Integrated Monitoring in Bird Conservation Regions (IMBCR):

2015 Field Season Report

June 2016

Bird Conservancy of the Rockies
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Bird Conservancy of the Rockies

Connecting people, birds and land

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

Vision: Native bird populations are sustained in healthy ecosystems

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

Core Values:

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

Goals:

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

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Executive Summary

Bird Conservancy of the Rockies (Bird Conservancy), in conjunction with its partners, conducted landbird monitoring for the eighth year in a row for the Integrated Monitoring in Bird Conservation Regions (IMBCR) program. In 2015, IMBCR surveyed across three entire states (Colorado, Montana and Wyoming) and portions of ten additional states (Arizona, Idaho, Kansas, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas and Utah). We surveyed across US Forest Service (USFS) Regions 1 and 2 and portions of Regions 3 and 4; all of the Badlands and Prairies Bird Conservation Region (BCR) and portions of seven other BCRs (Great Basin, Northern Rockies, Prairie Potholes, Southern Rockies/Colorado Plateau, Shortgrass Prairie, Central Mixed-grass Prairie and Sierra Madre Occidental).

IMBCR uses a spatially balanced sampling design which allows inferences to avian species occurrence and population sizes at various scales, from local management units to entire BCRs or states, facilitating conservation at local and national levels. The sampling design allows density, population size and occupancy estimates for individual strata or biologically meaningful combinations of strata.

In 2015, field technicians completed 1,313 of 1,331 (98.6%) planned surveys. Technicians conducted 14,887 point counts within the 1,313 surveyed sampling units between 2 May and 29 July 2015. They detected 190,759 individual birds representing 306 species.

To view interactive maps illustrating survey and detection locations, species counts and density, population and occupancy results, please visit Bird Conservancy's Avian Data Center at http://rmbo/v3/avian/ExploretheData.aspx. Instructions for using the Avian Data Center are included in Appendix A of this report and are available on the Avian Data Center itself. Each stratum or combination of strata presented in the results section contains a web link that leads directly to the Avian Data Center with the appropriate queries already populated. Please note that not every stratum or conceivable combination of strata are summarized in this report. All individual strata and all biologically meaningful combinations of strata, or "superstrata", can be found on the Avian Data Center.

The IMBCR design provides a spatially consistent and flexible framework for understanding the status and annual changes of bird populations. Collaboration across organizations and spatial scales increased sample sizes and improved the accuracy and precision of the population estimates. Analyzing the data collectively allowed us to estimate detection probabilities for species that would have otherwise had insufficient numbers of detections at local scales.

The IMBCR program is well positioned to address conservation and management needs for a wide range of stakeholders, landowners and government entities at various spatial scales. By focusing on multiple scales from local management units to BCRs, IMBCR can easily be integrated within an interdisciplinary approach to bird conservation that combines monitoring, research and management. Recently developed habitat analyses and species distribution maps can be used as the basis of decision support tools for avian conservation.

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Acronyms

BCR	Bird Conservation Region
BCR 9	Great Basin Bird Conservation Region
BCR 10	Northern Rockies Bird Conservation Region
BCR 11	Prairie Potholes Bird Conservation Region
BCR 16	Southern Rockies and Colorado Plateau Bird Conservation Region
BCR 17	Badlands and Prairies Bird Conservation Region
BCR 18	Shortgrass Prairie Bird Conservation Region
BCR 19	Central Mixed-grass Prairie Bird Conservation Region
BCR 33	Sonoran and Mohave Deserts Bird Conservation Region
BCR 34	Sierra Madre Occidental Bird Conservation Region
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CPW	Colorado Parks and Wildlife
DoD	Department of Defense
GRTS	Generalized Random-Tessellation Stratification
IBO	Intermountain Bird Observatory
IMBCR	Integrated Monitoring in Bird Conservation Regions
MRGS	Military Grid Reference System
NABCI	North American Bird Conservation Initiative
NCPN	Northern Colorado Plateau Network
NF	National Forest
NG	National Grassland
NGPN	Northern Great Plains Network
NPS	National Park Service
RMNW	Rocky Mountain Network
TNC	The Nature Conservancy
USFS	US Forest Service
USFWS	US Fish and Wildlife Service
USNG	US National Grid
WYNDD	Wyoming Natural Diversity Database

Introduction

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

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, such as a national forest (Lindenmayer and 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 et al. 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 et al. 2005, Sauer and Knutson 2008).

Bird Conservation Regions (BCRs) provide a spatially consistent framework for bird conservation in North America (Figure 1, US North American Bird Conservation Initiative 2007). The BCRs represent distinct ecological regions with similar bird communities, vegetation types and resource management interests (US North American Bird Conservation Initiative 2000). Population monitoring within BCRs can be implemented with a flexible hierarchical framework of nested units, where information on status of bird populations can be partitioned into smaller units for small-scale conservation planning, or aggregated to support large-scale conservation efforts throughout a species' geographic range. By focusing on scales relevant to management and conservation, information obtained from monitoring in BCRs can be integrated into research and management at various scales applicable to land managers (Ruth et al. 2003).

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 2007). Population monitoring helps to achieve the intent of legislation such as the Migratory Bird Treaty Act (1918), National Environmental Policy Act (1969), Endangered Species Act (1973), the National Forest Management Act (1976) and various state laws (Manley et al. 1993, Sauer 1993).

Before monitoring can be used by land managers to guide conservation efforts, sound program designs and analytic methods are necessary to produce unbiased population estimates (Sauer and 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 et al. 2002, Thompson 2002). Addressing spatial variation entails the use of probabilistic sampling designs that allow 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 analytic methods to address the fact that few, if any, species are so conspicuous that they are detected with certainty when present during a survey (Pollock et al. 2002, Thompson 2002). Accounting for these two sources of

variation ensures observed trends reflect true population changes rather than artifacts of the sampling and observation processes (Pollock et al. 2002, Thompson 2002).
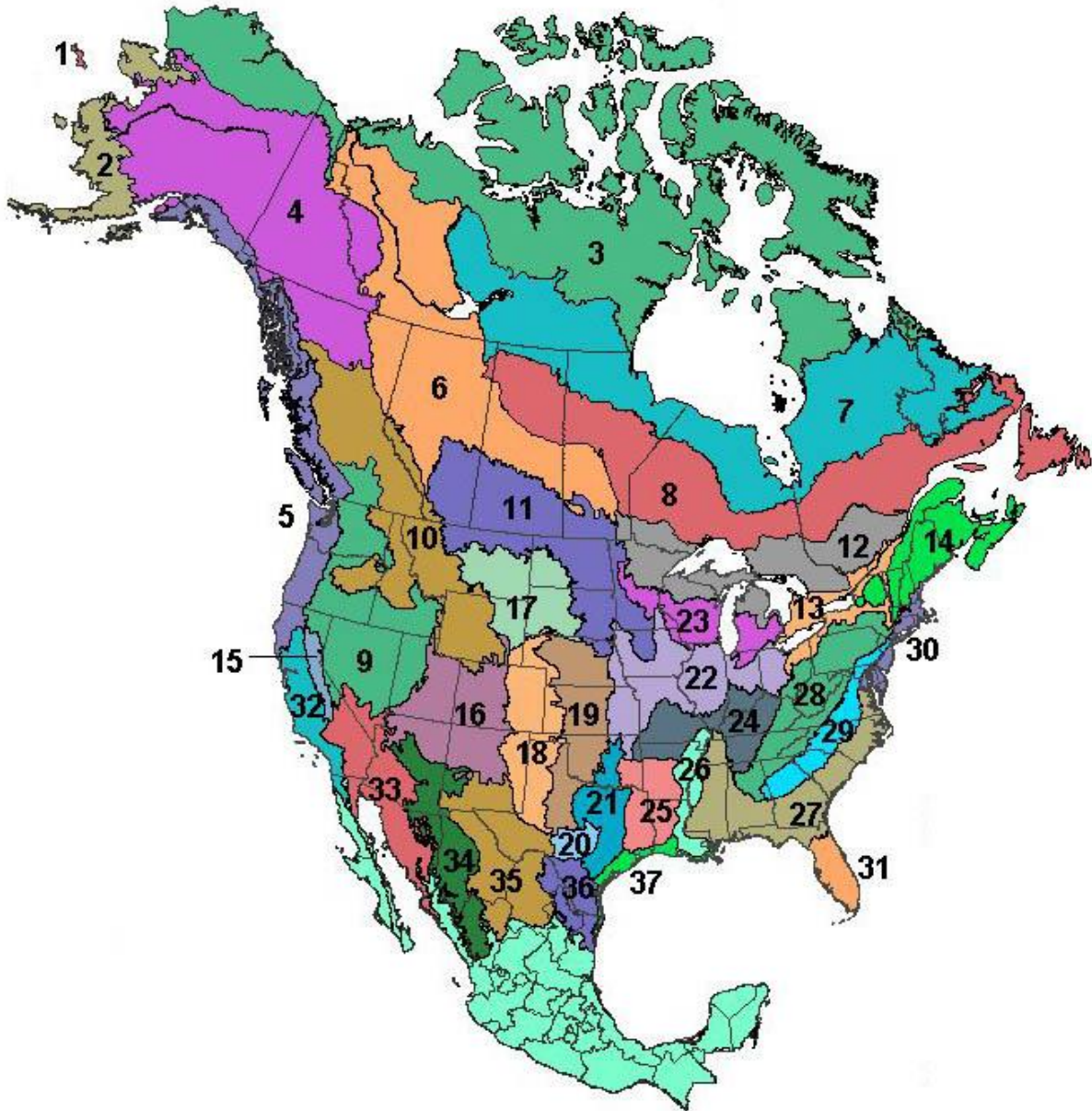
Figure 1. Bird Conservation Regions throughout North America, excluding Hawaii and Mexico (Source: http://www.nabci-us.org/map.html).

The US North American Bird Conservation Initiative's (NABCI) "Opportunities for Improving Avian Monitoring" (US North American Bird Conservation Initiative 2007) provided goals for avian monitoring programs:

> 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, the IMBCR partners designed a broad-scale monitoring program entitled "Integrated Monitoring in Bird Conservation Regions" (IMBCR) (Blakesley and Hanni 2009). Important properties of the IMBCR design are:

- All areas are available for sampling including all vegetation types;
- Strata are based on fixed attributes; this will allow us to relate changes in bird populations to changes on the landscape through time;
- Each state's portion of a BCR can be stratified differently, depending upon local needs and areas to which one wants to make inferences;
- Aggregation of strata-wide estimates to BCR- or state-wide estimates is built into the design;
- Local population trends can be directly compared to regional trends; and
- Coordination among partners can reduce the costs and/or increase efficiencies of monitoring per partner.

Using the IMBCR design, the IMBCR partnership monitoring objectives 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 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 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.

Program 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" (US North American Bird Conservation Initiative 2007) which offered recommendations for improving the efficiency and effectiveness of avian monitoring in North America. After taking NABCI's recommendations into consideration, IMBCR partners developed a new study design and protocol for statewide bird monitoring in Colorado. The new study design used BCRs as the sampling frame and further stratified by land ownership within each BCR.

2008

IMBCR partners stratified and surveyed the Southern Rockies/Colorado Plateau BCR (BCR 16) and the Shortgrass Prairie BCR (BCR 18) portions of Colorado, as well as the BCR 16 portion of Wyoming. Furthermore, in Colorado BCR 16, we used cell weighting to target high order rivers and streams (based on Strahler stream order) and higher elevation habitats (e.g. alpine tundra), which occur in a small proportion of the landscape (Blakesley and Hanni 2009). Field crews completed over 209 surveys within BCR 16 and BCR 18, resulting in density estimates for 69 landbird species.

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 restratified 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 restratifications done in Colorado BCRs 10 and 16 between 2009 and 2010. The Colorado BCR 10 stratum was restratified 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 restratified because some NCPN park units were initially misclassified into the RMNW stratum. In

Wyoming, the USFS Region 4 stratum was restratified 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 restratification 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 restratifications 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 restratified 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 restratified into two strata based on elevation for the same reason. In Montana, several strata were restratified 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 restratification 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 south-eastern 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 restratified 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 restratification 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 restratification 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 restratified 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 restratifying 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 restratification, 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 restratified 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 restratification. 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 Recreation 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.

Methods

Study Area

In 2015, IMBCR encompassed 3 entire states (Colorado, Montana and Wyoming) and portions of 10 additional states (Arizona, Idaho, Kansas, North Dakota, Nebraska, New Mexico, Oklahoma, South Dakota, Texas and Utah); 2 entire USFS Regions (Regions 1 and 2) and portions of Regions 3 and 4; all of the Badlands and Prairies BCR and portions of 8 additional BCRs (Great Basin, Northern Rockies, Prairie Potholes, Southern Rockies/Colorado Plateau, Shortgrass Prairie, Central Mixed-grass Prairie, Sonoran and Mohave Deserts and Sierra Madre Occidental; Figure 2).
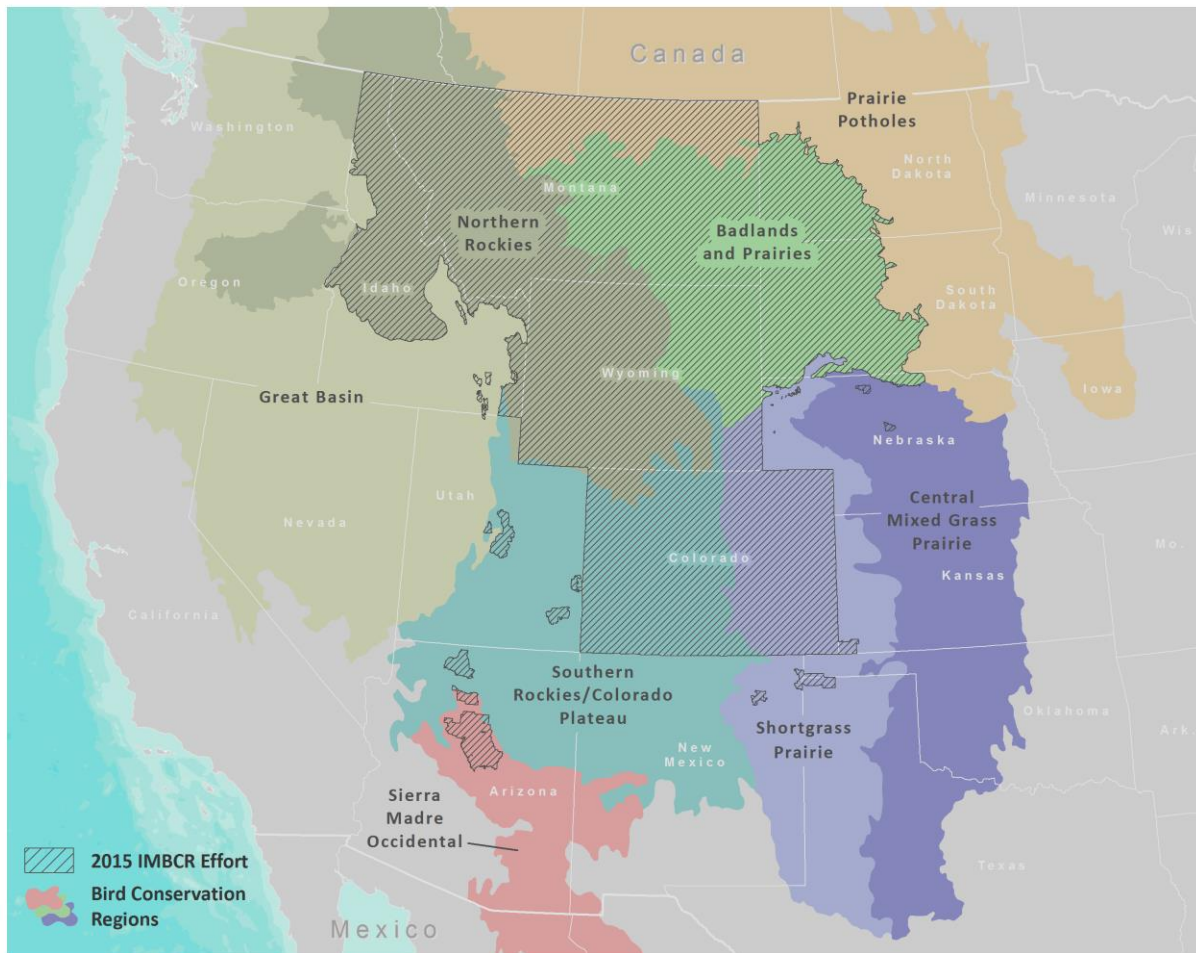
Figure 2. Spatial extent of sampled strata using the IMBCR design, 2015.

BCR 9: Great Basin

The Great Basin Bird Conservation Region is a large area encompassing a wide variety of habitats throughout lowlands and mountains (US North American Bird Conservation Initiative 2000). It is a mostly dry region of grassland and semi-desert shrubland spread across the lowlands and flat country, interspersed with a few marshes and lakes that are very important to shorebirds and waterbirds. At higher elevations Pinyon-Juniper woodlands and Ponderosa Pine forests transition into Lodgepole Pine and sub-alpine fir forests. BCR 9

covers portions of British Columbia, Washington, Oregon, California, Nevada, Idaho, Utah and Wyoming.

This was the fifth year we implemented IMBCR within BCR 9. The 2015 survey effort in BCR 9 took place within the Wyoming, Idaho and Utah portions of Caribou-Targhee National Forest. Bird Conservancy conducted surveys within three strata comprising 2,113 km².

BCR 10: Northern Rockies
The Northern Rockies Bird Conservation Region is characterized by high-elevation mountain ranges with mixed conifer forests and intermountain regions dominated by sagebrush steppe and grasslands (Partners in Flight 2000). Higher elevation forests consist mainly of Ponderosa Pine, Douglas-Fir, Lodgepole Pine, Engelmann Spruce and Subalpine Fir. Tundra occurs at the highest elevations. BCR 10 covers portions of Wyoming, Montana, Idaho, British Columbia, Oregon and small portions of Colorado, Washington and Alberta.

This was the seventh year we implemented IMBCR within BCR 10. Intermountain Bird Observatory (IBO), Bird Conservancy and Wyoming Natural Diversity Database (WYNDD) conducted surveys within the Colorado, Idaho, Montana and Wyoming portions of BCR 10 comprising 64 strata covering 409,255 km².

BCR 11: Prairie Potholes
The Prairie Potholes Bird Conservation Region consists of mixed grass prairie in the west, tall grass prairie in the east and thousands of small wetlands scattered across its geographical extent (US North American Bird Conservation Initiative 2000). About 70% of BCR 11's original grasslands have been converted to agriculture, but large tracts of grassland still exist on larger ranches and on preserved land (Prairie Pothole Joint Venture 2005). BCR 11 covers portions of Montana, North Dakota, South Dakota, Minnesota, Nebraska, Iowa, Alberta, Saskatchewan and Manitoba.

This was the sixth year we implemented within BCR 11. IBO and Bird Conservancy conducted surveys within the Montana portion of BCR 11 comprising eight strata covering 83,906 km².

BCR 16: Southern Rockies and Colorado Plateau
The Southern Rockies and Colorado Plateau Bird Conservation Region is a diverse area ranging from the southern Rocky Mountains in the east to the Wasatch and Uinta mountains in the west. In the center of the region are the tablelands of the Colorado Plateau. Within this region, vegetation types transition from shrub steppe; pinyon-juniper; montane shrubland; mixed conifer and aspen; and alpine tundra with increasing elevation (Parrish et al. 2002). BCR 16 is centered on the Four Corners Region and consists mainly of Colorado, Utah, New Mexico and Arizona, with portions extending into southern Wyoming and Idaho.

This was the eighth year we implemented IMBCR within BCR 16. Bird Conservancy, IBO and WYNDD conducted surveys across the Colorado and Wyoming portions of BCR 16, as well as the BCR16 portion of Kaibab and Coconino National Forests in Arizona, Caribou-Targhee National Forest in Idaho and Utah and Manti-La Sal National Forest in Utah. This area comprises 31 strata covering 165,396 km².

BCR 17: Badlands and Prairies

The Badlands and Prairies Bird Conservation Region is characterized by rolling plains and mixed-grass prairie that contain large, continuous tracts of intact dry grassland managed predominately as ranchland (US North American Bird Conservation Initiative 2000). The Black Hills and western portions of BCR 17 contain pine and spruce forests at higher elevations. BCR 17 covers portions of five states: Montana; North Dakota; South Dakota; Wyoming and Nebraska.

This was the seventh year we implemented IMBCR within BCR 17. IBO, Bird Conservancy and WYNDD conducted surveys throughout the entire BCR comprising 39 strata covering 364,774 km².

BCR 18: Shortgrass Prairie

The Shortgrass Prairie Bird Conservation Region is characterized by unique shortgrass prairie. What was once contiguous prairie is now fragmented by agriculture and the remnant grasslands are now exposed to new grazing regimes (Playa Lakes Joint Venture Landbird Team 2007). Numerous playa lakes dot the region and wetlands occur along major river corridors that drain the Rocky Mountains. Because of a change in the hydrology of these rivers, more shrubs and trees have encroached upon the wetlands (US North American Bird Conservation Initiative 2000). BCR 18 stretches north-south in the rain shadow of the Rocky Mountains and covers portions of Colorado, Wyoming, Nebraska, Kansas, Oklahoma, South Dakota, Texas and New Mexico.

This was the eighth year we implemented IMBCR within BCR 18. In BCR 18, Bird Conservancy conducted surveys throughout Wyoming and Colorado; NPS lands in Nebraska; and USFS lands in Nebraska, New Mexico, Oklahoma and Texas. The effort in BCR 18 comprised 29 strata covering 127,882 km².

BCR 19: Central Mixed-grass Prairie

The Central Mixed-grass Prairie Bird Conservation Region lies between shortgrass prairie to the west and tallgrass prairie to the east (US North American Bird Conservation Initiative 2000). This region consists of a mixture of shortgrass and tallgrass prairie habitats, with some native and hand-planted Ponderosa Pine forests in northwestern Nebraska. BCR 19 runs north-south from the southern border of South Dakota through Nebraska, Kansas, Oklahoma and north-central Texas.

This was the fifth year we implemented IMBCR within BCR 19. Bird Conservancy conducted surveys in USFS lands throughout BCR 19 in Nebraska, comprising two strata covering 829 km².

BCR 34: Sierra Madre Occidental

The Sierra Madre Occidental Bird Conservation Region contains rugged, high-elevation mountains supporting oak-pine, pine and fir forests and semi-desert shrubland. BCR 34 stretches from the northwest to the southeast covering portions of New Mexico, Arizona and Mexico.

This was the sixth year we implemented IMBCR within BCR 34. Bird Conservancy conducted surveys in Coconino and Kaibab National Forests within BCR 34, comprising three strata covering 13,927 km².

Sampling Design

Sampling Frame and Stratification

A key component of the IMBCR design is the ability to infer across spatial scales, from small management units, such as individual national forests or BLM 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 avian population estimates; data from each individual stratum in Montana are combined to produce statewide estimates; data from each individual stratum in BCR 17 are combined to produce BCR-wide estimates.

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

Sampling Units

The IMBCR design defined 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, then we assign each cell to a stratum using ArcGIS version 10.X and higher (Environmental Systems Research Institute 2006).
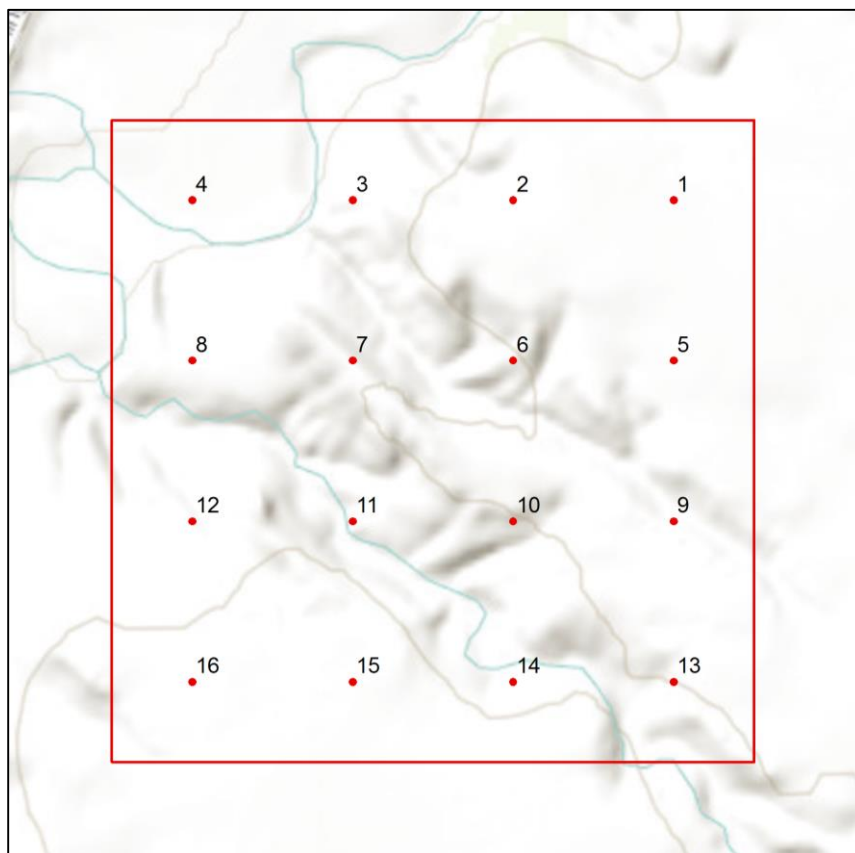
Figure 3. Example 1 km² sampling unit using the IMBCR design.

Sample Selection

Within each stratum, the IMBCR design used generalized random-tessellation stratification (GRTS), a spatially-balanced sampling algorithm, to select sample units (Stevens and Olsen 2004). The GRTS design has several appealing properties with respect to long-term monitoring of birds at large spatial scales:

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

- All sample units in the sampling frame are ordered, such that any set of consecutively numbered units is a spatially well-balanced sample (Stevens and 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 were required within each stratum to estimate the variances of population parameters. The remaining allocation of sampling effort among strata was based on the priorities of the funding partners.

Sampling Methods

IMBCR surveyors (also referred to as field technician, technician or observer in this report), with excellent aural and visual bird-identification skills, conducted field work in 2015. Prior to conducting surveys, technicians completed an intensive training program to ensure full understanding of the field protocol; review bird and plant identification; and practice distance estimation in a variety of habitats. Many field technicians attended a second, shorter mid-season training to review protocol and practice bird and plant identification at high-elevation sites that were inaccessible earlier in the season.

Field technicians conducted point counts (Buckland et al. 2001) following protocols established by IMBCR partners (Hanni et al. 2014, Hanni et al. 2015). Observers conducted surveys in the morning, beginning one-half hour before sunrise and concluding no later than five hours after sunrise. Technicians 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 or not 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 to measure the distance to a bird, 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 squirrels, American red squirrels and American pika. 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 mapping purposes only.

Technicians 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. Technicians navigated to each point using hand-held Global Positioning System units. Before beginning each six-minute count, surveyors recorded vegetation data within a 50 m 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; as well as grass height and ground cover types. Technicians 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 website at http://rmbo/v3/avian/DataCollection.aspx. There you will find links to past and current protocols and data sheets.

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, technicians 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. Technicians 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). Technicians 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 technicians could record the actual minute of each bird detection during a point count. Previously, technicians used tick marks to separate minute intervals. We added a "visual" checkbox to the bird datasheet for technicians to check if they visually observed and identified any of the species recorded. This reminds technicians 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 technicians 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, technicians 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, technicians sometimes incorrectly distinguish flyovers from birds using the surrounding habitat while foraging on the wing (e.g., swallows, swifts and raptors). Therefore, if we find an incorrectly recorded flyover, we can still use the detection data in analysis.

In 2012, technicians 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 projects. Prior to 2012, technicians were allowed to conduct point counts until 1100 local time each day.

In order to account for variability across study areas from Arizona to Montana, crew leaders instructed technicians to survey no later than five hours after sunrise in 2012. Technicians 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 technicians 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 technicians to only identify the sex of a visually observed bird of a sexually dimorphic species. We instructed technicians 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 technicians 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 technicians 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, technicians 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, technicians 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 technicians spend estimating these values.

In 2012, crew leaders provided technicians 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 technicians recorded all contacts or attempted contacts they had with landowners. This information was later entered into the landowner database when the technician had internet access.

In 2015, we began recording American pika, similarly to the way we record Abert's and red squirrels. Other than this addition, there have been no major protocol changes since 2012.

Data Analysis
Distance Analysis
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 et al. 2008).

Analysis of distance data includes fitting a detection function to the distribution of recorded distances (Buckland et al. 2001). The distribution of distances can be a function of characteristics of the object (e.g., for birds, size and color, movement, volume of song or call and frequency of call), the surrounding environment (e.g., density of vegetation) and observer ability. Because detectability varies among species, we analyzed these data separately for each species. The development of robust density estimates typically requires 80 or more independent detections ($n \geq 80$) within the entire sampling area. We excluded birds flying over, but not using the immediate surrounding landscape, birds detected while migrating (not breeding), juvenile birds and birds detected between points from analyses.

We estimated density for each species using a sequential framework where 1) year specific detection functions were applied to species with greater than or equal to 80 detections per year ($n \geq 80$), 2) global detection functions were applied to species with less than 80 detections per year ($n < 80$) and greater than or equal to 80 detections over the life of the project ($n \geq 80$) and 3) remedial measures were used for species with moderate departures from the assumptions of distance sampling (Buckland et al. 2001).

Beginning this year, we streamlined the analysis by fitting models with no series expansions to all species using the recommended 10% truncation for point transects. For the year specific detection functions, we fit Conventional Distance Sampling models using the half-normal and hazard-rate key functions with no series expansions (Thomas et al. 2010). For the global detection functions, in addition to the above models, we fit Multiple-Covariate Distance Sampling models using half-normal and hazard-rate key function models with a categorical year covariate and no series expansions (Thomas et al. 2010). We selected the most parsimonious detection function for each species using Akaike's Information Criterion adjusted for sample size (AIC_c; Burnham & Anderson 2002; Thomas et al. 2010) and considered the most parsimonious model as the estimation model. We estimated population size ($\widehat{N}$) for each stratum as $\widehat{N} = \widehat{D} * A$, where $\widehat{D}$ was the estimated population density and A was the number of 1 km² sampling units in each stratum. We calculated Satterthwaite 90% Confidence Intervals (CI) for the estimates of density and population size for each stratum (Buckland et al. 2001). In addition, we combined the stratum-level density estimates at various spatial scales, such as management entity, State and BCR, using an area-weighted mean. For the combined density estimates, we estimated the variance for detection and cluster size using the delta method (Powell 2007, Thomas et al. 2010) and the variance for the encounter rate using the design-based estimator of Fewster et al. (2009).

We reviewed the highest ranking detection function for each species to check the shape criteria, evaluate the fit of the model and identify species with moderate departure from the assumptions of distance sampling (Buckland et al. 2001). First, we checked the shape criteria of the histogram to make sure the detection data exhibited a "shoulder" that fell away at increasing distances from the point. Second, we evaluated the fit of the model using the Kolmogorov-Smirnov goodness-of-fit test. Finally, we visually inspected the detection histograms to identify species that demonstrated evasive movement and/ or measurement errors. We looked for a type of measurement error involving the heaping of detections at certain distances that occurs when observers round detection distances. We also looked for histograms with detections that were highly skewed to the right, which may indicate a pattern of evasive movement (Buckland et al. 2001).

For species with moderate departures from the assumptions and shape criteria, we used two sequential remedial measures. First, we truncated the data to the point where detection probability was approximately 0.1 [$g(w) \sim 0.1$] and included key functions with second order cosine series-expansion terms in the candidate set of models (Buckland et al. 2001). We did not include detection function models with a single cosine expansion term because the half-normal and hazard-rate models require the order of the terms are > 1 (Buckland et al. 2001). Second, when the goodness-of-fit test and/ or inspection of the detection histogram continued to suggest evasive movement and/or measurement errors, we grouped the distance data into four to eight bins and applied custom truncation and second order expansion terms. These remedial measures can ameliorate problems associated with moderate levels of evasive movement and/ or distance measurement errors (Buckland et al. 2001).

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 multi-scale occupancy model to estimate 1) the probability of detecting a species given presence (p), 2) the proportion of points occupied by a species given presence within sampled sampling units (θ, Theta) and 3) the proportion of sampling units occupied by a species (ψ, Psi).

We truncated the data, using only detections less than 125 m from the sample points. Truncating the data at less than 125 m 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 Theta (the proportion of points occupied within each sampling unit) (Pavlacky et al. 2012)

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 (Psi) for each stratum by evaluating four models with different structure for detection (p) and the proportion of points occupied (Theta). Within these models, p and Theta were held constant across the BCRs and/or allowed to vary by BCR. Models are defined as follows:

> Model 1: Held p and Theta constant;
> Model 2: Held p constant, but allowed Theta to vary across BCRs;
> Model 3: Allowed p to vary across BCRs, but held Theta constant;
> Model 4: Allowed both p and Theta to vary across BCRs.

We ran model 1 for species with less than 10 point detections in each BCR or less than 10 point detections in all but one BCR. We ran models 1 through 4 for species with greater than

10 point detections in more than one BCR. For the purpose of estimating regional variation in detection (p) and availability (Theta), we pooled data for BCRs with fewer than 10 point detections into adjacent BCRs with sufficient numbers of detections. We used model selection and AIC corrected for small sample size (AIC_c) to weight models from which estimates of Psi were derived for each species (Burnham and Anderson 2002). We model averaged the estimates of Psi from models 1 through 4 and calculated unconditional standard errors and 90% CIs (Burnham and Anderson 2002). We combined stratum-level estimates of Psi using an area-weighted mean. The variances and standard errors for the combined estimates of Psi were estimated using the delta method (Powell 2007).

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

Automated Analysis

We estimated population density using point transect distance sampling and site occupancy using the multi-scale occupancy model within a modified version of the RIMBCR package (R Core Team 2014; Paul Lukacs, University of Montana, Missoula). The RIMBCR package streamlined the analyses by calling the raw data from the IMBCR Structured Query Language (SQL) server database and incorporated the R code created in previous years. 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 RIMBCR package used package mrds (Thomas et al. 2010, R Core Team 2014) to fit the point transect distance sampling model, and program MARK (White and Burnham 1999) and package RMark (Laake 2013, R Core Team 2014) to fit the multi-scale occupancy model. The RIMBCR package provided an automated framework for combining strata-level estimates of population density and site occupancy at multiple spatial scales, as well as approximating the standard errors and CIs for the combined estimates.

In October 2014, we revised the RIMBCR distance sampling code to accommodate updates to package mrds 2.18. However, because we were unable to troubleshoot the complex structure of the RIMBCR code, we completely rewrote the distance sampling code between October 2014 and April 2015. The new distance sampling code retained the "roll-up" code for combining the strata-level estimates from the previous version of RIMBCR. In March 2015, we discovered a delta method (Powell 2007) error in the RIMBCR "roll-up" code (Powell 2007). We estimated the proportion of sampling units occupied (Psi) for all species that estimates the standard errors and CIs for the combined occupancy estimates. In April 2015, we revised RIMBCR to fix the error, but we were unable to troubleshoot the complex structure of the RIMBCR code. We plan to rewrite the RIMBCR occupancy code in way that allows testing, but in the mean time we developed an R "roll-up" patch that correctly estimates the standard errors and CIs for the combined occupancy estimates. We reran the "roll-up" patch for 2012-2014 to retroactively correct the standard errors and CIs for the previous combined (superstrata) occupancy estimates. We currently maintain version control of the automated analysis code in the Bird Conservancy repository (Atlassian Stash, version 3.6.1).

Results

In 2015, field technicians completed 1,313 of 1,331 (98.6%) planned surveys throughout all or portions of BCRs 9, 10, 11, 16, 17, 18, 19 and 34 using the IMBCR design (Table 1, Figure 2). Reasons surveys were not completed are summarized in Table 2. Technicians conducted 14,887 point counts within the 1,313 surveyed sampling units between 2 May and 29 July 2015. They detected 190,759 individual birds representing 306 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. Results from all strata and all biologically meaningful superstrata can be found on the Rocky Mountain Avian Data Center (http://rmbo.org/v3/avian/ExploretheData.aspx).This online database contains interactive maps showing survey and detection locations, as well as species counts and density, population and occupancy results using the IMBCR study design. Instructions for using the Avian Data Center are included in Appendix A of this report and are available on the Avian Data Center itself. Each stratum or superstratum presented in the Results section contains a web link that leads directly to the Avian Data Center with the appropriate queries already populated.

Unless otherwise specified, all bird species names listed in this report are from the American Ornithologists' Union Check-list of North and Middle American Birds, seventh edition (2007).

Table 1. Planned and completed surveys, by stratum, 2015. BCR = Bird Conservancy of the Rockies. IBO = Intermountain Bird Observatory. WYNDD = Wyoming Natural Diversity Database.

State	BCR	Stratum	Stratum Definition	Collected By	Area (km^2)	Planned	Completed	% Completed
AZ	16/34	AZ-BCR34-CF	Coconino National Forest	BCR	7,426	40	40	100.0%
AZ	16/34	AZ-KAIBAB-KH	Kaibab National Forest - High Elevation	BCR	4,319	16	16	100.0%
AZ	16/34	AZ-KAIBAB-KL	Kaibab National Forest - Low Elevation	BCR	2,182	5	5	100.0%
				Subtotal	**13,927**	**61**	**61**	**100.0%**
CO	10	CO-BCR10-AO	All Other Lands	BCR	5,060	5	5	100.0%
CO	10	CO-BCR10-BL	Bureau of Land Management	BCR	4,288	33	33	100.0%
				Subtotal	**9,348**	**38**	**38**	**100.0%**
CO	16	CO-BCR16-AO	All Other Lands	BCR	51,214	19	19	100.0%
CO	16	CO-BCR16-BL	Bureau of Land Management	BCR	27,825	25	25	100.0%
CO	16	CO-BCR16-GM	Grand Mesa; Uncompahgre and Gunnison National Forests	BCR	13,630	7	7	100.0%
CO	16	CO-BCR16-MA	Manti-La Sal National Forest	BCR	131	2	2	100.0%
CO	16	CO-BCR16-NC	National Park Service - Northern Colorado Plateau Network	BCR	807	2	2	100.0%
CO	16	CO-BCR16-PC	Pike-San Isabel National Forest Control	BCR	1,300	15	15	100.0%
CO	16	CO-BCR16-PO	Pike-San Isabel National Forest All Other	BCR	9,650	7	7	100.0%
CO	16	CO-BCR16-RA	Rio Grande National Forest - High Elevation	BCR	866	8	8	100.0%
CO	16	CO-BCR16-RC	Arapaho-Roosevelt National Forest Control	BCR	780	15	15	100.0%
CO	16	CO-BCR16-RM	National Park Service - Rocky Mountain Network	BCR	1,644	2	2	100.0%
CO	16	CO-BCR16-RO	Routt National Forest	BCR	5,734	19	19	100.0%
CO	16	CO-BCR16-RP	Rio Grande National Forest - Middle Elevation	BCR	5,410	8	8	100.0%
CO	16	CO-BCR16-RS	Rio Grande National Forest - Low Elevation	BCR	1,896	8	8	100.0%
CO	16	CO-BCR16-SA	San Juan National Forest	BCR	8,794	7	7	100.0%
CO	16	CO-BCR16-SC	National Park Service - Southern Colorado Plateau Network	BCR	214	2	2	100.0%
CO	16	CO-BCR16-VO	Arapaho-Roosevelt National Forest All Other	BCR	6,152	7	7	100.0%
CO	16	CO-BCR16-WA	White River National Forest - High Elevation	BCR	2,138	7	6	85.7%
CO	16	CO-BCR16-WF	USFS - Williams Fork Management Unit	BCR	551	7	7	100.0%
CO	16	CO-BCR16-WP	White River National Forest - Middle Elevation	BCR	5,443	7	7	100.0%
CO	16	CO-BCR16-WS	White River National Forest - Low Elevation	BCR	2,786	7	7	100.0%
CO	16	CO-CFLRP-CF	Arapaho-Roosevelt and Pike-San Isabel Control	BCR	128	20	20	100.0%
CO	16	CO-DOD16-AF	Department of Defense - US Air Force Academy lands within Bird Conservation Region 16	BCR	28	10	10	100.0%

State	BCR	Stratum	Stratum Definition	Collected By	Area (km²)	Planned	Completed	% Completed
CO	16	CO-DOD16-FC	Fort Carson Non-range Fan Area	BCR	133	8	6	75.0%
CO	16	CO-DOD16-FF	Fort Carson Range Fan Area	BCR	52	6	5	83.3%
				Subtotal	**147,306**	**225**	**221**	**98.2%**
CO	18	CO-BCR18-AF	Department of Defense - US Air Force Academy lands within Bird Conservation Region 18	BCR	42	10	10	100.0%
CO	18	CO-BCR18-AR	Arkansas River and Tributaries	BCR	1,127	8	8	100.0%
CO	18	CO-BCR18-CO	Comanche National Grassland	BCR	4,836	8	8	100.0%
CO	18	CO-BCR18-DL	Department of Defense - All Other Lands	BCR	144	2	2	100.0%
CO	18	CO-BCR18-FC	Department of Defense - Fort Carson (non-fan areas)	BCR	149	8	8	100.0%
CO	18	CO-BCR18-FF	Department of Defense - Fort Carson (fan areas)	BCR	65	8	8	100.0%
CO	18	CO-BCR18-IA	Area between I-70 and the Arkansas River	BCR	34,755	8	8	100.0%
CO	18	CO-BCR18-NP	Area North of the Platte River	BCR	11,457	7	7	100.0%
CO	18	CO-BCR18-PC	Pawnee National Grassland - Private Lands	BCR	2,458	2	2	100.0%
CO	18	CO-BCR18-PD	Department of Defense - Pueblo Chemical Depot	BCR	82	15	15	100.0%
CO	18	CO-BCR18-PF	Department of Defense - Pinon Canyon Maneuver Site (fan areas)	BCR	116	10	10	100.0%
CO	18	CO-BCR18-PG	Pawnee National Grassland - Public Lands	BCR	810	5	5	100.0%
CO	18	CO-BCR18-PI	Area between the Platte River and I-70	BCR	30,365	8	8	100.0%
CO	18	CO-BCR18-PM	Department of Defense - Pinon Canyon Maneuver Site (non-fan areas)	BCR	500	25	25	100.0%
CO	18	CO-BCR18-PT	Platte River and Tributaries	BCR	970	7	7	100.0%
CO	18	CO-BCR18-RW	Department of Defense - Rocky Mountain Arsenal National Wildlife Refuge	BCR	66	10	10	100.0%
CO	18	CO-BCR18-SA	Area South of the Arkansas River	BCR	24,985	8	8	100.0%
				Subtotal	**112,927**	**149**	**149**	**100.0%**
ID	9	ID-BCR9-CT	Caribou-Targhee National Forest	BCR	1,940	5	5	100.0%
ID	10	ID-BCR10-BI	Bitterroot National Forest	IBO	1,916	2	2	100.0%
ID	10	ID-BCR10-BO	Boise National Forest	IBO	8,778	4	4	100.0%
ID	10	ID-BCR10-CL	Clearwater National Forest - Roaded/Managed	IBO	1,946	16	16	100.0%
ID	10	ID-BCR10-CR	Clearwater National Forest - Roadless/Wilderness	IBO	5,036	6	6	100.0%
ID	10	ID-BCR10-CT	Caribou-Targhee National Forest	BCR	7,752	12	12	100.0%
ID	10	ID-BCR10-IP	Idaho Panhandle National Forest - Roaded/Managed	IBO	8,660	26	26	100.0%
ID	10	ID-BCR10-IR	Idaho Panhandle National Forest - Roadless/Wilderness	IBO	3,155	7	7	100.0%
ID	10	ID-BCR10-KO	Kootenai National Forest	IBO	169	2	2	100.0%

State	BCR	Stratum	Stratum Definition	Collected By	Area (km²)	Planned	Completed	% Completed
ID	10	ID-BCR10-NP	Nez Perce National Forest - Roaded/Managed	IBO	2,864	16	16	100.0%
ID	10	ID-BCR10-NR	Nez Perce National Forest - Roadless/Wilderness	IBO	6,370	6	6	100.0%
ID	10	ID-BCR10-PA	Payette National Forest	IBO	9,857	4	4	100.0%
ID	10	ID-BCR10-SA	Salmon-Challis National Forest	IBO	13,563	4	4	100.0%
ID	10	ID-BCR10-SW	Sawtooth National Forest	IBO	6,302	4	4	100.0%
				Subtotal	76,368	109	109	100.0%
ID	16	ID-BCR16-CT	Caribou-Targhee National Forest	BCR	909	3	3	100.0%
KS	18	KS-BCR18-CI	Cimarron National Grassland	BCR	690	5	5	100.0%
MT	10	MT-BCR10-AO	All Other Lands	IBO	53,215	8	8	100.0%
MT	10	MT-BCR10-BE	Beaverhead-Deerlodge National Forest - Roaded/Managed	IBO	7,697	10	10	100.0%
MT	10	MT-BCR10-BI	Bitterroot National Forest - Roaded/Managed	IBO	2,324	10	10	100.0%
MT	10	MT-BCR10-BM	Bureau of Land Management - Missoula/Butte	IBO	1,356	2	2	100.0%
MT	10	MT-BCR10-BR	Beaverhead-Deerlodge National Forest - Roadless/Wilderness	IBO	8,236	3	3	100.0%
MT	10	MT-BCR10-BS	Bureau of Land Management - southwestern Montana	IBO	3,447	2	2	100.0%
MT	10	MT-BCR10-BW	Bitterroot National Forest - Roadless/Wilderness	IBO	2,763	3	3	100.0%
MT	10	MT-BCR10-CR	Custer National Forest - Roadless/Wilderness	IBO	1,783	3	3	100.0%
MT	10	MT-BCR10-CU	Custer National Forest - Roaded/Managed	IBO	779	3	3	100.0%
MT	10	MT-BCR10-FL	Flathead National Forest - Roaded/Managed	IBO	4,945	10	10	100.0%
MT	10	MT-BCR10-FR	Flathead National Forest - Roadless/Wilderness	IBO	6,410	3	3	100.0%
MT	10	MT-BCR10-FW	Fish and Wildlife Service - All Refuges	IBO	359	2	2	100.0%
MT	10	MT-BCR10-GA	Gallatin National Forest - Roaded/Managed	IBO	3,479	10	10	100.0%
MT	10	MT-BCR10-GR	Gallatin National Forest - Roadless/Wilderness	IBO	5,787	3	3	100.0%
MT	10	MT-BCR10-HE	Helena National Forest - Roaded/Managed	IBO	3,024	10	10	100.0%
MT	10	MT-BCR10-HR	Helena National Forest - Roadless/Wilderness	IBO	2,248	3	3	100.0%
MT	10	MT-BCR10-KO	Kootenai National Forest - Roaded/Managed	IBO	7,239	26	26	100.0%
MT	10	MT-BCR10-KR	Kootenai National Forest - Roadless/Wilderness	IBO	1,887	7	7	100.0%
MT	10	MT-BCR10-LC	Lewis and Clark National Forest - Roaded/Managed	IBO	2,778	5	5	100.0%
MT	10	MT-BCR10-LO	Lolo National Forest - Roaded/Managed	IBO	7,742	10	10	100.0%
MT	10	MT-BCR10-LR	Lewis and Clark National Forest - Roadless/Wilderness	IBO	5,007	3	3	100.0%

State	BCR	Stratum	Stratum Definition	Collected By	Area (km²)	Planned	Completed	% Completed
MT	10	MT-BCR10-LW	Lolo National Forest - Roadless/Wilderness	IBO	3,859	3	3	100.0%
MT	10	MT-BCR10-NG	National Park Service - Glacier National Park	IBO	3,936	2	2	100.0%
MT	10	MT-BCR10-RI	Rivers	IBO	3,515	2	2	100.0%
MT	10	MT-BCR10-TB	Blackfeet and Crow Reservations	IBO	9,349	2	2	100.0%
MT	10	MT-BCR10-TF	Flathead Reservation	IBO	5,043	2	2	100.0%
				Subtotal	**158,207**	**147**	**147**	**100.0%**
MT	11	MT-BCR11-AO	All Other Lands	IBO	62,631	9	9	100.0%
MT	11	MT-BCR11-BN	Bureau of Land Management - North Valley	IBO	1,588	2	2	100.0%
MT	11	MT-BCR11-BO	Bureau of Land Management - Other	IBO	6,826	2	2	100.0%
MT	11	MT-BCR11-CM	Charles M. Russell National Wildlife Refuge	IBO	93	2	2	100.0%
MT	11	MT-BCR11-FO	All other USFWS lands	IBO	448	2	2	100.0%
MT	11	MT-BCR11-TR	Rocky Boys; Fort Peck; Fort Belknap and Blackfeet Reservations	IBO	11,829	2	2	100.0%
				Subtotal	**83,415**	**19**	**19**	**100.0%**
MT	17	MT-BCR17-AO	All Other Lands	IBO	102,779	8	8	100.0%
MT	17	MT-BCR17-BL	Bureau of Land Management	IBO	25,013	5	4	80.0%
MT	17	MT-BCR17-CM	Charles M. Russell National Wildlife Refuge	IBO	3,709	2	2	100.0%
MT	17	MT-BCR17-CU	Custer National Forest	IBO	2,649	6	6	100.0%
MT	17	MT-BCR17-FO	All other USFWS lands	IBO	326	2	2	100.0%
MT	17	MT-BCR17-LC	Lewis and Clark National Forest	IBO	867	3	3	100.0%
MT	17	MT-BCR17-RI	Rivers - Yellowstone; Tongue; Musselshell; and Missouri	IBO	4,575	2	2	100.0%
				Subtotal	**139,918**	**28**	**27**	**96.4%**
ND	17	ND-BCR17-BM	Bureau of Land Management	BCR	165	6	2	33.3%
ND	17	ND-BCR17-KR	Knife River Indian Villages National Historic Site	BCR	5	5	5	100.0%
ND	17	ND-BCR17-MG	Little Missouri National Grassland	BCR	4,133	5	5	100.0%
ND	17	ND-BCR17-OW	All Other Lands	BCR	48,631	7	4	57.1%
ND	17	ND-BCR17-RG	Cedar River National Grassland	BCR	20	5	5	100.0%
ND	17	ND-BCR17-TB	Select Tribal Lands	BCR	1,768	2	2	100.0%
ND	17	ND-BCR17-TN	Theodore Roosevelt National Park - North Unit	BCR	100	6	6	100.0%
ND	17	ND-BCR17-TS	Theodore Roosevelt National Park - South Unit	BCR	193	8	8	100.0%
				Subtotal	**55,015**	**44**	**37**	**84.1%**
NE	17	NE-BCR17-LG	Oglala National Grassland	BCR	350	4	4	100.0%

State	BCR	Stratum	Stratum Definition	Collected By	Area (km²)	Planned	Completed	% Completed
NE	17	NE-BCR17-OW	All Other Lands	BCR	1,898	6	3	50.0%
			Subtotal		2,248	10	7	70.0%
NE	17	NE-NGPIM-NI	Niobrara National Scenic River	BCR	64	14	13	92.9%
NE	18	NE-BCR18-AF	Agate Fossil Beds National Monument	BCR	12	9	9	100.0%
NE	18	NE-BCR18-GG	Oglala National Grassland	BCR	31	3	3	100.0%
NE	18	NE-BCR18-RD	Nebraska National Forest - Pine Ridge	BCR	200	3	3	100.0%
NE	18	NE-BCR18-SB	Scotts Bluff National Monument	BCR	13	7	7	100.0%
			Subtotal		320	36	35	97.2%
NE	19	NE-BCR19-BE	Nebraska National Forest - Bessey District	BCR	361	3	3	100.0%
NE	19	NE-BCR19-SG	Samuel R. McKelvie National Forest	BCR	468	3	3	100.0%
			Subtotal		829	6	6	100.0%
NE/SD	11	MR-NGPIM-FM	Missouri River National Recreational River - 59 Mile District	BCR	243	8	8	100.0%
NE/SD	11	MR-NGPIM-TM	Missouri River National Recreational River - 39 Mile District	BCR	248	8	8	100.0%
			Subtotal		491	16	16	100.0%
NM	18	NM-BCR18-KI	Kiowa National Grassland	BCR	565	3	3	100.0%
NM	18	NM-BCR18-RI	Rita Blanca National Grassland	BCR	473	3	3	100.0%
			Subtotal		1,038	6	6	100.0%
OK	18	OK-BCR18-RI	Rita Blanca National Grassland	BCR	187	2	2	100.0%
SD	17	SD-BCR17-BF	Black Hills National Forest - All other Watersheds	BCR	5,009	13	13	100.0%
SD	17	SD-BCR17-BM	Bureau of Land Management	BCR	831	13	13	100.0%
SD	17	SD-BCR17-BN	Badlands National Park - North Unit	BCR	434	16	15	93.8%
SD	17	SD-BCR17-BS	Badlands National Park - South Unit	BCR	539	2	2	100.0%
SD	17	SD-BCR17-GG	Buffalo Gap National Grassland	BCR	2,356	5	5	100.0%
SD	17	SD-BCR17-HU	Black Hills National Forest - Hydrologic Code 7 Watersheds	BCR	376	3	3	100.0%
SD	17	SD-BCR17-JC	Jewel Cave National Monument	BCR	5	5	5	100.0%
SD	17	SD-BCR17-MR	Mount Rushmore National Monument	BCR	6	6	6	100.0%
SD	17	SD-BCR17-OW	All Other Lands	BCR	87,072	8	8	100.0%
SD	17	SD-BCR17-PG	Fort Pierre National Grassland	BCR	482	5	5	100.0%
SD	17	SD-BCR17-RG	Grand River National Grassland	BCR	125	5	5	100.0%
SD	17	SD-BCR17-TB	Select Tribal Lands	BCR	5,388	2	2	100.0%

State	BCR	Stratum	Stratum Definition	Collected By	Area (km²)	Planned	Completed	% Completed
SD	17	SD-BCR17-UF	Custer National Forest	BCR	326	13	13	100.0%
SD	17	SD-BCR17-WC	Wind Cave National Park	BCR	136	14	14	100.0%
			Subtotal		**103,085**	**110**	**109**	**99.1%**
TX	18	TX-BCR18-RI	Rita Blanca National Grassland	BCR	526	3	3	100.0%
UT	9	UT-BCR9-CT	Caribou-Targhee National Forest	BCR	54	2	2	100.0%
UT	16	UT-BCR16-MA	Manti-La Sal National Forest	IBO	5,280	42	42	100.0%
UT	16	UT-BCR16-SA	Manti-La Sal National Forest - Sanpitch	IBO	307	3	3	100.0%
			Subtotal		**5,587**	**45**	**45**	**100.0%**
WY	9	WY-BCR9-WY	Caribou-Targhee National Forest	BCR	119	2	2	100.0%
WY	10	WY-BCR10-AO	All Other Lands	BCR	52,161	12	12	100.0%
WY	10	WY-BCR10-AS	Ashley National Forest	BCR	540	2	2	100.0%
WY	10	WY-BCR10-BE	Bridger-Teton National Forest - Roaded/Managed	BCR	3,034	17	17	100.0%
WY	10	WY-BCR10-BH	Bighorn Canyon National Recreation Area	BCR	57	2	2	100.0%
WY	10	WY-BCR10-BI	Bighorn National Forest	WYNDD	4,712	10	10	100.0%
WY	10	WY-BCR10-BR	Bridger-Teton National Forest - Roadless/Wilderness	BCR	11,364	3	3	100.0%
WY	10	WY-BCR10-BU	Bureau of Land Management - Buffalo Field Office	BCR	547	2	2	100.0%
WY	10	WY-BCR10-CA	Bureau of Land Management - Casper Field Office	BCR	2,509	2	2	100.0%
WY	10	WY-BCR10-CO	Bureau of Land Management - Cody Field Office	BCR	4,704	2	2	100.0%
WY	10	WY-BCR10-CT	Caribou-Targhee National Forest	BCR	1,397	4	4	100.0%
WY	10	WY-BCR10-GR	Grand Teton National Park	BCR	856	2	2	100.0%
WY	10	WY-BCR10-KE	Bureau of Land Management - Kemmerer Field Office	BCR	5,733	2	2	100.0%
WY	10	WY-BCR10-LA	Bureau of Land Management - Lander Field Office	BCR	9,829	2	2	100.0%
WY	10	WY-BCR10-MB	Medicine Bow National Forest	WYNDD	773	3	3	100.0%
WY	10	WY-BCR10-PI	Bureau of Land Management - Pinedale Field Office	BCR	3,687	8	8	100.0%
WY	10	WY-BCR10-RA	Bureau of Land Management - Rawlins Field Office	BCR	13,954	8	8	100.0%
WY	10	WY-BCR10-RO	Bureau of Land Management - Rock Springs Field Office	BCR	15,152	8	8	100.0%
WY	10	WY-BCR10-SE	Shoshone National Forest - Roaded/Managed	BCR	2,101	20	20	100.0%
WY	10	WY-BCR10-SR	Shoshone National Forest - Roadless/Wilderness	BCR	8,311	6	6	100.0%

State	BCR	Stratum	Stratum Definition	Collected By	Area (km²)	Planned	Completed	% Completed
WY	10	WY-BCR10-WA	Wasatch National Forest	BCR	33	2	2	100.0%
WY	10	WY-BCR10-WO	Bureau of Land Management - Worland Field Office	BCR	8,467	2	2	100.0%
WY	10	WY-BCR10-WR	Wind River Reservation	BCR	7,819	4	4	100.0%
WY	10	WY-BCR10-YE	Yellowstone National Park	BCR	7,592	4	4	100.0%
				Subtotal	**165,332**	**127**	**127**	**100.0%**
WY	16	WY-BCR16-AO	All Other Lands	BCR	5,438	6	6	100.0%
WY	16	WY-BCR16-BL	Bureau of Land Management	BCR	647	2	2	100.0%
WY	16	WY-BCR16-MB	Medicine Bow National Forest	WYNDD	5,329	27	27	100.0%
WY	16	WY-BCR16-WA	Wasatch National Forest	BCR	180	2	2	100.0%
				Subtotal	**11,594**	**37**	**37**	**100.0%**
WY	17	WY-BCR17-AO	All Other Lands	BCR	52,186	25	25	100.0%
WY	17	WY-BCR17-BH	Black Hills National Forest	BCR	1,085	3	3	100.0%
WY	17	WY-BCR17-BU	Bureau of Land Management - Buffalo Field Office	BCR	2,653	8	7	87.5%
WY	17	WY-BCR17-CA	Bureau of Land Management - Casper Field Office	BCR	2,695	8	8	100.0%
WY	17	WY-BCR17-NE	Bureau of Land Management - Newcastle Field Office	BCR	1,025	8	8	100.0%
WY	17	WY-BCR17-TB	Thunder Basin National Grassland	WYNDD	4,520	10	10	100.0%
WY	17	WY-DOD-CG	Department of Defense - Camp Guernsey	BCR	280	20	20	100.0%
				Subtotal	**64,444**	**82**	**81**	**98.8%**
WY	18	WY-BCR18-AO	All Other Lands	BCR	12,064	10	10	100.0%
WY	18	WY-BCR18-BL	Bureau of Land Management	BCR	171	2	2	100.0%
WY	18	WY-BCR18-DO	Department of Defense	BCR	23	2	2	100.0%
				Subtotal	**12,258**	**14**	**14**	**100.0%**
				Grand Total	**1,168,082**	**1331**	**1313**	**98.6%**

Table 2. Reasons planned surveys were not completed, 2015.

Stratum	# Not Completed	Reason
CO-BCR16-WA	1	High water in river unsafe to cross
CO-DOD16-FC	2	Unable to schedule due to Military training schedule and weather
CO-DOD16-FF	1	Unable to schedule due to Military training schedule and weather
MT-BCR17-BL	1	Crew leader did not assign the survey
ND-BCR17-BM	4	unknown land ownership
ND-BCR17-OW	3	unknown land ownership
NE-BCR17-OW	3	Landowner denied permission or tech got confused and did not complete
NE-NGPIM-NI	1	unable to secure landowner permission for a backup survey
SD-BCR17-BN	1	Bad weather
WY-BCR17-BU	1	Roads to access transect ended up being private

I. Bird Conservation Region 17

STRATA

Bureau of Land Management
- ■ All Other BLM
- ■ Buffalo Field Office
- ■ Casper Field Office
- ■ Newcastle Field Office

National Park Service
- ■ Badlands NP - North Unit
- ■ Badlands NP - South Unit
- ■ Jewel Cave NM
- ■ Knife River Indian Villages NHS
- ■ Mount Rushmore NM
- ■ Theodore Roosevelt NP
- ■ Wind Cave NP

USFS - National Forests
- ■ Black Hills
- ■ Black Hills HUC 7
- ■ Custer
- ■ Lewis and Clark

USFS - National Grasslands
- ■ Buffalo Gap
- ■ Cedar River
- ■ Fort Pierre
- ■ Grand River
- ■ Little Missouri
- ■ Oglala
- ■ Thunder Basin

US Fish and Wildlife Service
- ■ Charles M. Russel National Wildlife Refuge
- ■ All Other Refuges

All Other Strata
- ■ All Other Ownership
- ■ Rivers

■ Surveyed Transects Bird Conservation Regions

Figure 4. Survey locations in the Badlands and Prairies Bird Conservation Region (BCR 17), 2015.

A. BCR 17: Total

The IMBCR program was expanded in 2009 to include all of the Badlands and Prairies (BCR 17). This is currently the only BCR that is entirely stratified and sampled through this program. There have been several changes made within this BCR to allow for greater efficiency and to provide land managers with more useful data. In 2011, the Black Hills National Forest stratum in South Dakota BCR 17 was split into two strata based on watersheds in the Forest: Hydrologic Code 7 Watersheds and all other watersheds. This stratification by watershed allows for adjusting sampling intensity to target Management Indicator Species on the Forest. In Montana in 2012, several strata were restratified 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.

In 2013 the North Dakota, South Dakota and Nebraska portions of BCR 17 underwent a complete restratification to integrate several NPS NGPN strata. During restratification, we defined new strata using the US National Grid, a grid system that covers the entire country. 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 restratification schemes in 2013.

All of the strata in these states were retained and renamed to avoid confusion, except for the original NPS strata. These strata were broken up so that each NPS unit is now its own stratum (including 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). This will allow the NGPN to monitor birds on each of its units separately.

We obtained results for BCR 17 by compiling and jointly analyzing data from 37 strata in 5 states (Figure 4).

Field technicians completed 241 of 254 planned surveys (94.9%) in 2015. Technicians conducted 2,653 point counts within the 241 surveyed grid cells between 16 May and 14 July. They detected 223 bird species, including 41 priority species (Appendix B).

Bird Conservancy estimated densities and population sizes for 155 species, 33 of which are priority species. The data yielded robust density estimates (CV < 50%) for 68 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout BCR 17 for 153 species, 33 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 74 of these species.

To view a map of survey locations, density and occupancy results and species counts within BCR 17 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015,

after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

BCR 17 Results

B. Montana BCR 17

We obtained results for Montana BCR 17 by compiling and jointly analyzing data from seven strata (Figure 4).

Field technicians completed 27 of 28 planned surveys (96.4%) in 2015. Technicians conducted 315 point counts within the 27 surveyed grid cells between 19 May and 2 July. They detected 156 bird species, including 20 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 110 species, 12 of which are priority species. The data yielded robust density estimates (CV < 50%) for 22 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Montana BCR 17 for 104 species, 11 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 40 of these species.

To view a map of survey locations, density and occupancy results and species counts within Montana BCR 17 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Montana BCR 17 Results

C. North Dakota BCR 17

We obtained results for North Dakota BCR 17 by compiling and jointly analyzing data from eight strata (Figure 4). For results on All Other Lands, BLM, NPS and USFS Lands within North Dakota refer to section III: Land Ownership.

Field technicians completed 37 of 44 planned surveys (84.1%) in 2015. Technicians conducted 371 point counts within the 37 surveyed grid cells between 1 June and 13 July. They detected 121 bird species, including 20 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 92 species, 14 of which are priority species. The data yielded robust density estimates (CV < 50%) for 22 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout North Dakota BCR 17 for 91 species, 14 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 40 of these species.

To view a map of survey locations, density and occupancy results and species counts within North Dakota BCR 17 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

North Dakota BCR 17 Results

D. Nebraska BCR 17
We obtained results for Nebraska BCR 17 by compiling and jointly analyzing data from two strata (Figure 4). For results on All Other Lands and Oglala National Grassland refer to section III: Land Ownership.

Field technicians completed 7 of 10 planned surveys (70%) in 2015. Technicians conducted 80 point counts within the 7 surveyed grid cells between 26 May and 13 July. They detected 54 bird species, including 6 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 32 species, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 10 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Nebraska BCR 17 for 24 species, 3 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 13 of these species.

To view a map of survey locations, density and occupancy results and species counts within Nebraska BCR 17 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Nebraska BCR 17 Results

E. South Dakota BCR 17
We obtained results for South Dakota BCR 17 by compiling and jointly analyzing data from 14 strata (Figure 4). For results on All Other Lands, BLM, NPS and USFS Lands within South Dakota refer to section III: Land Ownership.

Field technicians completed 109 of 110 planned surveys (99.1%) in 2015. Technicians conducted 1,197 point counts within the 109 surveyed grid cells between 19 May and 14 July. They detected 157 bird species, including 16 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 124 species, 12 of which are priority species. The data yielded robust density estimates (CV < 50%) for 29 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout South Dakota BCR 17 for 119 species, 9 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 37 of these species.

To view a map of survey locations, density and occupancy results and species counts within South Dakota BCR 17 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

South Dakota BCR 17 Results

F. Wyoming BCR 17

We obtained results for Wyoming BCR 17 by compiling and jointly analyzing data from six strata (Figure 4). For additional results within Wyoming, refer to section II: States. For results on BLM, NPS, Tribal and USFS lands within Wyoming refer to section III: Land Ownership.

Field technicians completed 61 of 62 planned surveys (98.4%) in 2015. Technicians conducted 690 point counts within the 61 surveyed grid cells between 16 May and 13 July. They detected 146 bird species, including 21 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 103 species, 12 of which are priority species. The data yielded robust density estimates (CV < 50%) for 31 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Wyoming BCR 17 for 101 species, 12 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 36 of these species.

To view a map of survey locations, density and occupancy results and species counts within Wyoming BCR 17 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Wyoming BCR 17 Results

II. States
A. Colorado
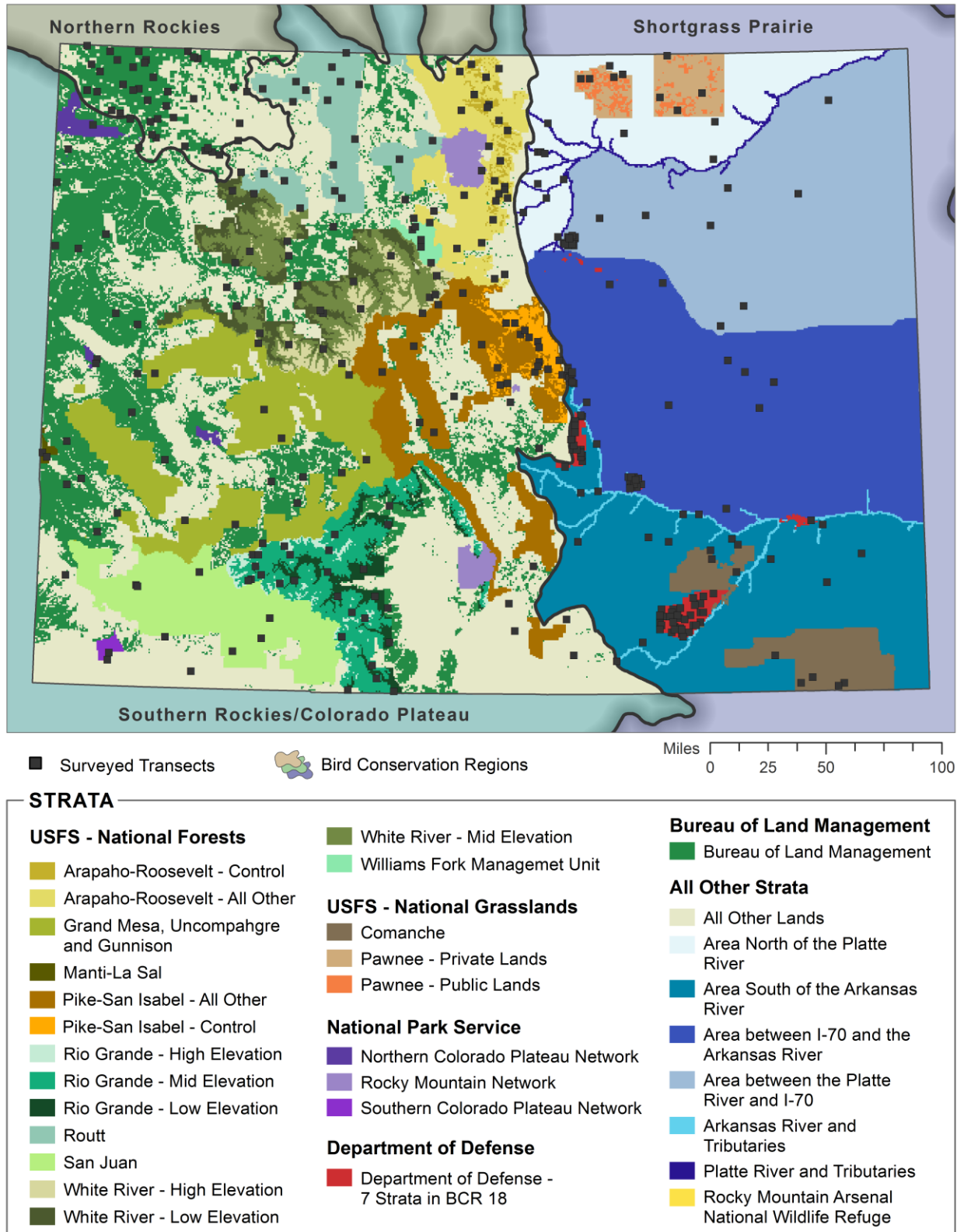
Figure 5. Survey locations in Colorado, 2015.

1. Colorado Statewide

Colorado was the first state to implement the IMBCR design in 2008. In the first season of surveys in Colorado BCR 16, we used cell weighting based on Strahler stream order and elevation to target higher order rivers and streams and higher elevation habitats (Blakesley and Hanni 2009). However, IMBCR partners decided after the initial field season that cell weighting had caused middle-elevations in Colorado to be under-sampled. To correct this, all strata in Colorado BCR 16 were restratified without cell weighting in 2009. No samples were surveyed in the BCR 10 portion of Colorado in 2008 because of issues getting permission to conduct surveys on private lands.

There were several restratifications done in Colorado BCRs 10 and 16 between 2009 and 2010. The Colorado BCR10 stratum was restratified to include the tiny easternmost portion of BCR 10 that dips into Colorado so it now represents all of BCR 10 in Colorado. The NPS Rocky Mountain Inventory and Monitoring Network (RMNW) and Northern Colorado Plateau Inventory and M Network (NCPN) were restratified because under the initial design some NCPN park units were misclassified into the RMNW stratum.

In 2011, the Colorado BCR 10 stratum was split into two strata: BLM Lands and All Other Lands. This was done to facilitate better 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 allows for adjusting sampling intensity to target Management Indicator Species on the Forests. The Routt National Forest and Arapaho and Roosevelt National Forest strata were reorganized and a third stratum, the Williams Fork Area, was created from the two, because it is a portion of the Routt National Forest that is managed by the Arapaho and Roosevelt National Forests but falls within the Routt National Forest Plan. The RMNW stratum was restratified 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 2013, the Pawnee National Grasslands stratum in BCR 18 was split into two strata – public lands and private lands – since Pawnee National Grasslands contains a large amount of private land within its borders. This allowed the USFS to concentrate more survey effort specifically on public lands.

In 2014, the Arapaho and Roosevelt and the Pike and San Isabel National Forests were restratified to allow these forests to monitor treatments within heavy beetle kill areas. Each forest was divide into two strata – a control stratum and the remainder of the forest. The control portion of the Arapaho and Roosevelt National Forests consisted of lands ranging in elevation from 6,000 ft to 9,000 ft, excluding burn areas. The Pike and San Isabel control stratum ranges from 6,300 ft to 9,000 ft and also excludes burn areas. An experiment overlay stratum was created for Arapaho and Roosevelt and Pike and San Isabel National Forests consisting of actual treatment areas. Since this stratum spans multiple forests it is not actually considered to be a part of the IMBCR design and is not presented in this report. However, detections from this stratum do contribute to the number of detections used in analyses for IMBCR.

In 2015, the Department of Defense (DoD) stratum in Colorado BCR 18 was completely restratified 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 will allow 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.

Surprisingly, the Rocky Mountain Arsenal National Wildlife Refuge also came out of this 2015 restratification. 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.

a) Colorado Statewide: Total
We obtained results for Colorado by compiling and jointly analyzing data from 39 strata (Figure 5). For results on BLM, NPS, DoD and USFS Lands within Colorado, refer to section III: Land Ownership.

Field technicians completed 349 of 350 planned surveys (99.7%) in 2014. Technicians conducted 4,066 point counts within the 349 surveyed sampling units between 12 May and 20 July. They detected 208 bird species, including 41 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 161 species, 27 of which are priority species. The data yielded robust density estimates (CV < 50%) for 112 of these species.

Bird Conservancy estimated the proportion of 1 km² sampling units occupied (Psi) throughout Colorado for 154 species, 23 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 111 of these species.

To view a map of survey locations, density and occupancy results and species counts within Colorado across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Colorado Statewide Results

b) All Other Lands in Colorado
We obtained results for All Other Lands in Colorado by compiling and jointly analyzing data from seven strata (Figure 5).

Field technicians completed all 57 planned surveys (100%) in 2015. Technicians conducted 669 point counts within the 57 surveyed grid cells between 9 May and 21 July. They detected 172 bird species, including 30 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 128 species, 19 of which are priority species. The data yielded robust density estimates (CV < 50%) for 50 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout All Other Lands in Colorado for 126 species, 20 of which are priority

species. The data yielded robust occupancy estimates (CV < 50%) for 64 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

All Other Lands in Colorado Results

2. **Colorado BCR 10**
   a) Colorado BCR 10: Total
   We obtained results for Colorado BCR 10 by compiling and jointly analyzing data from two strata (Figure 5).

   Field technicians completed all 38 planned surveys (100%) in 2015. Technicians conducted 507 point counts within the 38 surveyed grid cells between 18 May and 30 June. They detected 109 bird species, including 19 priority species (Appendix C).

   Bird Conservancy estimated densities and population sizes for 77 species, 10 of which are priority species. The data yielded robust density estimates (CV < 50%) for 25 of these species.

   Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Colorado BCR 10 for 74 species, 10 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 31 of these species.

   To view a map of survey locations, density and occupancy results and species counts within Colorado BCR 10 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Colorado BCR 10 Results

   b) All Other Lands in Colorado BCR 10
   We obtained results for All Other Lands in Colorado BCR 10 by analyzing data from one stratum (Figure 5).

   Field technicians completed all 5 planned surveys (100%) in 2015. Technicians conducted 67 point counts within the 5 surveyed grid cells between 28 May and 15 June. They detected 78 bird species, including 10 priority species (Appendix C).

   Bird Conservancy estimated densities and population sizes for 61 species, 7 of which are priority species. The data yielded robust density estimates (CV < 50%) for 9 of these species.

   Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout All Other Lands in Colorado BCR 10 for 55 species, 6 of which are

priority species. The data yielded robust occupancy estimates (CV < 50%) for 13 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

All Other Lands in Colorado BCR 10 Results

3. **Colorado BCR 16**
   a) **Colorado BCR 16: Total**
   We obtained results for Colorado BCR 16 by compiling and jointly analyzing data from 20 strata (Figure 5).

   Field technicians completed 180 of 181 planned surveys (99.4%) in 2015. Technicians conducted 1,980 point counts within the 180 surveyed grid cells between 12 May and 29 July. They detected 178 bird species, including 29 priority species (Appendix C).

   Bird Conservancy estimated densities and population sizes for 134 species, 18 of which are priority species. The data yielded robust density estimates (CV < 50%) for 77 of these species.

   Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Colorado BCR 16 for 130 species, 17 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 85 of these species.

   To view a map of survey locations, density and occupancy results and species counts within Colorado BCR 16 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

   Colorado BCR 16 Results

   b) **All Other Lands in Colorado BCR 16**
   We obtained results for All Other Lands in Colorado BCR 16 by analyzing data from one stratum (Figure 5).

   Field technicians completed all 19 planned surveys (100%) in 2015. Technicians conducted 191 point counts within the 19 surveyed grid cells between 17 May and 21 July. They detected 130 bird species, including 16 priority species (Appendix C).

   Bird Conservancy estimated densities and population sizes for 101 species, 8 of which are priority species. The data yielded robust density estimates (CV < 50%) for 29 of these species.

   Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout All Other Lands in Colorado BCR 16 for 105 species, 12 of which are

priority species. The data yielded robust occupancy estimates (CV < 50%) for 40 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

All Other Lands in Colorado BCR 16 Results

4. **Colorado BCR 18**
   a) **Colorado BCR 18: Total**
   We obtained results for Colorado BCR 18 by compiling and jointly analyzing data from 17 strata (Figure 5).

   Field technicians completed all 149 planned surveys (100%) in 2015. Technicians conducted 1,832 point counts within the 149 surveyed grid cells between 9 May and 17 June. They detected 182 bird species, including 23 priority species (Appendix C).

   Bird Conservancy estimated densities and population sizes for 120 species, 18 of which are priority species. The data yielded robust density estimates (CV < 50%) for 35 of these species.

   Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Colorado BCR 18 for 114 species, 16 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 41 of these species.

   To view a map of survey locations, density and occupancy results and species counts within Colorado BCR 18 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Colorado BCR 18 Results

   b) **Colorado BCR 18 Rivers**
   We obtained results for Colorado BCR 18 Rivers by compiling and jointly analyzing data from two strata (Figure 5).

   Field technicians completed all 15 planned surveys (100%) in 2015. Technicians conducted 144 point counts within the 15 surveyed grid cells between 12 May and 8 June. They detected 120 bird species, including 10 priority species (Appendix C).

   Bird Conservancy estimated densities and population sizes for 77 species, 5 of which are priority species. The data yielded robust density estimates (CV < 50%) for 28 of these species.

   Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Colorado BCR 18 Rivers for 76 species, 5 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 35 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Colorado BCR 18 Rivers Results

c) All Other Lands in Colorado BCR 18
We obtained results for All Other Lands in Colorado BCR 18 by compiling and jointly analyzing data from five strata (Figure 5).

Field technicians completed all 33 planned surveys (100%) in 2015. Technicians conducted 411 point counts within the 33 surveyed grid cells between 9 May and 5 June. They detected 92 bird species, including 14 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 63 species, 11 of which are priority species. The data yielded robust density estimates (CV < 50%) for 15 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout All Other Lands in Colorado BCR 18 for 56 species, 9 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 20 of these species.

To view a map of survey locations, density and occupancy results and species counts within All Other Lands in Colorado BCR 18 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

All Other Lands in Colorado BCR 18 Results

B. Montana
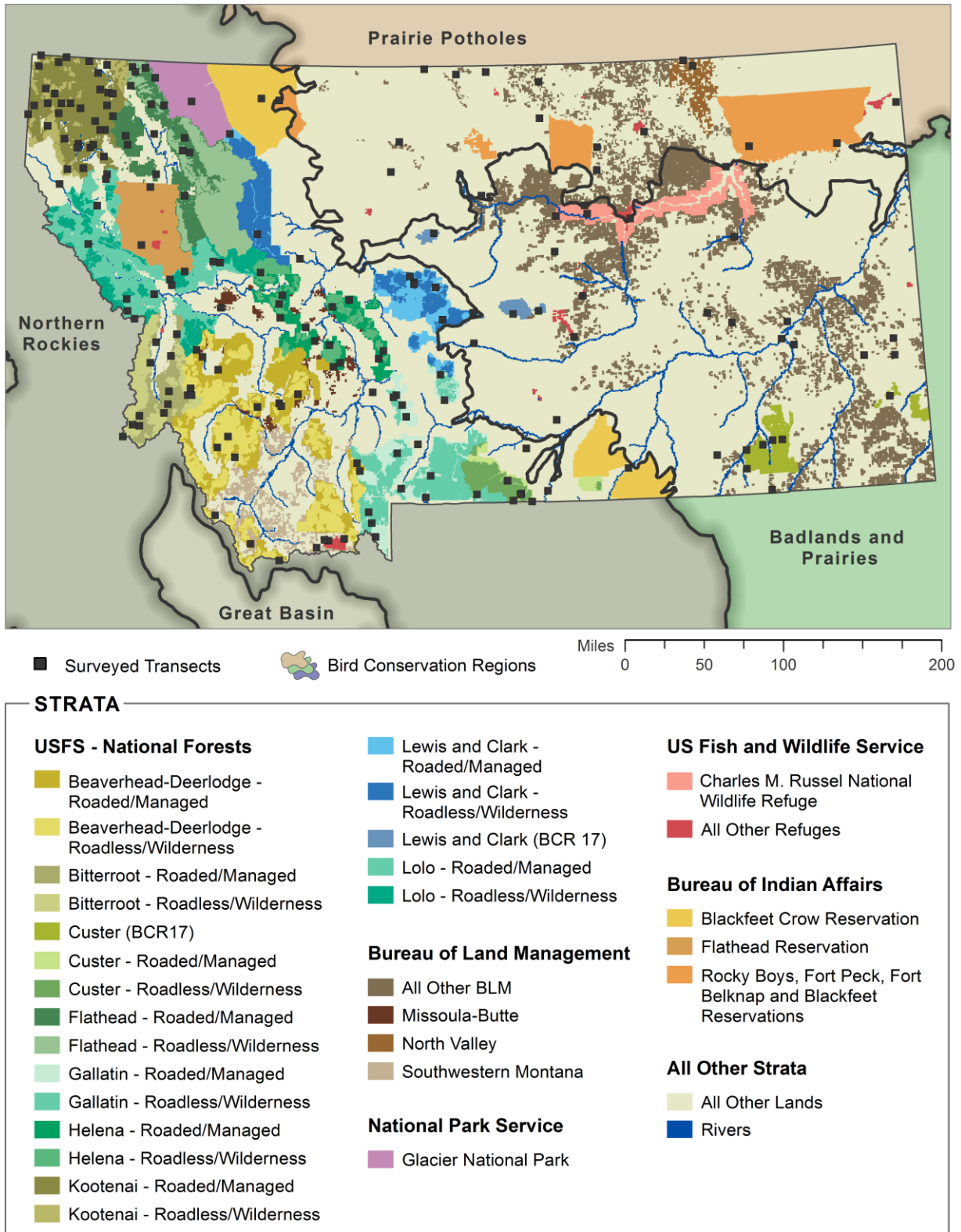
Figure 6. Survey locations in Montana, 2015.

1. Montana Statewide

IMBCR surveys were first conducted in Montana in 2009 within the BCR 17 portion of the state. This was part of the larger sampling effort throughout all of BCR 17. In 2010, the program expanded to include the BCR 10 and the Prairie Potholes BCR (BCR 11) portions of Montana, making it a statewide effort.

In 2012, several strata were restratified and combined within the Montana portion of 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.

The USFWS strata in Montana BCRs 11 and 17 were subdivided in 2014 to allow density and occupancy estimation specifically within the Charles M. Russell National Wildlife Refuge. Previously, all USFWS lands were grouped together in these BCRs, limiting our ability to get estimates for individual refuges. In each BCR, two new strata were created – a Charles M. Russel NWR stratum and an All Other USFWS Lands stratum.

a) Montana Statewide: Total

We obtained results for Montana by compiling and jointly analyzing data from 39 strata (Figure 6). For results on BLM, NPS, Tribal, USFS and USFWS lands within Montana, refer to section III: Land Ownership.

Field technicians completed 193 of 194 planned surveys (99.5%) in 2015. Technicians conducted 1,994 point counts within the 193 surveyed grid cells between 19 May and 15 July. They detected 241 bird species, including 39 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 159 species, 23 of which are priority species. The data yielded robust density estimates (CV < 50%) for 90 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Montana for 156 species, 20 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 116 of these species.

To view a map of survey locations, density and occupancy results and species counts within Montana across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Montana Statewide Results

b) All Other Lands in Montana

We obtained results for All Other Lands in Montana by compiling and jointly analyzing data from three strata (Figure 6).

Field technicians completed all 25 planned surveys (100%) in 2015. Technicians conducted 284 point counts within the 25 surveyed grid cells between 20 May and 4 July. They detected 155 bird species, including 17 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 110 species, 12 of which are priority species. The data yielded robust density estimates (CV < 50%) for 33 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout All Other Lands in Montana for 105 species, 10 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 52 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

All Other Lands in Montana Results

2. **Montana BCR 10**
   a) **Montana BCR 10: Total**
   We obtained results for Montana BCR 10 by compiling and jointly analyzing data from 26 strata (Figure 6).

   Field technicians completed all 147 planned surveys (100%) in 2015. Technicians conducted 1,415 point counts within the 147 surveyed grid cells between 23 May and 15 July. They detected 205 bird species, including 29 priority species (Appendix C).

   Bird Conservancy estimated densities and population sizes for 141 species, 16 of which are priority species. The data yielded robust density estimates (CV < 50%) for 70 of these species.

   Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Montana BCR 10 for 138 species, 15 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 98 of these species.

   To view a map of survey locations, density and occupancy results and species counts within Montana BCR 10 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

   Montana BCR 10 Results

   b) **Montana BCR 10 Rivers**
   We obtained results for Rivers in Montana BCR 10 by analyzing data from one stratum (Figure 6).

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 18 point counts within the 2 surveyed grid cells between 28 May and 3 June. They detected 63 bird species, including 3 priority species (Appendix C).

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

To view a map of survey locations, density and occupancy results and species counts within Montana BCR 10 Rivers across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Montana BCR 10 Rivers Results

c) All Other Lands in Montana BCR 10
We obtained results for All Other Lands in Montana BCR 10 by analyzing data from one stratum (Figure 6).

Field technicians completed all 8 planned surveys (100%) in 2015. Technicians conducted 80 point counts within the 8 surveyed grid cells between 29 May and 4 July. They detected 104 bird species, including 6 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 83 species, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 13 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout All Other Lands in Montana BCR 10 for 76 species, 3 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 20 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

All Other Lands in Montana BCR 10 Results

3. Montana BCR 11
a) Montana BCR 11: Total
We obtained results for Montana BCR 11 by compiling and jointly analyzing data from six strata (Figure 6).

Field technicians completed all 19 planned surveys (100%) in 2015. Technicians conducted 264 point counts within the 19 surveyed grid cells between 21 May and 12 June. They detected 103 bird species, including 12 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 70 species, 9 of which are priority species. The data yielded robust density estimates (CV < 50%) for 23 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Montana BCR 11 for 68 species, 7 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 35 of these species.

To view a map of survey locations, density and occupancy results and species counts within Montana BCR 11 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Montana BCR 11 Results

b) All Other Lands in Montana BCR 11
We obtained results for All Other Lands in Montana BCR 11 by analyzing data from one stratum (Figure 6).

Field technicians completed all 9 planned surveys (100%) in 2015. Technicians conducted 116 point counts within the 9 surveyed grid cells between 23 May and 12 June. They detected 77 bird species, including 10 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 56 species, 8 of which are priority species. The data yielded robust density estimates (CV < 50%) for 18 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout All Other Lands in Montana BCR 11 for 53 species, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 31 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

All Other Lands in Montana BCR 11 Results

4. Montana BCR 17
a) Montana BCR 17: Total
We obtained results for Montana BCR 17 by compiling and jointly analyzing data from seven strata (Figure 4).

Field technicians completed 27 of 28 planned surveys (96.4%) in 2015. Technicians conducted 315 point counts within the 27 surveyed grid cells between 19 May and 2 July. They detected 156 bird species, including 20 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 110 species, 12 of which are priority species. The data yielded robust density estimates (CV < 50%) for 22 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Montana BCR 17 for 104 species, 11 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 40 of these species.

To view a map of survey locations, density and occupancy results and species counts within Montana BCR 17 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Montana BCR 17 Results

b) Montana BCR 17 Rivers
We obtained results for Montana BCR 17 Rivers by analyzing data from one stratum (Figure 6).

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 18 point counts within the 2 surveyed grid cells between 20 May and 28 May. They detected 40 bird species, including 3 priority species (Appendix C).

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

To view a map of survey locations, density and occupancy results and species counts within Montana BCR 17 Rivers across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Montana BCR 17 Rivers Results

c) All Other Lands in Montana BCR 17
We obtained results for All Other Lands in Montana BCR 17 by analyzing data from one stratum (Figure 6).

Field technicians completed all 8 planned surveys (100%) in 2015. Technicians conducted 88 point counts within the 8 surveyed grid cells between 20 May and 24 June. They detected 91 bird species, including 6 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 60 species, 4 of which are priority species. The data yielded robust density estimates (CV < 50%) for 6 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout All Other Lands in Montana BCR 17 for 56 species, 4 of which are priority

species. The data yielded robust occupancy estimates (CV < 50%) for 16 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

All Other Lands in Montana BCR 17 Results

C. Wyoming
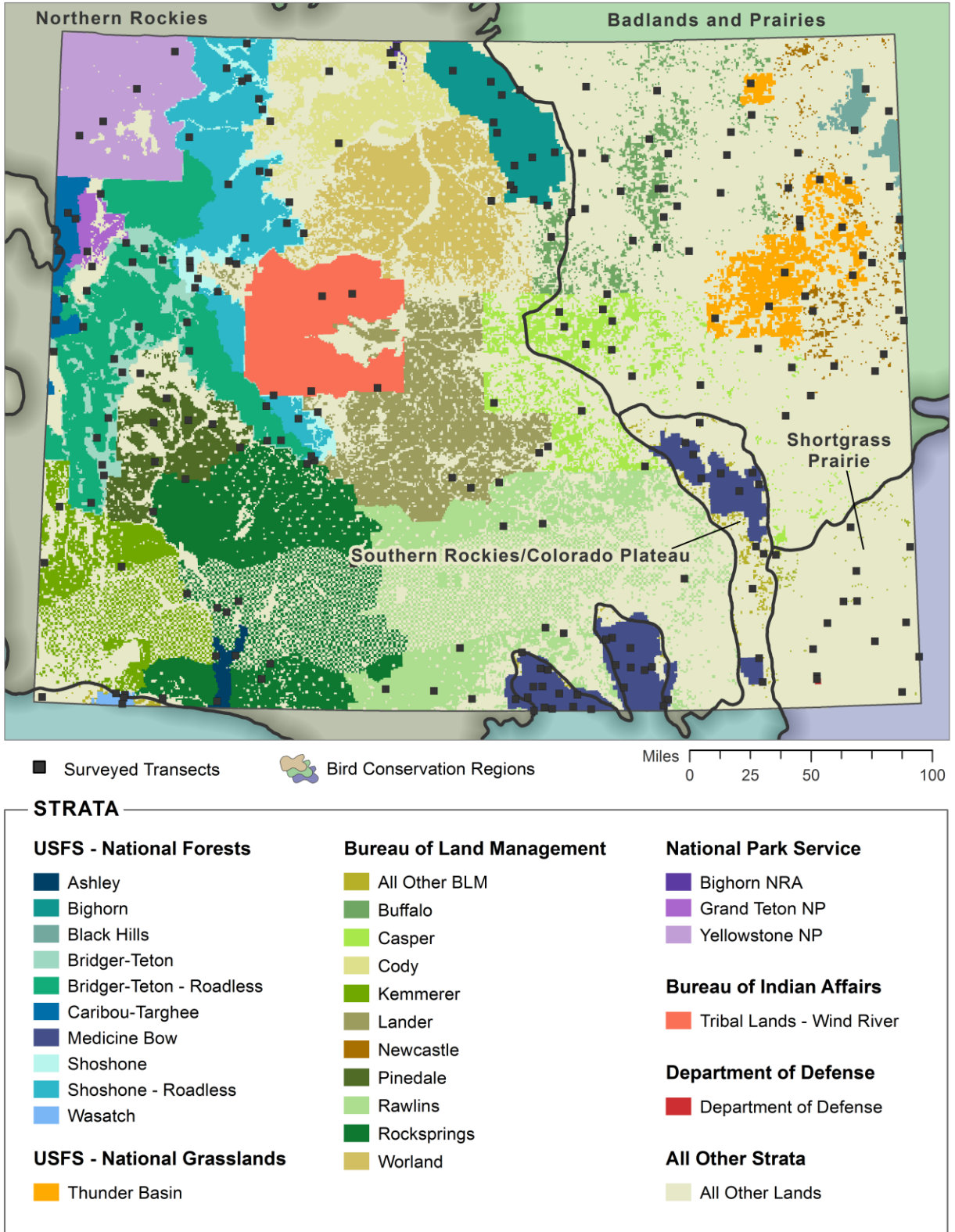
Figure 7. Survey locations in Wyoming, 2015.

1. Wyoming Statewide

In 2008, the Wyoming portion of BCR 16 was sampled under the IMBCR design as a part of the pilot effort in Colorado. That year, we used cell weighting based on Strahler stream order and elevation to target higher order rivers and streams and higher elevation habitats (Blakesley and Hanni 2009). However, IMBCR partners decided after the initial field season that cell weighting had caused middle-elevations to be under-sampled. To correct this, all strata in the Colorado and Wyoming portions of BCR 16 were restratified without cell weighting in 2009. Additionally, the All Other Lands stratum in Wyoming BCR 16 was split into two strata: All Other Lands and BLM Lands.

The IMBCR program was expanded in 2009 to include the entire state of Wyoming. Most of the strata in Wyoming have remained unchanged since then. In 2010, the USFS Region 4 stratum in Wyoming BCR 10 was restratified 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. Later, in 2014, the remainder of USFS Region 4 was split out into three separate strata, one for each remaining national forest (Caribou-Targhee, Ashley and Wasatch). This restratification was done to allow for density and occupancy estimation at the national forest level within Wyoming for these USFS Region 4 Forests.

a) Wyoming Statewide: Total

We obtained results for Wyoming by compiling and jointly analyzing data from 37 strata (Figure 7). For results on BLM, DoD, NPS, Tribal and USFS lands within Wyoming refer to section III: Land Ownership.

Field technicians completed 241 of 242 planned surveys (99.6%) in 2015. Technicians conducted 2,972 point counts within the 241 surveyed grid cells between 16 May and 24 July. They detected 216 bird species, including 34 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 159 species, 20 of which are priority species. The data yielded robust density estimates (CV < 50%) for 80 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Wyoming for 158 species, 20 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 95 of these species.

To view a map of survey locations, density and occupancy results and species counts within Wyoming across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Wyoming Statewide Results

b) All Other Lands in Wyoming

We obtained results for All Other Lands in Wyoming by compiling and jointly analyzing data from four strata (Figure 7).

Field technicians completed all 53 planned surveys (100%) in 2015. Technicians conducted 594 point counts within the 53 surveyed grid cells between 18 May and 25 June. They detected 162 bird species, including 24 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 122 species, 16 of which are priority species. The data yielded robust density estimates (CV < 50%) for 35 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout All Other Lands in Wyoming for 114 species, 15 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 44 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

All Other Lands in Wyoming Results

2. **Wyoming BCR 10**
   a) **Wyoming BCR 10: Total**
   We obtained results for Wyoming BCR 10 by compiling and jointly analyzing data from 23 strata (Figure 7).

   Field technicians completed all 127 planned surveys (100%) in 2015. Technicians conducted 1,685 point counts within the 127 surveyed grid cells between 26 May and 24 July. They detected 188 bird species, including 26 priority species (Appendix C).

   Bird Conservancy estimated densities and population sizes for 134 species, 13 of which are priority species. The data yielded robust density estimates (CV < 50%) for 55 of these species.

   Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Wyoming BCR 10 for 132 species, 12 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 76 of these species.

   To view a map of survey locations, density and occupancy results and species counts within Wyoming BCR 10 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

   Wyoming BCR 10 Results

   b) **All Other Lands in Wyoming BCR 10**
   We obtained results for All Other Lands in Wyoming BCR 10 by analyzing data from one stratum (Figure 7).

Field technicians completed all 12 planned surveys (100%) in 2015. Technicians conducted 139 point counts within the 12 surveyed grid cells between 26 May and 25 June. They detected 110 bird species, including 12 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 83 species, 9 of which are priority species. The data yielded robust density estimates (CV < 50%) for 12 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout All Other Lands in Wyoming BCR 10 for 81 species, 8 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 26 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

All Other Lands in Wyoming BCR 10 Results

3. **Wyoming BCR 16**
   a) **Wyoming BCR 16: Total**
   We obtained results for Wyoming BCR 16 by compiling and jointly analyzing data from four strata (Figure 7).

   Field technicians completed all 37 planned surveys (100%) in 2015. Technicians conducted 410 point counts within the 37 surveyed grid cells between 22 May and 23 July. They detected 125 bird species, including 11 priority species (Appendix C).

   Bird Conservancy estimated densities and population sizes for 95 species, 7 of which are priority species. The data yielded robust density estimates (CV < 50%) for 39 of these species.

   Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Wyoming BCR 16 for 90 species, 5 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 48 of these species.

   To view a map of survey locations, density and occupancy results and species counts within Wyoming BCR 16 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

   Wyoming BCR 16 Results

   b) **All Other Lands in Wyoming BCR 16**
   We obtained results for All Other Lands in Wyoming BCR 16 by analyzing data from one stratum (Figure 7).

Field technicians completed all 6 planned surveys (100%) in 2015. Technicians conducted 61 point counts within the 6 surveyed grid cells between 22 May and 25 June. They detected 60 bird species, including 5 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 50 species, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 5 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout All Other Lands in Wyoming BCR 16 for 45 species, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 10 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

All Other Lands in Wyoming BCR 16 Results

4. **Wyoming BCR 17**
   a) **Wyoming BCR 17: Total**
   We obtained results for Wyoming BCR 17 by compiling and jointly analyzing data from six strata (Figure 4).

   Field technicians completed 61 of 62 planned surveys (98.4%) in 2015. Technicians conducted 690 point counts within the 61 surveyed grid cells between 16 May and 13 July. They detected 146 bird species, including 21 priority species (Appendix C).

   Bird Conservancy estimated densities and population sizes for 103 species, 12 of which are priority species. The data yielded robust density estimates (CV < 50%) for 31 of these species.

   Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Wyoming BCR 17 for 101 species, 12 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 36 of these species.

   To view a map of survey locations, density and occupancy results and species counts within Wyoming BCR 17 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

   Wyoming BCR 17 Results

   b) **All Other Lands in Wyoming BCR 17**
   We obtained results for All Other Lands in Wyoming BCR 17 by analyzing data from one stratum (Figure 7).

Field technicians completed all 25 planned surveys (100%) in 2015. Technicians conducted 280 point counts within the 25 surveyed grid cells between 18 May and 9 June. They detected 120 bird species, including 16 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 83 species, 11 of which are priority species. The data yielded robust density estimates (CV < 50%) for 20 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout All Other Lands in Wyoming BCR 17 for 80 species, 10 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 27 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

All Other Lands in Wyoming BCR 17 Results

5. **Wyoming BCR 18**
   a) **Wyoming BCR 18: Total**
   We obtained results for Wyoming BCR 18 by compiling and jointly analyzing data from three strata (Figure 7).

   Field technicians completed all 14 planned surveys (100%) in 2015. Technicians conducted 160 point counts within the 14 surveyed grid cells between 20 May and 8 June. They detected 85 bird species, including 12 priority species (Appendix C).

   Bird Conservancy estimated densities and population sizes for 64 species, 10 of which are priority species. The data yielded robust density estimates (CV < 50%) for 9 of these species.

   Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Wyoming BCR 18 for 51 species, 8 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 16 of these species.

   To view a map of survey locations, density and occupancy results and species counts within Wyoming BCR 18 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

   Wyoming BCR 18 Results

   b) **All Other Lands in Wyoming BCR 18**
   We obtained results for All Other Lands in Wyoming BCR 18 by analyzing data from one stratum (Figure 7).

Field technicians completed all 10 planned surveys (100%) in 2015. Technicians conducted 114 point counts within the 10 surveyed grid cells between 21 May and 8 June. They detected 76 bird species, including 10 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 56 species, 8 of which are priority species. The data yielded robust density estimates (CV < 50%) for 9 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout All Other Lands in Wyoming BCR 18 for 46 species, 5 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 16 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

All Other Lands in Wyoming BCR 18 Results

III. Land Ownership

A. All Other Lands

This section contains results for All Other Lands sampled in states that do not have full IMBCR coverage across the entire state. Results for All Other Lands strata within Colorado, Montana and Wyoming are reported in Section II: States.

1. All Other Lands in Nebraska BCR 17

We obtained results for All Other Lands in Nebraska BCR 17 from one stratum.

Field technicians completed 3 of 6 planned surveys (50%) in 2015. Technicians conducted 35 point counts within the 3 surveyed grid cells between 23 June and 12 July. They detected 41 bird species, including 2 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 24 species. The data yielded robust density estimates (CV < 50%) for 8 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout All Other Lands in Nebraska BCR 17 for 17 species. The data yielded robust occupancy estimates (CV < 50%) for 11 of these species.

To view a map of survey locations and species counts within All Other Lands in Nebraska BCR 17 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

All Other Lands in Nebraska BCR 17 Results

2. All Other Lands in North Dakota BCR 17

We obtained results for All Other Lands in North Dakota BCR 17 by compiling and jointly analyzing data from two strata.

Field technicians completed 6 of 9 planned surveys (66.7%) in 2015. Technicians conducted 56 point counts within the 6 surveyed grid cells between 1 June and 13 July. They detected 73 bird species, including 9 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 56 species, 8 of which are priority species. The data yielded robust density estimates (CV < 50%) for 12 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout All Other Lands in North Dakota BCR 17 for 57 species, 8 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 23 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

All Other Lands in North Dakota BCR 17 Results

3. All Other Lands in South Dakota BCR 17

We obtained results for All Other Lands in South Dakota BCR 17 by compiling and jointly analyzing data from two strata.

Field technicians completed all 10 planned surveys (100%) in 2015. Technicians conducted 105 point counts within the 10 surveyed grid cells between 19 May and 8 July. They detected 99 bird species, including 8 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 69 species, 7 of which are priority species. The data yielded robust density estimates (CV < 50%) for 9 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout All Other Lands in South Dakota BCR 17 for 63 species, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 13 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

All Other Lands in South Dakota BCR 17 Results

B. Bureau of Land Management
    1. BLM in Colorado
      a) BLM in Colorado: Total
We obtained results for BLM in Colorado by compiling and jointly analyzing data from two strata.

Field technicians completed all 58 planned surveys (100%) in 2015. Technicians conducted 748 point counts within the 58 surveyed grid cells between 14 May and 7 July. They detected 130 bird species, including 4 priority species (Appendix D).

Bird Conservancy estimated densities and population sizes for 96 species, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 45 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout BLM in Colorado for 93 species, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 47 of these species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Colorado across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

BLM in Colorado Results

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

Field technicians completed all 33 planned surveys (100%) in 2015. Technicians conducted 440 point counts within the 33 surveyed grid cells between 18 May and 30 June. They detected 93 bird species, including 4 priority species (Appendix D).

Bird Conservancy estimated densities and population sizes for 62 species, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 30 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout BLM in Colorado BCR 10 for 60 species, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 30 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

BLM in Colorado BCR 10 Results

c) BLM in Colorado BCR 16

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

Field technicians completed all 25 planned surveys (100%) in 2015. Technicians conducted 308 point counts within the 25 surveyed grid cells between 14 May and 7 July. They detected 108 bird species, including 2 priority species (Appendix D).

Bird Conservancy estimated densities and population sizes for 87 species, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 40 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout BLM in Colorado BCR 16 for 81 species, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 43 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

BLM in Colorado BCR 16 Results

2. BLM in Montana
a) BLM in Montana: Total

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

Field technicians completed 12 of 13 planned surveys (92.3%) in 2015. Technicians conducted 154 point counts within the 12 surveyed grid cells between 24 May and 2 July. They detected 109 bird species, including 11 priority species (Appendix D).

Bird Conservancy estimated densities and population sizes for 70 species, 8 of which are priority species. The data yielded robust density estimates (CV < 50%) for 18 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout BLM in Montana for 70 species, 8 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 31 of these species.

To view a map of survey locations, density and occupancy results and species counts within BLM in Montana across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

BLM in Montana Results

b) 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 4 planned surveys (100%) in 2015. Technicians conducted 35 point counts within the 4 surveyed grid cells between 25 May and 2 July. They detected 54 bird species, including 3 priority species (Appendix D).

Bird Conservancy estimated densities and population sizes for 33 species, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 10 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout BLM in Montana BCR 10 for 31 species, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 16 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

BLM in Montana BCR 10 Results

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

Field technicians completed all 4 planned surveys (100%) in 2015. Technicians conducted 60 point counts within the 4 surveyed grid cells between 24 May and 6 June. They detected 55 bird species, including 6 priority species (Appendix D).

Bird Conservancy estimated densities and population sizes for 38 species, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 10 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout BLM in Montana BCR 11 for 38 species, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 18 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

BLM in Montana BCR 11 Results

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

Field technicians completed 4 of 5 planned surveys (80%) in 2015. Technicians conducted 59 point counts within the 4 surveyed grid cells between 26 May and 19 June. They detected 48 bird species, including 9 priority species (Appendix D).

Bird Conservancy estimated densities and population sizes for 27 species, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 3 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout BLM in Montana BCR 17 for 28 species, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 6 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

BLM in Montana BCR 17 Results

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

Field technicians completed 2 of 6 planned surveys (33.3%) in 2015. Technicians conducted 26 point counts within the 2 surveyed grid cells between 4 June and 5 June. They detected 48 bird species, including 3 priority species (Appendix D).

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

To view a map of survey locations, density and occupancy results and species counts within BLM in North Dakota BCR 17 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

BLM in North Dakota BCR 17 Results

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

Field technicians completed all 13 planned surveys (100%) in 2015. Technicians conducted 150 point counts within the 13 surveyed grid cells between 22 May and 3 July. They detected 74 bird species, including 6 priority species (Appendix D).

Bird Conservancy estimated densities and population sizes for 49 species, 4 of which are priority species. The data yielded robust density estimates (CV < 50%) for 16 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout BLM in South Dakota BCR 17 for 48 species, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 12 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

BLM in South Dakota BCR 17 Results

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

   Field technicians completed 63 of 64 planned surveys (98.4%) in 2015. Technicians conducted 818 point counts within the 63 surveyed grid cells between 18 May and 12 July. They detected 141 bird species, including 10 priority species (Appendix D).

   Bird Conservancy estimated densities and population sizes for 107 species, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 29 of these species.

   Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout BLM in Wyoming for 98 species, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 42 of these species.

   To view a map of survey locations, density and occupancy results and species counts within BLM in Wyoming across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

   BLM in Wyoming Results

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

   Field technicians completed 9 of 10 planned surveys (90%) in 2015. Technicians conducted 113 point counts within the 9 surveyed grid cells between 26 May and 29 June. They detected 66 bird species, including 4 priority species (Appendix D).

Bird Conservancy estimated densities and population sizes for 51 species, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 14 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout the Buffalo Field Office for 45 species, 3 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 24 of these species.

To view a map of survey locations, density and occupancy results and species counts within the Buffalo Field Office across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Buffalo Field Office Results

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

Field technicians completed all 10 planned surveys (100%) in 2015. Technicians conducted 139 point counts within the 10 surveyed grid cells between 21 May and 28 June. They detected 63 bird species, including 5 priority species (Appendix D).

Bird Conservancy estimated densities and population sizes for 46 species, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 7 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout the Casper Field Office for 39 species, 3 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 13 of these species.

To view a map of survey locations, density and occupancy results and species counts within the Casper Field Office across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Casper Field Office Results

d) Cody Field Office
We obtained results for the Cody Field Office from one stratum.

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 24 point counts within the 2 surveyed grid cells between 5 June and 6 June. They detected 33 bird species, including 2 priority species (Appendix D).

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

To view a map of survey locations and get species counts within the Cody Field Office across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Cody Field Office Results

e) Kemmerer Field Office
We obtained results for the Kemmerer Field Office from one stratum.

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 28 point counts within the 2 surveyed grid cells between 4 June and 5 June. They detected 18 bird species, including 5 priority species (Appendix D).

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

To view a map of survey locations and get species counts within the Kemmerer Field Office across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Kemmerer Field Office Results

f) Lander Field Office
We obtained results for the Lander Field Office from one stratum.

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 28 point counts within the 2 surveyed grid cells between 9 June and 11 June. They detected 43 bird species, including 1 priority species (Appendix D). Bird Conservancy did not generate density or occupancy results for this stratum, because results from strata with only two samples are not informative. However, these data were incorporated into larger scale estimates.

To view a map of survey locations and get species counts within the Lander Field Office across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Lander Field Office Results

g) Newcastle Field Office
We obtained results for the Newcastle Field Office from one stratum.

Field technicians completed all 8 planned surveys (100%) in 2015. Technicians conducted 75 point counts within the 8 surveyed grid cells between 18 May and 10 June. They detected 70 bird species, including 5 priority species (Appendix D).

Bird Conservancy estimated densities and population sizes for 50 species, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 5 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout the Newcastle Field Office for 50 species, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 11 of these species.

To view a map of survey locations and get species counts within the Newcastle Field Office across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Newcastle Field Office Results

h) Pinedale Field Office
We obtained results for the Pinedale Field Office by analyzing data from one stratum.

Field technicians completed all 8 planned surveys (100%) in 2015. Technicians conducted 117 point counts within the 8 surveyed grid cells between 12 June and 12 July. They detected 33 bird species, including 4 priority species (Appendix D).

Bird Conservancy estimated densities and population sizes for 23 species, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 6 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout the Pinedale Field Office for 19 species, 3 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 6 of these species.

To view a map of survey locations, density and occupancy results and species counts within the Pinedale Field Office across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Pinedale Field Office Results

i) Rawlins Field Office
We obtained results for the Rawlins Field Office by analyzing data from one stratum.

Field technicians completed all 8 planned surveys (100%) in 2015. Technicians conducted 113 point counts within the 8 surveyed grid cells between 9 June and 24 June. They detected 41 bird species, including 6 priority species (Appendix D).

Bird Conservancy estimated densities and population sizes for 26 species, 4 of which are priority species. The data yielded robust density estimates (CV < 50%) for 7 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout the Rawlins Field Office for 24 species, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 8 of these species.

To view a map of survey locations, density and occupancy results and species counts within the Rawlins Field Office across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Rawlins Field Office Results

j) Rock Springs Field Office
We obtained results for the Rock Springs Field Office by analyzing data from one stratum.

Field technicians completed all 8 planned surveys (100%) in 2015. Technicians conducted 120 point counts within the 8 surveyed grid cells between 6 June and 30 June. They detected 53 bird species, including 5 priority species (Appendix D).

Bird Conservancy estimated densities and population sizes for 44 species, 4 of which are priority species. The data yielded robust density estimates (CV < 50%) for 7 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout the Rock Springs Field Office for 41 species, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 13 of these species.

To view a map of survey locations, density and occupancy results and species counts within the Rock Springs Field Office across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Rock Springs Field Office Results

k) Worland Field Office
We obtained results for the Worland Field Office from one stratum.

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 21 point counts within the 2 surveyed grid cells between 1 June and 18 June. They detected 27 bird species, including 2 priority species (Appendix D).

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

Bird Conservancy of the Rockies
Conserving birds and their habitats

To view a map of survey locations and get species counts within the Worland Field Office across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Worland Field Office Results

l) BLM in Wyoming BCR 16
We obtained results for BLM in Wyoming BCR 16 from one stratum.

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 16 point counts within the 2 surveyed grid cells between 8 June and 11 June. They detected 34 bird species (Appendix D).

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

To view a map of survey locations and get species counts within BLM in Wyoming BCR 16 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

BLM in Wyoming BCR 16 Results

m) BLM in Wyoming BCR 18
We obtained results for BLM in Wyoming BCR 18 from one stratum.

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 24 point counts within the 2 surveyed grid cells between 20 May and 31 May. They detected 29 bird species, including 3 priority species (Appendix D).

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

To view a map of survey locations and get species counts within BLM in Wyoming BCR 18 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page.

BLM in Wyoming BCR 18 Results

C. Department of Defense
1. US Air Force Academy
We obtained results for the US Air Force Academy in Colorado by compiling and jointly analyzing data from two strata.

Field technicians completed all 20 planned surveys (100%) in 2015. Technicians conducted 239 point counts within the 20 surveyed grid cells between 3 June and 25 June. They detected 106 bird species, including 22 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 78 species, 22 of which are priority species. The data yielded robust density estimates (CV < 50%) for 32 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout the US Air Force Academy in Colorado for 76 species, 20 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 47 of these species.

To view a map of survey locations and get species counts within the US Air Force Academy in Colorado across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

US Air Force Academy Results

2. Fort Carson

We obtained results for Fort Carson in Colorado by compiling and jointly analyzing data from four strata.

Field technicians completed 27 of 30 planned surveys (90%) in 2015. Technicians conducted 329 point counts within the 27 surveyed grid cells between 13 May and 14 June. They detected 110 bird species, including 23 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 80 species, 20 of which are priority species. The data yielded robust density estimates (CV < 50%) for 25 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Fort Carson in Colorado for 75 species, 21 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 35 of these species.

To view a map of survey locations and get species counts within Fort Carson across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Fort Carson Results

a) Range Fan Areas in Fort Carson

We obtained results for Range Fan Areas in Fort Carson by compiling and jointly analyzing data from two strata.

Field technicians completed 13 of 14 planned surveys (92.9%) in 2015. Technicians conducted 171 point counts within the 13 surveyed grid cells between 6 June and 14 June. They detected 84 bird species, including 19 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 64 species, 17 of which are priority species. The data yielded robust density estimates (CV < 50%) for 15 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Range Fan Areas in Fort Carson for 61 species, 17 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 23 of these species.

To view a map of survey locations and get species counts within Range Fan Areas in Fort Carson across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Range Fan Areas in Fort Carson Results

b) All Other Areas in Fort Carson
We obtained results for All Other Areas in Fort Carson by compiling and jointly analyzing data from two strata.

Field technicians completed 14 of 16 planned surveys (87.5%) in 2015. Technicians conducted 158 point counts within the 14 surveyed grid cells between 13 May and 8 June. They detected 92 bird species, including 19 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 66 species, 16 of which are priority species. The data yielded robust density estimates (CV < 50%) for 12 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout All Other Areas in Fort Carson for 59 species, 15 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 21 of these species.

To view a map of survey locations and get species counts within All Other Areas in Fort Carson across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

All Other Areas in Fort Carson Results

3. Piñon Canyon Maneuver Site in Colorado
We obtained results for Piñon Canyon Maneuver Site in Colorado by compiling and jointly analyzing data from two strata.

Field technicians completed all 35 planned surveys (100%) in 2015. Technicians conducted 445 point counts within the 35 surveyed grid cells between 11 May and 24 May. They detected 103 bird species (Appendix C).

Bird Conservancy estimated densities and population sizes for 69 species. The data yielded robust density estimates (CV < 50%) for 23 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Piñon Canyon Maneuver Site in Colorado for 63 species. The data yielded robust occupancy estimates (CV < 50%) for 28 of these species.

To view a map of survey locations and get species counts within Piñon Canyon Maneuver Site across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Piñon Canyon Maneuver Site Results

a) Range Fan Areas in Piñon Canyon Maneuver Site
We obtained results for Range Fan Areas in Piñon Canyon Maneuver Site by analyzing data from one stratum.

Field technicians completed all 10 planned surveys (100%) in 2015. Technicians conducted 120 point counts within the 10 surveyed grid cells between 18 May and 24 May. They detected 70 bird species, including 10 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 47 species, 5 of which are priority species. The data yielded robust density estimates (CV < 50%) for 10 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Range Fan Areas in Piñon Canyon Maneuver Site for 40 species, 5 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 14 of these species.

To view a map of survey locations and get species counts within Range Fan Areas in Piñon Canyon Maneuver Site across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Range Fan Areas in Piñon Canyon Maneuver Site Results

b) All Other Areas in Piñon Canyon Maneuver Site
We obtained results for All Other Areas in Piñon Canyon Maneuver Site by analyzing data from one stratum.

Field technicians completed all 25 planned surveys (100%) in 2015. Technicians conducted 325 point counts within the 25 surveyed grid cells between 11 May and 24 May. They detected 88 bird species, including 12 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 60 species, 7 of which are priority species. The data yielded robust density estimates (CV < 50%) for 19 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout All Other Areas in Piñon Canyon Maneuver Site for 57 species, 8 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 24 of these species.

To view a map of survey locations and get species counts within b)   All Other Areas in Piñon Canyon Maneuver Site across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

All Other Areas in Piñon Canyon Maneuver Site Results

4. Pueblo Chemical Depot
We obtained results for Pueblo Chemical Depot in Colorado by analyzing data from one stratum.

Field technicians completed all 15 planned surveys (100%) in 2015. Technicians conducted 195 point counts within the 15 surveyed grid cells between 13 May and 2 June. They detected 58 bird species, including 5 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 40 species, 4 of which are priority species. The data yielded robust density estimates (CV < 50%) for 13 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Pueblo Chemical Depot in Colorado for 37 species, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 15 of these species.

To view a map of survey locations and get species counts within Pueblo Chemical Depot across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Pueblo Chemical Depot Results

5. DoD in Wyoming BCR 18
We obtained results for DoD in Wyoming BCR 18 from one stratum.

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 22 point counts within the 2 surveyed grid cells between 29 May and 4 June. They detected 30 bird species, including 6 priority species (Appendix C).

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

To view a map of survey locations and get species counts within DoD in Wyoming BCR 18 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

DoD in Wyoming BCR 18 Results

6. Camp Guernsey
We obtained results for Camp Guernsey in Wyoming by analyzing data from one stratum.

Field technicians completed all 20 planned surveys (100%) in 2015. Technicians conducted 244 point counts within the 20 surveyed grid cells between 20 May and 7 June. They detected 92 bird species, including 8 priority species (Appendix C).

Bird Conservancy estimated densities and population sizes for 72 species, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 23 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Camp Guernsey in Wyoming for 65 species, 5 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 27 of these species.
To view a map of survey locations and get species counts within Camp Guernsey across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Camp Guernsey Results

D. National Park Service
  1. Greater Yellowstone Network
    a) Greater Yellowstone Network: Total
    We obtained results for the Greater Yellowstone Network by compiling and jointly analyzing data from three strata.

    Field technicians completed all 8 planned surveys (100%) in 2015. Technicians conducted 113 point counts within the 8 surveyed grid cells between 27 May and 7 July. They detected 89 bird species.

    Bird Conservancy estimated densities and population sizes for 76 species. The data yielded robust density estimates (CV < 50%) for 13 of these species.

    Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout the Greater Yellowstone Network for 76 species. The data yielded robust occupancy estimates (CV < 50%) for 26 of these species.

To view a map of survey locations, density and occupancy results and species counts within the Greater Yellowstone Network across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Greater Yellowstone Network Results

b) Bighorn Canyon National Recreation Area
We obtained results for Bighorn Canyon National Recreation Area from one stratum.

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 26 point counts within the 2 surveyed grid cells between 27 May and 28 May. They detected 30 bird species.

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

To view a map of survey locations and get species counts within Bighorn Canyon National Recreation Area across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Bighorn Canyon National Recreation Area Results

c) Grand Teton National Park
We obtained results for Grand Teton National Park from one stratum.

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 32 point counts within the 2 surveyed grid cells between 9 June and 3 July. They detected 40 bird species.

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

To view a map of survey locations and get species counts within Grand Teton National Park across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Grand Teton National Park Results

d) Yellowstone National Park
We obtained results for Yellowstone National Park from one stratum.

Field technicians completed all 4 planned surveys (100%) in 2015. Technicians conducted 55 point counts within the 4 surveyed grid cells between 2 July and 7 July. They detected 58 bird species.

Bird Conservancy estimated densities and population sizes for 53 species. The data yielded robust density estimates (CV < 50%) for 12 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Yellowstone National Park for 53 species. The data yielded robust occupancy estimates (CV < 50%) for 20 of these species.

To view a map of survey locations and get species counts within Yellowstone National Park across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Yellowstone National Park Results

2. Northern Colorado Plateau Network in Colorado
We obtained results for Northern Colorado Plateau Network in Colorado from one stratum.

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 20 point counts within the 2 surveyed grid cells between 12 May and 17 June. They detected 38 bird species.

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

To view a map of survey locations and get species counts within the Northern Colorado Plateau Network in Colorado across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Northern Colorado Plateau Network Results

3. Northern Great Plains Network

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

Field technicians completed all 9 planned surveys (100%) in 2015. Technicians conducted 97 point counts within the 9 surveyed grid cells between 2 June and 15 June. They detected 57 bird species.

Bird Conservancy estimated densities and population sizes for 45 species. The data yielded robust density estimates (CV < 50%) for 19 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Agate Fossil Beds National Monument for 37 species. The data yielded robust occupancy estimates (CV < 50%) for 19 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Agate Fossil Beds National Monument Results

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

Field technicians completed 15 of 16 planned surveys (93.8%) in 2015. Technicians conducted 161 point counts within the 15 surveyed grid cells between 20 May and 11 July. They detected 84 bird species.

Bird Conservancy estimated densities and population sizes for 60 species. The data yielded robust density estimates (CV < 50%) for 13 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout North Unit of the Badlands National Park for 50 species. The data yielded robust occupancy estimates (CV < 50%) for 12 of these species.

To view a map of survey locations, density and occupancy results and species counts within the North Unit of the Badlands National Park across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Badlands National Park - North Unit Results

c) Jewel Cave National Monument
We obtained results for Jewel Cave National Monument by analyzing data from one stratum.

Field technicians completed all 5 planned surveys (100%) in 2015. Technicians conducted 57 point counts within the 5 surveyed grid cells between 1 July and 6 July. They detected 45 bird species.

Bird Conservancy estimated densities and population sizes for 36 species. The data yielded robust density estimates (CV < 50%) for 22 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Jewel Cave National Monument for 34 species. The data yielded robust occupancy estimates (CV < 50%) for 24 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Jewel Cave National Monument Results

d) Knife River Indian Villages National Historic Site

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

Field technicians completed all 5 planned surveys (100%) in 2015. Technicians conducted 55 point counts within the 5 surveyed grid cells between 24 June and 28 June. They detected 76 bird species.

Bird Conservancy estimated densities and population sizes for 58 species. The data yielded robust density estimates (CV < 50%) for 30 of these species.

Bird Conservancy estimated the proportion of 1 km² grid cells occupied (Psi) throughout Knife River Indian Villages National Historic Site for 52 species. The data yielded robust occupancy estimates (CV < 50%) for 33 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Knife River Indian Villages National Historic Site Results

e) Missouri National Recreation River

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

Field technicians completed all 16 planned surveys (100%) in 2015. Technicians conducted 135 point counts within the 16 surveyed grid cells between 10 June and 12 July. They detected 108 bird species.

Bird Conservancy estimated densities and population sizes for 69 species. The data yielded robust density estimates (CV < 50%) for 37 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Missouri National Recreational River for 68 species. The data yielded robust occupancy estimates (CV < 50%) for 46 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Missouri National Recreational River Results

(1) Missouri National Recreational River - 59 Mile District
We obtained results for Missouri National Recreational River - 59 Mile District by analyzing data from one stratum.

Field technicians completed all 8 planned surveys (100%) in 2015. Technicians conducted 69 point counts within the 8 surveyed grid cells between 12 June and 12 July. They detected 89 bird species.

Bird Conservancy estimated densities and population sizes for 60 species. The data yielded robust density estimates (CV < 50%) for 24 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Missouri National Recreational River - 59 Mile District for 59 species. The data yielded robust occupancy estimates (CV < 50%) for 33 of these species.

To view a map of survey locations, density and occupancy results and species counts within Missouri National Recreational River – 59 Mile District across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Missouri National Recreational River – 59 Mile District Results

(2) Missouri National Recreational River - 39 Mile District
We obtained results for Missouri National Recreational River - 39 Mile District by analyzing data from one stratum.

Field technicians completed all 8 planned surveys (100%) in 2015. Technicians conducted 66 point counts within the 8 surveyed grid cells between 10 June and 12 July. They detected 87 bird species.

Bird Conservancy estimated densities and population sizes for 59 species. The data yielded robust density estimates (CV < 50%) for 22 of these species.

Bird Conservancy estimated the proportion of 1 km2 grid cells occupied (Psi) throughout Missouri National Recreational River - 39 Mile District for 60 species. The data yielded robust occupancy estimates (CV < 50%) for 33 of these species.

To view a map of survey locations, density and occupancy results and species counts within Missouri National Recreational River – 39 Mile District across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

[Missouri National Recreational River – 39 Mile District Results](#)

f) Mount Rushmore National Monument

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

Field technicians completed all 6 planned surveys (100%) in 2015. Technicians conducted 55 point counts within the 6 surveyed grid cells between 30 June and 14 July. They detected 39 bird species.

Bird Conservancy estimated densities and population sizes for 32 species. The data yielded robust density estimates (CV < 50%) for 14 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Mount Rushmore National Monument for 33 species. The data yielded robust occupancy estimates (CV < 50%) for 21 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

[Mount Rushmore National Monument Results](#)

g) Niobrara National Scenic River

We obtained results for Niobrara National Scenic River by analyzing data from one stratum.

Field technicians completed 13 of 14 planned surveys (92.9%) in 2015. Technicians conducted 136 point counts within the 13 surveyed grid cells between 12 June and 8 July. They detected 91 bird species.

Bird Conservancy estimated densities and population sizes for 69 species. The data yielded robust density estimates (CV < 50%) for 42 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Niobrara National Scenic River for 70 species. The data yielded robust occupancy estimates (CV < 50%) for 38 of these species.

To view a map of survey locations, density and occupancy results and species counts within Niobrara National Scenic River across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Niobrara National Scenic River Results

h) Scotts Bluff National Monument

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

Field technicians completed all 7 planned surveys (100%) in 2015. Technicians conducted 89 point counts within the 7 surveyed grid cells between 27 May and 9 July. They detected 64 bird species.

Bird Conservancy estimated densities and population sizes for 48 species. The data yielded robust density estimates (CV < 50%) for 15 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Scotts Bluff National Monument for 42 species. The data yielded robust occupancy estimates (CV < 50%) for 17 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Scotts Bluff National Monument Results

i)   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 14 planned surveys (100%) in 2015. Technicians conducted 133 point counts within the 14 surveyed grid cells between 2 June and 3 July. They detected 73 bird species.

Bird Conservancy estimated densities and population sizes for 52 species. The data yielded robust density estimates (CV < 50%) for 25 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Theodore Roosevelt National Park for 48 species. The data yielded robust occupancy estimates (CV < 50%) for 27 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Theodore Roosevelt National Park Results

j) Wind Cave National Park
We obtained results for Wind Cave National Park by analyzing data from one stratum.

Field technicians completed all 14 planned surveys (100%) in 2015. Technicians conducted 159 point counts within the 14 surveyed grid cells between 12 June and 12 July. They detected 67 bird species.

Bird Conservancy estimated densities and population sizes for 58 species. The data yielded robust density estimates (CV < 50%) for 24 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Wind Cave National Park for 57 species. The data yielded robust occupancy estimates (CV < 50%) for 25 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Wind Cave National Park Results

4. Rocky Mountain Network
a) Rocky Mountain Network in Colorado
We obtained results for Rocky Mountain Network in Colorado from one stratum.

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 25 point counts within the 2 surveyed grid cells between 19 June and 6 July. They detected 33 bird species.

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

To view a map of survey locations and get species counts within the Rocky Mountain Network in Colorado across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Rocky Mountain Network in Colorado Results

b) Glacier National Park

We obtained results for Glacier National Park from one stratum.

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 16 point counts within the 2 surveyed grid cells between 2 July and 3 July. They detected 48 bird species.

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

To view a map of survey locations and get species counts within Glacier National Park across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Glacier National Park Results

5. Southern Colorado Plateau Network in Colorado

We obtained results for Southern Colorado Plateau Network in Colorado from one stratum.

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 26 point counts within the 2 surveyed grid cells between 27 May and 28 May. They detected 55 bird species.

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

To view a map of survey locations and get species counts within the Southern Colorado Plateau Network in Colorado across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Southern Colorado Plateau Network in Colorado Results

6. Craters of the Moon National Monument

We obtained results for Craters of the Moon National Monument in the Upper Columbia Basin Network by compiling and jointly analyzing data from two strata.

Field technicians completed all 28 planned surveys (100%) in 2015. Technicians conducted 342 point counts within the 28 surveyed grid cells between 24 May and 17 June. They detected 62 bird species.

Bird Conservancy estimated densities and population sizes for 39 species. The data yielded robust density estimates (CV < 50%) for 12 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Craters of the Moon National Monument for 38 species. The data yielded robust occupancy estimates (CV < 50%) for 15 of these species.

To view a map of survey locations and get species counts within the Craters of the Moon National Monument across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Craters of the Moon National Monument Results

E. Tribal Lands
1. Blackfeet and Crow Tribal Lands in Montana BCR 10
We obtained results for Blackfeet and Crow Tribal Lands in Montana BCR 10 from one stratum.

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 30 point counts within the 2 surveyed grid cells between 15 June and 16 June. They detected 48 bird species, including 5 priority species.

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

To view a map of survey locations and get species counts within the Blackfeet and Crow Tribal Lands in Montana BCR 10 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Blackfeet and Crow Tribal Lands in Montana BCR 10 Results

2. Flathead Tribal Lands in Montana BCR 10
We obtained results for Flathead Tribal Lands in Montana BCR 10 from one stratum.

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 22 point counts within the 2 surveyed grid cells between 10 June and 11 June. They detected 54 bird species, including 2 priority species.

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

To view a map of survey locations and get species counts within the Flathead Tribal Lands in Montana BCR 10 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Flathead Tribal Lands in Montana BCR 10 Results

3. Blackfeet, Fort Belknap, Fort Peck and Rocky Boys Tribal Lands in Montana BCR 11

We obtained results for Blackfeet, Fort Belknap, Fort Peck, and Rocky Boys Tribal Lands in Montana BCR 11 from one stratum.

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 32 point counts within the 2 surveyed grid cells between 21 May and 22 May. They detected 36 bird species, including 6 priority species.

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

To view a map of survey locations and get species counts within the Rocky Boys; Fort Peck; Fort Belknap and Blackfeet Tribal Lands in Montana BCR 11 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Blackfeet, Fort Belknap, Fort Peck and Rocky Boys Tribal Lands in Montana BCR 11 Results

4. Wind River Tribal Lands in Wyoming BCR 10

We obtained results for Wind River Tribal Lands in Wyoming BCR 10 from one stratum.

Field technicians completed all 4 planned surveys (100%) in 2015. Technicians conducted 56 point counts within the 4 surveyed grid cells between 10 June and 21 June. They detected 54 bird species, including 4 priority species.

Bird Conservancy estimated densities and population sizes for 42 species, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 6 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Wind River Tribal Lands in Wyoming BCR 10 for 36 species, 3 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 9 of these species.

To view a map of survey locations and get species counts within the Wind River Tribal Lands in Wyoming BCR 10 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Wind River Tribal Lands in Wyoming BCR 10 Results

F. US Fish and Wildlife Service
1. Charles M. Russell National Wildlife Refuge

We obtained results for Charles M. Russell National Wildlife Refuge by compiling and jointly analyzing data from two strata. The USFWS strata in Montana BCRs 11 and 17 were subdivided in 2015 to allow density and occupancy estimation specifically within the Charles M. Russell National Wildlife Refuge. Previously, all USFWS lands were grouped together in these BCRs, limiting our ability to get estimates for individual refuges. In each BCR, two new strata were created: a Charles M. Russel NWR stratum and an All Other USFWS Lands stratum. This refuge-level stratification distinction between BCRs is made to allow for the summation of the data for individual BCRs involved.

Field technicians completed all 4 planned surveys (100%) in 2015. Technicians conducted 40 point counts within the 4 surveyed grid cells between 22 May and 27 May. They detected 56 bird species, including 1 priority species.

Bird Conservancy estimated densities and population sizes for 32 species, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 8 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Charles M. Russell National Wildlife Refuge for 33 species, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 13 of these species.

To view a map of survey locations, density and occupancy results and species counts within Charles M. Russell National Wildlife Refuge across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Charles M. Russell National Wildlife Refuge Results

2. Montana BCR 10 US Fish and Wildlife Service

We obtained results for US Fish and Wildlife Service Lands in Montana BCR 10 from one stratum.

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 14 point counts within the 2 surveyed grid cells between 10 June and 11 June. They detected 28 bird species, including 2 priority species (Appendix C).

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

To view a map of survey locations and get species counts within U.S. Fish and Wildlife Service Lands in Montana BCR 10 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Montana BCR 10 US Fish and Wildlife Service Results

3. Montana BCR 11 US Fish and Wildlife Service
We obtained results for US Fish and Wildlife Service Lands in Montana BCR 11 by compiling and jointly analyzing data from two strata.

Field technicians completed all 4 planned surveys (100%) in 2015. Technicians conducted 56 point counts within the 4 surveyed grid cells between 22 May and 7 June. They detected 66 bird species, including 7 priority species.

Bird Conservancy estimated densities and population sizes for 43 species, 5 of which are priority species. The data yielded robust density estimates (CV < 50%) for 15 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Montana BCR 11 US Fish and Wildlife Service for 45 species, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 19 of these species.

To view a map of survey locations, density and occupancy results and species counts within US Fish and Wildlife Service Lands in Montana BCR 11 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Montana BCR 11 US Fish and Wildlife Service Results

4. Montana BCR 17 US Fish and Wildlife Service
We obtained results for U.S. Fish and Wildlife Service Lands in Montana BCR 17by compiling and jointly analyzing data from two strata.

Field technicians completed all 4 planned surveys (100%) in 2015. Technicians conducted 45 point counts within the 4 surveyed grid cells between 19 May and 27 May. They detected 56 bird species, including 9 priority species.

Bird Conservancy estimated densities and population sizes for 34 species, 5 of which are priority species. The data yielded robust density estimates (CV < 50%) for 6 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Montana BCR 17 US Fish and Wildlife Service for 33 species, 5 of which are priority

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species. The data yielded robust occupancy estimates (CV < 50%) for 12 of these species.

To view a map of survey locations, density and occupancy results and species counts within U.S. Fish and Wildlife Service Lands in Montana BCR 17 across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Montana BCR 17 US Fish and Wildlife Service Results

5. Rocky Mountain Arsenal National Wildlife Refuge
We obtained results for Rocky Mountain Arsenal National Wildlife Refuge in Colorado by analyzing data from one stratum.

Field technicians completed all 10 planned surveys (100%) in 2015. Technicians conducted 139 point counts within the 10 surveyed grid cells between 23 May and 13 June. They detected 73 bird species, including 9 priority species.

Bird Conservancy estimated densities and population sizes for 39 species, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 8 of these species.

Bird Conservancy estimated the proportion of 1 km2 grid cells occupied (Psi) throughout Rocky Mountain Arsenal National Wildlife Refuge in Colorado for 36 species, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 18 of these species.

To view a map of survey locations, density and occupancy results and species counts within Rocky Mountain Arsenal National Wildlife Refuge across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Rocky Mountain Arsenal National Wildlife Refuge Results

G. US Forest Service
    1. Region 1
        a) Region 1 National Forests
        Within this sampling design each national forest in Region 1 is stratified separately. In this section of the report, we summarize results for all Region 1 Forests combined, followed by summaries for each individual national forest.

        (1) Region 1 National Forests: Total
        We obtained results for Region 1 National Forests by compiling and jointly analyzing data from 29 strata in 3 states.

        Field technicians completed all 228 planned surveys (100%) in 2015. Technicians conducted 2,144 point counts within the 228 surveyed grid cells between 23 May and 15 July. They detected 195 bird species, including 28 priority species (Appendix E).

Bird Conservancy estimated densities and population sizes for 141 species, 17 of which are priority species. The data yielded robust density estimates (CV < 50%) for 74 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Region 1 National Forests for 136 species, 17 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 89 of these species.

To view a map of survey locations, density and occupancy results and species counts within Region 1 National Forests across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Region 1 National Forests Results

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

Field technicians completed all 13 planned surveys (100%) in 2015. Technicians conducted 101 point counts within the 13 surveyed grid cells between 26 May and 9 July. They detected 71 bird species (Appendix E).

Bird Conservancy estimated densities and population sizes for 53 species. The data yielded robust density estimates (CV < 50%) for 15 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Beaverhead-Deerlodge National Forest for 57 species. The data yielded robust occupancy estimates (CV < 50%) for 27 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Beaverhead-Deerlodge National Forest Results

(3) Bitterroot National Forest
We obtained results for Bitterroot National Forest by compiling and jointly analyzing data from three strata in two states: Montana front-country/managed areas, Montana designated roadless/wilderness areas and Idaho. This forest-level stratification distinction in Montana was made due to field implementation

cost considerations and the desire to focus monitoring on the more highly managed areas while maintaining inference to the entire management unit. The stratification distinction between states is made to allow for the summation of the data for individual states involved.

There were some significant stratification changes made to the BCR 10 portion of Idaho between the 2013 and 2014 field seasons. The "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" strata were further subdivided. The new strata created in Idaho BCR 10 include the Idaho portion of Bitterroot National Forest. Since Bitterroot National Forest spans Idaho and Montana, 2014 density and occupancy estimates for this forest will include strata from both states. In the past, "forest-wide" estimates have only represented the Montana portion of this forest.

Field technicians completed all 15 planned surveys (100%) in 2015. Technicians conducted 134 point counts within the 15 surveyed grid cells between 4 June and 5 July. They detected 85 bird species, including 1 priority species (Appendix E).

Bird Conservancy estimated densities and population sizes for 69 species, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 21 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Bitterroot National Forest for 68 species, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 33 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Bitterroot National Forest Results

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

Field technicians completed all 22 planned surveys (100%) in 2015. Technicians conducted 180 point counts within the 22 surveyed grid cells between 4 June and 7 July. They detected 79 bird species, including 1 priority species (Appendix E).

Bird Conservancy estimated densities and population sizes for 66 species, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 24 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Clearwater National Forest for 65 species, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 29 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Clearwater National Forest Results

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

Field technicians completed all 25 planned surveys (100%) in 2015. Technicians conducted 284 point counts within the 25 surveyed grid cells between 1 June and 8 July. They detected 109 bird species, including 9 priority species (Appendix E).

Bird Conservancy estimated densities and population sizes for 92 species, 9 of which are priority species. The data yielded robust density estimates (CV < 50%) for 28 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Custer National Forest for 87 species, 8 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 40 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Custer National Forest Results

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

Field technicians completed all 13 planned surveys (100%) in 2015. Technicians conducted 119 point counts within the 13 surveyed grid cells between 23 May and 9 July. They detected 85 bird species, including 1 priority species (Appendix E).

Bird Conservancy estimated densities and population sizes for 61 species. The data yielded robust density estimates (CV < 50%) for 30 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Flathead National Forest for 60 species. The data yielded robust occupancy estimates (CV < 50%) for 39 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Flathead National Forest Results

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

Field technicians completed all 13 planned surveys (100%) in 2015. Technicians conducted 126 point counts within the 13 surveyed grid cells between 13 June and 10 July. They detected 81 bird species, including 1 priority species (Appendix E).

Bird Conservancy estimated densities and population sizes for 59 species. The data yielded robust density estimates (CV < 50%) for 18 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Gallatin National Forest for 59 species. The data yielded robust occupancy estimates (CV < 50%) for 26 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Gallatin National Forest Results

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

Field technicians completed all 13 planned surveys (100%) in 2015. Technicians conducted 149 point counts within the 13 surveyed grid cells between 14 June and 15 July. They detected 92 bird species, including 2 priority species (Appendix E).

Bird Conservancy estimated densities and population sizes for 75 species, 2 of which are priority species. The data yielded robust density estimates (CV < 50%) for 23 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Helena National Forest for 76 species, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 37 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Helena National Forest Results

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

Field technicians completed all 33 planned surveys (100%) in 2015. Technicians conducted 308 point counts within the 33 surveyed grid cells between 5 June and 11 July. They detected 86 bird species, including 7 priority species (Appendix E).

Bird Conservancy estimated densities and population sizes for 63 species, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 35 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Idaho Panhandle National Forest for 66 species, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 39 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Idaho Panhandle National Forest Results

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

There were some significant stratification changes made to the BCR 10 portion of Idaho between the 2013 and 2014 field seasons. The "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" strata were further subdivided. The new strata created in Idaho BCR 10 include the Idaho portion of Kootenai National Forest. Since Kootenai National Forest spans Idaho and Montana, 2014 density and occupancy estimates for this forest will include strata from both states. In the past, "forest-wide" estimates have only represented the Montana portion of this forest.

Field technicians completed all 35 planned surveys (100%) in 2015. Technicians conducted 320 point counts within the 35 surveyed grid cells between 27 May and 7 July. They detected 103 bird species, including 7 priority species (Appendix E).

Bird Conservancy estimated densities and population sizes for 72 species, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 36 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Kootenai National Forest for 70 species, 6 of which are priority

species. The data yielded robust occupancy estimates (CV < 50%) for 38 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Kootenai National Forest Results

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

Field technicians completed all 11 planned surveys (100%) in 2015. Technicians conducted 132 point counts within the 11 surveyed grid cells between 17 June and 2 July. They detected 97 bird species, including 1 priority species (Appendix E).

Bird Conservancy estimated densities and population sizes for 71 species. The data yielded robust density estimates (CV < 50%) for 25 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Lewis and Clark National Forest for 71 species. The data yielded robust occupancy estimates (CV < 50%) for 32 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Lewis and Clark National Forest Results

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

Field technicians completed all 13 planned surveys (100%) in 2015. Technicians conducted 120 point counts within the 13 surveyed grid cells between 24 May

and 12 July. They detected 94 bird species, including 2 priority species (Appendix E).

Bird Conservancy estimated densities and population sizes for 76 species, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 23 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Lolo National Forest for 73 species, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 27 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Lolo National Forest Results

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

Field technicians completed all 22 planned surveys (100%) in 2015. Technicians conducted 171 point counts within the 22 surveyed grid cells between 3 June and 11 July. They detected 85 bird species, including 2 priority species (Appendix E).

Bird Conservancy estimated densities and population sizes for 65 species, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 31 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Nez Perce National Forest for 66 species, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 36 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Nez Perce National Forest Results

b) Region 1 National Grasslands

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

Field technicians completed all 15 planned surveys (100%) in 2015. Technicians conducted 156 point counts within the 15 surveyed grid cells between 26 May and 11 July. They detected 81 bird species, including 13 priority species (Appendix E).

Bird Conservancy estimated densities and population sizes for 65 species, 9 of which are priority species. The data yielded robust density estimates (CV < 50%) for 11 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Region 1 National Grasslands for 66 species, 12 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 20 of these species.

To view a map of survey locations, density and occupancy results and species counts within Region 1 National Grasslands across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Region 1 National Grasslands Results

2. Region 2

a) Region 2 National Forests

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

(1) Region 2 National Forests: Total

We obtained results for all Region 2 National Forests combined by compiling and jointly analyzing data from 25 strata in USFS Region 2 across 4 states. This forest-level stratification distinction is made to allow for the summation of the data for individual Forests, BCRs and States.

Field technicians completed 222 of 223 planned surveys (99.6%) in 2015. Technicians conducted 2,508 point counts within the 222 surveyed grid cells between 26 May and 29 July. They detected 197 bird species, including 12 priority species (Appendix F).

Bird Conservancy estimated densities and population sizes for 147 species, 7 of which are priority species. The data yielded robust density estimates (CV < 50%) for 78 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Region 2 National Forests for 144 species, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 90 of these species.

To view a map of survey locations, density and occupancy results and species counts within Region 2 National Forests across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Region 2 National Forests Results

(2) Arapaho and Roosevelt National Forests
We obtained results for this section by analyzing data from compiling and jointly analyzing data from two strata.

In 2011, the Routt and Arapaho and Roosevelt National Forests strata were reorganized and a third stratum, the Williams Fork Area, was created from the two, because it is a portion of the Arapaho and Roosevelt National Forests that is included in the Routt National Forest land management plan, but administered by the Arapaho and Roosevelt National Forests. For information on the Williams Fork Management Unit, please refer to the Routt National Forest section.

In 2014, the Arapaho and Roosevelt National Forests were restratified to allow these forests to monitor treatments intended to mitigate fire hazard and improve forest health. The forest was divide into two strata – a control stratum and the remainder of the forest. The control portion consists of lands ranging in elevation from 6,000 ft to 9,000 ft and excludes treatment areas and areas burned between 1998 and 2013. An experiment overlay stratum was created for 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 actually considered to be a part of the IMBCR design. However, detections from this stratum do contribute to the number of detections used in analyses.

Field technicians completed all 22 planned surveys (100%) in 2015. Technicians conducted 246 point counts within the 22 surveyed grid cells between 8 June and 14 July. They detected 80 bird species, including 6 priority species (Appendix F).

Bird Conservancy estimated densities and population sizes for 67 species, 5 of which are priority species. The data yielded robust density estimates (CV < 50%) for 19 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Arapaho and Roosevelt National Forests for 63 species, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 23 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Arapaho and Roosevelt National Forests Results

(3) Bighorn National Forest

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

Field technicians completed all 10 planned surveys (100%) in 2015. Technicians conducted 127 point counts within the 10 surveyed grid cells between 28 June and 22 July. They detected 54 bird species, including 1 priority species (Appendix F).

Bird Conservancy estimated densities and population sizes for 39 species, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 11 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Bighorn National Forest for 40 species, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 16 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Bighorn National Forest Results

(4) Black Hills National Forest

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

Field technicians completed all 19 planned surveys (100%) in 2015. Technicians conducted 186 point counts within the 19 surveyed grid cells between 19 June and 13 July. They detected 89 bird species, including 5 priority species (Appendix F).

Bird Conservancy estimated densities and population sizes for 70 species, 4 of which are priority species. The data yielded robust density estimates (CV < 50%) for 26 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Black Hills National Forest for 67 species, 3 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 38 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Black Hills National Forest Results

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

Field technicians completed all 7 planned surveys (100%) in 2015. Technicians conducted 79 point counts within the 7 surveyed grid cells between 3 June and 14 July. They detected 64 bird species, including 2 priority species (Appendix F).

Bird Conservancy estimated densities and population sizes for 55 species, 2 of which are priority species. The data yielded robust density estimates (CV < 50%) for 15 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Grand Mesa, Uncompaghre and Gunnison National Forests for 55 species, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 27 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Grand Mesa, Uncompaghre and Gunnison National Forest Results

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

Field technicians completed all 30 planned surveys (100%) in 2015. Technicians conducted 346 point counts within the 30 surveyed grid cells between 10 June

and 23 July. They detected 110 bird species, including 6 priority species (Appendix F).

Bird Conservancy estimated densities and population sizes for 81 species, 4 of which are priority species. The data yielded robust density estimates (CV < 50%) for 39 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Medicine Bow National Forest for 80 species, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 45 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Medicine Bow National Forest Results

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

Field technicians completed all 9 planned surveys (100%) in 2015. Technicians conducted 120 point counts within the 9 surveyed grid cells between 26 May and 8 June. They detected 80 bird species, including 3 priority species (Appendix F).

Bird Conservancy estimated densities and population sizes for 58 species, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 15 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Nebraska National Forests for 52 species, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 24 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Nebraska National Forest Results

(8) Pike and San Isabel National Forests
We obtained results for this section by analyzing data from two Pike and San Isabel National Forests strata in Colorado BCR 16.

In 2014, the Pike and San Isabel National Forests were restratified to allow these forests to monitor treatments intended to mitigate fire hazard and improve forest health. The forest was divide into two strata – a control stratum and the remainder of the forest. The control portion consists of lands ranging from 6,000 ft to 9,500 ft and excludes treatment areas and areas burned between 1998 and 2013. An experiment overlay stratum was created for 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 actually considered to be a part of the IMBCR design. However, detections from this stratum do contribute to the number of detections used in analyses.

Field technicians completed all 22 planned surveys (100%) in 2015. Technicians conducted 238 point counts within the 22 surveyed grid cells between 2 June and 14 July. They detected 99 bird species (Appendix F).

Bird Conservancy estimated densities and population sizes for 77 species. The data yielded robust density estimates (CV < 50%) for 24 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Pike and San Isabel National Forests for 79 species. The data yielded robust occupancy estimates (CV < 50%) for 27 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Pike and San Isabel National Forests Results

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

Field technicians completed all 24 planned surveys (100%) in 2015. Technicians conducted 279 point counts within the 24 surveyed grid cells between 20 June and 14 July. They detected 98 bird species, including 6 priority species (Appendix F).

Bird Conservancy estimated densities and population sizes for 74 species, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 29 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Rio Grande National Forest for 75 species, 6 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 40 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Rio Grande National Forest Results

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

Field technicians completed all 26 planned surveys (100%) in 2015. Technicians conducted 274 point counts within the 26 surveyed grid cells between 17 June and 10 July. They detected 93 bird species, including 3 priority species (Appendix F).

Bird Conservancy estimated densities and population sizes for 70 species, 2 of which are priority species. The data yielded robust density estimates (CV < 50%) for 38 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Routt National Forest for 71 species, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 39 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Routt National Forest Results

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

Field technicians completed all 7 planned surveys (100%) in 2015. Technicians conducted 77 point counts within the 7 surveyed grid cells between 26 June and 15 July. They detected 70 bird species, including 3 priority species (Appendix F).

Bird Conservancy estimated densities and population sizes for 60 species, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 15 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout San Juan National Forest for 59 species, 3 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 23 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

San Juan National Forest Results

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

Field technicians completed all 26 planned surveys (100%) in 2015. Technicians conducted 339 point counts within the 26 surveyed grid cells between 7 June and 24 July. They detected 115 bird species, including 4 priority species (Appendix F).

Bird Conservancy estimated densities and population sizes for 87 species, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 24 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Shoshone National Forest for 86 species, 3 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 32 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Shoshone National Forest Results

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

Field technicians completed 20 of 21 planned surveys (95.2%) in 2015. Technicians conducted 197 point counts within the 20 surveyed grid cells between 15 June and 29 July. They detected 93 bird species, including 2 priority species (Appendix F).

Bird Conservancy estimated densities and population sizes for 68 species, 2 of which are priority species. The data yielded robust density estimates (CV < 50%) for 30 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout White River National Forest for 65 species, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 43 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".
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 and hit the "Run Query" button highlighted in red located near the top of the page.

White River National Forest Results

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

(1) Region 2 National Grasslands: Total
We obtained results for the Region 2 National Grasslands from eight USFS Region 2 strata across five states. This grassland-level stratification distinction is made to allow for the summation of the data for individual Grasslands, BCRs and States.

Field technicians completed all 45 planned surveys (100%) in 2015. Technicians conducted 544 point counts within the 45 surveyed grid cells between 16 May and 13 July. They detected 123 bird species, including 14 priority species (Appendix F).

Bird Conservancy estimated densities and population sizes for 97 species, 11 of which are priority species. The data yielded robust density estimates (CV < 50%) for 21 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Region 2 National Grasslands for 90 species, 10 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 24 of these species.

To view a map of survey locations and species counts within Region 2 National Grasslands across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Region 2 National Grasslands Results

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

Field technicians completed all 17 planned surveys (100%) in 2015. Technicians conducted 191 point counts within the 17 surveyed grid cells between 19 May and 13 July. They detected 92 bird species, including 9 priority species (Appendix F).

Bird Conservancy estimated densities and population sizes for 66 species, 6 of which are priority species. The data yielded robust density estimates (CV < 50%) for 13 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Nebraska National Grasslands for 60 species, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 21 of these species.

To view a map of survey locations, density and occupancy results and species counts within Nebraska National Grasslands across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Nebraska National Grasslands Results

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

Field technicians completed all 5 planned surveys (100%) in 2015. Technicians conducted 52 point counts within the 5 surveyed grid cells between 17 May and 20 May. They detected 35 bird species, including 1 priority species (Appendix F).

Bird Conservancy estimated densities and population sizes for 28 species, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 9 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Cimarron National Grassland for 24 species, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 11 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Cimarron National Grassland Results

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

Field technicians completed all 8 planned surveys (100%) in 2015. Technicians conducted 101 point counts within the 8 surveyed grid cells between 24 May and 2 June. They detected 46 bird species, including 1 priority species (Appendix F).

Bird Conservancy estimated densities and population sizes for 36 species, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 7 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Comanche National Grassland for 32 species, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 9 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Comanche National Grassland Results

(5) Public Lands on Pawnee National Grassland
We obtained results for Public Lands on Pawnee National Grassland by analyzing data from one stratum.

In 2013 Pawnee National Grasslands was split into two strata – public lands and private lands – since Pawnee National Grasslands contains a large amount of private land within its borders. This allowed the USFS to concentrate more survey effort on public lands. We only present estimates for the public lands portion of Pawnee National Grasslands in this report.

Field technicians completed all 5 planned surveys (100%) in 2015. Technicians conducted 77 point counts within the 5 surveyed grid cells between 1 June and 9 June. They detected 15 bird species, including 2 priority species (Appendix F).

Bird Conservancy estimated densities and population sizes for 15 species, 2 of which are priority species. The data yielded robust density estimates (CV < 50%) for 4 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Public Lands on Pawnee National Grassland for 15 species, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 4 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Pawnee National Grassland Results

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

Field technicians completed all 10 planned surveys (100%) in 2015. Technicians conducted 123 point counts within the 10 surveyed grid cells between 16 May and 3 June. They detected 57 bird species (Appendix F).

Bird Conservancy estimated densities and population sizes for 45 species. The data yielded robust density estimates (CV < 50%) for 10 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Thunder Basin National Grassland for 44 species. The data yielded robust occupancy estimates (CV < 50%) for 12 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Thunder Basin National Grassland Results

3. Region 3

In this section of the report we summarize results for two national forests and two national grasslands in Region 3: Coconino National Forest, Kaibab National Forest, Kiowa National Grassland and Rita Blanca National Grassland.

a) Coconino National Forest

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

Field technicians completed all 40 planned surveys (100%) in 2015. Technicians conducted 533 point counts within the 40 surveyed grid cells between 4 May and 26 June. They detected 152 bird species, including 6 priority species (Appendix G).

Bird Conservancy estimated densities and population sizes for 108 species, 5 of which are priority species. The data yielded robust density estimates (CV < 50%) for 53 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Coconino National Forest for 105 species, 5 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 64 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Coconino National Forest Results

b) Kaibab National Forest

We obtained results for Kaibab National Forest by compiling and jointly analyzing data from two strata. The stratum was split into two strata based on elevation prior to the 2012 field season. Stratification by elevation allows for adjusting sampling intensity to target different Management Indicator Species on the Forest.

Field technicians completed all 21 planned surveys (100%) in 2015. Technicians conducted 273 point counts within the 21 surveyed grid cells between 5 May and 20 June. They detected 107 bird species, including 3 priority species (Appendix G).

Bird Conservancy estimated densities and population sizes for 86 species, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 42 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Kaibab National Forest for 83 species, 3 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 48 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Kaibab National Forest Results

c) Kiowa National Grassland

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

Field technicians completed all 3 planned surveys (100%) in 2015. Technicians conducted 20 point counts within the 3 surveyed grid cells between 3 May and 5 May. They detected 54 bird species (Appendix G).

Bird Conservancy estimated densities and population sizes for 40 species. The data yielded robust density estimates (CV < 50%) for 8 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Kiowa National Grassland for 39 species. The data yielded robust occupancy estimates (CV < 50%) for 10 of these species.

To view a map of survey locations, density and occupancy results and species counts within Kiowa National Grassland across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Kiowa National Grassland Results

d) Rita Blanca National Grassland

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

Field technicians completed all 8 planned surveys (100%) in 2015. Technicians conducted 83 point counts within the 8 surveyed grid cells between 2 May and 7 May. They detected 33 bird species, including 1 priority species (Appendix G).

Bird Conservancy estimated densities and population sizes for 24 species, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 10 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Rita Blanca National Grassland for 23 species, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 15 of these species.

To view a map of survey locations, density and occupancy results and species counts within Rita Blanca National Grassland across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Rita Blanca National Grasslands Results

4. Region 4

In this section, we summarize results for all or portions of nine national forests in Region 4. In 2010, the USFS Region 4 stratum in Wyoming BCR 10 was restratified 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 restratification was done to allow for density and occupancy estimation at the national forest level for the Bridger-Teton National Forest. Similarly, in 2013 the remaining USFS Region 4 stratum was restratified into three separate strata, one for each Forest (Caribou-Targhee, Ashley, and Wasatch NFs). This allows for forest-wide estimates within Caribou-Targhee National Forest since the remainder of the forest outside of Wyoming was also sampled. 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. There were some significant stratification changes made to the BCR 10 portion of Idaho between the 2013 and 2014 field seasons. The boundary between USFS Regions 1 and 4 runs through Idaho and was taken into account when restratifying so that estimates could be generated at the USFS Region level. The new USFS Region 4 strata created in Idaho BCR 10 include Boise National Forest, Payette National Forest, Salmon-Challis National Forest and Sawtooth National Forest.

a) Ashley National Forest

We obtained results for Ashley National Forest from one stratum in Wyoming.

These samples were added to supplement statewide estimates in Wyoming and were supported by state and regional partners. Only the Wyoming portion of Ashley National Forest was surveyed using the IMBCR design.

Field technicians completed both planned surveys (100%) in 2015. Technicians conducted 32 point counts within the 2 surveyed grid cells between 8 June and 9 June. They detected 13 bird species (Appendix H).

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

To view a map of survey locations and get species counts within Ashley National Forest across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Ashley National Forest Results

b) Boise National Forest

We obtained results for Boise National Forest by analyzing data from one stratum. There were some significant stratification changes made to the BCR 10 portion of Idaho between the 2013 and 2014 field seasons. The "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" strata were further subdivided. The new strata created in Idaho BCR 10 include Boise National Forest. This is the first year density and occupancy estimates were generated specifically within Boise National Forest.

Field technicians completed all 4 planned surveys (100%) in 2015. Technicians conducted 49 point counts within the 4 surveyed grid cells between 12 June and 5 July. They detected 60 bird species, including 4 priority species (Appendix E).

Bird Conservancy estimated densities and population sizes for 42 species, 2 of which are priority species. The data yielded robust density estimates (CV < 50%) for 11 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Boise National Forest for 42 species, 2 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 19 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Boise National Forest Results

c) Bridger-Teton National Forest

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

Field technicians completed all 20 planned surveys (100%) in 2015. Technicians conducted 252 point counts within the 20 surveyed grid cells between 3 June and 17 July. They detected 101 bird species, including 3 priority species (Appendix H).

Bird Conservancy estimated densities and population sizes for 80 species, 1 of which are priority species. The data yielded robust density estimates (CV < 50%) for 27 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Bridger-Teton National Forest for 77 species, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 26 of these species.

Bird Conservancy estimated the proportion of 1 km² sampling units occupied (Psi) throughout Bridger-Teton National Forest for 71 species, 1 of which is a priority species. The data yielded robust occupancy estimates (CV < 50%) for 26 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Bridger-Teton National Forest Results

d) Caribou-Targhee National Forest

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

Field technicians completed all 28 planned surveys (100%) in 2015. Technicians conducted 343 point counts within the 28 surveyed grid cells between 29 May and 15 July. They detected 123 bird species, including 1 priority species (Appendix H).

Bird Conservancy estimated densities and population sizes for 93 species. The data yielded robust density estimates (CV < 50%) for 33 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Caribou-Targhee National Forest for 88 species. The data yielded robust occupancy estimates (CV < 50%) for 48 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Caribou-Targhee National Forest Results

e) Manti-La Sal National Forest

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

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

Field technicians completed all 47 planned surveys (100%) in 2015. Technicians conducted 520 point counts within the 47 surveyed grid cells between 21 May and 11 July. They detected 126 bird species, including 4 priority species (Appendix H).

Bird Conservancy estimated densities and population sizes for 97 species, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 49 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Manti-La Sal National Forest for 93 species, 1 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 62 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Manti-La Sal National Forest Results

f) Payette National Forest

We obtained results for Payette National Forest by analyzing data from one stratum. There were some significant stratification changes made to the BCR 10 portion of Idaho between the 2013 and 2014 field seasons. The "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" strata were further subdivided. The new strata created in Idaho BCR 10 include Payette National Forest. This is the first year density and occupancy estimates were generated specifically within Payette National Forest.

Field technicians completed all 4 planned surveys (100%) in 2015. Technicians conducted 31 point counts within the 4 surveyed grid cells between 13 June and 13 July. They detected 59 bird species, including 6 priority species (Appendix E).

Bird Conservancy estimated densities and population sizes for 47 species, 5 of which are priority species. The data yielded robust density estimates (CV < 50%) for 13 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Payette National Forest for 44 species, 5 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 17 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Payette National Forest Results

g) Salmon-Challis National Forest

We obtained results for Salmon-Challis National Forest by analyzing data from one stratum. There were some significant stratification changes made to the BCR 10 portion of Idaho between the 2013 and 2014 field seasons. The "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" strata were further subdivided. The new strata created in Idaho BCR 10 include Salmon-Challis National Forest. This is the first year density and occupancy estimates were generated specifically within Salmon-Challis National Forest.

Field technicians completed all 4 planned surveys (100%) in 2015. Technicians conducted 45 point counts within the 4 surveyed grid cells between 1 July and 4 July. They detected 48 bird species, including 4 priority species (Appendix E).

Bird Conservancy estimated densities and population sizes for 35 species, 4 of which are priority species. The data yielded robust density estimates (CV < 50%) for 3 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Salmon-Challis National Forest for 34 species, 4 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 12 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Salmon Challis National Forest Results

h) Sawtooth National Forest

We obtained results for Sawtooth National Forest by analyzing data from one stratum. There were some significant stratification changes made to the BCR 10 portion of Idaho between the 2013 and 2014 field seasons. The "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" strata were further subdivided. The new strata created in

Idaho BCR 10 include Sawtooth National Forest. This is the first year density and occupancy estimates were generated specifically within Sawtooth National Forest.

Field technicians completed all 4 planned surveys (100%) in 2015. Technicians conducted 51 point counts within the 4 surveyed grid cells between 25 June and 2 July. They detected 53 bird species, including 3 priority species (Appendix E).

Bird Conservancy estimated densities and population sizes for 38 species, 3 of which are priority species. The data yielded robust density estimates (CV < 50%) for 13 of these species.

Bird Conservancy estimated the proportion of 1 km^2 grid cells occupied (Psi) throughout Sawtooth National Forest for 36 species, 3 of which are priority species. The data yielded robust occupancy estimates (CV < 50%) for 22 of these 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 and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Sawtooth National Forest Results

i) Wasatch National Forest

We obtained results for Wasatch National Forest from two strata. Two strata were created for Wasatch National Forest in Wyoming, since the forest spans two BCRs (10 and 16) in that state. The BCR-level stratification distinction is made to allow for the summation of the data for individual BCRs within Wyoming. These samples were added to supplement statewide estimates in Wyoming and were supported by state and regional partners. Only the Wyoming portion of Wasatch National Forest has been surveyed using the IMBCR design. The strata were not combined to generate a single estimate since it would not represent the entirety of the national forest.

Field technicians completed both planned surveys in each of the Wasatch National Forest strata in (100%) in 2015. Technicians conducted 54 point counts within the 4 surveyed grid cells between 26 June and 18 July. They detected 76 bird species, including 1 priority species (Appendix H).

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

To view a map of survey locations and species counts within Wasatch National Forest across all years of the project follow the web link below and hit the "Run Query" button highlighted in red located near the top of the page. If you want to limit results to 2015, after you click on the link below select "Year" from the Filter drop down box on the top left of the screen. Hit the "Add" button, select 2015, hit "Add Filter", then "Run Query".

Wasatch National Forest Results

Discussion

Applications of IMBCR Data

The IMBCR program collects breeding bird information in all or portions of 12 states annually. Each year, occupancy and density estimates are calculated at a variety of spatial scales. This information can be used in the following ways to inform avian conservation:

1. Bird Population estimates can be compared in space and time. Stratum-level estimates can be compared to state and regional estimates to determine whether local populations are above or below estimates for the region.

   Example: Bobolink is designated as a Common Bird in Steep Decline and a US and Canada Concern species in BCR 17 by Partners in Flight (Appendix B). We can compare any of the strata or combinations of strata within BCR 17 to the BCR-wide estimate. The density estimate for Bobolink in Knife River Indian Villages NHS is much higher than the BCR 17 estimate, indicating that Knife River may have excellent habitat for this species. On the other hand, Theodore Roosevelt National Park had a lower density estimate than BCR 17 overall. There could be a number of reasons to explain this, one being a lack of appropriate habitat for Bobolink in the Park. If land managers are interested in maintaining a healthy Bobolink population in BCR 17, they could compare stratum-level estimates and then attempt to protect areas where the species is doing very well while targeting areas with low population estimates for habitat management projects.

   Table 3. Density estimates for Bobolink in Bird Conservation Region 17, Theodore Roosevelt National Park and Knife River Indian Villages National Historic Site, 2013. The estimated densities per km² (D), the total estimated population size of the study area (N), the percent coefficient of variation of estimates (% CV) and the number of independent detections used in analyses (n) are shown.

Stratum/Superstratum	D	N	% CV	n
BCR 17	2.15	783,522	42	334
Theodore Roosevelt NP	1.12	328	57	9
Knife River Indian Villages NHS	51.68	258	11	155

2. Population estimates can be used to make informed management decisions about where to focus conservation efforts. For example, strata with large populations can be targeted for protection and strata with low populations can be prioritized for conservation action. A threshold could be set to trigger a management action when populations reach a predetermined level.

   Example: Brewer's Sparrow is designated as a Species of Greatest Conservation Need by Wyoming Game and Fish and a Sensitive Species by the Bureau of Land Management in Wyoming. Population estimates were generated for several BLM field offices within the state of Wyoming. Comparing Brewer's Sparrow population estimates across the various offices shows that the largest estimated population size falls within the Rawlins Field Office (Table 4). When comparing population sizes, it is also important to look at the size of the area involved. Rawlins is the second largest field office in Wyoming, after the Rock Springs Field Office. Rock Springs has the largest area and yet has a smaller population size than Rawlins. It also has the smallest density estimate compared to the other field offices and statewide BLM estimates. This may indicate the need for further investigation to determine why this may be. Perhaps the Rock Springs Field Office naturally contains less ideal habitat for Brewer's Sparrow or there could be anthropogenic disturbances that are contributing to the lower population densities.

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Table 4. Density estimates for Brewer's Sparrow in Wyoming and on BLM Lands in Wyoming, 2013. The estimated densities per km² (D), the total estimated population size of the study area (N), the percent coefficient of variation of estimates (% CV), the number of independent detections used in analyses (n) and the total area (in km²) are shown.

Stratum/Superstratum	D	N	% CV	n	Area (km²)
WY	24.20	6,134,460	16	1235	253,467
WY-BLM	33.12	2,377,177	21	557	71,773
Buffalo Field Office	57.78	184,885	62	60	3,200
Casper Field Office	56.33	293,167	35	82	5,204
Pinedale Field Office	66.34	244,577	21	175	3,687
Rawlins Field Office	23.75	331,473	31	62	13,954
Rock Springs Field Office	19.66	297,874	39	51	15,152

3. Stratum-level population estimates of treatment areas can be compared to regional estimates to evaluate effectiveness of management actions. For example, if Ponderosa Pine habitat is treated to thin dense stands of Ponderosa Pine to reduce forest fire fuels, these areas can be defined as individual strata and sampling can take place within the strata. If estimates for Ponderosa Pine-obligate songbirds increase within this stratum compared to regional estimates, the results would suggest these management actions are also beneficial to Ponderosa Pine-obligate songbird species, or vice versa.

Example: In 2015 and 2016 we surveyed within Four Forest Restoration Initiative Task Orders in Coconino and Kaibab National Forests. The goal of the project is to thin Ponderosa Pine stands in these forests to reduce the potential for catastrophic fire events and to restore the habitat to a more historically natural condition. The surveys will be conducted pre- and post-thinning and the estimates generated can be compared to forest-wide estimates for Coconino and Kaibab National Forest.

4. Annual estimates of density and occupancy can be compared over time to determine if population changes are a result of population growth or decline and/or range expansion or contraction. For example, if population densities of a species declined over time, but the occupancy rates remained constant, then the population change was due to declines in local abundance. In contrast, if both density and occupancy rates of a species declined, then population change was due to range contraction.

Example: Hairy Woodpecker is a Management Indicator Species in Idaho Panhandle National Forest. We've monitored this Forest since 2010 and if we look at estimates from 2010 through 2013, there appears to be a decline in density over time. Similarly, there appears to be a decline in occupancy from 2010 – 2013 as well. This seems to indicate that Hairy Woodpeckers may be undergoing a range contraction within Idaho Panhandle NF. These results indicate further research on Hairy Woodpecker may be warranted in the Forest to determine the reason for the range contraction.

Table 5. Density and occupancy estimates for Hairy Woodpecker in Idaho Panhandle National Forest, 2010 – 2013. The estimated densities per km² (D), the total estimated population size of the study area (N), the percent coefficient of variation of estimates on density (D %CV), the number of independent detections used in density analyses (n), estimated proportion of 1 km² sample units occupied (Psi), percent coefficient of variation of Psi (Psi % CV) and number of sample cells with one or more detections used to calculate occupancy (nTran) are shown.

Year	D	N	D %CV	n	Psi	Psi %CV	nTran
2010	10.29	121,630	25	15	0.901	16	10
2011	5.92	69,980	42	6	0.889	28	6
2012	3.89	45,931	31	14	0.702	6	12
2013	3.48	41,132	37	11	0.536	8	10

5. Occupancy rates can be multiplied by the land area in a region of interest to estimate the area occupied by a species.

   Example: Sprague's Pipit is a priority species in Montana as designated by Montana Fish, Wildlife, and Parks. The occupancy estimate for Sprague's Pipit is 0.028 and the total area of the Montana superstratum is 381,540km². Multiplying the occupancy estimate by the area gives an estimate of 10,683km² of habitat occupied by Sprague's Pipit in Montana. This information can be used by land managers to set goals for how much habitat should be provided for the species in Montana.

Research Applications

Auxiliary, or "overlay", projects are a growing component of the IMBCR program that improve efficiency and can be tailored to address specific management questions. Auxiliary projects utilize the IMBCR sampling design and field methods but are not integrated into the nested stratification of the IMBCR program. These projects benefit from the IMBCR program by incorporating detection data from relevant IMBCR surveys in their analyses. Utilizing the IMBCR design also allows the resulting population estimates to be placed in a regional context. In this way, the collaborative efficiency of the IMBCR program is extended to auxiliary projects by improving the accuracy and precision of population estimates for infrequently detected species as well as allowing those estimates to be compared to larger, regional populations. In a similar fashion, data collected as part of auxiliary projects contributes to the efficiency of the IMBCR program. The project entitled "Monitoring Birds in the Atlantic Rim Natural Gas Development Project Area" is an example of an auxiliary project conducted jointly by the BLM and Bird Conservancy of the Rockies. We monitored bird populations on the Atlantic Rim Natural Gas Development Project Area to investigate the influence of oil and gas development on the bird community (Van Lanen et al. 2012). This project found few differences between bird communities in high and low development areas, but bird species richness was much greater for the Atlantic Rim than other BLM Lands in the Northern Rockies BCR, highlighting the conservation value of the Atlantic Rim Project Area (Van Lanen et al. 2012).

Value as a Management Tool

The availability of consistent monitoring data at multiple scales is an important challenge for avian conservation (Ruth et al. 2003). The IMBCR program is well positioned to address the conservation and management needs of a wide range of stakeholders, landowners and government entities at various spatial scales. The program was designed to provide accurate information about bird populations from local management units to BCRs. The hierarchical framework of nested strata is useful for partitioning bird population estimates according to management units and aggregating bird population estimates at various scales to support large-

scale conservation efforts. At the management unit scale, IMBCR population estimates can be used to support local management efforts. Whereas, monitoring at regional and BCR scales provides land managers with dependable knowledge about the status and change of bird populations at ecologically relevant scales (US North American Bird Conservation Initiative 2009). In addition, population estimates at the management unit scale can be compared to those at the BCR scale to place the population estimates in a regional context. The large-scale context provides biological information for conservation planning and allows an assessment of conservation responsibility.

By focusing on multiple scales relevant to management and conservation, IMBCR can easily be integrated within an interdisciplinary approach to bird conservation that combines monitoring, research and management (Ruth et al. 2003). The IMBCR program accommodates the principles of adaptive monitoring (Lindenmayer and 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. 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. For example, the IMBCR program allows for different stratification schemes and the restratification of local management units to better address partner management objectives. The flexible hierarchical design accommodates restratification and annual fluctuation of sampling intensity without compromising the regional population estimates. Because IMBCR strata are based on fixed attributes rather than existing vegetation types, this program is in a strong position to directly tie changes in bird populations to changes in vegetation at multiple scales. The hierarchical stratification scheme is well suited for linking bird population responses to climate and landscape change at biogeographical scales (Opdam and Wascher 2004). Finally, the IMBCR program uses the best available science to support natural resource management by providing bird population estimates that appropriately account for spatial variation and incomplete detection (Pollock et al. 2002, Rosenstock et al. 2002, Thompson 2002).

IMBCR and Adaptive Resource Management

Monitoring is integral to the management and conservation of wildlife populations (Marsh and Trenham 2008, Sauer and Knutson 2008). In particular, monitoring is necessary for the adaptive management of wildlife populations (Nichols and Williams 2006, Lyons et al. 2008). Monitoring in adaptive management is used to: 1) make state-dependent management decisions; 2) evaluate management effectiveness; and 3) improve system understanding (Lyons et al. 2008). For example, management decisions may depend on a bird population status and a threshold can be set to trigger a management action when the population reaches a predetermined level. Bird population monitoring is also necessary to determine if management actions implemented in previous management cycle(s) are achieving conservation objectives. Population estimates within management units can be compared over time and space and to average conditions in the region to evaluate effectiveness of management actions. Monitoring data are also useful for evaluating competing hypotheses about how bird populations respond to system dynamics. Understanding regional bird population dynamics will help land managers predict species responses to landscape change and large-scale conservation efforts (Jones 2011, Noon et al. 2012).

Population estimates for a particular species or group of species can be used to make informed management decisions to focus conservation efforts. For example, management units with large populations can be targeted for protection or management units with small populations can be prioritized for conservation action. Although IMBCR does not employ vegetation stratification, the monitoring data can easily be post stratified to estimate vegetation-specific population density and occupancy rates. The IMBCR program is a rich data source for modeling habitat

relationships, as well as developing spatially explicit abundance and occupancy maps. Recently, Bird Conservancy completed a project to determine multi-scale habitat relationships for sagebrush birds. This project used vegetation data collected at sampling points to model habitat relationships and digital land cover data within sampling units to map large-scale bird occupancy rates. In addition, Bird Conservancy adapted a hierarchical model developed by Chandler et al. (2011) to the IMBCR design that allows the prediction and mapping of bird population densities at large-scales (Figure 8). The IMBCR design provides a legitimate way to extend population estimates to un-sampled regions, and the models provide population estimates that account for incomplete detection. The population estimation approach to species distribution modeling represents an improvement over opportunistic, index-based approaches (Rota et al. 2011), especially when the fate of declining species depends on conservation action. Large-scale species distribution maps and local habitat relationships are useful for answering the "where" and "what to do" questions in conservation planning (Wilson et al. 2007). Bird distributions can be summarized for un-sampled management units and regions, extending the ability of IMBCR to inform management and assess conservation responsibility.
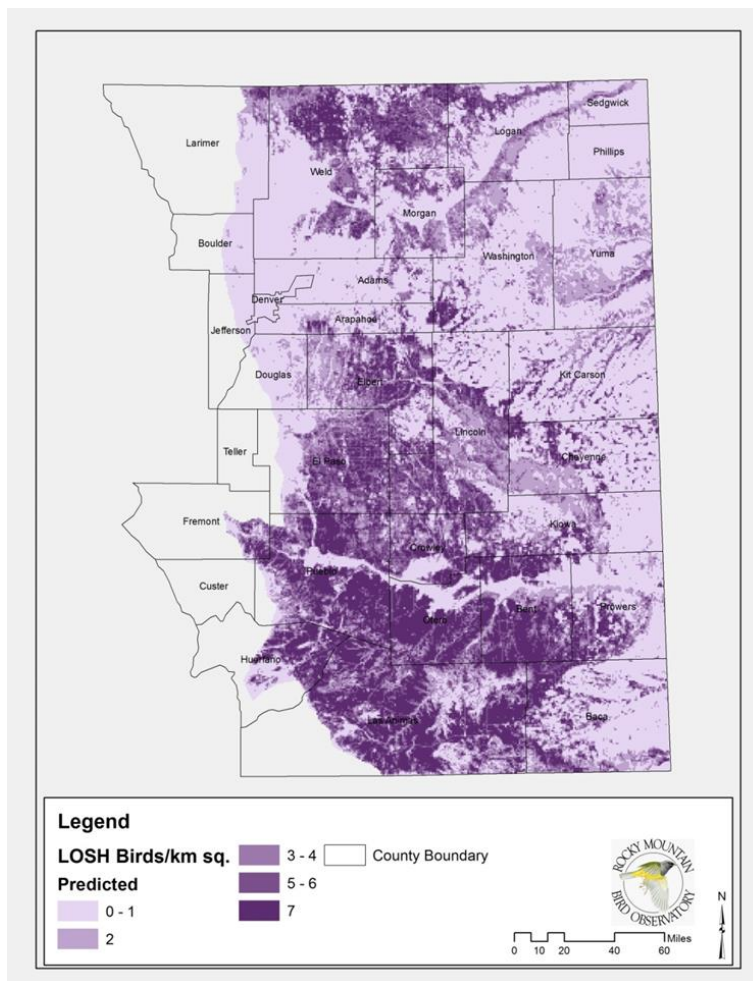
Figure 8. Loggerhead Shrike predicted distribution showing population density within the Colorado Shortgrass Prairie Bird Conservation Region (Sparks et al.)

The IMBCR data provide a source for decision support tools development to help land managers and resource professionals address important conservation issues. Bird Conservancy is currently developing a decision support tool that will assist resource professionals, land managers and private landowners in managing the sagebrush bird community. The tool's foundation will be species distribution maps, used to prioritize landscapes for conservation, and bird-habitat relationships, used to evaluate the effectiveness of conservation practices. Decision

support tools that integrate biological, social and economic objectives are important for cost effective conservation outcomes in working landscapes.

Future Directions and Limitations

Land managers and conservation organizations can use IMBCR population estimates to better understand annual trends in landbird populations (US North American Bird Conservation Initiative 2009). Simulations using 10 years of data from a similar avian monitoring program (J. Blakesley, Bird Conservancy, unpublished) indicated the IMBCR program would have 80% power to detect an average annual decline of 3% in a population within 25 years when % CVs of the estimates are ≤ 40%. A similar trend could be detected within 30 years with a % CV of ≤ 50%. The ability to detect population trends for any species is a function of the sampling effort, abundance and annual variation of abundance for individual species. Some grassland bird species such as Lark Bunting shift their breeding ranges from year to year based on environmental conditions (Shane 2000), resulting in local abundance estimates that fluctuate significantly among years. More precise density estimates will be required to monitor population trends within 25-30 years for species exhibiting larger degree annual variation in density and abundance estimates. Currently, we are investigating Bayesian trend estimation, which should have greater power to detect a trend and will provide probability estimates of population decline. The IMBCR data can also be used to investigate population, metapopulation and community dynamics over time. Annually surveyed sampling units provide information on dynamic processes that give rise to the patterns of abundance, occupancy and species richness over time.

The primary limitation in estimating avian population parameters using the IMBCR approach is sample size within strata. A minimum number of two samples per stratum is necessary to estimate regional density and occupancy. However, reliable stratum-level occupancy estimates require larger samples sizes, with a minimum of approximately 10 samples per stratum. Furthermore, additional samples may be required for strata comprising large geographic areas. Because we estimate regional density and occupancy using an area weighted mean, estimates from large, under-sampled strata often receive more weight than estimates from small, well sampled strata.

Conclusion

Although the importance of long-term and intensive population monitoring is well known, it is expensive, with costs typically determining sampling effort. The IMBCR design reduces costs through cooperation with multiple partners, one of the stated goals of effective collaboration and coordinated bird monitoring (US North American Bird Conservation Initiative 2007). Partners and managers can investigate other priority species and taxa with only slight modifications to the IMBCR design, further reducing costs associated with developing new studies and monitoring programs. Ideally, these cost savings can be used to increase sample efforts, particularly in under-sampled strata, and conduct additional avian-habitat relationship analyses.

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Appendix A: Avian Data Center Usage Tips
Overview

All results, including parameter estimates, distribution maps, raw count data and effort, are available online. To view interactive maps showing survey and detection locations, as well as species counts, and density, population and occupancy results using the IMBCR study design please visit the Rocky Mountain Avian Data Center. Click on the "Explore the Data" tab to view IMBCR results.

The 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.

Management Entity: This filter will allow users to select data and results for All Other Lands, Colorado State Land Board, The Nature Conservancy (TNC), US Bureau of Indian Affairs (BIA), US Bureau of Land Management (BLM), US Department of Defense (DoD), US Fish and Wildlife Service (USFWS), US Forest Service (USFS), or National Park Service (NPS). Once a management entity is chosen, users may notice that additional filter types are available in the filters drop down list. These additional filter types, listed from most general to most specific, are management regions (e.g., USFS Region 1), management units (e.g., Dakota Prairie Grasslands), management forests (e.g., Shoshone National Forest), or management districts (e.g., North Kaibab district within Kaibab National Forest). Below is the filter hierarchy for the different management entities.

Priority Species List: This filter will allow users to select data and results for multiple species at once. The query will display data and results for all species included on the selected management indicator list, species of conservation concern list, etc.

Species: This filter allows users to select data and results for a particular species.

Year: This filter will allow users to select all data and results for a particular year.

Superstratum: This filter allows users to select IMBCR data and results for multiple strata that were analyzed jointly (e.g., the entire Bridger-Teton National Forest which was broken up into 2 strata or the entire state of Colorado which was broken up into 30 strata).

Individual Stratum: This filter allows users to select data and results for a particular stratum.

Hierarchy for the different management entities

All Other Lands:
Tier One – Management Entity – All Other Lands
Tier Two – Management Region – Not applicable
Tier Three – Management Unit – Not applicable
Tier Four – National Forest or Grassland – Not applicable
Tier Five – Management District – Not applicable

Colorado State Land board:
Tier One – Management Entity – Colorado State Land Board
Tier Two – Management Region – Lowry Range
Tier Three – Management Unit – Not applicable
Tier Four – National Forest or Grassland – Not applicable
Tier Five – Management District – Not applicable

TNC:
Tier One – Management Entity – The Nature Conservancy
Tier Two – Management Region – Cherry Creek
Tier Three – Management Unit – Not applicable
Tier Four – National Forest or Grassland – Not applicable
Tier Five – Management District – Not applicable

Tribal Lands:
Tier One – Management Entity – US Bureau of Indian Affairs
Tier Two – Management Region – Reservation
Tier Three – Management Unit – Not applicable
Tier Four – National Forest or Grassland – Not applicable
Tier Five – Management District – Not applicable

BLM:
Tier One – Management Entity – Bureau of Land Management
Tier Two – Management Region – BLM Field Office
Tier Three – Management Unit – Not applicable
Tier Four – National Forest or Grassland – Not applicable
Tier Five – Management District – Not applicable

DoD:
Tier One – Management Entity – US Department of Defense
Tier Two – Management Region – US DoD Installation
Tier Three – Management Unit – Not applicable
Tier Four – National Forest or Grassland – Not applicable
Tier Five – Management District – Not applicable

USFWS:
Tier One – Management Entity – US Fish and Wildlife Service
Tier Two – Management Region – USFWS Region
Tier Three – Management Unit – USFWS Management Unit, Refuge, etc.
Tier Four – National Forest or Grassland – Not applicable
Tier Five – Management District – Not applicable

USFS:
Tier One – Management Entity – US Forest Service
Tier Two – Management Region – USFS Regions
Tier Three – Management Unit – National Forest (NF) or National Grassland (NG) management
    units (used to represent situations where multiple forests are managed jointly)
Tier Four – National Forest or Grassland – NF or NG
Tier Five – Management District – NF or NG Ranger Districts

NPS:
Tier One – Management Entity – National Park Service
Tier Two – Management Region – Inventory and Monitoring Network
Tier Three – Management Unit – Individual NPS Parks, Monuments, Memorials, Recreation
    Areas and Historic Sites
Tier Four – Management Forest – Not applicable
Tier Five – Management District – Not applicable

Clearing Filters
Filters can be cleared in one of two ways. You may click on the circled "X" to the left of an individual filter at the top of the screen to remove it or you may click the "clear all filters" button at the top of the screen to start building a new query.

Running Queries
Once you have selected your desired filters, please click on the "Run Query" button located at the top of the screen. The amount of time it takes for the desired data and results to be displayed will depend on how specific your query is.

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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 an 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 and

standard error (SE) of the estimate and the percent coefficient of variation (% CV). The density tables will display species, stratum or habitat type, year, number of birds expected per km² (D), total number of individuals expected to reside 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 mouse arrow over the column heading. You may also sort the table by clicking on any of the column headings.

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.

How to interpret the estimates

The Integrated Monitoring in Bird Conservation Regions Program annually collects breeding bird information in all or portions of 13 states. Each year, we calculate occupancy and density estimates at a variety of spatial scales. This information can be used in the following ways to inform avian conservation:

1. **Bird Population estimates can be compared in space and time.** For example, stratum-level estimates can be compared to state and regional estimates to determine whether local populations are above or below estimates for the region;
2. **Population estimates can inform management decisions on where to focus conservation efforts.** For example, strata with large populations can be targeted for protection and strata with low populations can be prioritized for conservation action; a threshold could be set to trigger a management action when populations reach a predetermined level;
3. **Treatment area population estimates can be compared to regional estimates to evaluate effectiveness of management actions.** For example, if sagebrush areas are being treated to improve habitat for Greater Sage-grouse (GRSG) and estimates for sagebrush-obligate birds increase in these areas in relation to regional estimates where treatment is not occurring, the results would suggest that the GRSG management actions are also beneficial to other sagebrush-obligate bird species;
4. **Annual density and occupancy estimates can be compared over time to determine if population changes are a result of population growth or decline and/or range expansion or contraction.** For example, if population densities of a species declined over time, but the occupancy rates remained constant, then the population change was due to declines in local abundance. In contrast, if both density and occupancy rates of a species declined, then population change was due to range contraction;
5. **Occupancy rates can be multiplied by the land area in a region of interest to estimate the area occupied by a species.** For example, if a stratum comprises 120,000 km² and the occupancy estimate for Western Meadowlark is 0.57, managers can estimate that 68,400 km² (120,000 km² * 0.57) of habitat within that stratum is occupied by Western Meadowlarks.

Knowing which species have estimates

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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'd like to continue. This pop-up box is designed to prevent your web browser from crashing while the ADC 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.

What is available?
Currently, occupancy results for 2010 through 2015 and density results for 2008 through 2015 are available via the ADC.

Viewing Raw Count Statistics (Species Counts Tab)

You may view the raw count of detections for each species and the effort (expressed as the number of point count stations surveyed) for your query by clicking on the "Species Counts" tab located just below the drop down filter menu in the upper left corner of the screen. Both the counts (left table) and effort tables (right table) may be sorted by clicking on the row header. Additionally, you may view the counts and effort by BCR, State, County, Stratum, or Management Entity by clicking on the "Count by" drop down menu located above the counts table. If you have filtered using "Superstrata", viewing counts by Stratum is an excellent way of getting a list of all the strata that comprise a Superstratum. If you would prefer to view effort expressed as the number of sampling units surveyed, click on the "View Options" button located at the top of the screen and check the box labeled "Show effort by number of sampling units instead of by point".

Appendix B

Priority species detected in all Bird Conservation Regions (BCRs) surveyed in 2015, as designated by Partners in Flight. BCRs include BCR 9 (Great Basin), BCR 10 (Northern Rockies), BCR 11 (Prairie Potholes), BCR 16 (Southern Rockies and Colorado Plateau), BCR 17 (Badlands and Prairies), BCR 18 (Shortgrass Prairie), BCR 19 (Central Mixed-grass Prairie) and BCR 34 (Sierra Madre Occidental). An "X" in the Occupancy or Density Estimated column indicates that occupancy or density estimates were generated for the priority species at some level in one or more of the BCRs where it holds a priority designation.

Species	Partners In Flight*				Density Estimate	Occupancy Estimate
	BCR 9	BCR 10	BCR 11	BCR 16		
American Dipper		RS,UCS				
American Kestrel	RC,RS,UCS	RC			X	X
Ash-throated Flycatcher					X	X
Baird's Sparrow			RC,RS,TNC,UCC,UCS		X	X
Baltimore Oriole						X
Bank Swallow	CBSD	CBSD	CBSD,RC	CBSD	X	X
Bell's Vireo				RC,TNC,UCC	X	X
Belted Kingfisher	CBSD,RC	CBSD	CBSD	CBSD		
Black Rosy-Finch	RC,RS,TNC,UCC,UCS	RC,RS,TNC,UCC,UCS		RC,TNC,UCC		
Black Swift	RC,TNC,UCC	RC,TNC,UCC		RC,TNC,UCC		
Black-billed Cuckoo			CBSD,RC,UCC			
Black-billed Magpie	UCS		UCS	UCS	X	X
Black-chinned Sparrow	CBSD,UCC			CBSD,UCC	X	X
Black-throated Gray Warbler				RC	X	X
Black-throated Sparrow	UCS				X	X
Bobolink		CBSD,UCC	CBSD,RC,RS,UCC,UCS		X	X
Boreal Chickadee		CBSD				
Brewer's Sparrow	CBSD,RC,RS,UCS	CBSD,RC	CBSD	CBSD,RC	X	X
Broad-tailed Hummingbird				RS,UCS	X	X
Brown Thrasher			RC		X	X
Brown-capped Rosy-Finch				RC,RS,TNC,UCC,UCS	X	X
Bullock's Oriole					X	X
Burrowing Owl			RC		X	X
Bushtit					X	X

Species	Partners In Flight*				Density Estimate	Occupancy Estimate
	BCR 9	BCR 10	BCR 11	BCR 16		
Cactus Wren					X	X
Calliope Hummingbird	RS,UCS	RS,UCS				
Canyon Towhee					X	X
Canyon Wren					X	X
Cassin's Finch	CBSD,RS,UCC,UCS	CBSD,RC,RS,UCC,UCS		CBSD,RC,UCC	X	X
Cassin's Kingbird					X	X
Cassin's Sparrow					X	X
Cassin's Vireo		RS,UCS			X	X
Chestnut-collared Longspur			RC,RS,TNC,UCC,UCS		X	X
Chihuahuan Raven					X	
Chimney Swift			CBSD			
Chipping Sparrow		RC,RS,,UCS			X	X
Clark's Nutcracker		RS,UCS		RC,RS,UCS	X	X
Clay-colored Sparrow			RS,UCS		X	X
Common Nighthawk	CBSD	CBSD	CBSD	CBSD,RC	X	X
Common Poorwill				RC		
Cooper's Hawk				RS,UCS	X	X
Cordilleran Flycatcher				RS,UCS	X	X
Crissal Thrasher					X	X
Dickcissel			RC		X	X
Dusky Flycatcher		UCS			X	X
Dusky Grouse	RC,RS,UCS	RS,UCS		RS,UCS	X	X
Eastern Kingbird			UCS		X	X
Eastern Meadowlark				CBSD	X	X
Evening Grosbeak		RC			X	X
Ferruginous Hawk	RC,RS,UCS	RC	RC,RS,UCS	RC		
Field Sparrow			CBSD		X	X
Gambel's Quail					X	X
Golden Eagle	RC,RS,UCS		RC	RC	X	
Golden-crowned Kinglet		UCS			X	X

| Species | Partners In Flight* | | | | Density Estimate | Occupancy Estimate |
	BCR 9	BCR 10	BCR 11	BCR 16		
Grace's Warbler				RS,UCS	X	X
Grasshopper Sparrow	CBSD	CBSD			X	X
Gray Flycatcher	RS,UCS					
Gray Vireo	UCC			RC,RS,UCC,UCS	X	X
Greater Prairie-Chicken			RC,TNC,UCC		X	
Greater Sage-Grouse	RC,TNC,UCC	RC,RS,TNC,UCC,UCS	RC,TNC,UCC,CBSD,RC	RC,TNC,UCC		
Green-tailed Towhee	RC,RS,UCS			RS,UCS	X	X
Hammond's Flycatcher		UCS			X	X
Hepatic Tanager					X	X
Horned Lark	CBSD	CBSD	CBSD,RC	CBSD	X	X
Juniper Titmouse				RS,UCS	X	X
Ladder-backed Woodpecker					X	X
Lark Bunting		CBSD	CBSD,RC		X	X
Lark Sparrow	RC				X	X
Lazuli Bunting	RS,UCS	UCS		RC,RS,UCS	X	X
Lewis's Woodpecker	RC,RS,UCS	RC		RC,RS,UCS	X	X
Loggerhead Shrike	CBSD	CBSD	CBSD	CBSD,RC	X	X
Lucy's Warbler					X	X
MacGillivray's Warbler	RC	UCS			X	X
McCown's Longspur		RC	RC,RS,UCS		X	X
Mountain Bluebird	UCS	UCS		RC,RS,UCS	X	X
Mountain Chickadee	RC	UCS			X	X
Northern Bobwhite					X	X
Northern Flicker	CBSD,UCS	CBSD,UCS	CBSD	CBSD,RS,UCS	X	X
Northern Goshawk	RC	RS,UCS				
Northern Harrier	RS,UCS		RC,RS,UCS		X	X
Olive Warbler					X	X
Olive-sided Flycatcher	RC,TNC,UCC	RC,TNC,UCC		RC,TNC,UCC	X	X
Phainopepla					X	X
Pine Siskin	CBSD,RC	CBSD,RS,UCS	CBSD	CBSD,RS,UCS	X	X

Species	Partners In Flight*				Density Estimate	Occupancy Estimate
	BCR 9	BCR 10	BCR 11	BCR 16		
Pinyon Jay	RC,RS,TNC,UCC,UCS	RC,TNC,UCC		RC,RS,TNC,UCC,UCS	X	X
Plumbeous Vireo				RS,UCS	X	X
Prairie Falcon	RS,UCS		RC	RC		X
Pygmy Nuthatch				RS,UCS	X	X
Red Crossbill					X	X
Red-breasted Nuthatch		UCS			X	X
Red-faced Warbler					X	X
Red-headed Woodpecker			CBSD,RC,UCC		X	X
Red-naped Sapsucker		RS,UCS			X	X
Ring-necked Pheasant					X	X
Rock Wren	CBSD,RS,UCS	CBSD		CBSD,RS,UCS	X	X
Ruby-crowned Kinglet		UCS			X	X
Ruffed Grouse	CBSD	CBSD,RS,UCS	CBSD		X	X
Rufous Hummingbird	CBSD,UCC	CBSD,UCC			X	X
Rufous-crowned Sparrow					X	X
Sage Sparrow	RC,RS,UCS	RC		RC	X	X
Sage Thrasher	RC,RS,UCS				X	X
Savannah Sparrow			UCS		X	X
Say's Phoebe				UCS	X	X
Scaled Quail					X	X
Scott's Oriole					X	X
Sharp-shinned Hawk						
Sharp-tailed Grouse	RC	RC	RS,UCS		X	X
Short-eared Owl	CBSD,RC	CBSD,RC	CBSD,RC			X
Sprague's Pipit		RC,TNC,UCC	RC,RS,TNC,UCC,UCS		X	X
Swainson's Hawk			RC,RS,UCS		X	X
Swainson's Thrush		UCS			X	X
Townsend's Solitaire		RS,UCS			X	X
Townsend's Warbler	RC	RS,UCS			X	X
Tree Swallow		UCS			X	X

Species	Partners In Flight*				Density Estimate	Occupancy Estimate
	BCR 9	BCR 10	BCR 11	BCR 16		
Varied Thrush		RC			X	X
Verdin					X	X
Vesper Sparrow		RC	UCS		X	X
Violet-green Swallow				UCS	X	X
Virginia's Warbler	UCC			RS,UCC,UCS	X	X
Warbling Vireo		UCS		UCS	X	X
Western Bluebird					X	X
Western Kingbird					X	X
Western Meadowlark	UCS		UCS		X	X
White-breasted Nuthatch					X	X
White-tailed Ptarmigan		RC,RS,UCS		RC		
Wild Turkey					X	
Williamson's Sapsucker	RC	RS,UCS		RS,UCS	X	X
Willow Flycatcher	RC	RS,UCS			X	X
Wilson's Warbler	CBSD	CBSD		CBSD	X	X
Yellow-headed Blackbird	UCS		UCS		X	X

*CBSD = Common Bird in Steep Decline; RC = Regional Concern Species; RS = Regional Stewardship Species; TNC = Tri-National Concern Species; UCC = U.S. and Canada Concern Species; UCS = U.S. and Canada Stewardship Species (PIF Science Committee 2012).

Appendix B continued. Priority species detected in all Bird Conservation Regions (BCRs) surveyed in 2015, as designated by Partners in Flight (PIF). BCRs include BCR 9 (Great Basin), BCR 10 (Northern Rockies), BCR 11 (Prairie Potholes), BCR 16 (Southern Rockies and Colorado Plateau), BCR 17 (Badlands and Prairies), BCR 18 (Shortgrass Prairie), BCR 19 (Central Mixed-grass Prairie) and BCR 34 (Sierra Madre Occidental). An "X" in the Occupancy or Density Estimated column indicates that occupancy or density estimates were generated for the priority species at some level in one or more of the BCRs where it holds a priority designation.

Species	Partners In Flight*				Density Estimate	Occupancy Estimate
	BCR 17	BCR 18	BCR 19	BCR 34		
American Dipper	RC			RC		
American Kestrel				RC	X	X
Ash-throated Flycatcher				UCS	X	X
Baird's Sparrow	RC,TNC,UCC				X	X
Baltimore Oriole			RC,RS,UCS			X
Bank Swallow	CBSD	CBSD	CBSD		X	X
Bell's Vireo		RC,TNC,UCC	RC,TNC,UCC	RC,TNC,UCC	X	X
Belted Kingfisher	CBSD	CBSD	CBSD	CBSD		
Black Rosy-Finch						
Black Swift						
Black-billed Cuckoo	CBSD,RC,UCC		CBSD,UCC			
Black-billed Magpie	RC				X	X
Black-chinned Sparrow				CBSD,RC,RS,UCC,UCS	X	X
Black-throated Gray Warbler				RC	X	X
Black-throated Sparrow				RC,RS,UCS	X	X
Bobolink	CBSD,UCC		CBSD,UCC		X	X
Boreal Chickadee						
Brewer's Sparrow	CBSD,RC	CBSD,RC			X	X
Broad-tailed Hummingbird				RC	X	X
Brown Thrasher			RS,UCS		X	X
Brown-capped Rosy-Finch					X	X
Bullock's Oriole		UCS	RC		X	X
Burrowing Owl	RC	RC,RS,UCS	RC		X	X
Bushtit				RS,UCS	X	X
Cactus Wren				RC,RS,UCS	X	X

Species	Partners In Flight*				Density Estimate	Occupancy Estimate
	BCR 17	BCR 18	BCR 19	BCR 34		
Calliope Hummingbird						
Canyon Towhee				RS,UCS	X	X
Canyon Wren				RS,UCS	X	X
Cassin's Finch					X	X
Cassin's Kingbird				RC,RS,UCS	X	X
Cassin's Sparrow		RC,RS,UCS	RC		X	X
Cassin's Vireo					X	X
Chestnut-collared Longspur	RC,RS,TNC,UCC,UCS	RC,TNC,UCC			X	X
Chihuahuan Raven		RS,UCS			X	
Chimney Swift		CBSD	CBSD			
Chipping Sparrow					X	X
Clark's Nutcracker					X	X
Clay-colored Sparrow					X	X
Common Nighthawk	CBSD,RC	CBSD,RC	CBSD,UCS	CBSD,RC	X	X
Common Poorwill				RS,UCS		
Cooper's Hawk				RS,UCS	X	X
Cordilleran Flycatcher				RS,UCS	X	X
Crissal Thrasher				RS,UCS	X	X
Dickcissel	RC		RC,RS,UCS		X	X
Dusky Flycatcher					X	X
Dusky Grouse					X	X
Eastern Kingbird	UCS		UCS		X	X
Eastern Meadowlark		CBSD	CBSD,RC,RS,UCS	CBSD	X	X
Evening Grosbeak				RC	X	X
Ferruginous Hawk	RC,RS,UCS	RC,RS,UCS	RC			
Field Sparrow	CBSD		CBSD,RC		X	X
Gambel's Quail				RS,UCS	X	X
Golden Eagle	RC			RC	X	
Golden-crowned Kinglet					X	X
Grace's Warbler				RC,RS,UCS	X	X

Species	Partners In Flight*				Density Estimate	Occupancy Estimate
	BCR 17	BCR 18	BCR 19	BCR 34		
Grasshopper Sparrow	CBSD,RC,RS,UCS	CBSD,RC,RS,UCS	CBSD,RC,RS,UCS	CBSD	X	X
Gray Flycatcher						
Gray Vireo				RC,RS,UCC,UCS	X	X
Greater Prairie-Chicken	RC,TNC,UCC	RC,TNC,UCC	RC,RS,TNC,UCC,UCS		X	
Greater Sage-Grouse	RC,RS,TNC,UCC,UCS					
Green-tailed Towhee					X	X
Hammond's Flycatcher					X	X
Hepatic Tanager				UCS	X	X
Horned Lark	CBSD	CBSD,RS,UCS	CBSD	CBSD	X	X
Juniper Titmouse				RC,RS,UCS	X	X
Ladder-backed Woodpecker				RS,UCS	X	X
Lark Bunting	CBSD,RC,RS,UCS	CBSD,RC,RS,UCS	CBSD,RC		X	X
Lark Sparrow	RC	UCS	RC,RS,UCS		X	X
Lazuli Bunting	RS,UCS				X	X
Lewis's Woodpecker	RC	RC		RC	X	X
Loggerhead Shrike	CBSD	CBSD	CBSD,RC	CBSD	X	X
Lucy's Warbler				RC,RS,UCS	X	X
MacGillivray's Warbler					X	X
McCown's Longspur	RC,RS,UCS	RS,UCS			X	X
Mountain Bluebird					X	X
Mountain Chickadee					X	X
Northern Bobwhite		CBSD	CBSD,UCS		X	X
Northern Flicker	CBSD	CBSD	CBSD	CBSD	X	X
Northern Goshawk	RC			RC		
Northern Harrier	RC,RS,UCS	RC	RC		X	X
Olive Warbler				RS,UCS	X	X
Olive-sided Flycatcher				TNC,UCC	X	X
Phainopepla				RC,RS,UCS	X	X
Pine Siskin	CBSD			CBSD	X	X
Pinyon Jay	RC,TNC,UCC	RC,TNC,UCC		RC,TNC,UCC	X	X

Species	Partners In Flight*				Density Estimate	Occupancy Estimate
	BCR 17	BCR 18	BCR 19	BCR 34		
Plumbeous Vireo				RC,RS,UCS	X	X
Prairie Falcon		RC		RC		X
Pygmy Nuthatch				RS,UCS	X	X
Red Crossbill	UCS				X	X
Red-breasted Nuthatch					X	X
Red-faced Warbler				RC,RS,UCS	X	X
Red-headed Woodpecker	CBSD,RC,UCC	CBSD,UCC	CBSD,RS,UCC,UCS		X	X
Red-naped Sapsucker					X	X
Ring-necked Pheasant	UCS	RS,UCS			X	X
Rock Wren	CBSD	CBSD		CBSD	X	X
Ruby-crowned Kinglet					X	X
Ruffed Grouse	CBSD				X	X
Rufous Hummingbird					X	X
Rufous-crowned Sparrow				RS,UCS	X	X
Sage Sparrow	RC				X	X
Sage Thrasher	RC				X	X
Savannah Sparrow					X	X
Say's Phoebe					X	X
Scaled Quail		RC		RC	X	X
Scott's Oriole				RS,UCS	X	X
Sharp-shinned Hawk				RC		
Sharp-tailed Grouse	RS,UCS	RC			X	X
Short-eared Owl	CBSD,RC	CBSD				X
Sprague's Pipit	RC,TNC,UCC				X	X
Swainson's Hawk		RS,UCS	RC		X	X
Swainson's Thrush				RC	X	X
Townsend's Solitaire					X	X
Townsend's Warbler					X	X
Tree Swallow					X	X
Varied Thrush					X	X

Species	Partners In Flight*				Density Estimate	Occupancy Estimate
	BCR 17	BCR 18	BCR 19	BCR 34		
Verdin			CBSD	CBSD,RS,UCS	X	X
Vesper Sparrow	RC,RS,UCS				X	X
Violet-green Swallow				UCS	X	X
Virginia's Warbler	UCC			RS,UCC,UCS	X	X
Warbling Vireo					X	X
Western Bluebird				RS,UCS	X	X
Western Kingbird		UCS			X	X
Western Meadowlark	UCS	RC,RS,UCS	RC,RS,UCS		X	X
White-breasted Nuthatch				UCS	X	X
White-tailed Ptarmigan						
Wild Turkey			UCS		X	
Williamson's Sapsucker				RS,UCS	X	X
Willow Flycatcher					X	X
Wilson's Warbler					X	X
Yellow-headed Blackbird					X	X

*CBSD = Common Bird in Steep Decline; RC = Regional Concern Species; RS = Regional Stewardship Species; TNC = Tri-National Concern Species; UCC = U.S and Canada Concern Species; UCS = U.S. and Canada Stewardship Species (PIF Science Committee 2012).

Appendix C

Priority species detected in 2015, by state, with management designations by state agencies. Agencies include Arizona Game and Fish Department (AZGFD), Colorado Parks and Wildlife (CPW), Idaho Fish and Game Department (IDFG), Montana Fish, Wildlife and Parks (MTFWP), North Dakota Game and Fish Department (NDGFD), Nebraska Game and Parks Commission (NGPC), South Dakota Game, Fish and Parks (SDGFP) and Wyoming Game and Fish Department (WGFD). An "X" in the Occupancy or Density Estimated columns indicates estimates were generated for that species at some level in one or more of the states where it holds a priority designation.

| Species | State Agencies* | | | | | | | | Density Estimate | Occupancy Estimate |
	AZGFD	CPW	IDFG	MTFWP	NDGFD	NGPC	SDGFP	WGFD		
Abert's Towhee	SGCN									
Acorn Woodpecker	SGCN								X	X
American Avocet			SGCN		SoCP L2	T2			X	X
American Bittern	SGCN	T2		SOC	SoCP L1	T2		SGCN		
American Three-toed Woodpecker	SGCN		SGCN				SGCN	SGCN	X	X
American White Pelican		T2	SGCN	SOC	SoCP L1	T2	SGCN		X	
Ash-throated Flycatcher								SGCN	X	X
Baird's Sparrow	SGCN			SOC	SoCP L1		SGCN		X	X
Bald Eagle	SGCN	SSC,T2	SGCN		SoCP L2	T1	SE,SGCN	SGCN		
Band-tailed Pigeon	SGCN	T2							X	
Bell's Vireo	SGCN	T2				T1			X	X
Black Rosy-Finch		T2	SGCN	SOC				SGCN		
Black Swift		T2	SGCN	SOC						
Black Tern		T2	SGCN	SOC	SoCP L1	T2	SGCN	SGCN		
Black-backed Woodpecker				SOC			SGCN	SGCN		
Black-billed Cuckoo				SOC	SoCP L1	T2				
Black-chinned Sparrow	SGCN								X	X
Black-throated Gray Warbler	SGCN								X	X
Blue Grosbeak			SGCN							
Blue-gray Gnatcatcher				SOC		T2			X	X
Bobolink		T2		SOC	SoCP L2			SGCN	X	X
Boreal Chickadee				SOC						
Boreal Owl		T2	SGCN					SGCN		
Brewer's Blackbird						T2			X	X

Species	State Agencies*								Density Estimate	Occupancy Estimate
	AZGFD	CPW	IDFG	MTFWP	NDGFD	NGPC	SDGFP	WGFD		
Brewer's Sparrow	SGCN	T2	SGCN	SOC	SoCP L3	T1		SGCN	X	X
Brown Creeper				SOC		T2			X	X
Brown-capped Rosy-Finch		T1						SGCN	X	X
Bullock's Oriole	SGCN								X	X
Burrowing Owl	SGCN	ST,T1	SGCN	SOC	SoCP L2	T1	SGCN	SGCN	X	X
Cassin's Finch		T2		SOC					X	X
Cassin's Sparrow	SGCN	T2							X	X
Chestnut-collared Longspur	SGCN	T2		SOC	SoCP L1	T2	SGCN	SGCN	X	X
Clark's Nutcracker				SOC		T2			X	X
Common Loon			SGCN	SOC				SGCN		
Common Nighthawk	SGCN								X	X
Common Poorwill	SGCN					T2				
Cooper's Hawk	SGCN					T2				
Cordilleran Flycatcher	SGCN					T2			X	X
Dark-eyed Junco						T2			X	X
Dusky Flycatcher	SGCN								X	X
Eastern Meadowlark	SGCN					T2			X	X
Evening Grosbeak	SGCN			SOC					X	X
Ferruginous Hawk		SSC,T2	SGCN	SOC	SoCP L1	T1	SGCN	SGCN		
Franklin's Gull			SGCN	SOC	SoCP L1			SGCN		
Golden Eagle	SGCN	T1		SOC	SoCP L2	T2			X	
Grace's Warbler	SGCN	T2							X	X
Grasshopper Sparrow	SGCN	T2	SGCN		SoCP L1			SGCN	X	X
Gray Flycatcher	SGCN								X	X
Gray Vireo	SGCN	T2							X	X
Gray-crowned Rosy-Finch				SOC						
Great Blue Heron				SOC						
Great Gray Owl				SOC				SGCN		
Greater Prairie-Chicken		T2			SoCP L2	T1	SGCN		X	
Greater Sage-Grouse		SSC,T1	SGCN	SOC	SoCP L2	T2	SGCN	SGCN		

| Species | State Agencies* | | | | | | | | Density Estimate | Occupancy Estimate |
	AZGFD	CPW	IDFG	MTFWP	NDGFD	NGPC	SDGFP	WGFD		
Green-tailed Towhee				SOC					X	X
Horned Grebe				SOC	SoCP L1					
Juniper Titmouse	SGCN	T2	SGCN					SGCN	X	X
Lark Bunting		T2			SoCP L1		SGCN	SGCN	X	X
Lazuli Bunting	SGCN	T2							X	X
Lesser Scaup			SGCN			T2		SGCN		
Lewis's Woodpecker	SGCN	T2	SGCN	SOC		T1	SGCN	SGCN	X	X
Loggerhead Shrike		T2		SOC	SoCP L2	T2			X	X
Long-billed Curlew		SSC,T2	SGCN	SOC	SoCP L1	T1	SGCN	SGCN	X	X
Lucy's Warbler	SGNC								X	X
MacGillivray's Warbler	SGCN								X	X
Marbled Godwit					SoCP L1		SGCN		X	X
McCown's Longspur	SGCN	T2		SOC	SoCP L3	T1		SGCN	X	X
Merlin			SGCN			T2		SGCN		
Mountain Bluebird	SGCN					T2			X	X
Mountain Plover	SGCN	SSC,T1		SOC		T1		SGCN	X	X
Mountain Quail			SGCN							
Northern Bobwhite	SGCN	T2				T2			X	
Northern Goshawk	SGCN	T2		SOC			SGCN	SGCN		
Northern Harrier		T2		SOC	SoCP L2	T2			X	X
Northern Pintail			SGCN		SoCP L2			SGCN	X	X
Northern Pygmy-Owl	SGCN							SGCN		
Olive Warbler	SGCN								X	X
Olive-sided Flycatcher	SGCN	T2							X	X
Orange-crowned Warbler	SGCN									
Ovenbird						T2			X	X
Pacific Wren	SGCN			SOC					X	X
Peregrine Falcon	SGCN	SSC,T2	SGCN	SOC	SoCP L3	T2	SE,SGCN	SGCN		
Phainopepla	SGCN								X	X
Pileated Woodpecker				SOC		T2			X	X

Species	State Agencies*								Density Estimate	Occupancy Estimate
	AZGFD	CPW	IDFG	MTFWP	NDGFD	NGPC	SDGFP	WGFD		
Pinyon Jay	SGCN	T2	SGCN	SOC		T2			X	X
Plumbeous Vireo						T2				
Prairie Falcon	SGCN	T2			SoCP L2	T2				X
Purple Martin	SGCN	T2							X	X
Pygmy Nuthatch			SGCN			T2		SGCN	X	X
Red Crossbill	SGCN		SGCN			T2			X	X
Red-faced Warbler	SGCN								X	X
Redhead					SoCP L2			SGCN		
Red-headed Woodpecker				SOC	SoCP L2				X	X
Rufous Hummingbird		T2								
Sage Sparrow	SGCN	T2		SOC				SGCN	X	X
Sage Thrasher	SGCN			SOC		T2		SGCN	X	X
Sandhill Crane		SSC,T1	SGCN			T2		SGCN	X	X
Scott's Oriole	SGCN								X	X
Sedge Wren				SOC	SoCP L2	T2			X	X
Sharp-tailed Grouse		SE,SSC,T1	SGCN		SoCP L2			SGCN	X	X
Short-eared Owl		T2	SGCN		SoCP L2	T1		SGCN		X
Sprague's Pipit	SGCN			SOC	SoCP L1		SGCN		X	X
Summer Tanager	SGCN					T2			X	X
Swainson's Hawk	SGCN	T2	SGCN		SoCP L1	T2		SGCN	X	X
Trumpeter Swan			SGCN	SOC		T1	SGCN	SGCN		
Upland Sandpiper		T2	SGCN		SoCP L1			SGCN	X	X
Varied Thrush				SOC					X	X
Veery		T2		SOC					X	X
Violet-green Swallow						T2			X	X
Virginia Rail	SGCN					T2		SGCN		
Virginia's Warbler	SGCN	T2	SGCN						X	X
Western Scrub-Jay	SGCN							SGCN	X	X
Western Tanager						T2			X	X
White-crowned Sparrow	SGCN									

Species	State Agencies*								Density Estimate	Occupancy Estimate
	AZGFD	CPW	IDFG	MTFWP	NDGFD	NGPC	SDGFP	WGFD		
White-faced Ibis		T2	SGCN	SOC		T2		SGCN		
White-tailed Ptarmigan		T1		SOC						
White-throated Swift	SGCN					T2			X	X
Wild Turkey	SGCN								X	X
Willet					SoCP L1	T2	SGCN		X	X
Williamson's Sapsucker	SGCN								X	X
Willow Flycatcher	SGCN	FE,SE,T1						SGCN	X	X
Wilson's Phalarope			SGCN		SoCP L1		SGCN		X	X
Yellow Warbler	SGCN									
Yellow-billed Cuckoo	SGCN	FT,SSC,T1	SGCN	SOC		T2		SGCN		X
Yellow-breasted Chat	SGCN					T2			X	X

***AZGFD:** SGCN = Species of Greatest Conservation Need (Arizona Game and Fish Department 2012); **CPW:** T1 = Tier 1 priority species; T2 = Tier 2 priority species; FE = Federally Endangered; FT= Federally Threatened; SCC = State Special Concern; SE = State Endangered; ST = State Threatened (Colorado Parks and Wildlife (CPW 2015); **IDFG:** SGCN = Species of Greatest Conservation Need (Idaho Department of Fish and Game 2005) ; **MTFWP:** SOC = Species of Concern(Montana Natural Heritage Program (MTNHP) 2015); **NDGFD:** SoCP = Species of Conservation Priority; L1 = Level 1: Species in greatest need of conservation; L2 = Level 2: Species in need of conservation; but that have had support from other wildlife programs (Hagen et al. 2005); **NGPC:** T1 = Tier I: Globally or nationally most at-risk of extinction; T2 = Tier II: State Critically Imperiled, State Imperiled or State Vulnerable; **SDGFP:** SGCN = Species of Greatest Conservation Need; ST = State Threatened Species; SE = State Endangered (South Dakota Department of Game Fish and Parks (SDGFP) 2006;2008); **WGFD:** SGCN = Species of Greatest Conservation Need (Wyoming Game and Fish Department (WGFD) 2005).

Appendix D

Priority species detected on Bureau of Land Management lands in 2015, with management designations by state. An "X" in the Occupancy or Density Estimated columns indicates estimates were generated for that species in at least one BLM stratum in one or more of the states where it holds a priority designation.

Species	Bureau of Land Management*					Density Estimated	Occupancy Estimated
	Colorado	Montana	North Dakota	South Dakota	Wyoming		
Bald Eagle	SS		SS	SS	SS		
Baird's Sparrow		SS	SS	SS	SS	X	X
Blue-gray Gnatcatcher		SS	SS	SS			
Bobolink		SS	SS	SS		X	X
Brewer's Sparrow	SS	SS	SS	SS	SS	X	X
Burrowing Owl	SS	SS	SS	SS	SS		X
Chestnut-collared Longspur		SS	SS	SS		X	X
Dickcissel			SS	SS			
Ferruginous Hawk	SS	SS	SS	SS	SS		
Golden Eagle		SS	SS	SS			
Greater Sage-Grouse	SS	SS	SS	SS	SS		
Long-billed Curlew	SS	SS	SS	SS	SS	X	X
Loggerhead Shrike		SS	SS	SS	SS	X	X
Marbled Godwit			SS	SS			
McCown's Longspur		SS	SS	SS		X	X
Mountain Plover	SS	SS	SS	SS	SS	X	X
Peregrine Falcon	SS	SS	SS	SS	SS		
Sage Sparrow		SS	SS	SS	SS	X	X
Sage Thrasher		SS	SS	SS	SS	X	X
Sprague's Pipit		SS	SS	SS		X	X

*SS = Sensitive Species; Colorado (Bureau of Land Management 2000); Montana (Montana Natural Heritage Program (MTNHP) 2015); North Dakota, South Dakota (Bureau of Land Management 2009); Wyoming (Bureau of Land Management 2010); T2 = Tier 23 Sensitive Species; Idaho (USDI Bureau of Land Management (BLM) 2015).

Appendix E

Priority species detected on US Forest Service lands in Region 1 in 2015, with management designations by region and unit. Codes for Units: Bitterroot NF (BINF), Clearwater NF (CLNF), Custer NF (CUNF), Flathead NF (FLNF), Gallatin NF (GANF), Helena NF (HENF), Idaho Panhandle NF (IPNF). An "X" in the Occupancy or Density Estimated columns indicates estimates were generated for that species in at least one USFS stratum where it holds a priority designation.

Species	USFS Region 1*								Density Estimated	Occupancy Estimated
	Region 1	BINF	CLNF	CUNF	FLNF	GANF	HENF	IPNF		
American Bittern	Other									
American Dipper	Other									
Baird's Sparrow	R1SS								X	X
Bald Eagle	R1SS	MIS	MIS	MIS	MIS	MIS	MIS	MIS		
Black-backed Woodpecker	R1SS				MIS					
Black-billed Cuckoo	Other									
Blue-gray Gnatcatcher	R1SS								X	X
Bobolink	Other								X	X
Boreal Chickadee	Other									
Brewer's Sparrow				MIS					X	X
Bullock's Oriole				MIS					X	X
Cassin's Kingbird				MIS					X	X
Chestnut-collared Longspur	Other								X	X
Chipping Sparrow								MIS	X	X
Clark's Nutcracker	Other								X	X
Common Loon	R1SS				MIS					
Dusky Flycatcher								MIS	X	X
Grasshopper Sparrow	Other								X	X
Gray Jay	Other								X	X
Gray-crowned Rosy-Finch	Other									
Great Gray Owl	Other									
Hairy Woodpecker						MIS		MIS	X	X
Hammond's Flycatcher								MIS	X	X
Lark Bunting	Other								X	X
Lark Sparrow				MIS					X	X

Species	USFS Region 1*								Density Estimated	Occupancy Estimated
	Region 1	BINF	CLNF	CUNF	FLNF	GANF	HENF	IPNF		
Lewis's Woodpecker	Other								X	X
Loggerhead Shrike	R1SS									X
Long-billed Curlew	R1SS									
Marbled Godwit	Other								X	X
Mountain Quail	R1SS									
Northern Goshawk			MIS	MIS		MIS	MIS	MIS		
Northern Harrier	Other								X	X
Olive-sided Flycatcher	Other							MIS	X	X
Ovenbird				MIS					X	X
Pileated Woodpecker		MIS	MIS				MIS	MIS	X	X
Pygmy Nuthatch	R1SS								X	X
Red-headed Woodpecker	Other								X	X
Red-naped Sapsucker	Other								X	X
Sage Thrasher	Other								X	X
Sandhill Crane	Other								X	
Sharp-tailed Grouse				MIS					X	
Short-eared Owl	Other									X
Spotted Towhee				MIS					X	X
Sprague's Pipit	R1SS								X	X
Swainson's Hawk	Other								X	X
Upland Sandpiper	Other								X	X
Western Kingbird				MIS					X	X
Williamson's Sapsucker	Other								X	X
Wilson's Phalarope	Other								X	X
Yellow Warbler				MIS					X	X

*R1SS = Region 1 Sensitive Species; Other = Other Priority Species in Region 1; MIS = Management Indicator Species (Skorkowsky and Hahn 2010).

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Appendix E continued. Priority species detected on US Forest Service lands in Region 1 in 2015, with management designations by region and unit. Codes for Units: Kootenai NF (KONF), Lewis and Clark NF (LCNF), Lolo NF (LONF), Nez Perce NF (NPNF), Cedar River NG (CRNG), Grand River NG (GRNG) and Little Missouri NG (LMNG). An "X" in the Occupancy or Density Estimated columns indicates estimates were generated for that species in at least one USFS stratum where it holds a priority designation.

Species	USFS Region 1*								Density Estimated	Occupancy Estimated
	Region 1	KONF	LCNF	LONF	NPNF	CRNG	GRNG	LMNG		
American Bittern	Other									
American Dipper	Other									
Baird's Sparrow	R1SS								X	X
Bald Eagle	R1SS	MIS	MIS	MIS	MIS					
Black-backed Woodpecker	R1SS									
Black-billed Cuckoo	Other									
Blue-gray Gnatcatcher	R1SS								X	X
Bobolink	Other								X	X
Boreal Chickadee	Other									
Brewer's Sparrow									X	X
Bullock's Oriole									X	X
Cassin's Kingbird									X	X
Chestnut-collared Longspur	Other								X	X
Chipping Sparrow		MIS							X	X
Clark's Nutcracker	Other								X	X
Common Loon	R1SS									
Dusky Flycatcher		MIS							X	X
Grasshopper Sparrow	Other								X	X
Gray Jay	Other								X	X
Gray-crowned Rosy-Finch	Other									
Great Gray Owl	Other									
Hairy Woodpecker		MIS							X	X
Hammond's Flycatcher		MIS							X	X
Lark Bunting	Other								X	X
Lark Sparrow									X	X
Lewis's Woodpecker	Other								X	X

Species	USFS Region 1*								Density Estimated	Occupancy Estimated
	Region 1	KONF	LCNF	LONF	NPNF	CRNG	GRNG	LMNG		
Loggerhead Shrike	R1SS									X
Long-billed Curlew	R1SS									
Marbled Godwit	Other								X	X
Mountain Quail	R1SS									
Northern Goshawk			MIS	MIS	MIS					
Northern Harrier	Other								X	X
Olive-sided Flycatcher	Other	MIS							X	X
Ovenbird									X	X
Pileated Woodpecker		MIS		MIS	MIS				X	X
Pygmy Nuthatch	R1SS								X	X
Red-headed Woodpecker	Other								X	X
Red-naped Sapsucker	Other								X	X
Sage Thrasher	Other								X	X
Sandhill Crane	Other								X	
Sharp-tailed Grouse						MIS	MIS	MIS	X	
Short-eared Owl	Other									X
Spotted Towhee									X	X
Sprague's Pipit	R1SS								X	X
Swainson's Hawk	Other								X	X
Upland Sandpiper	Other								X	X
Western Kingbird									X	X
Williamson's Sapsucker	Other								X	X
Wilson's Phalarope	Other								X	X
Yellow Warbler									X	X

*R1SS = Region 1 Sensitive Species; Other = Other Priority Species in Region 1; MIS = Management Indicator Species (Skorkowsky and Hahn 2010).

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Appendix F

Priority species detected on US Forest Service lands in Region 2 in 2015, with management designations by region and unit. Codes for Units: Arapaho and Roosevelt NF (ARNF), Bighorn NF (BINF), Black Hills NF (BHNF), Grand Mesa, Uncompaghre and Gunnison NF (GMUG), Medicine Bow NF (MBNF), Nebraska NF (NENF), Pike and San Isabel NF (PSINF), Rio Grande NF (RGNF), Routt NF (RONF). An "X" in the Occupancy or Density Estimated columns indicates estimates were generated for that species in at least one USFS stratum where it holds a priority designation.

Species	USFS Region 2*										Density Estimated	Occupancy Estimated
	Region 2	ARNF	BINF	BHNF	GMUG	MBNF	NENF	PSINF	RGNF	RONF		
American Pipit											X	X
American Three-toed Woodpecker						MIS					X	X
Black Tern	R2SS											
Black-backed Woodpecker	R2SS			MIS								
Boreal Owl	R2SS											
Brewer's Sparrow	R2SS		MIS		MIS						X	X
Brown Creeper				MIS		SSC		MIS			X	X
Bullock's Oriole											X	X
Burrowing Owl	R2SS	MIS									X	X
Cassin's Sparrow	R2SS										X	X
Chestnut-collared Longspur	R2SS										X	X
Cooper's Hawk				SOLC							X	
Golden-crowned Kinglet		MIS	SOLC	MIS		MIS				MIS	X	X
Grasshopper Sparrow	R2SS			MIS							X	X
Greater Prairie-Chicken	R2SS						MIS				X	
Green-tailed Towhee											X	X
Hairy Woodpecker		MIS			MIS						X	X
Hermit Thrush								MIS			X	X
Lark Bunting		MIS									X	X
Lewis's Woodpecker	R2SS				MIS						X	X
Lincoln's Sparrow						MIS		MIS			X	X
Loggerhead Shrike	R2SS										X	X
Long-billed Curlew	R2SS										X	X
McCown's Longspur	R2SS										X	X

Species	USFS Region 2*										Density Estimated	Occupancy Estimated
	Region 2	ARNF	BINF	BHNF	GMUG	MBNF	NENF	PSINF	RGNF	RONF		
Mountain Bluebird		MIS									X	X
Northern Goshawk	R2SS				MIS	MIS				MIS		
Northern Harrier	R2SS										X	X
Olive-sided Flycatcher	R2SS										X	X
Peregrine Falcon	R2SS				MIS							
Purple Martin	R2SS										X	X
Pygmy Nuthatch		MIS	SOLC	SOLC			MIS		MIS		X	X
Red Crossbill					MIS						X	X
Red-breasted Nuthatch			MIS								X	X
Ruffed Grouse				MIS							X	X
Sharp-tailed Grouse	R2SS						MIS				X	X
Short-eared Owl	R2SS											X
Song Sparrow				MIS							X	X
Vesper Sparrow									MIS	MIS	X	X
Virginia's Warbler											X	X
Warbling Vireo		MIS									X	X
White-tailed Ptarmigan	R2SS											
Wilson's Warbler		MIS				MIS			MIS	MIS	X	X

*R2SS = Region 2 Sensitive Species (US Forest Service 2008b); MIS = Management Indicator Species; SOLC = Species of Local Concern; SOC = Species of Concern; SVC = Species of Viability Concern; SSC = Species of Special Concern.

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Appendix F continued. Priority species detected on US Forest Service lands in Region 2 in 2015, with management designations by region and unit. Codes for Units: Samuel R. McKelvie NF (SMNF), San Juan NF (SJNF), Shoshone NF (SHNF), White River NF (WRNF), Comanche NG (CONG), Pawnee NG (PANG), Nebraska NG (NBNG) and Thunder Basin NG (TBNG). An "X" in the Occupancy or Density Estimated columns indicates estimates were generated for that species in at least one USFS stratum where it holds a priority designation.

Species	USFS Region 2*									Density Estimated	Occupancy Estimated
	Region 2	SMNF	SJNF	SHNF	WRNF	CONG	NBNG	PANG	TBNG		
American Pipit					MIS					X	X
American Three-toed Woodpecker										X	X
Black Tern	R2SS										
Black-backed Woodpecker	R2SS										
Boreal Owl	R2SS										
Brewer's Sparrow	R2SS			MIS	MIS					X	X
Brown Creeper										X	X
Bullock's Oriole						MIS				X	X
Burrowing Owl	R2SS							MIS		X	X
Cassin's Sparrow	R2SS									X	X
Chestnut-collared Longspur	R2SS									X	X
Cooper's Hawk										X	
Golden-crowned Kinglet								MIS		X	X
Grasshopper Sparrow	R2SS									X	X
Greater Prairie-Chicken	R2SS	MIS					MIS			X	
Green-tailed Towhee			MIS							X	X
Hairy Woodpecker			MIS	MIS				MIS		X	X
Hermit Thrush										X	X
Lark Bunting								MIS		X	X
Lewis's Woodpecker	R2SS									X	X
Lincoln's Sparrow										X	X
Loggerhead Shrike	R2SS									X	X
Long-billed Curlew	R2SS					MIS				X	X
McCown's Longspur	R2SS									X	X
Mountain Bluebird			MIS					MIS		X	X
Northern Goshawk	R2SS		MIS	MIS							

Species	USFS Region 2*									Density Estimated	Occupancy Estimated
	Region 2	SMNF	SJNF	SHNF	WRNF	CONG	NBNG	PANG	TBNG		
Northern Harrier	R2SS									X	X
Olive-sided Flycatcher	R2SS									X	X
Peregrine Falcon	R2SS			MIS	SOC						
Purple Martin	R2SS									X	X
Pygmy Nuthatch		MIS			SVC			MIS		X	X
Red Crossbill										X	X
Red-breasted Nuthatch										X	X
Ruffed Grouse				MIS						X	X
Sharp-tailed Grouse	R2SS	MIS	MIS				MIS		MIS	X	X
Short-eared Owl	R2SS										X
Song Sparrow										X	X
Vesper Sparrow										X	X
Virginia's Warbler					MIS					X	X
Warbling Vireo								MIS		X	X
White-tailed Ptarmigan	R2SS										
Wilson's Warbler								MIS		X	X

*R2SS = Region 2 Sensitive Species (US Forest Service 2008b); MIS = Management Indicator Species; SOLC = Species of Local Concern; SOC = Species of Concern; SVC = Species of Viability Concern; SSC = Species of Special Concern.

Appendix G

Priority species detected on US Forest Service lands in Region 3 in 2015, with management designations by region and unit. An "X" in the Occupancy or Density Estimated columns indicates estimates were generated for that species in at least one USFS stratum where it holds a priority designation.

Species	USFS Region 3*				Density Estimated	Occupancy Estimated
	Region 3	Coconino NF	Kaibab NF	Kiowa/Rita Blanca NG		
Abert's Towhee	R3SS					
Bald Eagle	R3SS					
Boreal Owl	R3SS					
Burrowing Owl	R3SS			PMIS	X	X
Costa's Hummingbird	R3SS					
Grace's Warbler			MIS		X	X
Grasshopper Sparrow	R3SS				X	X
Gray Vireo	R3SS				X	X
Hairy Woodpecker		MIS			X	X
Juniper Titmouse		MIS			X	X
Lucy's Warbler		MIS			X	X
Pygmy Nuthatch		MIS			X	X
Ruby-crowned Kinglet			MIS		X	X
Western Bluebird			MIS		X	X
Wild Turkey	R3SS	MIS			X	X
Yellow-breasted Chat		MIS				

*R3SS = USFS Region 3 Sensitive Species (US Forest Service 2013); MIS = Management Indicator Species; PMIS = Proposed Management Indicator Species; SOC = Species of Concern.

Appendix H

Priority species detected on US Forest Service lands in Region 4 in 2015, with management designations by region and unit. Codes for Units: Ashley NF (ASNF), Boise NF (BONF), Bridger-Teton NF (BTNF), Caribou-Targhee NF (CTNF), Manti-La Sal NF (MLNF), Payette NF (PANF), Salmon-Challis National Forest (SCNF), Sawtooth NF (SANF), Uinta-Wasatch-Cache National Forest (UWCNF). An "X" in the Occupancy or Density Estimated columns indicates estimates were generated for that species in at least one USFS stratum where it holds a priority designation.

Species	USFS Region 4*										Density Estimated	Occupancy Estimated
	Region 4	ASNF	BONF	BTNF	CTNF	MLNF	PANF	SCNF	SANF	UWCNF		
American Three-toed Woodpecker	R4SS									MIS	X	X
Bald Eagle	R4SS			MIS	MIS							
Brewer's Sparrow			MIS	MIS			MIS		MIS		X	X
Cooper's Hawk						SS					X	
Dusky Grouse						MIS					X	X
Golden Eagle		MIS				MIS,SS						
Greater Sage-Grouse	R4SS		MIS				MIS	PMIS	MIS			
Lewis's Woodpecker			MIS		SS		MIS		MIS		X	
Mountain Bluebird								MIS			X	X
Mountain Chickadee			MIS				MIS		MIS		X	X
Northern Goshawk	R4SS	MIS			MIS			MIS		MIS		
Peregrine Falcon	R4SS			MIS	MIS							
Pileated Woodpecker			MIS				MIS	MIS	MIS		X	X
Ruby-crowned Kinglet								MIS			X	X
Vesper Sparrow			MIS				MIS	MIS	MIS		X	X
Williamson's Sapsucker			MIS				MIS		MIS			
Willow Flycatcher	FE										X	X
Yellow Warbler			MIS				MIS	MIS	MIS		X	X

*FE = Federally Endangered Species; MIS = Management Indicator Species; R4SS = Region 4 Sensitive Species (US Forest Service 2008a); SS = Sensitive Species.