.2. All Other Lands in Utah BCR 9

We obtained results for All Other Lands in Utah BCR 9 by compiling and analyzing data from one stratum.

Field technicians completed 41 of 40 planned surveys (102%) in 2022. Technicians conducted 471 point counts within the 41 surveyed grid cells between May 7 and June 28. They detected 85 bird species, including 2 priority species.

Bird Conservancy estimated densities and population sizes for 134 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust density estimates (CV < 50%) for 45 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in Utah BCR 9 for 132 species that were detected in any year during which surveys were conducted, 7 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 51 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in Utah BCR 9 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 tab in the upper left above the map.

UT-BCR9-AO

14.2. Utah BCR 10

14.2.0.1. Utah BCR 10: Total

We obtained results for Utah BCR 10: Total by compiling and jointly analyzing data from five strata.

Field technicians completed 25 of 26 planned surveys (96%) in 2022. Technicians conducted 260 point counts within the 25 surveyed grid cells between May 21 and July 14. They detected 84 bird species, including 4 priority species.

Bird Conservancy estimated densities and population sizes for 130 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 41 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Utah BCR 10: Total for 128 species that were detected in any year during which surveys were conducted, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 51 species.

To view a map of survey locations, density and occupancy results and species counts within Utah BCR 10: Total 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 tab in the upper left above the map.

UT-BCR10

14.2.0.2. All Other Lands in Utah BCR 10

We obtained results for All Other Lands in Utah BCR 10 by compiling and analyzing data from one stratum.

Field technicians completed 14 of 15 planned surveys (93%) in 2022. Technicians conducted 158 point counts within the 14 surveyed grid cells between May 21 and June 27. They detected 45 bird species, including 4 priority species.

Bird Conservancy estimated densities and population sizes for 91 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust density estimates (CV < 50%) for 16 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in Utah BCR 10 for 87 species that were detected in any year during which surveys were conducted, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 28 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in Utah BCR 10 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 tab in the upper left above the map.

UT-BCR10-AO

14.3. Utah BCR 16

14.3.0.1. Utah BCR 16: Total

We obtained results for Utah BCR 16: Total by compiling and jointly analyzing data from 18 strata.

Field technicians completed 108 of 107 planned surveys (101%) in 2022. Technicians conducted 1191 point counts within the 108 surveyed grid cells between May 7 and July 15. They detected 146 bird species, including 6 priority species.

Bird Conservancy estimated densities and population sizes for 188 species that were detected in any year during which surveys were conducted, 9 of which are priority species. The data yielded robust density estimates (CV < 50%) for 81 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Utah BCR 16: Total for 185 species that were detected in any year during which surveys were conducted, 9 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 116 species.

To view a map of survey locations, density and occupancy results and species counts within Utah BCR 16: Total 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 tab in the upper left above the map.

UT-BCR16

14.3.0.2. All Other Lands in Utah BCR 16

We obtained results for All Other Lands in Utah BCR 16 by compiling and analyzing data from one stratum.

Field technicians completed 41 of 40 planned surveys (102%) in 2022. Technicians conducted 461 point counts within the 41 surveyed grid cells between May 10 and July 13. They detected 112 bird species, including 3 priority species.

Bird Conservancy estimated densities and population sizes for 159 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust density estimates (CV < 50%) for 72 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in Utah BCR 16 for 156 species that were detected in any year during which surveys were conducted, 8 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 67 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in Utah BCR 16 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 tab in the upper left above the map.

UT-BCR16-AO

14.4. Utah BCR 33

14.4.0.1. Utah BCR 33: Total

We obtained results for Utah BCR 33: Total by compiling and jointly analyzing data from two strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 208 point counts within the 17 surveyed grid cells between May 2 and May 21. They detected 101 bird species, including 3 priority species.

Bird Conservancy estimated densities and population sizes for 112 species that were detected in any year during which surveys were conducted, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 24 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Utah BCR 33: Total for 114 species that were detected in any year during which surveys were conducted, 3 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 28 species.

To view a map of survey locations, density and occupancy results and species counts within Utah BCR 33: Total 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 tab in the upper left above the map.

UT-BCR33

14.4.0.2. All Other Lands in Utah BCR 33

We obtained results for All Other Lands in Utah BCR 33 by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 182 point counts within the 15 surveyed grid cells between May 2 and May 21. They detected 95 bird species, including 2 priority species.

Bird Conservancy estimated densities and population sizes for 105 species that were detected in any year during which surveys were conducted, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 31 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in Utah BCR 33 for 106 species that were detected in any year during which surveys were conducted, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 33 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in Utah BCR 33 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 tab in the upper left above the map.

UT-BCR33-AO

15. Wyoming

15.0.0.1. Wyoming Statewide: Total

We obtained results for Wyoming Statewide: Total by compiling and jointly analyzing data from 37 strata.

Field technicians completed 170 of 173 planned surveys (98%) in 2022. Technicians conducted 2173 point counts within the 170 surveyed grid cells between May 24 and July 20. They detected 190 bird species, including 44 priority species.

Bird Conservancy estimated densities and population sizes for 217 species that were detected in any year during which surveys were conducted, 61 of which are priority species. The data yielded robust density estimates (CV < 50%) for 94 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Wyoming Statewide: Total 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 143 species.

To view a map of survey locations, density and occupancy results and species counts within Wyoming Statewide: Total 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 tab in the upper left above the map.

WY

15.0.0.2. All Other Lands in Wyoming

We obtained results for All Other Lands in Wyoming by compiling and jointly analyzing data from four strata.

Field technicians completed 42 of 44 planned surveys (95%) in 2022. Technicians conducted 464 point counts within the 42 surveyed grid cells between May 24 and June 24. They detected 141 bird species, including 28 priority species.

Bird Conservancy estimated densities and population sizes for 192 species that were detected in any year during which surveys were conducted, 50 of which are priority species. The data yielded robust density estimates (CV < 50%) for 57 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in Wyoming for 192 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 88 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in 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

Figure 15.1.: Survey locations and strata in Wyoming, 2022.

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 tab in the upper left above the map.

WY-All Other

15.1. Wyoming BCR 10

15.1.0.1. Wyoming BCR 10: Total

We obtained results for Wyoming BCR 10: Total by compiling and jointly analyzing data from 23 strata.

Field technicians completed 111 of 112 planned surveys (99%) in 2022. Technicians conducted 1470 point counts within the 111 surveyed grid cells between May 24 and July 20. They detected 171 bird species, including 40 priority species.

Bird Conservancy estimated densities and population sizes for 201 species that were detected in any year during which surveys were conducted, 55 of which are priority species. The data yielded robust density estimates (CV < 50%) for 83 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Wyoming BCR 10: Total for 203 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 123 species.

To view a map of survey locations, density and occupancy results and species counts within Wyoming BCR 10: Total 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 tab in the upper left above the map.

WY-BCR10

15.1.0.2. All Other Lands in Wyoming BCR 10

We obtained results for All Other Lands in Wyoming BCR 10 by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 158 point counts within the 15 surveyed grid cells between May 25 and June 24. They detected 107 bird species, including 22 priority species.

Bird Conservancy estimated densities and population sizes for 164 species that were detected in any year during which surveys were conducted, 36 of which are priority species. The data yielded robust density estimates (CV < 50%) for 40 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in Wyoming BCR 10 for 161 species that were detected in any year during which surveys were conducted, 36 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 56 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in Wyoming BCR 10 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 tab in the upper left above the map.

WY-BCR10-AO

15.2. Wyoming BCR 16

15.2.0.1. Wyoming BCR 16: Total

We obtained results for Wyoming BCR 16: Total by compiling and jointly analyzing data from four strata.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 150 point counts within the 14 surveyed grid cells between June 4 and July 15. They detected 89 bird species, including 13 priority species.

Bird Conservancy estimated densities and population sizes for 164 species that were detected in any year during which surveys were conducted, 37 of which are priority species. The data yielded robust density estimates (CV < 50%) for 36 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Wyoming BCR 16: Total for 159 species that were detected in any year during which surveys were conducted, 36 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 65 species.

To view a map of survey locations, density and occupancy results and species counts within Wyoming BCR 16: Total 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 tab in the upper left above the map.

WY-BCR16

15.2.0.2. All Other Lands in Wyoming BCR 16

We obtained results for All Other Lands in Wyoming BCR 16 by compiling and analyzing data from one stratum.

Field technicians completed all planned surveys (100%) in 2022. Technicians conducted 42 point counts within the 5 surveyed grid cells between June 7 and June 23. They detected 52 bird species, including 9 priority species.

Bird Conservancy estimated densities and population sizes for 114 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 14 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in Wyoming BCR 16 for 107 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 22 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in Wyoming BCR 16 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 tab in the upper left above the map.

WY-BCR16-AO

15.3. Wyoming BCR 17

15.3.0.1. Wyoming BCR 17: Total

We obtained results for Wyoming BCR 17: Total by compiling and jointly analyzing data from six strata.

Field technicians completed 28 of 29 planned surveys (97%) in 2022. Technicians conducted 357 point counts within the 28 surveyed grid cells between May 24 and June 22. They detected 110 bird species, including 23 priority species.

Bird Conservancy estimated densities and population sizes for 175 species that were detected in any year during which surveys were conducted, 43 of which are priority species. The data yielded robust density estimates (CV < 50%) for 41 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Wyoming BCR 17: Total for 176 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 58 species.

To view a map of survey locations, density and occupancy results and species counts within Wyoming BCR 17: Total 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 tab in the upper left above the map.

WY-BCR17

15.3.0.2. All Other Lands in Wyoming BCR 17

We obtained results for All Other Lands in Wyoming BCR 17 by compiling and analyzing data from one stratum.

Field technicians completed 11 of 12 planned surveys (92%) in 2022. Technicians conducted 132 point counts within the 11 surveyed grid cells between May 24 and June 16. They detected 90 bird species, including 20 priority species.

Bird Conservancy estimated densities and population sizes for 145 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 33 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in Wyoming BCR 17 for 141 species that were detected in any year during which surveys were conducted, 28 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 45 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in Wyoming BCR 17 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 tab in the upper left above the map.

[WY-BCR17-AO](WY-BCR17-AO)

15.4. Wyoming BCR 18

15.4.0.1. Wyoming BCR 18: Total

We obtained results for Wyoming BCR 18: Total by compiling and jointly analyzing data from three strata.

Field technicians completed 15 of 16 planned surveys (94%) in 2022. Technicians conducted 176 point counts within the 15 surveyed grid cells between May 25 and June 16. They detected 63 bird species, including 12 priority species.

Bird Conservancy estimated densities and population sizes for 111 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 21 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout Wyoming BCR 18: Total for 109 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 30 species.

To view a map of survey locations, density and occupancy results and species counts within Wyoming BCR 18: Total 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 tab in the upper left above the map.

[WY-BCR18](WY-BCR18)

15.4.0.2. All Other Lands in Wyoming BCR 18

We obtained results for All Other Lands in Wyoming BCR 18 by compiling and analyzing data from one stratum.

Field technicians completed 11 of 12 planned surveys (92%) in 2022. Technicians conducted 132 point counts within the 11 surveyed grid cells between May 31 and June 16. They detected 54 bird species, including 17 priority species.

Bird Conservancy estimated densities and population sizes for 104 species that were detected in any year during which surveys were conducted, 25 of which are priority species. The data yielded robust density estimates (CV < 50%) for 21 species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Ψ, Psi) throughout All Other Lands in Wyoming BCR 18 for 100 species that were detected in any year during which surveys were conducted, 24 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 29 species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in Wyoming BCR 18 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 tab in the upper left above the map.

WY-BCR18-AO

Part II.

Discussion

16. Data Applications

Each year, we collected breeding bird information in the Great Plains, Rocky Mountains, and Intermountain West 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 to inform avian conservation and management decisions, such as:

> **State wildlife agencies** use the trend estimates to monitor Species of Greatest Conservation Need and revise their State Wildlife Action Plans. Trend estimates allow them to identify species that may need additional conservation efforts (e.g., declining populations) or species-specific monitoring efforts. Conversely, species with increasing populations across a state may warrant a lower priority status.

16.0.0.1. Federal agency partners

> The **Bureau of Land Management** (BLM) use the density estimates for project-level planning in specific strata, such as a field office. The density estimates inform potential population impacts on species of concern for NEPA projects and environmental assessments by multiplying the densities by the project area to determine the potential number of individuals that could be impacted by the project.

> The **U.S. Forest Service** (USFS) uses the trend estimates to monitor focal species within a unit's Land Management Plan, and to support larger processes under forest plan revision, such as assessing species of conservation concern and identifying focal species.

> The **Department of Defense** (DoD) uses the density and trend estimates for priority species to examine impacts of installation activities on birds. They also compare estimates for specific DoD strata to surrounding regional estimates for context.

16.1. Recent Overlay Projects

IMBCR partners also implement overlays, or targeted projects, to address specific management questions. Overlay projects use the same sampling design and field methods but are not integrated into the nested stratification of the IMBCR program. These projects benefit from pooling detection data across the IMBCR program, and have regional context for project-specific estimates. Some overlay projects include:

> Monitored 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.

Examined community-level effects and bird species relationships with restoration treatments under the **USFS's Collaborative Forest Landscape Restoration Program** implemented across the Front Range in Colorado.

Compared population estimates on private ranches in the Great Plains to estimates in the surrounding region to see if ranches participating in the **Audubon Conservation Ranching** program provide breeding habitat for grassland birds.

16.2. Adaptive Management

Monitoring is integral to the management and conservation of wildlife populations (Marsh & Trenham, 2008; Sauer & Knutson, 2008). In particular, 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). With progression of adaptive management, however, monitoring may also need to adapt to changing management objectives and environmental circumstances. 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 states 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.

17. Special Feature - Population Trends

17.1. Using IMBCR Trend Estimates to Track Species of Concern

Long-term, rigorous monitoring provides valuable information on population status, allowing managers and biologists to focus limited resources on species of greatest concern. Monitoring populations at local and regional scales also facilitates a mechanistic understanding of how local and regional processes may interact and affect populations (Hewett et al. 2007, Pavlacky et al. 2017). Here we provide a few examples demonstrating the use of IMBCR population trends for tracking the status of designated species of concern and determining where specific populations may require management or conservation efforts.

Trend estimates can be found in this Google Drive folder. Please see the associated Read Me document for an explanation of columns in the trend estimates spreadsheet. If you cannot access Google Drive, please contact Jennifer Timmer for a copy of the data.

17.1.1. Wyoming BLM

We have been monitoring birds across the state of Wyoming since 2009, including all BLM land. Currently, Brewer's sparrow, sage thrasher, and sagebrush sparrow are listed sensitive species for the Wyoming BLM. Due to the loss and degradation of sagebrush rangelands over the last century, many avian species associated with this biome have also declined and are now of conservation concern (Knick and Rotenberry 2002).

Throughout all BLM land in Wyoming, populations for these three species are stable-to-increasing across the monitoring period (2009-2022; Figure 17.1), illustrating the overall value of these publicly managed lands for sagebrush birds (Table 17.1).

Within several specific BLM field offices, however, populations for these three species are decreasing and may require specific management or conservation efforts to restore sagebrush rangelands. For example, the Brewer's sparrow population is decreasing approximately 6% each year in the Lander Field Office, the sagebrush sparrow sparrow population is decreasing 19% per year in the Lander Field Office, and the sage thrasher population in the Worland Field Office is decreasing 5% each year (Table 17.1).

Table 17.1.: Population trend estimates for sensitive sagebrush bird species within select Wyoming Bureau of Land Management strata from the IMBCR program.

Stratum	Species	Percent change per year	Trend estimate	Coefficient of Variation	Lower 90%	Upper 90%	f	Number of Detections	Monitoring period
BLM land in WY	Brewer's Sparrow	3	1.03	0.71	1.02	1.04	1.00	11,455	2009-2022
BLM land in WY	Sagebrush Sparrow	3	1.03	1.07	1.02	1.05	1.00	5,757	2009-2022
BLM land in WY	Sage Thrasher	2	1.02	0.67	1.01	1.03	1.00	5,680	2009-2022
Lander Field Office	Brewer's Sparrow	-6	0.94	1.62	0.92	0.96	1.00	664	2009-2022
Lander Field Office	Sagebrush Sparrow	-19	0.81	3.24	0.77	0.86	1.00	295	2009-2022
Worland Field Office	Sage Thrasher	-5	0.95	3.25	0.90	1.01	0.94	136	2009-2022
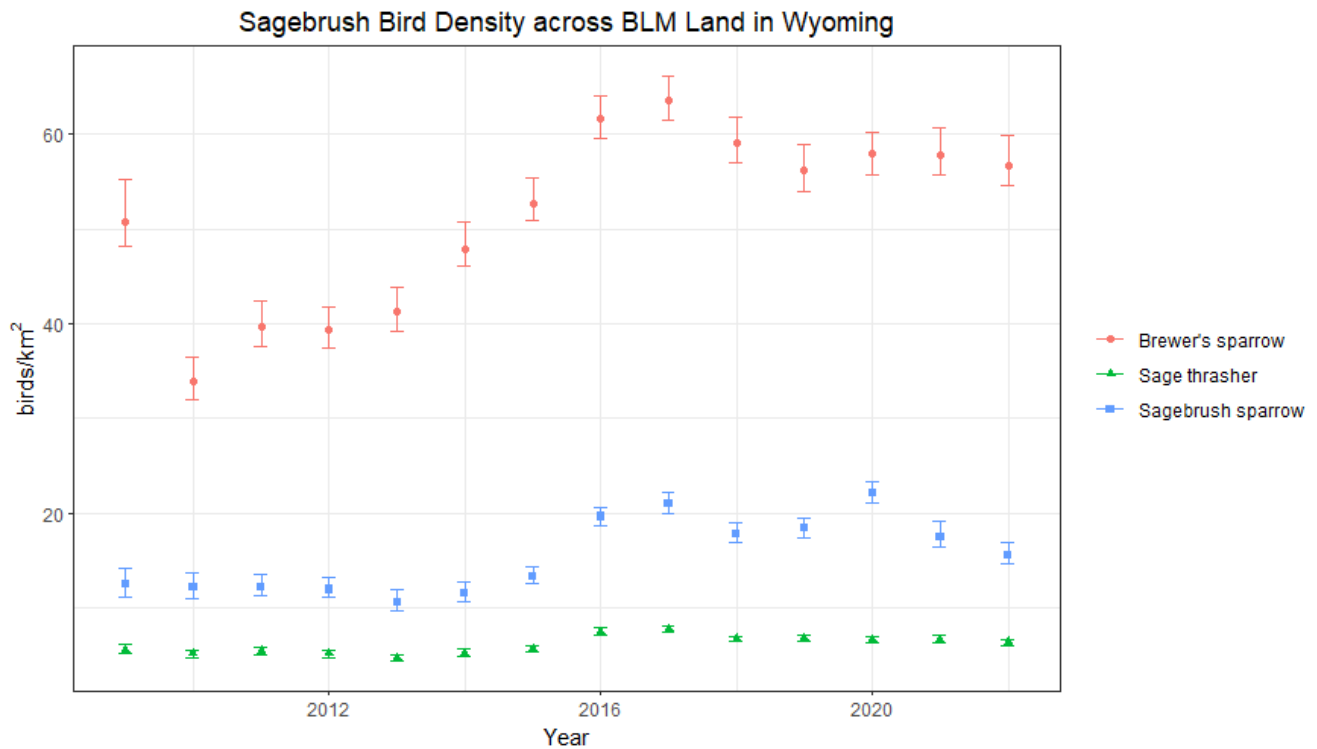
Figure 17.1.: Density of three sagebrush-associated species across all BLM land in Wyoming from 2009-2022, illustrating stable to increasing population change.

Table 17.2.: Population trend estimates for two grassland bird species within Bird Conservation Region 17 from the IMBCR program.

Stratum	Species	Percent change per year	Trend estimate	Coefficient of Variation	Lower 90%	Upper 90%	f	Number of Detections	Monitoring period
BCR17	Chestnut-collared Longspur	-17	0.83	2.57	0.79	0.86	1.00	4,602	2009-2022
BCR17	Sprague's Pipit	-26	0.74	16.83	0.56	0.95	0.98	160	2009-2022
Cedar River National Grassland	Chestnut-collared Longspur	4	1.04	1.20	1.02	1.06	1.00	885	2013-2022
Grand River National Grassland	Sprague's Pipit	17	1.17	10.71	0.98	1.40	0.94	35	2013-2022

17.1.2. Bird Conservation Region 17

We have also monitored across the Badlands and Prairies Bird Conservation Region (BCR 17) since 2009. Grassland birds are among the fastest declining group of birds in North America (Rosenberg et al. 2019, NABCI 2022). Grassland prairie converted for cropland or residential development threatens these populations on both the breeding and wintering grounds (NABCI 2016), and the loss may be as high as 700 million breeding individuals over the past 50 years (Rosenberg et al. 2019).

For the Northern Great Plains Joint Venture, the chestnut-collared longspur and Sprague's pipit are focal species of conservation concern, and are also declining across this region (17% each year for chestnut-collared longspur and 26% each year for Sprague's pipit; Table 17.2). However, if we look at specific management units in BCR17, local populations for these species are actually increasing: chestnut-collared longspur by 4% each year on Cedar River National Grassland in North Dakota and Sprague's pipit by 17% each year on Grand River National Grassland in South Dakota (Table 17.2).

Grassland birds often show low site fidelity from year-to-year as they track suitable breeding sites (Cody 1985), emphasizing the need for regional monitoring to identify these important breeding locations and to track population change over time. In addition, the monitoring data serve as a logical place to form hypotheses for observed population fluctuations and predictions about bird response to drivers of change

Table 17.3.: Population trend estimates for sensitive species within select U.S. Forest Service National Grassland and National Forest strata from the IMBCR program.

Stratum	Species	Percent change per year	Trend estimate	Coefficient of Variation	Lower 90%	Upper 90%	f	Number of Detections	Monitoring period
USFS Region 2 National Grasslands	Cassin's Sparrow	5	1.05	1.36	1.03	1.07	1.00	3,667	2009-2022
USFS Region 2 National Forests	Olive-sided Flycatcher	4	1.04	1.29	1.02	1.06	1.00	845	2011-2022
Comanche National Grassland	Cassin's Sparrow	3	1.03	0.53	1.02	1.04	1.00	2,755	2008-2022
Cimarron National Grassland	Cassin's Sparrow	-11	0.09	2.07	0.86	0.92	1.00	738	2016-2022
Arapaho & Roosevelt National Forests	Olive-sided Flycatcher	-19	0.81	11.23	0.67	0.95	0.98	57	2008-2022
Shoshone National Forest	Olive-sided Flycatcher	35	1.35	4.61	1.24	1.43	1.00	97	2009-2022

(Pavlacky et al. 2017). For example, we could model abiotic and biotic habitat features relevant for grassland birds to understand population discrepancies between regional and local scales.

17.1.3. USFS Rocky Mountain Region

The USFS Rocky Mountain Region has been involved in IMBCR since the beginning in 2008, so we now have 15 years of monitoring data across this region. Cassin's sparrow and olive-sided flycatcher are designated sensitive species for the Rocky Mountain Region because of concern about the population viability of these species on USFS land within the region (USFS Manual 2670.5).

Cassin's sparrows are actually increasing across national grasslands collectively in this region (5% each year; Figure 17.2), and olive-sided flycatchers are also increasing about 4% each year across national forests in the region (Table 17.3). It's important to look at trends within specific units, however, because populations may show variable trends locally and could warrant a designation as Species of Conservation Concern (36 CFR § 219.19).

For instance, olive-sided flycatchers are decreasing 19% each year on the Arapaho and Roosevelt National Forests, but increasing 35% per year on the Shoshone National Forest (Table 17.3). Populations of western forest species may be stable overall, but forests with a greater departure from historical conditions shaped by frequent fire activity could be hotspots for avian population declines (NABCI 2022).

Cassin's sparrows are decreasing 11% each year on Cimarron National Grassland, but increasing 3% each year on Comanche National Grassland (Table 17.3; Figure 17.2). Although many grassland birds breed on privately owned land, publicly managed grasslands also provide critical breeding habitat.
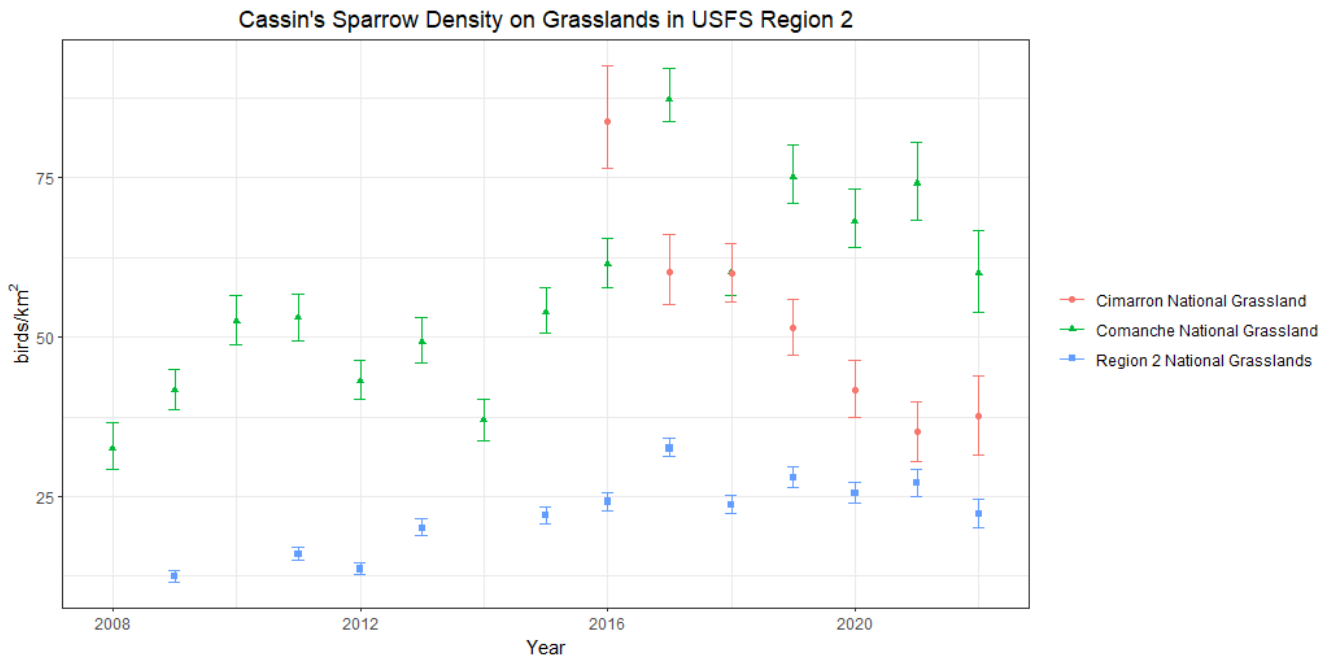
Figure 17.2.: Density of Cassin's sparrows on Comanche National Grassland, Cimarron National Grassland, and all national grasslands in USFS Region 2 from 2008-2022 (2016-2022 for Cimarron only), illustrating variable population trends at local and regional scales.

18. Conclusions

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, nested design, which allows for inference to multiple scales 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 often cost-prohibitive. The IMBCR program reduces expenses through cooperation with multiple partners, one of the stated goals of effective collaboration and coordinated bird monitoring (NABCI Monitoring Subcommittee, 2007), and also through efficiencies in data collection and analyses. 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 Joint Ventures, 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, creating efficiencies 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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A. Rocky Mountain Avian Data Center Tips

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.

Selecting filters

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.

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).

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.

Hierarchy for the different management entities

All Other Lands:

Tier One – Management Entity – All Other Lands
Tier Two – Management Region – n/a
Tier Three – Management Unit – n/a
Tier Four – National Forest or Grassland – n/a
Tier Five – Management District – n/a

Colorado State Land Board:

Tier One – Management Entity – Colorado State Land Board
Tier Two – Management Region – Lowry Range
Tier Three – Management Unit – n/a
Tier Four – National Forest or Grassland – n/a
Tier Five – Management District – n/a

TNC:

Tier One – Management Entity – The Nature Conservancy
Tier Two – Management Region – Cherry Creek
Tier Three – Management Unit – n/a
Tier Four – National Forest or Grassland – n/a
Tier Five – Management District – n/a

Tribal Lands:

Tier One – Management Entity – US Bureau of Indian Affairs
Tier Two – Management Region – Reservation
Tier Three – Management Unit – n/a
Tier Four – National Forest or Grassland – n/a
Tier Five – Management District – n/a

BLM:

Tier One – Management Entity – Bureau of Land Management
Tier Two – Management Region – BLM Field Office
Tier Three – Management Unit – n/a
Tier Four – National Forest or Grassland – n/a
Tier Five – Management District – n/a

DOD:

Tier One – Management Entity – US Department of Defense
Tier Two – Management Region – US DoD Installation
Tier Three – Management Unit – n/a
Tier Four – National Forest or Grassland – n/a
Tier Five – Management District – n/a

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 – n/a Tier Five – Management District – n/a

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 – n/a
Tier Five – Management District – n/a

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 km^2 (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".

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.

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 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. Russel NWR stratum and an "All Other USFWS Lands" stratum.

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 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.

2022

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.

2021

In 2021, IMBCR expanded to include BCR 10 BLM lands in the Burns, Prineville, and Vale Districts.

2022

In 2022, we combined several strata within two National Forests in Colorado that had previously been created to serve as control strata for an overlay project. In Arapaho Roosevelt National Forest we combined the Arapaho Roosevelt National Forests All Other stratum (CO-BCR16-VO) and the Arapaho Roosevelt National Forests Control (CO-BCR16-RC) stratum into a single stratum for the forest (CO-BCR16-AR). In Pike-San Isabel National Forest we combined the Pike San Isabel National Forests All Other (CO-BCR16-PO) stratum and the Pike and San Isabel National Forests Control (CO-BCR16-PC) stratum into a single stratum for the forest (CO-BCR16-PS). In South Dakota, the Black Hills National Forest - Hydrologic Code 7 Watersheds (SD-BCR17-HU) stratum and the Black Hills National Forest - All other Watersheds (SD-BCR17-BF) stratum were combined into a single Black Hills National Forest stratum (SD-BCR17-BI). This change was made to help maintain survey coverage of the forest.

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.

2012

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 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.

2015

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.

2018

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.

D. Data 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

$$z_{ijkt} \sim Bern(\psi_i).$$

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

$$N_{ijkt} \sim Poisson(\lambda_{ijt} \times z_{ijkt})$$

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

$$logit(\psi_i) \sim Normal(\mu_{\psi_i}, \sigma_\psi^2),$$

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:

$$\alpha \sim Normal(0, 4),$$
$$exp\ (r) \sim Uniform(0.25, 1.75),$$

$$\varepsilon \sim Normal(0, \sigma_\varepsilon^2),$$

and

$$\sigma_\varepsilon^2 \sim Uniform(0,5).$$

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

$$s \sim Gamma(k,\theta) + 1,$$

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 $\geq$ 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 ($HN(t)$)
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:

$$p_l = \frac{(2\pi \int_{c=b_l}^{c=b_{l+1}} exp\ (-(\frac{c^2}{2\theta^2}))cdc)}{A_l}$$

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

$$p_l = 1 - exp\ (-(\frac{m_l}{a})^b)$$

*

To allow detection probabilities to vary by year, we sampled year-specific shape parameters from hyper-distributions:

$$\theta_t \sim Normal(\mu_\theta, \sigma_\theta^2),$$

$$a_t \sim Normal(\mu_a, \sigma_a^2),$$

and

$$b_t \sim Normal(\mu_b, \sigma_b^2),$$

with priors of

$$\mu_\theta \sim Unif(0, 1000),$$

$$\mu_a \sim Unif(0, 500),$$

$$\sigma_\theta, \sigma_a, \mu_b \sim Unif(0, 100),$$

and

$$\sigma_b \sim Unif(0, 25).$$

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 _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

$$y_{ijkt} \sim Multinom(\pi_t, N_{ijkt}).$$

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,

$$log\ (\hat{D}_{itm}) \sim \alpha_{im} + r_{im}(t-1).$$

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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 (α_{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,

$$\tilde{\alpha}_{im} \sim Normal(\mu_{\alpha_{im}}, SE_{\alpha_{im}})$$

and

$$\tilde{r}_{im} \sim Normal(\mu_{r_{im}}, SE_{r_{im}}).$$

D.0.1. 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 sample points, except for species in Accipitriformes, Anseriformes, Falconiformes, Galliformes, Gruiformes, Pelecaniformes, Podicepidiformes, 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,

$$logit(p_{BCR,t}) \sim Normal(\mu_{p_{BCR}}, \sigma_p^2)$$

and

$$logit(\theta_{BCR,t}) \sim Normal(\mu_{\theta_{BCR}}, \sigma_\theta^2),$$

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

$$z_{ijt} \sim Bernoulli(\psi_{it})$$

and

$$logit(\psi_{it}) \sim Normal(\mu_{\psi_i}, \sigma_\psi^2),$$

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,

$$u_{ijkt} \sim Bernoulli(\theta_{BCR,t} \times z_{ijt}).$$

Finally, we modeled the observation process conditional on the point being occupied (i.e., $u = 1$) as

$$y_{ijkt} \sim Binomial(p_{BCR,t} \times u_{ijkt}, J_{ijkt}),$$

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).

D.0.2. Automated Analysis

We updated our analytical methods and are used Bayesian hierarchical models specifically designed for analysis of IMBCR data. We performed all data and output manipulation in R (R Core Team, 2022) 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 strata-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 on www.github.com.

E. Priority Species Designations

Table E.1.: Priority species detected in Bird Conservation Regions (BCRs) surveyed in 2022, 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	Density Estimate	Occupancy Estimate	BCR 9	BCR 10	BCR 11	BCR 15	BCR 16	BCR 17	BCR 18	BCR 19	BCR 33	BCR 34
Abert's Towhee	x	x									RS	
American Avocet	x	x	RC,RS				RC					
American Bittern	x	x	RC	RC			RC					
American Coot	x	x	RC			RS						
American Dipper	x	x		RS		RC	RC	RC				RC
American Kestrel	x	x	RC	RC			RC					RC
American Wigeon	x	x						RC				
Ash-throated Flycatcher	x	x				RC						
American White Pelican	x	x	RC			RC,RS						
Baird's Sparrow	x	x		RC		RC,RS		RC				
Bank Swallow	x	x				RC						
Baltimore Oriole	x	x								RC		
Black-billed Cuckoo	x	x				RC		RC		RC		
Black-billed Magpie	x	x						RC				
Black-chinned Hummingbird	x	x										RC
Brown-capped Rosy-Finch	x	x					RC,RS					
Black-chinned Sparrow	x	x	RC									RC
Belted Kingfisher	x		RC									
Bell's Vireo	x	x										RC
Bewick's Wren	x	x								RC		RC
Black Rosy-Finch	x	x	RC	RC,RS			RC					
Black Tern	x	x	RC	RC	RC,RS		RC		RC			
Bobolink	x	x	RC	RC	RS							
Brewer's Blackbird	x	x	RS									
Brown Creeper	x	x				RC						
Brewer's Sparrow	x	x	RC,RS	RC			RC	RC	RC			
Brown Thrasher	x	x				RC				RC		
Bridled Titmouse	x	x										RS
Black-tailed Gnatcatcher	x	x									RC,RS	
Broad-tailed Hummingbird	x	x					RS					
Band-tailed Pigeon	x	x				RC	RC					RC
Black-throated Gray Warbler	x	x	RC			RC	RC					RC
Bullock's Oriole	x	x				RC				RC	RC	RC
Burrowing Owl	x	x						RC		RC		
Blue-winged Teal	x	x				RS						
Cactus Wren	x	x									RC	
Cassin's Finch	x	x	RS	RC,RS			RC	RC				
California Gull	x	x	RS				RC					
Calliope Hummingbird	x	x	RS	RS								
California Quail	x	x	RS									
Cassin's Sparrow	x	x								RC,RS	RC	
Cassin's Vireo	x	x			RS							
Chestnut-collared Longspur	x	x			RC	RC,RS			RC	RC		
Clay-colored Sparrow	x	x				RS						
Chipping Sparrow	x	x			RC							
Chimney Swift	x	x								RC		
Cinnamon Teal	x	x	RS	RC						RC		
Clark's Nutcracker	x	x		RS			RC,RS					RC
Cordilleran Flycatcher	x	x										RC
Common Goldeneye		x			RC							
Costa's Hummingbird	x	x									RC,RS	
Common Nighthawk	x	x	RC	RC			RC					RC
Common Poorwill	x	x	RC									RC
Dickcissel	x	x								RS		
Dusky Flycatcher	x	x			RS							
Dusky Grouse	x	x			RS							RC
Eared Grebe	x	x	RS									
Eastern Kingbird	x	x				RC				RC		

(continued)

Species	Density Estimate	Occupancy Estimate	BCR 9	BCR 10	BCR 11	BCR 15	BCR 16	BCR 17	BCR 18	BCR 19	BCR 33	BCR 34
Eastern Meadowlark	x	x								RC		
Evening Grosbeak	x	x	RS	RC		RC	RC					
Ferruginous Hawk	x	x	RC	RC	RS			RC	RC	RC		
Forster's Tern	x	x	RC,RS	RC			RC		RC			
Franklin's Gull	x	x	RC	RC	RC,RS			RC		RC		
Gambel's Quail	x	x									RS	
Golden-crowned Kinglet	x	x		RC								
Gilded Flicker	x	x					RC				RC	RC
Gila Woodpecker	x	x									RC,RS	
Golden Eagle	x	x				RC	RC	RC				
Gray Flycatcher	x	x	RS									
Greater Prairie-Chicken	x	x			RC			RC	RC	RC,RS		
Greater Sage-Grouse	x	x	RC	RC,RS	RC	RC	RC	RC				
Grasshopper Sparrow	x	x			RC			RC	RC	RC		
Gray Vireo	x	x					RS				RC	
Grace's Warbler	x	x					RC,RS					RC
Green-tailed Towhee	x	x	RC,RS				RS					
Hammond's Flycatcher	x	x		RS								
Hooded Oriole	x	x									RC	RC
Juniper Titmouse	x	x					RS					
Killdeer	x	x	RC		RC							
Lark Bunting	x	x		RC	RC			RC,RS	RC,RS	RC		
Lark Sparrow	x	x									RC	
Lazuli Bunting	x	x	RS	RS			RC					
Long-billed Curlew	x	x	RC		RC	RC	RC	RC	RC	RC		
Long-eared Owl		x	RC									
Lesser Prairie-Chicken	x	x							RC,RS	RC,RS		
Lesser Scaup	x	x			RS							
Least Tern	x	x			RC			RC	RC	RC		
Lewis's Woodpecker	x	x	RC,RS	RC,RS		RC	RC	RC	RC			RC
Loggerhead Shrike	x	x						RC	RC	RC	RC	RC
Lucy's Warbler	x	x									RC	RS
Marbled Godwit	x	x		RC	RC,RS			RC				
Marsh Wren	x	x			RS							
Mexican Jay	x	x										RS
MacGillivray's Warbler	x	x	RC	RS								
Mississippi Kite	x	x								RS		
Mountain Bluebird	x	x		RS			RC,RS					
Mountain Chickadee	x	x	RC	RS			RC					RC
Mountain Plover	x	x	RC	RC	RC		RC	RC	RC,RS			
Northern Bobwhite	x	x								RC		
Northern Goshawk	x	x		RC				RC				
Northern Harrier	x	x	RC		RC,RS		RC	RC	RC	RC		
Northern Pintail	x	x		RC	RC		RC	RC	RC			
Northern Rough-winged Swallow	x	x	RC									
Olive-sided Flycatcher	x	x	RC	RC		RC	RC					
Phainopepla	x	x										RC
Pinyon Jay	x	x	RC,RS	RC		RC	RC,RS	RC	RC		RC	RC
Pine Siskin	x	x	RC	RS								
Plumbeous Vireo	x	x		RC			RS					RC
Prairie Falcon	x	x					RC	RC	RC			RC
Pygmy Nuthatch	x	x				RC	RS					RS
Pyrrhuloxia	x	x									RC	
Red-breasted Nuthatch	x	x		RS								
Red Crossbill	x	x		RC								
Redhead	x	x	RC		RS							
Red-faced Warbler	x	x										RS
Red-headed Woodpecker	x	x			RC			RC	RC	RC		
Red-naped Sapsucker	x	x	RC	RS			RC					
Rock Wren	x	x	RS						RC			
Ruddy Duck		x			RS							
Rufous Hummingbird	x	x		RC								
Rufous-winged Sparrow	x	x									RS	
Sagebrush Sparrow	x	x	RS				RC					
Sage Thrasher	x	x	RC,RS	RC,RS			RC					
Scott's Oriole	x	x	RC								RC	RC

Species	Density Estimate	Occupancy Estimate	BCR 9	BCR 10	BCR 11	BCR 15	BCR 16	BCR 17	BCR 18	BCR 19	BCR 33	BCR 34
Scaled Quail	x	x					RC		RC	RC		RC
Short-eared Owl	x	x	RC		RC		RC		RC			
Snowy Plover		x	RC				RC		RC	RC	RC	
Sooty Grouse		x	RS									
Sora	x	x				RS						
Sprague's Pipit	x	x			RC,RS			RC				
Spotted Towhee	x	x										RC
Scissor-tailed Flycatcher	x	x								RC		
Sharp-tailed Grouse	x	x	RC									
Swainson's Hawk	x	x				RS				RC		
Thick-billed Longspur	x	x		RC	RC,RS		RC	RC	RC			
Townsend's Warbler	x	x	RC	RC,RS								
Trumpeter Swan		x	RC	RC				RC				
Upland Sandpiper	x	x			RC	RC			RC	RC		
Vaux's Swift	x	x		RC		RC						
Varied Thrush	x	x	RC	RC								
Veery	x	x	RC	RC								
Verdin	x	x									RC	
Vesper Sparrow	x	x	RC	RC	RS		RC	RC				
Violet-green Swallow	x	x					RC					
Virginia's Warbler	x	x	RC				RC,RS					RC
Warbling Vireo	x	x		RS		RC						
Western Bluebird	x	x					RS					
Western Grebe	x	x	RS									
Western Kingbird	x	x							RS			
Western Meadowlark	x	x			RC				RC	RC		
Western Tanager	x	x		RS								
Western Wood-Pewee	x	x		RC,RS		RC						RC
White-headed Woodpecker	x	x	RC	RC		RS						
Willow Flycatcher	x	x	RC	RC,RS			RC					
Willet	x	x		RC	RC,RS		RC			RC		
Wilson's Phalarope	x	x	RC	RC	RS		RC					
Williamson's Sapsucker	x	x		RC,RS			RC,RS					
Woodhouse's Scrub-Jay	x	x					RS					
White-tailed Ptarmigan	x	x		RC			RC					
White-throated Swift	x	x					RC					RC
Yellow-billed Cuckoo	x	x								RC		
Yellow-headed Blackbird	x	x	RC,RS			RS	RC					

Note:
RC = Regional Concern Species; RS = Regional Stewardship Species (Partners in Flight 2019)

Table E.2.: Priority species detected in 2022, 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	Density Estimate	Occupancy Estimate	Colorado	Idaho	Kansas	Montana	Nebraska	New Mexico
Abert's Towhee	x	x					T2	
Acadian Flycatcher							T2	
Acorn Woodpecker	x	x						
Alder Flycatcher						S3B		
American Avocet	x	x			T2		T2	
American Bittern	x	x	T2	T2	T2	S3B		SGCN
American Dipper	x	x						
American Golden-Plover					T2			
American Kestrel	x	x						
American Oystercatcher								
American Pipit	x	x						
American Three-toed Woodpecker	x	x						
American Tree Sparrow						T2		
American White Pelican	x	x	T2	T2	T2	S3B		
American Wigeon	x	x					T2	
American Woodcock							T2	
Aplomado Falcon								SGCN, SE
Ash-throated Flycatcher	x	x						
Bachman's Sparrow								
Baird's Sandpiper						T2		
Baird's Sparrow	x	x			T2	S3B	T1	
Bald Eagle	x	x	T2, SC			T2	T2	SGCN, ST
Baltimore Oriole	x	x				T2		
Band-tailed Pigeon	x	x	T2					
Bank Swallow	x	x						SGCN
Barrow's Goldeneye			T2					
Bell's Vireo	x	x				T2		SGCN, ST
Bendire's Thrasher								SGCN
Bewick's Wren	x	x						
Black Rail						T2		
Black Rosy-Finch	x	x	T2	T3		S2		
Black Skimmer								
Black Swift			T2	T2		S1B		SGCN
Black Tern	x	x	T2	T2	T2	S3B	T1	
Black-and-white Warbler	x	x					T2	
Black-backed Woodpecker	x	x				S3		
Black-bellied Plover						T2		
Black-bellied Whistling-Duck								
Black-billed Cuckoo	x	x			T2	S3B	T1	
Black-billed Magpie	x	x					T1	
Black-capped Gnatcatcher								
Black-capped Vireo								
Black-chinned Hummingbird	x	x						
Black-chinned Sparrow	x	x						SGCN
Black-crowned Night-Heron						S3B	T2	
Black-necked Stilt		x			T2	S3B	T2	
Black-tailed Gnatcatcher	x	x						
Black-throated Gray Warbler	x	x						SGCN
Blue Grosbeak	x	x						
Blue-gray Gnatcatcher	x	x				S2B		
Blue-throated Hummingbird								
Blue-winged Warbler								
Bobolink	x	x	T2	T2	T2	S3B		
Boreal Chickadee		x				S3		
Boreal Owl			T2					SGCN, ST
Botteri's Sparrow	x	x						SGCN
Brewer's Sparrow	x	x	T2			S3B	T1	
Bridled Titmouse	x	x						

Table E.2.: Priority species detected in 2022, 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. *(continued)*

Species	Density Estimate	Occupancy Estimate	Colorado	Idaho	Kansas	Montana	Nebraska	New Mexico
Brown Creeper	x	x				S3	T2	
Brown Pelican								
Brown-capped Rosy-Finch	x	x	T1					SGCN
Brown-crested Flycatcher	x	x						
Brown-headed Nuthatch								
Buff-breasted Flycatcher								
Buff-breasted Sandpiper					T2		T1	
Buff-collared Nightjar								
Bullock's Oriole	x	x				T2	T2	
Burrowing Owl	x	x	T1, ST	T2	T2	S3B		SGCN
Bushtit	x	x						
California Gull	x	x			T2			
Calliope Hummingbird	x	x						
Canada Jay	x	x						
Canvasback					T2		T2	
Canyon Wren	x	x						
Carolina Chickadee	x	x						
Caspian Tern					T2	S2B		
Cassia Crossbill					T2			
Cassin's Finch	x	x	T2			S3		SGCN
Cassin's Kingbird	x	x					T2	
Cassin's Sparrow	x	x	T2		T2		T2	SGCN
Cattle Egret	x	x						
Cerulean Warbler					T2			
Chestnut-collared Longspur	x	x	T2		T2	S2B	T1	SGCN
Chihuahuan Raven	x	x			T2			
Chuck-will's-widow					T2		T2	
Cinnamon Teal	x	x					T2	
Clark's Grebe					T2	S3B	T2	SGCN
Clark's Nutcracker	x	x		T3		S3		SGCN
Colima Warbler								
Common Black-Hawk								SGCN, ST
Common Gallinule								
Common Ground-Dove	x	x						SGCN, SE
Common Loon					T2	S3B		
Common Nighthawk	x	x		T3	T2			SGCN
Common Poorwill	x	x			T2			
Common Tern						S3B		
Common Yellowthroat	x	x						
Cordilleran Flycatcher	x	x					T2	
Costa's Hummingbird	x	x						SGCN, ST
Curve-billed Thrasher	x	x			T2			
Dark-eyed Junco	x	x					T2	
Dark-eyed Junco (White-winged)								
Dickcissel	x	x			T2			
Dusky Flycatcher	x	x						
Dusky Grouse	x	x						
Dusky-capped Flycatcher	x	x						
Eared Grebe	x	x				T2		SGCN
Eastern Bluebird	x	x						
Eastern Kingbird	x	x				T2		
Eastern Meadowlark	x	x				T2	T2	
Eastern Whip-poor-will					T2		T2	
Eastern Wood-Pewee	x	x			T2			
Elegant Trogon								SGCN, SE
Elf Owl								SGCN
Evening Grosbeak	x	x				S3		SGCN

Table E.2.: Priority species detected in 2022, 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. *(continued)*

Species	Density Estimate	Occupancy Estimate	Colorado	Idaho	Kansas	Montana	Nebraska	New Mexico
Ferruginous Hawk	x	x	T2, SC	T2	T2	S3B	T1	
Ferruginous Pygmy-Owl								
Field Sparrow	x	x						
Five-striped Sparrow								
Flammulated Owl			T2			S3B		SGCN
Forster's Tern	x	x			T2	S3B	T2	
Franklin's Gull	x	x		T3		S3B		
Gila Woodpecker	x	x						
Gilded Flicker	x	x						
Golden Eagle	x	x	T1	T2	T2	S3	T2	
Golden-cheeked Warbler								
Golden-crowned Kinglet	x	x						
Golden-fronted Woodpecker	x	x						
Golden-winged Warbler								
Grace's Warbler	x	x	T2					SGCN
Grasshopper Sparrow	x	x	T2	T3	T2			SGCN, SE
Gray Catbird	x	x						
Gray Flycatcher	x	x						
Gray Hawk	x	x						
Gray Vireo	x	x	T2					
Gray-crowned Rosy-Finch						S2B,S5N		
Great Blue Heron	x	x				S3		
Great Egret								
Great Gray Owl				T3		S3		
Greater Pewee								
Greater Prairie-Chicken	x	x	T2		T2		T2	
Greater Sage-Grouse	x	x	T1, SC	T1		S2		
Greater Yellowlegs						T2		
Green Heron	x							
Green Parakeet								
Green-tailed Towhee	x	x				S3B		
Gull-billed Tern								
Gunnison Sage-Grouse			T1, SC					
Harris's Sparrow						T2		
Henslow's Sparrow						T2	T1	
Hooded Oriole	x	x						
Hooded Warbler								
Hook-billed Kite								
Horned Grebe						S3B		
Hudsonian Godwit						T2		
Juniper Titmouse	x	x	T2					SGCN
Kentucky Warbler						T2	T2	
King Rail							T2	
Ladder-backed Woodpecker	x	x				T2		
Lark Bunting	x	x	T2			T2		
Lark Sparrow	x	x				T2		
Lazuli Bunting	x	x	T2					
Le Conte's Sparrow						S3B		
Le Conte's Thrasher								
Least Bittern						T2		
Least Sandpiper						T2		
Least Tern	x	x	T2, SE		T1, SE	S1B	T1	SGCN, SE
Lesser Prairie-Chicken	x	x	T1, ST		T1			SGCN
Lesser Scaup	x	x					T2	
Lesser Yellowlegs						T2		
Lewis's Woodpecker	x	x	T2	T2		S2B	T2	SGCN
Lincoln's Sparrow	x	x						

Table E.2.: Priority species detected in 2022, 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. *(continued)*

Species	Density Estimate	Occupancy Estimate	Colorado	Idaho	Kansas	Montana	Nebraska	New Mexico
Little Blue Heron								
Loggerhead Shrike	x	x	T2		T2	S3B	T1	SGCN
Long-billed Curlew	x	x	T2, SC	T2	T2	S3B	T1	SGCN
Long-billed Dowitcher					T2			
Long-eared Owl		x						
Louisiana Waterthrush							T2	
Lucifer Hummingbird								SGCN, ST
Lucy's Warbler	x	x						SGCN
MacGillivray's Warbler	x	x						
Magnificent Hummingbird								
Marbled Godwit	x	x			T2			
Marsh Wren	x	x					T2	
Merlin	x	x					T2	
Mexican Chickadee								
Mexican Jay	x	x						
Mexican Whip-poor-will								SGCN
Mississippi Kite	x	x			T2		T2	
Montezuma Quail	x	x						
Mottled Duck								
Mountain Bluebird	x	x						SGCN
Mountain Plover	x	x	T1, SC		T2	S2B	T1	SGCN
Mountain Quail	x	x		T2				
Nelson's Sparrow						S3B		
Neotropic Cormorant								
Northern Bobwhite	x	x	T2		T2			
Northern Goshawk	x	x	T2			S3		
Northern Harrier	x	x	T2					
Northern Pintail	x	x			T2		T2	
Northern Pygmy-Owl	x	x						
Northern Saw-whet Owl							T2	
Olive Warbler		x						
Olive-sided Flycatcher	x	x	T2	T3				SGCN
Orange-crowned Warbler	x	x						
Orchard Oriole	x	x						
Osprey	x	x						
Pacific Wren	x	x				S3		
Painted Bunting	x	x			T2			
Painted Redstart	x	x						SGCN
Pectoral Sandpiper					T2			
Peregrine Falcon	x	x	T2, SC		T2	S3	T2	
Phainopepla	x	x						
Pied-billed Grebe	x	x					T2	
Pileated Woodpecker	x	x				S3	T2	
Pine Grosbeak	x	x						
Pine Siskin	x	x					T2	
Pinyon Jay	x	x	T2	T2		S3	T1	SGCN
Piping Plover			T2, ST		T1, ST	S2B	T1	
Plumbeous Vireo	x	x					T2	
Prairie Falcon	x	x	T2				T2	
Prairie Warbler								
Prothonotary Warbler					T2		T2	
Purple Martin	x	x	T2					
Pygmy Nuthatch	x	x					T2	SGCN
Red Crossbill	x	x						
Red Knot								
Red-cockaded Woodpecker								
Red-crowned Parrot								
Red-eyed Vireo	x	x						

Table E.2.: Priority species detected in 2022, 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. *(continued)*

Species	Density Estimate	Occupancy Estimate	Colorado	Idaho	Kansas	Montana	Nebraska	New Mexico
Red-faced Warbler	x	x						SGCN
Red-headed Woodpecker	x	x			T2	S3B		SGCN
Red-naped Sapsucker	x	x						
Red-shouldered Hawk							T2	
Reddish Egret								
Ring-billed Gull	x	x		T3				
Rose-throated Becard								
Ruby-throated Hummingbird		x					T2	
Ruffed Grouse	x	x						
Rufous Hummingbird	x	x	T2					
Rufous-crowned Sparrow	x	x						
Rufous-winged Sparrow	x	x						
Rusty Blackbird						T2		
Sage Thrasher	x	x			T2	S3B		
Sagebrush Sparrow	x	x	T2	T2		S3B		SGCN
Sandhill Crane	x	x	T1, SC	T3			T2	
Savannah Sparrow	x	x					T2	
Scaled Quail	x	x			T2			
Scissor-tailed Flycatcher	x	x			T2		T2	
Scott's Oriole	x	x						
Seaside Sparrow								
Sedge Wren	x	x				S3B		
Semipalmated Sandpiper					T2			
Sharp-tailed Grouse	x	x	T1, SC, SE	T2		S4,S1		
Short-eared Owl	x	x	T2	T3	T2		T1	
Smith's Longspur					T2			
Snowy Egret								
Snowy Plover		x	T2, SC		T1, ST		T2	SGCN
Solitary Sandpiper		x						
Sooty Tern								
Sora	x	x						
Spotted Owl			T2, ST					SGCN
Spotted Towhee	x	x			T2			
Sprague's Pipit	x	x			T2	S3B	T1	SGCN
Stilt Sandpiper					T2			
Sulphur-bellied Flycatcher								
Summer Tanager	x	x					T2	
Swainson's Hawk	x	x	T2		T2			
Swainson's Thrush	x	x						
Swainson's Warbler								
Swallow-tailed Kite								
Swamp Sparrow							T2	
Thick-billed Kingbird								SGCN, SE
Thick-billed Longspur	x	x	T2		T2	S3B	T1	SGCN
Thick-billed Parrot								
Townsend's Solitaire	x	x					T2	
Tricolored Heron								
Tropical Parula								
Trumpeter Swan		x			T2	S3	T2	
Tufted Titmouse	x	x					T2	
Upland Sandpiper	x	x	T2		T2			
Varied Bunting	x	x						
Varied Thrush	x	x				S3B		
Veery	x	x	T2			S3B		
Vermilion Flycatcher	x	x						
Vesper Sparrow	x	x						SGCN
Violet-crowned Hummingbird								SGCN, ST

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Species	Density Estimate	Occupancy Estimate	Colorado	Idaho	Kansas	Montana	Nebraska	New Mexico
Violet-green Swallow	x	x					T2	
Virginia Rail	x							
Virginia's Warbler	x	x	T2					SGCN
Western Bluebird	x	x						SGCN
Western Grebe	x	x			T2	T2	T2	
Western Kingbird	x	x				T2		
Western Meadowlark	x	x						
Western Sandpiper								
Western Screech-Owl								
Whiskered Screech-Owl								SGCN, ST
White-crowned Sparrow	x	x						
White-faced Ibis	x	x	T2	T2	S3B			
White-headed Woodpecker	x	x		T3				
White-rumped Sandpiper					T2			
White-tailed Hawk								
White-tailed Ptarmigan	x	x	T1			S3		SGCN, SE
White-throated Swift	x	x					T2	
Whooping Crane			T2, SE		T1, SE	S1M	T1	
Wild Turkey	x	x						SGCN, ST
Willet	x	x						
Williamson's Sapsucker	x	x						SGCN
Willow Flycatcher	x	x	T1, SE					SGCN, SE
Wilson's Phalarope	x	x			T2			
Wilson's Plover								
Wood Duck	x	x						
Wood Stork								
Wood Thrush	x	x					T1	
Woodhouse's Scrub-Jay	x	x						
Worm-eating Warbler								
Yellow Rail					T2	S3B		
Yellow Warbler	x	x						
Yellow-billed Cuckoo	x	x	T1, SC	T1		S3B	T2	SGCN
Yellow-breasted Chat	x	x						
Yellow-eyed Junco	x	x						
Yellow-throated Vireo	x	x					T2	
Yellow-throated Warbler					T2		T2	
Zone-tailed Hawk								

Note:
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 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).

Table E.3.: Priority species detected in 2021, 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	Density Estimate	Occupancy Estimate	North Dakota	Oklahoma	South Dakota	Texas	Utah	Wyoming
Abert's Towhee	x	x						
Acadian Flycatcher								
Acorn Woodpecker	x	x						
Alder Flycatcher								
American Avocet	x	x	L2					
American Bittern	x	x	L1				S3N,S4B,S3	T2
American Dipper	x	x			1, ST			
American Golden-Plover				T3		S3		
American Kestrel	x	x	L2			S4B		T3
American Oystercatcher						S3B		
American Pipit	x	x						T3
American Three-toed Woodpecker	x	x						
American Tree Sparrow								
American White Pelican	x	x	L2		2B	S2B,S3N	S3B	T2
American Wigeon	x	x						
American Woodcock				T3		S2B,S3N		
Aplomado Falcon						S1		
Ash-throated Flycatcher	x	x						T2
Bachman's Sparrow				T1		S3B		
Baird's Sandpiper								
Baird's Sparrow	x	x	L1	T3	2A	S2		T2
Bald Eagle	x	x	L2	T3		S3B,S3N	S4N,S2B	T2
Baltimore Oriole	x	x						
Band-tailed Pigeon	x	x					S3B	
Bank Swallow	x	x						
Barrow's Goldeneye								
Bell's Vireo	x	x		T2		S3B		
Bendire's Thrasher							SU	
Bewick's Wren	x	x				S5B		T3
Black Rail				T2		S2B		
Black Rosy-Finch	x	x					S1	T2
Black Skimmer						S4B		
Black Swift							S4N,S2B	
Black Tern	x	x	L1		2A	S3		T2
Black-and-white Warbler	x	x						
Black-backed Woodpecker	x	x						T2
Black-bellied Plover								
Black-bellied Whistling-Duck								
Black-billed Cuckoo	x	x	L1					T2
Black-billed Magpie	x	x						
Black-capped Gnatcatcher								
Black-capped Vireo				T1		S2B		
Black-chinned Hummingbird	x	x						T2
Black-chinned Sparrow	x	x						
Black-crowned Night-Heron								T2
Black-necked Stilt		x						
Black-tailed Gnatcatcher	x	x						
Black-throated Gray Warbler	x	x						T2
Blue Grosbeak	x	x						T3
Blue-gray Gnatcatcher	x	x						T3
Blue-throated Hummingbird								
Blue-winged Warbler				T2				
Bobolink	x	x	L2					T2
Boreal Chickadee		x						
Boreal Owl							S2	T2
Botteri's Sparrow	x	x				S3B		
Brewer's Sparrow	x	x	L3					T2
Bridled Titmouse	x	x						

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Species	Density Estimate	Occupancy Estimate	North Dakota	Oklahoma	South Dakota	Texas	Utah	Wyoming
Brown Creeper	x	x						
Brown Pelican						S3B		
Brown-capped Rosy-Finch	x	x						T2
Brown-crested Flycatcher	x	x						
Brown-headed Nuthatch				T2				
Buff-breasted Flycatcher								
Buff-breasted Sandpiper				T2		S2S3		
Buff-collared Nightjar								
Bullock's Oriole	x	x		T3				
Burrowing Owl	x	x	L2	T2		S3B	S3B	T1
Bushtit	x	x						T2
California Gull	x	x						
Calliope Hummingbird	x	x						T2
Canada Jay	x	x						
Canvasback			L2	T3				
Canyon Wren	x	x						T3
Carolina Chickadee	x	x				S5B		
Caspian Tern							S3B	T2
Cassia Crossbill								
Cassin's Finch	x	x						
Cassin's Kingbird	x	x						
Cassin's Sparrow	x	x		T2		S4B		
Cattle Egret	x	x						T2
Cerulean Warbler				T2		SHB,S3N		
Chestnut-collared Longspur	x	x	L1	T2	2A			T2
Chihuahuan Raven	x	x						
Chuck-will's-widow						S3S4B		
Cinnamon Teal	x	x						
Clark's Grebe								T2
Clark's Nutcracker	x	x						T2
Colima Warbler						S3B		
Common Black-Hawk						S2B		
Common Gallinule								
Common Ground-Dove	x	x						
Common Loon								T1
Common Nighthawk	x	x						T3
Common Poorwill	x	x						
Common Tern								
Common Yellowthroat	x	x				S5B		T3
Cordilleran Flycatcher	x	x						
Costa's Hummingbird	x	x						
Curve-billed Thrasher	x	x						
Dark-eyed Junco	x	x						
Dark-eyed Junco (White-winged)					2B			
Dickcissel	x	x	L2			S4B		T2
Dusky Flycatcher	x	x						
Dusky Grouse	x	x						
Dusky-capped Flycatcher	x	x						
Eared Grebe	x	x						
Eastern Bluebird	x	x						
Eastern Kingbird	x	x						
Eastern Meadowlark	x	x				S5B		
Eastern Whip-poor-will				T2				
Eastern Wood-Pewee	x	x						
Elegant Trogon								
Elf Owl								
Evening Grosbeak	x	x						

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Species	Density Estimate	Occupancy Estimate	North Dakota	Oklahoma	South Dakota	Texas	Utah	Wyoming
Ferruginous Hawk	x	x	L1	T3		S2B,S4N	S3B	T2
Ferruginous Pygmy-Owl						S3B		
Field Sparrow	x	x				S5B		
Five-striped Sparrow								
Flammulated Owl							S3,S4B	T3
Forster's Tern	x	x				S5		T2
Franklin's Gull	x	x	L1			S2		T2
Gila Woodpecker	x	x						
Gilded Flicker	x	x						
Golden Eagle	x	x	L2	T3		S3B	S4	T2
Golden-cheeked Warbler						S2B		
Golden-crowned Kinglet	x	x						
Golden-fronted Woodpecker	x	x		T3				
Golden-winged Warbler				T3				
Grace's Warbler	x	x						
Grasshopper Sparrow	x	x	L1			S3B		T2
Gray Catbird	x	x						
Gray Flycatcher	x	x						
Gray Hawk	x	x				S2B		
Gray Vireo	x	x						T2
Gray-crowned Rosy-Finch								
Great Blue Heron	x	x						T2
Great Egret								
Great Gray Owl								T2
Greater Pewee								
Greater Prairie-Chicken	x	x	L2	T3	2A	S1B		
Greater Sage-Grouse	x	x	L1				S3	T2
Greater Yellowlegs								
Green Heron	x					S5B		
Green Parakeet						S3		
Green-tailed Towhee	x	x						
Gull-billed Tern						S4B		
Gunnison Sage-Grouse							S2	
Harris's Sparrow				T3		S4		
Henslow's Sparrow				T1		SXB,S3N,S2		
Hooded Oriole	x	x						
Hooded Warbler				T2				
Hook-billed Kite						S2		
Horned Grebe			L1					
Hudsonian Godwit				T3		S2		
Juniper Titmouse	x	x		T3				T2
Kentucky Warbler				T3		S3B		
King Rail				T3		S3B		
Ladder-backed Woodpecker	x	x						
Lark Bunting	x	x	L1		2A			
Lark Sparrow	x	x				S4B		
Lazuli Bunting	x	x						
Le Conte's Sparrow			L2	T2		S3		
Le Conte's Thrasher								
Least Bittern						S4B		
Least Sandpiper								
Least Tern	x	x	L2	T2	1, SE	S3B		
Lesser Prairie-Chicken	x	x		T2		S2B		
Lesser Scaup	x	x	L2	T3				
Lesser Yellowlegs								
Lewis's Woodpecker	x	x					S3	T2
Lincoln's Sparrow	x	x						

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Species	Density Estimate	Occupancy Estimate	North Dakota	Oklahoma	South Dakota	Texas	Utah	Wyoming
Little Blue Heron				T2		S5B		
Loggerhead Shrike	x	x	L2	T1		S4B		T2
Long-billed Curlew	x	x	L1	T2	2A	S3B,S5N		T2
Long-billed Dowitcher								
Long-eared Owl		x						
Louisiana Waterthrush				T3		S3B		
Lucifer Hummingbird								
Lucy's Warbler	x	x						
MacGillivray's Warbler	x	x						T2
Magnificent Hummingbird								
Marbled Godwit	x	x	L1		2A			
Marsh Wren	x	x						
Merlin	x	x						T3
Mexican Chickadee								
Mexican Jay	x	x						
Mexican Whip-poor-will								
Mississippi Kite	x	x				S4B		
Montezuma Quail	x	x				S3B		
Mottled Duck						S4B		
Mountain Bluebird	x	x						
Mountain Plover	x	x		T1		S2		T1
Mountain Quail	x	x						
Nelson's Sparrow			L1	T3				
Neotropic Cormorant								
Northern Bobwhite	x	x		T3		S4B		
Northern Goshawk	x	x						T1
Northern Harrier	x	x	L2			S3N,S2B		
Northern Pintail	x	x	L2	T3		S3B,S5N		
Northern Pygmy-Owl	x	x					S4B,S3	T2
Northern Saw-whet Owl								
Olive Warbler		x						
Olive-sided Flycatcher	x	x					S3,S4B	
Orange-crowned Warbler	x	x						
Orchard Oriole	x	x				S4B		
Osprey	x	x			1, ST			
Pacific Wren	x	x						
Painted Bunting	x	x		T2		S4B		
Painted Redstart	x	x						
Pectoral Sandpiper								
Peregrine Falcon	x	x	L3	T3	1, SE	S3	S3B	T2
Phainopepla	x	x						
Pied-billed Grebe	x	x						
Pileated Woodpecker	x	x				S4B		
Pine Grosbeak	x	x						
Pine Siskin	x	x						
Pinyon Jay	x	x		T3				
Piping Plover			L2	T3	1, ST	S2		
Plumbeous Vireo	x	x						
Prairie Falcon	x	x	L2	T3				
Prairie Warbler				T2				
Prothonotary Warbler				T2		S3B		
Purple Martin	x	x						T3
Pygmy Nuthatch	x	x						T2
Red Crossbill	x	x						T2
Red Knot			L3	T3		S3N		
Red-cockaded Woodpecker				T1		S2B		
Red-crowned Parrot						S2		
Red-eyed Vireo	x	x						T2

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Species	Density Estimate	Occupancy Estimate	North Dakota	Oklahoma	South Dakota	Texas	Utah	Wyoming
Red-faced Warbler	x	x						
Red-headed Woodpecker	x	x	L1	T2		S3B		T2
Red-naped Sapsucker	x	x						
Red-shouldered Hawk						S4B		
Reddish Egret						S3B		
Ring-billed Gull	x	x						
Rose-throated Becard								
Ruby-throated Hummingbird		x						
Ruffed Grouse	x	x						
Rufous Hummingbird	x	x						T2
Rufous-crowned Sparrow	x	x				S4B		
Rufous-winged Sparrow	x	x						
Rusty Blackbird				T3		S3		
Sage Thrasher	x	x						T2
Sagebrush Sparrow	x	x						T2
Sandhill Crane	x	x						
Savannah Sparrow	x	x						
Scaled Quail	x	x		T3		S4B		
Scissor-tailed Flycatcher	x	x				S3B		
Scott's Oriole	x	x						T2
Seaside Sparrow						S4B		
Sedge Wren	x	x				S4		
Semipalmated Sandpiper								
Sharp-tailed Grouse	x	x	L2				S2	T2
Short-eared Owl	x	x	L2	T3		S4N		T2
Smith's Longspur				T2		S3		
Snowy Egret				T3		S5B		T2
Snowy Plover		x		T1		S3B	S3B	T3
Solitary Sandpiper		x		T3				
Sooty Tern						S2B		
Sora	x	x						
Spotted Owl						S1B	S2	
Spotted Towhee	x	x						
Sprague's Pipit	x	x	L1	T3	2A	S3N		
Stilt Sandpiper						S3		
Sulphur-bellied Flycatcher								
Summer Tanager	x	x				S5B		
Swainson's Hawk	x	x	L1	T2		S4B		T2
Swainson's Thrush	x	x						
Swainson's Warbler				T2		S3B		
Swallow-tailed Kite				T3		S2B		
Swamp Sparrow								
Thick-billed Kingbird								
Thick-billed Longspur	x	x	L3	T2		S4		T2
Thick-billed Parrot								
Townsend's Solitaire	x	x						
Tricolored Heron						S5B		
Tropical Parula						S3B		
Trumpeter Swan		x		T3	2B			T2
Tufted Titmouse	x	x						
Upland Sandpiper	x	x	L2	T3				T2
Varied Bunting	x	x						
Varied Thrush	x	x						
Veery	x	x						
Vermilion Flycatcher	x	x						
Vesper Sparrow	x	x						
Violet-crowned Hummingbird								

Table E.3.: Priority species detected in 2021, 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. *(continued)*

Species	Density Estimate	Occupancy Estimate	North Dakota	Oklahoma	South Dakota	Texas	Utah	Wyoming
Violet-green Swallow	x	x						
Virginia Rail	x							T3
Virginia's Warbler	x	x						T2
Western Bluebird	x	x						
Western Grebe	x	x						T2
Western Kingbird	x	x						
Western Meadowlark	x	x	L2					
Western Sandpiper				T3		S5		
Western Screech-Owl								
Whiskered Screech-Owl								
White-crowned Sparrow	x	x						
White-faced Ibis	x	x				S4B	S2,S3B	T2
White-headed Woodpecker	x	x						
White-rumped Sandpiper								
White-tailed Hawk						S4B		
White-tailed Ptarmigan	x	x						
White-throated Swift	x	x						
Whooping Crane			L3	T3	1, SE	S1		
Wild Turkey	x	x				S5B		
Willet	x	x	L2		2B			
Williamson's Sapsucker	x	x						T2
Willow Flycatcher	x	x		T3			S1B	T3
Wilson's Phalarope	x	x	L1	T3	2B			
Wilson's Plover						S4B		
Wood Duck	x	x						
Wood Stork					T3	S2N,SHB		
Wood Thrush	x	x		T2		S4B		
Woodhouse's Scrub-Jay	x	x						T2
Worm-eating Warbler				T2		S3B		
Yellow Rail			L1	T3				
Yellow Warbler	x	x						
Yellow-billed Cuckoo	x	x				S5B,S4	S2B	T2
Yellow-breasted Chat	x	x						
Yellow-eyed Junco	x	x						
Yellow-throated Vireo	x	x						
Yellow-throated Warbler						S4B		
Zone-tailed Hawk						S3B		

Note:
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 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; (Utan 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).

Priority species detected in 2022, 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.

Bureau of Land Management

Table E.4.: Priority species detected on Bureau of Land Management lands in 2022, 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	Density Estimate	Occupancy Estimate	South Dakota BLM	Washington BLM	Idaho BLM	Nevada BLM	California BLM	Oregon BLM	Wyoming BLM	North Dakota BLM	Colorado BLM	Utah BLM	Montana BLM
Abert's Towhee	x	x										SS	
Acorn Woodpecker	x	x											
American Avocet	x	x										SS	
American Bittern	x	x	SS									SS	SS
Ash-throated Flycatcher	x	x											
American Three-toed Woodpecker	x	x										SS	
American White Pelican	x	x						SS			SS	SS	
Bald Eagle	x	x	SS		T2	SS	SS	SS	SS	SS	SS	SS	SS
Baird's Sparrow	x	x	SS						SS	SS			SS
Bank Swallow	x	x						SS					
Black-billed Cuckoo	x	x	SS										
Black-backed Woodpecker	x	x	SS							SS			SS
Black-chinned Sparrow	x	x										SS	
Bendire's Thrasher						SS	SS					SS	
Bell's Vireo	x	x					SS					SS	
Blue-gray Gnatcatcher	x	x	SS										SS
Black Rail							SS						
Black Rosy-Finch	x	x				SS		SS				SS	
Black Swift					T2			SS			SS	SS	
Black Tern	x	x	SS		T2					SS			SS
Black-necked Stilt		x										SS	
Bobolink	x	x						SS				SS	
Brown Pelican							SS	SS					
Brewer's Sparrow	x	x	SS			SS			SS		SS	SS	SS
Band-tailed Pigeon	x	x										SS	
Black-throated Sparrow	x	x			T2								
Black-throated Gray Warbler	x	x										SS	
Bufflehead								SS					
Burrowing Owl	x	x	SS		T2	SS	SS		SS	SS	SS	SS	SS
Cassin's Finch	x	x			T2							SS	
Calliope Hummingbird	x	x										SS	
California Towhee							SS						
Caspian Tern			SS									SS	SS
Chestnut-collared Longspur	x	x	SS									SS	SS
Clark's Grebe													
Clapper Rail						SS	SS						
Common Loon													
Common Tern			SS										SS
Crissal Thrasher	x	x				SS						SS	
Eared Grebe	x	x										SS	
Elf Owl							SS						
Ferruginous Hawk	x	x	SS		T2	SS			SS	SS	SS	SS	SS
Flammulated Owl			SS		T2	SS						SS	SS
Forster's Tern	x	x	SS									SS	SS
Franklin's Gull	x	x	SS					SS					SS
Gambel's Quail	x	x										SS	
Gray-crowned Rosy-Finch						SS							
Great Gray Owl			SS										SS
Gilded Flicker	x	x					SS						
Gila Woodpecker	x	x					SS						
Golden Eagle	x	x	SS		T2	SS	SS			SS	SS	SS	SS
Gray Flycatcher	x	x											
Greater Sage-Grouse	x	x	SS		T2	SS	SS	SS	SS	SS	SS	SS	SS
Grasshopper Sparrow	x	x	SS		T2			SS				SS	
Gray Vireo	x	x						SS				SS	
Grace's Warbler	x	x										SS	
Green-tailed Towhee	x	x			T2							SS	
Gunnison Sage-Grouse											FT	SS	
Gyrfalcon													
Horned Grebe			SS					SS					
Long-billed Curlew	x	x	SS		T2	SS			SS	SS	SS	SS	SS
Le Conte's Sparrow								SS					
Le Conte's Thrasher						SS							
Least Bittern						SS							
Lesser Goldfinch	x	x											
Lesser Prairie-Chicken	x	x									SS		
Least Tern	x	x								FE			
Lewis's Woodpecker	x	x	SS		T2	SS		SS				SS	SS
Loggerhead Shrike	x	x	SS		T2	SS			SS			SS	SS
Lucy's Warbler	x	x					SS					SS	

Species	Density Estimate	Occupancy Estimate	South Dakota BLM	Washington BLM	Idaho BLM	Nevada BLM	California BLM	Oregon BLM	Wyoming BLM	North Dakota BLM	Colorado BLM	Utah BLM	Montana BLM
Marbled Godwit	x	x	SS									SS	
Mountain Plover	x	x	SS				SS		SS		SS	SS	SS
Mountain Quail	x	x			T2	SS							
Northern Goshawk	x	x			T2	SS	SS		SS		SS	SS	
Northern Pygmy-Owl	x	x										SS	
Northern Waterthrush	x	x						SS					
Olive-sided Flycatcher	x	x			T2							SS	
Osprey	x	x										SS	
Peregrine Falcon	x	x	SS				SS		SS	SS	SS	SS	SS
Phainopepla	x	x				SS							
Pinyon Jay	x	x			T2	SS						SS	
Prairie Falcon	x	x										SS	
Purple Martin	x	x						SS					
Red Knot										FT			
Red-headed Woodpecker	x	x	SS										SS
Red-necked Grebe								SS					
Sagebrush Sparrow	x	x	SS		T2				SS			SS	SS
Sandhill Crane	x	x				SS	SS						
Sage Thrasher	x	x	SS		T2	SS			SS			SS	SS
Short-eared Owl	x	x			T2	SS						SS	
Snowy Egret								SS					
Snowy Plover		x				SS		SS			SS	SS	
Spotted Owl							SS					SS	
Sprague's Pipit	x	x	SS							SS			SS
Sharp-tailed Grouse	x	x			T2	SS			SS	SS	SS	SS	
Swainson's Hawk	x	x				SS	SS						
Thick-billed Longspur	x	x	SS										SS
Tricolored Blackbird							SS	SS				SS	
Trumpeter Swan		x	SS		T2				SS	SS			SS
Tufted Puffin									SS				
Upland Sandpiper	x	x							SS				
Vaux's Swift	x	x			T2								
Veery	x	x	SS									SS	SS
Virginia's Warbler	x	x			T2							SS	
White-faced Ibis	x	x	SS						SS		SS	SS	SS
Whooping Crane												SS	
White-headed Woodpecker	x	x			T2			SS				SS	
Willow Flycatcher	x	x			T2	SS	SS					SS	
Wilson's Phalarope	x	x										SS	
Williamson's Sapsucker	x	x										SS	
White-tailed Kite								SS					
Yellow-billed Cuckoo	x	x			FT	SS	SS		FT		FT	FT	
Yellow Rail			SS						SS			SS	

Note:
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); 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).

U.S.F.S. Region 1

Table E.5.: Priority species detected on US Forest Service lands in Region 1 in 2022, 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	Occupancy	Density	Region-wide USFS R1	Helena NF	Kootenai NF	Flathead NF	Bitterroot NF	Beaverhead-Deerlodge NF	Dakota Prairie NG	Idaho Panhandle NF	Lewis and Clark NF	Lolo NF	Gallatin NF	Clearwater NF	Nez Perce NF	Custer NF
American Three-toed Woodpecker	x	x									MIS					
Bald Eagle	x	x	SS	MIS, SS	SS	MIS, SS	SS	SS	SS	SS	MIS, SS	SS		MIS, SS	MIS, SS	SS
Baird's Sparrow	x	x	SS						SS							SS
Black-backed Woodpecker	x	x	SS	SS	SS		SS	SS			SS	SS	SS	SS	SS	SS
Belted Kingfisher		x													MIS	
Blue-gray Gnatcatcher	x	x	SS													SS
Black Swift			SS							SS					SS	
Brewer's Sparrow	x	x														MIS
Bullock's Oriole	x	x														MIS
Burrowing Owl	x	x	SS						SS		SS					SS
Cassin's Kingbird	x	x														MIS
Chipping Sparrow	x	x			FS					FS						
Common Loon			SS		SS	MIS, SS					SS		SS		SS	
Dusky Flycatcher	x	x			FS					FS						
Dusky Grouse	x	x									MIS					
Flammulated Owl			SS	SS	SS	MIS, SS	SS	SS			SS	SS	SS	SS	SS	
Golden Eagle	x	x									MIS					
Greater Prairie-Chicken	x	x	SS						MIS, SS							MIS
Greater Sage-Grouse	x	x	SS					SS	MIS, SS							SS
Hammond's Flycatcher	x	x			FS					FS						
Hairy Woodpecker	x	x			FS					FS						
Lark Sparrow	x	x														MIS
Long-billed Curlew	x	x	SS						SS						SS	SS
Least Tern	x	x														FE
Loggerhead Shrike	x	x	SS						SS							SS
Mountain Quail	x	x	SS												SS	
Northern Goshawk	x	x	MIS								MIS	MIS	MIS	MIS	MIS	MIS
Olive-sided Flycatcher	x	x			FS					FS						MIS
Ovenbird	x	x														MIS
Peregrine Falcon	x	x	SS		SS	MIS, SS	SS	SS			MIS, SS	MIS, SS	SS		MIS, SS	SS
Piping Plover									FT							FT
Pileated Woodpecker	x	x	MIS			MIS						MIS		MIS	MIS	
Prairie Falcon	x	x									MIS					
Pygmy Nuthatch	x	x	SS								SS				SS	SS
Red Knot									FT							
Ruffed Grouse	x	x														MIS
Sprague's Pipit	x	x	SS						SS							SS
Spotted Towhee	x	x														
Sharp-tailed Grouse	x	x							MIS							MIS
Trumpeter Swan	x							SS					SS			
Western Kingbird	x	x														MIS
Whooping Crane									FE							
White-headed Woodpecker	x	x	SS												SS	
Yellow-billed Cuckoo	x	x				FT						FT				
Yellow Warbler	x	x														MIS

Note:
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)

U.S.F.S. Region 2

Table E.6.: Priority species detected on US Forest Service lands in Region 2 in 2022, 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, Uncompahgre 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	Occupancy	Density	Region-wide USFS R2	White River NF	Routt NF	Oglala NG	San Juan NF	Arapaho/Roosevelt NF	Rio Grande NF	Medicine Bow NF	Nebraska/Samuel R. McKelvie NF
American Dipper	x	x									
American Pipit	x	x		MIS							
American Three-toed Woodpecker	x	x								MIS	
Bald Eagle	x	x									
Barrow's Goldeneye				SVC							
Black-and-white Warbler	x	x									
Black-backed Woodpecker	x	x	SS								
Brown-capped Rosy-Finch	x	x								SSC	
Black Swift			SS	SNMI							
Black Tern	x	x	SS								
Boreal Owl			SS								
Brown Creeper	x	x							MIS	SSC	
Brewer's Sparrow	x	x	SS	MIS							
Bullock's Oriole	x	x									
Burrowing Owl	x	x	SS					MIS			
Broad-winged Hawk	x										
Calliope Hummingbird	x	x									
Cassin's Sparrow	x	x	SS								
Chestnut-collared Longspur	x	x	SS								
Cooper's Hawk	x	x									
Common Loon											
Dusky Grouse	x	x									
Ferruginous Hawk	x	x	SS					MIS			
Flammulated Owl			SS								
Golden-crowned Kinglet	x	x					MIS	MIS		MIS	
Great Gray Owl											
Greater Prairie-Chicken	x	x	SS								MIS
Greater Sage-Grouse	x	x	SS			MIS					
Grasshopper Sparrow	x	x	SS								
Grace's Warbler	x	x	SS								
Green-tailed Towhee	x	x					MIS				
Gunnison Sage-Grouse											
Hairy Woodpecker	x	x					MIS	MIS			
Hermit Thrush	x	x							MIS		
Juniper Titmouse	x	x									
Lark Bunting	x	x	SS					MIS			
Long-billed Curlew	x	x	SS								
Lesser Prairie-Chicken	x	x									
Least Tern	x	x	FE								
Lewis's Woodpecker	x	x	SS								
Lincoln's Sparrow	x	x							MIS	MIS	
Loggerhead Shrike	x	x	SS								
Mallard	x	x					MIS				
Mountain Bluebird	x	x					MIS	MIS			
Mountain Plover	x	x	SS					MIS			
Northern Goshawk	x	x	SS		MIS			MIS		MIS	
Northern Harrier	x	x	SS								
Northern Saw-whet Owl											
Olive-sided Flycatcher	x	x	SS								
Peregrine Falcon	x	x		SC							
Pinyon Jay	x	x	SS								
Piping Plover			FE								
Purple Martin	x	x	SS								
Pygmy Nuthatch	x	x		SVC					MIS	MIS	MIS
Red-breasted Nuthatch	x	x									
Red Crossbill	x	x									
Ruffed Grouse	x	x									
Sagebrush Sparrow	x	x	SS								
Short-eared Owl	x	x	SS								
Song Sparrow	x	x									
Spotted Owl			FT				MIS				
Sharp-shinned Hawk	x	x									
Sharp-tailed Grouse	x	x	SS			MIS		MIS			MIS
Swainson's Hawk	x	x									
Thick-billed Longspur	x	x	SS								
Trumpeter Swan	x		SS								

Table E.6.: Priority species detected on US Forest Service lands in Region 2 in 2022, 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. *(continued)*

Species	Occupancy	Density	Region-wide USFS R2	White River NF	Routt NF	Oglala NG	San Juan NF	Arapaho/Roosevelt NF	Rio Grande NF	Medicine Bow NF	Nebraska/Samuel R. McKelvie NF
Vesper Sparrow	x	x			MIS					MIS	
Virginia's Warbler	x	x	SS	MIS							
Warbling Vireo	x	x							MIS		
Whooping Crane			FE								
Willow Flycatcher	x	x					MIS				
Wild Turkey	x	x					MIS				
Wilson's Warbler	x	x			MIS			MIS	MIS	MIS	
White-tailed Ptarmigan	x	x	SS								
Yellow-billed Cuckoo	x	x	FT								

Note:
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).

Table E.7.: Priority species detected on US Forest Service lands in Region 2 in 2022, 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.

Species	Occupancy	Density	Thunder Basin NG	Fort Pierre NG	Shoshone NF	Comanche/Cimarron NG	Buffalo Gap NG	Pawnee NG	Grand Mesa/Uncompahgre/Gunnison NF	Bighorn NF	Black Hills NF
American Dipper	x	x									SLC
American Pipit	x	x									
American Three-toed Woodpecker	x	x									
Bald Eagle	x	x			MIS				MIS		
Barrow's Goldeneye											
Black-and-white Warbler	x	x									SLC
Black-backed Woodpecker	x	x									MIS
Brown-capped Rosy-Finch	x	x									
Black Swift											
Black Tern	x	x									
Boreal Owl											
Brown Creeper	x	x									MIS
Brewer's Sparrow	x	x			MIS				MIS	MIS	
Bullock's Oriole	x	x				MIS					
Burrowing Owl	x	x						MIS			
Broad-winged Hawk	x										SLC
Calliope Hummingbird	x	x								SLC	
Cassin's Sparrow	x	x									
Chestnut-collared Longspur	x	x									
Cooper's Hawk	x	x									SLC
Common Loon										SLC	
Dusky Grouse	x	x			MIS						
Ferruginous Hawk	x	x						MIS			
Flammulated Owl											
Golden-crowned Kinglet	x	x							MIS	SLC	MIS
Great Gray Owl										SLC	
Greater Prairie-Chicken	x	x		MIS							
Greater Sage-Grouse	x	x	MIS	MIS			MIS				
Grasshopper Sparrow	x	x									MIS
Grace's Warbler	x	x									
Green-tailed Towhee	x	x									
Gunnison Sage-Grouse									MIS		
Hairy Woodpecker	x	x			MIS			MIS	MIS		
Hermit Thrush	x	x									
Juniper Titmouse	x	x							MIS		
Lark Bunting	x	x						MIS			
Long-billed Curlew	x	x				MIS					
Lesser Prairie-Chicken	x	x				MIS					
Least Tern	x	x									
Lewis's Woodpecker	x	x							MIS		
Lincoln's Sparrow	x	x									
Loggerhead Shrike	x	x									
Mallard	x	x									
Mountain Bluebird	x	x						MIS			
Mountain Plover	x	x						MIS			
Northern Goshawk	x	x			MIS				MIS		
Northern Harrier	x	x									
Northern Saw-whet Owl											SLC
Olive-sided Flycatcher	x	x									
Peregrine Falcon	x	x			MIS				MIS		
Pinyon Jay	x	x							MIS		
Piping Plover											
Purple Martin	x	x									
Pygmy Nuthatch	x	x						MIS		SLC	SLC
Red-breasted Nuthatch	x	x								MIS	
Red Crossbill	x	x							MIS		
Ruffed Grouse	x	x			MIS						MIS
Sagebrush Sparrow	x	x									
Short-eared Owl	x	x									
Song Sparrow	x	x									MIS
Spotted Owl											
Sharp-shinned Hawk	x	x									SLC
Sharp-tailed Grouse	x	x	MIS	MIS			MIS				
Swainson's Hawk	x	x								SLC	
Thick-billed Longspur	x	x									
Trumpeter Swan	x										
Vesper Sparrow	x	x									
Virginia's Warbler	x	x									

Table E.7.: Priority species detected on US Forest Service lands in Region 2 in 2022, 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. *(continued)*

Species	Occupancy	Density	Thunder Basin NG	Fort Pierre NG	Shoshone NF	Comanche/Cimarron NG	Buffalo Gap NG	Pawnee NG	Grand Mesa/Uncompahgre/Gunnison NF	Bighorn NF	Black Hills NF
Warbling Vireo	x	x						MIS			
Whooping Crane											
Willow Flycatcher	x	x									
Wild Turkey	x	x									
Wilson's Warbler	x	x						MIS			
White-tailed Ptarmigan	x	x									
Yellow-billed Cuckoo	x	x									

Note:
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).

U.S.F.S. Region 3

Table E.8.: Priority species detected on US Forest Service lands in Region 3 in 2022, 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	Occupancy	Density	Region-wide USFS R3	Tonto NF	Carson NF	Kiowa/Rita Blanca NG	Prescott NF	Kaibab NF	Coconino NF	Coronado NF
Squirrel, Abert's	x	x			MIS					
Abert's Towhee	x	x	SS				SC			
Acorn Woodpecker	x	x								MIS
American Kestrel	x	x								MIS
Ash-throated Flycatcher	x	x		MIS						MIS
Bald Eagle	x	x	SS	MIS			SC			
Baird's Sparrow	x	x	SS							MIS
Buff-breasted Flycatcher			SS							MIS
Brown-crested Flycatcher	x	x								MIS
Buff-collared Nightjar			SS							
Black-chinned Sparrow	x	x		MIS						
Bendire's Thrasher							SC			
Bell's Vireo	x	x	SS	MIS			SC			MIS
Bewick's Wren	x	x								MIS
Brown-headed Cowbird	x	x					SC			
Blue-throated Hummingbird										MIS
Boreal Owl			SS							
Brown Creeper	x	x								MIS
Brewer's Sparrow	x	x			MIS					
Bridled Titmouse	x	x								MIS
Black-throated Sparrow	x	x		MIS						
Burrowing Owl	x	x	SS			PMIS	SC			
Canyon Towhee	x	x		MIS						
Common Black-Hawk			SS	MIS			SC			
Cinnamon Teal	x	x							MIS	
Cordilleran Flycatcher	x	x					SC			MIS
Common Ground-Dove	x	x	SS							
Costa's Hummingbird	x	x	SS							
Crissal Thrasher	x	x					SC			
Dusky-capped Flycatcher	x	x								MIS
Eastern Bluebird	x	x								MIS
Elf Owl							SC			MIS
Elegant Trogon			SS							MIS
European Starling	x	x					SC			MIS
Ferruginous Hawk	x	x					SC			
Ferruginous Pygmy-Owl			SS							
Flammulated Owl							SC			MIS
Five-striped Sparrow										MIS
Gilded Flicker	x	x					SC			
Gila Woodpecker	x	x	SS				SC			MIS
Gray Catbird	x	x	SS							
Gray Hawk	x	x								MIS
Grasshopper Sparrow	x	x	SS				SC			
Gray Vireo	x	x	SS	MIS			SC			
Grace's Warbler	x	x					SC	FS		
Hairy Woodpecker	x	x		MIS	MIS		SC		MIS	MIS
Horned Lark	x	x		MIS						
Hooded Oriole	x	x		MIS						
House Wren	x	x								MIS
Juniper Titmouse	x	x		MIS	MIS		SC		MIS	MIS
Ladder-backed Woodpecker	x	x								MIS
Lincoln's Sparrow	x	x							MIS	
Lucifer Hummingbird			SS							
Lucy's Warbler	x	x					SC		MIS	MIS
MacGillivray's Warbler	x	x					SC			
Mountain Bluebird	x	x				MIS				
Montezuma Quail	x	x								MIS
Mountain Plover	x	x	SS							
Northern Flicker	x	x		MIS						MIS
Northern Goshawk	x	x	SS	MIS			SC		MIS	
Northern Pygmy-Owl	x	x								MIS

Species	Occupancy	Density	Region-wide USFS R3	Tonto NF	Carson NF	Kiowa/Rita Blanca NG	Prescott NF	Kaibab NF	Coconino NF	Coronado NF
Orange-crowned Warbler	x	x					SC			
Peregrine Falcon	x	x	SS				SC			MIS
Pinyon Jay	x	x					SC			
Purple Martin	x	x					SC			
Pygmy Nuthatch	x	x		MIS			SC		MIS	MIS
Red-breasted Nuthatch	x	x								MIS
Ruby-crowned Kinglet	x	x						FS		
Squirrel, Red	x	x			MIS					MIS
Red-faced Warbler	x	x					SC			
Red-naped Sapsucker	x	x							MIS	
Rose-throated Becard			SS							MIS
Savannah Sparrow	x	x		MIS						
Sulphur-bellied Flycatcher			SS							MIS
Spotted Owl							SC		MIS	MIS
Spotted Towhee	x	x		MIS			SC			
Summer Tanager	x	x		MIS						
Swainson's Hawk	x	x					SC			
Thick-billed Kingbird			SS							MIS
Townsend's Solitaire	x	x		MIS						
Varied Bunting	x	x	SS							
Violet-crowned Hummingbird			SS							
Violet-green Swallow	x	x		MIS						MIS
Virginia's Warbler	x	x					SC			
Warbling Vireo	x	x		MIS						
White-breasted Nuthatch	x	x								MIS
Western Bluebird	x	x		MIS				FS		
White-eared Hummingbird			SS							
Western Screech-Owl										MIS
Western Wood-Pewee	x	x		MIS						
Whiskered Screech-Owl			SS							MIS
Willow Flycatcher	x	x					SC			
Wild Turkey	x	x	SS	MIS	MIS		SC		MIS	MIS
White-tailed Ptarmigan	x	x	SS		MIS					
Yellow-breasted Chat	x	x							MIS	
Yellow-billed Cuckoo	x	x					FT			
Yellow-eyed Junco	x	x	SS							

Note:
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).

U.S.F.S. Region 4

Table E.9.: Priority species detected on US Forest Service lands in Region 4 in 2022, 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	Occupancy	Density	Region-wide USFS R4	Sawtooth NF	Boise NF	Uinta-Wasatch-Cache NF	Ashley NF	Humboldt-Toiyabe NF	Caribou-Targhee NF	Salmon-Challis NF	Bridger-Teton NF	Payette NF	Manti-La Sal NF
American Dipper	x	x			FS								
American Three-toed Woodpecker	x	x	SS		SS		SS	SS			SS		
Bald Eagle	x	x	SS		SS		SS	SS	MIS		SS		
Black-backed Woodpecker	x	x			MIS								
Black Rosy-Finch	x	x										PSCC	
Boreal Owl			SS		SS						SS		
Brown Creeper	x	x								MIS			
Brewer's Sparrow	x	x		SI								MIS	
Clark's Grebe					FS								
Cooper's Hawk	x	x											SS
Common Loon			SS		SS						SS		
Dusky Grouse	x	x											MIS
Flammulated Owl			SS		SS		SS	SS			SS		
Great Gray Owl			SS		SS					MIS	SS		
Golden Eagle	x	x					MIS	EPA					MIS, SS
Greater Sage-Grouse	x	x	SS	MIS	SS		MIS, SS	SS		PMIS	PSCC, SS	MIS	
Lazuli Bunting	x	x			FS								
Lewis's Woodpecker	x	x			FS							MIS	SS
Lincoln's Sparrow	x	x					MIS						
Loggerhead Shrike	x	x			FS								
Mountain Bluebird	x	x								MIS			
Mountain Chickadee	x	x										MIS	
Mountain Quail	x	x	SS		SS			SS					
Northern Goshawk	x	x	SS	MIS	SS	FS	MIS, SS	SS	MIS		MIS	SS	
Olive-sided Flycatcher	x	x		SI									
Peregrine Falcon	x	x	SS		SS		SS	CAS, SS	MIS		SS		
Phainopepla	x	x						MIS					
Pinyon Jay	x	x						NSC					
Pileated Woodpecker	x	x			MIS					MIS		MIS	
Pygmy Nuthatch	x	x								MIS			
Ruby-crowned Kinglet	x	x								MIS			
Red-naped Sapsucker	x	x					MIS						
Song Sparrow	x	x					MIS						
Spotted Owl			S(C),T(M)										
Sharp-tailed Grouse	x	x	SS	SI	SS			SS					MIS
Trumpeter Swan	x		SS							MIS	SS		
Vesper Sparrow	x	x								MIS		MIS	
Warbling Vireo	x	x					MIS						
Western Meadowlark	x	x			FS								
Whooping Crane													
White-headed Woodpecker	x	x	SS		MIS			SS				PMIS	
Willow Flycatcher	x	x											
Williamson's Sapsucker	x	x										MIS	
Yellow-billed Cuckoo	x	x	FT		FT						FT		FT
Yellow-bellied Sapsucker										MIS			
Yellow Warbler	x	x								MIS		MIS	

Note:

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)