Monitoring Colorado's Birds: 2005 Field Season Report

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In Cooperation With:

ROCKY MOUNTAIN BIRD OBSERVATORY

The mission of the Rocky Mountain Bird Observatory (RMBO) is the conservation of birds of the Rocky Mountains, Great Plains, and Intermountain West, and the habitats on which they depend. *RMBO practices a multi-faceted approach to bird conservation that integrates scientific research and monitoring studies with education and outreach programs to bring bird conservation issues to the public and other conservation partners. RMBO works closely with state and federal natural resource agencies, private landowners, schools, and other nonprofit organizations. RMBO accomplishes its mission by working in four areas:*

Research: *RMBO studies avian responses to habitat conditions, ecological processes, and management actions to provide scientific information that guides bird conservation efforts.*

Monitoring: *RMBO monitors the distribution and abundance of birds through long-term, broad-scale monitoring programs designed to track population trends for birds of the region.*

Education: *RMBO provides active, experiential, education programs for K-12 students in order to create an awareness and appreciation for birds, with a goal of their understanding of the need for bird conservation.*

Outreach: *RMBO shares the latest information in land management and bird conservation practices with private landowners, land managers, and resource professionals at natural resource agencies. RMBO develops voluntary, working partnerships with these individuals and groups for habitat conservation throughout the Great Plains and Rocky Mountains.*

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EXECUTIVE SUMMARY

Birds are excellent indicators of environmental quality and change. In addition, they are one of the most highly visible and valued components of our native wildlife. Monitoring birds provides data needed not only to effectively manage bird populations, but also to understand the effects of human activities on ecosystem and to gauge their sustainability. Because bird communities reflect an integration of a broad array of ecosystem conditions, monitoring entire bird communities at the habitat level offers a cost-effective means for monitoring biological integrity at a variety of scales.

In 2005, Rocky Mountain Bird Observatory (RMBO), in conjunction with its funding partners, the Colorado Division of Wildlife, the U.S.D.A. Forest Service, and the Bureau of Land Management, implemented Year 8 of *Monitoring Colorado's Birds* (MCB), using a protocol similar to other RMBO monitoring programs as delineated by Panjabi et al. (2001). RMBO has designed this program to provide statistically rigorous, long-term, trend data for populations of most diurnal, regularly breeding bird species in Colorado, including several species listed by government and non-government conservation organizations as species of concern. In the short term, this program provides information needed to effectively manage and conserve bird populations in Colorado, including the spatial distribution, abundance, and relationship to important habitat characteristics for each species. It also contributes to RMBO's broader landscape-scale breeding-bird monitoring program, which currently includes 11 states in the Rocky Mountains and Great Plains regions.

This year, RMBO staff conducted 349 point-transect surveys (3,514 point counts) in twelve habitats in Colorado (alpine tundra, aspen, grassland, high-elevation riparian, mixed conifer, montane shrubland, pinyon-juniper, ponderosa pine, sage shrubland, semidesert shrubland, spruce-fir, and wetland).

RMBO staff recorded a total of 214 breeding bird species on point transects in the twelve habitats, many of which were observed on only a few occasions. The habitat-stratified point-transect data provided robust results (CV of $\leq$ 50% in at least one habitat) on 84 bird species. The 84 species should be effectively monitored under the current program in at least one of the twelve habitats surveyed this year. We estimate that a total of 263 species of birds breed in Colorado, therefore we are effectively monitoring at least 32% of all species breeding in the state. Also, we obtained sufficient data on several other species to monitor their populations across habitat types, although in some cases, these species may be better monitored with additional transects in certain habitats.

We are also in the process of redesigning our web site so that data can be queried and results can be displayed on a variety of scales (i.e. management unit, county, state). This effort will make the data much more useful and dynamic to land managers. Real-time access to the raw data and habitat relationships will allow managers to apply the data to local management issues. In addition, we are working with the Cornell Lab of Ornithology's Avian Knowledge Network and the U.S. Geological Survey to compile and merge results from a variety of sources. This long-needed effort will identify monitoring programs, integrate information, and conduct analyses on regional datasets that can help inform management decisions.

ACKNOWLEDGEMENTS

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INTRODUCTION

Program History

In 1995, the Rocky Mountain Bird Observatory (RMBO), in conjunction with the Colorado Division of Wildlife (CDOW), U.S.D.A. Forest Service (USFS), Bureau of Land Management (BLM), and National Park Service (NPS), began efforts to create and conduct a Colorado-wide program to monitor breeding-bird populations, entitled *Monitoring Colorado's Birds* (MCB). This was one of the first attempts in the nation to develop and implement a statewide all-bird monitoring plan. In 1997, after review by statisticians and CDOW biologists, the program was structured so that count-based data were obtained for most diurnal, regularly breeding bird species in the state on a randomized and habitat-stratified basis. Using the Colorado GAP dataset, blocks of habitat (stands) large enough to support a 3.5 km MCB transect were randomly selected within the specified habitats. In 1998, we conducted a pilot year on three habitats: aspen, ponderosa pine and spruce-fir. In 1999, after a successful pilot year, the protocol was implemented in an additional 10 habitats.

Since 1999, RMBO has continually expanded its monitoring efforts to include neighboring states using a similar transect-selection protocol and survey methodology. In 2001, in cooperation with our partner, the Black Hills National Forest (BHNF), RMBO implemented a habitat-based bird monitoring program designed to provide rigorous population trend data on most diurnal, regularly occurring breeding birds species in the Black Hills (Panjabi et al. 2001). Modeled after *Monitoring Colorado's Birds,* this program is entitled *Monitoring Birds of the Black Hills* (MBBH) with transects in 10 habitats. This program, as well as other RMBO monitoring programs, is consistent with the goals emphasized in the Partners in Flight National Landbird Monitoring Strategy (Bart et al. 2001). In addition to monitoring bird populations, the program also generates information useful in managing birds (e.g., habitat associations, spatial distribution).

In 2002, RMBO initiated a similar program in Wyoming entitled *Monitoring Wyoming's Birds* (MWB). In cooperation with the BLM, USFS, Wyoming Game and Fish Department (WGFD), and the Wyoming Partners in Flight group (WY-PIF), RMBO implemented a long-term, habitat-based bird monitoring program for six habitats statewide. We also established additional transects in the Bighorn and Shoshone national forests at that time.

In 2003, RMBO began working with the Carson National Forest in New Mexico to increase the state of knowledge about the status and habitat requirements of avian species in that forest. Transects have been established in nine habitats, with an emphasis on pinyon-juniper that has undergone large die- offs in the Southwest from drought and *Ips* beetle outbreaks. In 2006, we will also establish new transects in the Valle Vidal managed by the USFS in New Mexico.

The NPS expanded monitoring efforts with RMBO in 2005 to include 11 National Parks in three states (CO, WY, UT) in the Northern Colorado Plateau Inventory and Monitoring Network in order to monitor bird species in three habitats.

We will continue to build partnerships and to expand the level of effort so that bird-population monitoring occurs across Bird Conservation Regions (BCR). BCRs were delineated by the North American Bird Conservation Initiative (NABCI) as ecologically based planning, implementation, and evaluation units for all birds. We will accomplish monitoring at the BCR level by increasing our own efforts and by coordinating with other organizations conducting similar work. BCRs are ideal management units for birds as they cover distinct ecoregions in North America that host similar bird communities (NABCI 2000).

Reasons for Monitoring

Much like the canary in the coal mine, birds can be excellent indicators of biological integrity and ecosystem health. Because they comprise a diverse group of niche specialists, occupy a broad range of habitats, are sensitive to both physical and chemical impacts on the environment, and often reflect the abundance and diversity of other organisms with which they coexist, birds can be useful barometers of environmental change and for measuring the sustainability of human activities on ecosystems (Morrison 1986, Croonquist and Brooks 1991, Bureau of Land Management 1998, Hutto 1998, O'Connell et al. 2000, Rich 2002, U.S. EPA 2002, Birdlife International 2003).

Bird communities reflect an integration of a broad array of ecosystem conditions including vegetation structure and composition, water quality, and landscape integrity (Adamus et al. 2001). The response of bird communities to changes in the environment can be examined at a variety of spatial scales, making them a powerful and practical tool for evaluating the broader effects of resource management, conservation and restoration activities, or other environmental changes. And because birds are generally abundant, conspicuous, and relatively easy to identify, they offer tremendous logistical and economic advantages over monitoring populations of other taxonomic groups. Also, birds are popular with the public, and there is a strong and growing interest, both nationally and internationally, to manage and conserve bird populations, many of which are exhibiting long-term population declines (Sauer et al. 2003).

Aside from serving as indicators, birds are a tremendous economic resource in and of themselves. A recent federal economic report found that 46 million birdwatchers across America spent $32 billion in 2001 on bird watching and related activities (USFWS 2003). This spending generated $85 billion in overall economic output and $13 billion in federal and state income taxes, and supported more than 863,000 jobs. In addition to being an economic attraction, birds also pollinate flowers, disperse seeds, and consume pests of ecologically and economically important plants, thereby providing ecosystem services worth many billions of dollars. Thus, declines in bird populations diminish a valuable

economic resource that could have profound negative implications for regional and local economies, both directly and indirectly.

In order for birds to be conserved on a global scale, people in all areas must assume responsibility to conserve the species and habitats for which they are stewards, and population monitoring forms the backbone of avian conservation. To date, resource managers have relied on data derived from the Breeding Bird Survey (BBS) for bird-population information. The BBS, however, is a road-based, volunteer-dependent survey that does not effectively sample many species or habitats (Robbins et al. 1993, Sauer 1993) and does not reliably decipher population trends at small geographic scales (e.g., statewide; Sauer 2000). Furthermore, the design and implementation of the BBS are such that results generated from these efforts are often inconclusive due to the difficulty associated with interpreting index counts (Sauer 2000) and numerous confounding variables (e.g., observer bias) (Robbins et al. 1986, Bohning-Gaese et al. 1993, Sauer et al. 1994, James et al. 1996, Thomas 1996). For these reasons, BBS data generally are insufficient to guide local or regional management decisions.

Without current monitoring data, conservation efforts are likely to be misguided and inefficient. For these and other reasons, monitoring is mandated by legislation such as the National Environmental Policy Act (1969), Endangered Species Act (ESA; 1973), and the Forest Management Act (1976), as well as by various state laws, Forest plans, preserve-management plans, and other long-range plans (Sauer 1993, Manley et al. 1993).

Given the well-publicized declines of many species of North American breeding birds, there is an urgent need for monitoring programs that serve as an "early-warning" system to identify declining species so that natural resource managers can proactively prevent further declines. RMBO's monitoring programs are designed to be comparable, repeatable, data rich, long-term, multi-scale, and efficient, so that managers can make informed decisions to effectively conserve birds and their habitats.

Monitoring Objectives

RMBO's bird-monitoring programs are designed to provide population trend or status data on all regularly occurring breeding species within each program area. Initially, we expect to collect data to provide "early-warning" information for all species that can be monitored through a habitat-based approach. After establishing this monitoring framework, we anticipate collecting more demographic information and testing *a priori* hypotheses to determine the possible reasons for known declines and to better inform management decisions. Herein we discuss the initial surveillance monitoring framework, the monitoring goals, and progress to date. In the future, with the initial trend information, we will develop and establish the second phase of the program to gather demographic and other information to address specific management issues.

The specific objectives of RMBO's monitoring program are:

1.) To integrate existing bird-monitoring efforts in the region to provide better information on distribution and abundance of all breeding-bird species, and especially for priority species;
2.) to provide basic habitat-association data for most bird species to address habitat-management issues;
3.) to provide long-term trend or status data on all regularly occurring breeding species in the region, with a target of detecting a minimum rate of population change of ±3.0% per year over a maximum time period of 30 years with a statistical significance of p=0.1 and power of 0.8;
4.) to maintain a high-quality database that is accessible to all of our collaborators as well as the public on the Web in the form of raw and summarized data; and,
5.) to generate decision-support tools such as population-estimate models that help guide conservation efforts and provide a better measure of our conservation success.

METHODS

Study Area

RMBO conducts monitoring in all or parts of four BCRs: BCR 10 – Northern Rockies, BCR 16 – Southern Rockies/Colorado Plateau, BCR 17 – Badlands and Prairies, and BCR 18 – Shortgrass Prairie (Figure 1). These BCRs cover a broad array of habitats and elevation gradients and have a correspondingly diverse suite of priority birds. Parts of three BCRS lie within Colorado: BCR10, BCR16 and BCR18.

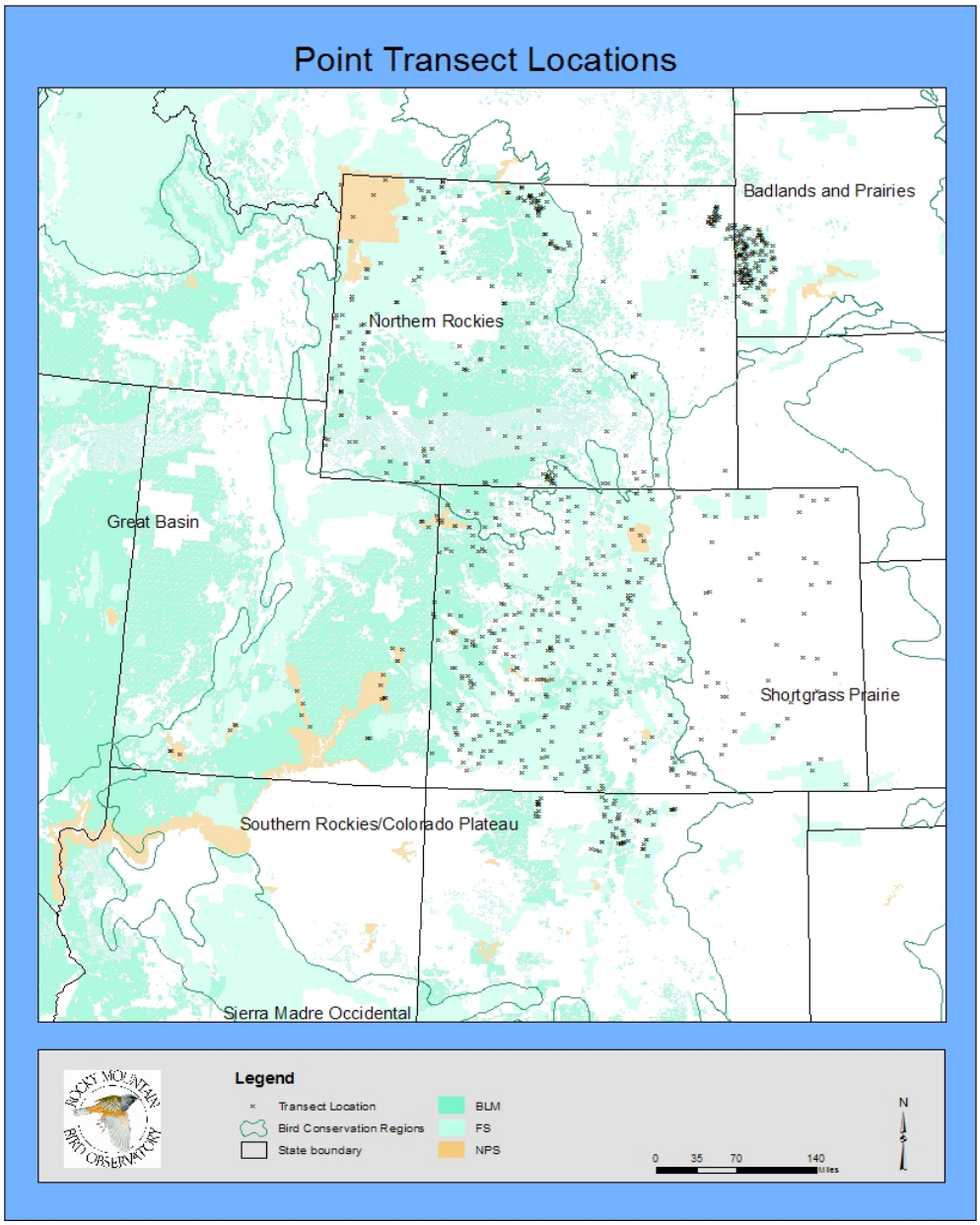

Figure 1. RMBO point-transect locations within state boundaries, BCR boundaries and land ownership.

Below is a breakdown of the habitats we surveyed in 2005 in Colorado. For more detailed descriptions of these habitats or habitats within other monitoring programs, please visit our website at www.rmbo.org where reports from other projects are available for download.

The Habitats

Using the Colorado GAP dataset, we randomly selected suitable stands in each habitat in which to place transects. Stand selection followed two criteria: 1) they had to be large enough to fit 15 points spaced 250 meters apart and 2) some part of the stand had to be within one mile of a road. In previous years, this list has included low-elevation riparian habitat; however, we did not survey this habitat in 2005 in order to research and develop a more effective protocol.

Alpine Tundra

Alpine tundra habitat is composed of open areas above treeline, dominated by high-elevation grass species and several species of shrubs. The three most common shrubs (or shrub-sized plants) recorded on points in 2005 were willow (*Salix* sp.), Engelmann spruce (*Picea engelmannii*) , and subalpine fir (*Abies lasiocarpa*). Some of the alpine tundra point-count locations are near high-elevation wind-formed stands of trees (krummholz). The most commonly recorded trees on points in alpine tundra in 2005 were subalpine fir, Engelmann spruce, and aspen (*Populus tremuloides*).

Aspen

Aspen habitat consists of small or large forested stands dominated by quaking aspen. Aspen stands are generally not monotypic; other tree species that frequently occur within or adjacent to aspen include, from lower to higher elevations, ponderosa pine (*Pinus ponderosa*), white fir (*Abies concolor*), blue spruce (*Picea pungens*), Douglas-fir (*Psuedotsuga menziesii*), lodgepole pine (*Pinus contorta*), Englemann spruce, and subalpine fir. The three most common trees recorded on aspen transects in 2005 were aspen, subalpine fir, and Engelmann spruce. Some aspen stands have a woody understory of a variety of species, depending upon location, elevation, and other factors. These understory species can include common juniper (*Juniperus communis*), mountain mahogany (*Cercocarpus* sp.), big sagebrush (*Artemisia tridentata*), snowberry (*Symphoricarpos oreophilus*), and serviceberry (*Amelanchier* sp.), among others. The three most commonly recorded shrubs on aspen transects in 2005 were snowberry, aspen saplings, and gooseberry (*Ribes* sp.). Some aspen stands have understories composed completely of grass and herbaceous plants.

Grassland

Grassland habitat in eastern Colorado is dominated by shortgrass prairie vegetation, including blue grama (*Bouteloua gracilis*) and buffalograss (*Buchloe dactyloides*). In Colorado, grassland habitat is low in elevation and also semi-arid. Many shrubs are present and this season the three most commonly

recorded species were cholla (*Opuntia* sp.), yucca (*Yucca* sp.), and sage (*Artemisia* sp.).

High-elevation Riparian

High-elevation mountain streams lined with willows and other shrubs comprise this habitat. Several species of trees are often present and in 2005 we recorded subalpine fir, Engelmann spruce, and lodgepole pine as the three most common species in the overstory. The three most commonly recorded bushes were willow, big sagebrush, and snowberry.

Mixed Conifer

This habitat designation describes mid-elevation, conifer-dominated stands made up of a diverse suite of tree species. In 2005, the most commonly recorded species were Douglas-fir, aspen, and ponderosa pine. A variety of shrubs are also found in this habitat, including gooseberry, mountain mahogany, big sagebrush, willow, Gambel's oak (*Quercus gambelii*), and chokecherry (*Prunus virginiana*).

Montane Shrubland

Montane shrubland is a common mid-elevation habitat located throughout Colorado. The dominant plant in this habitat is Gambel's oak. In 2005, observers recorded overstory species including aspen, ponderosa pine, Douglas-fir, and narrowleaf cottonwood (*Populus angustifolia*). Shrubs recorded on points in this habitat were chokecherry, serviceberry, hawthorn (*Crataegus* sp.), snowberry, willow, mountain mahogany, big sagebrush, and rabbitbrush (*Chrysothamnus* sp.).

Pinyon-Juniper

Arid forested areas dominated by pinyon pine (*Pinus edulis*) and juniper (*Juniperus* sp.) comprise this habitat. Some common shrubs on pinyon-juniper transects in 2005 were big sagebrush, Gambel's oak, mountain mahogany, rabbitbrush, serviceberry, chokecherry, and skunkbrush (*Rhus trilobata*).

Ponderosa Pine

This habitat is composed of arid conifer stands dominated by ponderosa pine. In 2005, the most common tree species associated with ponderosa pine were Douglas-fir and white fir (*Abies concolor*). Some of the recorded plants in the understory in 2005 were Gambel's oak, snowberry, common juniper, mountain mahogany, chokecherry, serviceberry, gooseberry, and rabbitbrush.

Sage Shrubland

Open landscapes dominated by big sagebrush make up this habitat. After big sagebrush, the next most common shrubs in this habitat in 2005 were serviceberry and rabbitbrush.

Semidesert Shrubland

This habitat is also dominated by shrubs, and in 2005, we recorded big sagebrush, saltbush (*Atriplex* sp.), snowberry, yucca, Gambel's oak, gooseberry, serviceberry, and chokecherry on these transects.

Spruce-Fir

This habitat is composed of high-elevation coniferous trees, such as Englemann spruce, Douglas-fir, blue spruce, and subalpine fir. In 2005, some of the frequently recorded plants in the understory were gooseberry, common juniper, willow, snowberry, honeysuckle (*Lonicera* sp.), and alder (*Alnus* sp).

Wetland

Wetland transects traverse areas dominated by cattail (*Typha* sp.), sedge (*Carex* sp.), grass (many water-tolerant species), or bulrush (*Scirpus* sp). Wetland transects are not necessarily in areas with standing water; in fact, in some years, many of these have no standing water.

Field Personnel

Nineteen experienced biological technicians (not counting permanent staff) with excellent aural and visual bird-identification skills comprised the RMBO staff that executed the field component of MCB in 2005. All technicians brought with them considerable experience conducting bird surveys across the United States and excellent bird-identification skills. Each technician also completed a four-day training program at the beginning of the season to ensure full understanding of the field protocols and to practice distance estimation.

Site Selection

Survey sites were selected in 1998 for aspen, ponderosa pine, and spruce-fir. In 1999, alpine tundra, grassland, high-elevation riparian, low-elevation riparian, mixed conifer, montane shrubland, pinyon-juniper, sage shrubland, semidesert shrubland, and wetland transects were established. Due to the limitations in the GAP dataset, many of the original transect locations surveyed the incorrect habitat and new transect locations were randomly selected in subsequent years.

Point-transect Protocol

RMBO staff conducted point transects (Buckland et al. 1993) to sample bird populations in each habitat selected for monitoring. Each transect was surveyed by one observer following protocol established by Leukering (2000) and modified by Panjabi (2005). RMBO technicians conducted all transect surveys in the morning, between ½-hour before sunrise and 11 AM; most surveys were completed before 10 AM. To maximize efficiency, observers located the selected stand on the ground prior to the morning of the survey. For new transects, observers used this pre-survey visit to establish an access point for each stand,

and a random distance and compass bearing from the access point (0-400 m and 0-360 degrees, respectively) at which the first point count station would be located. On the morning of the survey, the observer began the point transect at the first count station and then continued along the bearing for all remaining points if possible. In many cases, the pre-selected bearing eventually would lead the transect out of the target habitat, or to some obstruction (e.g., cliff or private land), forcing the observer to change the bearing of the transect. When this happened, the observer back-tracked to the last completed count station and randomly turned the transect right or left, at an angle perpendicular to the original bearing, and then alternated right or left if additional turns were necessary. In some small or linear stands (e.g., riparian sites), the size and shape of the stand determined the location and course of the transect.

Observers conducted up to 15 five-minute point counts at stations located at 250-m intervals along each transect, recording all detections of birds and red squirrels (*Tamiasciurus hudsonicus*) on standardized forms. Fly-overs (birds flying over but not using the immediate surrounding landscape) were recorded, but excluded from analyses of density. For each bird detected, observers recorded the species, sex, how it was detected (e.g., call, song, drumming, etc.), and distance from the observation point. Whenever possible, they measured distances using Bushnell® Yardage Pro 500™ laser rangefinders. When it was not possible to measure the distance to a bird, staff used rangefinders to gauge distance estimates by measuring to some nearby object. Observers treated the 250-m intervals between count stations as parts of a line transect, and recorded individuals of a short list of low-density species (all grouse, raptors, woodpeckers, and a few other rare or uncommon species) and measured the distance and bearing to each from where it was detected along the transect line. They also recorded bearings and distances to individuals of the same low-density species when they were detected at count stations. Individual birds initially detected on points that were again detected while moving between points were not included in the line-transect data. However, individuals detected between points, but then again during the subsequent point count, were removed from the line-transect data, and included only on the point count.

In 2004, we incorporated a change in the bird-data collection protocol relative to previous years in that we treat all non-independent detections of individual birds as part of a 'cluster' together with the first independently observed bird, rather than as separate independent observations of those individuals. This means that if the detection of an individual bird is dependent upon the previous detection of another individual, the resulting observation is recorded as one independent detection with a cluster size of *C*, where *C* is the original individual detected plus the sum of any additional individuals whose detection was dependent upon the first individual revealing its presence. For example, a bird sings, and is thus detected independently. The observer then looks over to that bird, and as a result, detects a second individual. The resulting observation is recorded as one detection of a cluster of two birds. This practice ensures that we adhere more

strictly to the assumption inherent in random sampling that all observations are independent of each other.

Observers recorded atmospheric data (i.e., temperature in degrees Fahrenheit, cloud cover, precipitation, and wind - Beaufort scale) and the time at the start and end of each transect. They measured distances between count stations using hand-held Garmin® E-trex™ or other similar Global Positioning System units. All GPS data were logged in Universal Transverse Mercator (UTM) North American Datum 1927. At each count station, observers recorded UTM coordinates, whether or not the station was within 100m of a road, and vegetation data, including the structural stage and canopy closure of the forest, mean canopy height, the types and relative proportions of overstory trees, the sub-canopy volume and tree species composition, and the % coverage and types of shrubs within a 50-m radius of the point. Observers recorded these data prior to beginning each bird count.

Data Analysis

We used program DISTANCE (Thomas et al. 1998-99) to generate density estimates (*D*) using only data collected at point count stations. The notation, concepts, and analysis methods of DISTANCE were developed by Buckland et al. (1993). In DISTANCE analysis, a unique detection function is fit to each distribution of distances associated with a species in a given habitat. Because the detection function is unique to each species in each habitat, DISTANCE analysis avoids some serious problems inherent in traditional analyses of point-count data (e.g., unquantifiable differences in detectability among habitats, species, and years). DISTANCE analysis relies on three assumptions, all of which are reasonably well met by MCB: 1) all birds at distance=0 are detected, 2) distances of birds close to the point are measured accurately, and 3) birds do not move in response to the observer's presence.

Density estimates were generated only for species for which there was a minimum of 25 independently detected observations as recorded from count stations in a given habitat (not including fly-overs or between-point observations, and prior to truncation or removal of outliers). Because we considered only independent detections in our analyses of density, the number of *observations* (n) reported for each species may be lower than the number of *individuals* (N) observed. This is especially true for species that tend to associate in groups (e.g., swifts, swallows, crossbills, etc.). Both numbers are useful, especially for low-density species, and thus both are reported in the "Species Accounts" section for species with at least 25 detections. Note however, that in the habitat accounts in the "Results" section, the number of observations reported (n) reflects only the number of independent detections *used to estimate density* (i.e., after any truncation or removal of outliers), and may be less than the total number of independent detections or the total number of individuals observed.

RESULTS

RMBO staff conducted a total of 3,514 point counts along 349 point transects in 12 habitats (Figure 2) between 12 May and 20 July 2005. At least 25 point transects were surveyed in each habitat (Table 1). The habitats surveyed were alpine tundra, aspen, grassland, high-elevation riparian, mixed conifer, montane shrubland, pinyon-juniper, ponderosa pine, sage shrubland, semidesert shrubland, spruce-fir, and wetland.

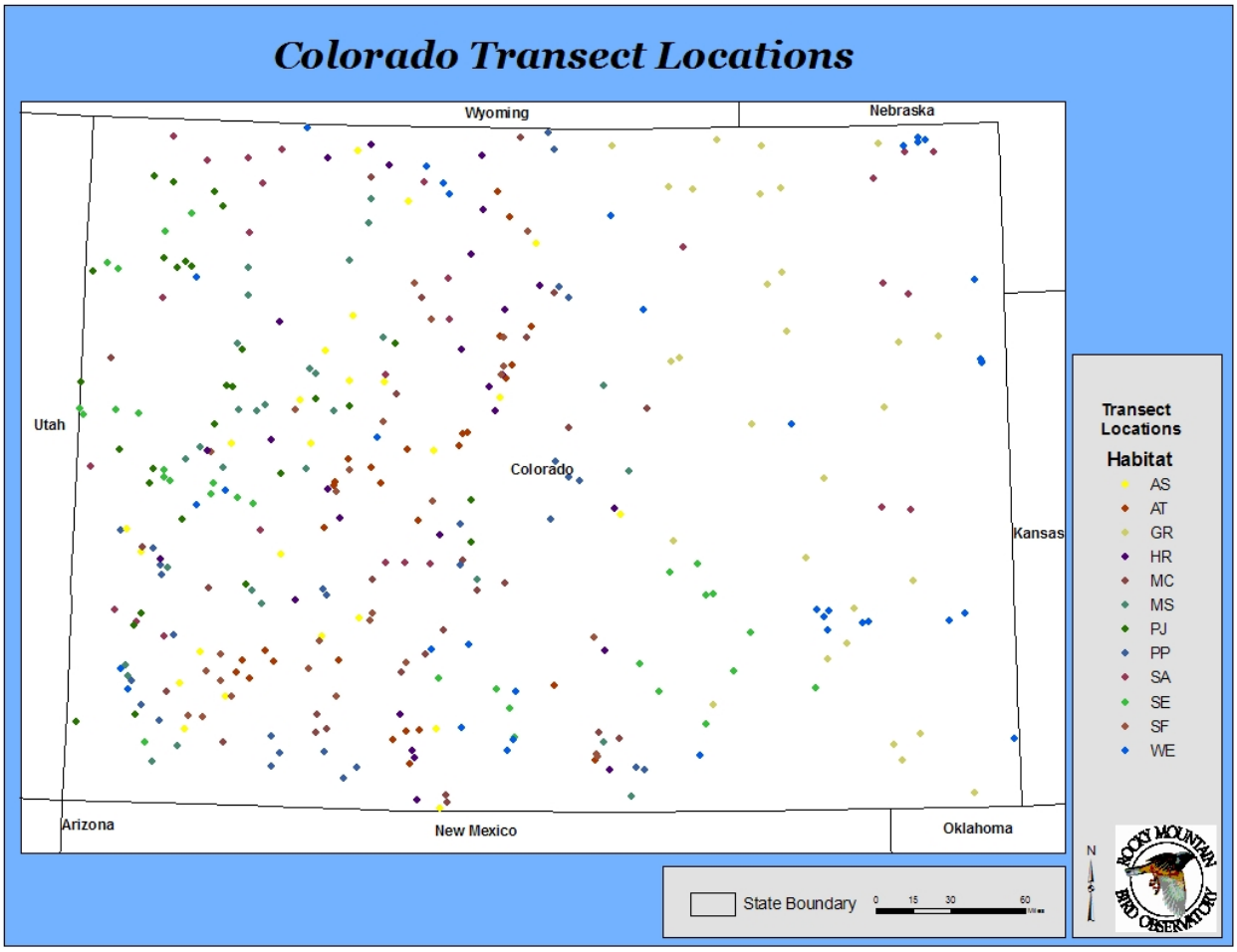

Figure 2. Location of point-transects in Colorado by habitat, summer 2005.

Table 1. Sampling periods and effort in each habitat in Colorado, summer 2005.

Habitat	Dates sampled	# point transects	# point counts
Alpine Tundra	1 July – 17 July	29	425
Aspen	11 June – 15 July	25	358
Grassland	14 May – 10 July	29	435
High-elevation Riparian	13 June – 20 July	28	361
Mixed Conifer	7 June – 7 July	27	388
Montane Shrubland	28 May – 14 July	29	434
Pinyon-Juniper	17 May – 22 June	29	427
Ponderosa Pine	16 May – 14 July	29	421
Sage Shrubland	19 May – 28 June	28	418
Semidesert Shrubland	15 May – 15 June	30	445
Spruce-Fir	27 June – 16 July	27	402
Wetland	12 May – 11 July	39	*
All Habitats	**12 May – 20 July**	**349**	**4514**

*wetland transects are line transects

RMBO staff observed a total of 38,970 birds of 214 species on point transects. Of these, 205 species are believed to breed regularly in Colorado, which represents 78% of the 263 species believed to breed in the state. Data collected on transects enabled us to estimate densities for 91 species in at least one habitat. For several species, we are able to calculate density estimates in more than one habitat.

The total number of species detected in each habitat in 2005 ranged from 47 in alpine tundra to 109 in montane shrubland (Table 2). While these totals communicate the magnitude of the spectrum of possible species across a range of sites within a habitat type, it should be understood that some species observed were largely peripheral to the habitat in which they were recorded. Thus, species richness measures reflect both the within- and between-habitat diversity of the sites surveyed in each habitat category.

Of the habitats surveyed in 2005, more birds were detected, and average species richness was greatest, in montane shrubland (Table 2). We have provided estimates of avian species richness at both the count-level (i.e., sub-sample) and the transect (i.e., sample) level, as the count-level data are not influenced by stand size (i.e., the number of sub-samples per site), and are therefore best for direct inter-habitat comparisons, while the site-level data, which are influenced by stand size, provide a more complete picture of the bird community within a given stand of habitat. Thus, both estimates are useful from a management perspective.

Table 2. Bird totals and species richness in habitats surveyed in Colorado, summer 2005.

Habitat	# birds detected	Avg. # birds/point	# species detected	Avg.# species/ point	Avg. # species/ transect
Alpine Tundra	2206	5.2	47	2.8	11.8
Aspen	2951	8.2	77	6.1	24.0
Grassland	4810	11.1	70	4.2	11.8
High-elevation Riparian	3238	9.0	77	5.8	21.0
Mixed Conifer	3376	8.7	79	6.3	25.9
Montane Shrubland	4132	9.5	109	6.4	27.5
Pinyon-Juniper	2937	6.9	84	5.0	21.9
Ponderosa Pine	3695	8.8	78	6.4	26.2
Sage Shrubland	3674	8.8	97	4.6	15.1
Semidesert Shubland	2988	6.7	87	3.5	14.8
Spruce-Fir	3033	7.5	67	5.5	20.7
Wetland	1930	*	107	*	13.2
All Habitats	**38970**	**8.3**	**214**	**5.1**	**19.1**

*wetland transects are line transects

Alpine Tundra (AT)

RMBO staff surveyed 425 point counts along 29 transects in alpine tundra between 1 July and 17 July 2005 (Table 1). They recorded a total of 2,206 birds in this habitat, and an average of 5.2 birds per count station (Table 2). Observers detected 47 species in total and an average of 2.8 species per point count and 11.8 species per transect (i.e., per site) in alpine tundra.

The point-transect data from alpine tundra yielded robust density estimates for nine species (CV<50%) and moderately robust estimates for one additional species (CV=50-75%; Table 3). MCB should effectively monitor these ten species, which represent 21% of all species recorded from alpine tundra in 2005. Please note that many birds typically associated with forested areas were detected from the wind-formed dwarf forests (krummholz) near the selected alpine tundra study sites.

White-crowned Sparrow, American Pipit, Broad-tailed Hummingbird, Horned Lark, and American Robin were the most abundant species in alpine tundra areas in 2005. Two species (American Pipit and Brown-capped Rosy-Finch), both of which are of high management and conservation interest, had higher estimated densities in alpine tundra than in other habitats surveyed in 2005; however, they do not breed in other habitats.

Table 3. Estimated densities of breeding birds in alpine tundra in Colorado, summer 2005.

Species	D	LCL	UCL	CV	n	N
Broad-tailed Hummingbird	28.89	10.76	77.58	52.6%	43	46
Dusky Flycatcher	1.99	0.81	4.88	47.0%	25	29
Horned Lark	20.68	13.79	31.02	20.4%	233	249
American Robin	16.63	9.38	29.47	29.6%	124	137
American Pipit	48.92	36.61	65.38	14.6%	463	490
Lincoln's Sparrow	6.61	3.89	11.22	26.9%	94	94
White-crowned Sparrow	64.47	46.85	88.71	16.1%	680	749
Dark-eyed Junco	6.11	2.61	14.28	44.4%	33	38
Brown-capped Rosy-Finch	2.23	0.94	5.32	45.4%	27	33
Pine Siskin	13.82	7.25	26.34	33.2%	45	57

D = density estimate in birds/km^2; LCL and UCL = lower and upper 95% confidence limits on D; CV = coefficient of variation of D; n = number of observations used to estimate D; N = number of individuals detected

Aspen (AS)

RMBO staff surveyed 358 point counts along 25 transects in aspen between 11 June and 15 July 2005 (Table 1). They recorded a total of 2,951 individual birds in this habitat, with an average of 8.2 birds per point count (Table 2). Observers detected 77 species in total and, on average, 6.1 species per point count and 24.0 species per transect in this habitat.

The point-transect data from aspen yielded robust density estimates (CV<50%) for 26 species (Table 4). MCB should effectively monitor these 26 species, which represent 34% of all species recorded from aspen in 2005.

Dark-eyed Junco, Yellow-rumped Warbler, Warbling Vireo, Pine Siskin, and Broad-tailed Hummingbird were the most abundant species in aspen this year. Nine species (Red-naped Sapsucker, Northern Flicker, Western Wood-Pewee, Warbling Vireo, House Wren, American Robin, Yellow-rumped Warbler, Western Tanager, and Dark-eyed Junco) had higher estimated densities in aspen relative to that in other habitats surveyed in 2005.

Table 4. Estimated densities of breeding birds in aspen in Colorado, summer 2005.

Species	D	LCL	UCL	CV	n	N
Broad-tailed Hummingbird	95.79	44.76	204.99	39.1%	36	40
Red-naped Sapsucker	23.32	13.44	40.45	28.2%	60	68
Hairy Woodpecker	4.37	2.63	7.27	25.7%	28	28
Northern Flicker	12.22	6.93	21.54	29.0%	58	61
Western Wood-Pewee	16.25	10.54	25.03	22.0%	93	93
Dusky Flycatcher	5.78	2.78	12.02	37.3%	49	50
Warbling Vireo	124.58	101.08	153.55	10.4%	473	485
Steller's Jay	2.39	1.22	4.67	34.3%	25	30
Violet-green Swallow	17.35	9.70	31.04	29.9%	62	138
Mountain Chickadee	62.39	34.44	113.02	30.6%	96	109
Red-breasted Nuthatch	6.15	3.54	10.70	27.9%	32	32

Table 4 cont. Estimated densities of breeding birds in aspen in Colorado, summer 2005.

Species	D	LCL	UCL	CV	n	N
House Wren	82.88	51.14	134.31	24.4%	171	180
Ruby-crowned Kinglet	19.98	13.89	28.74	18.2%	144	148
Mountain Bluebird	9.81	4.13	23.31	44.8%	29	30
Hermit Thrush	11.43	8.07	16.21	17.4%	139	148
American Robin	61.47	44.31	85.27	16.5%	236	248
Orange-crowned Warbler	17.90	7.85	40.79	42.7%	25	30
Yellow-rumped Warbler	139.39	101.16	192.06	16.3%	248	252
MacGillivray's Warbler	3.82	1.72	8.48	40.9%	26	26
Western Tanager	39.98	20.49	78.01	33.7%	75	75
Green-tailed Towhee	15.89	8.01	31.52	35.4%	53	53
Chipping Sparrow	8.21	3.82	17.62	38.9%	27	28
Lincoln's Sparrow	14.28	7.95	25.63	29.1%	81	83
White-crowned Sparrow	18.16	8.10	40.69	41.9%	43	46
Dark-eyed Junco	178.61	124.78	255.65	18.2%	242	254
Pine Siskin	101.89	58.81	176.51	28.1%	109	141

D = density estimate in birds/km^2; LCL and UCL = lower and upper 95% confidence limits on D; CV = coefficient of variation of D; n = number of observations used to estimate D; N = number of individuals detected

Grassland (GR)

RMBO staff surveyed 435 point counts along 29 transects in grassland between 14 May and 10 July 2005 (Table 1). They recorded a total of 4,810 individual birds in this habitat, with an average of 11.1 birds per point count (Table 2). Observers detected 70 species in total and, on average, 4.2 species per point count and 11.8 species per transect in this habitat.

The point-transect data from grassland yielded robust density estimates (CV<50%) for ten species and a moderately robust estimate for two additional species (CV=50-75%; Table 5). MCB should effectively monitor these 12 species, which represent 17% of all species recorded in grassland in 2005.

Horned Lark, Lark Bunting, Western Meadowlark, Grasshopper Sparrow, and Cassin's Sparrow were the most abundant species in grassland this year. Five species (Horned Lark, Cassin's Sparrow, Lark Bunting, Grasshopper Sparrow, and McCown's Longspur) had higher estimated densities in grassland relative to other habitats surveyed in 2005.

Table 5. Estimated densities of breeding birds in grassland in Colorado, summer 2005.

Species	D	LCL	UCL	CV	n	N
Killdeer	0.75	0.37	1.51	36.1%	39	43
Mourning Dove	6.00	3.81	9.45	23.0%	191	237
Western Kingbird	3.53	1.85	6.74	33.3%	59	74
Horned Lark	80.13	58.35	110.04	15.9%	1182	1443
Northern Mockingbird	0.64	0.26	1.56	46.5%	36	36
Cassin's Sparrow	8.62	4.03	18.44	39.2%	188	189
Brewer's Sparrow	4.40	1.48	13.04	58.1%	46	54
Lark Sparrow	7.92	3.65	17.20	40.4%	46	65

Table 5 cont. Estimated densities of breeding birds in grassland in Colorado, summer 2005.

Species	D	LCL	UCL	CV	n	N
Lark Bunting	20.90	15.25	28.66	15.8%	763	840
Grasshopper Sparrow	18.02	10.16	31.96	29.1%	195	196
McCown's Longspur	4.87	1.45	16.38	66.1%	121	129
Western Meadowlark	20.86	15.68	27.75	14.3%	1027	1048

D = density estimate in birds/km^2; LCL and UCL = lower and upper 95% confidence limits on D; CV = coefficient of variation of D; n = number of observations used to estimate D; N = number of individuals detected

High-elevation Riparian (HR)

RMBO staff conducted 361 counts along 28 transects in high-elevation riparian habitat between 13 June and 20 July 2005 (Table 1). We recorded a total of 3,238 birds in this habitat, with an average of 9.0 birds per count station (Table 2). Observers detected a total of 77 species, and on average, 5.8 species per point count and 21.0 species per site in high-elevation riparian.

The point-transect data from high-elevation riparian yielded robust density estimates (CV<50%) for 23 species and moderately robust estimates for three additional species (CV=50-75%; Table 6). MCB should effectively monitor these 26 species, which represent 34% of all species recorded from high-elevation riparian in 2005.

Lincoln's Sparrow, Broad-tailed Hummingbird, Wilson's Warbler, White-crowned Sparrow, and Pine Siskin were the most abundant species in this habitat this year. Nine species (Spotted Sandpiper, Tree Swallow, Wilson's Warbler, Savannah Sparrow, Fox Sparrow, Song Sparrow, Lincoln's Sparrow, White-crowned Sparrow, and Lazuli Bunting) had higher estimated densities in high-elevation riparian than in other habitats surveyed in 2005.

Table 6. Estimated densities of breeding birds in high-elevation riparian habitat in Colorado, summer 2005.

Species	D	LCL	UCL	CV	n	N
Spotted Sandpiper	3.11	1.36	7.09	42.6%	33	33
Broad-tailed Hummingbird	222.40	136.96	361.13	24.6%	111	118
Red-naped Sapsucker	10.61	6.26	17.96	26.6%	55	56
Northern Flicker	3.29	2.11	5.14	22.6%	43	44
Western Wood-Pewee	3.67	1.83	7.35	35.2%	31	31
Dusky Flycatcher	8.41	4.21	16.80	35.5%	47	47
Warbling Vireo	16.88	9.76	29.21	27.6%	98	108
Tree Swallow	7.20	3.27	15.86	40.7%	33	44
Violet-green Swallow	17.28	9.48	31.49	30.3%	71	92
Mountain Chickadee	35.15	18.57	66.54	32.8%	40	49
Ruby-crowned Kinglet	23.49	16.28	33.89	18.5%	134	134
Hermit Thrush	1.97	1.13	3.44	27.8%	35	38
American Robin	51.41	36.29	72.84	17.3%	224	248
Yellow Warbler	18.73	6.54	53.60	55.2%	42	51
Yellow-rumped Warbler	40.21	24.12	67.02	26.0%	93	101
MacGillivray's Warbler	14.85	6.31	34.93	43.9%	48	48

Table 6 cont. Estimated densities of breeding birds in high-elevation riparian habitat in Colorado, summer 2005.

Species	D	LCL	UCL	CV	n	N
Wilson's Warbler	124.55	81.09	191.29	21.7%	137	141
Western Tanager	2.06	0.85	5.00	46.2%	31	31
Savannah Sparrow	6.68	2.48	17.99	51.8%	43	44
Fox Sparrow	5.18	2.27	11.81	42.0%	55	55
Song Sparrow	6.06	2.92	12.58	37.6%	39	39
Lincoln's Sparrow	254.96	185.54	350.35	15.9%	541	568
White-crowned Sparrow	76.82	47.11	125.26	24.4%	375	384
Dark-eyed Junco	58.03	31.66	106.35	31.3%	83	90
Lazuli Bunting	11.61	2.97	45.44	74.7%	27	29
Pine Siskin	68.79	44.01	107.50	22.3%	131	197

D = density estimate in birds/km^2; LCL and UCL = lower and upper 95% confidence limits on D; CV = coefficient of variation of D; n = number of observations used to estimate D; N = number of individuals detected

Mixed Conifer (MC)

RMBO staff conducted 388 point counts along 27 transects in mixed conifer forests in Colorado between 7 June and 7 July 2005 (Table 1). They recorded 3,376 birds in total in this habitat and an average of 8.7 birds per count station (Table 2). Observers detected 79 species in mixed conifer and an average of 6.3 species per point count and 25.9 species per site in this habitat.

The point-transect data from mixed conifer yielded robust density estimates (CV<50%) for 24 species and moderately robust estimates for another 3 species (CV=50-75%; Table 7). MCB should effectively monitor these 27 species, which represent 34% of all species recorded from mixed conifer habitat in 2005.

Broad-tailed Hummingbird, Pine Siskin, Dark-eyed Junco, Mountain Chickadee, and Chipping Sparrow were the most abundant species in this habitat this year. Eight species (Broad-tailed Hummingbird, Williamson's Sapsucker, Cordilleran Flycatcher, Clark's Nutcracker, Mountain Chickadee, Red-breasted Nuthatch, Red Crossbill, and Pine Siskin) had higher estimated densities in mixed conifer than in other habitats surveyed in 2005.

Table 7. Estimated densities of breeding birds in mixed conifer in Colorado, summer 2005.

Species	D	LCL	UCL	CV	n	N
Broad-tailed Hummingbird	434.65	204.02	925.99	39.4%	68	70
Williamson's Sapsucker	5.86	3.26	10.53	29.8%	38	48
Hairy Woodpecker	3.89	2.11	7.20	31.3%	31	31
Northern Flicker	4.82	2.55	9.11	32.7%	44	44
Western Wood-Pewee	5.46	2.92	10.22	31.7%	43	45
Cordilleran Flycatcher	8.85	4.02	19.50	40.9%	27	27
Warbling Vireo	47.41	34.70	64.77	15.7%	222	228
Steller's Jay	12.32	7.81	19.41	22.9%	87	96
Clark's Nutcracker	3.91	1.22	12.54	62.0%	54	77
Violet-green Swallow	18.42	10.53	32.19	28.3%	48	84
Mountain Chickadee	89.96	63.58	127.28	17.6%	205	219

Table 7 cont. Estimated densities of breeding birds in mixed conifer in Colorado, summer 2005.

Species	D	LCL	UCL	CV	n	N
Red-breasted Nuthatch	12.83	7.58	21.73	26.5%	86	87
House Wren	25.62	13.59	48.32	32.8%	74	86
Ruby-crowned Kinglet	27.40	18.02	41.66	21.3%	165	172
Townsend's Solitaire	7.66	4.86	12.09	23.0%	48	50
Hermit Thrush	6.38	3.49	11.66	31.2%	142	145
American Robin	32.50	22.78	46.36	18.0%	177	192
Orange-crowned Warbler	6.59	2.60	16.71	47.9%	35	35
Yellow-rumped Warbler	48.15	35.06	66.12	15.8%	229	231
MacGillivray's Warbler	12.91	3.73	44.67	67.2%	25	26
Western Tanager	34.41	24.37	48.60	17.1%	232	240
Green-tailed Towhee	10.04	3.75	26.87	51.1%	69	74
Chipping Sparrow	55.94	29.44	106.30	32.8%	69	104
Dark-eyed Junco	114.31	70.64	184.98	24.7%	226	235
Black-headed Grosbeak	4.24	2.21	8.15	33.0%	30	30
Red Crossbill	25.86	11.83	56.54	40.7%	29	71
Pine Siskin	158.79	113.42	222.31	17.1%	159	215

D = density estimate in birds/km^2; LCL and UCL = lower and upper 95% confidence limits on D; CV = coefficient of variation of D; n = number of observations used to estimate D; N = number of individuals detected

Montane Shrubland (MS)

RMBO staff conducted 434 point counts along 29 transects in montane shrubland stands between 28 May and 14 July 2005 (Table 1). They recorded a total of 4,132 birds in this habitat, with an average of 9.5 birds detected at each count station (Table 2). Observers detected 109 species in total and, on average, detected 6.4 species per point count and 27.5 species per site.

The point transect data from montane shrubland habitat yielded robust density estimates (CV<50%) for 26 species and moderately robust estimates for another 3 species (CV=50-75%; Table 8). MCB should effectively monitor these 29 species, which represent 27% of all species recorded from montane shrubland in 2005.

Broad-tailed Hummingbird, Green-tailed Towhee, Violet-green Swallow, Blue-gray Gnatcatcher, and Warbling Vireo were among the most abundant species in this habitat this year. Eleven species (Dusky Flycatcher, Black-billed Magpie, Violet-green Swallow, Black-capped Chickadee, Orange-crowned Warbler, Virginia's Warbler, Yellow Warbler, MacGillivray's Warbler, Green-tailed Towhee, Spotted Towhee, and Black-headed Grosbeak) had higher estimated densities in montane shrubland than in other habitats surveyed in 2005.

Table 8. Estimated densities of breeding birds in montane shrubland in Colorado, 2005.

Species	D	LCL	UCL	CV	n	N
Mourning Dove	0.78	0.45	1.36	28.2%	40	41
Broad-tailed Hummingbird	366.88	205.60	654.69	29.9%	119	130
Northern Flicker	6.45	3.58	11.62	30.3%	72	76
Western Wood-Pewee	2.35	1.33	4.15	29.2%	54	54

Table 8 cont. Estimated densities of breeding birds in montane shrubland in Colorado, 2005.

Species	D	LCL	UCL	CV	n	N
Dusky Flycatcher	44.58	30.35	65.50	19.2%	195	203
Plumbeous Vireo	4.72	2.57	8.68	31.0%	30	30
Warbling Vireo	52.81	36.29	76.86	18.6%	319	322
Black-billed Magpie	3.54	1.75	7.16	36.1%	27	72
Violet-green Swallow	84.11	35.31	200.32	46.0%	94	183
Black-capped Chickadee	9.90	2.58	37.95	74.1%	28	29
House Wren	38.12	24.24	59.94	23.0%	141	144
Blue-gray Gnatcatcher	64.44	34.80	119.31	31.3%	48	53
Mountain Bluebird	7.04	3.31	14.95	39.0%	30	33
Hermit Thrush	1.48	0.57	3.81	49.6%	33	45
American Robin	28.96	21.73	38.61	14.3%	243	248
Orange-crowned Warbler	27.60	17.86	42.65	21.9%	116	121
Virginia's Warbler	27.00	15.96	45.67	26.6%	160	166
Yellow Warbler	46.74	17.36	125.87	51.6%	112	117
Yellow-rumped Warbler	8.74	3.76	20.30	43.9%	25	25
MacGillivray's Warbler	15.19	7.62	30.26	35.2%	63	70
Western Tanager	9.27	4.02	21.42	44.0%	52	54
Green-tailed Towhee	104.40	73.59	148.10	17.3%	459	481
Spotted Towhee	45.67	29.78	70.04	21.6%	210	216
Chipping Sparrow	23.23	14.05	38.41	25.6%	93	96
Vesper Sparrow	9.92	3.09	31.83	63.2%	30	32
Black-headed Grosbeak	21.89	14.23	33.66	22.0%	139	161
Lazuli Bunting	5.02	2.35	10.69	39.1%	29	30
Brown-headed Cowbird	18.40	10.86	31.18	27.0%	79	92
Pine Siskin	50.12	22.06	113.83	42.0%	98	129

D = density estimate in birds/km^2; LCL and UCL = lower and upper 95% confidence limits on D; CV = coefficient of variation of D; n = number of observations used to estimate D; N = number of individuals detected

Pinyon-Juniper (PJ)

RMBO staff conducted 427 point counts along 29 transects in pinyon-juniper stands between 17 May and 22 June 2005 (Table 1). They recorded a total of 2,937 birds in this habitat, with an average of 6.9 birds detected at each count station (Table 2). Observers detected 84 species in total and, on average, detected 5.0 species per point count and 21.9 species per site.

The point-transect data from pinyon-juniper habitat yielded robust density estimates (CV<50%) for 24 species and moderately robust estimates for another six species (CV=50-75%; Table 9). MCB should effectively monitor these 30 species, which represent 36% of all species recorded from pinyon-juniper in 2005.

Blue-gray Gnatcatcher, Chipping Sparrow, Black-throated Gray Warbler, Gray Flycatcher, and Spotted Towhee were among the most abundant species in this habitat this year. Fourteen species (Gray Flycatcher, Ash-throated Flycatcher, Plumbeous Vireo, Western Scrub-Jay, Pinyon Jay, Juniper Titmouse, Bushtit, Rock Wren, Bewick's Wren, Blue-gray Gnatcatcher, Mountain Bluebird, Black-

throated Gray Warbler, Chipping Sparrow, and House Finch) had higher estimated densities in pinyon-juniper than in other habitats surveyed in 2005.

Table 9. Estimated densities of breeding birds in pinyon-juniper in Colorado, 2005.

Species	D	LCL	UCL	CV	n	N
Mourning Dove	9.46	6.14	14.57	21.9%	172	182
Broad-tailed Hummingbird	25.97	9.97	67.65	50.5%	47	47
Gray Flycatcher	52.09	32.75	82.84	23.5%	155	164
Ash-throated Flycatcher	16.09	10.17	25.46	23.2%	114	116
Plumbeous Vireo	12.65	7.45	21.51	27.1%	68	71
Western Scrub-Jay	7.47	4.03	13.84	31.6%	40	44
Pinyon Jay	2.16	1.05	4.43	36.8%	58	158
Black-billed Magpie	0.53	0.29	0.97	30.5%	28	29
Common Raven	0.89	0.52	1.52	27.1%	65	116
Violet-green Swallow	9.72	4.84	19.54	36.0%	36	86
Mountain Chickadee	25.54	9.77	66.73	50.8%	33	39
Juniper Titmouse	11.74	3.84	35.88	59.6%	29	36
Bushtit	17.89	8.20	38.99	40.1%	32	66
Rock Wren	2.32	0.88	6.12	51.6%	33	71
Bewick's Wren	19.62	10.15	37.92	33.9%	133	141
Blue-gray Gnatcatcher	69.48	45.28	106.60	21.9%	115	118
Mountain Bluebird	26.59	16.58	42.65	23.8%	105	150
American Robin	6.91	3.82	12.48	30.2%	45	47
Virginia's Warbler	9.00	3.36	24.07	51.4%	42	64
Black-throated Gray Warbler	62.18	44.09	87.67	17.4%	205	212
Green-tailed Towhee	11.45	6.11	21.44	31.8%	72	73
Spotted Towhee	42.26	20.81	85.85	36.7%	149	160
Chipping Sparrow	66.35	48.58	90.62	15.8%	192	205
Brewer's Sparrow	4.94	1.76	13.88	54.9%	25	27
Vesper Sparrow	2.41	0.98	5.95	47.3%	30	30
Black-headed Grosbeak	7.21	3.84	13.54	31.7%	37	37
Western Meadowlark	1.30	0.67	2.50	33.4%	54	57
Brown-headed Cowbird	13.91	7.21	26.84	33.2%	43	53
House Finch	7.47	3.32	16.85	42.2%	59	68
Pine Siskin	15.58	7.69	31.57	36.4%	37	60

D = density estimate in birds/km^2; LCL and UCL = lower and upper 95% confidence limits on D; CV = coefficient of variation of D; n = number of observations used to estimate D; N = number of individuals detected

Ponderosa Pine (PP)

RMBO staff conducted 421 point counts along 29 transects in ponderosa pine stands between 16 May and 14 July 2005 (Table 1). They recorded a total of 3,695 birds in this habitat, with an average of 8.8 birds detected per count station (Table 2). Observers detected 78 species in total and, on average, detected 6.4 species per point count and 26.2 species per site.

The point-transect data from ponderosa pine habitat yielded robust density estimates (CV<50%) for 34 species (Table 10). MCB should effectively monitor these 34 species, which represent 44% of all species recorded from ponderosa pine in 2005, in this habitat.

Broad-tailed Hummingbird, Dark-eyed Junco, Pine Siskin, Mountain Chickadee, and Dusky Flycatcher were among the most abundant species in this habitat this year. Eight species (Steller's Jay, Common Raven, White-breasted Nuthatch, Pygmy Nuthatch, Western Bluebird, Townsend's Solitaire, Grace's Warbler, and Cassin's Finch) had higher estimated densities in ponderosa pine than in other habitats surveyed in 2005.

Table 10. Estimated densities of breeding birds in ponderosa pine in Colorado, 2005.

Species	D	LCL	UCL	CV	n	N
Mourning Dove	1.64	0.95	2.82	27.5%	58	59
Broad-tailed Hummingbird	162.33	79.09	333.18	37.2%	74	83
Williamson's Sapsucker	2.77	1.47	5.21	32.2%	26	28
Northern Flicker	3.67	2.18	6.17	26.6%	75	77
Western Wood-Pewee	10.90	7.09	16.76	21.6%	176	176
Dusky Flycatcher	28.29	16.63	48.12	27.0%	95	99
Plumbeous Vireo	7.40	4.14	13.22	29.3%	79	85
Warbling Vireo	12.50	7.60	20.58	24.9%	155	165
Steller's Jay	16.77	11.50	24.46	19.0%	107	121
Common Raven	0.98	0.54	1.80	30.9%	45	49
Violet-green Swallow	27.55	16.12	47.10	27.1%	77	127
Mountain Chickadee	29.64	21.26	41.31	16.8%	132	148
Red-breasted Nuthatch	2.58	1.07	6.22	45.6%	25	26
White-breasted Nuthatch	10.92	7.05	16.92	22.1%	86	90
Pygmy Nuthatch	17.78	10.93	28.91	24.5%	71	80
House Wren	15.71	10.07	24.51	22.0%	107	109
Ruby-crowned Kinglet	3.33	1.54	7.22	39.7%	59	60
Western Bluebird	24.52	15.89	37.85	21.9%	74	87
Mountain Bluebird	16.64	8.33	33.27	35.3%	53	74
Townsend's Solitaire	9.32	5.88	14.75	23.3%	64	68
Hermit Thrush	2.69	1.95	3.72	16.0%	121	121
American Robin	23.01	16.57	31.95	16.3%	166	178
Virginia's Warbler	14.15	7.53	26.60	32.0%	76	78
Yellow-rumped Warbler	27.43	16.52	45.55	25.4%	117	127
Grace's Warbler	22.75	10.56	48.97	39.8%	61	62
Western Tanager	23.64	15.38	36.34	21.5%	183	189
Green-tailed Towhee	19.03	11.19	32.35	26.6%	111	121
Spotted Towhee	6.77	3.17	14.45	38.6%	58	58
Chipping Sparrow	21.53	14.54	31.89	19.6%	127	137
Dark-eyed Junco	97.42	66.20	143.38	19.5%	176	197
Black-headed Grosbeak	2.06	0.82	5.20	48.2%	30	30
Brown-headed Cowbird	7.65	4.24	13.82	30.1%	27	36
Cassin's Finch	18.33	8.18	41.10	42.0%	32	38
Pine Siskin	69.79	45.46	107.15	21.9%	122	191

D = density estimate in birds/km^2; LCL and UCL = lower and upper 95% confidence limits on D; CV = coefficient of variation of D; n = number of observations used to estimate D; N = number of individuals detected

Sage Shrubland (SA)

RMBO staff conducted 418 point counts along 28 transects in sage shrubland between 19 May and 28 June 2005 (Table 1). They recorded a total of 3,674

birds in this habitat, with an average of 8.8 birds detected at each count station (Table 2). Observers detected 97 species in total and, on average, detected 4.6 species per point count and 15.1 species per site.

The point-transect data from sage shrubland habitat yielded robust density estimates (CV<50%) for 17 species and moderately robust estimates for another five species (CV=50-75%; Table 11). MCB should effectively monitor these 25 species, which represent 22% of all species recorded from sage shrubland in 2005.

Brewer's Sparrow, Vesper Sparrow, Horned Lark, Broad-tailed Hummingbird, and Western Meadowlark were among the most abundant species in this habitat this year. Eight species (Ring-necked Pheasant, Killdeer, Sage Thrasher, Brewer's Sparrow, Vesper Sparrow, Sage Sparrow, Western Meadowlark, and Brewer's Blackbird) had higher estimated densities in sage shrubland than in other habitats surveyed in 2005.

Table 11. Estimated densities of breeding birds in sage shrubland in Colorado, 2005.

Species	D	LCL	UCL	CV	n	N
Ring-necked Pheasant	0.14	0.05	0.40	52.8%	32	32
Killdeer	2.55	1.30	4.99	34.4%	30	34
Mourning Dove	3.69	2.11	6.48	28.6%	129	153
Broad-tailed Hummingbird	22.14	7.50	65.30	57.8%	26	29
Western Kingbird	1.57	0.69	3.58	42.6%	29	33
Black-billed Magpie	0.69	0.28	1.70	47.1%	41	41
Common Raven	0.18	0.09	0.38	37.1%	26	33
Horned Lark	24.43	13.59	43.93	29.6%	216	239
Mountain Bluebird	1.79	0.72	4.42	47.3%	25	25
American Robin	3.43	1.40	8.45	47.2%	37	45
Sage Thrasher	16.38	8.88	30.20	30.7%	256	269
Green-tailed Towhee	20.14	9.89	41.04	36.3%	192	207
Cassin's Sparrow	7.83	3.39	18.06	43.2%	133	136
Brewer's Sparrow	95.34	64.73	140.42	19.5%	541	573
Vesper Sparrow	33.49	20.09	55.85	26.1%	251	261
Lark Sparrow	10.57	4.67	23.92	41.8%	84	97
Sage Sparrow	4.95	1.84	13.31	51.6%	42	43
Lark Bunting	3.57	1.28	9.98	53.6%	96	97
Grasshopper Sparrow	3.30	1.14	9.59	55.9%	77	80
Western Meadowlark	21.49	14.22	32.48	20.5%	565	595
Brewer's Blackbird	5.30	2.15	13.06	46.7%	49	81
Brown-headed Cowbird	5.13	2.17	12.10	45.1%	50	63

D = density estimate in birds/km^2; LCL and UCL = lower and upper 95% confidence limits on D; CV = coefficient of variation of D; n = number of observations used to estimate D; N = number of individuals detected

Semidesert Shrubland (SE)

RMBO staff conducted 445 point counts along 30 transects in semidesert shrubland between 15 May and 15 June 2005 (Table 1). They recorded a total of 2,988 birds in this habitat, with an average of 6.7 birds detected per count station

(Table 2). Observers detected 87 species in total and, on average, detected 3.5 species per point count and 14.8 species per site.

The point-transect data from semidesert shrubland habitat yielded robust density estimates (CV<50%) for nine species and moderately robust estimates for another seven species (CV=50-75%; Table 12). MCB should effectively monitor these 16 species, which represent 18% of all species recorded from semidesert shrubland in 2005.

Horned Lark, Lark Sparrow, Brewer's Sparrow, Western Meadowlark, and Vesper Sparrow were among the most abundant species in this habitat this year. Four species (Western Kingbird, Northern Mockingbird, Lark Sparrow, and Bullock's Oriole) had higher estimated densities in semidesert shrubland than in other habitats surveyed in 2005.

Table 12. Estimated densities of breeding birds in semidesert shrubland in Colorado, 2005.

Species	D	LCL	UCL	CV	n	N
Mourning Dove	5.83	3.73	9.11	22.4%	156	224
Western Kingbird	3.58	1.59	8.05	41.8%	59	78
Black-billed Magpie	0.96	0.36	2.58	52.2%	26	28
Common Raven	0.41	0.22	0.74	30.5%	52	60
Horned Lark	39.49	23.57	66.16	25.9%	360	435
Rock Wren	1.39	0.69	2.80	36.0%	40	41
Northern Mockingbird	3.29	1.53	7.08	39.1%	99	100
Sage Thrasher	0.80	0.28	2.31	55.3%	44	44
Brewer's Sparrow	32.00	12.13	84.38	51.6%	166	180
Vesper Sparrow	10.44	4.51	24.17	42.9%	87	110
Lark Sparrow	34.01	18.49	62.54	31.3%	187	207
Lark Bunting	2.18	0.61	7.75	68.7%	52	56
Red-winged Blackbird	1.05	0.37	2.98	55.9%	36	40
Western Meadowlark	13.15	8.76	19.74	20.4%	460	473
Brown-headed Cowbird	2.85	1.00	8.17	56.1%	25	27
Bullock's Oriole	3.98	1.44	11.02	53.8%	40	46

D = density estimate in birds/km^2; LCL and UCL = lower and upper 95% confidence limits on D; CV = coefficient of variation of D; n = number of observations used to estimate D; N = number of individuals detected

Spruce-Fir (SF)

RMBO staff conducted 402 point counts along 27 transects in sage shrubland between 27 June and 16 July 2005 (Table 1). They recorded a total of 3,033 birds in this habitat with an average of 7.5 birds detected per count station (Table 2). Observers detected 67 species in total and, on average, detected 5.5 species per point count and 20.7 species per site.

The point-transect data from spruce-fir habitat yielded robust density estimates (CV<50%) for 20 species and a moderately robust estimate for one species (CV=50-75%; Table 13). MCB should effectively monitor these 21 species, which represent 31% of all species recorded from spruce-fir in 2005.

Broad-tailed Hummingbird, Pine Siskin, Mountain Chickadee, Dark-eyed Junco, and Yellow-rumped Warbler were among the most abundant species in this habitat this year. Five species (Hairy Woodpecker, Gray Jay, Golden-crowned Kinglet, Ruby-crowned Kinglet, and Hermit Thrush) had higher estimated densities in spruce-fir than in other habitats surveyed in 2005.

Table 13. Estimated densities of breeding birds in spruce-fir in Colorado, 2005.

Species	D	LCL	UCL	CV	n	N
Broad-tailed Hummingbird	117.99	48.65	286.17	46.4%	29	40
Hairy Woodpecker	5.59	2.91	10.72	33.3%	27	30
Northern Flicker	1.66	0.92	3.00	30.2%	29	31
Warbling Vireo	11.46	4.72	27.82	46.5%	31	31
Gray Jay	5.99	3.51	10.22	27.3%	33	38
Steller's Jay	7.56	1.95	29.37	75.0%	29	30
Clark's Nutcracker	1.51	0.67	3.41	42.3%	28	29
Mountain Chickadee	82.32	57.94	116.97	17.9%	182	207
Red-breasted Nuthatch	7.36	3.38	16.03	40.1%	28	28
Golden-crowned Kinglet	28.84	16.80	49.51	27.4%	45	48
Ruby-crowned Kinglet	63.17	48.30	82.63	13.6%	358	364
Hermit Thrush	26.83	18.30	39.33	19.6%	316	336
American Robin	57.95	41.29	81.34	17.1%	180	186
Yellow-rumped Warbler	76.37	57.29	101.81	14.6%	273	279
Western Tanager	8.15	3.40	19.52	45.8%	36	37
Chipping Sparrow	5.19	2.84	9.46	30.6%	48	54
Lincoln's Sparrow	8.78	4.85	15.91	29.9%	77	78
White-crowned Sparrow	6.54	3.11	13.74	38.0%	46	59
Dark-eyed Junco	80.47	59.07	109.62	15.7%	282	340
Red Crossbill	9.26	3.97	21.58	44.3%	39	51
Pine Siskin	102.50	68.75	152.81	20.3%	163	234

D = density estimate in birds/km^2; LCL and UCL = lower and upper 95% confidence limits on D; CV = coefficient of variation of D; n = number of observations used to estimate D; N = number of individuals detected

Wetland (WE)

RMBO staff conducted 39 transects in wetland habitat between 12 May and 11 July 2005 (Table 1). They recorded a total of 1,930 birds in this habitat, a total of 107 species, and 13.2 species per site (Table 2).

The line-transect data from wetland habitat yielded robust density estimates (CV<50%) for 10 species (Table 14). MCB should effectively monitor these 10 species, which represent 9% of all species recorded from wetland in 2005.

Red-winged Blackbird, Yellow-headed Blackbird, Common Yellowthroat, Mourning Dove, and Brown-headed Cowbird were among the most abundant species in this habitat this year. Nine species (Gadwall, Mallard, American Coot, Mourning Dove, Marsh Wren, Common Yellowthroat, Red-winged Blackbird, Yellow-headed Blackbird, and Brown-headed Cowbird) had higher estimated densities in wetland than in other habitats surveyed in 2005.

Table 14. Estimated densities of breeding birds in wetland in Colorado, 2005.

Species	D	LCL	UCL	CV	n	N
Gadwall	3.60	1.79	7.25	36.2%	25	42
Mallard	4.83	2.65	8.80	30.8%	40	59
American Coot	8.48	4.27	16.87	35.3%	60	88
Mourning Dove	55.68	26.50	117.01	38.7%	50	64
Marsh Wren	7.66	3.58	16.37	39.2%	38	38
Common Yellowthroat	89.79	60.98	132.20	19.6%	89	98
Red-winged Blackbird	302.94	196.73	466.46	21.7%	261	580
Western Meadowlark	10.58	6.13	18.26	27.8%	35	36
Yellow-headed Blackbird	92.85	49.90	172.76	31.7%	141	185
Brown-headed Cowbird	23.76	10.51	53.70	42.5%	29	38

D = density estimate in birds/km^2; LCL and UCL = lower and upper 95% confidence limits on D; CV = coefficient of variation of D; n = number of observations used to estimate D; N = number of individuals detected

DISCUSSION AND RECOMMENDATIONS

Prospects for Population Monitoring

The habitat-stratified point transects produced excellent results with low coefficients of variation (≤ 50%) for 84 bird species in at least one habitat surveyed in 2005, including several Species of Greatest Conservation Need as noted in Colorado's Comprehensive Wildlife Conservation Strategy (CDOW 2005). Thus we should be able to detect habitat-specific population trends for these species within our maximum target of 30 years.

We obtained sufficient data on an additional 35 species to monitor their populations across habitat types, although in some cases, these species may be better monitored with additional transects in a certain habitat. For several more species, we generally do not record enough detections either within one habitat or across habitats annually to generate density estimates (e.g., Say's Pheobe, Loggerhead Shrike). Given interest, however, with several years' data we may be able to pool data across years and habitats and weight observations by habitat area to generate global detection functions for these species, and thereby generate annual statewide density estimates that may be robust enough for population trend monitoring.

The 119 species for which we have enough data to monitor either within or across habitats represent about 56% of *all species* observed in the twelve habitats surveyed in 2005, but they represent almost 98% of all *individual birds* observed. The other 44% of species (~2% of birds observed) fall into one of the following categories below:

1) Low-density, highly localized species (e.g., Lewis's Woodpecker);
2) Low-density, widespread species (e.g., Northern Goshawk);
3) Irregular species (e.g., Dickcissel);
4) Vagrant species (e.g. Northern Parula);
5) Species that occur mainly outside of Colorado in other habitats (e.g., McCown's Longspur);
6) Nocturnal species (e.g., Flammulated Owl);
7) Wetland-obligate species (e.g. American White Pelican); and
8) Species that are most readily detectable prior to late May (e.g. Greater Sage-Grouse).

Species in the aforementioned groups, except vagrant species, could be monitored through additional effort using one or more of the following survey techniques:

1) Additional point transects in existing habitats;
2) Complete census of small, localized populations;
3) Complete census of birds at nesting sites (e.g., colonies, eyries, etc);

4) Species-specific call-response surveys;
5) Nocturnal surveys;
6) Wetland surveys; and
7) Early-season (i.e., winter/spring) surveys.

One effective way to monitor the health of bird populations, especially small ones, is to monitor reproductive output at nests. While this method can be more labor intensive than count-based monitoring, depending on the species in question and the detail of information needed, monitoring reproductive output does not necessarily imply high costs.

For species with small populations, such as Golden Eagles and Prairie Falcons, monitoring could be achieved by locating active nests and visiting a subset during the spring and summer as necessary to evaluate the outcome of each. Nests would first be located by consulting with local biologists, birders, and other experts, and then as part of the field effort, additional suitable habitat could be searched to locate previously unrecorded nests. Ultimately, the majority of active nests would be included in the monitoring scheme and a random subset would be visited each year to check for occupancy and outcome.

For some low-density but widespread species, such as Northern Goshawk, a brief call-response survey could be used to detect the presence of this or other similar species across the areas already covered by the habitat-stratified point transects. A high-powered, yet highly portable playback system would be required for each observer, but other than this expense, relatively few additional expenses would be incurred. RMBO will be implementing a pilot study in 2006 that will use a call-playback technique developed by the USFS for Northern Goshawk. This study will be conducted in several National Forests through out Colorado, Wyoming and the Black Hills.

RMBO has been implementing some of these techniques through the special-species program under MCB with great success. Details of these findings are available in the 2005 MCB special species report, which will be available for download on our website. RMBO is open to discussing implementing additional techniques for targeted species with our Colorado partners.

Coordinated Bird Monitoring

Coordinated Bird Monitoring (CBM) is an ongoing effort that began with the Western Working Group of Partners in Flight in 1999, to integrate existing monitoring data to estimate trends in population size, describe changes in abundance, and monitor several fitness indicators. CBM focuses on management issues and, ideally, the integration will be useful at many spatial and administrative levels.

RMBO has been working with the Western Working Group of PIF over the last few years to implement CBM, especially in the Intermountain West. We are in

the process of redesigning our web site to enable web-based queries of our data and the display of results by habitat, management unit, ecoregion, and other scales. Some of these data will be available via web crawlers to a larger network of monitoring programs so that data can be queried at a regional level in collaboration with CBM. Currently, several partners are involved in this effort, including the Avian Science Center at the University of Montana, Cornell Lab of Ornithology's Avian Knowledge Network, and the US Geological Survey. Within the next few years, we plan to merge results, broaden our scale of comparison, and provide our collaborators with an easily accessible and more dynamic dataset.

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APPENDIX A. SPECIES ACCOUNTS

In this section we present one-page accounts and a one-page map for each bird species detected in 2005 that is of management interest, as designated by either the BLM, USFS, Partners in Flight, USFWS and/or CDOW. Species covered more thoroughly in the 2005 MCB special species report are not included in these accounts.

All species accounts follow the same format with an overview of our findings, a table of the density estimates by habitat, a comparison of density estimates by habitat and management unit (providing there were sufficient data), and a summary of the findings and prospect for monitoring. In the density estimate tables we present *N, the number of individuals observed*, and if N was at least 25, we also present *n, the number of independent observations for each species*. These numbers may be different as often several individuals are detected in a single observation, as when birds are in a flock. While the number of individuals observed is of interest, especially for rare species, density estimates are derived using only independent observations. The codes used to describe each project and the habitats where we conducted surveys are listed in Tables 9 and 10.

Table 9. List of projects and project codes used in the species accounts.

Project	Project Code
Monitoring Colorado's Birds	MCB
Monitoring Birds of the Black Hills	MBBH
Monitoring Wyoming's Birds	MWB
Monitoring Wyoming's Birds – Bighorn National Forest	MWB-BI
Monitoring Wyoming's Birds – Shoshone National Forest	MWB-SH
Monitoring the Birds of the Carson National Forest	MBCNF
Monitoring Birds of the Northern Colorado Plateau Network	NCPN

Table 10. List of Habitat types by project used in the species accounts.

Habitat Type	Code	Project
Aspen	AS	MCB, MWB, MBCNF
Alpine Tundra	AT	MCB
Burn Areas	BU	MBBH
Foothills Riparian	FR	MBBH
Grassland	GR	MCB, MWB, MBCNF
High-elevation Conifer	HC	MWB-BI
High-elevation Riparian	HR	MCB
Juniper Woodland	JW	MWB
Low-elevation Riparian	LR	NCPN
Mid-elevation Conifer	MC	MWB, MWB-BI, MWB-SH
Mixed Conifer	MC	MCB, MWB, MBCNF
Montane Grassland	MG	MWB-SH
Montane Riparian	MR	MWB, MWB-BI, MWB-SH, MBBH
Montane Shrubland	MS	MCB
Pinyon Juniper	PJ	MCB, MBCNF, MBBH, NCPN
Ponderosa Pine, northern hills	PN	MBBH

Table 10 cont. List of Habitat types by project used in the species accounts.

Habitat Type	Code	Project
Ponderosa Pine	PP	MCB, MBCNF
Ponderosa Pine, southern hills	PS	MBBH
Sage Shrubland	SA	MCB, MBCNF, NCPN
Semi-desert Shrubland	SE	MCB
Spruce Fir	SF	MCB, NCPN
Shrubsteppe	SS	MWB, MWB-BI
Wetlands	WE	MCB
White Spruce	WS	MBBH

The geographic distribution maps in the following accounts depict the locations and relative abundance of species of management interest that were detected on point transects in 2005. Wetland transects, since they are line transects, are not depicted in the maps. For more information on wetland species please see the 2005 MCB special species report. The relative abundance scale used in the maps is based on the average number of birds observed per point count *along each transect* where the species was detected, and the scale will vary by species depending on the number of detections of that species. Also, the location of each dot does not necessarily indicate the precise location of the point at which the species was observed, but rather the access point of that transect. It is important to keep in mind that the maps only reflect the abundance and distribution of the species across the sites we surveyed, and should not necessarily be construed to suggest anything about the areas in between. Finally, as a note of caution, species may seem more abundant in certain areas, especially the Black Hills, because the sampling effort is greater within a smaller area and not necessarily because it is in fact more abundant. Therefore, it is important to consider the level of sampling effort in conjunction with the index of abundance when comparing a species' occurrence across the region.

In the summary, we tried to briefly describe the breeding habitat for each species in Colorado, other pertinent information, and evaluate our ability to monitor the species under MCB. If we had enough detections to calculate a density estimate for the species and the coefficient of variation was 0.50 or less, we assumed that we will be able to effectively monitor the species and detect a population trend (decline of 3.0% per year) in at least 30 years. Although there is yearly variation in the coefficient of variation for each species, typically it does not fluctuate beyond our ability to calculate a density estimate. RMBO also implements a section-based survey technique in eastern Colorado. The sampling unit for this technique is a section (1 mi. X 1mi.). At each sampling unit we conduct three, five minute, 180 degree, road-based point counts looking into the section. We indicate our ability to also monitor a species through this technique in the species accounts. Overall, the section-survey program should be able to monitor bird population trends for approximately 30 species within the shortgrass prairie of eastern Colorado.

Greater Sage-Grouse
(*Centrocercus urophasianus*)

BLM Sensitive Species
State Candidate - Threatened and Endangered Species List
CDOW - Species of Greatest Conservation Need
USFS Region 2 Sensitive Species
PIF Species of Continental and Regional Concern
CO-PIF Physiographic Regions 62 and 87 Priority Species

We detected 3 Greater Sage-Grouse in sage shrubland on the MCB project in 2005. We also detected this species on the MWB and NCPN projects. Detections were too few, however, to calculate a density estimate for this species in any habitat on any project.

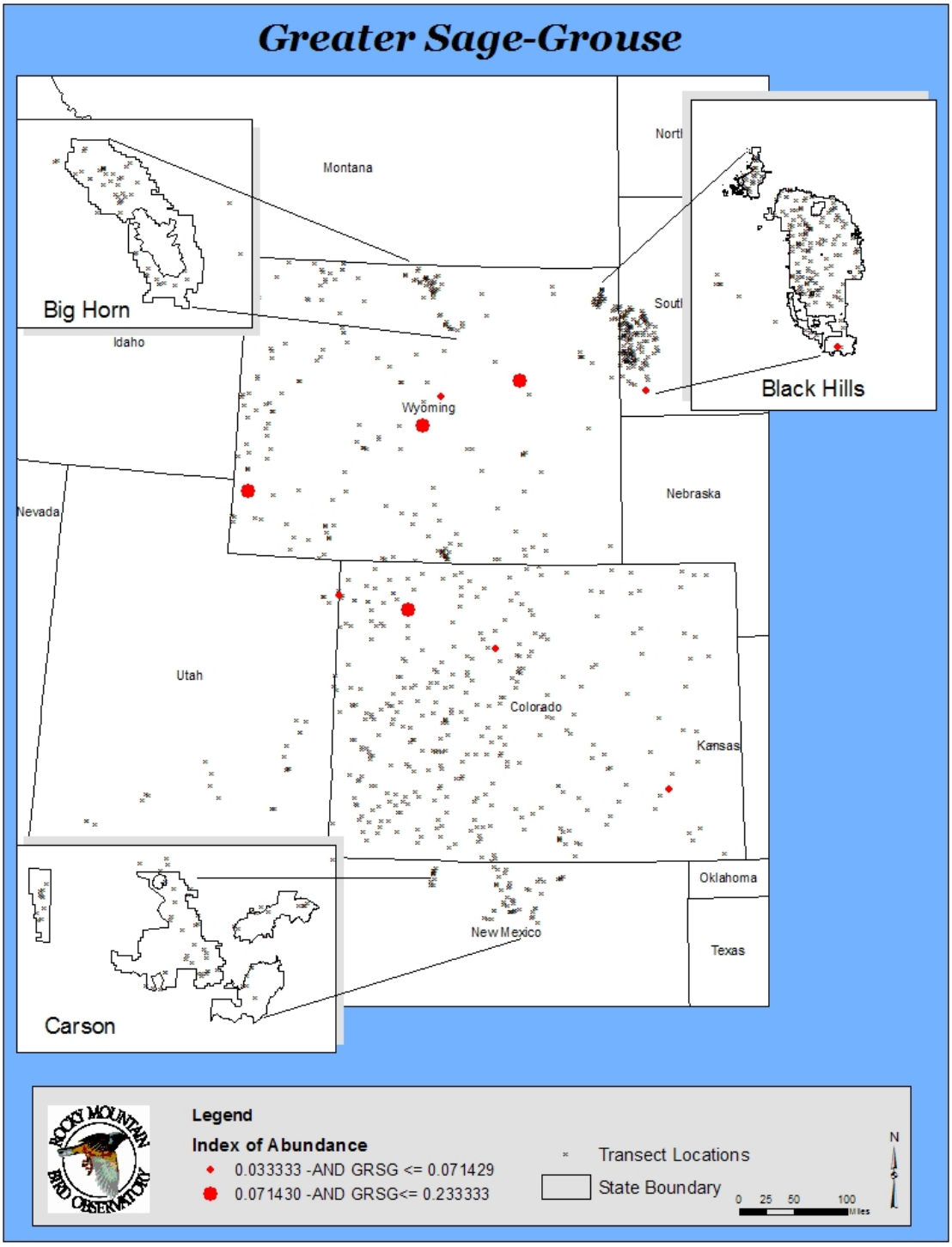
Total number of independent detections, number of individuals, and habitat-specific density estimates for Greater Sage-Grouse for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
SA	ID	--	--	--	--	3

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – As the name implies, Greater Sage-Grouse is found in large, contiguous stands of sagebrush that also have a healthy grass component (Kingery 1998). Historically, this species was abundant wherever sagebrush was present, but today habitat conversion and degradation have resulted in this species being listed as of high conservation importance both locally and across its range (Audubon 2002). A recent study has shown that this species is negatively impacted by natural gas wells near leks and, as these wells are planned for much of its range across the state, further habitat loss for this species is likely (Holloran 2005). The species was recently proposed for listing under the Endangered Species Act.

This monitoring project does not target Greater Sage-Grouse or any gallinaceous birds, all of which are game species in Colorado, whose populations are monitored by the CDOW. Although we do regularly detect this species on sage shrubland transects it is unlikely that we will be able to monitor this species through point-transect under MCB due to its rarity, localized nature, and timing of breeding.


Greater Sage-Grouse
Montana
Big Horn
Idaho
Wyoming
Nevada
Utah
Colorado
Nebraska
Kansas
Oklahoma
Texas
New Mexico
Black Hills
Carson
Legend
Index of Abundance
0.033333 -AND GRSG <= 0.071429
0.071430 -AND GRSG<= 0.233333
Transect Locations
State Boundary
0 25 50 100
Miles
N

White-tailed Ptarmigan

(Lagopus leucurus)

CDOW - Species of Greatest Conservation Need
CO-PIF Physiographic Region 62 Priority Species
USFS Region 2 Sensitive Species
USFWS Bird of Conservation Concern – BCR16

We detected 18 White-tailed Ptarmigan in alpine tundra on the MCB project in 2005. We did not detect this species on other RMBO point-transect monitoring projects; however, those projects do not monitor alpine-tundra habitat, the only habitat occupied by White-tailed Ptarmigan.

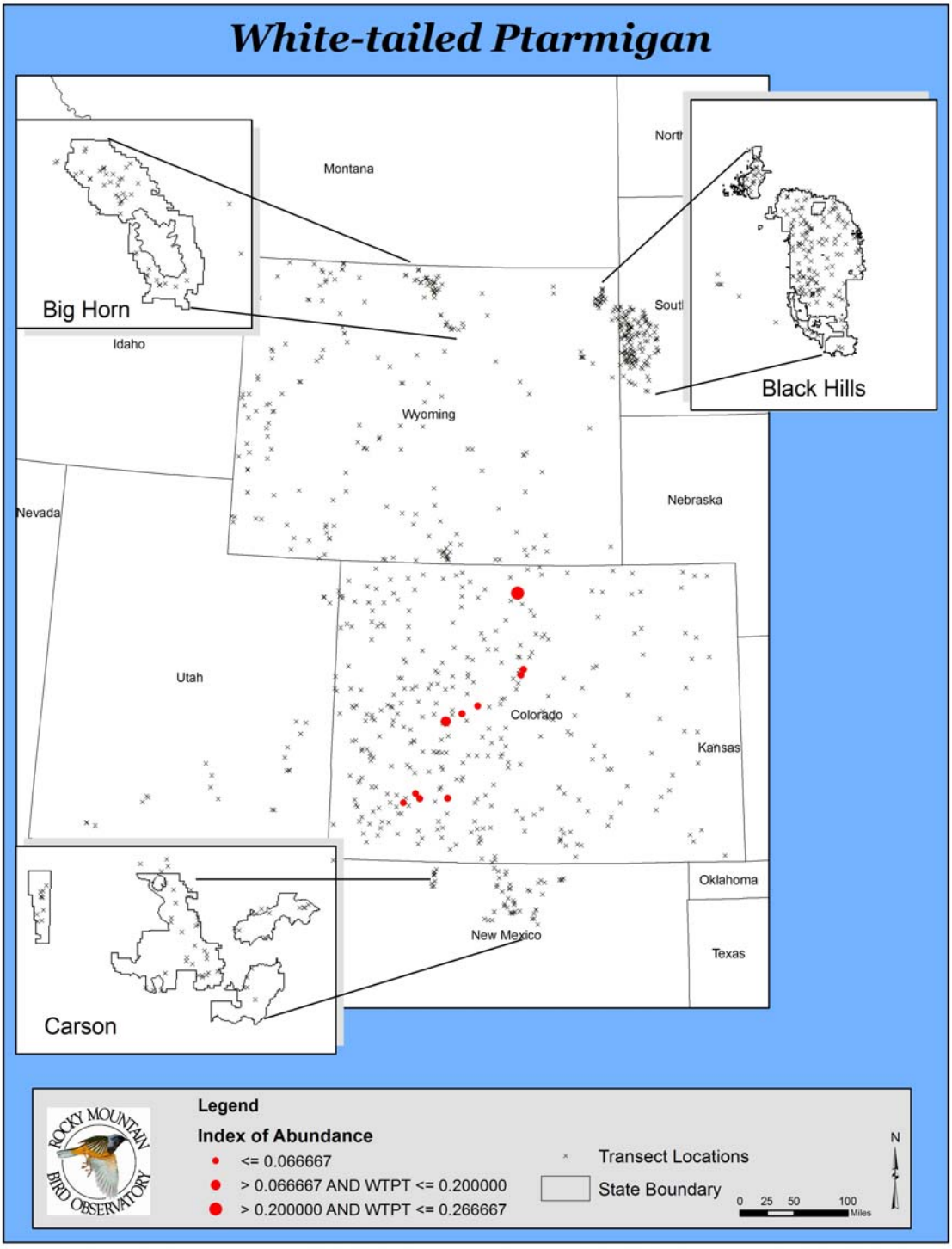
Total number of independent detections, number of individuals, and habitat-specific density estimates for White-tailed Ptarmigan for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
AT	ID	--	--	--	--	18

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – White-tailed Ptarmigan stays in or near the tundra throughout the year. Birds are undoubtedly missed during surveys as they are extremely cryptic in the tundra grasses and rocks.

We detect this species in low numbers every year along alpine tundra point-count transects. Most often we detect them between point count stations when they flush to avoid observers. Detections of this species are too low to monitor their status through point-count transects under MCB. Given interest, however, with several years' data we may be able to pool data across years and habitats and weight observations by habitat area to generate a global detection function for this species and thereby generate an annual statewide density estimate that may be robust enough for population trend monitoring.


White-tailed Ptarmigan
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nebraska
Nevada
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.066667
> 0.066667 AND WTPT <= 0.200000
> 0.200000 AND WTPT <= 0.266667
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Blue Grouse

(Dendragapus obscurus)

CDOW - Species of Greatest Conservation Need
PIF Species of Continental Concern
CO-PIF Physiographic Region 62 Priority Species

In 2005, we detected 48 Blue Grouse in six habitats on the MCB project. We also detected Blue Grouse on the MBCNF, MCB and NCPN projects. The number of detections, however, was too low to calculate a density estimate for this species in any habitat on any project.

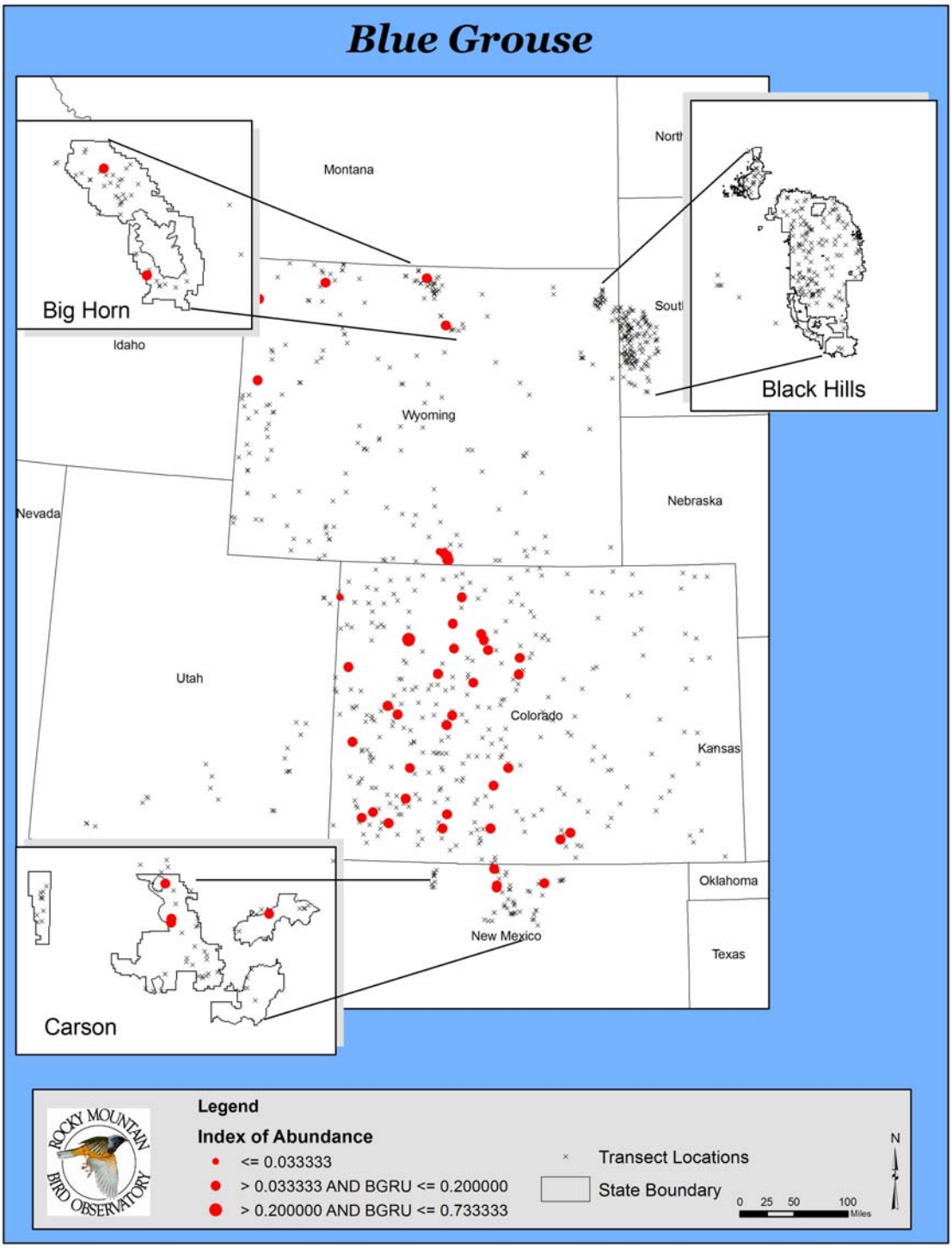
Total number of independent detections, number of individuals, and habitat-specific density estimates for Blue Grouse for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
AS	ID	--	--	--	--	3
AT	ID	--	--	--	--	1
MC	ID	--	--	--	--	11
MS	ID	--	--	--	--	20
PP	ID	--	--	--	--	2
SF	ID	--	--	--	--	11

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Blue Grouse can usually be found in coniferous forests or shrubby lowlands in summer, and some move to higher elevations in the fall to spend the winter (Righter et al. 2004). Blue Grouse are hunted in Colorado and throughout much of the species' range.

We detect this species in low numbers every year especially in mixed conifer, montane shrubland, spruce-fir and aspen habitats. Blue Grouse are often detected along transects and less frequently at point-count stations. Data from the full spectrum of habitat-based point transects across the state may provide a means to loosely track the status of Blue Grouse over time.


Blue Grouse
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.033333
> 0.033333 AND BGRU <= 0.200000
> 0.200000 AND BGRU <= 0.733333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Greater Prairie-Chicken
(*Tympanuchus cupido*)

CDOW - Species of Greatest Conservation Need
PIF Species of Continental and Regional Concern
PIF Species of Regional Concern
CO-PIF Physiographic Region 36 Priority Species
USFS Region 2 Sensitive Species
USFWS Bird of Conservation Concern – BCR18

In 2005, we detected 14 Greater Prairie-Chickens in grassland and sage shrubland on the MCB project. We did not detect this species on any of the other RMBO point-count transect projects. Detections of this species were too few to calculate a density estimate for MCB.

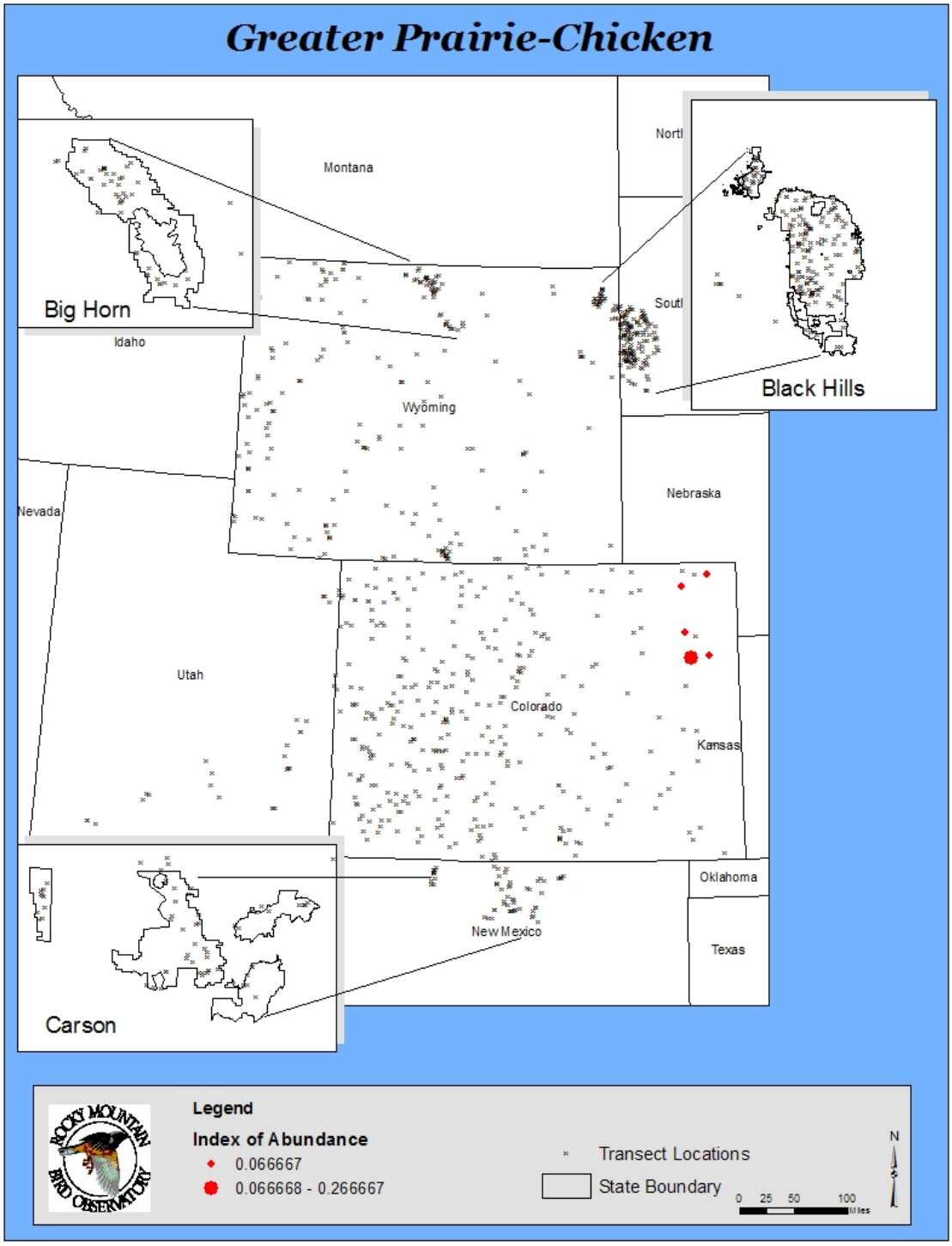
Total number of independent detections, number of individuals, and habitat-specific density estimates for Greater Prairie-Chicken for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
GR	ID	--	--	--	--	11
SA	ID	--	--	--	--	3

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Greater Prairie-Chicken is found in northeastern Colorado in the region known as the sandhills. Interestingly, this species is believed not to have existed in Colorado until the very end of the 1800s as birds colonized and thrived in areas with grain production (Andrews and Righter 1992). In fact, this species spread all of the way to the Denver area (Barr Lake) by the early 1900s. Changing agricultural practices quickly forced the range to shrink back to where it is today (Andrews and Righter 1992).

We detect this species in most years on MCB transects, however the number of detections is always low. Given the species' rarity and localized nature in Colorado, it is unlikely that we will be able to monitor this species in any habitat on the MCB project. Adding additional grassland and sage shrubland transects in the northeastern part of the state may improve our ability to monitor this species. However, as a gallinaceous bird, Greater Prairie-Chicken is monitored by CDOW.


Greater Prairie-Chicken
Montana
Nortl
Soutl
Big Horn
Black Hills
Idaho
Wyoming
Nebraska
Nevada
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
0.066667
0.066668 - 0.266667
Transect Locations
State Boundary
0 25 50 100
Miles
N

Northern Harrier
(*Circus cyaneus*)

CDOW - Species of Greatest Conservation Need
PIF Species of Regional Concern
CO-PIF Physiographic Regions 36 & 87 Priority Species
USFS Region 2 Sensitive Species
USFWS Bird of Conservation Concern – BCR 16 & 18

In 2005, we detected 26 Northern Harriers in five habitats on the MCB project. We detected Northern Harrier on all RMBO monitoring projects except MBCNF. We did not detect Northern Harrier in sufficient numbers to calculate a density estimate in any habitat on any monitoring project.

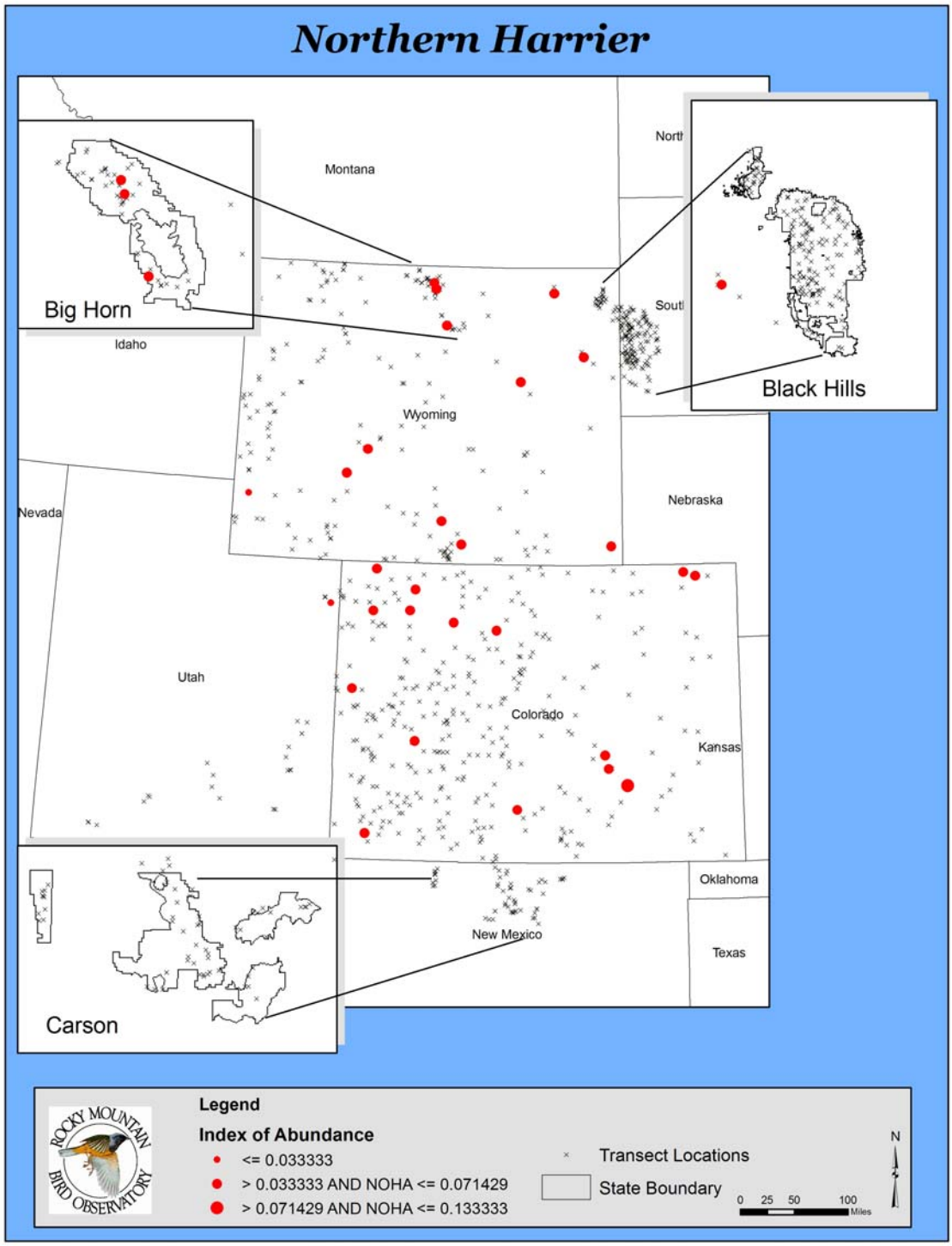
Total number of independent detections, number of individuals, and habitat-specific density estimates for Northern Harrier for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
GR	ID	--	--	--	--	1
MS	ID	--	--	--	--	1
SA	ID	--	--	--	--	6
SE	ID	--	--	--	--	9
WE	ID	--	--	--	--	9

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Historically, Northern Harrier was thought to be one of the most common raptors of the plains, but populations have been declining since the 1970s due to habitat loss, particularly of wetlands (Cornell 2003).

Northern Harrier, like other raptor species, is difficult to monitor under MCB using the point-transect protocol because of its low density and large territory size. Therefore, it is unlikely that we will be able to effectively monitor this species in any individual habitat. Adding transects, especially in sage shrubland and semidesert shrubland habitats, may improve our ability to monitor this species. Given interest, we may also be able to pool data across the full range of habitats to calculate a density estimate on a yearly basis and loosely track its status in Colorado over time.


Northern Harrier
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.033333
> 0.033333 AND NOHA <= 0.071429
> 0.071429 AND NOHA <= 0.133333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Northern Goshawk

(Accipiter gentilis)

BLM Sensitive Species
CDOW - Species of Greatest Conservation Need
USFS Region 2 Sensitive Species

In 2005, we detected four Northern Goshawks in three habitats on the MCB project. We also detected Northern Goshawk on the MBBH and MWB projects. However, detections of this species were insufficient to calculate density in any habitat on any project.

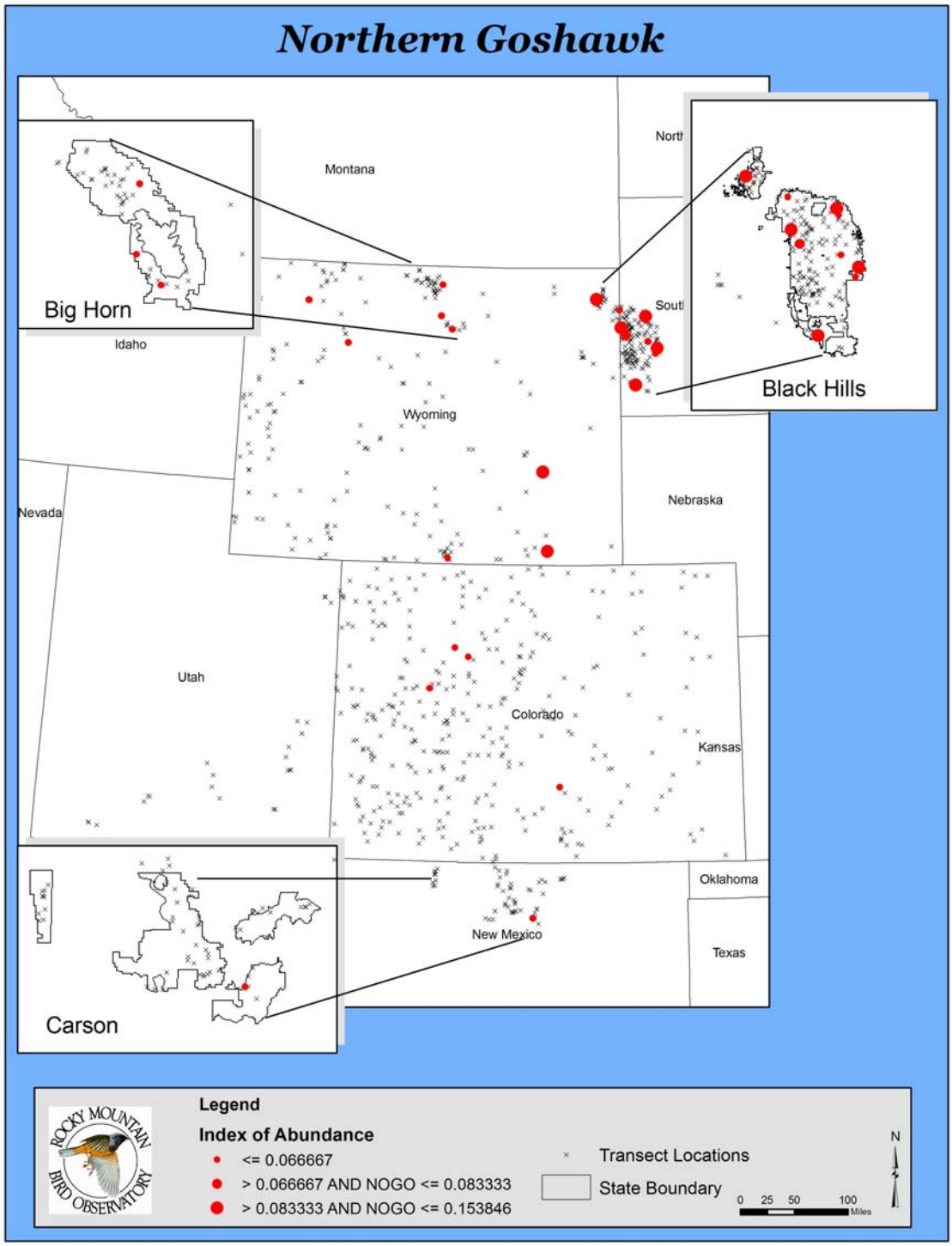
Total number of detections, number of individuals, and habitat-specific density estimates for Northern Goshawk on the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
AS	ID	--	--	--	--	2
MS	ID	--	--	--	--	1
SF	ID	--	--	--	--	1

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Northern Goshawks are believed to inhabit only mature, old-growth forests and require large blocks of forest for nesting and foraging, thus may be vulnerable to the effects of logging (Audubon 2002).

Data from all of the habitat-based point transects will likely not be sufficient to track population trends of Northern Goshawk over time. RMBO will be implementing a pilot study in 2006 that will use a call-playback technique developed by the USFS for Northern Goshawk. This study will be conducted in several National Forests through out Colorado, Wyoming and the Black Hills.


Northern Goshawk
Montana
North
South
Idaho
Wyoming
Nebraska
Nevada
Utah
Colorado
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.066667
> 0.066667 AND NOGO <= 0.083333
> 0.083333 AND NOGO <= 0.153846
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Swainson's Hawk

(Buteo swainsoni)

CDOW - Species of Greatest Conservation Need
PIF Species of Continental and Regional Concern
PIF Regional Stewardship Species
CO-PIF Physiographic Region 36 Priority Species
USFWS Bird of Conservation Concern – BCR 16

In 2005, we detected 26 Swainson's Hawks in six habitats on the MCB project. The only other RMBO monitoring project on which we detected the species in 2005 was the MWB project. We did not detect Swainson's Hawk in sufficient numbers to calculate a density estimate for this species in any habitat on any monitoring project.

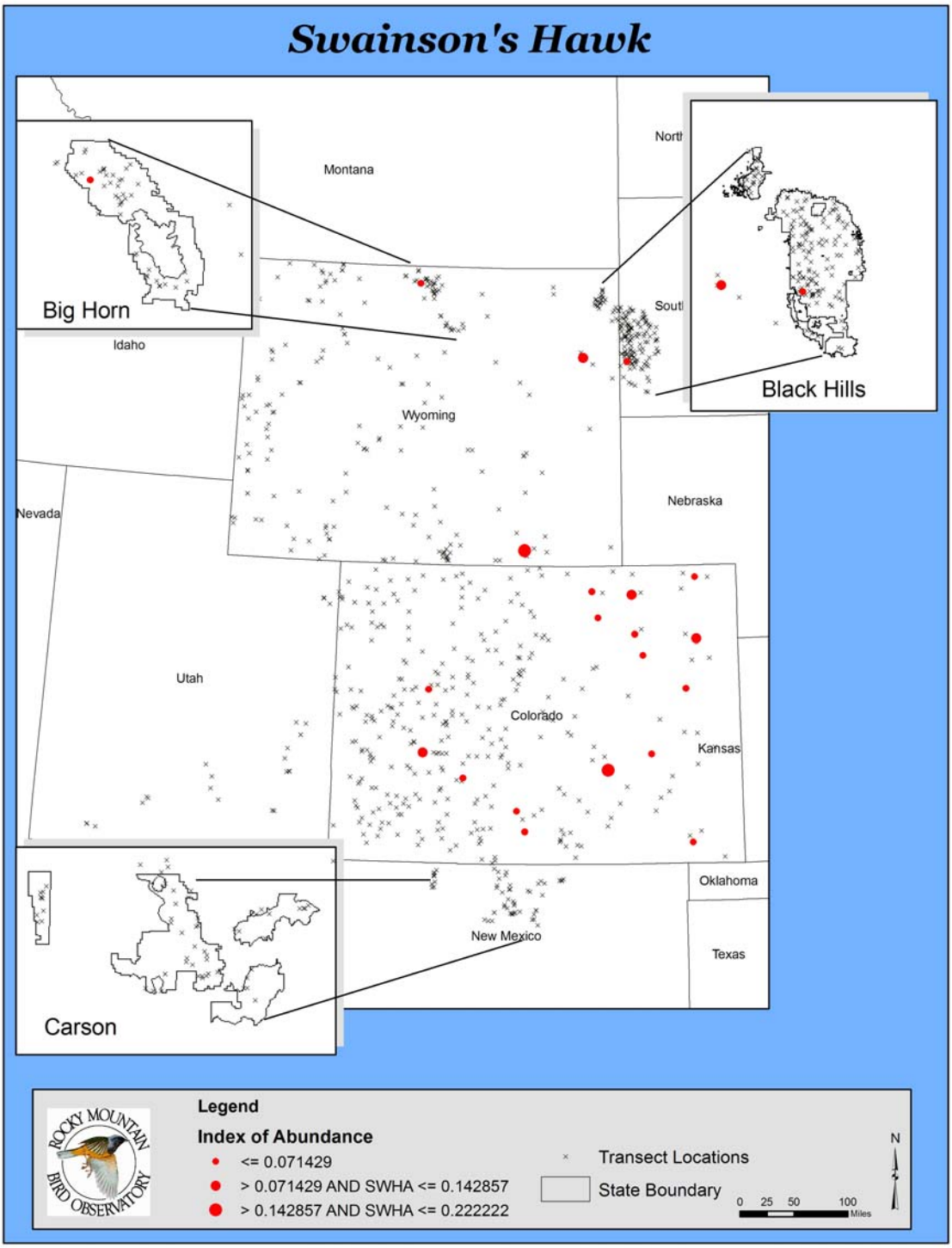
Total number of independent detections, number of individuals, and habitat-specific density estimates for Swainson's Hawk for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	N	N
AS	ID	--	--	--	--	2
GR	ID	--	--	--	--	10
SA	ID	--	--	--	--	4
SE	ID	--	--	--	--	5
SF	ID	--	--	--	--	2
WE	ID	--	--	--	--	3

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – In Colorado, Swainson's Hawks nest most commonly in the eastern prairies but also in shrublands and agricultural areas throughout the state. Interestingly, there are several pairs of this species nesting at high elevation on the Grand Mesa in western Colorado (Righter et al. 2004).

Swainson's Hawk, like other raptor species, is difficult to monitor under MCB using the point-transect protocol, because of its low density and large territory size. Therefore, it is unlikely we will be able to effectively monitor Swainson's Hawk in any individual habitat under MCB. Given interest though, we may be able to pool data across the full range of habitats to calculate a density estimate on a yearly basis and loosely track its status in Colorado over time. Adding transects, especially in grassland habitat may improve our ability to monitor this species. The RMBO section-survey program, however, is currently collecting sufficient data to effectively monitor this species in eastern Colorado.


Swainson's Hawk
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.071429
> 0.071429 AND SWHA <= 0.142857
> 0.142857 AND SWHA <= 0.222222
Transect Locations
State Boundary
0 25 50 100
Miles
N

Ferruginous Hawk

(Buteo regalis)

BLM Sensitive Species
State Candidate - Threatened and Endangered Species List
CDOW - Species of Greatest Conservation Need
PIF Species of Regional Concern
PIF Regional Stewardship Species
CO-PIF Physiographic Region 36 Priority Species
USFWS Bird of Conservation Concern – BCR 16 & 18

In 2005, we detected six Ferruginous Hawks in two habitats on the MCB project and in two habitats on the MWB project. MWB was the only other RMBO monitoring project on which Ferruginous Hawk was detected in 2005. We did not detect this species in sufficient numbers to calculate a density estimate in any habitat on any monitoring project.

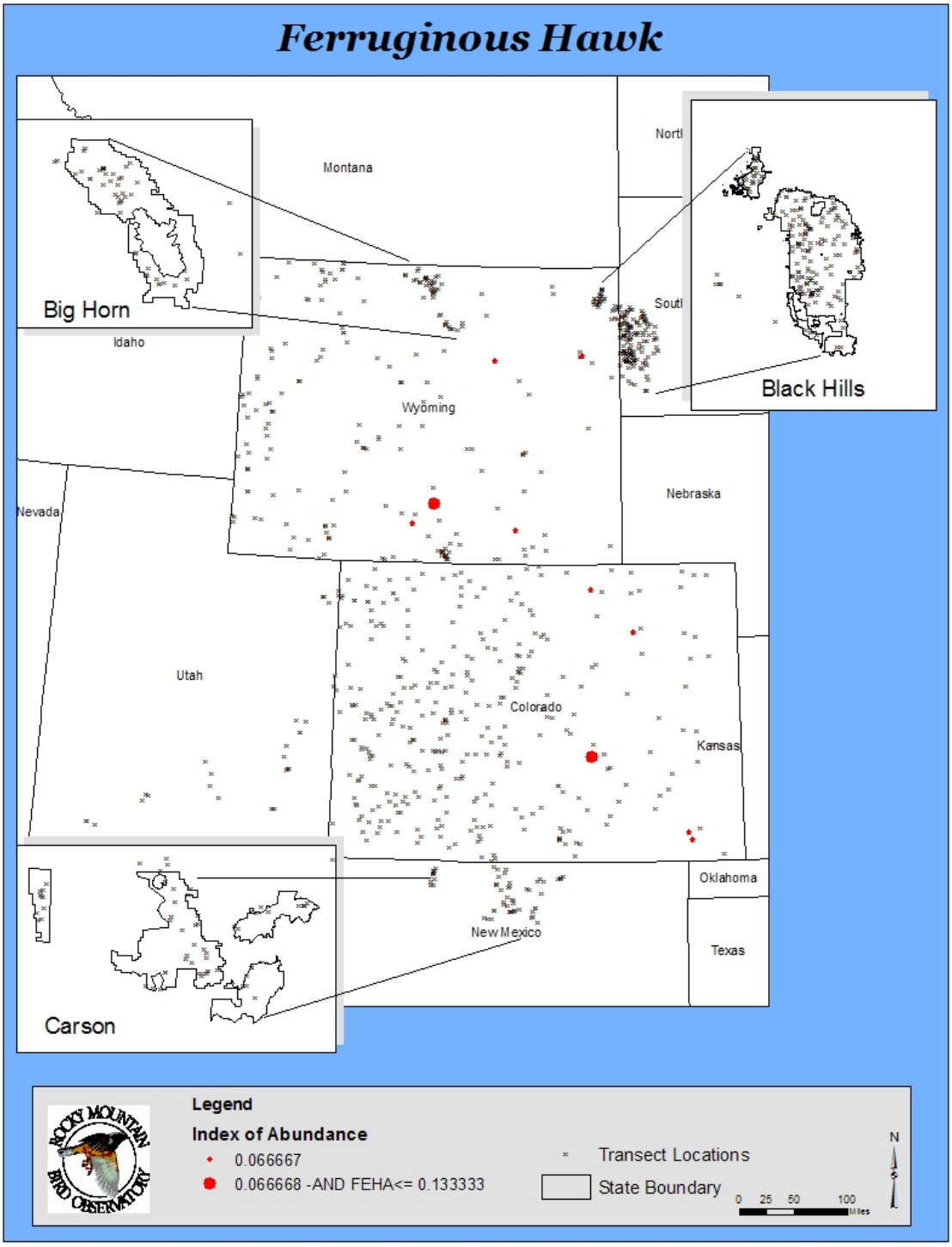
Total number of independent detections, number of individuals, and habitat-specific density estimates for Ferruginous Hawk for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
GR	ID	--	--	--	--	4
SE	ID	--	--	--	--	2

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – In Colorado, Ferruginous Hawks nest most commonly in the eastern prairies but also in semidesert shrubland, and rarely in pinyon-juniper habitat in western Colorado.

Ferruginous Hawk, like other raptor species, is difficult to monitor under MCB using the point-transect protocol, because of its low density and large territory size. Therefore, it is unlikely we will be able to effectively monitor Ferruginous Hawk in any individual habitat or across habitats under MCB. Adding transects, especially in grassland habitat may also improve our ability to monitor this species; however, effective monitoring will likely best be accomplished through locating and monitoring all known nests of this species in Colorado. Such an effort could be incorporated into the MCB special species program in a cost-effective manner, especially if combined with similar efforts for other raptor species (e.g., Swainson's Hawk).


Ferruginous Hawk
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Nebraska
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
0.066667
0.066668 -AND FEHA<= 0.133333
Transect Locations
State Boundary
0 25 50 100
Miles
N

Golden Eagle

(Aquila chrysaetos)

CDOW - Species of Greatest Conservation Need
PIF Species of Regional Concern
USFWS Bird of Conservation Concern – BCR 16

In 2005, we detected 22 Golden Eagles in seven habitats on the MCB project. Golden Eagle was detected on all the RMBO point-transect monitoring project in 2005, except MBCNF. We did not detect Golden Eagle in sufficient numbers to calculate a density estimate in any habitat on any monitoring project.

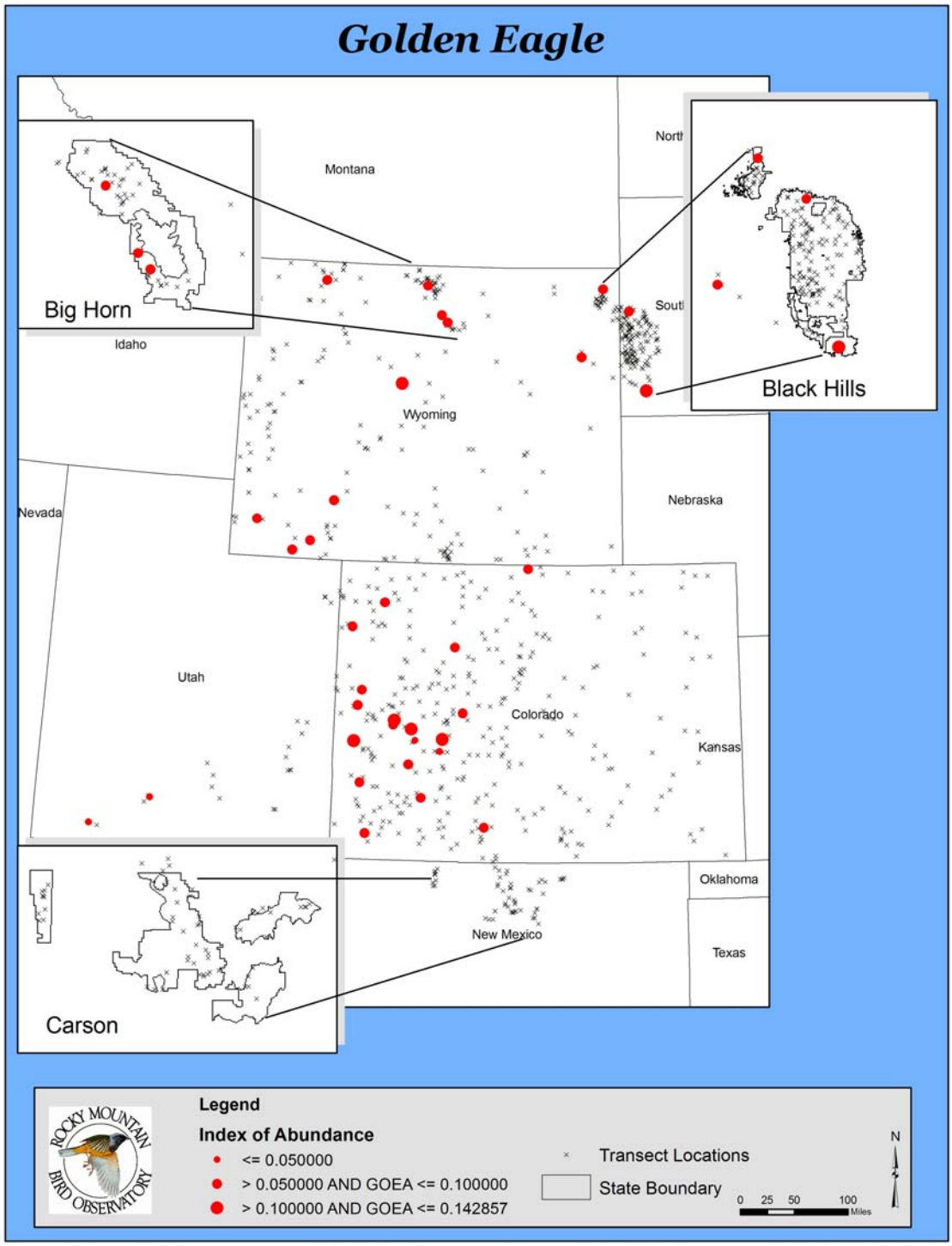
Total number of independent detections, number of individuals, and habitat-specific density estimates for Golden Eagle for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
AS	ID	--	--	--	--	1
AT	ID	--	--	--	--	5
MC	ID	--	--	--	--	1
PJ	ID	--	--	--	--	2
PP	ID	--	--	--	--	2
SE	ID	--	--	--	--	9
WE	ID	--	--	--	--	2

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Golden Eagles inhabit a wide variety of habitats, with most nesting on cliffs, but some nest in trees. Because of their size, Golden Eagles need vast expanses of hunting space, usually over open habitats including grassland, sagebrush, farmlands, and even tundra.

Golden Eagle, like other raptor species, is difficult to monitor under MCB using the point-transect protocol, because of its low density and large territory size. Therefore, it is unlikely that we will be able to effectively monitor Golden Eagle in any individual habitat or across habitats under MCB. Adding transects in certain habitats may improve our ability to monitor this species; however, effective monitoring will likely best be accomplished through locating and monitoring nests of this species in Colorado. Such an effort could be incorporated into the MCB special-species program in a cost-effective manner, especially if combined with similar efforts for other raptor species (e.g., Prairie Falcon). Also, given interest, with several years of data, we may be able to pool data across years and habitats and weight observations by habitat area, to generate a global detection function for this species, thereby generating an annual statewide density estimate that may be robust enough for population trend monitoring.


Golden Eagle
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.050000
> 0.050000 AND GOEA <= 0.100000
> 0.100000 AND GOEA <= 0.142857
Transect Locations
State Boundary
0 25 50 100
Miles
N

Peregrine Falcon

(Falco peregrinus)

State Candidate - Threatened and Endangered Species List
CDOW - Species of Greatest Conservation Need
CO-PIF Physiographic Regions 62 & 87 Priority Species
USFS Region 2 Sensitive Species
USFWS Bird of Conservation Concern - BCR 16 & 18

In 2005, we detected two Peregrine Falcons in two habitats on the MCB project. This species was also recorded in low-elevation riparian habitat on the NCPN project. We were unable to calculate a density estimate for this species in any habitat on any RMBO monitoring project.

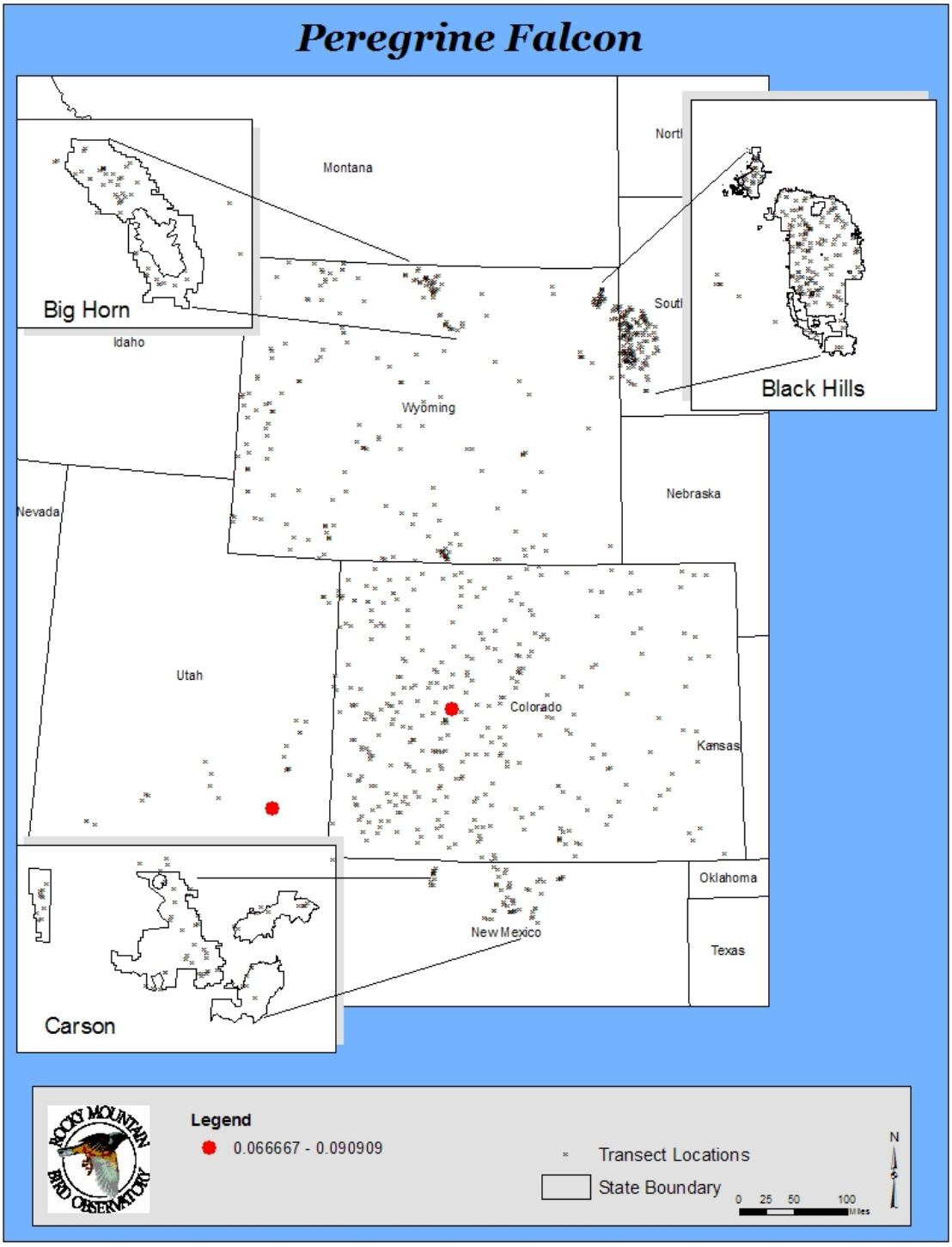
Total number of independent detections, number of individuals, and habitat-specific density estimates for Peregrine Falcon for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
AT	ID	--	--	--	--	1
WE	ID	--	--	--	--	1

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Peregrine Falcons usually nest on ledges of high cliffs. They need vast expanses of hunting space, usually near water. The plight of the Peregrine Falcon is well known; once near extinction, its population has recovered well enough for the species to be removed from the list of Endangered species.

Due to the low density and specialized nesting requirements of Peregrine Falcon in Colorado, habitat-stratified point transects may only provide a means to loosely track the status of this species, and will be inadequate for monitoring. Effective monitoring will likely best be accomplished through locating and monitoring nests of this species in Colorado. Such an effort could be incorporated into the MCB special-species program in a cost-effective manner, especially if combined with similar efforts for other cliff-nesting species (e.g., Prairie Falcon).


Peregrine Falcon
Montana
Idaho
Wyoming
Nebraska
Nevada
Utah
Colorado
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
0.066667 - 0.090909
Transect Locations
State Boundary
0 25 50 100
Miles
N

Prairie Falcon

(Falco mexicanus)

CDOW - Species of Greatest Conservation Need
PIF Species of Regional Concern
CO-PIF Physiographic Region 36 Priority Species
USFWS Bird of Conservation Concern – BCR 16 & 18

In 2005, we detected four Prairie Falcons in four habitats on the MCB project. Prairie Falcon was detected on all RMBO point-transect monitoring projects in 2005, except MBCNF. We did not detect Prairie Falcon in sufficient numbers to calculate a density estimate in any habitat on any monitoring project.

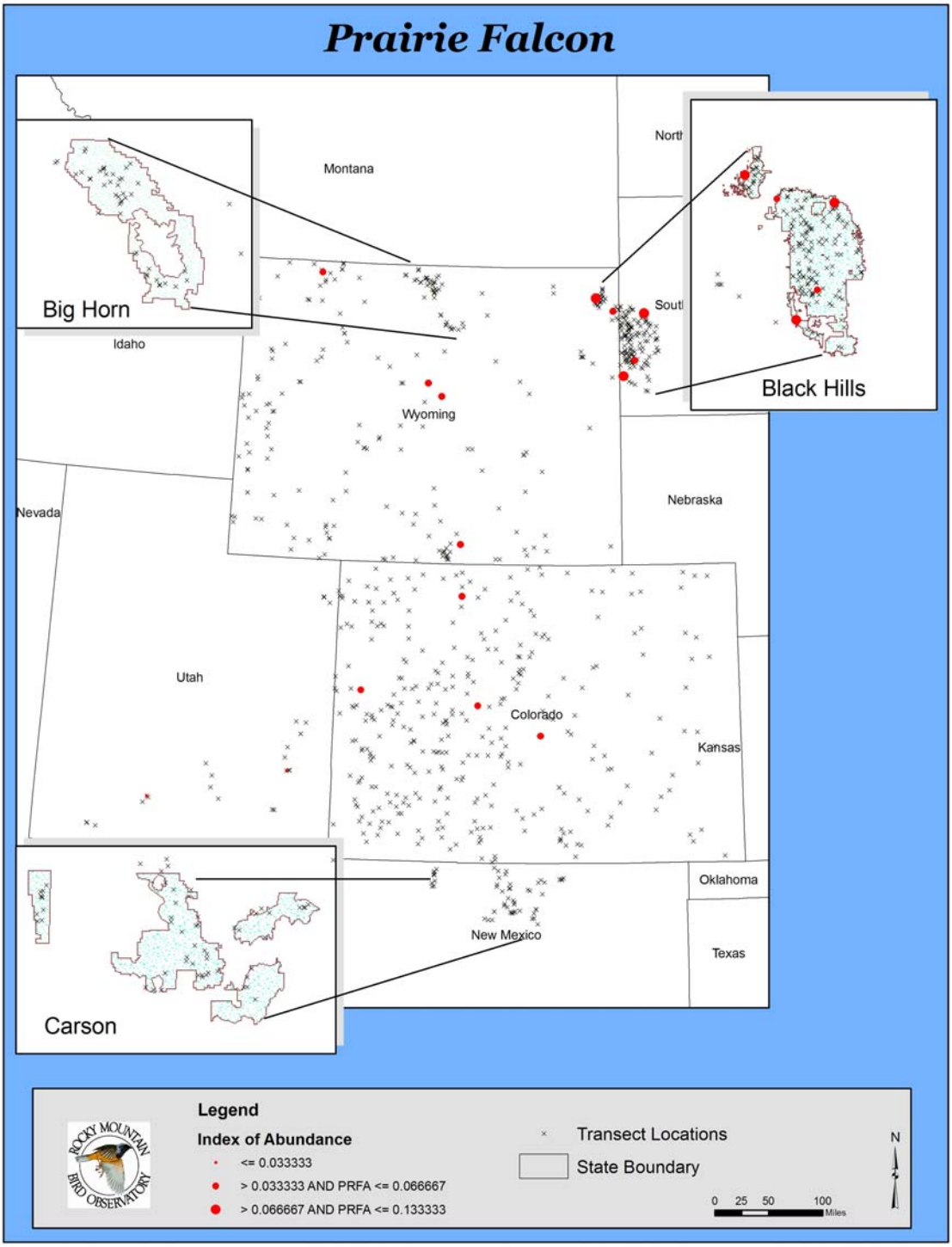
Total number of independent detections, number of individuals, and habitat-specific density estimates for Prairie Falcon for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
AT	ID	--	--	--	--	1
MS	ID	--	--	--	--	1
PP	ID	--	--	--	--	1
SE	ID	--	--	--	--	1

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Prairie Falcons inhabit grasslands, shrubsteppe, and other open country, including alpine tundra throughout Colorado. This species will use a variety of landscapes provided suitable cliffs and rock outcrops are available for nesting, and open country is available for hunting.

Prairie Falcon, like other raptor species, is difficult to monitor under MCB using the point-transect protocol, because of its low density and large territory size. Therefore, it is unlikely that we will be able to effectively monitor Prairie Falcons in any individual habitat or across habitats under MCB. Effective monitoring will likely best be accomplished through locating and monitoring nests of this species in Colorado. Such an effort could be incorporated into the MCB special-species program in a cost-effective manner, especially if combined with similar efforts for other cliff-nesting species (e.g., Peregrine Falcon).


Prairie Falcon
Montana
North
South
Idaho
Wyoming
Nebraska
Nevada
Utah
Colorado
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.033333
> 0.033333 AND PRFA <= 0.066667
> 0.066667 AND PRFA <= 0.133333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Upland Sandpiper

(Bartamia longicauda)

CDOW - Species of Greatest Conservation Need
CO-PIF Physiographic Region 36 Priority Species
USFWS Bird of Conservation Concern

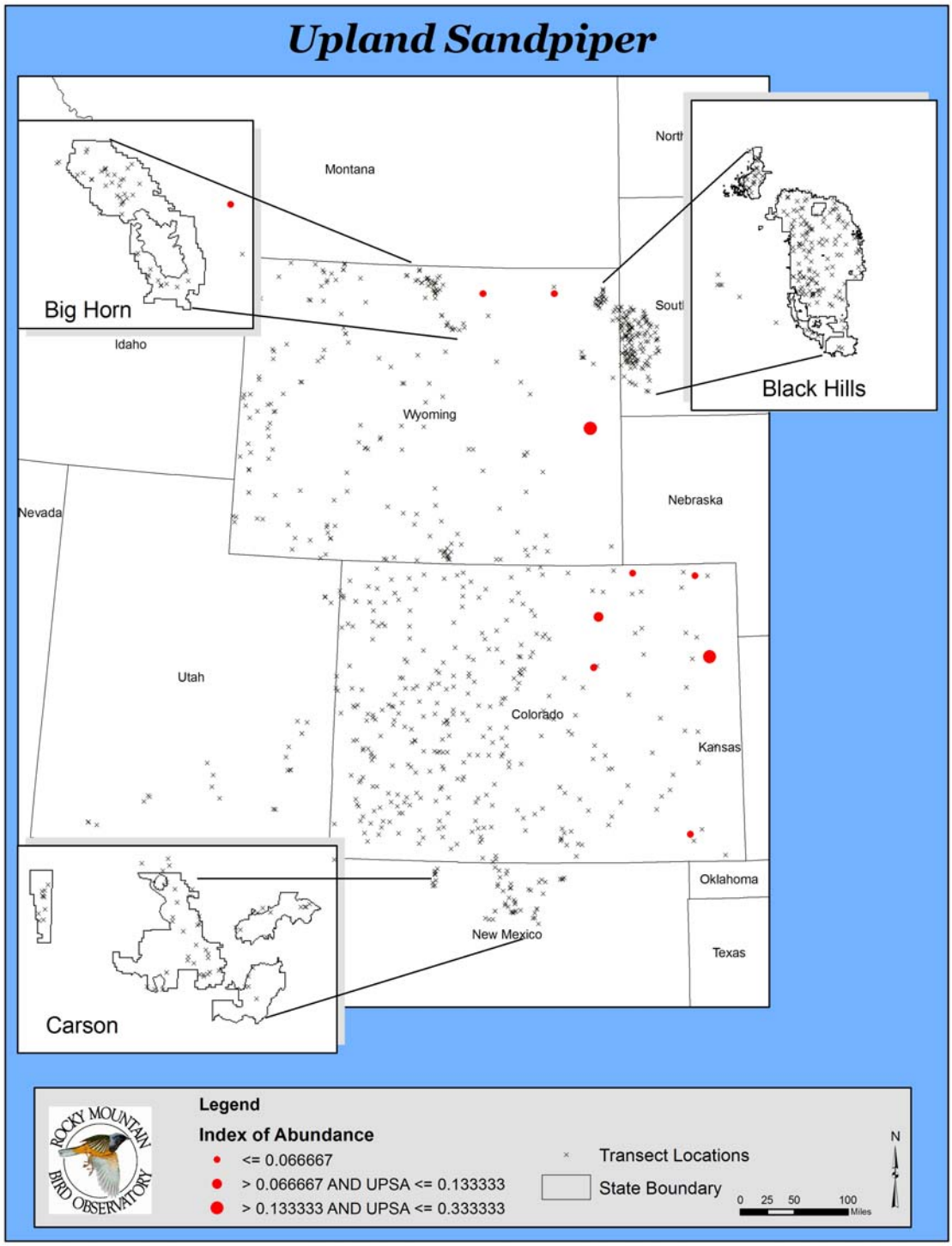
In 2005, we detected 11 Upland Sandpipers in grassland and sage shrubland habitats on the MCB project. We also detected Upland Sandpiper on the MWB project, but we were unable to calculate a density estimate for this species on any project.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Upland Sandpiper for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
GR	ID	--	--	--	--	8
SA	ID	--	--	--	--	3

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Upland Sandpipers breed in northeastern Colorado exclusively in the sandhill region in areas with tall grass or moist meadows (Andrews and Righter 1992). Every year we detect a few of them on grassland or sage shrubland transects, but never in high numbers. This species is listed as a migratory nongame species of management concern by the federal government because conversion of native prairies to croplands has threatened its breeding range. Another cause for decline is that Upland Sandpipers continue to be hunted during migration in the West Indies (Audubon 2002). The MCB special-species program catalogues locations for this species in Colorado.


Upland Sandpiper
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.066667
> 0.066667 AND UPSA <= 0.133333
> 0.133333 AND UPSA <= 0.333333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Long-billed Curlew

(Numenius americanus)

BLM Sensitive Species
State Candidate - Threatened and Endangered Species List
CDOW - Species of Greatest Conservation Need
CO-PIF Physiographic Region 36 Priority Species
USFS Region 2 Sensitive Species
USFWS Bird of Conservation Concern – BCR 18

In 2005, we 11 detected Long-billed Curlews in grassland and semidesert shrubland habitats on the MCB project. We also detected Long-billed Curlew on the MWB project but were unable to calculate a density estimate for this species on any project.

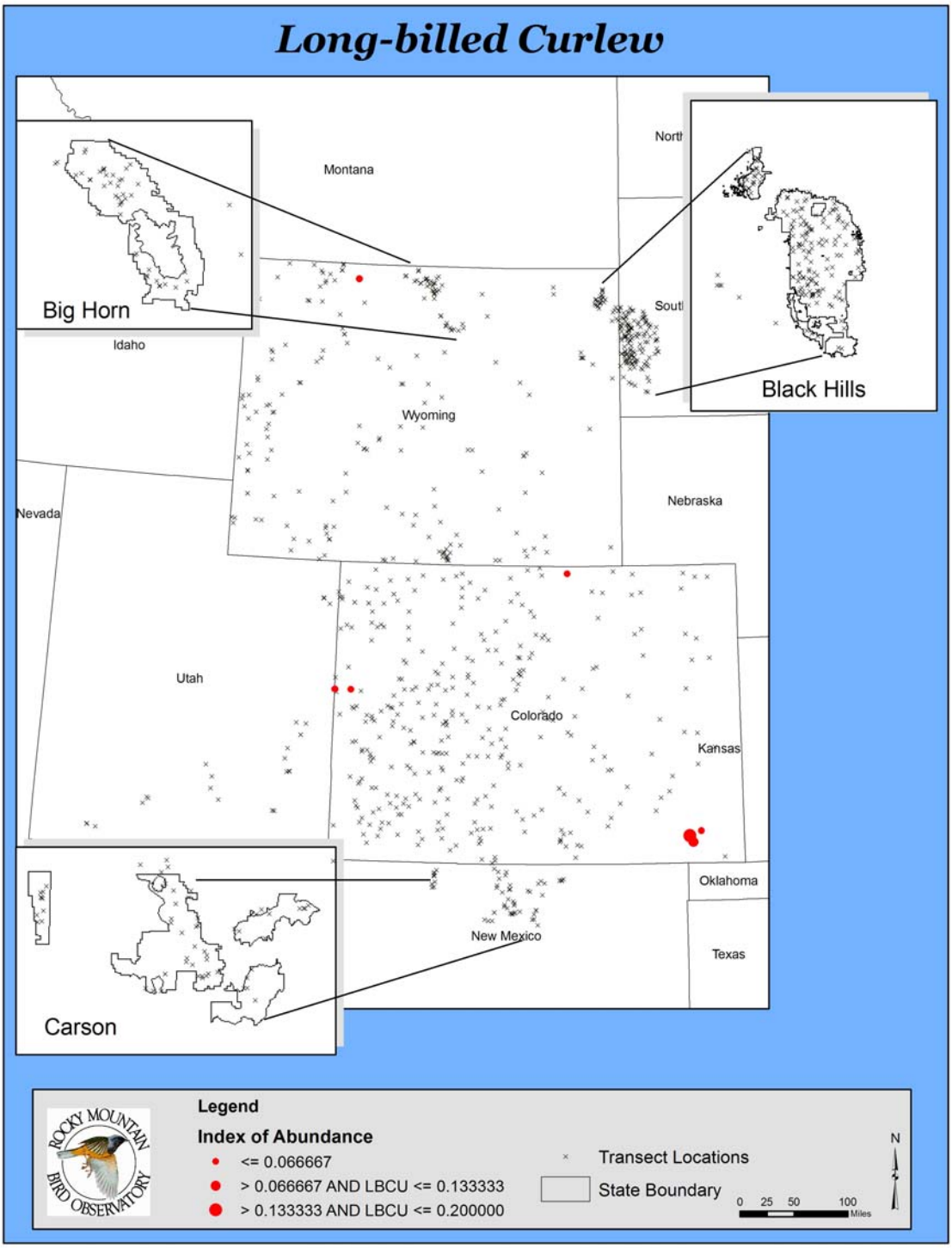
Total number of independent detections, number of individuals, and habitat-specific density estimates for Long-billed Curlew for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	N	N
GR	ID	--	--	--	--	8
SE	ID	--	--	--	--	3

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Long-billed Curlew, the largest shorebird in North America, is found in fields and dry prairie as well as mudflats, and prefers short vegetation near water (Cornell 2003). It is one of the most threatened shorebirds in the continent. Long-billed Curlew's small population size and negative population trends, combined with threats of habitat degradation on both their breeding and wintering grounds, has placed this species on many high priority conservation lists, including the National Audubon Society's WatchList (Audubon 2002).

We detected eight Long-billed Curlew in grassland on the eastern prairies this year and three on the western slope of Colorado in semidesert shrubland where they are rare but regular breeders. It is unlikely that we will be able to effectively monitor or track the status of this species through point transects under MCB. Additional grassland and shrupsteppe transects may yield better information on Long-billed Curlew, however, given the species' low population density effective monitoring will likely require a more intensive and focused effort.


Long-billed Curlew
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.066667
> 0.066667 AND LBCU <= 0.133333
> 0.133333 AND LBCU <= 0.200000
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Wilson's Phalarope

(Phalaropus tricolor)

CDOW - Species of Greatest Conservation Need
CO-PIF Physiographic Region 87 Priority Species

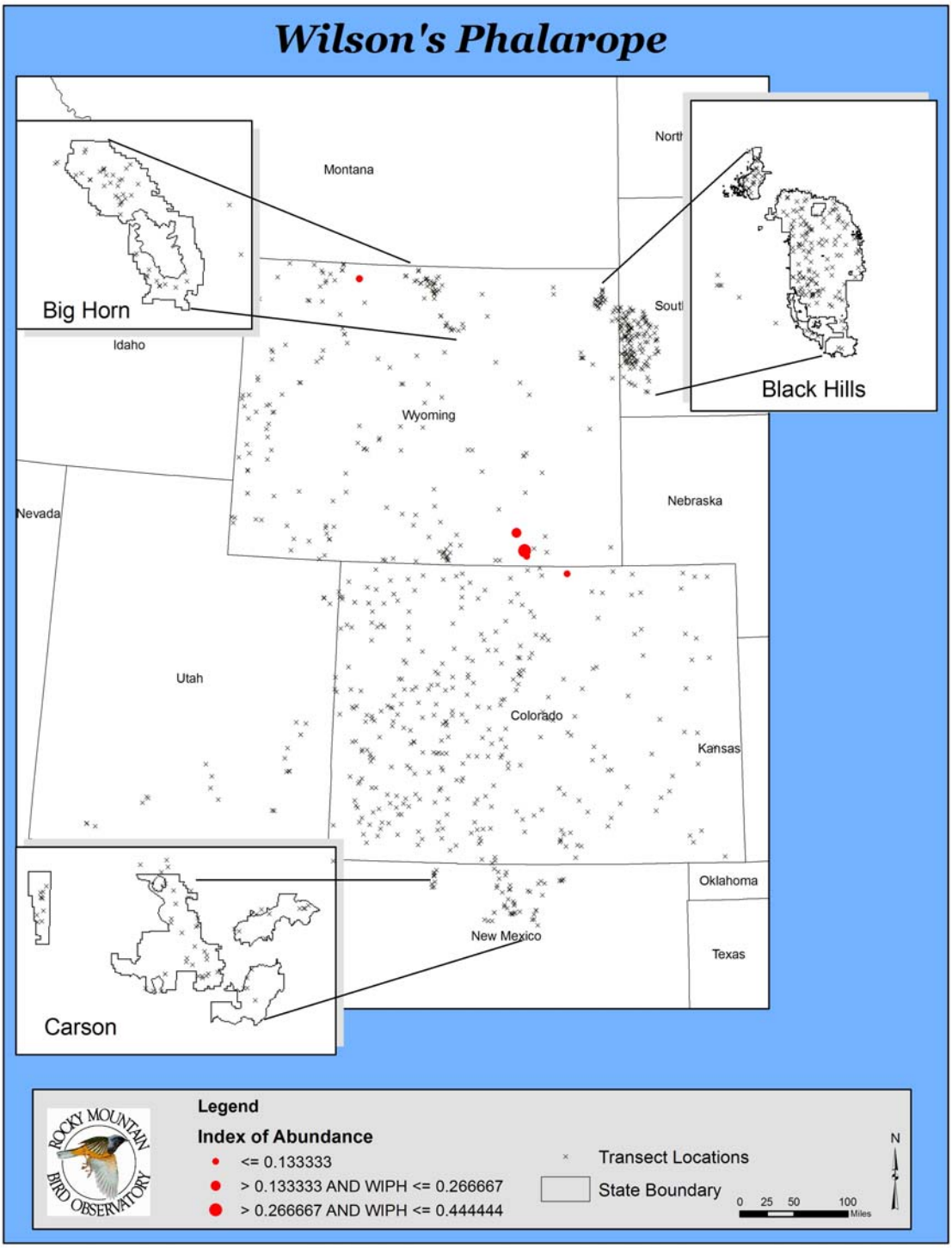
We detected 17 Wilson's Phalaropes in two habitats on the MCB project in 2005. This species was also detected on the MWB project; however, the number of detections was insufficient to provide a density estimate for any project.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Wilson's Phalarope for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	N	N
GR	ID	--	--	--	--	2
WE	ID	--	--	--	--	15

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary - Wilson's Phalarope breeds near ponds or in wet meadows at low elevations. This species has shown declines at several major staging areas throughout North America where regular counts are conducted. It is uncertain if these counts are showing an actual population decline or if this reduction in numbers is a response to drought conditions (Audubon 2002). We have provided a density estimate for the species in wetland habitat some years but this year we recorded an insufficient number of detections. If we continue to detect the species in sufficient numbers each year we will likely be able to monitor Wilson's Phalarope through wetland surveys under MCB.


Wilson's Phalarope
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.133333
> 0.133333 AND WIPH <= 0.266667
> 0.266667 AND WIPH <= 0.444444
Transect Locations
State Boundary
0 25 50 100
Miles
N

Band-tailed Pigeon

(Patagioenas fasciata)

CDOW - Species of Greatest Conservation Need
PIF Species of Continental Concern
CO-PIF Physiographic Regions 62 & 87 Priority Species

In 2005, we detected 19 Band-tailed Pigeons in three habitats on the MCB project and also detected the species on the MBCNF project. However, the total number of independent detections for this species was insufficient to calculate a density estimate in any habitat on any project.

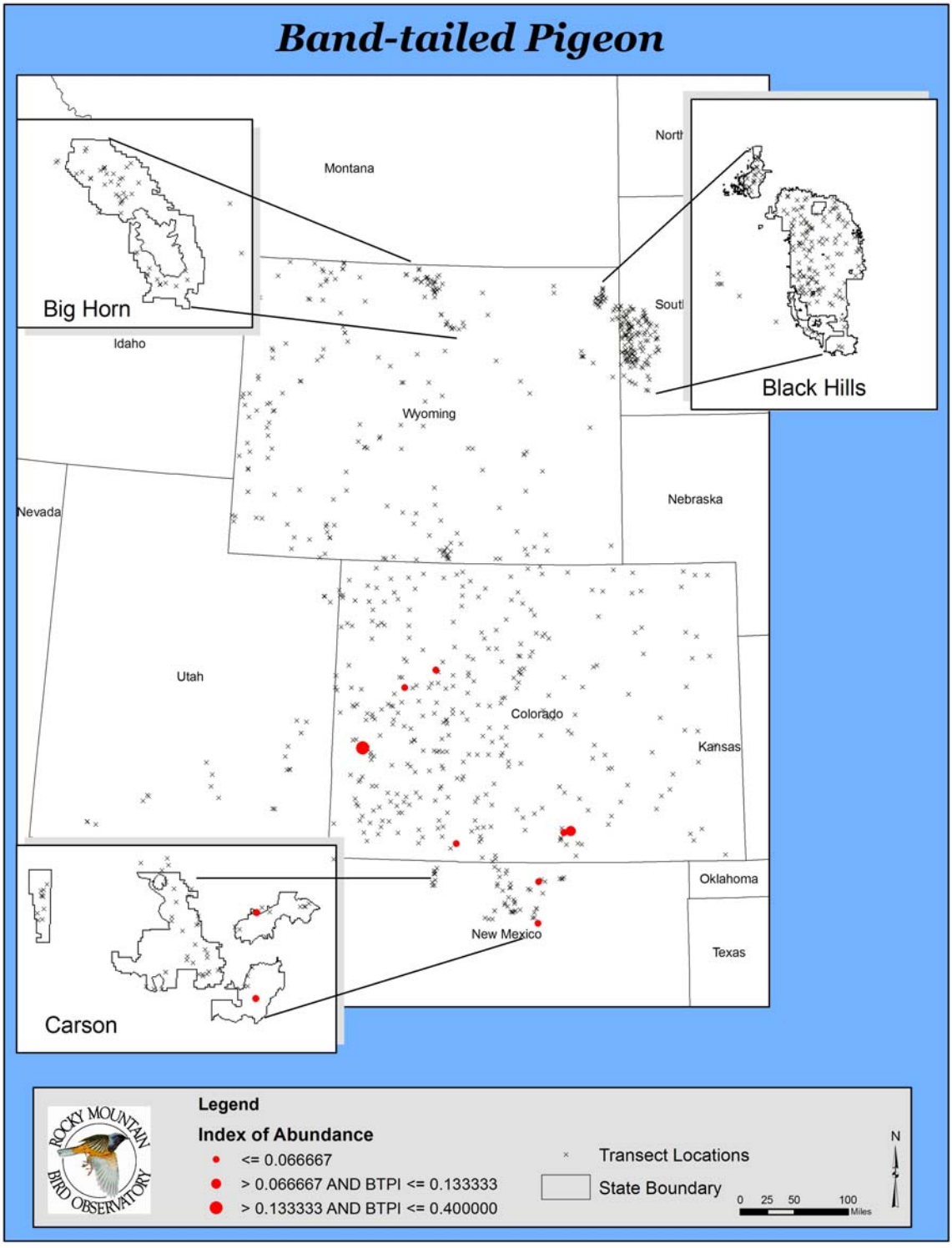
Total number of independent detections, number of individuals, and habitat-specific density estimates for Band-tailed Pigeon for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
MC	ID	--	--	--	--	13
MS	ID	--	--	--	--	4
PP	ID	--	--	--	--	2

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Band-tailed Pigeon nests in coniferous forests of all elevations, with territories near water. It feeds primarily on wild nuts such as pinyon pine nuts or acorns of Gambel's oak.

We detected Band-tailed Pigeons in mixed conifer, montane shrubland, and ponderosa pine habitats in 2005. With the current level of effort, it is unlikely we will be able to monitor this species through point transects under MCB. Adding transects, especially in mixed conifer habitat, may improve our ability to monitor Band-tailed Pigeons; however, given the species' low population density effective monitoring will likely require a more intensive and focused effort.


Band-tailed Pigeon
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.066667
> 0.066667 AND BTPI <= 0.133333
> 0.133333 AND BTPI <= 0.400000
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Common Nighthawk

(Chordeiles minor)

PIF Species of Regional Concern
USFWS Bird of Conservation Concern – BCR 16

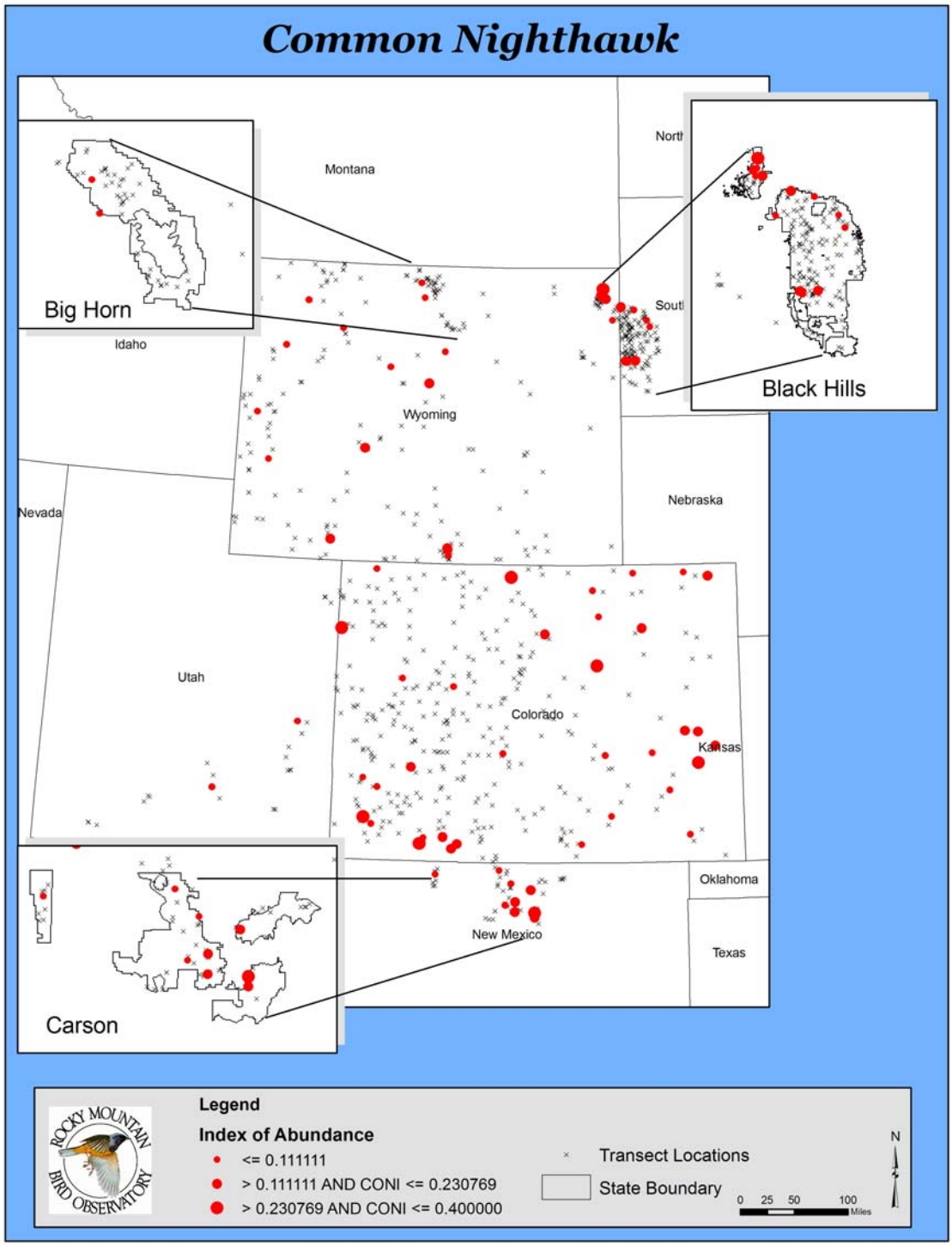
In 2005, we detected 76 Common Nighthawks in ten habitats on the MCB project. Overall, we detected Common Nighthawk on all RMBO point-count transect monitoring projects, though the number of detections was insufficient to provide a density estimate for any habitat on any project.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Common Nighthawk for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
GR	ID	--	--	--	--	19
HR	ID	--	--	--	--	4
MC	ID	--	--	--	--	1
MS	ID	--	--	--	--	3
PJ	ID	--	--	--	--	8
PP	ID	--	--	--	23	28
SA	ID	--	--	--	--	10
SE	ID	--	--	--	--	1
WE	ID	--	--	--	--	2

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Common Nighthawks lay their eggs in a scrape on bare ground in any open habitat. In 2005, we recorded the highest number of Common Nighthawks in ponderosa pine on the MCB project; however, the number of independent detections was still insufficient to calculate a density estimate. Although, given interest, we may be able to combine data from all of the habitats in Colorado to loosely track the status of Common Nighthawk over time. In addition, the RMBO section-survey program is collecting sufficient data to effectively monitor this species in eastern Colorado.


Common Nighthawk
Montana
North
South
Idaho
Wyoming
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.111111
> 0.111111 AND CONI <= 0.230769
> 0.230769 AND CONI <= 0.400000
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Black-chinned Hummingbird
(Archilochus alexandri)

CDOW – Species of Greatest Conservation Need
CO-PIF Physiographic Region 87 Priority Species

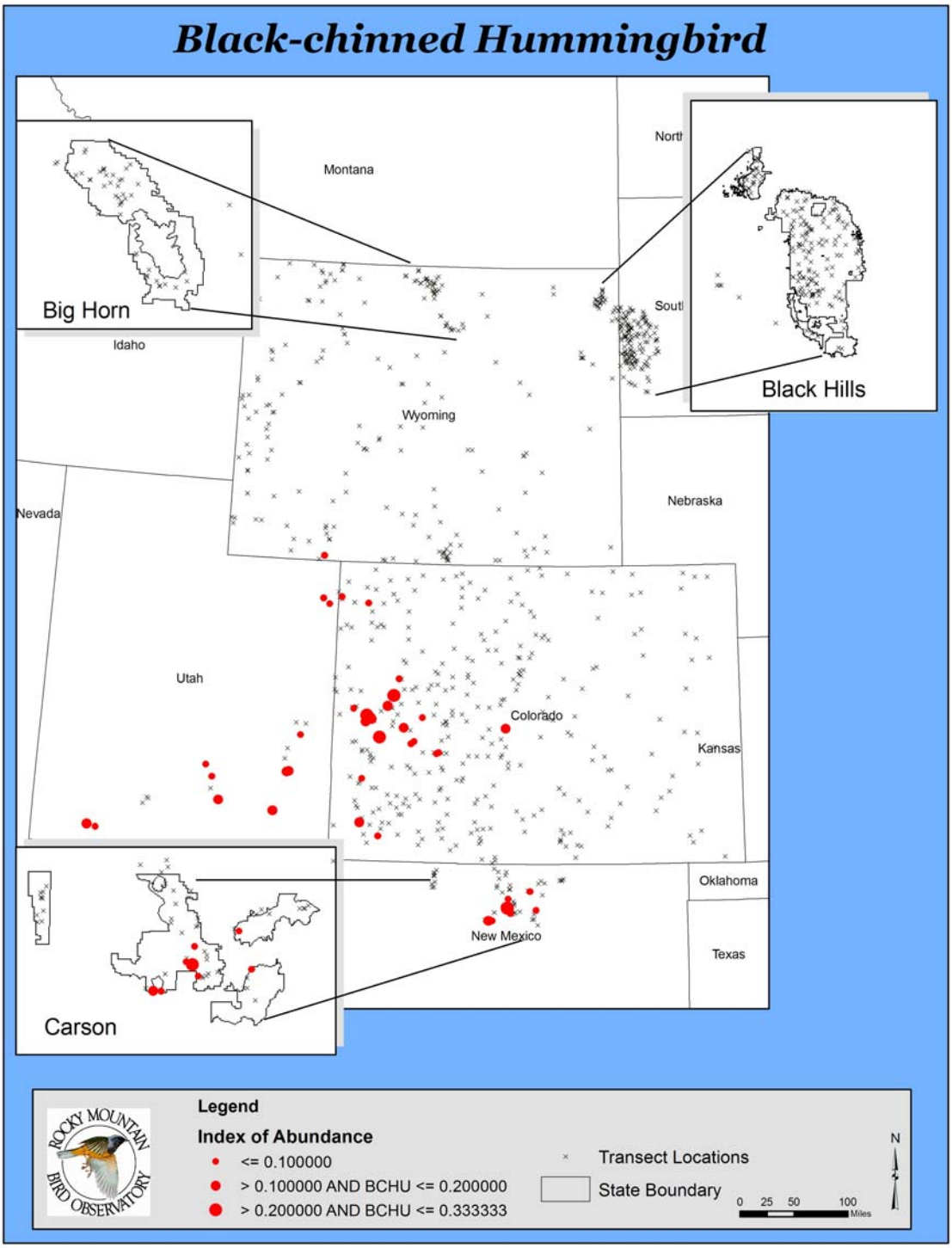
In 2005, we detected 35 Black-chinned Hummingbirds in four habitats on the MCB project. In total, we detected Black-chinned Hummingbird on four RMBO point-count transect monitoring projects and calculated a density estimate for low-elevation riparian habitat on the NCPN project.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Black-chinned Hummingbird for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	N	N
MS	ID	--	--	--	--	5
PJ	ID	--	--	--	--	23
SE	ID	--	--	--	--	6
WE	ID	--	--	--	--	1

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Black-chinned Hummingbird, in Colorado, breeds most frequently in pinyon-juniper, but is also found in low- and mid-elevation riparian habitat, Gambel's oak shrubland, and in urban areas. Although we did not have enough detections to effectively monitor this species in any one habitat, data from the full spectrum of habitat-based point transects may provide a means to track the status of the species in Colorado. Adding transects, especially in pinyon-juniper habitat, may improve our ability to monitor this species.


Black-chinned Hummingbird
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.100000
> 0.100000 AND BCHU <= 0.200000
> 0.200000 AND BCHU <= 0.333333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Broad-tailed Hummingbird

(Selasphorus platycercus)

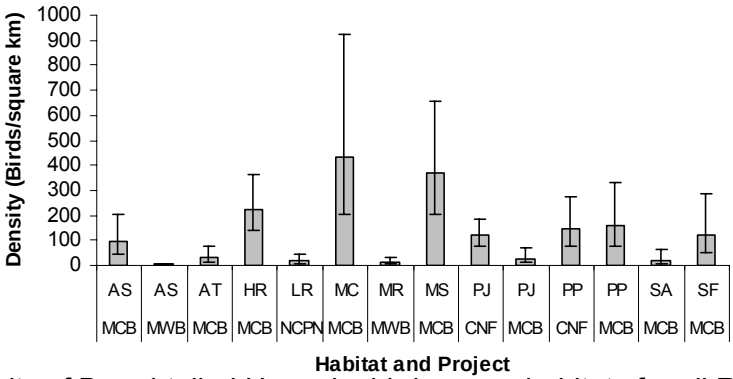
CDOW - Species of Greatest Conservation Need
PIF Regional Stewardship Species
CO-PIF Physiographic Region 62 Priority Species

We detected 614 Broad-tailed Hummingbirds in 11 habitats and calculated density estimates for this species in nine habitats on the MCB project. We recorded this species in sufficient numbers to estimate a density in at least one habitat on all RMBO point-count transect monitoring projects, except for in the Black Hills which is at the very edge of the species' range.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Broad-tailed Hummingbird for the MCB monitoring project, 2005.

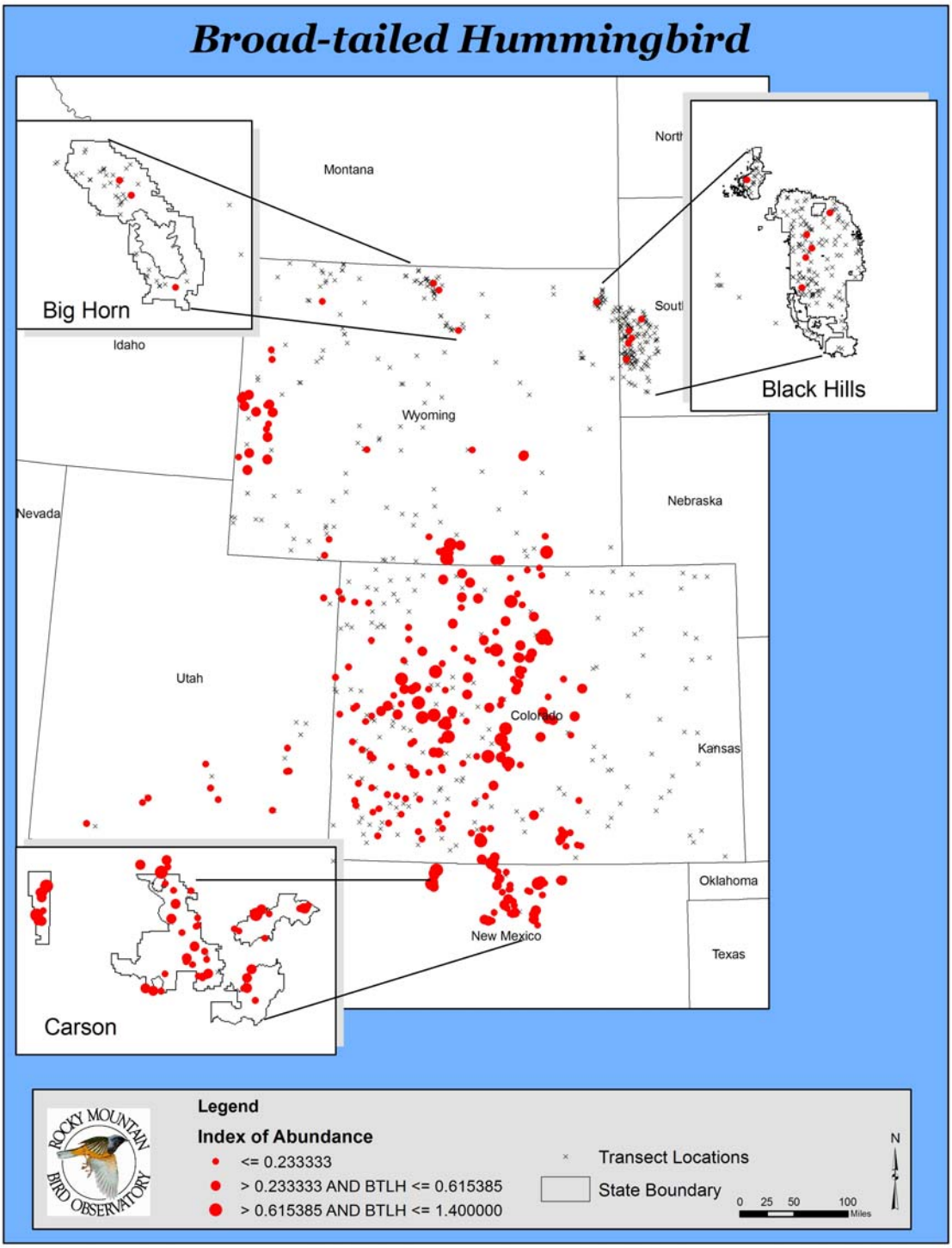
Habitat	D	LCL	UCL	CV	n	N
AS	95.79	44.76	204.99	39.1%	36	40
AT	28.89	10.76	77.58	52.6%	43	47
HR	222.40	136.96	361.13	24.6%	111	121
MC	434.65	204.02	925.99	39.4%	68	70
MS	366.88	205.60	654.69	29.9%	119	131
PJ	25.97	9.97	67.65	50.5%	47	47
PP	162.33	79.09	333.18	37.2%	74	83
SA	22.14	7.50	65.30	57.8%	26	29
SE	ID	--	--	--	--	3
SF	117.99	48.65	286.17	46.4%	29	41
WE	ID	--	--	--	--	2

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Broad-tailed Hummingbird among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – Broad-tailed Hummingbird is the most abundant hummingbird species in Colorado and breeds in a variety of montane habitats, including, ponderosa pine, mixed conifer, and mid- to high-elevation riparian habitats. The most limiting requirement for this hummingbird is an abundance of flowering plants from which to gather nectar (Righter et al. 2004). This species should be effectively monitored through point transects in nine habitats under MCB.


Broad-tailed Hummingbird
Montana
North
South
Idaho
Wyoming
Nebraska
Nevada
Utah
Colorado
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.233333
> 0.233333 AND BTLH <= 0.615385
> 0.615385 AND BTLH <= 1.400000
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Rufous Hummingbird

(Selasphorus rufus)

CDOW - Species of Greatest Conservation Need
USFWS Bird of Conservation Concern

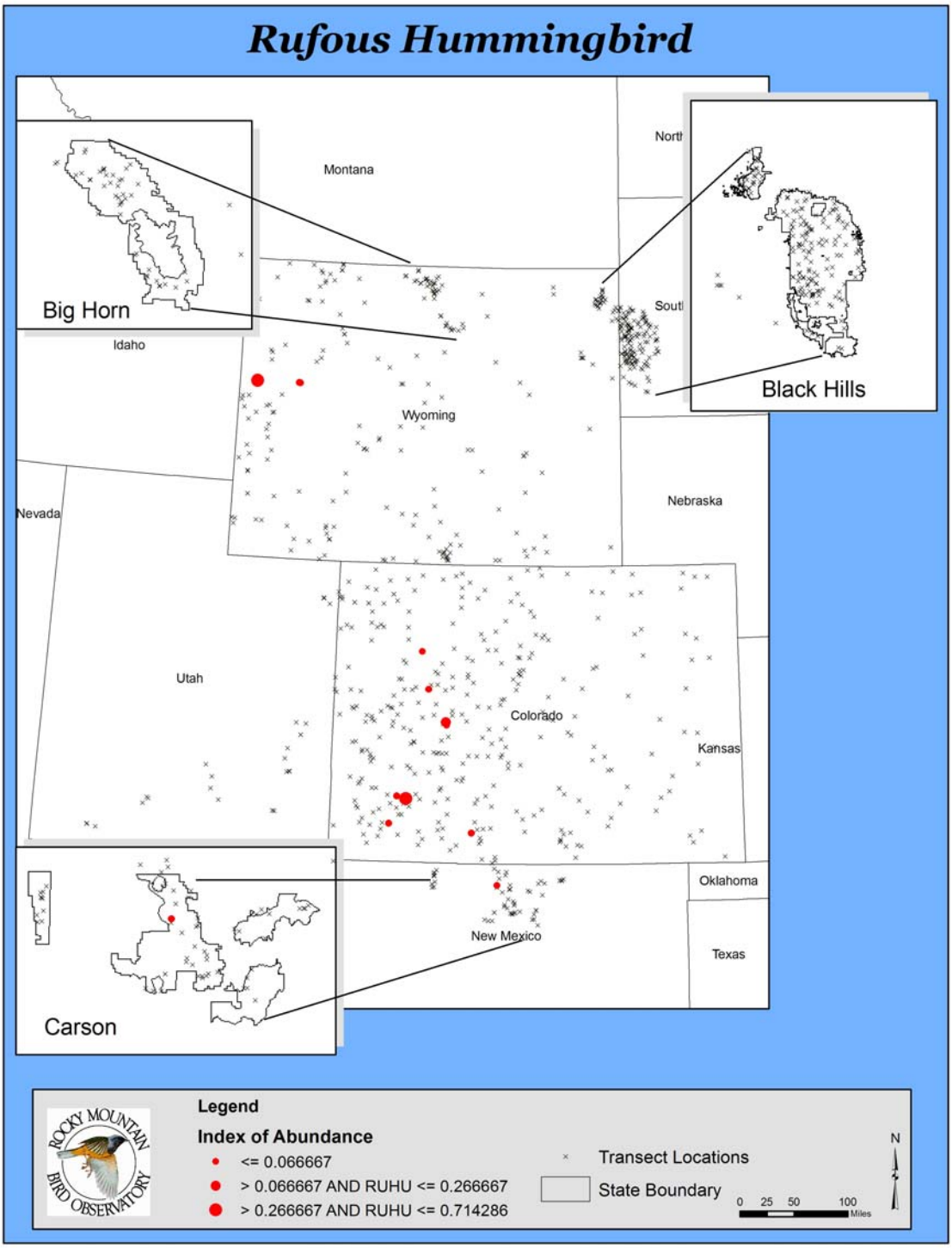
In 2005, we detected 19 Rufous Hummingbirds in three habitats on the MCB project. In total, we detected this species on three RMBO point-count transect monitoring projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Rufous Hummingbird for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
AT	ID	--	--	--	--	14
HR	ID	--	--	--	--	1
SF	ID	--	--	--	--	4

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Rufous Hummingbird does not breed in Colorado, but we do detect this species on high-elevation transects at the end of the summer as they are migrating south.


Rufous Hummingbird
Montana
North
South
Idaho
Wyoming
Nebraska
Nevada
Utah
Colorado
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.066667
> 0.066667 AND RUHU <= 0.266667
> 0.266667 AND RUHU <= 0.714286
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Red-headed Woodpecker

(Melanerpes erythrocephalus)

PIF Species of Continental and Regional Concern
USFWS Bird of Conservation Concern

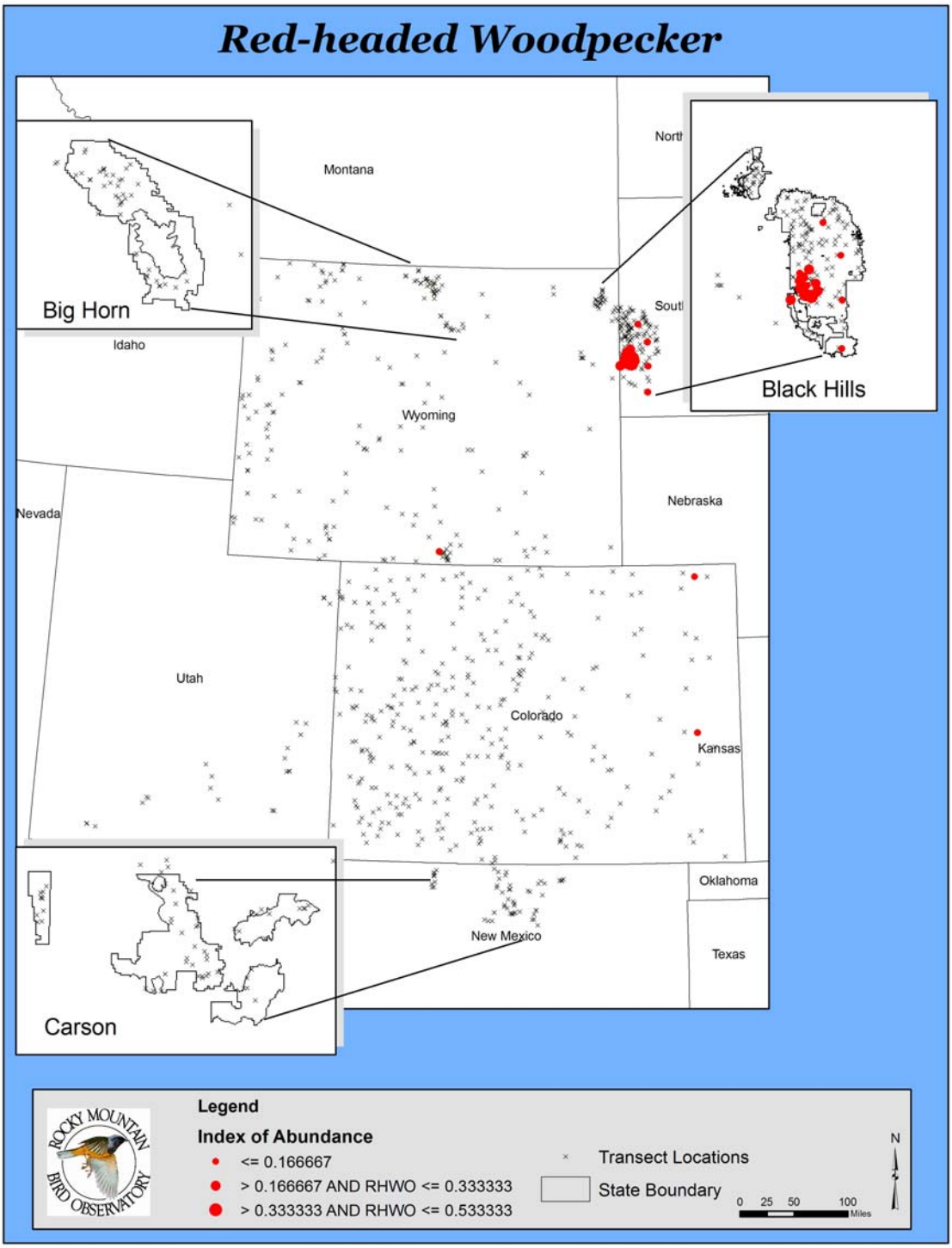
In 2005, we detected four Red-headed Woodpeckers in two habitats on the MCB project. Detections of the species were sufficient to calculate a density estimate only in burn areas on the MBBH project.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Red-headed Woodpecker for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
SA	ID	--	--	--	--	3
WE	ID	--	--	--	--	1

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – In Colorado, Red-headed Woodpecker breeds mostly in open woodlands and riparian lowlands and prefer to nest in deciduous trees, especially dead Cottonwoods (Kingery 1998). Red-headed Woodpeckers are not well-monitored via MCB transects but if we monitor low-elevation habitat, as we have in previous years, this should improve our ability to monitor this species. Also, breeding locations for this species could be catalogued and visited annually as part of the special-species program.


Red-headed Woodpecker
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.166667
> 0.166667 AND RHWO <= 0.333333
> 0.333333 AND RHWO <= 0.533333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Williamson's Sapsucker
(Sphyrapicus thyroideus)

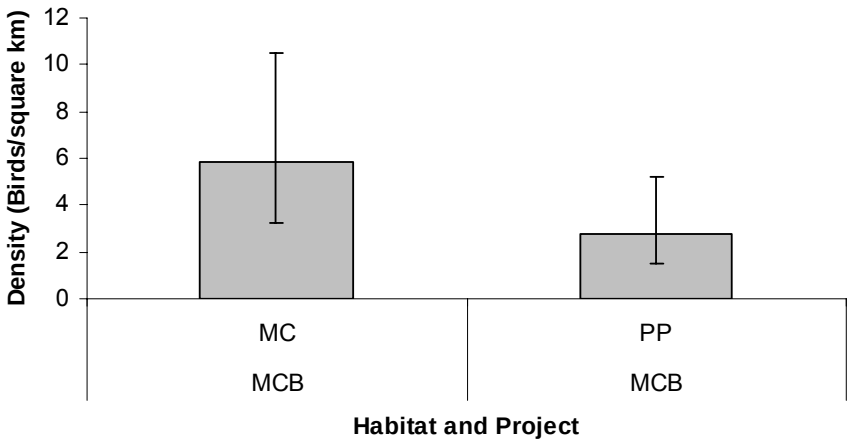
CDOW - Species of Greatest Conservation Need
PIF Continental and Regional Stewardship Species
CO-PIF Physiographic Region 62 Priority Species
USFWS Bird of Conservation Concern – BCR 16

We detected 150 Williamson's Sapsuckers in six habitats and in sufficient numbers to calculate a density estimate in two habitats on the MCB project. We detected the species on all RMBO point-transect monitoring projects but were able to calculate a density estimate only for MCB.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Williamson's Sapsucker for the MCB monitoring project, 2005.

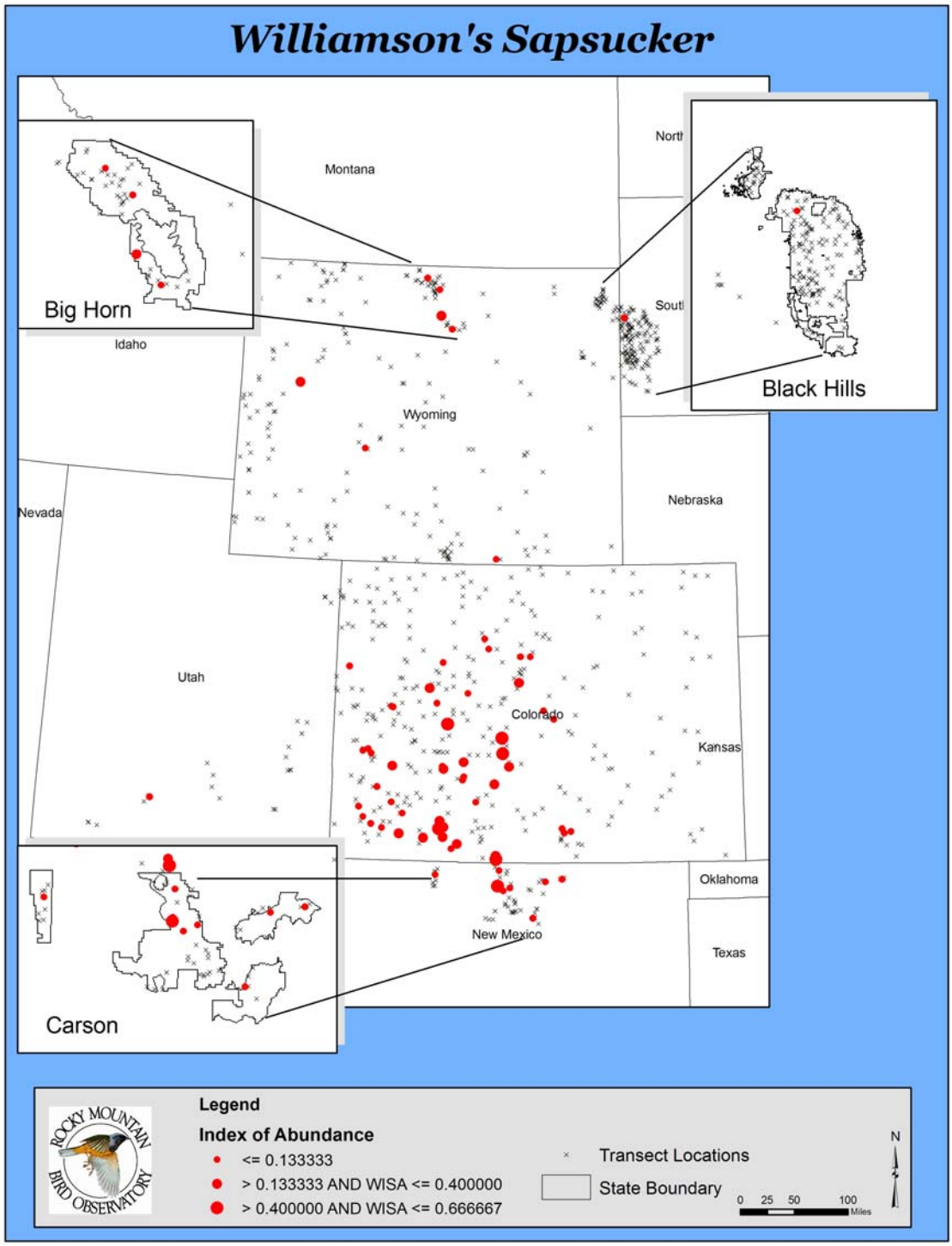
Habitat	D	LCL	UCL	CV	n	N
AS	ID	--	--	--	--	6
HR	ID	--	--	--	--	3
MC	5.86	3.26	10.53	29.8%	38	67
MS	ID	--	--	--	--	1
PP	2.77	1.47	5.21	32.2%	26	49
SF	ID	--	--	--	--	24

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Williamson's Sapsucker between habitats on the MCB point-count transect monitoring project, 2005.

Summary - Williamson's Sapsuckers will nest in a variety of habitats, but prefers mid-elevation coniferous forests, especially ponderosa pine. Williamson's Sapsucker should be effectively monitored through point transects under MCB in mixed conifer and ponderosa pine.


Williamson's Sapsucker
Montana
North
South
Idaho
Wyoming
Nevada
Utah
Colorado
Nebraska
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.133333
> 0.133333 AND WISA <= 0.400000
> 0.400000 AND WISA <= 0.666667
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Red-naped Sapsucker
(Sphyrapicus nuchalis)

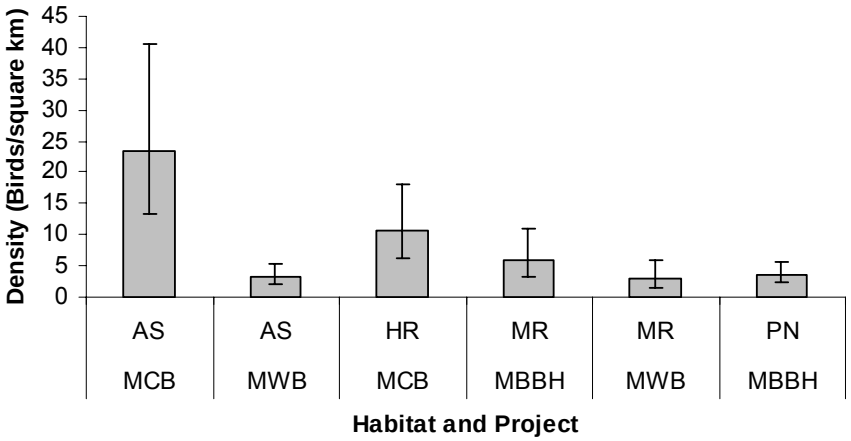
CDOW - Species of Greatest Conservation Need
CO-PIF Physiographic Region 62 Priority Species
USFWS Bird of Conservation Concern

In 2005, we detected 207 Red-naped Sapsuckers in eight habitats and calculated density estimates for this species in two habitats on the MCB project. Overall, we detected Red-naped Sapsucker on all RMBO point-count transect monitoring projects except NCPN. We were able to calculate a density estimate for this species in at least one habitat on the MBBH, MCB, and MWB projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Red-naped Sapsucker for the MCB monitoring project, 2005.

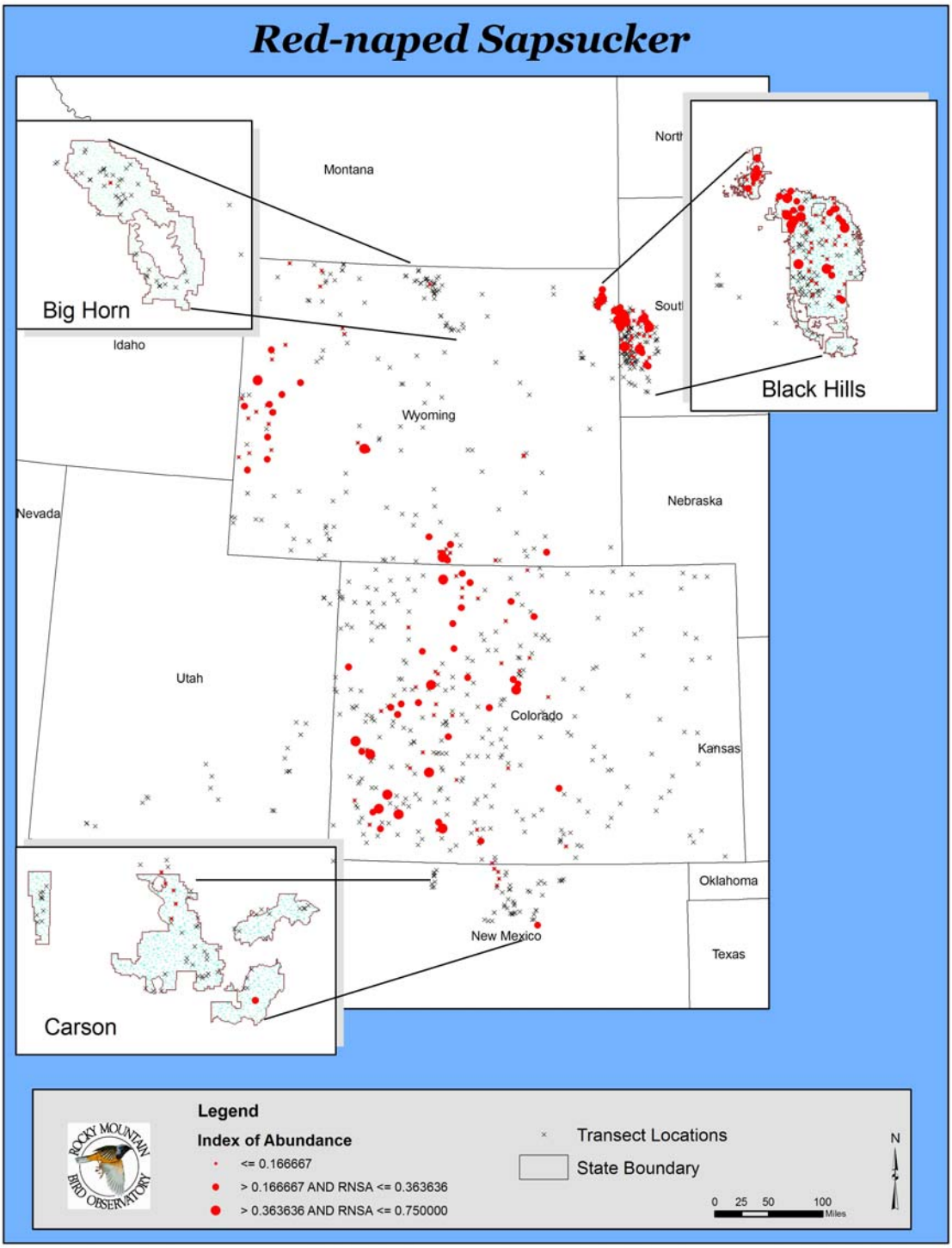
Habitat	D	LCL	UCL	CV	n	N
AS	23.32	13.44	40.45	28.2%	60	78
AT	ID	--	--	--	--	1
HR	10.61	6.26	17.96	26.6%	55	67
MC	ID	--	--	--	--	28
MS	ID	--	--	--	--	22
PP	ID	--	--	--	--	8
SF	ID	--	--	--	--	2
WE	ID	--	--	--	--	1

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Red-naped Sapsucker among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – This species prefers to nest in aspen over other high-elevation forested habitats. It is frequently encountered foraging in shrubby areas, especially in willow, during the breeding season (Righter et al. 2004). Red-naped Sapsucker should be effectively monitored through point transects under MCB in aspen and high-elevation riparian.


Red-naped Sapsucker
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.166667
> 0.166667 AND RNSA <= 0.363636
> 0.363636 AND RNSA <= 0.750000
Transect Locations
State Boundary
0 25 50 100
Miles
N

American Three-toed Woodpecker
(Picoides tridactylus)

CDOW – Species of Greatest Conservation Need
Region 2 Sensitive Species

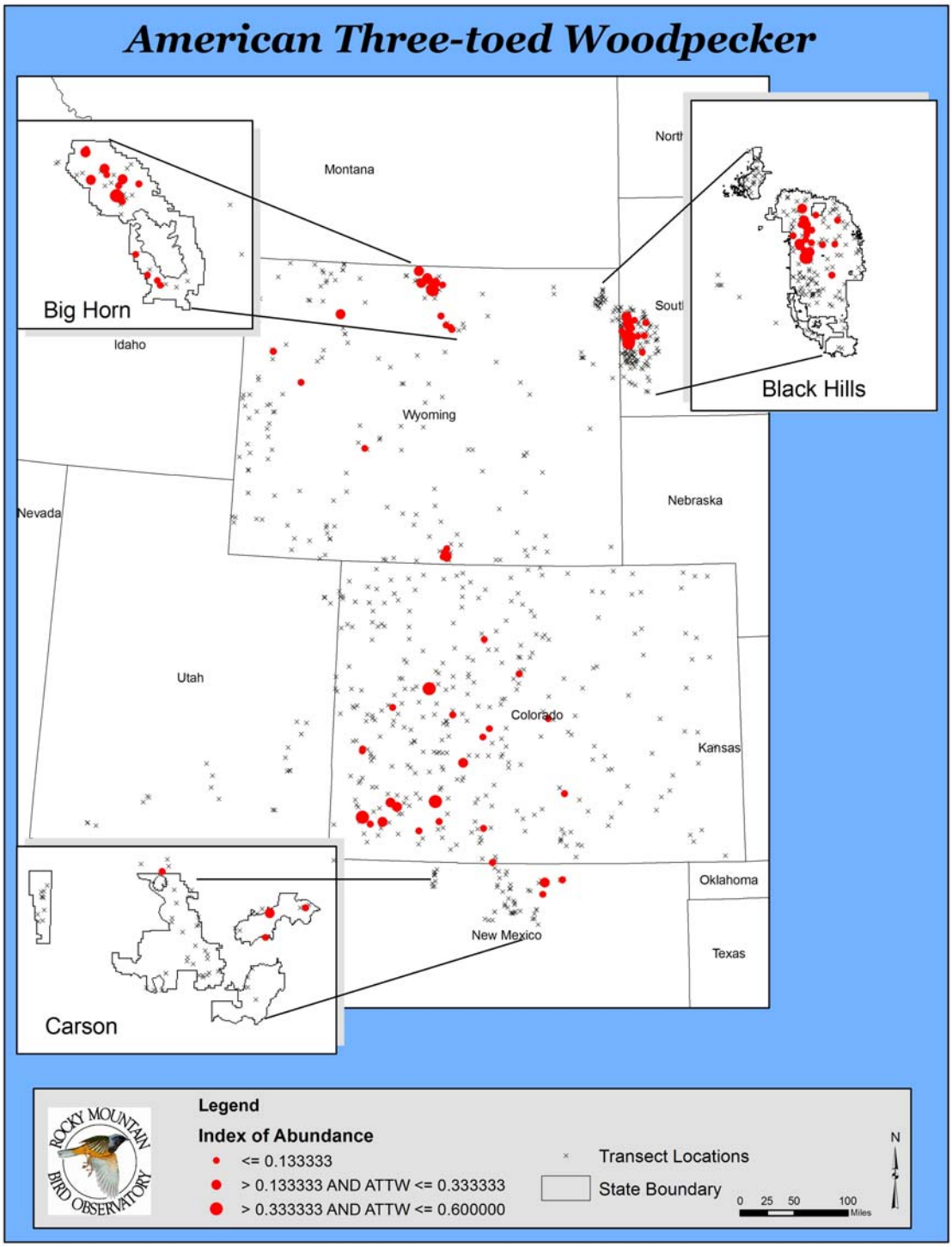
We detected 53 American Three-toed Woodpeckers in six habitats on the MCB project. Overall, this species was detected on four RMBO point-count transect monitoring projects and recorded in sufficient numbers in white spruce habitat in the Black Hills to estimate a density.

Total number of independent detections, number of individuals, and habitat-specific density estimates for American Three-toed Woodpecker for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
AS	ID	--	--	--	--	2
AT	ID	--	--	--	--	3
HR	ID	--	--	--	--	6
MC	ID	--	--	--	--	1
PP	ID	--	--	--	--	11
SF	ID	--	--	--	19	30

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – American Three-toed Woodpecker, in Colorado, is found primarily in high-elevation coniferous forests, although it can be found in coniferous forest at any elevation as well as aspen, with wood-boring insects and diseased trees (Kingery 1998). We calculated a density estimate for this species in spruce-fir in 2004, but this year we recorded only 19 independent detections in this habitat. Although we did not have enough detections to calculate a density estimate for this species in any one habitat in 2005, data from the full spectrum of habitat-based point transects may provide a means to track the status of the species in Colordao. Adding transects, especially in spruce-fir habitat, may improve our ability to monitor this species.


American Three-toed Woodpecker
Montana
North
South
Idaho
Wyoming
Nebraska
Nevada
Utah
Colorado
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.133333
> 0.133333 AND ATTW <= 0.333333
> 0.333333 AND ATTW <= 0.600000
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Olive-sided Flycatcher
(Contopus cooperi)

CDOW - Species of Greatest Conservation Need
PIF Species of Continental Concern
CO-PIF Physiographic Region 62 Priority Species
USFS Region 2 Sensitive Species
NM-PIF Priority management species in Spruce-Fir
USFWS Bird of Conservation Concern

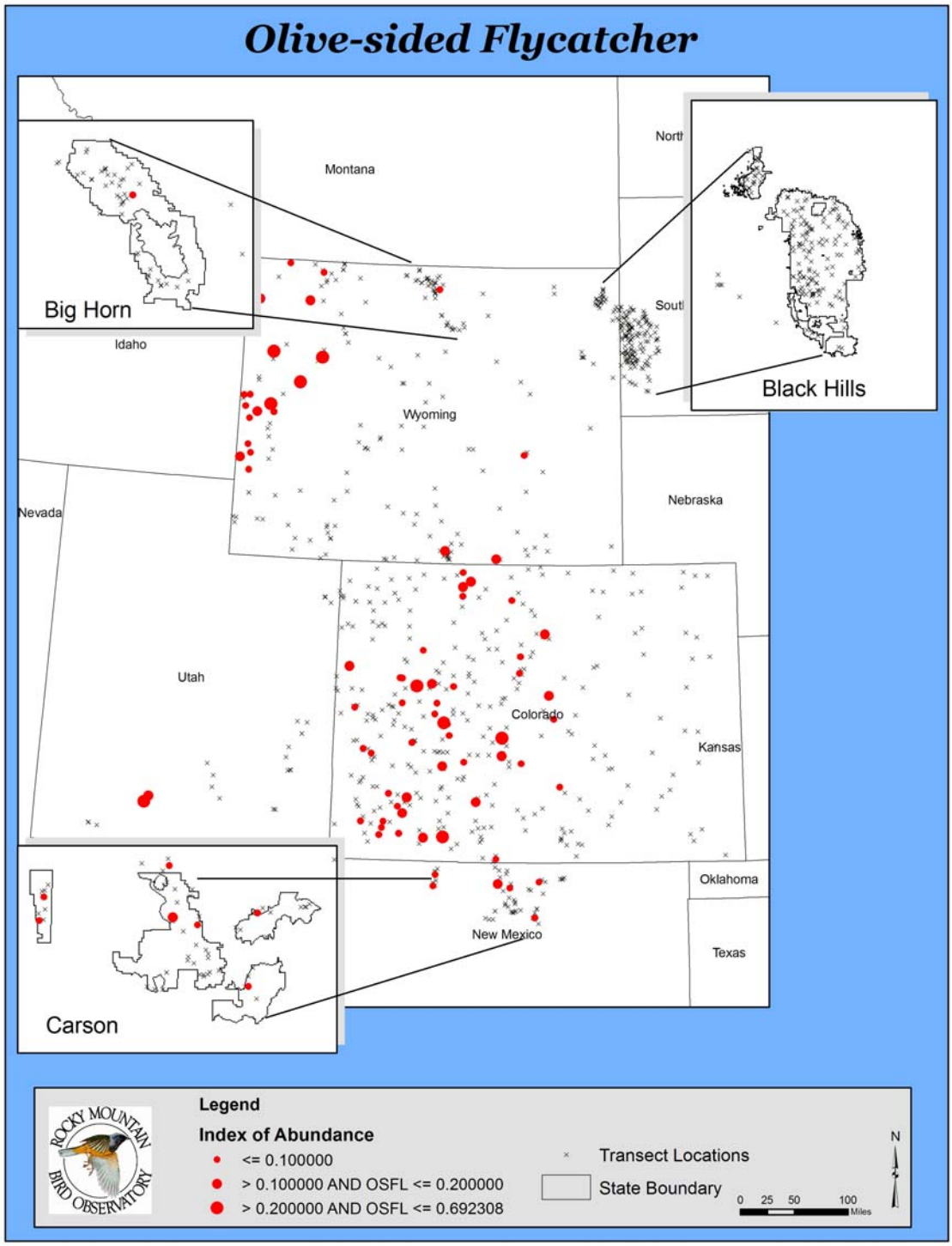
In 2005, we detected 77 Olive-sided Flycatchers in eight habitats on the MCB project. Overall, we detected Olive-sided Flycatchers on four RMBO point-count transect monitoring projects, however, we are unable to provide a density estimate for any project.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Olive-sided Flycatcher for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
AS	ID	--	--	--	--	7
AT	ID	--	--	--	--	3
HR	ID	--	--	--	--	12
MC	ID	--	--	--	--	13
MS	ID	--	--	--	--	8
PJ	ID	--	--	--	--	4
PP	ID	--	--	--	--	22
SF	ID	--	--	--	--	8

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Olive-sided Flycatcher breeds in a variety of forest types where snags and conifers are present, and often nest near forest clearings, bogs, stream and lake shores with dead trees, forest burns and logged areas (Kingery 1998). In this region, they are one of the most abundant species in young burned forests and clear-cuts, provided snags are available (Kingery 1998). In 2005, we did not detect Olive-sided Flycatcher in sufficient numbers to effectively monitor it in any one habitat. Given interest, however, we may be able to pool detections of this species across habitats to calculate a density estimate and thereby loosely track the status of this species in Colorado.


Olive-sided Flycatcher
Montana
North
South
Idaho
Wyoming
Nebraska
Nevada
Utah
Colorado
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.100000
> 0.100000 AND OSFL <= 0.200000
> 0.200000 AND OSFL <= 0.692308
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Willow Flycatcher
(Empidonax traillii)

CDOW - Species of Greatest Conservation Need
PIF Species of Continental and Regional Concern

In 2005, we detected 18 Willow Flycatchers in aspen and high-elevation riparian habitats on the MCB project. We also detected Willow Flycatcher on the MWB and NCPN projects; however, the number of detections was insufficient to calculate a density estimate in any habitat on any monitoring project.

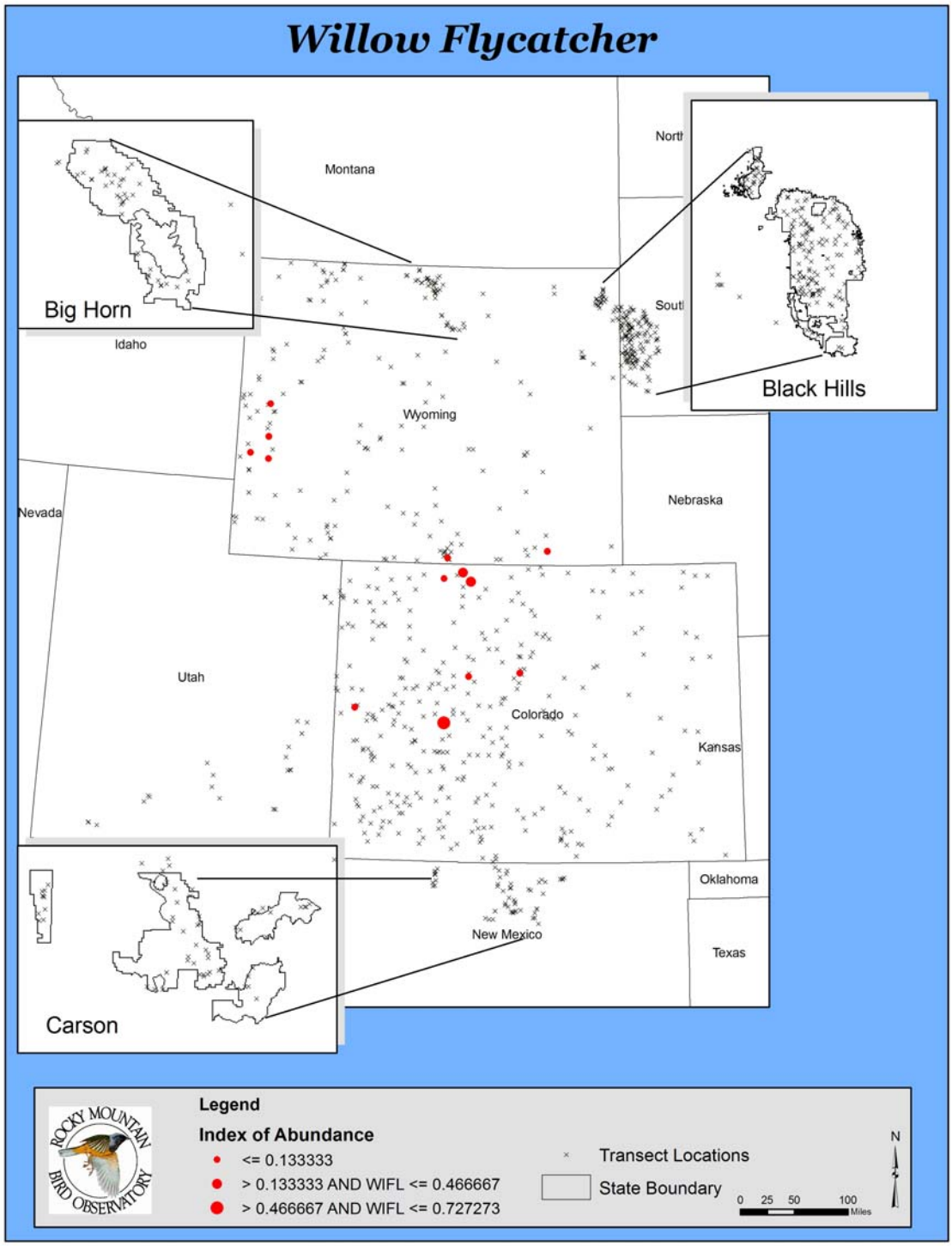
Total number of independent detections, number of individuals, and habitat-specific density estimates for Willow Flycatcher for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
AS	ID	--	--	--	--	1
HR	ID	--	--	--	--	17

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – In Colorado, Willow Flycather breeds mainly in riparian thickets in the foothills and montane zones (Kingery 1998). The southwestern subspecies of Willow Flycatcher (*E.t. extimus*) is a Federally listed Endangered Species. This subspecies is believed to breed in the San Luis Valley and several locations on the west slope of Colorado. The primary reasons for the precipitous decline of this subspecies are the loss of riparian habitat and increased cowbird parasitism (Audubon 2002).

With the current level of effort, it is unlikely that we will be able to monitor Willow Flycatcher through point transects under MCB. Adding montane riparian transects may improve our ability to monitor this species. Also, given interest, with several years' data, we may be able to pool data across years and habitats and weight observations by habitat area, to generate a global detection function for this species, thereby generating an annual statewide density estimate that may be robust enough for population-trend monitoring. RMBO also collects data on Willow Flycatchers through other projects, but sample sizes are currently insufficient for providing trend information (A. Cariveau pers. comm.).


Willow Flycatcher
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.133333
> 0.133333 AND WIFL <= 0.466667
> 0.466667 AND WIFL <= 0.727273
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Gray Flycatcher
(Empidonax wrightii)

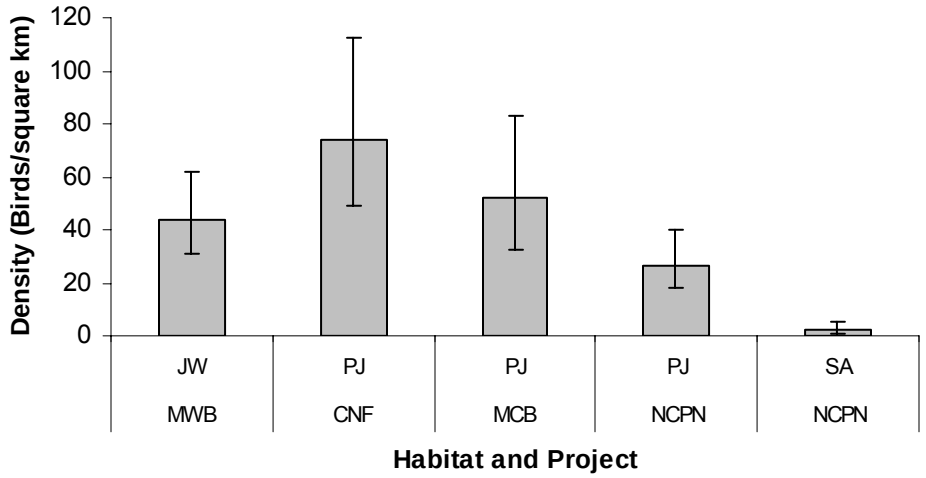
CDOW – Species of Greatest Conservation Need
CO-PIF Physiographic Region 87 Priority Species

We recorded 184 Gray Flycatchers in five habitats on the MCB project in 2005. We recorded this species on all RMBO point-transect monitoring projects, except MBBH which lies outside of the species' normal breeding range. We detected this species in sufficient numbers to calculate a density estimate on four projects in pinyon-juniper (juniper woodland) habitat.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Gray Flycatcher for the MCB monitoring project, 2005.

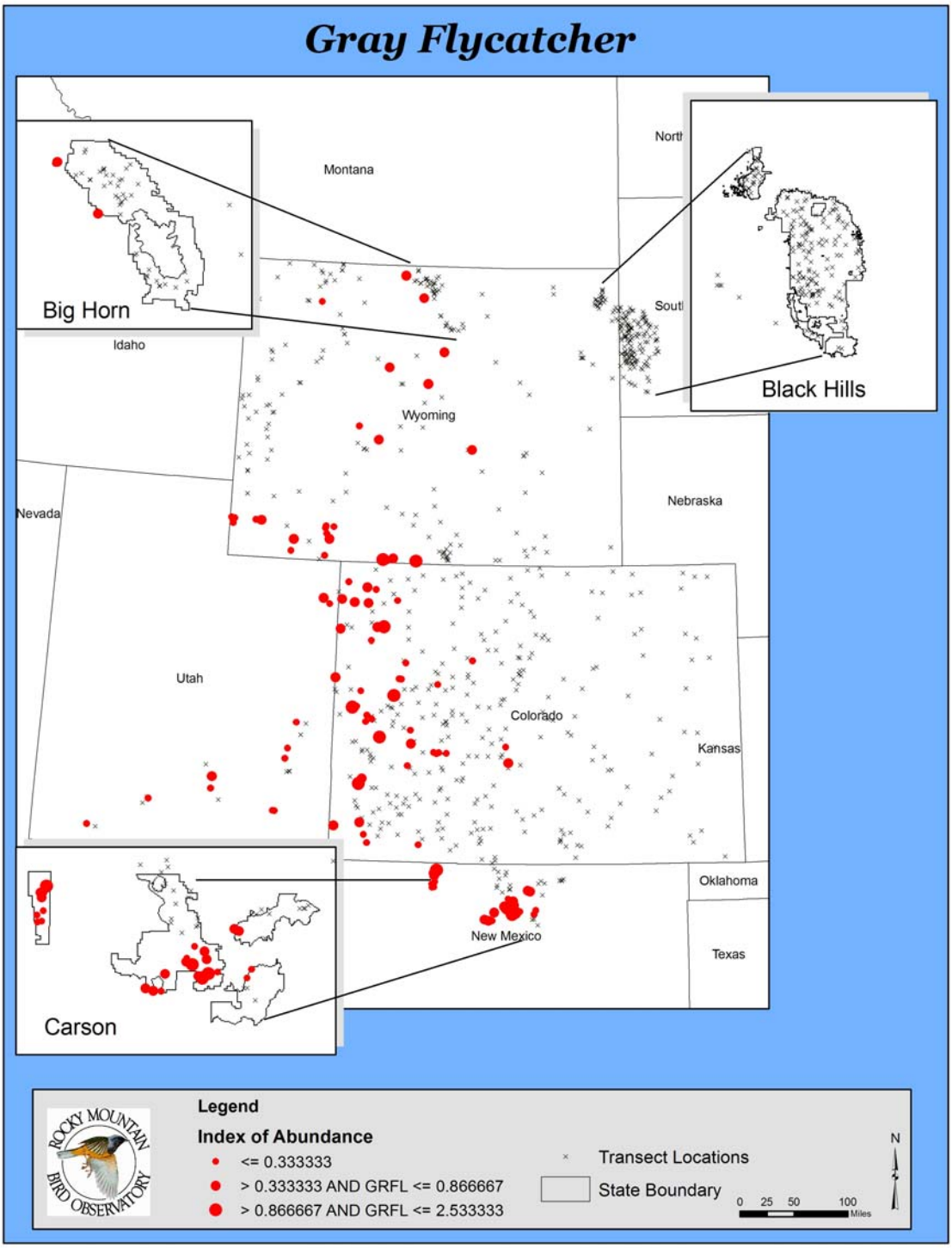
Habitat	D	LCL	UCL	CV	n	N
MS	ID	--	--	--	--	11
PJ	52.09	32.75	82.84	23.5%	155	164
PP	ID	--	--	--	--	1
SA	ID	--	--	--	--	2
SE	ID	--	--	--	--	5

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Gray Flycatcher among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – In Colorado, Gray Flycatcher breeds almost exclusively in pinyon-juniper habitat and only occasionally in sagebrush and tall desert shrub (Kingery 1998). Gray Flycatcher should be effectively monitored through point transects in pinyon-juniper habitat under MCB.


Gray Flycatcher
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.333333
> 0.333333 AND GRFL <= 0.866667
> 0.866667 AND GRFL <= 2.533333
Transect Locations
State Boundary
0 25 50 100
Miles
N

Dusky Flycatcher

(Empidonax oberholseri)

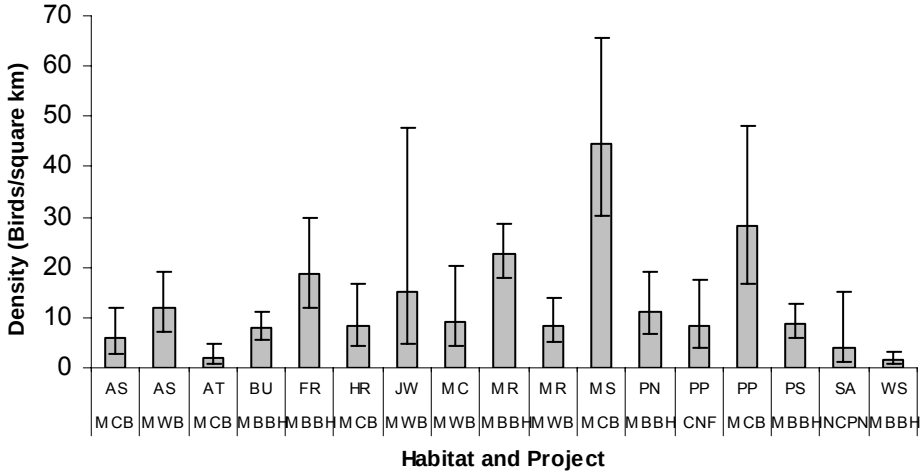
CDOW – Species of Greatest Conservation Need

We recorded 489 Dusky Flycatchers in nine habitats on the MCB project in 2005 and calculated density estimates in nine habitats. Overall, we detected this species on all of the RMBO point-count transect monitoring projects this summer and calculated density estimates in at least one habitat for all projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Dusky Flycatcher for the MCB monitoring project, summer 2005.

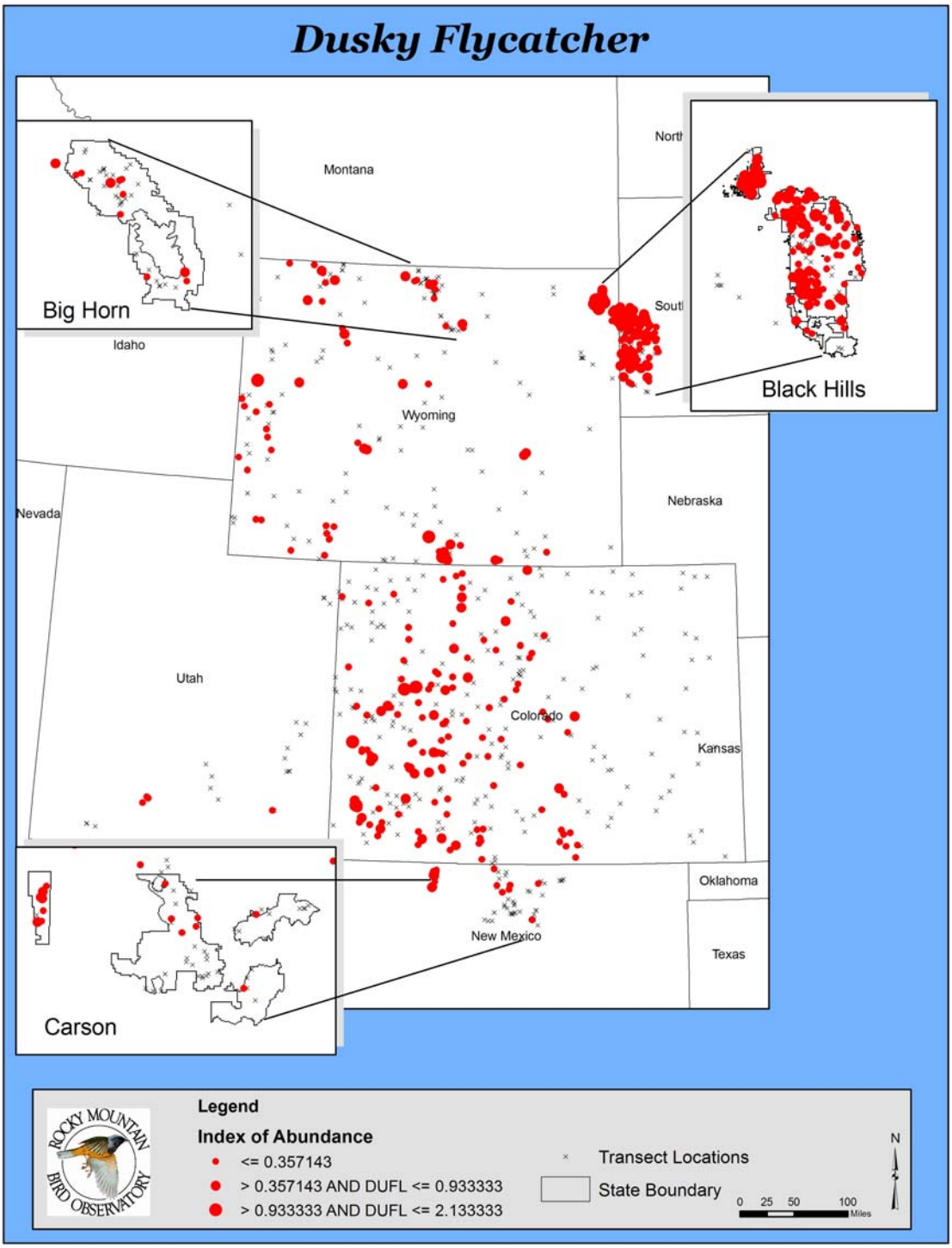
Habitat	D	LCL	UCL	CV	n	N
AS	5.78	2.78	12.02	37.3%	49	50
AT	1.99	0.81	4.88	47.0%	25	29
HR	8.41	4.21	16.80	35.5%	47	47
MC	ID	--	--	--	--	22
MS	44.58	30.35	65.50	19.2%	195	203
PJ	ID	--	--	--	--	18
PP	28.29	16.63	48.12	27.0%	95	99
SA	ID	--	--	--	--	15
SF	ID	--	--	--	--	6

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Dusky Flycatcher among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – Dusky Flycatcher uses a variety of habitats, including oak shrubland, willow riparian, aspen groves, coniferous forests and open brushy areas (Kingery 1998). Dusky Flycatcher should be effectively monitored through point transects under the MCB project in at least five habitats.


Dusky Flycatcher
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.357143
> 0.357143 AND DUFL <= 0.933333
> 0.933333 AND DUFL <= 2.133333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Cordilleran Flycatcher
(Empidonax occidentalis)

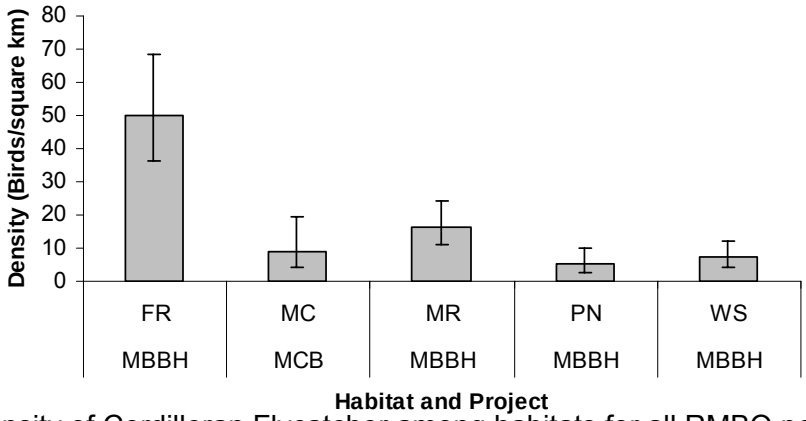
CDOW - Species of Greatest Conservation Need
PIF Regional Stewardship Species
NM-PIF Priority management species for Mixed Conifer

In 2005, we recorded 119 Cordilleran Flycatchers in seven habitats on the MCB project. This species was recorded on all other RMBO point-count transect monitoring projects and we calculated density estimates in at least one habitat on the MBBH and MCB projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Cordilleran Flycatcher for the MCB monitoring project, 2005.

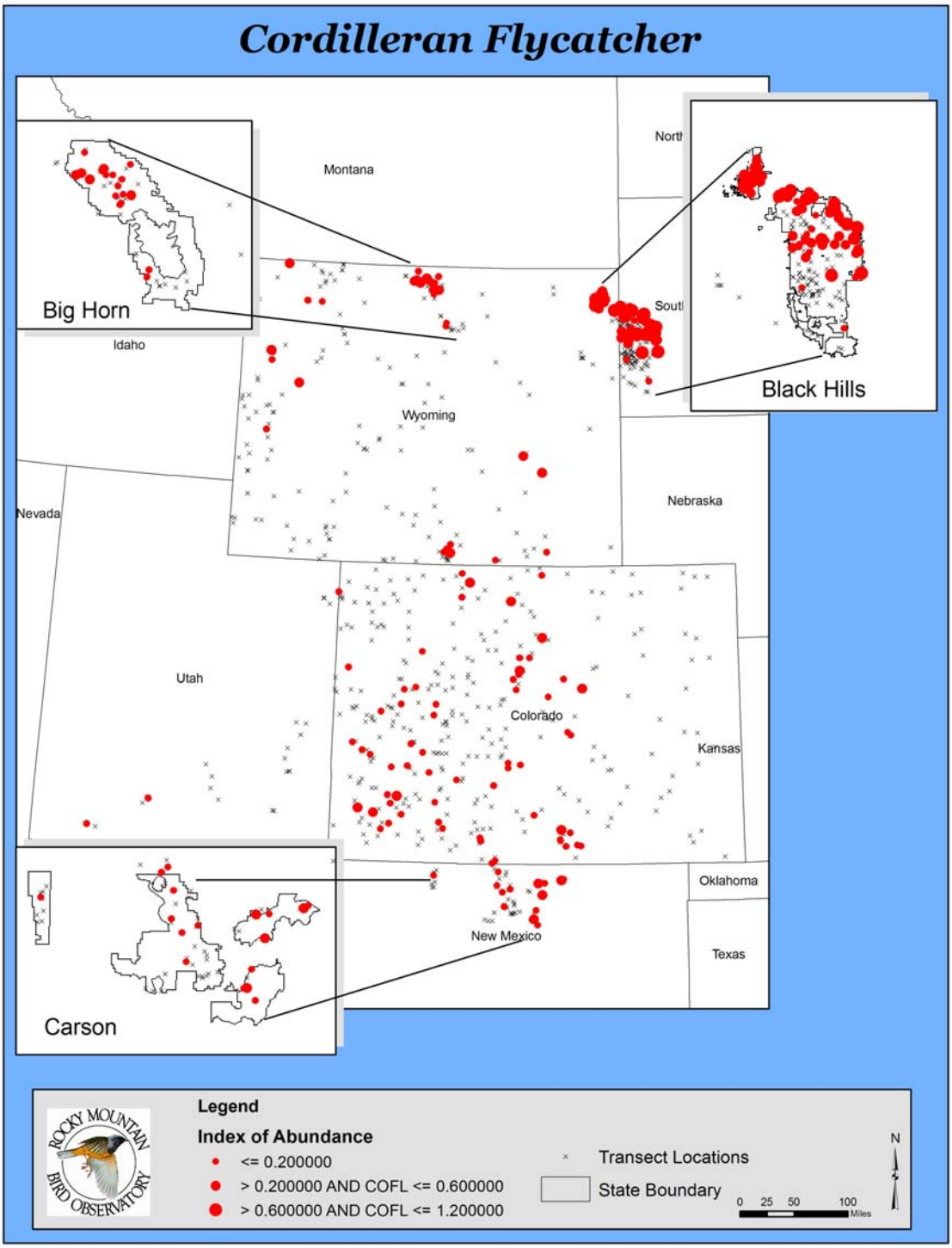
Habitat	D	LCL	UCL	CV	n	N
AS	ID	--	--	--	--	13
HR	ID	--	--	--	--	21
MC	8.85	4.02	19.50	40.9%	27	44
MS	ID	--	--	--	--	8
PJ	ID	--	--	--	--	1
PP	ID	--	--	--	--	10
SF	ID	--	--	--	--	22

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Cordilleran Flycatcher among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – Cordilleran Flycatchers, in Colorado, breed primarily in montane and subalpine forests, especially in which cliffs, rocky ledges, or suitable boulders are present (Kingery 1998). The species is also found as a breeder in montane riparian areas with many vertical surfaces, such as cut banks (Kingery 1998). Cordilleran Flycatcher should be effectively monitored through point transects under MCB, in at least mixed conifer habitat.


Cordilleran Flycatcher
Montana
North
South
Idaho
Wyoming
Nebraska
Nevada
Utah
Colorado
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.200000
> 0.200000 AND COFL <= 0.600000
> 0.600000 AND COFL <= 1.200000
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Say's Phoebe

(Sayornis saya)

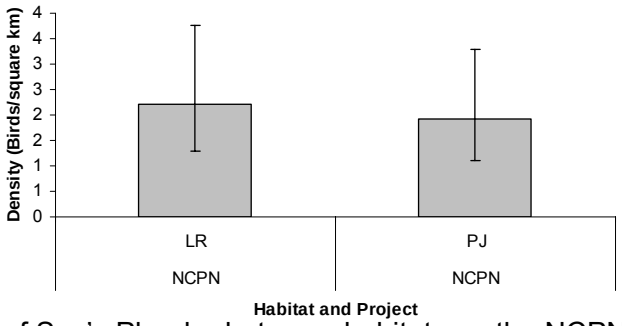
PIF Regional Stewardship Species

In 2005, we detected 19 Say's Phoebes in four habitats on the MCB project. We recorded the species on all RMBO point-transect monitoring projects except MBBH, which is outside of the species' normal breeding range. We detected Say's Phoebe in sufficient numbers to calculate density only on the NCPN project.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Say's Phoebe for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
GR	ID	--	--	--	--	9
MS	ID	--	--	--	--	1
PJ	ID	--	--	--	--	4
SE	ID	--	--	--	--	5

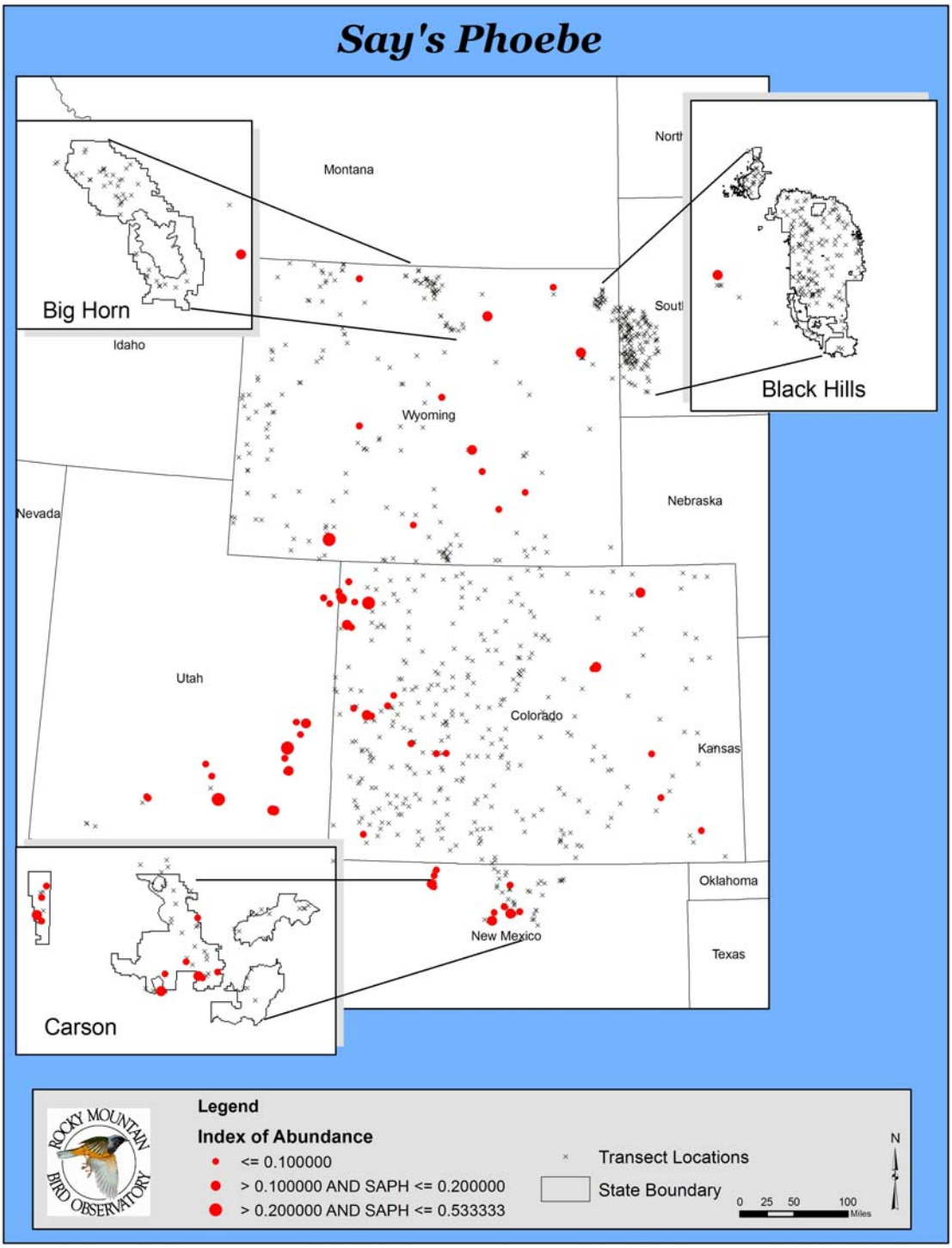
D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Say's Phoebe between habitats on the NCPN point-count transect monitoring project, 2005.

Summary – In Colorado, Say's Phoebe inhabits arid open country with sparse vegetation, nesting on rocky ledges, as well as on barns or other human structures (Andrews and Righter 1992). This species arrives on its breeding grounds earlier that most other migrants (in late March and early April); as a result, we may miss the period in which it sings most actively, as field work does not being until mid-May.

Say's Pheobe is not effectively monitored through point transects in any one habitat or across habitats under MCB. Adding transects, especially in grassland, may improve our ability to monitor this species. The RMBO section-survey program, however, is collecting sufficient data to effectively monitor this species in eastern Colorado.


Say's Phoebe
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.100000
> 0.100000 AND SAPH <= 0.200000
> 0.200000 AND SAPH <= 0.533333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Loggerhead Shrike

(Lanius ludovicianus)

CDOW - Species of Greatest Conservation Need
PIF Species of Regional Concern
CO-PIF Physiographic Region 87 Priority Species
USFS Region 2 Sensitive Species
USFWS Bird of Conservation Concern

In 2005, we detected 23 Loggerhead Shrikes in three habitats on the MCB project and also detected the species on our MWB and NCPN projects. However, we did not detect the species in sufficient numbers to calculate a density estimate in any habitat on any project.

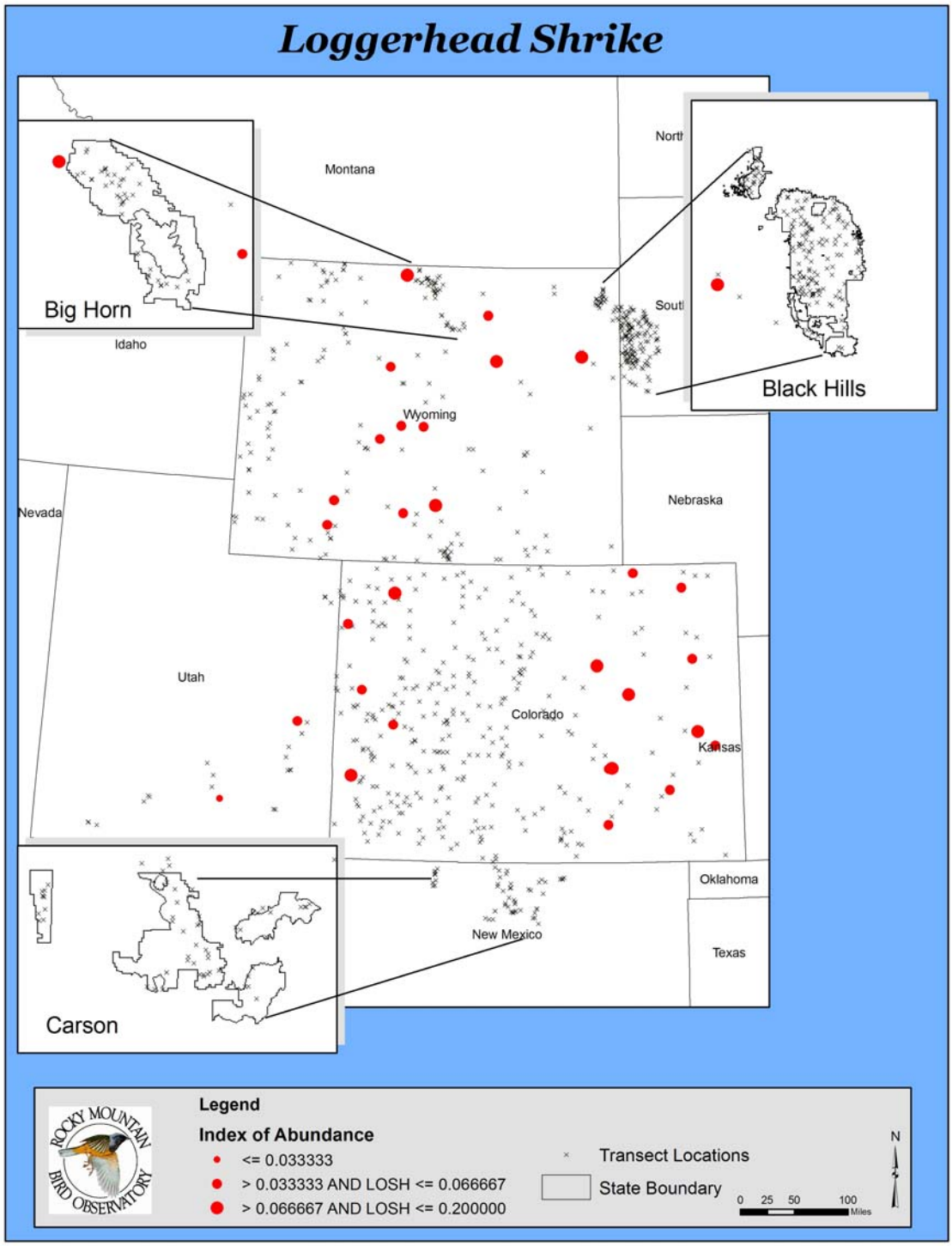
Total number of independent detections, number of individuals, and habitat-specific density estimates for Loggerhead Shrike for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
GR	ID	--	--	--	--	8
SA	ID	--	--	--	--	7
SE	ID	--	--	--	--	8

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – In Colorado, Loggerhead Shrike breeds primarily in rural areas and shortgrass prairie, and prefers low-elevation, open areas in which a few small, scattered trees and shrubs are present (Kingery 1998).

Due especially to its low density and large territory size, it is unlikely that with the current level of effort we will be able to effectively monitor Loggerhead Shrike through point transects under MCB. Adding transects may improve our ability to monitor this species; however, the RMBO section-survey program is collecting sufficient data to effectively monitor this species in eastern Colorado.


Loggerhead Shrike
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Nebraska
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.033333
> 0.033333 AND LOSH <= 0.066667
> 0.066667 AND LOSH <= 0.200000
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Gray Vireo

(Vireo vicinior)

CDOW - Species of Greatest Conservation Need
PIF Species of Continental and Regional Concern
PIF Regional Stewardship Species
CO-PIF Physiographic Region 87 Priority Species
USFWS Bird of Conservation Concern – BCR 16

In 2005, we detected 31 Gray Vireos in pinyon-juniper habitat on the MCB project and also on the MBCNF, MWB, and NCPN projects. However, we detected the species in sufficient numbers to calculate a density estimate only on the NCPN project.

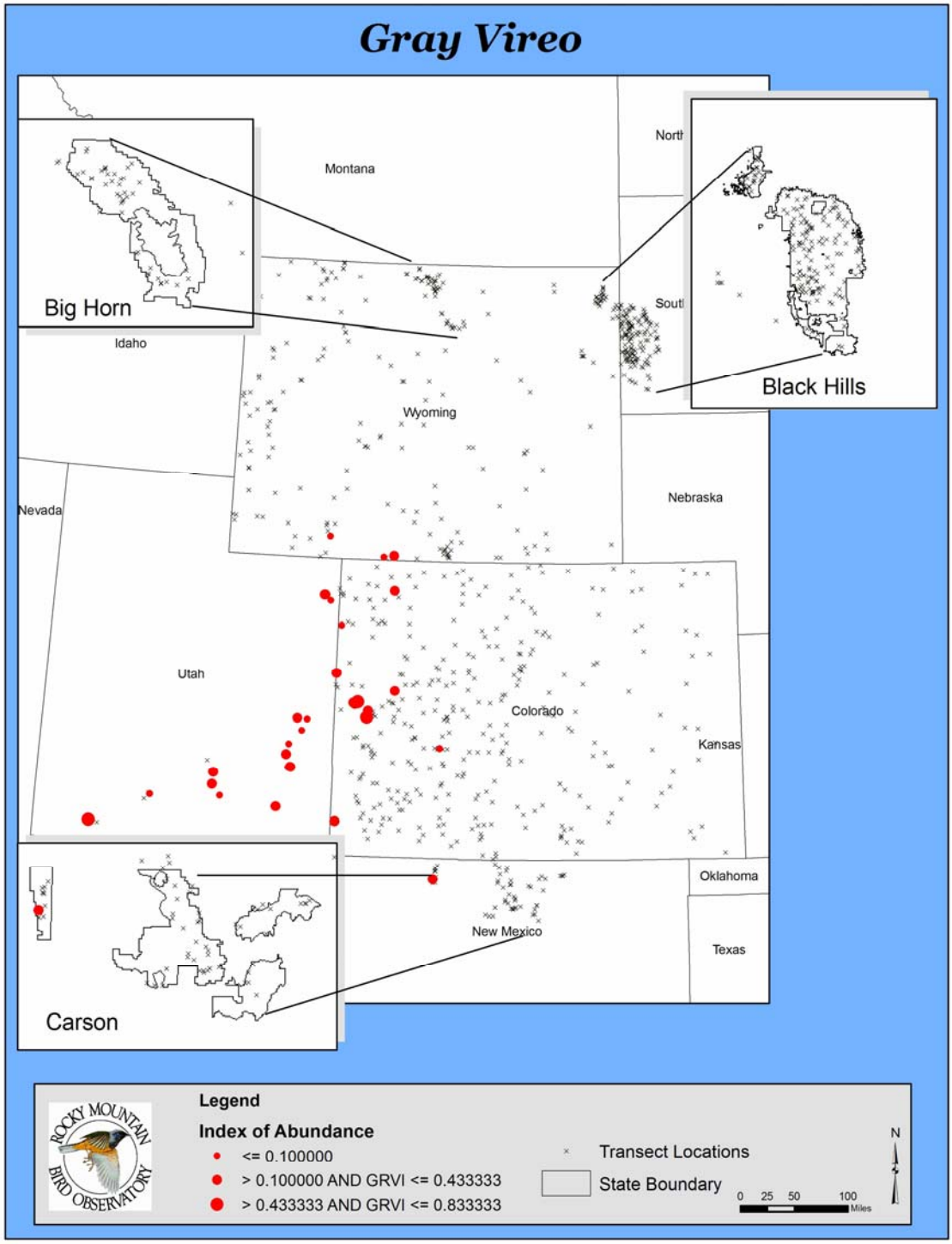
Total number of independent detections, number of individuals, and habitat-specific density estimates for Gray Vireo for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
PJ	ID	--	--	--	10	31

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – In Colorado, Gray Vireo nests almost exclusively in pinyon-juniper habitat, often with grasses, sagebrush, and desert scrub (Righter et al. 2004, Kingery 1998). It is believed to nest only in low-elevation pinyon-juniper, which may explain why it is not encountered more frequently on MCB transects (Righter et al. 2004).

Gray Vireo may be effectively monitored through point transects under MCB. In 2004, we were able to provide a density estimate for this species in Colorado; however, this year we did not have a sufficient number of on-point detections to accomplish this. Adding low-elevation pinyon-juniper transects could improve our ability to monitor this species.


Gray Vireo
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.100000
> 0.100000 AND GRVI <= 0.433333
> 0.433333 AND GRVI <= 0.833333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Plumbeous Vireo
(*Vireo plumbeous*)

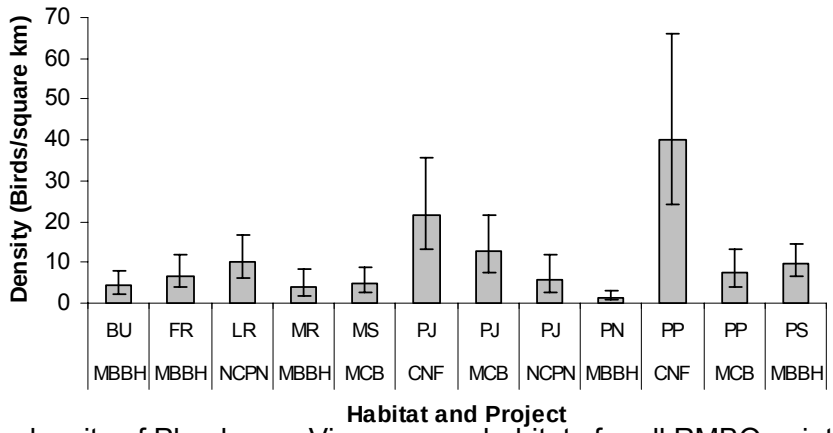
PIF Regional Stewardship Species

In 2005, we detected 195 Plumbeous Vireos in five habitats on the MCB project. Overall, we detected this species on all five RMBO point-count transect monitoring projects and calculated density estimates in at least one habitat on the MBBH, MCB, MBCNF, and NCPN projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Plumbeous Vireo for the MCB monitoring project, 2005.

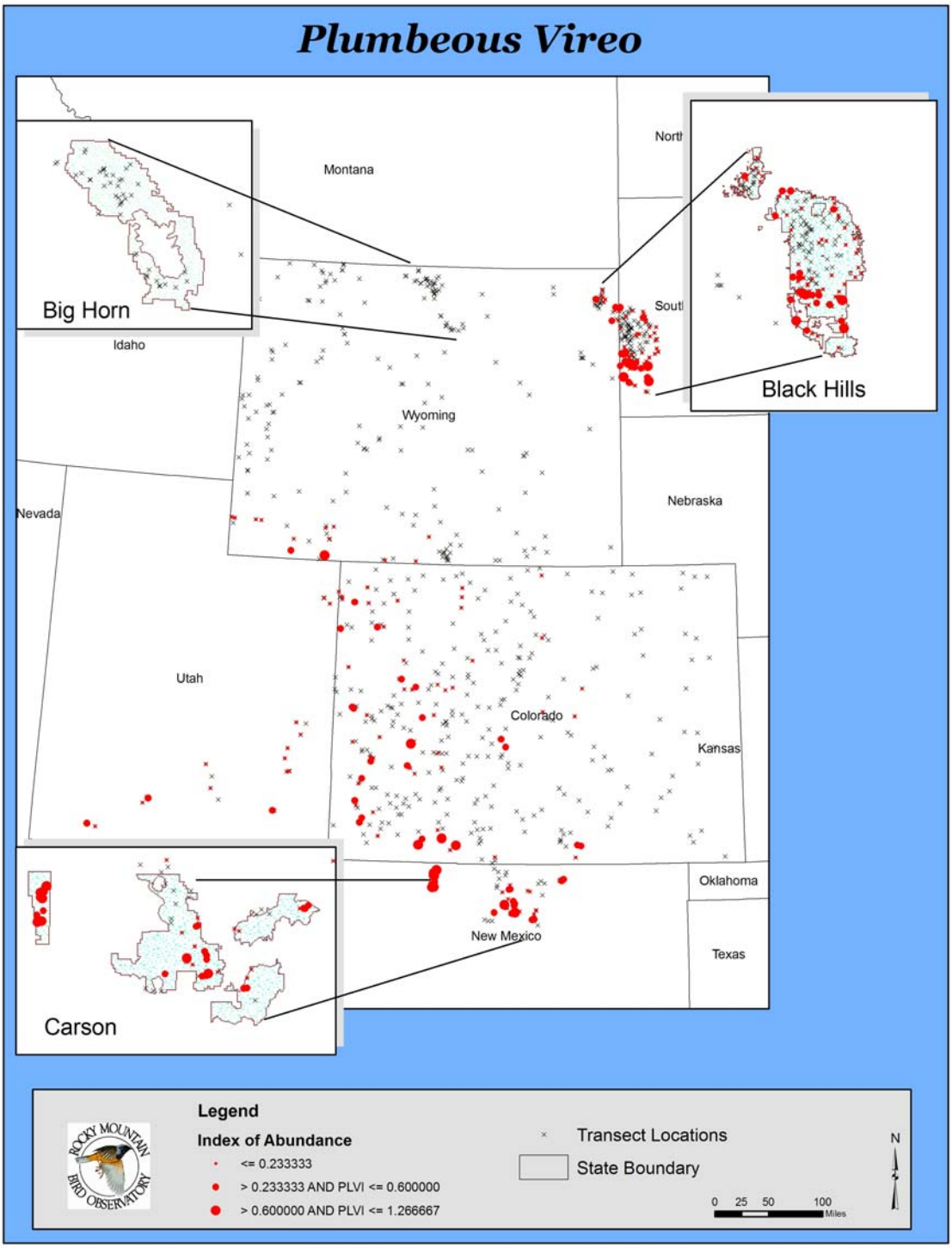
Habitat	D	LCL	UCL	CV	n	N
MC	ID	--	--	--	--	10
MS	4.72	2.57	8.68	31.0%	30	30
PJ	12.65	7.45	21.51	27.1%	68	71
PP	7.40	4.14	13.22	29.3%	79	83
SA	ID	--	--	--	--	1

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Plumbeous Vireo among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – In Colorado, Plumbeous Vireo nests in a variety of habitats, including pinyon-juniper, ponderosa pine, and riparian cottonwood galleries, but appears to reach its highest density in pinyon-juniper habitat (Kingery 1998). Plumbeous Vireo should be effectively monitored through point transects under MCB in a range of habitats, including, montane shrubland, pinyon-juniper, and ponderosa pine.


Plumbeous Vireo
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.233333
> 0.233333 AND PLVI <= 0.600000
> 0.600000 AND PLVI <= 1.266667
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Warbling Vireo
(Vireo gilvus)

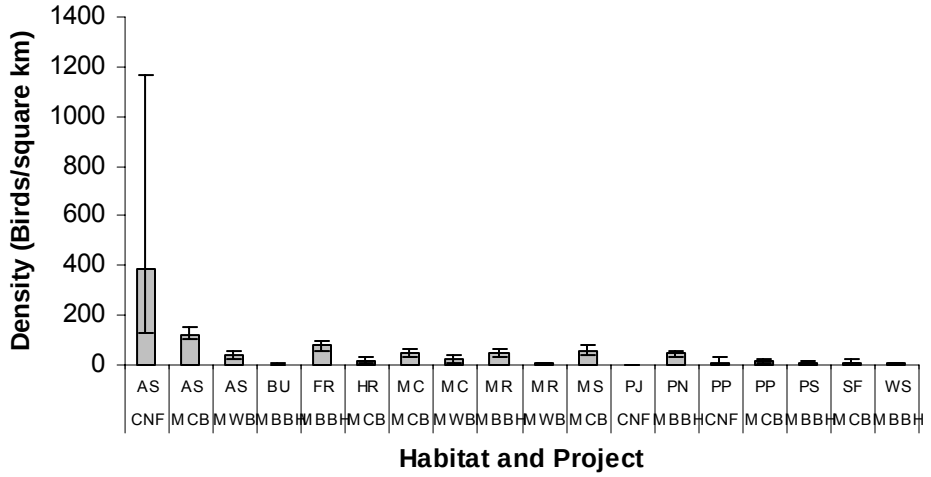
PIF Regional Stewardship Species

In 2005, we detected 1351 Warbling Vireos in nine habitats and calculated densities in six habitats on the MCB project. We also recorded the species on all other RMBO point-transect monitoring projects, calculating density estimates in at least one habitat on all projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Warbling Vireo for the MCB monitoring project, 2005.

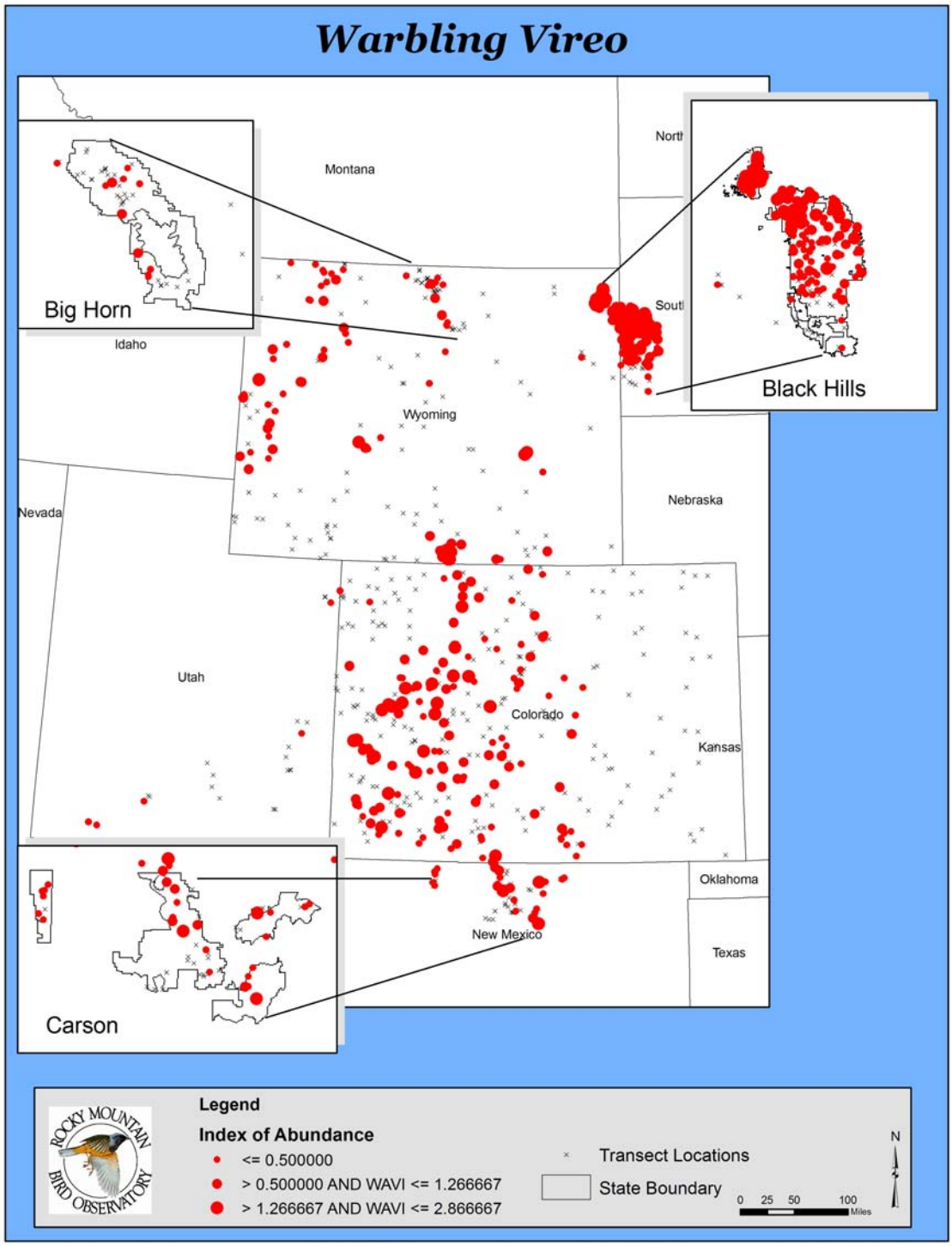
Habitat	D	LCL	UCL	CV	n	N
AS	124.58	101.08	153.55	10.4%	473	486
HR	16.88	9.76	29.21	27.6%	98	109
MC	47.41	34.70	64.77	15.7%	222	228
MS	52.81	36.29	76.86	18.6%	319	320
PJ	ID	--	--	--	--	6
PP	12.50	7.60	20.58	24.9%	155	158
SA	ID	--	--	--	--	12
SF	11.46	4.72	27.82	46.5%	31	31
WE	ID	--	--	--	--	1

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Warbling Vireo among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – In Colorado, Warbling Vireo nests primarily in riparian stream bottoms and aspen forests (Kingery 1998). In 2005, the density estimate we calculated for Warbling Vireo was highest in aspen, but Warbling Vireo should be effectively monitored through point transects under MCB in a range of habitats, including, montane shrubland and mixed conifer.


Warbling Vireo
Montana
North
South
Idaho
Wyoming
Nebraska
Nevada
Utah
Colorado
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.500000
> 0.500000 AND WAVI <= 1.266667
> 1.266667 AND WAVI <= 2.866667
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Pinyon Jay

(Gymnorhinus cyanocephalus)

CDOW - Species of Greatest Conservation Need
PIF Species of Continental and Regional Concern
PIF Continental and Regional Stewardship Species
CO-PIF Physiographic Region 87 Priority Species
USFWS Bird of Conservation Concern – BCR 16

In 2005, we detected 222 Pinyon Jays in five habitats and were able to calculate a density estimate in pinyon-juniper on the MCB project. In total, we recorded Pinyon Jay on all five RMBO point-transect monitoring projects and were able to calculate a density estimate in at least one habitat on three other projects.

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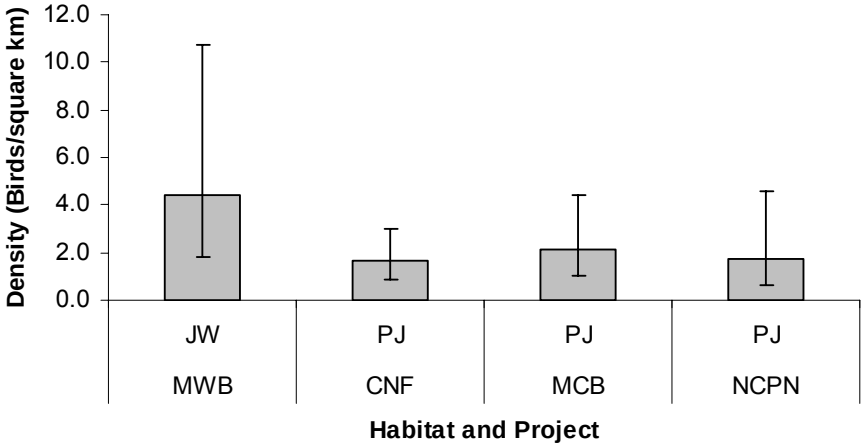
Total number of independent detections, number of individuals, and habitat-specific density estimates for Pinyon Jay for the MCB monitoring project, 2005.

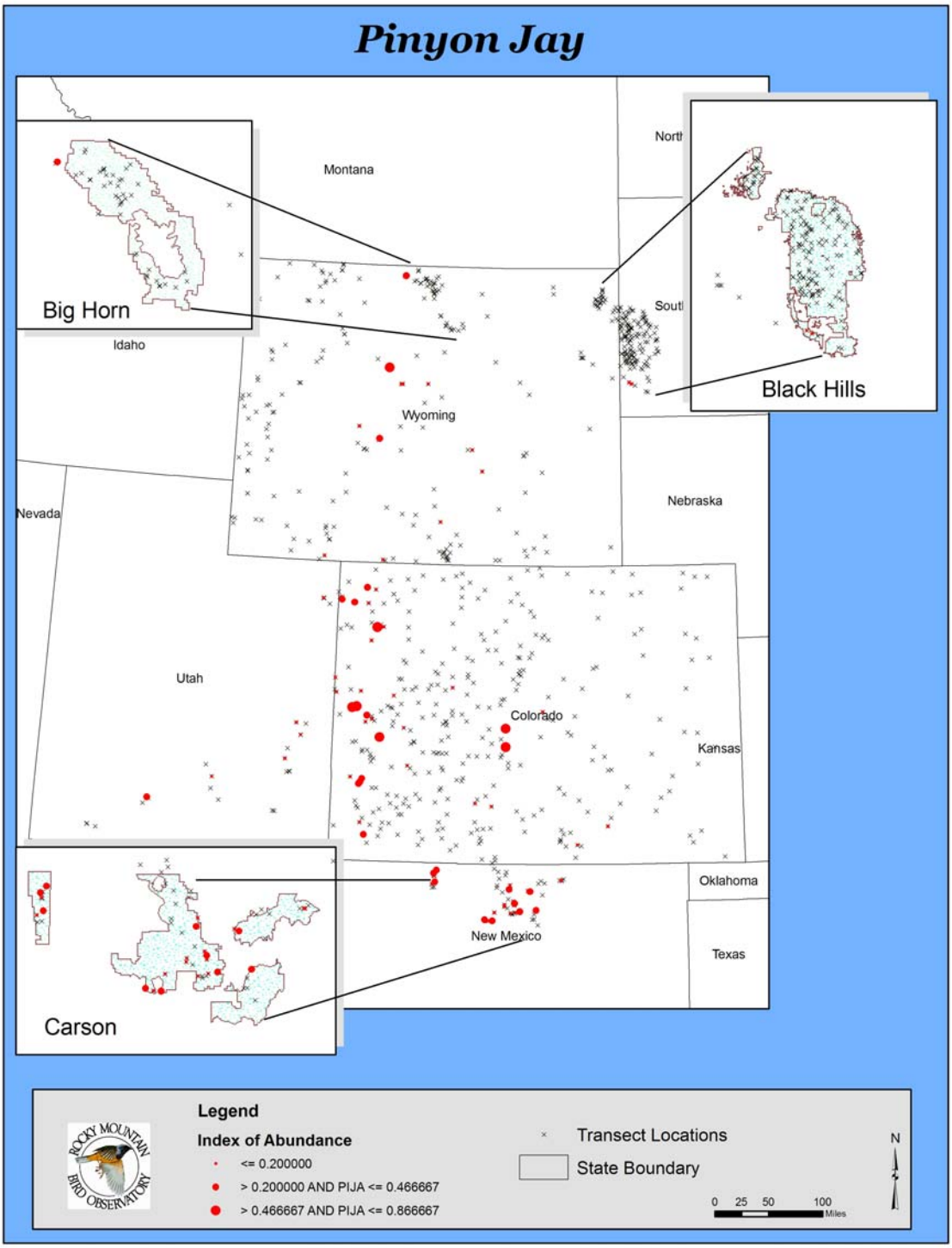
Habitat	D	LCL	UCL	CV	n	N
MC	ID	--	--	--	--	2
PJ	2.16	1.05	4.43	36.8%	58	158
PP	ID	--	--	--	--	3
SA	ID	--	--	--	--	8
SE	ID	--	--	--	14	51

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Pinyon Jay among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – Pinyon Jay is rarely found in habitats other than pinyon-juniper and is an important seed disperser for pinyon pines, as it caches large amounts of seeds (Righter et al. 2004). Pinyon Jay should be effectively monitored through point transects in at least pinyon-juniper habitat under MCB. However, Pinyon Jay is an early season breeder and without noting juveniles, it is possible to calculate inflated density estimates.


Pinyon Jay
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.200000
> 0.200000 AND PIJA <= 0.466667
> 0.466667 AND PIJA <= 0.866667
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Clark's Nutcracker
(Nucifraga Columbiana)

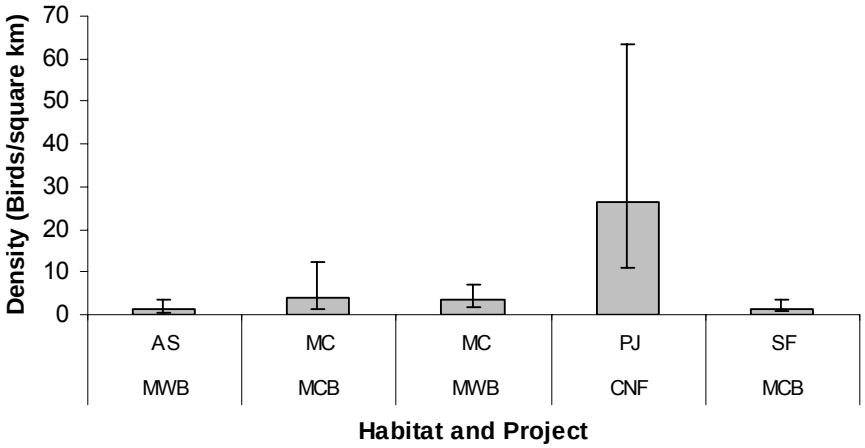
PIF Continental and Regional Stewardship Species

We detected 331 Clark's Nutcrackers in ten habitats and were able to calculate a density estimate in mixed conifer and spruce-fir habitats on the MCB project. In total, we detected Clark's Nutcracker on all other RMBO point-count transect monitoring projects and calculated a density estimate in at least one habitat on two other projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Clark's Nutcracker for the MCB monitoring project, 2005.

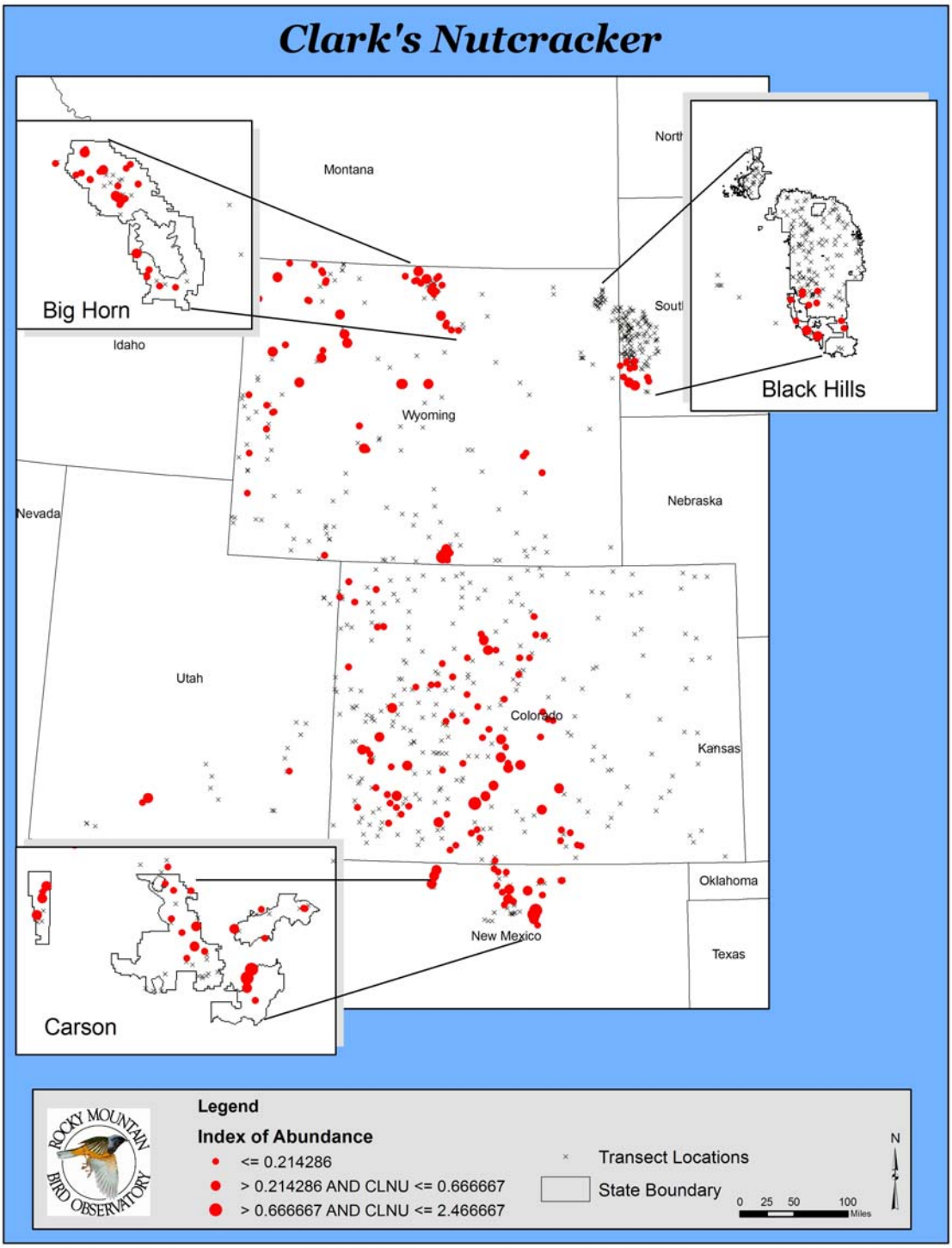
Habitat	D	LCL	UCL	CV	n	N
AS	ID	--	--	--	--	18
AT	ID	--	--	--	--	22
HR	ID	--	--	--	--	7
MC	3.91	1.22	12.54	62.0%	54	161
MS	ID	--	--	--	--	5
PJ	ID	--	--	--	--	21
PP	ID	--	--	--	13	44
SA	ID	--	--	--	--	2
SF	1.51	0.67	3.41	42.3%	28	43
WE	ID	--	--	--	--	8

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Clark's Nutcracker among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – Clark's Nutcracker nests in a variety of coniferous habitats, but is most often associated with pinyon habitat, whether or not it is nesting, as it relies extensively on pinyon seeds (Kingery 1998). Clark's Nutcracker should be effectively monitored through point transects under MCB in at least mixed conifer and spruce-fir habitats. However, Clark's Nutcracker is an early season breeder and without noting juveniles, it is possible to calculate inflated density estimates.


Clark's Nutcracker
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.214286
> 0.214286 AND CLNU <= 0.666667
> 0.666667 AND CLNU <= 2.466667
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Black-billed Magpie
(Pica hudsonia)

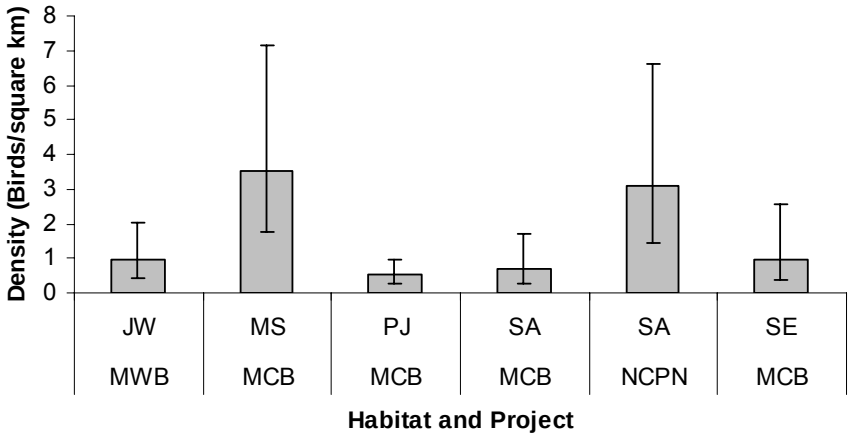
PIF Regional Stewardship Species

In 2005, we detected 191 Black-billed Magpies in nine habitats on the MCB project. Overall, we detected Black-billed Magpie on all other RMBO point transect monitoring projects and were able to calculate a density estimate for this species in at least one habitat on the MCB, MWB and NCPN projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Black-billed Magpie for the MCB monitoring project, 2005.

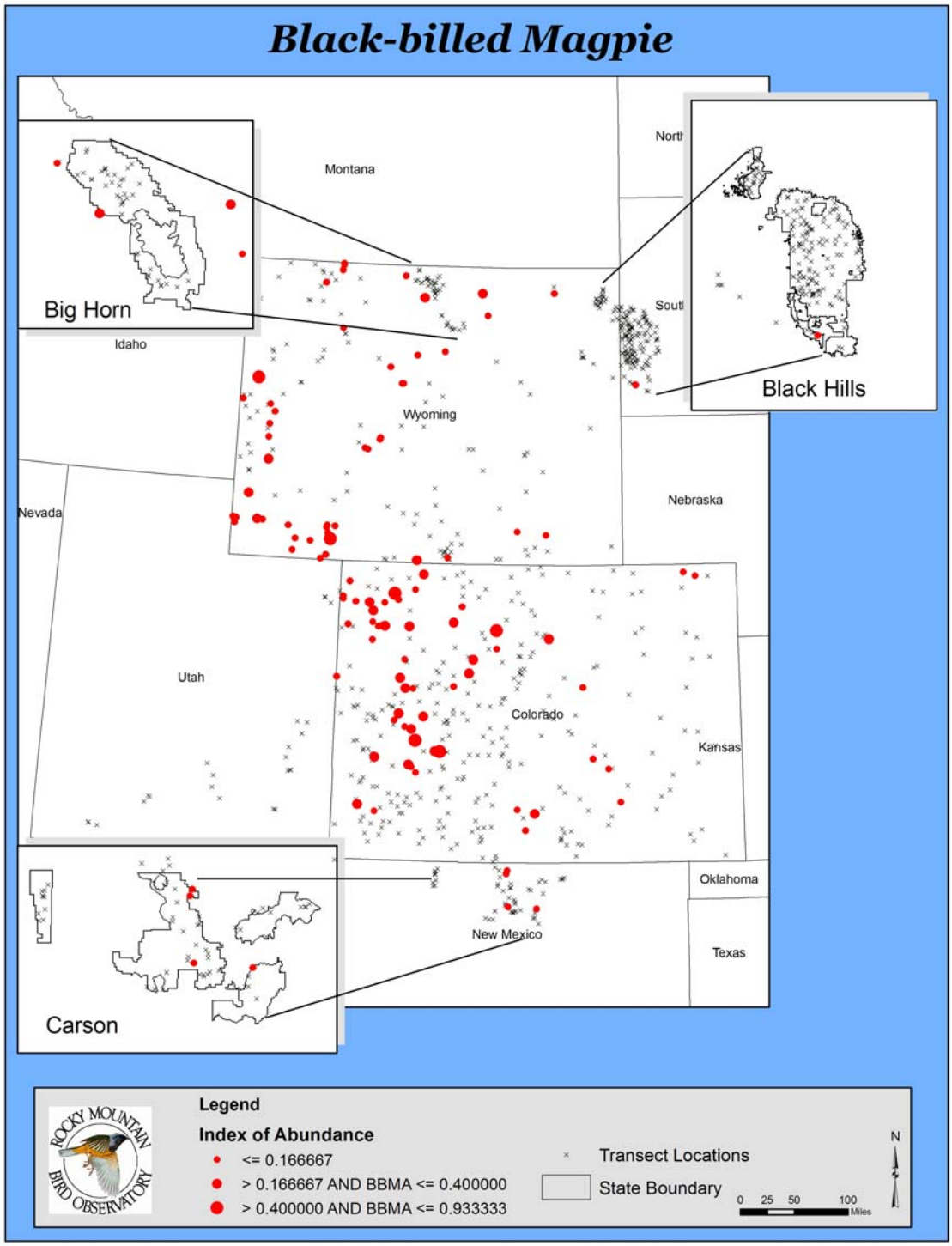
Habitat	D	LCL	UCL	CV	n	N
GR	ID	--	--	--	--	1
HR	ID	--	--	--	--	8
MC	ID	--	--	--	--	4
MS	3.54	1.75	7.16	36.1%	27	73
PJ	0.53	0.29	0.97	30.5%	28	29
PP	ID	--	--	--	--	4
SA	0.69	0.28	1.70	47.1%	41	42
SE	0.96	0.36	2.58	52.2%	26	28
WE	ID	--	--	--	--	2

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Black-billed Magpie among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – Black-billed Magpie occurs in all open habitats with scattered trees but is most common in riparian forests, agricultural areas, and pinyon-juniper habitat (Kingery 1998, Righter et al. 2004). Black-billed Magpies should be effectively monitored through point transects under MCB in a range of habitats, including montane shrubland and semi-desert shrubland.


Black-billed Magpie
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.166667
> 0.166667 AND BBMA <= 0.400000
> 0.400000 AND BBMA <= 0.933333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Chihuahuan Raven
(Corvis cryptoleucus)
PIF Species of Regional Concern

We detected 21 Chihuahuan Ravens in grassland and semidesert shrubland on the MCB project in 2005. The only other RMBO point transect monitoring project on which we detected Chihuahuan Raven in 2005 was MBCNF; however, the range of this species does not encompass areas where other RMBO monitoring projects occur.

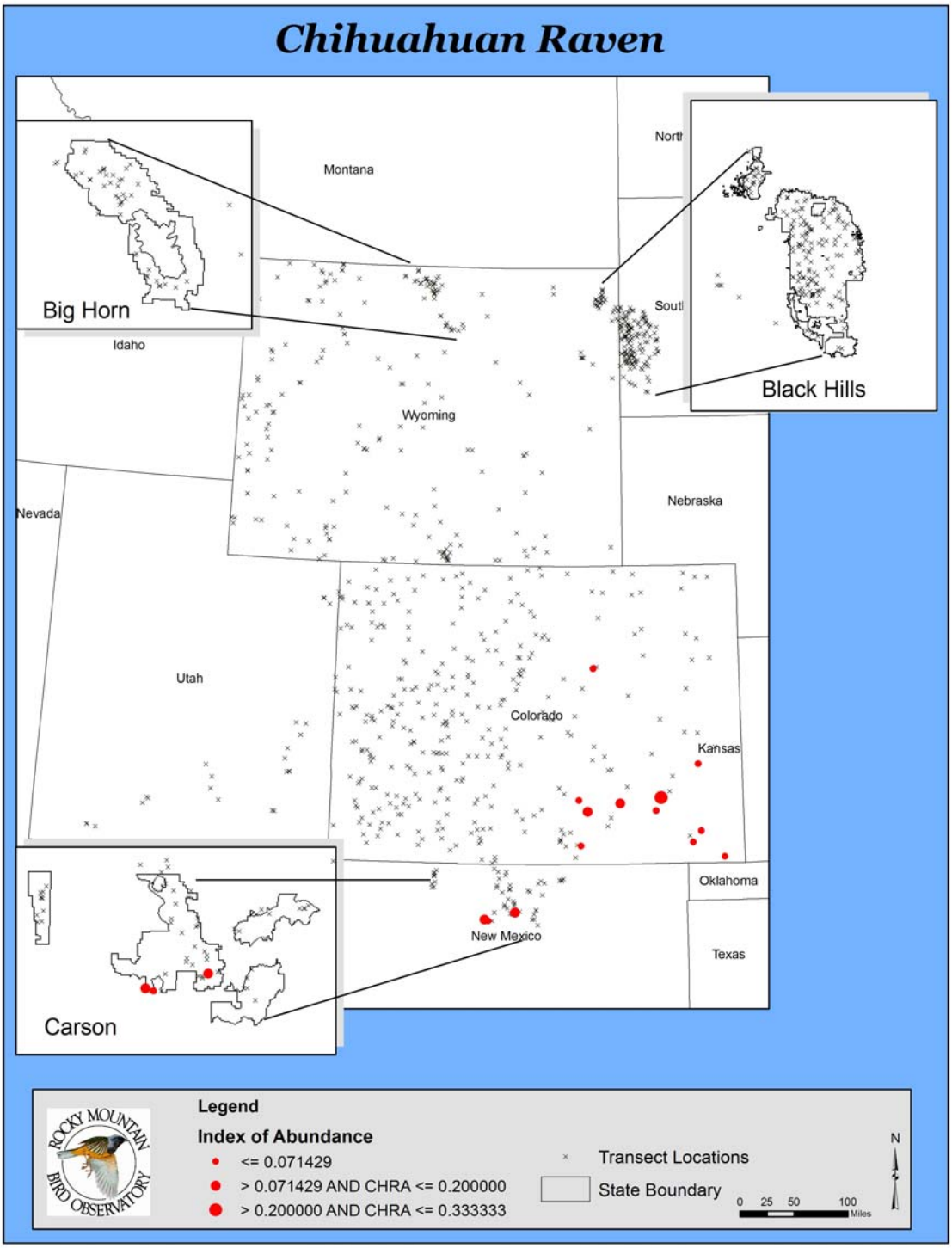
Total number of independent detections, number of individuals, and habitat-specific density estimates for Chihuahuan Raven for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
GR	ID	--	--	--	--	12
SE	ID	--	--	--	--	9

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – In Colorado, the Chihuahuan Raven occurs primarily in the southeast corner of the state in shortgrass prairie and cholla cactus grasslands (Kingery 1998). During the time when the bison herds were being slaughtered the population of this species exploded and it was found throughout the prairies of eastern Colorado. After the bison were extirpated, its range retracted back to its former and current range (Kingery 1998).

Chihuahuan Raven is not effectively monitored through point transects in any habitat or across habitats under MCB. Adding transects, especially in grassland in the southeast corner of the state, may improve our ability to monitor this species. Given interest, however, with several years' data, we may be able to pool data across years and habitats and weight observations by habitat area, to generate a global detection function for this species and thereby generate an annual statewide density estimate that may be robust enough for population-trend monitoring.


Chihuahuan Raven
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.071429
> 0.071429 AND CHRA <= 0.200000
> 0.200000 AND CHRA <= 0.333333
Transect Locations
State Boundary
0 25 50 100
Miles
N

Violet-green Swallow
(Tachycineta thalassina)

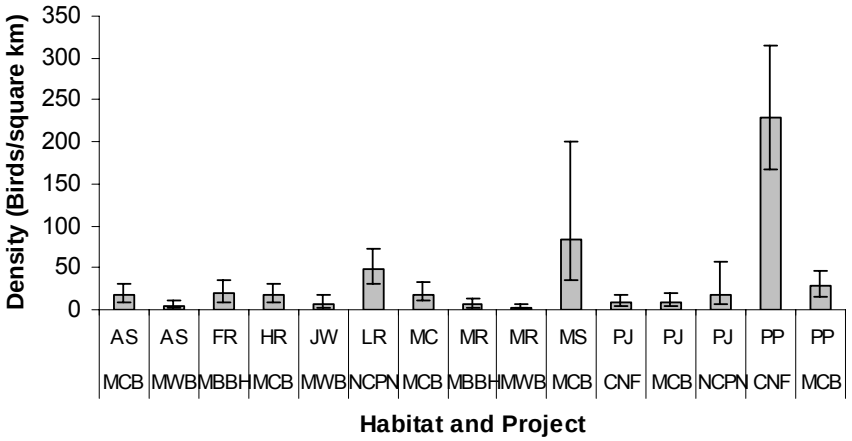
PIF Regional Stewardship Species
CO-PIF Physiographic Region 62 Priority Species

In 2005, we detected 813 Violet-green Swallows in eleven habitats and calculated density estimates in six habitats on the MCB project. In total, this species was detected on all RMBO point-count transect monitoring projects and we calculated density estimates for in at least one habitat for all projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Violet-green Swallow for the MCB monitoring project, 2005.

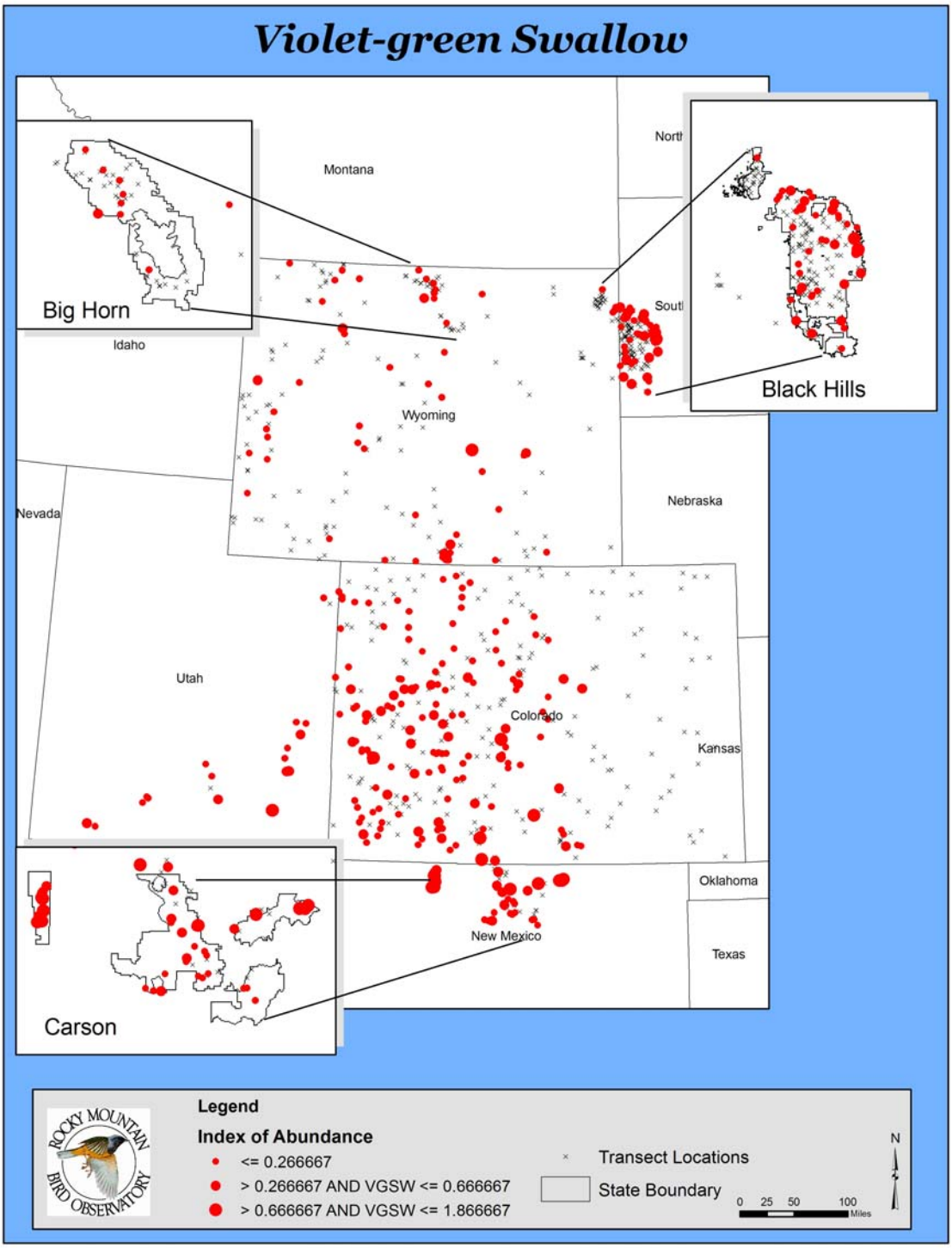
Habitat	D	LCL	UCL	CV	n	N
AS	17.35	9.70	31.04	29.9%	62	139
AT	ID	--	--	--	--	7
HR	17.28	9.48	31.49	30.3%	71	104
MC	18.42	10.53	32.19	28.3%	48	84
MS	84.11	35.31	200.32	46.0%	94	185
PJ	9.72	4.84	19.54	36.0%	36	86
PP	27.55	16.12	47.10	27.1%	77	130
SA	ID	--	--	--	--	10
SE	ID	--	--	--	21	50
SF	ID	--	--	--	--	7
WE	ID	--	--	--	--	11

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Violet-green Swallow among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary– Violet-green Swallows breed in a variety of habitats that offer cavities for nesting including cliffs and condos (Kingery 1998). Violet-green Swallow should be effectively monitored through point transects under MCB in at least six habitats.


Violet-green Swallow
Montana
North
South
Idaho
Wyoming
Nebraska
Nevada
Utah
Colorado
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.266667
> 0.266667 AND VGSW <= 0.666667
> 0.666667 AND VGSW <= 1.866667
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Juniper Titmouse

(Baeolophus ridgwayi)

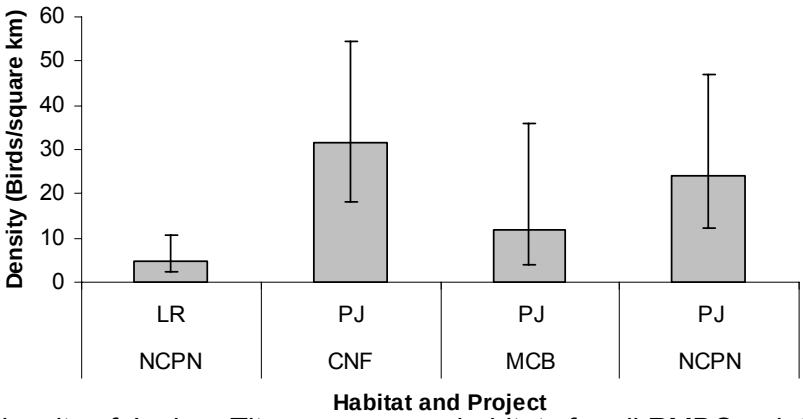
CDOW - Species of Greatest Conservation Need
PIF Species of Regional Concern
PIF Regional Stewardship Species
CO-PIF Physiographic Region 87 Priority Species
USFWS Bird of Conservation Concern - BCR 16

We detected 36 Juniper Titmice in one habitat on the MCB project in 2005 and recorded the species on all other RMBO point-transect monitoring projects except MBBH, which is outside of the species' normal breeding range. We detected Juniper Titmouse in sufficient numbers to calculate density in at least one habitat each on three projects, including MCB.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Juniper Titmouse for the MCB monitoring project, 2005.

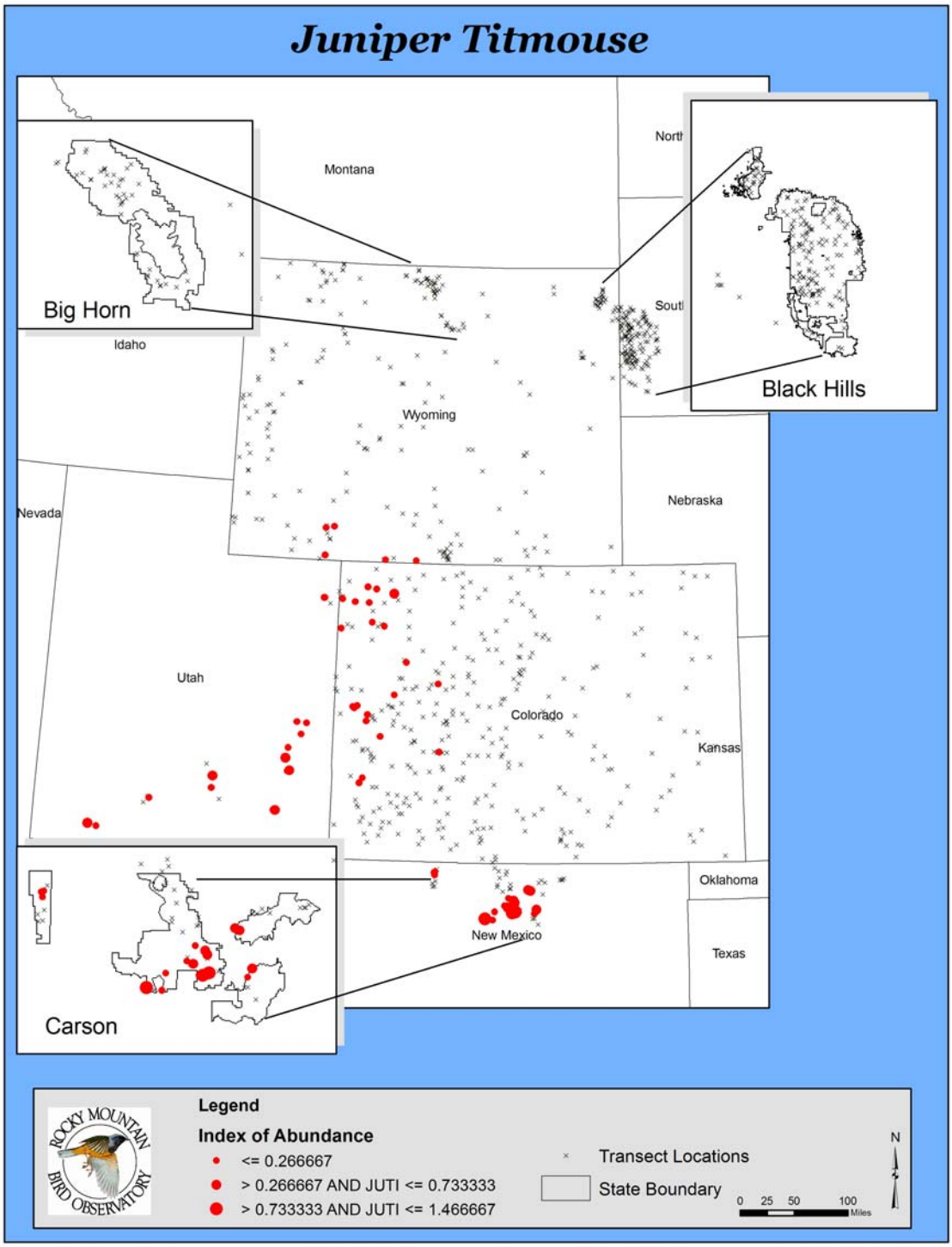
Habitat	D	LCL	UCL	CV	n	N
PJ	11.74	3.84	35.88	59.6%	29	36

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Juniper Titmouse among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – Juniper Titmouse is a pinyon-juniper specialist rarely found in other habitats, nesting in natural cavities or cavities excavated by woodpeckers (Kingery 1998). Juniper Titmouse should be effectively monitored through point transects under MCB in pinyon-juniper habitat.


Juniper Titmouse
Montana
North
South
Idaho
Wyoming
Nebraska
Nevada
Utah
Colorado
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.266667
> 0.266667 AND JUTI <= 0.733333
> 0.733333 AND JUTI <= 1.466667
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Pygmy Nuthatch
(Sitta pygmaea)

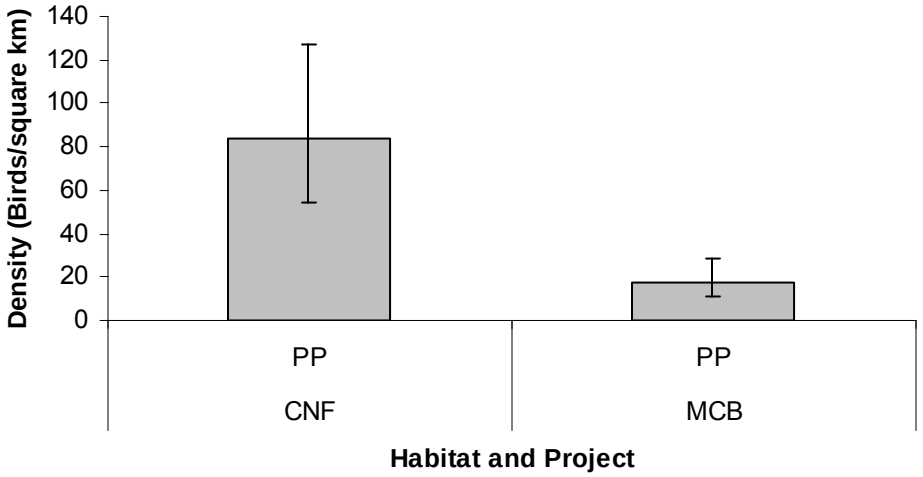
CDOW - Species of Greatest Conservation Need
PIF Species of Regional Concern
USFS Region 2 Sensitive Species

In 2005, we detected 88 Pygmy Nuthatches in five habitats on the MCB project and recorded the species on all RMBO point-transect monitoring projects. However, we were able to calculate a density estimate in at least one habitat only on MBCNF and MCB.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Pygmy Nuthatch for the MCB monitoring project, 2005.

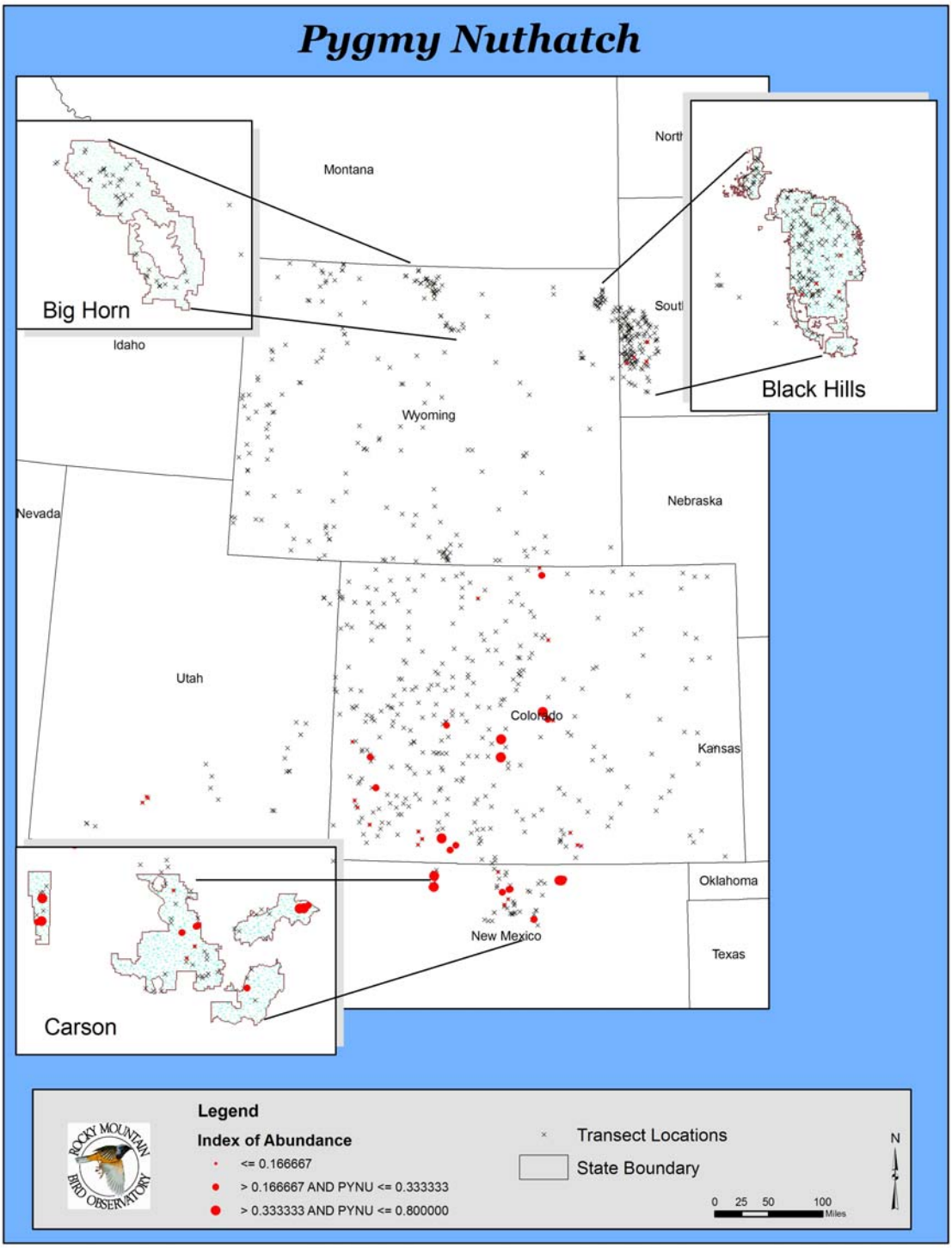
Habitat	D	LCL	UCL	CV	n	N
AS	ID	--	--	--	--	1
MC	ID	--	--	--	--	1
MS	ID	--	--	--	--	1
PP	17.78	10.93	28.91	24.5%	71	82
SF	ID	--	--	--	--	4

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Pygmy Nuthatch among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – Pygmy Nuthatch relies almost exclusively on ponderosa pine and is rarely detected in other habitats (Kingery 1998). Pygmy Nuthatch should be effectively monitored through point transect under MCB in ponderosa pine.


Pygmy Nuthatch
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.166667
> 0.166667 AND PYNU <= 0.333333
> 0.333333 AND PYNU <= 0.800000
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

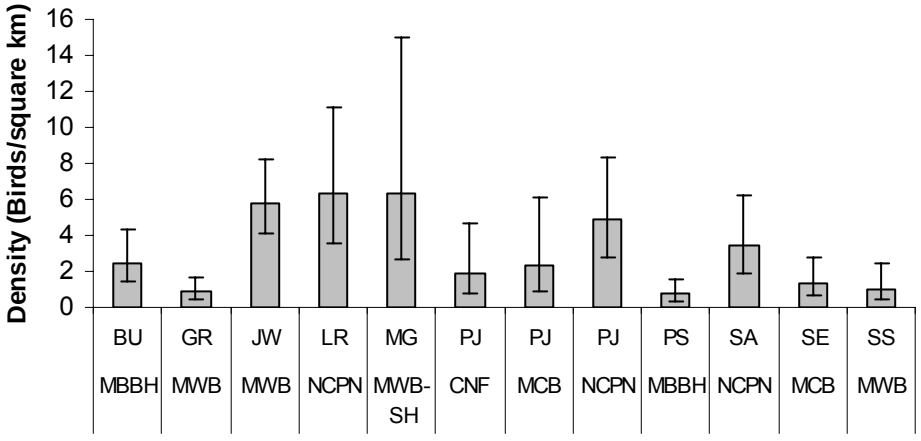
Rock Wren
(Salpinctes obsoletus)
PIF Regional Stewardship Species

In 2005, we detected 171 Rock Wrens in nine habitats on the MCB project and were able to calculate density estimates in pinyon-juniper and semidesert shrubland. Overall, we detected Rock Wren on all RMBO point-count monitoring projects in 2005, and we detected this species in sufficient numbers to calculate a density estimate in at least one habitat on each project.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Rock Wren for the MCB monitoring project, 2005.

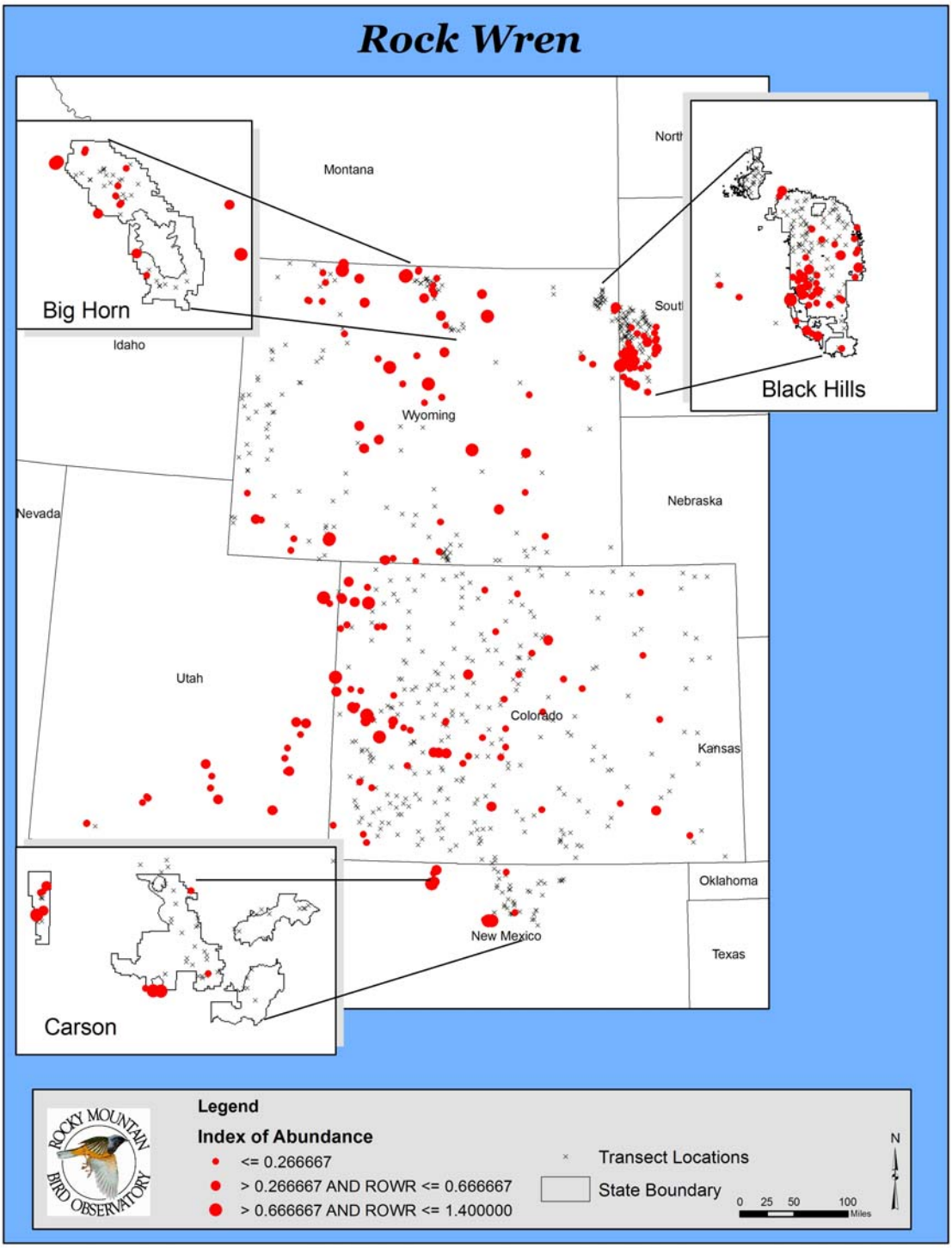
Habitat	D	LCL	UCL	CV	n	N
AT	ID	--	--	--	--	7
GR	ID	--	--	--	--	7
MC	ID	--	--	--	--	2
MS	ID	--	--	--	--	2
PJ	2.32	0.88	6.12	51.6%	33	71
PP	ID	--	--	--	--	7
SA	ID	--	--	--	--	20
SE	1.39	0.69	2.80	36.0%	40	54
SF	ID	--	--	--	--	1

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Rock Wren among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – In Colorado, Rock Wren nests in arid or semi-arid habitat, in rocky canyons, on rock slides and boulder-strewn slopes, and in arroyos with sparse vegetation (Kingery 1998). We detect this species in sufficient numbers to monitor it effectively under MCB in pinyon-juniper and semidesert shrubland habitat.


Rock Wren
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Nebraska
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.266667
> 0.266667 AND ROWR <= 0.666667
> 0.666667 AND ROWR <= 1.400000
Transect Locations
State Boundary
0 25 50 100
Miles
N

Canyon Wren
(Catherpes mexicanus)
PIF Species of Regional Concern

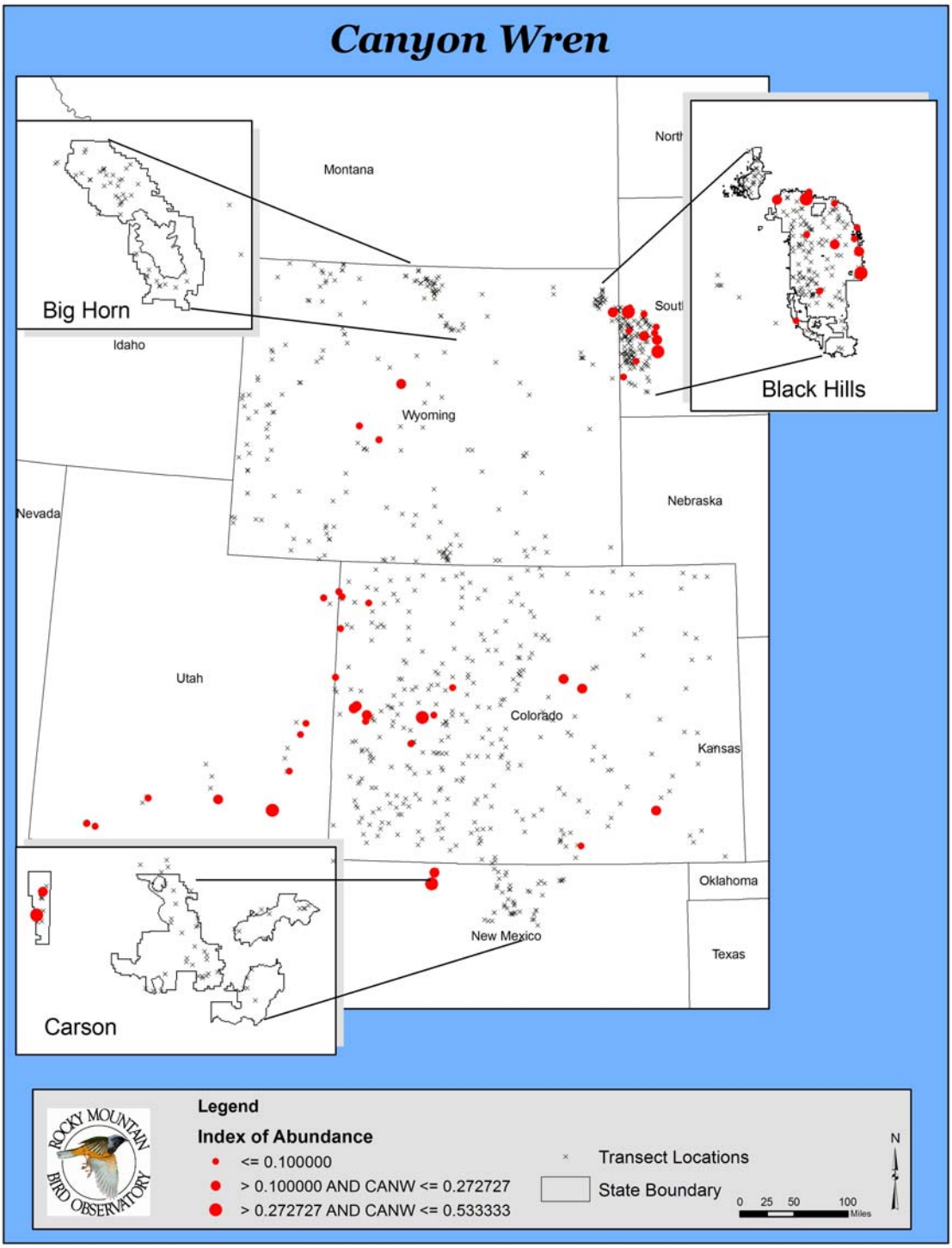
In 2005, we detected 24 Canyon Wrens in five habitats on the MCB project. We detected Canyon Wren on all RMBO point-transect monitoring projects; however, NCPN is the only project that extensively samples canyons, consequently detections were sufficient to calculate a density estimate only on this project.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Canyon Wren for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
MC	ID	--	--	--	--	2
MS	ID	--	--	--	--	5
PJ	ID	--	--	--	--	13
PP	ID	--	--	--	--	1
SE	ID	--	--	--	--	3

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Canyon Wrens breed in rocky areas, especially steep-sided canyons, with plenty of vertical surfaces with crevices in which to nest and search for prey (Kingery 1998). We detect this species every year in low numbers in several habitats on the MCB project; however, Canyon Wrens are too rare and localized in Colorado to be adequately monitored by point transects in any habitat or across habitats. Given interest though, with several years' data, we may be able to pool data across years and habitats and weight observations by habitat area, to generate a global detection function for this species and thereby generate an annual statewide density estimate that may be robust enough for population-trend monitoring.


Canyon Wren
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.100000
> 0.100000 AND CANW <= 0.272727
> 0.272727 AND CANW <= 0.533333
Transect Locations
State Boundary
0 25 50 100
Miles
N

Western Bluebird

(Sialia mexicana)

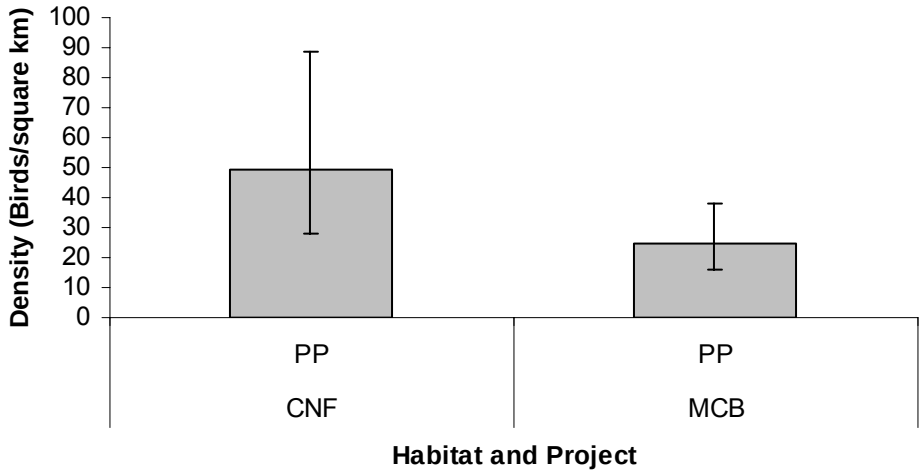
PIF Regional Stewardship Species
CO-PIF Physiographic Region 87 Priority Species

In 2005, we detected 108 Western Bluebirds in three habitats on the MCB project. We recorded the species on all other RMBO point-transect monitoring projects except MBBH, which lies outside of the species' normal breeding range. We counted Western Bluebird in sufficient numbers to calculate density in ponderosa pine habitat on MBCNF and MCB.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Western Bluebird for the MCB monitoring project, 2005.

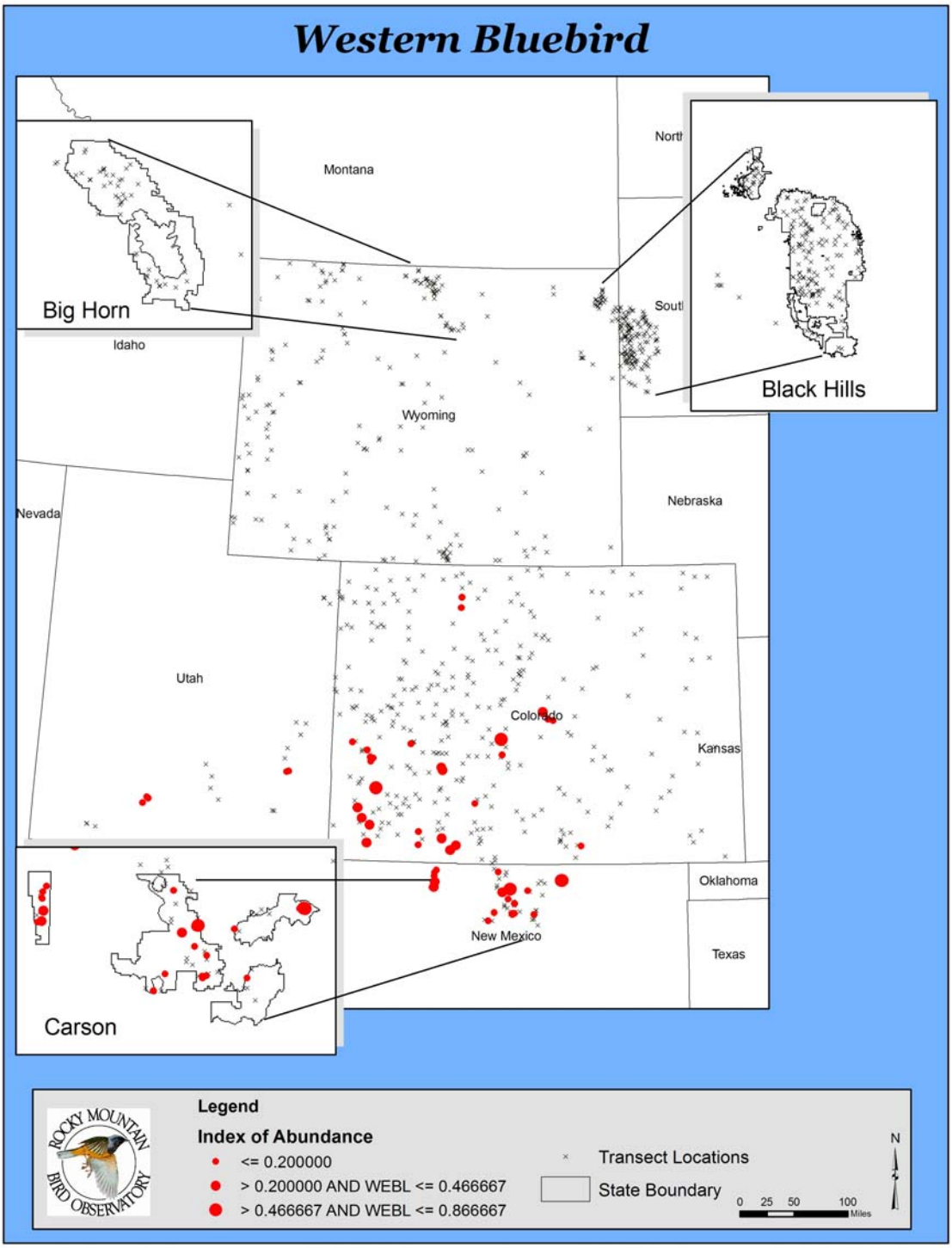
Habitat	D	LCL	UCL	CV	n	N
MC	ID	--	--	--	--	2
MS	ID	--	--	--	--	9
PP	24.52	15.89	37.85	21.9%	74	97

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Western Bluebird among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – Western Bluebird is a cavity-nester that, in Colorado, prefers ponderosa pine habitat, but also occasionally nests in other habitats including aspen, grassland and pinyon-juniper woodland (Kingery 1998). Western Bluebird should be effectively monitored through point transects under MCB in ponderosa pine habitat.


Western Bluebird
Montana
North
South
Idaho
Wyoming
Nevada
Utah
Colorado
Nebraska
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.200000
> 0.200000 AND WEBL <= 0.466667
> 0.466667 AND WEBL <= 0.866667
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Mountain Bluebird

(Sialia currocoides)

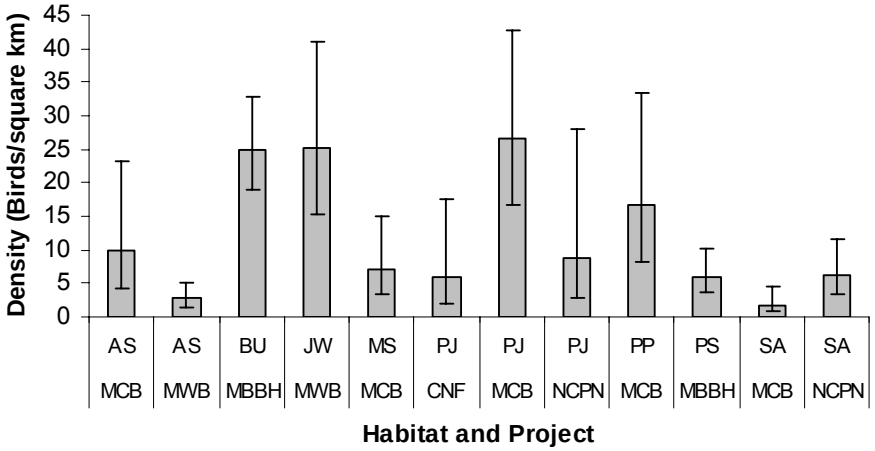
PIF Species of Regional Concern
PIF Continental and Regional Stewardship Species

In 2005, we detected 373 Mountain Bluebirds in ten habitats and calculated density estimates in six habitats on the MCB monitoring project. Overall, we detected Mountain Bluebird on all RMBO point-count monitoring projects and we detected sufficient numbers to calculate a density estimate in at least one habitat also on the four other projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Mountain Bluebird for the MCB monitoring project, 2005.

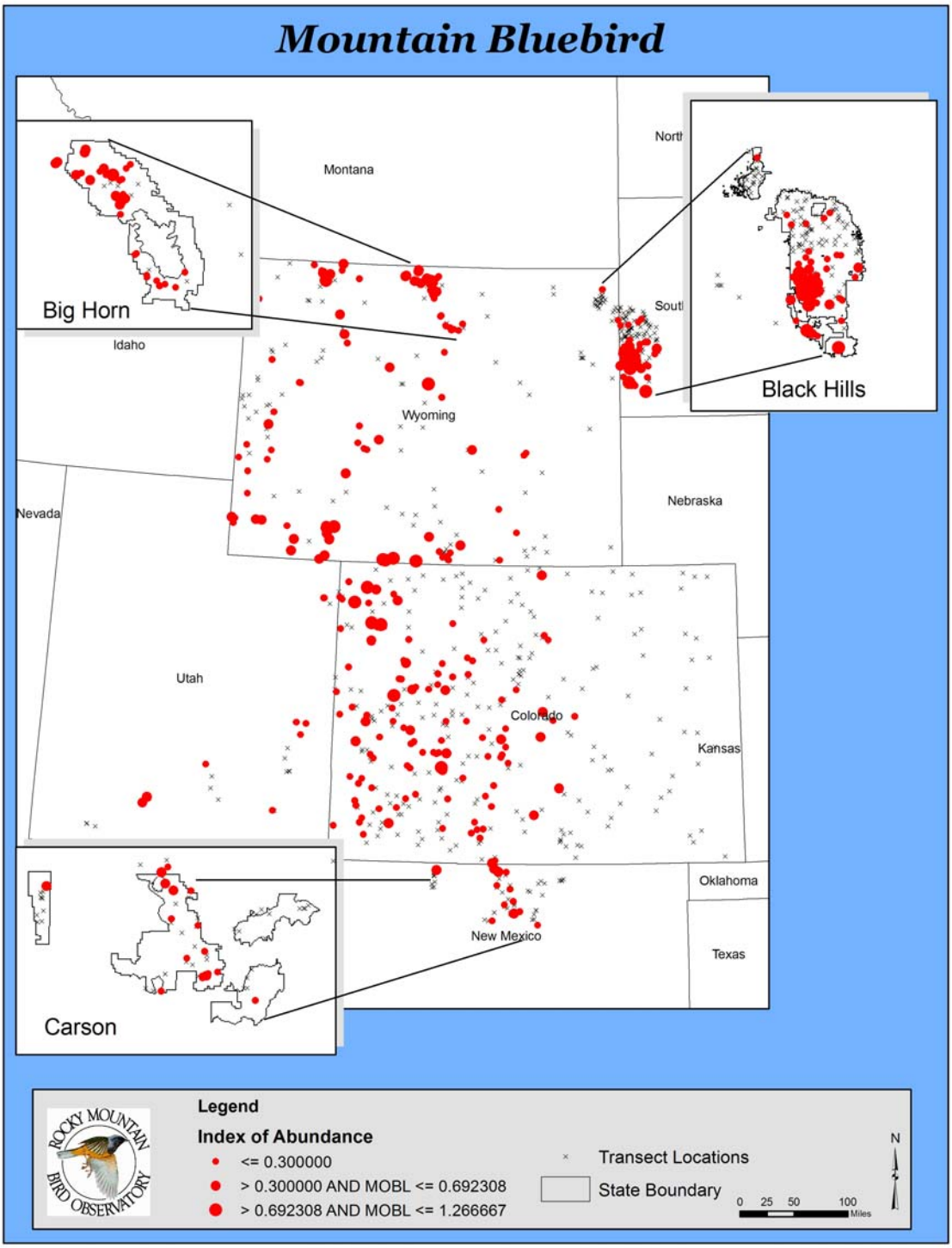
Habitat	D	LCL	UCL	CV	n	N
AS	9.81	4.13	23.31	44.8%	29	30
AT	ID	--	--	--	--	22
HR	5.93	2.01	17.48	57.9%	25	5
MC	ID	--	--	--	--	13
MS	7.04	3.31	14.95	39.0%	30	33
PJ	26.59	16.58	42.65	23.8%	105	150
PP	16.64	8.33	33.27	35.3%	53	61
SA	1.79	0.72	4.42	47.3%	25	25
SE	ID	--	--	--	--	13
SF	ID	--	--	--	--	21

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Mountain Bluebird among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary - Mountain Bluebirds are secondary cavity nesters that rely largely on woodpecker cavities and nest boxes for nest sites, and breed most commonly in pinyon-juniper woodland in Colorado (Kingery 1998). This species should be effectively monitored through point transects under MCB in at least five habitats.


Mountain Bluebird
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.300000
> 0.300000 AND MOBL <= 0.692308
> 0.692308 AND MOBL <= 1.266667
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Veery
(Catharus fuscescens)

CDOW - Species of Greatest Conservation Need

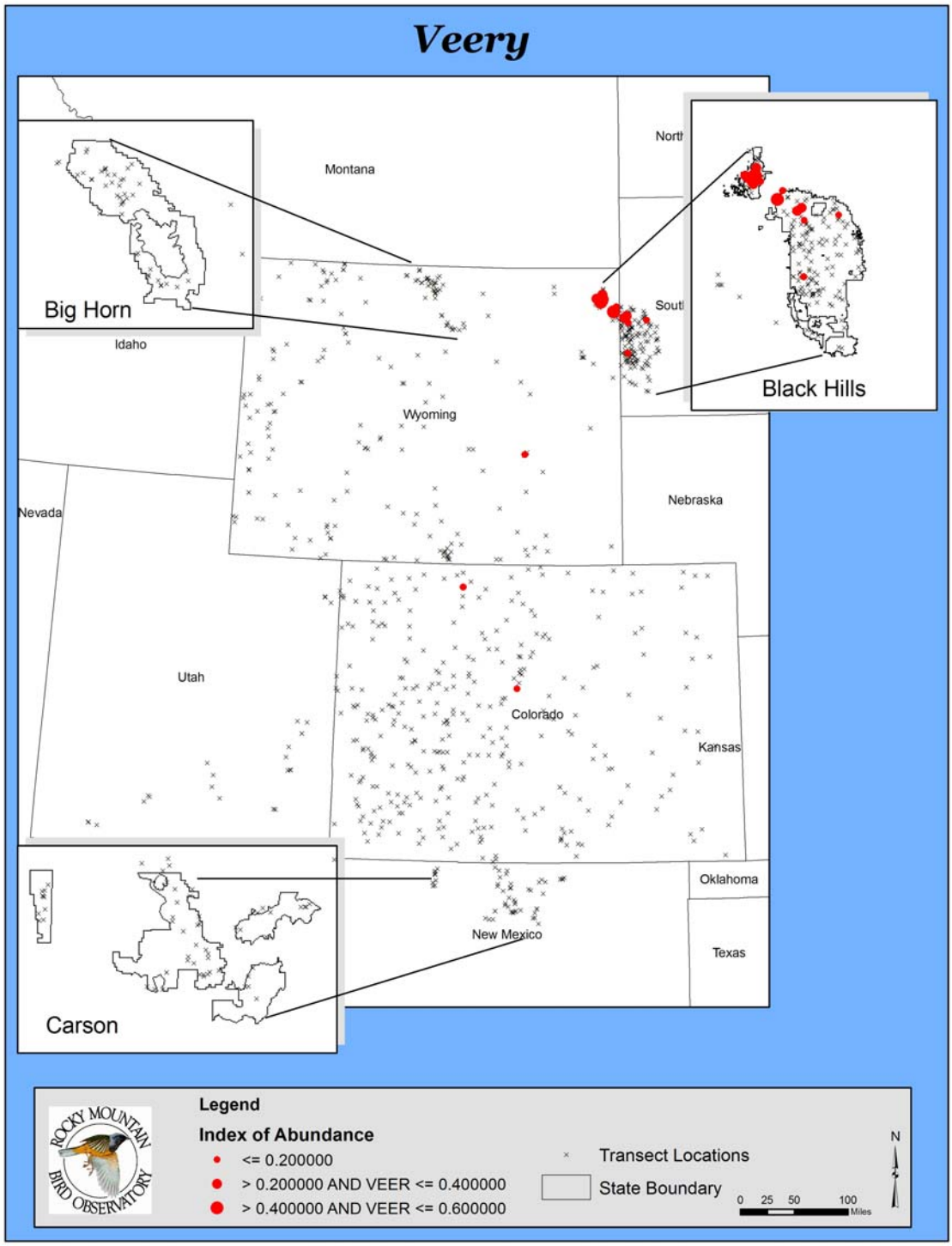
In 2005, we detected three Veeries on high-elevation riparian transects on the MCB project. We also detected this species on the MBBH and MWB projects, but the breeding range for Veery lies outside of the MBCNF and NCPN project areas. We were able to calculate a density estimate for Veery only in montane riparian habitat on the MBBH project.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Veery for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
HR	ID	--	--	--	--	3

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – There are few breeding records for Veery in Colorado and most pass through as migrants. The few that do remain to breed, nest primarily along montane rivers and streams in moist, dense riparian thickets, with willows and cottonwood saplings (Kingery 1988). We do not detect Veery in sufficient numbers to effectively monitor this species through point transects under MCB. Effective monitoring would likely require a greater effort, possibly involving adding transects in montane and high-elevation riparian habitats.


Veery
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Nebraska
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.200000
> 0.200000 AND VEER <= 0.400000
> 0.400000 AND VEER <= 0.600000
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Virginia's Warbler

(Vermivora virginiae)

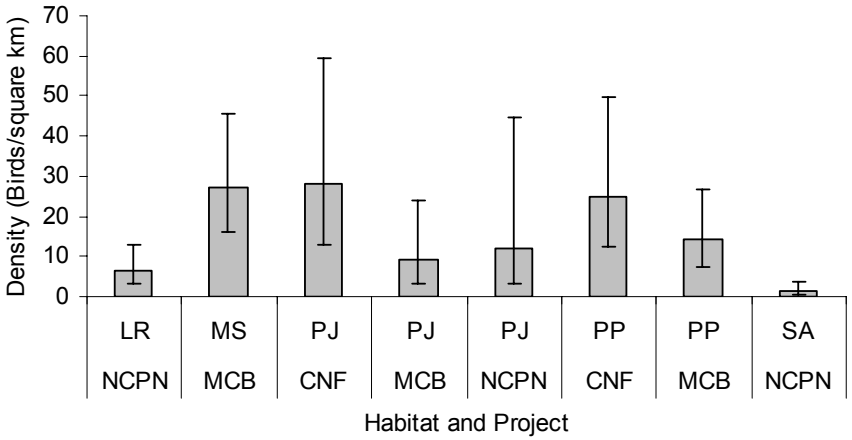
CDOW - Species of Greatest Conservation Need
PIF Species of Continental and Regional Concern
PIF Regional Stewardship Species
CO-PIF Physiographic Regions 62 & 87 Priority Species
USFWS Bird of Conservation Concern – BCR 16

In 2005, we detected 349 Virginia's Warblers in six habitats on the MCB project, and were able to calculate a density estimate for this species in montane shrubland, pinyon-juniper, and ponderosa pine habitats. Overall, we detected Virginia's Warbler on all RMBO point-count transect monitoring projects in 2005. We were also able to calculate a density estimates for this species for habitats on the MBCNF and NCPN projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Virginia's Warbler for the MCB monitoring project, 2005.

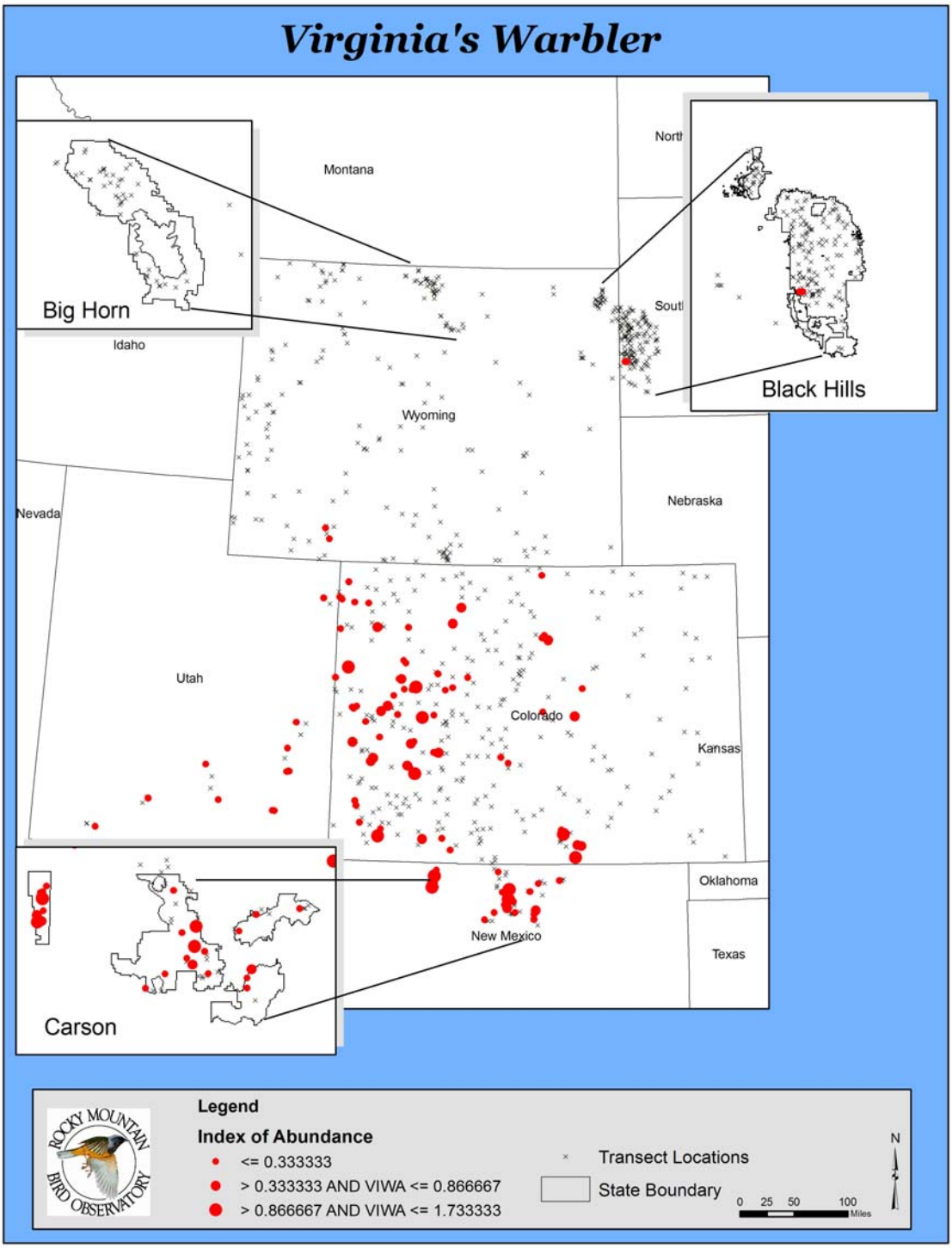
Habitat	D	LCL	UCL	CV	N	N
AS	ID	--	--	--	--	4
MC	ID	--	--	--	--	22
MS	27.00	15.96	45.67	26.6%	160	180
PJ	9.00	3.36	24.07	51.4%	42	64
PP	14.15	7.53	26.60	32.0%	76	78
SA	ID	--	--	--	--	1

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Virginia's Warbler among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – Virginia's Warbler is most often found in habitats with a strong Gambel's oak component, whether it be in ponderosa pine forest, pinyon-juniper woodlands, or in shrublands composed primarily of the oak (Kingery 1998). This species should be effectively monitored through point transects under MCB in montane shrubland, pinyon-juniper, and ponderosa pine habitats.


Virginia's Warbler
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.333333
> 0.333333 AND VIWA <= 0.866667
> 0.866667 AND VIWA <= 1.733333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

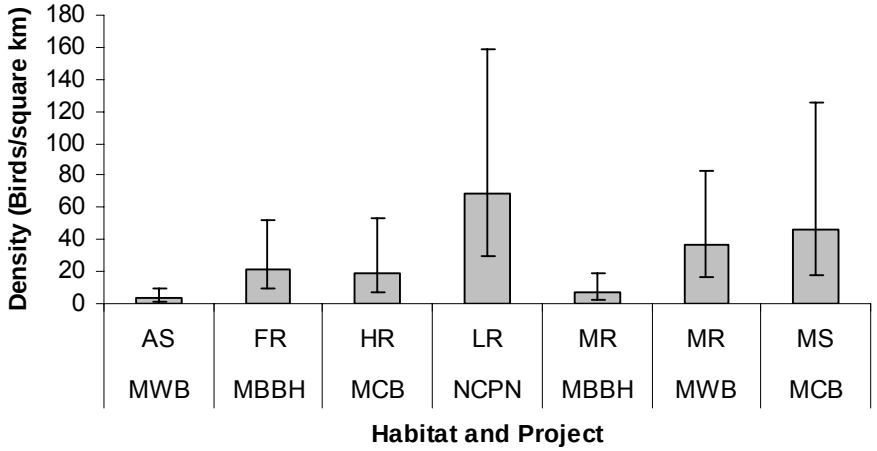
Yellow Warbler
(Dendroica petechia)
PIF Species of Regional Concern

In 2005, we detected 218 Yellow Warblers in nine habitats on the MCB project and were able to provide density estimates in high-elevation riparian and montane shrubland. Overall, we detected Yellow Warbler on all RMBO point-count transect monitoring projects and calculated a density estimate in at least one habitat on three other projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Yellow Warbler for the MCB monitoring project, 2005.

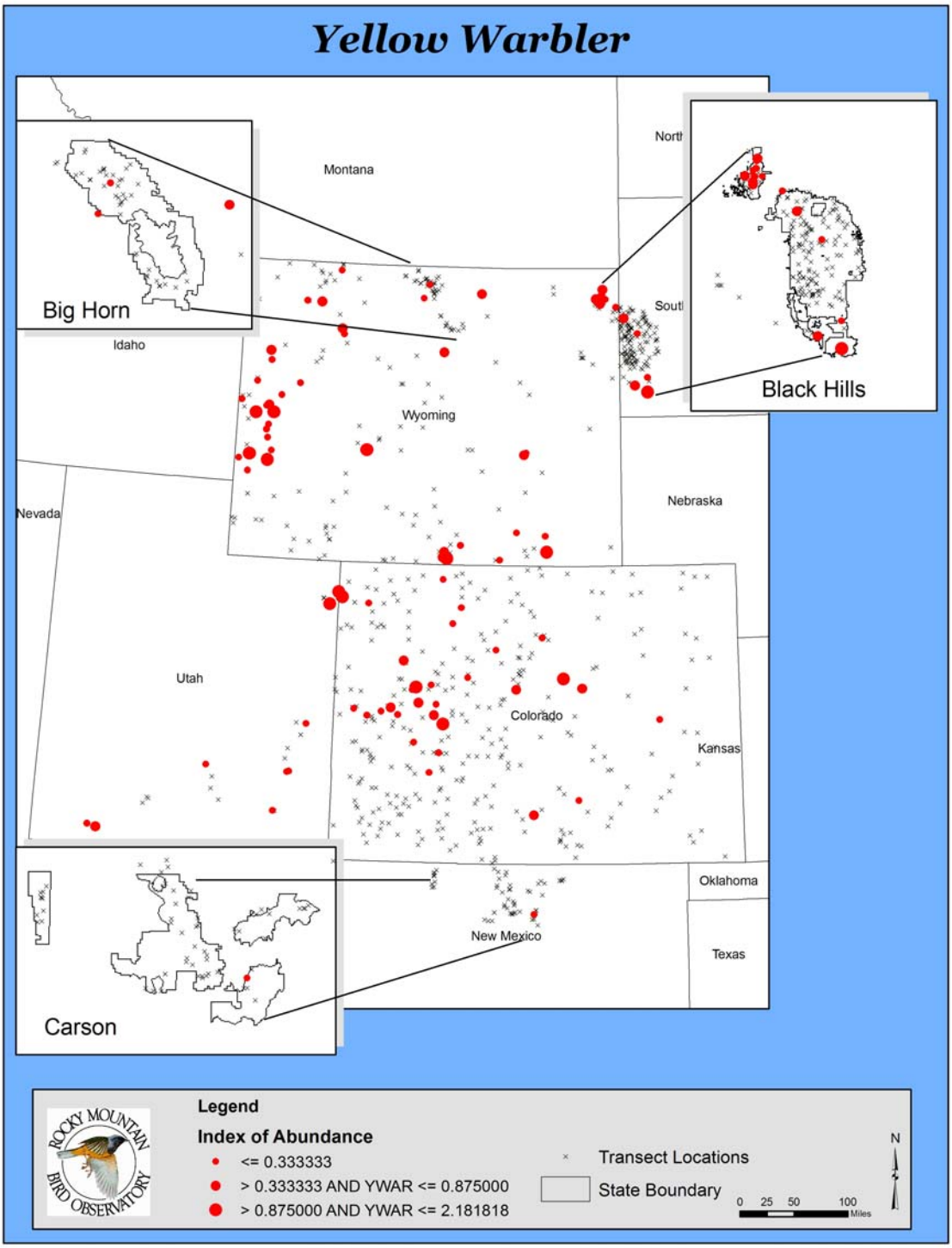
Habitat	D	LCL	UCL	CV	n	N
AS	ID	--	--	--	--	5
GR	ID	--	--	--	--	2
HR	18.73	6.54	53.60	55.2%	42	51
MC	ID	--	--	--	--	8
MS	46.74	17.36	125.87	51.6%	112	117
PJ	ID	--	--	--	--	1
SA	ID	--	--	--	--	5
SE	ID	--	--	--	--	3
WE	ID	--	--	--	24	26

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Yellow Warbler among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary- Yellow Warbler breeds in a wide variety of habitats but usually one with a deciduous component, including aspen stands with a multi-layered understory (Kingery 1998). Yellow Warbler should be effectively monitored through point transects under MCB in at least high-elevation riparian and montane shrubland habitats.


Yellow Warbler
Montana
North
South
Idaho
Wyoming
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.333333
> 0.333333 AND YWAR <= 0.875000
> 0.875000 AND YWAR <= 2.181818
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Black-throated Gray Warbler
(Dendroica nigrescens)

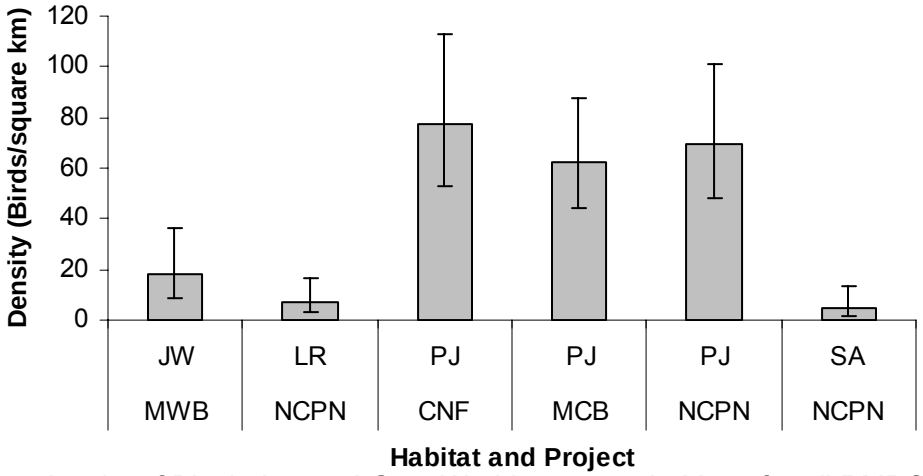
CDOW - Species of Greatest Conservation Need
PIF Species of Regional Concern
CO-PIF Physiographic Region 87 Priority Species
USFWS Bird of Conservation Concern – BCR 16

In 2005, we detected 218 Black-throated Gray Warblers in three habitats on the MCB project and were able to calculate a density estimate in pinyon-juniper habitat. We detected Black-throated Gray Warblers on all of our RMBO point-transect monitoring projects except MBBH, which is outside of the species' normal breeding range. We detected Black-throated Gray Warbler in sufficient numbers to calculate a density estimate in at least one habitat on all projects except MBBH.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Black-throated Gray Warbler for the MCB monitoring project, 2005.

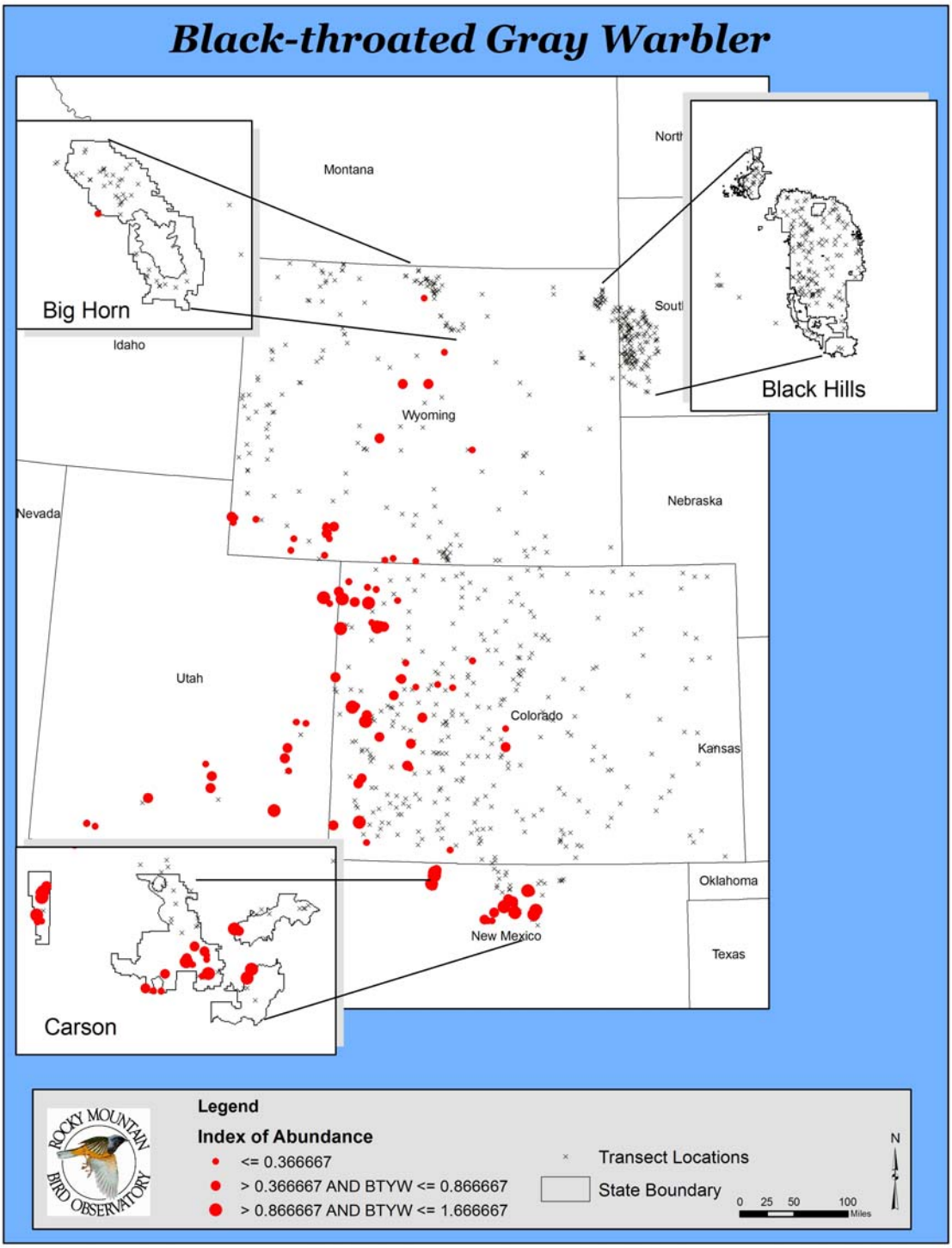
Habitat	D	LCL	UCL	CV	n	N
MS	ID	--	--	--	--	5
PJ	62.18	44.09	87.67	17.4%	205	212
PP	ID	--	--	--	--	1

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Black-throated Gray Warbler among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – Black-throated Gray Warbler, in Colorado, prefers large stands of pinyon-dominated woodland (Kingery 1998). Very rarely is this species found outside of pinyon-juniper habitat in summer. As in previous years, Black-throated Gray Warbler was one of the most abundant species in pinyon-juniper habitat in 2005 on the MCB project. We should effectively monitor this species under MCB through point transects in pinyon-juniper habitat.


Black-throated Gray Warbler
Montana
North
South
Idaho
Wyoming
Nebraska
Nevada
Utah
Colorado
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.366667
> 0.366667 AND BTYW <= 0.866667
> 0.866667 AND BTYW <= 1.666667
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Grace's Warbler

(Dendroica graciae)

CDOW - Species of Greatest Conservation Need
PIF Species of Continental and Regional Concern
CO-PIF Physiographic Regions 62 & 87 Priority Species
USFWS Bird of Conservation Concern – BCR 16

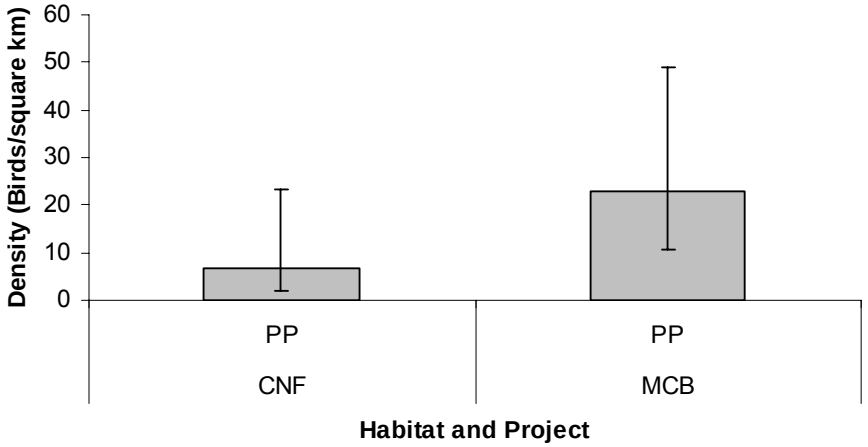
In 2005, we detected 80 Grace's Warblers in two habitats on the MCB project and were able to calculate a density estimate in ponderosa pine. We detected Grace's Warblers all RMBO point-transect monitoring projects except MBBH, which lies outside of the species' normal breeding range. We detected Grace's Warbler in sufficient numbers to also calculate a density estimate in ponderosa pine on the MBCNF project.

.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Grace's Warbler for the MCB monitoring project, 2005.

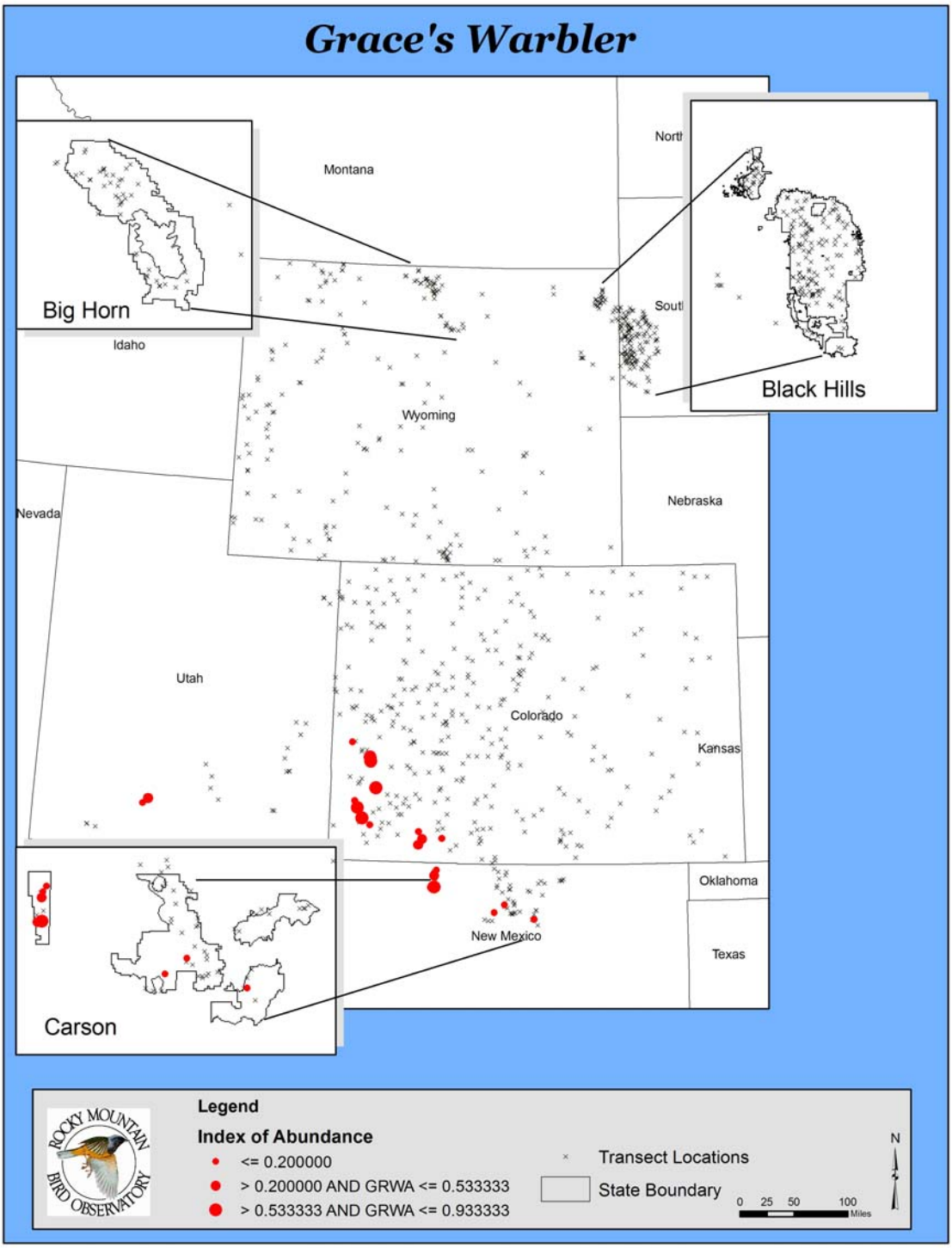
Habitat	D	LCL	UCL	CV	n	N
MS	ID	--	--	--	--	3
PP	22.75	10.56	48.97	39.8%	61	77

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Grace's Warbler among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – Grace's Warbler breeds in mature ponderosa pine stands, often with an understory of Gambel's oak (Kingery 1998). Grace's Warbler should be effectively monitored through point transects in ponderosa pine habitat under MCB.


Grace's Warbler
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.200000
> 0.200000 AND GRWA <= 0.533333
> 0.533333 AND GRWA <= 0.933333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Green-tailed Towhee

(Pipilo chlorurus)

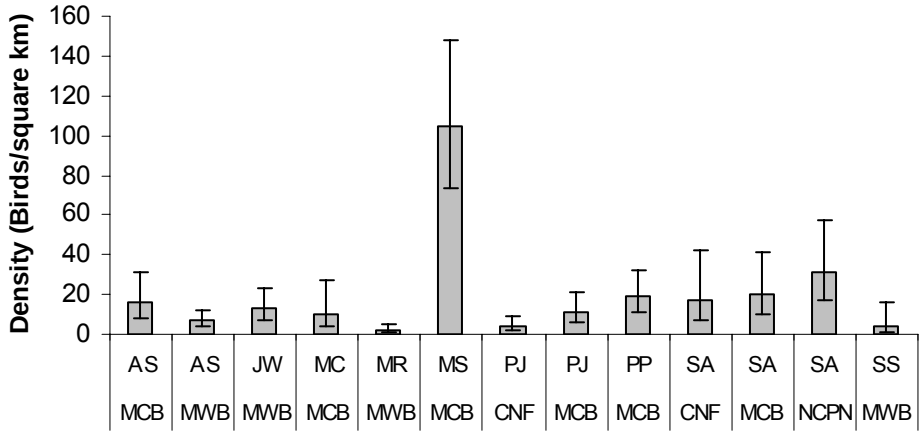
PIF Continental and Regional Stewardship Species
CO-PIF Physiographic Region 62 Priority Species

In 2005, we detected 1050 Green-tailed Towhees in ten habitats on the MCB project, and we were able to calculate a density estimate for this species in seven habitats. Overall, we detected Green-tailed Towhee on all five RMBO point-count transect monitoring projects. We were able to calculate density estimates in at least one habitat for three of the other RMBO monitoring projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Green-tailed Towhee for the MCB monitoring project, 2005.

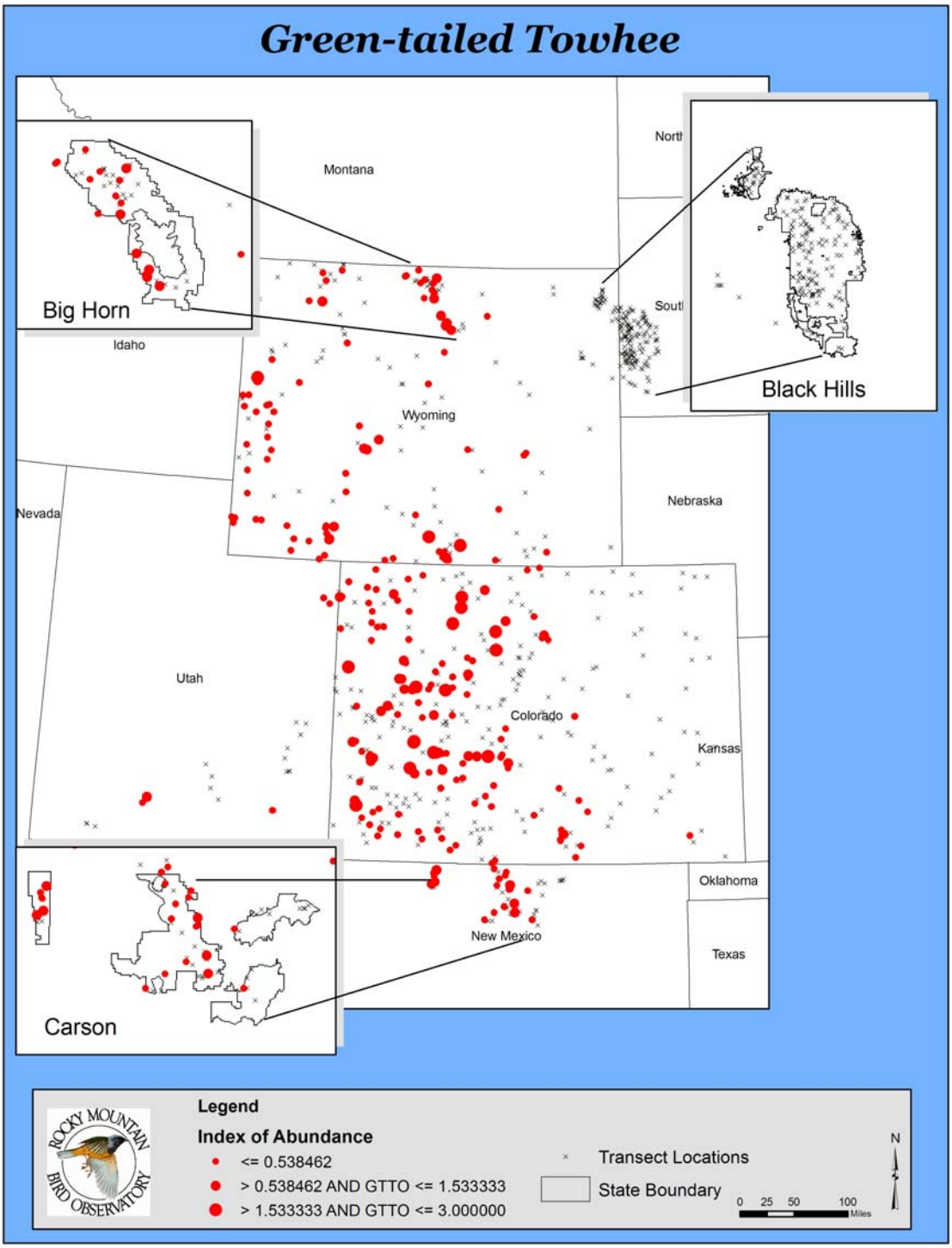
Habitat	D	LCL	UCL	CV	n	N
AS	15.89	8.01	31.52	35.4%	53	53
GR	ID	--	--	--	--	1
HR	4.13	1.86	9.18	40.4%	68	22
MC	10.04	3.75	26.87	51.1%	69	74
MS	104.40	73.59	148.10	17.3%	459	482
PJ	11.45	6.11	21.44	31.8%	72	73
PP	19.03	11.19	32.35	26.6%	111	118
SA	20.14	9.89	41.04	36.3%	192	209
SE	ID	--	--	--	--	8
SF	ID	--	--	--	--	10

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Green-tailed Towhee among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – In Colorado, at lower elevations Green-tailed Towhee nests in areas with a high diversity of shrub species, including sagebrush and pinyon-juniper, and at higher elevations it uses more xeric shrub areas (Kingery 1998). Green-tailed Towhee should be effectively monitored under MCB in seven habitats.


Green-tailed Towhee
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.538462
> 0.538462 AND GTTO <= 1.533333
> 1.533333 AND GTTO <= 3.000000
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Cassin's Sparrow

(Aimophila cassinii)

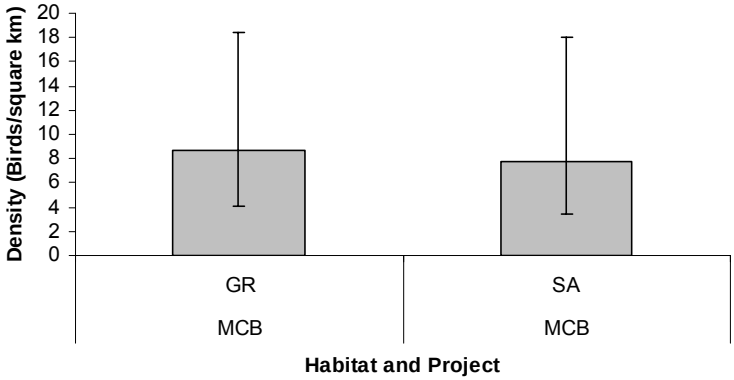
CDOW - Species of Greatest Conservation Need
PIF Species of Regional Concern
PIF Regional Stewardship Species
CO-PIF Physiographic Region 36 Priority Species
USFS Region 2 Sensitive Species
USFWS Bird of Conservation Concern – BCR 18

In 2005, we detected 336 Cassin's Sparrows in three habitats on the MCB project and were able to calculate density estimates for this species in grassland and sage shrubland. Overall, we detected this species on all of the other RMBO point transect monitoring projects except MBCNF but we were only able to calculate a density estimate for this species on the MCB project.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Cassin's Sparrow for the MCB monitoring project, 2005.

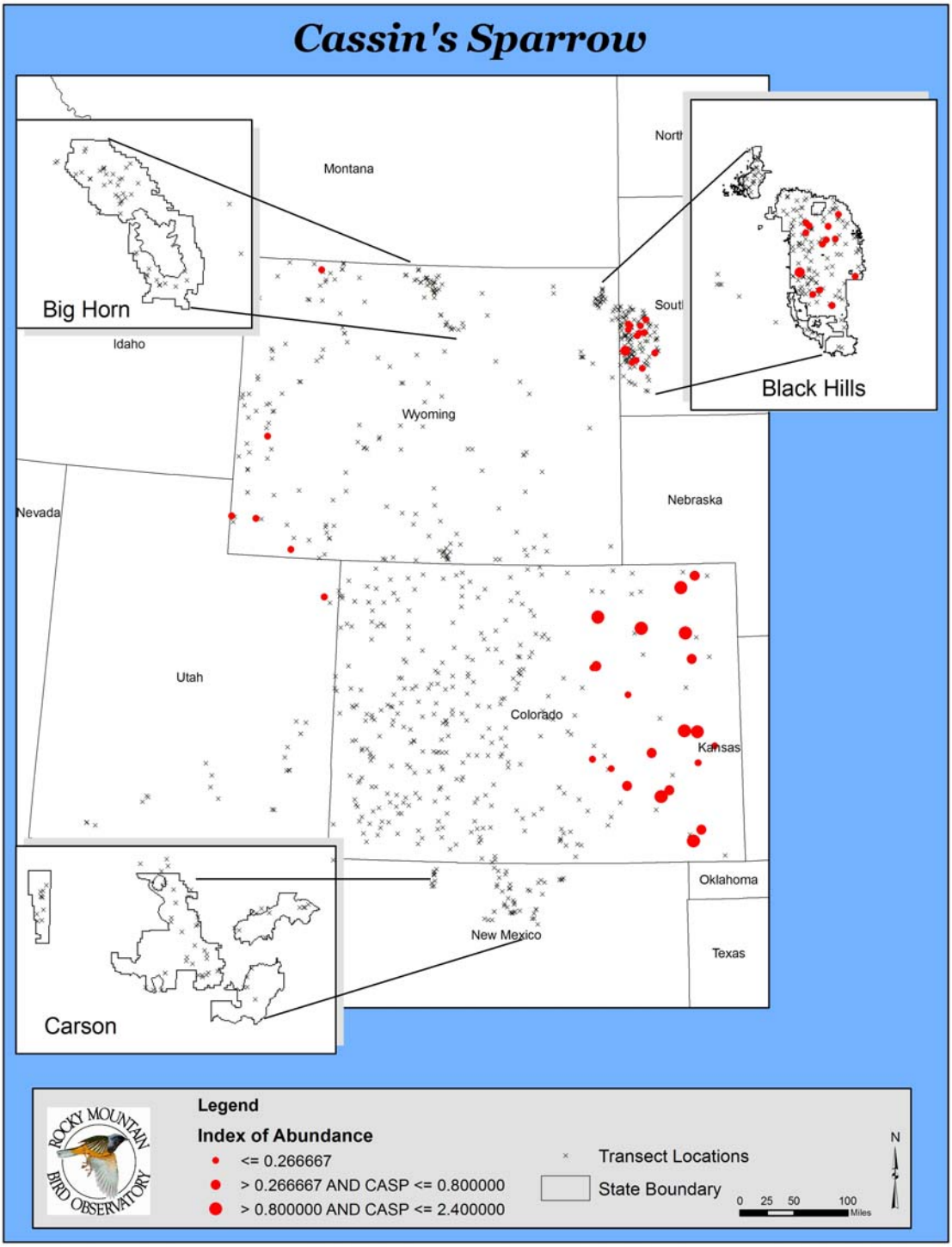
Habitat	D	LCL	UCL	CV	n	N
GR	8.62	4.03	18.44	39.2%	188	189
SA	7.83	3.39	18.06	43.2%	133	136
SE	ID	--	--	--	--	11

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Cassin's Sparrow among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – In Colorado, Cassin's Sparrow breeds almost exclusively in the eastern prairie, usually where some type of shrub or taller vegetation is present; it will not breed in pure open grassy areas (Kingery 1998). The semi-nomadic nature of this species makes it common in some years and difficult to find in others. If we continue to detect this species in sufficient numbers each year, Cassin's Sparrow should be effectively monitored through point transects in grassland and sage shrubland under MCB. The RMBO section-survey program also is collecting sufficient data to effectively monitor this species in eastern Colorado.


Cassin's Sparrow
Montana
North
South
Big Horn
Idaho
Black Hills
Wyoming
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.266667
> 0.266667 AND CASP <= 0.800000
> 0.800000 AND CASP <= 2.400000
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Brewer's Sparrow

(Spizella breweri)

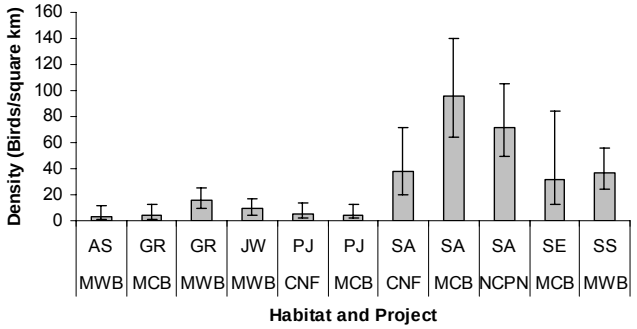
CDOW - Species of Greatest Conservation Need
PIF Species of Continental and Regional Concern
CO-PIF Physiographic Regions 62 & 87 Priority Species
USFS Region 2 Sensitive Species

In 2005, we detected 883 Brewer's Sparrows in eleven habitats on the MCB project and were able to calculate density estimates in four habitats. Overall, we detected Brewer's Sparrow on of the RMBO point-count transect monitoring projects, and calculated density estimates in at least one habitat for all projects except MBBH.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Brewer's Sparrow for the MCB monitoring project, 2005.

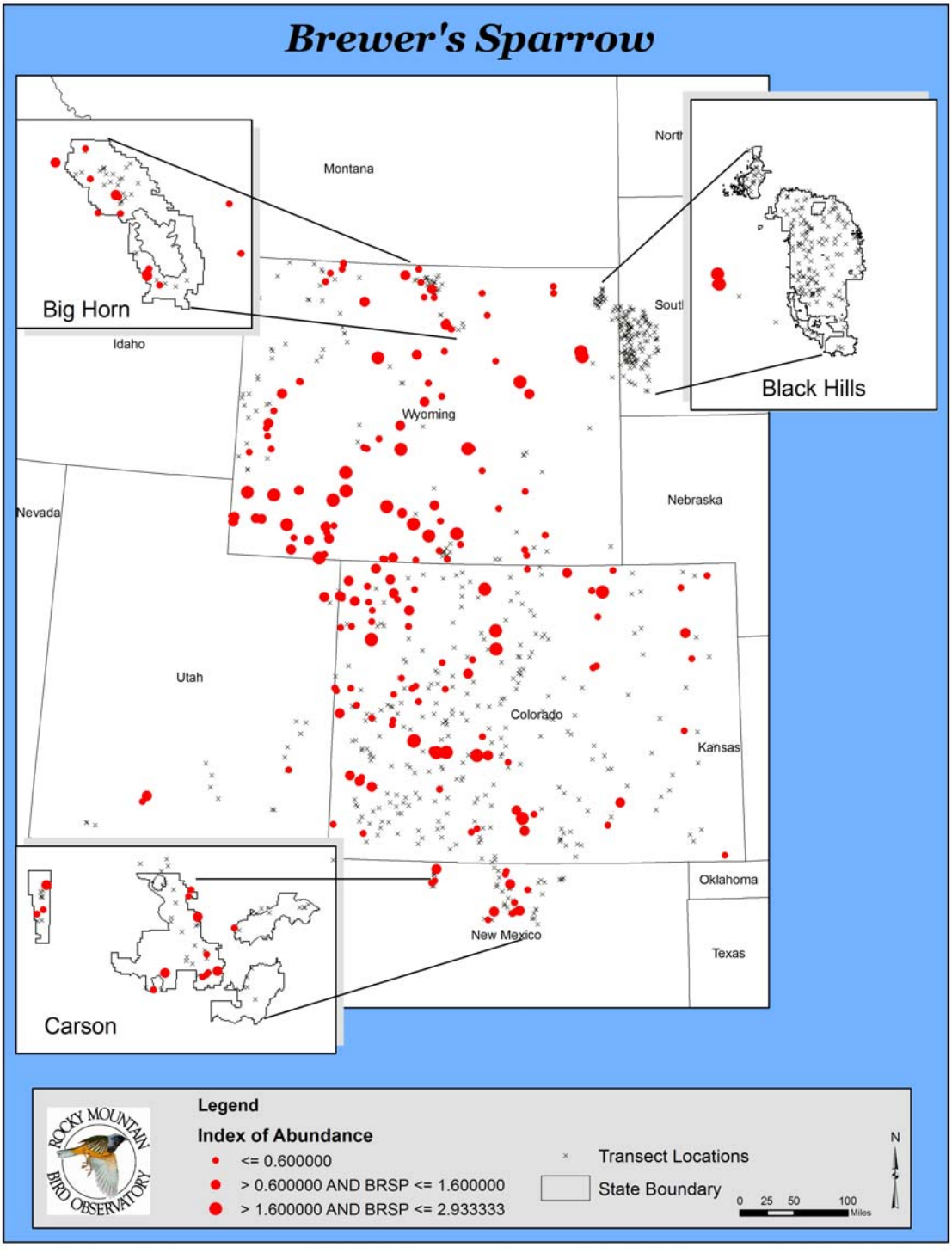
Habitat	D	LCL	UCL	CV	n	N
AS	ID	--	--	--	--	2
AT	ID	--	--	--	--	9
GR	4.40	1.48	13.04	58.1%	46	54
HR	ID	--	--	--	--	6
MC	ID	--	--	--	--	3
MS	ID	--	--	--	--	18
PJ	4.71	1.69	13.15	54.6%	25	27
SA	95.34	64.73	140.42	19.5%	541	576
SE	32.00	12.13	84.38	51.6%	166	180
SF	ID	--	--	--	--	3
WE	ID	--	--	--	--	5

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Brewer's Sparrow among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – Brewer's Sparrow prefers sagebrush habitat but may also breed in areas dominated by mountain mahogany or other shrubs (Kingery 1998). Brewer's Sparrow should be effectively monitored under MCB through point-transects in a range of habitats, including grassland, pinyon-juniper, sage shrubland, and semi-desert shrubland. The RMBO section-survey program also is collecting sufficient data to effectively monitor this species in eastern Colorado.


Brewer's Sparrow
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.600000
> 0.600000 AND BRSP <= 1.600000
> 1.600000 AND BRSP <= 2.933333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Vesper Sparrow

(Pooecetes gramineus)

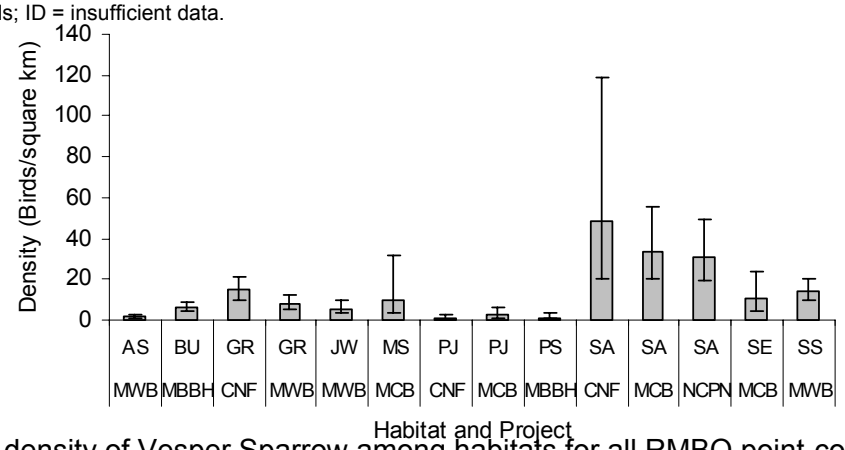
CDOW - Species of Greatest Conservation Need

In 2005, we recorded 497 Vesper Sparrows in five habitats on the MCB project, and calculate a density estimates for this species in four habitats. Overall, we recorded Vesper Sparrow on all five RMBO point-count transect monitoring projects in 2005. We detected this species in sufficient numbers to calculate a density estimate in at least one habitat on all four of the other monitoring projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Vesper Sparrow for the MCB monitoring project, 2005.

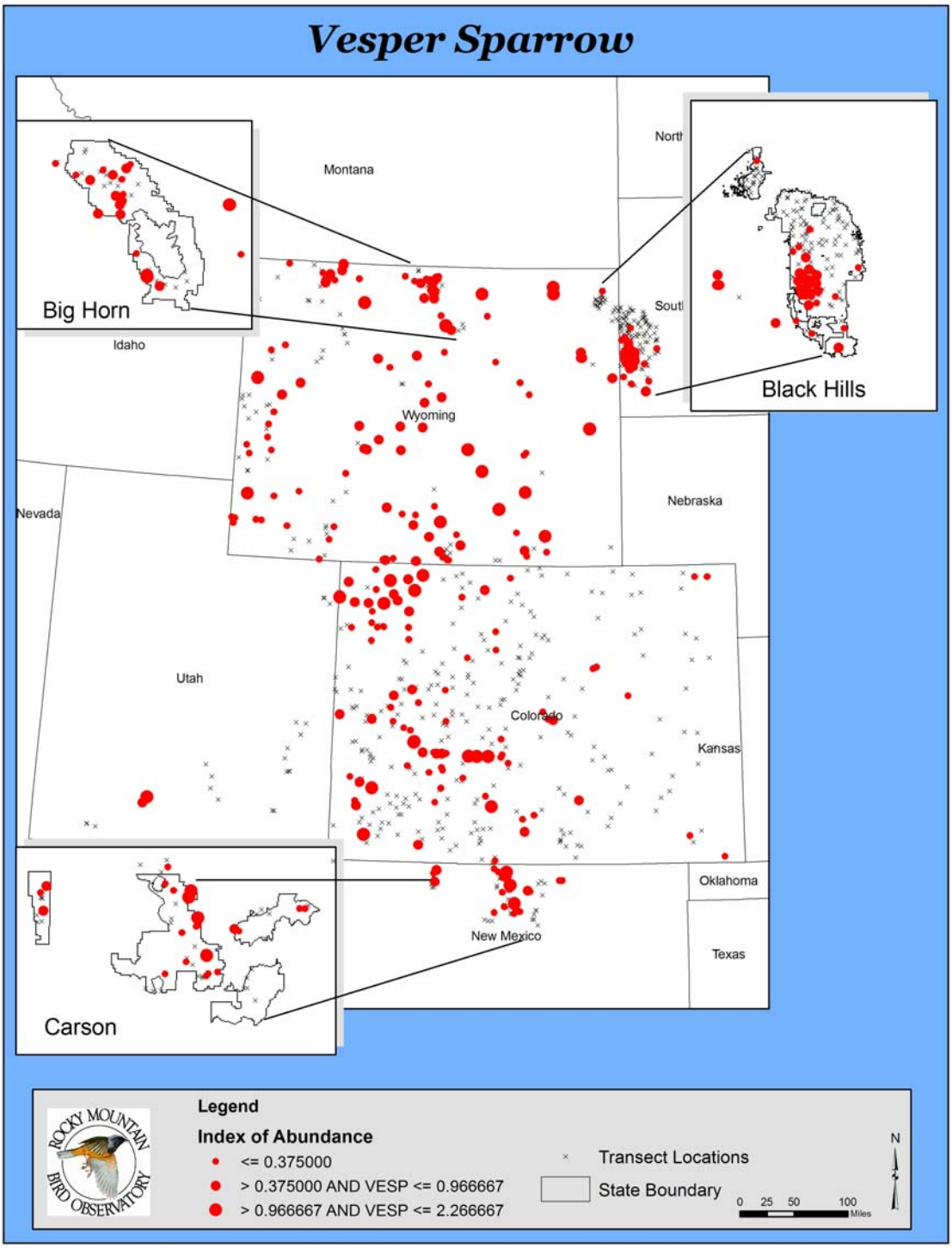
Habitat	D	LCL	UCL	CV	n	N
AS	ID	--	--	--	--	9
AT	ID	--	--	--	--	1
GR	ID	--	--	--	--	10
HR	ID	--	--	--	--	10
MC	ID	--	--	--	--	5
MS	9.92	3.09	31.83	63.2%	30	32
PJ	2.41	0.98	5.95	47.3%	30	30
PP	ID	--	--	--	24	26
SA	33.49	20.09	55.85	26.1%	251	261
SE	10.41	4.51	24.17	42.9%	87	110
SF	ID	--	--	--	--	3

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Vesper Sparrow among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – Vesper Sparrow, in Colorado, prefers sage shrubland and montane grassland, but will only occasionally nest other habitats with patchily distributed shrubs and good grass cover (Kingery 1998). Vesper Sparrow should be effectively monitored through point transects under MCB in at least grassland and sage shrubland habitats.


Vesper Sparrow
Montana
North
South
Idaho
Wyoming
Nevada
Utah
Colorado
Nebraska
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.375000
> 0.375000 AND VESP <= 0.966667
> 0.966667 AND VESP <= 2.266667
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Black-chinned Sparrow
(Spizella atrogularis)

PIF Species of Continental Concern

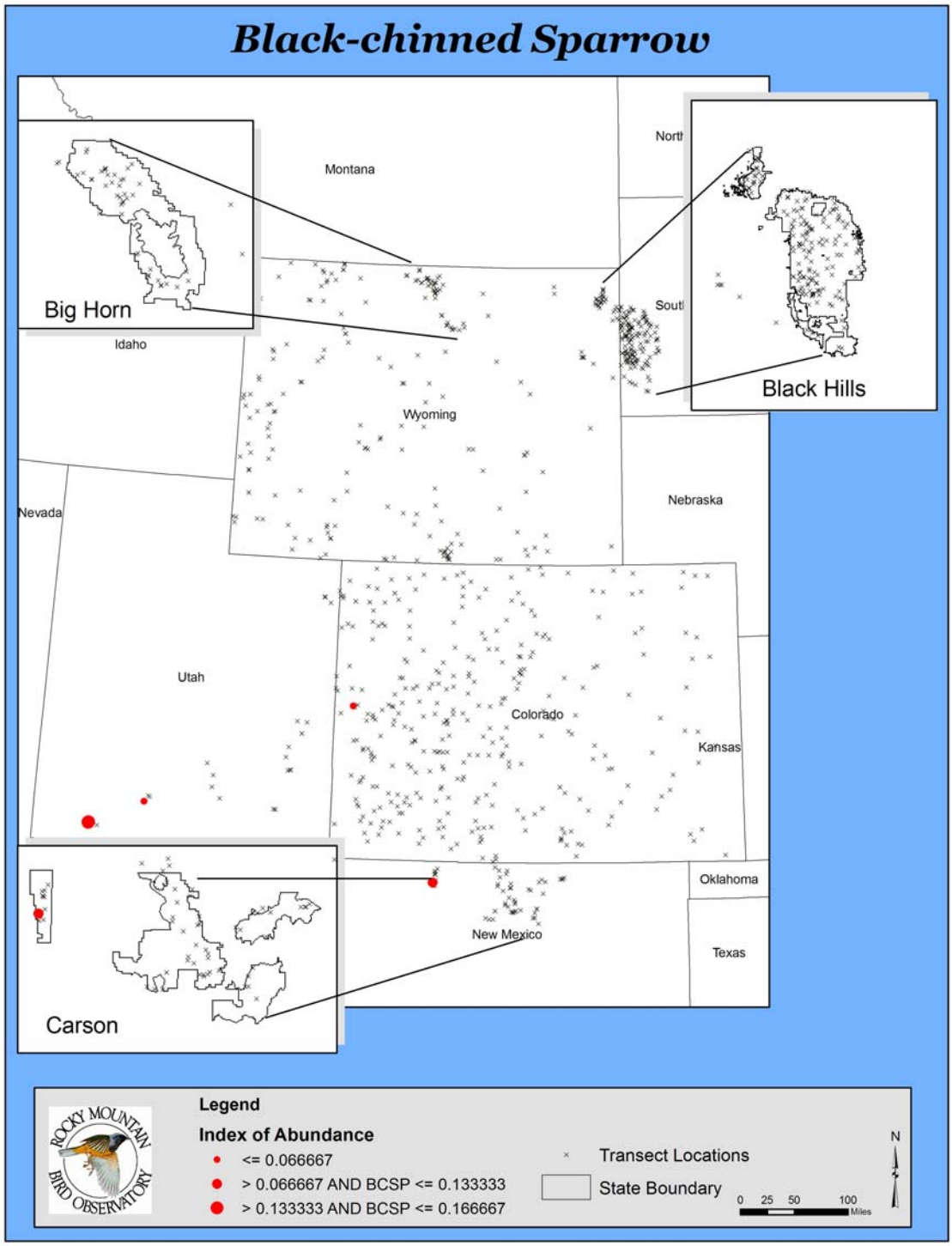
In 2005, we detected one Black-chinned Sparrow in pinyon-juniper habitat on the MCB project. We also detected Black-chinned Sparrow on all the MBCNF and NCPN monitoring projects but not on MWB or MBBH, which are north of the species' normal breeding range. We did not detect Black-chinned Sparrow in sufficient numbers to calculate a density estimate on any of our monitoring projects, most likely because all of our projects are outside of the species' normal breeding range.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Black-chinned Sparrow for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
PJ	ID	--	--	--	--	1

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Black-chinned Sparrow prefers arid shrublands on rugged slopes that are often south-facing (Audubon 2002). This species is considered rare in the areas where RMBO currently conducts monitoring, and we do not know whether the birds detected this summer were actually breeding locally or if they were out-of-place migrant individuals. Due to its rarity in our survey region, Black-chinned Sparrow will probably not be monitored or tracked under the MCB project but we can continue to note its presence in certain habitats. Repeat visits and nest searches could provide the first breeding records for this species in Colorado.


Black-chinned Sparrow
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.066667
> 0.066667 AND BCSP <= 0.133333
> 0.133333 AND BCSP <= 0.166667
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Lark Sparrow
(Chondestes grammacus)

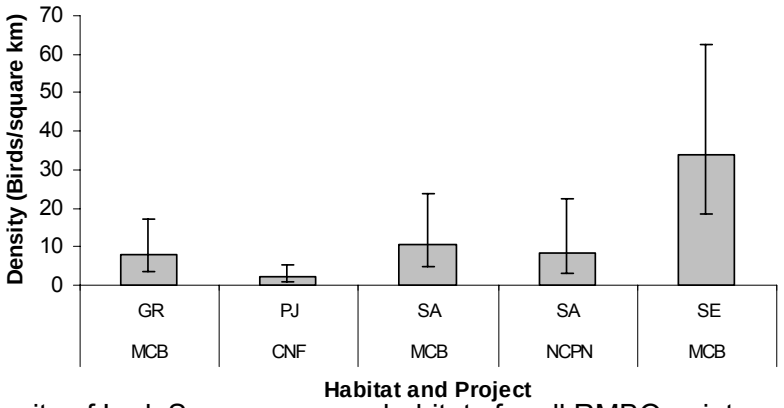
PIF Species of Regional Concern

In 2005, we detected 401 Lark Sparrows in five habitats and were able to calculate density estimates in three habitats on the MCB project. Overall, we detected Lark Sparrow on all five RMBO point-count transect monitoring projects and were able to calculate a density estimate for this species in at least one habitat for two other projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Lark Sparrow for the MCB monitoring project, 2005.

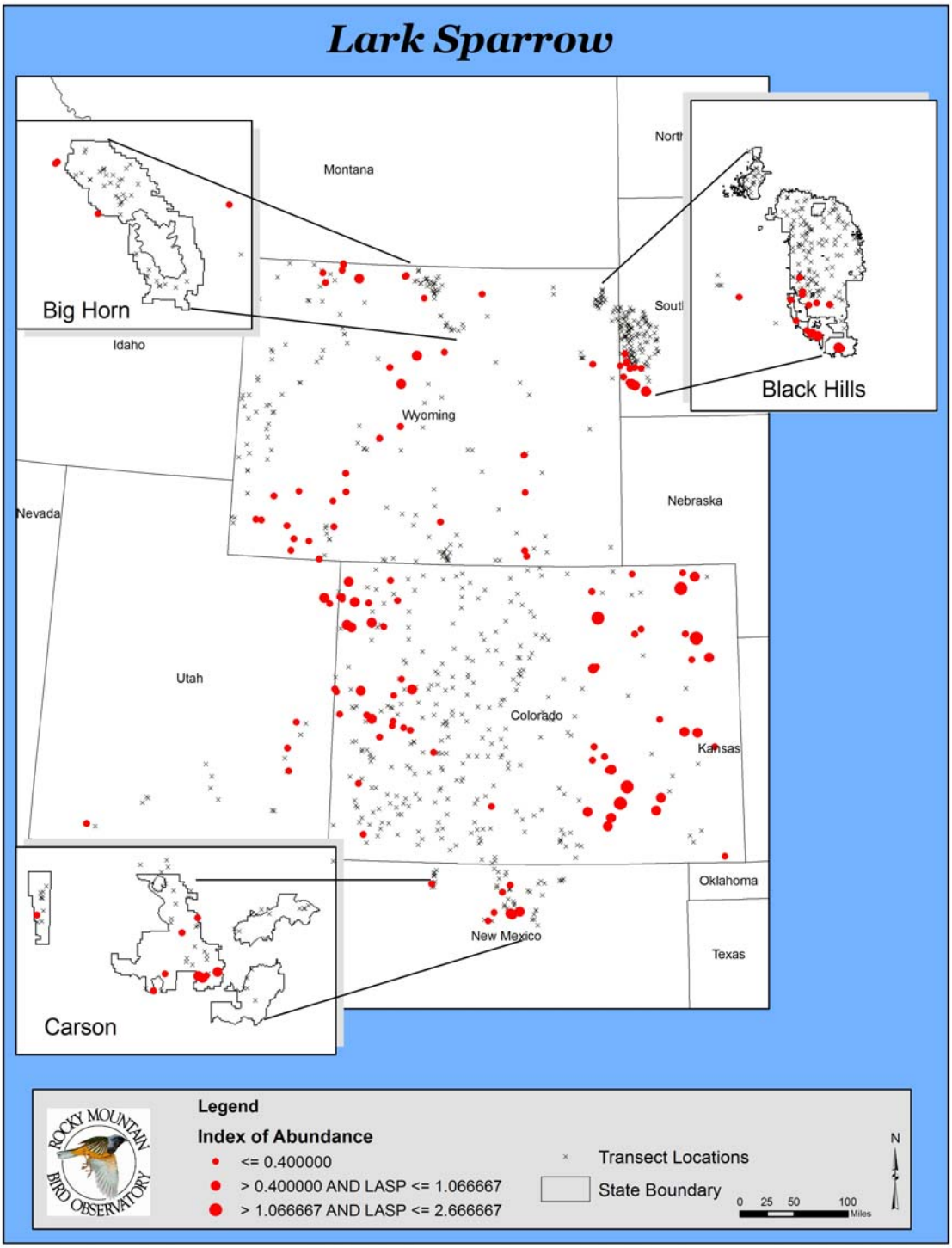
Habitat	D	LCL	UCL	CV	n	N
GR	7.92	3.65	17.20	40.4%	46	65
MS	ID	--	--	--	--	7
PJ	ID	--	--	--	--	23
SA	10.57	4.67	23.92	41.8%	84	97
SE	34.01	18.49	62.54	31.3%	187	207
WE	ID	--	--	--	--	2

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Lark Sparrow among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – In Colorado, Lark Sparrows prefer arid, open areas with some shrub component and breed in a variety of locations including prairies, roadsides, farms, open woodlands, and pinyon-juniper (Andrews and Righter 1992). Lark Sparrow should be effectively monitored through point transects under MCB in a range of habitats, especially grassland, sage shrubland, and semidesert shrubland. The RMBO section-survey program also is collecting sufficient data to effectively monitor this species in eastern Colorado.


Lark Sparrow
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.400000
> 0.400000 AND LASP <= 1.066667
> 1.066667 AND LASP <= 2.666667
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Black-throated Sparrow
(Amphispiza bilineata)
PIF Species of Regional Concern

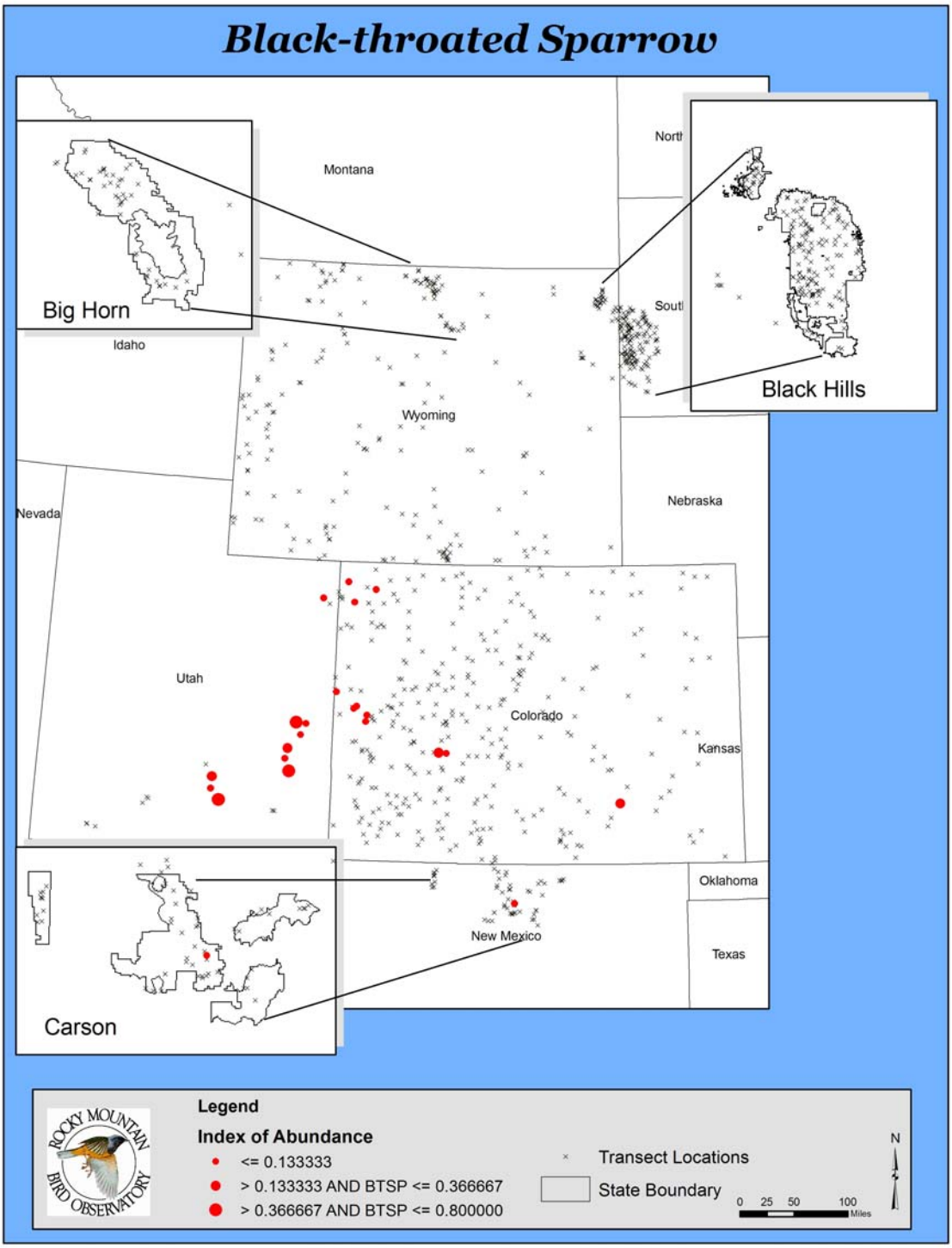
In 2005, we detected nine Black-throated Sparrows in two habitats on the MCB project. We detected Black-throated Sparrow on all RMBO point-transect monitoring programs except MBBH and MWB, which are both outside of the species' normal breeding range. NCPN was the only project on which we were able to calculate a density estimate for the species.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Black-throated Sparrow for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
PJ	ID	--	--	--	--	5
SE	ID	--	--	--	--	4

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Black-throated Sparrow nests in arid areas of low elevation with little or no ground cover and scattered shrubs (Kingery 1998, Righter el at. 2004). Black-throated Sparrows are uncommon in Colorado and will probably not be monitored through point transects in any one habitat or across habitats under MCB. Given interest though, with several years' data, we may be able to pool data across years and habitats and weight observations by habitat area, to generate a global detection function for this species and thereby generate an annual statewide density estimate that may be robust enough for population-trend monitoring.


Black-throated Sparrow
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.133333
> 0.133333 AND BTSP <= 0.366667
> 0.366667 AND BTSP <= 0.800000
Transect Locations
State Boundary
0 25 50 100
Miles
N

Sage Sparrow
(Amphispiza belli)

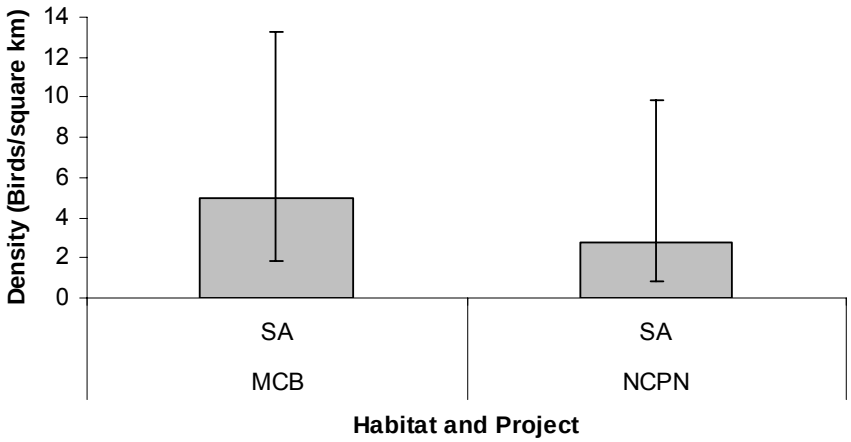
CDOW - Species of Greatest Conservation Need
PIF Species of Regional Concern
CO-PIF Physiographic Regions 62 & 87 Priority Species
USFS Region 2 Sensitive Species
USFWS Bird of Conservation Concern – BCR 16

In 2005, we detected 73 Sage Sparrows in two habitats on the MCB project. We detected this species on all RMBO point-transect monitoring projects except MBBH, which is outside of the species' normal breeding range. We detected Sage Sparrow in sufficient numbers to calculate density only on MCB and NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Sage Sparrow for the MCB monitoring project, 2005.

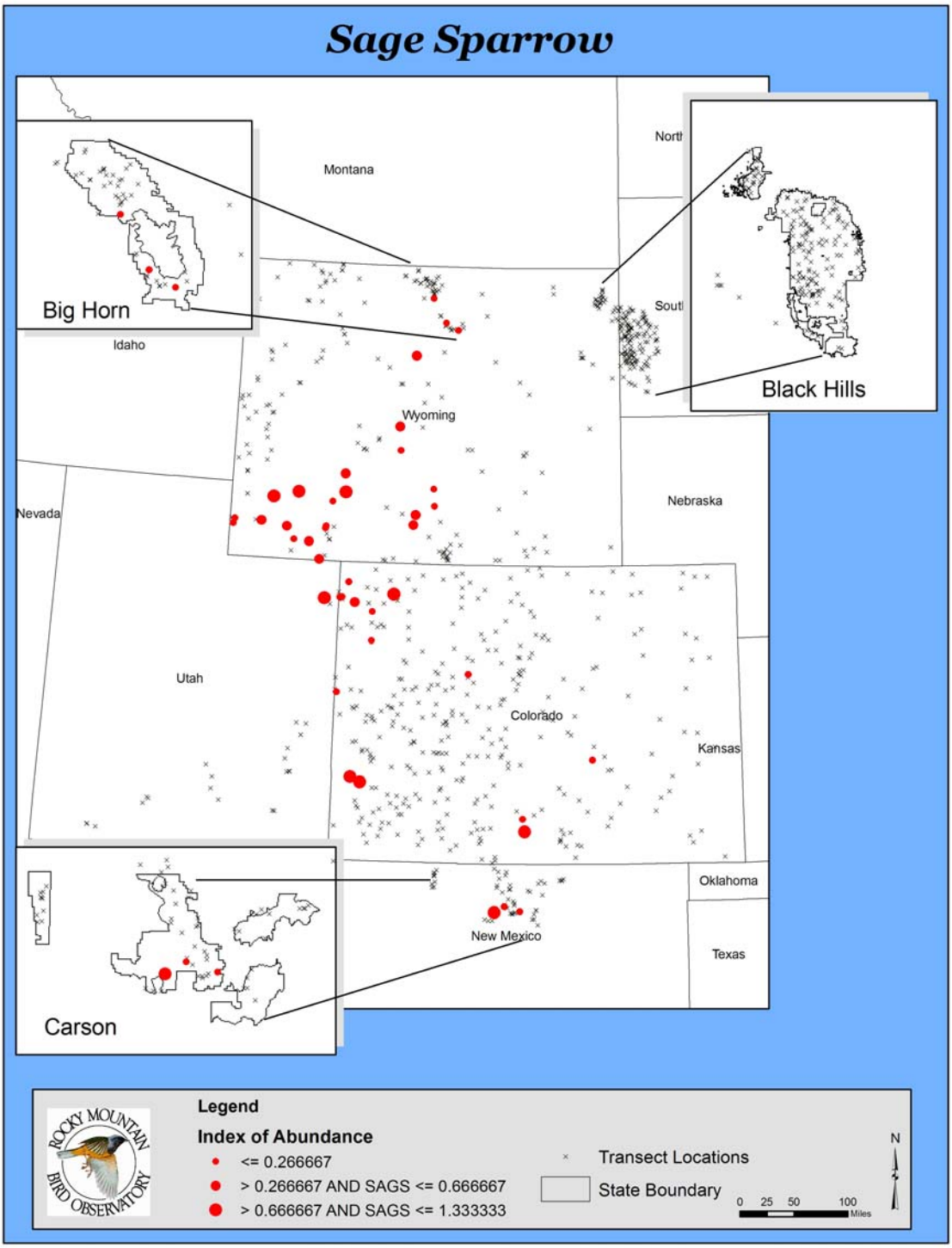
Habitat	D	LCL	UCL	CV	n	N
SA	4.95	1.84	13.31	51.6%	42	52
SE	ID	--	--	--	--	21

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Sage Sparrow among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – In Colorado, Sage Sparrow nests in low-elevation stands of big sagebrush or mixed big sagbrush and greasewood (Kingery 1998, Righter et al. 2004). In Colorado, we have also found that some Sage Sparrows will breed in pure stands of greasewood (*Sarcobatus vermiculatus*) as well as *Atriplex*-dominated shrubland. If we continue to detect this species in sufficient numbers each year, Sage Sparrow should be effectively monitored through point transects in sage shrubland under MCB.


Sage Sparrow
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.266667
> 0.266667 AND SAGS <= 0.666667
> 0.666667 AND SAGS <= 1.333333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Lark Bunting

(Calamospiza melanocorys)

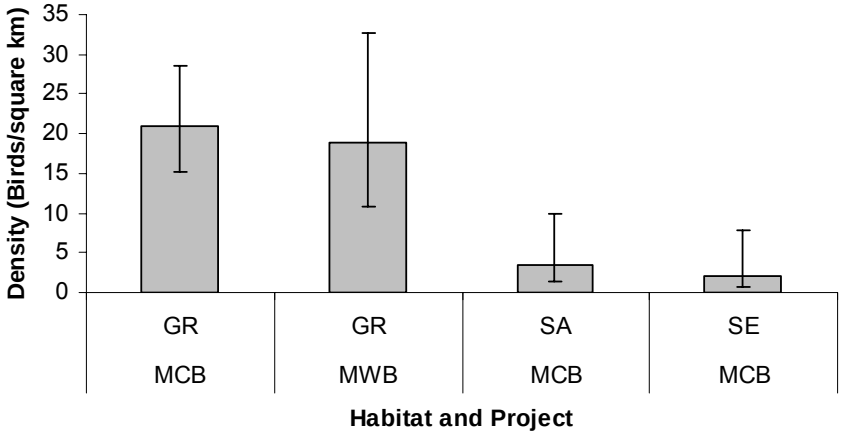
CDOW - Species of Greatest Conservation Need
PIF Species of Regional Concern
PIF Continental and Regional Stewardship Species
CO-PIF Physiographic Region 36 Priority Species
USFS Region 2 Sensitive Species
USFWS Bird of Conservation Concern – BCR 18

In 2005, we detected 998 Lark Buntings in three habitats and were able to calculate density estimates in grassland, sage shrubland, and semidesert shrubland on the MCB project. Overall, we detected this species on all RMBO point-count transect monitoring projects in 2005, but MWB was the only other project on which we were able to calculate a density estimate for Lark Bunting.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Lark Bunting for the MCB monitoring project, 2005.

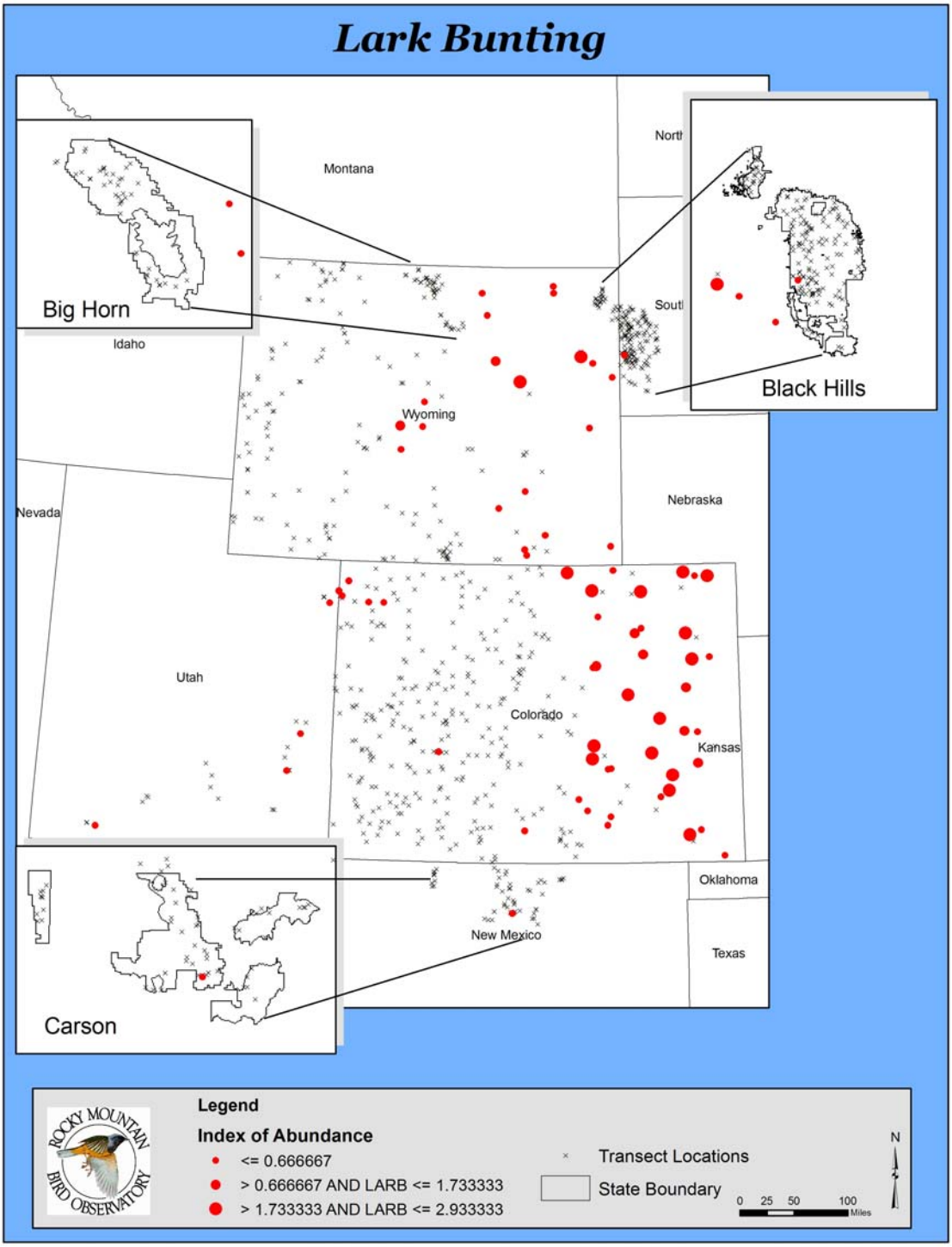
Habitat	D	LCL	UCL	CV	n	N
GR	20.90	15.25	28.66	15.8%	763	843
SA	3.57	1.28	9.98	53.6%	96	99
SE	2.18	0.61	7.75	68.7%	52	56

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Lark Bunting among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – Lark Bunting is the state bird of Colorado and breeds primarily in shortgrass prairie in the eastern part of the state (Kingery 1998). We detect this species in large numbers on grassland transects every year, but it is nomadic and more common in some years than others. If we continue to detect this species in sufficient numbers each year, Lark Bunting should be effectively monitored through point transects under MCB in three habitats. The RMBO section-survey program also is collecting sufficient data to effectively monitor this species in eastern Colorado.


Lark Bunting
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.666667
> 0.666667 AND LARB <= 1.733333
> 1.733333 AND LARB <= 2.933333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Grasshopper Sparrow
(Ammodramus savannarum)

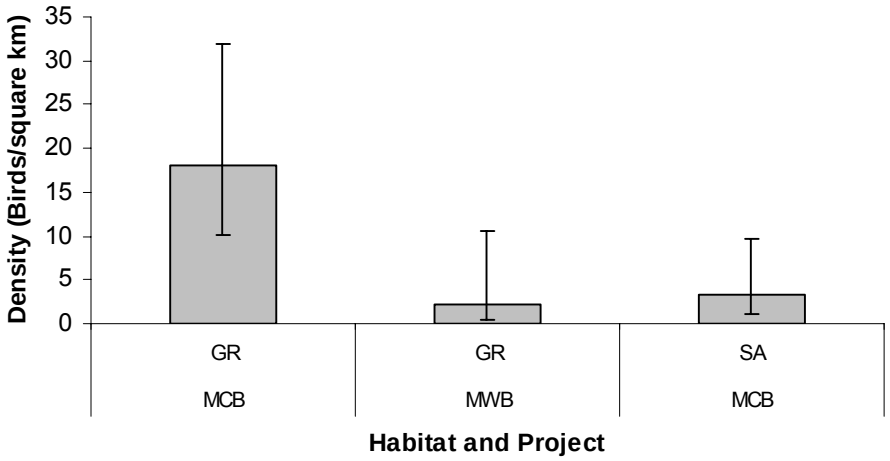
PIF Species of Regional Concern
PIF Continental Stewardship Species
PIF Regional Stewardship Species
CO-PIF Physiographic Region 36 Priority Species
USFS Region 2 Sensitive Species

We detected 278 Grasshopper Sparrows in three habitats on the MCB project in 2005 and in sufficient numbers to calculate density estimates in grassland and sage shrubland. Overall, we detected this species on two other RMBO point-count transect monitoring projects, but the only other project for which were able to calculate a density estimate for this species was MWB in grassland habitat.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Grasshopper Sparrow for the MCB monitoring project, 2005.

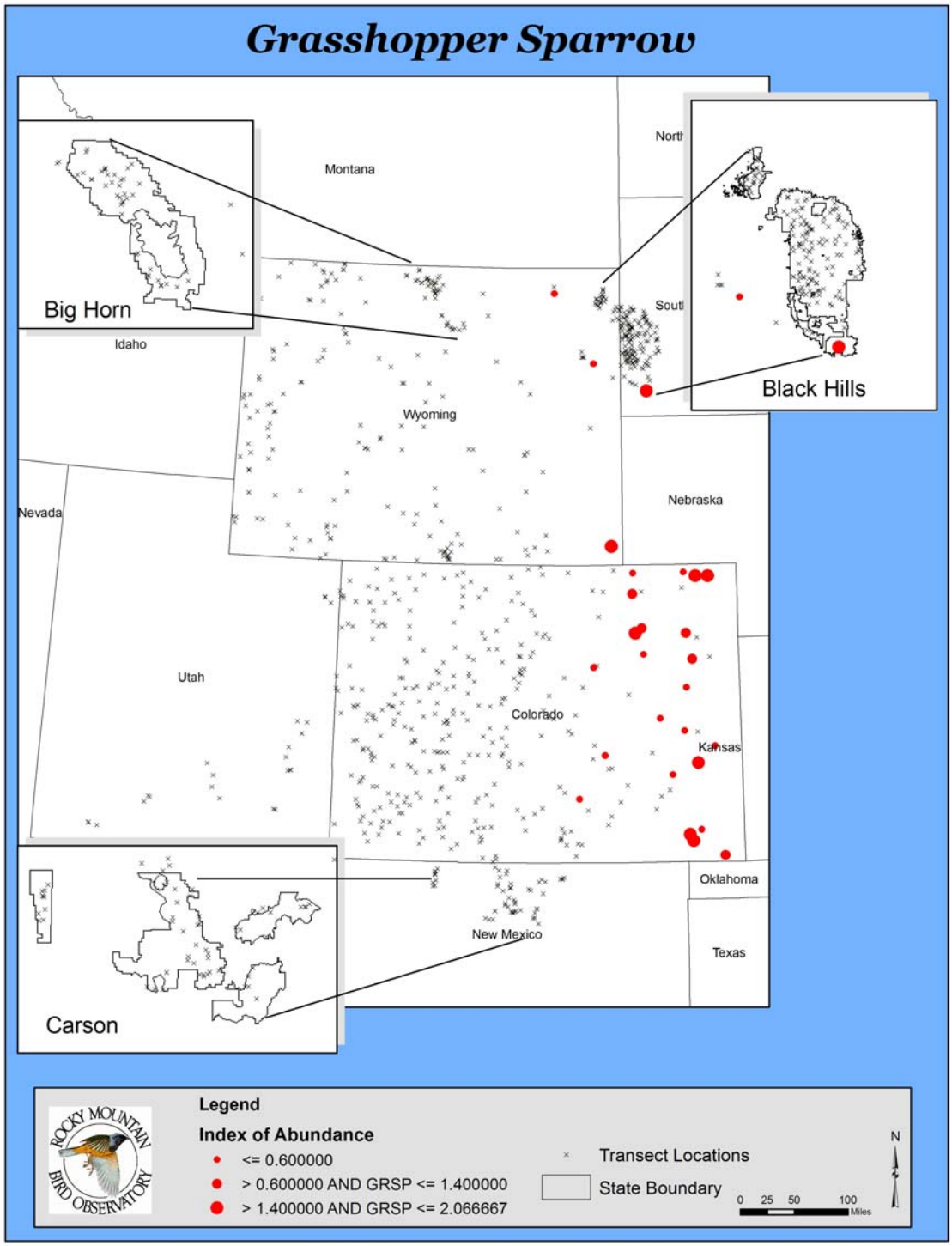
Habitat	D	LCL	UCL	CV	n	N
GR	18.02	10.16	31.96	29.1%	195	196
SA	3.30	1.14	9.59	55.9%	77	80
SE	ID	--	--	--	--	2

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Grasshopper Sparrow among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – In Colorado, Grasshopper Sparrow breeds in the eastern prairies, especially in areas with taller grass (Kingery 1998), and appears to be declining throughout its range from the loss, fragmentation, and degradation of habitat (Cornell 2003). Grasshopper Sparrow should be effectively monitored through point transects in grassland habitat under MCB. The RMBO section-survey program also is collecting sufficient data to effectively monitor this species in eastern Colorado.


Grasshopper Sparrow
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.600000
> 0.600000 AND GRSP <= 1.400000
> 1.400000 AND GRSP <= 2.066667
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

McCown's Longspur

(Calcarius mccownii)

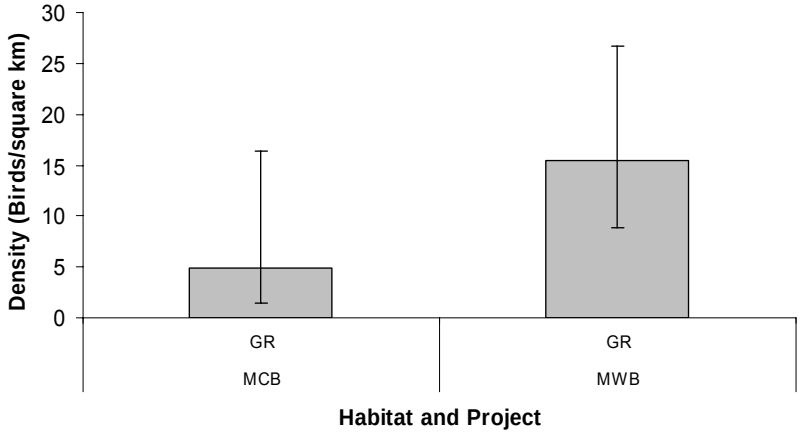
CDOW - Species of Greatest Conservation Need
PIF Species of Continental Concern
PIF Continental and Regional Stewardship Species
CO-PIF Physiographic Region 36 Priority Species
USFS Region 2 Sensitive Species
USFWS Bird of Conservation Concern – BCR 18

We detected 130 McCown's Longspurs in grassland habitat on the MCB project in 2005. MWB was the only other RMBO point-transect monitoring project on which this species was detected in 2005, although the other projects are outside of the normal breeding range for this species or the habitat is not suitable (MBBH). We also detected McCown's Longspur in sufficient numbers on the MWB project to calculate a density estimate in grassland habitat.

Total number of independent detections, number of individuals, and habitat-specific density estimates for McCown's Longspur for the MCB monitoring project, 2005.

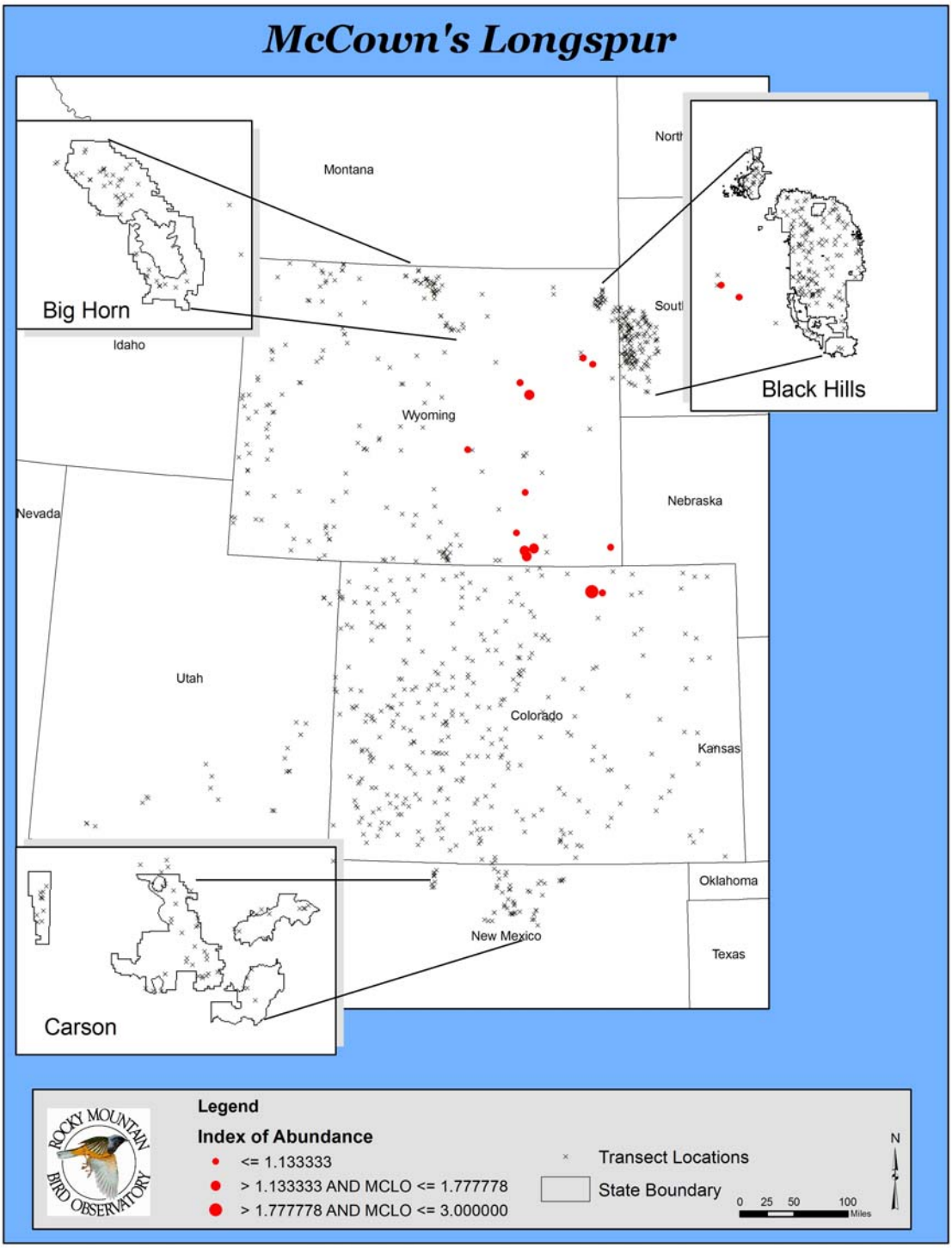
Habitat	D	LCL	UCL	CV	n	N
GR	4.87	1.45	16.38	66.1%	121	130

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of McCown's Longspur among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – In Colorado, McCown's Longspur breeds primarily in the shortgrass prairie in northern Weld County (Kingery 1998). It should be noted that all detections of this species on the MCB project in 2005 occurred on only two grassland transects. Therefore, the density of this species in the areas where breeding habitat occurs is actually quite high. McCown's Longspur should be effectively monitored through point transects in grassland habitat under MCB. The RMBO section-survey program also is collecting sufficient data to effectively monitor this species in eastern Colorado.


McCown's Longspur
Montana
North
South
Idaho
Wyoming
Nebraska
Nevada
Utah
Colorado
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 1.133333
> 1.133333 AND MCLO <= 1.777778
> 1.777778 AND MCLO <= 3.000000
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Chestnut-collared Longspur

(Calcarius ornatus)

CDOW - Species of Greatest Conservation Need
PIF Species of Regional Concern
USFWS Bird of Conservation Concern – BCR18

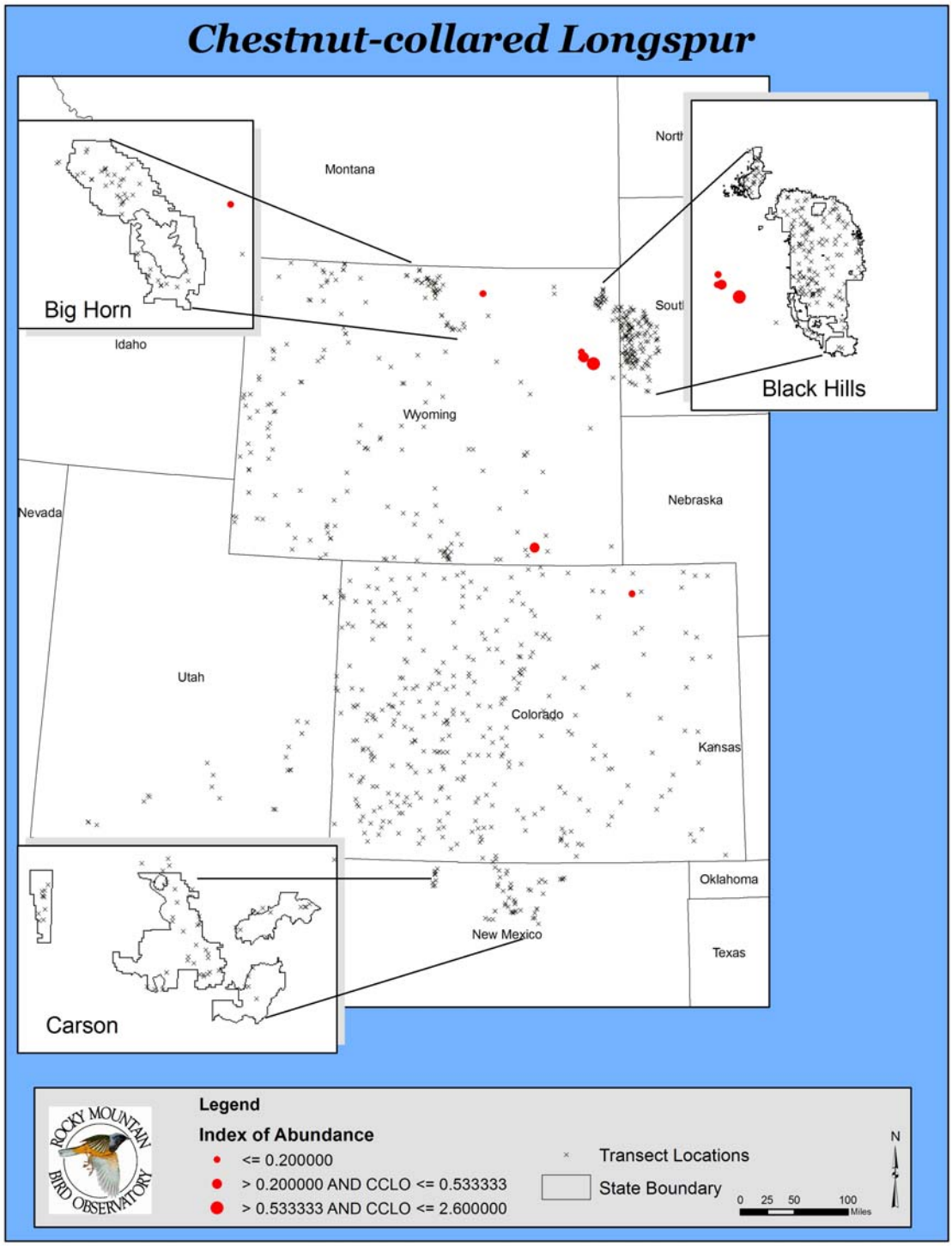
We detected three Chestnut-collared Longspurs in grassland on the MCB project in 2005 and we also detected this species on the MWB project on grassland transects. All of the other projects are either outside of the normal breeding range for this species or we do not survey the appropriate habitat (MBBH). We were able to calculate a density estimate for this species only in grassland habitat on the MWB project.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Chestnut-collared Longspur for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
GR	ID	--	--	--	--	3

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – In Colorado, Chestnut-collared Longspur breeds primarily in shortgrass prairie in the northeastern part of the state (Kingery 1998). Given its rarity in Colorado, with the current level of effort it is unlikely that we will effectively monitor this species through point transects under MCB. Adding grassland transects in northeastern Colorado may improve our ability to monitor Chestnut-collared Longspur.


Chestnut-collared Longspur
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.200000
> 0.200000 AND CCLO <= 0.533333
> 0.533333 AND CCLO <= 2.600000
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Lazuli Bunting

(Passerina amoena)

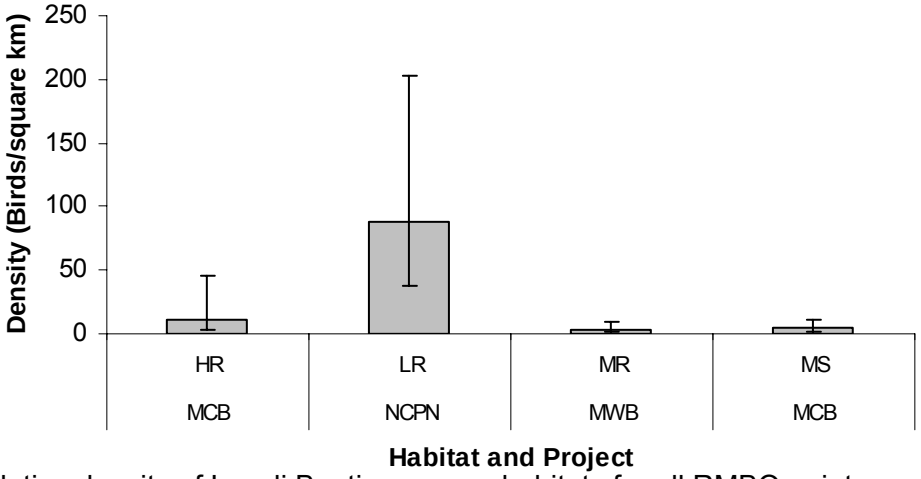
CO-PIF Physiographic Region 62 Priority Species

We detected 91Lazuli Buntings in nine habitats on the MCB project in 2005 and calculated density estimates in high-elevation riparian and montane shrubland. Overall, we detected this species on all RMBO point-count transect monitoring projects in 2005 and were able to calculate a density estimate for this species also on the MWB and NCPN projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Lazuli Bunting for the MCB monitoring project, 2005.

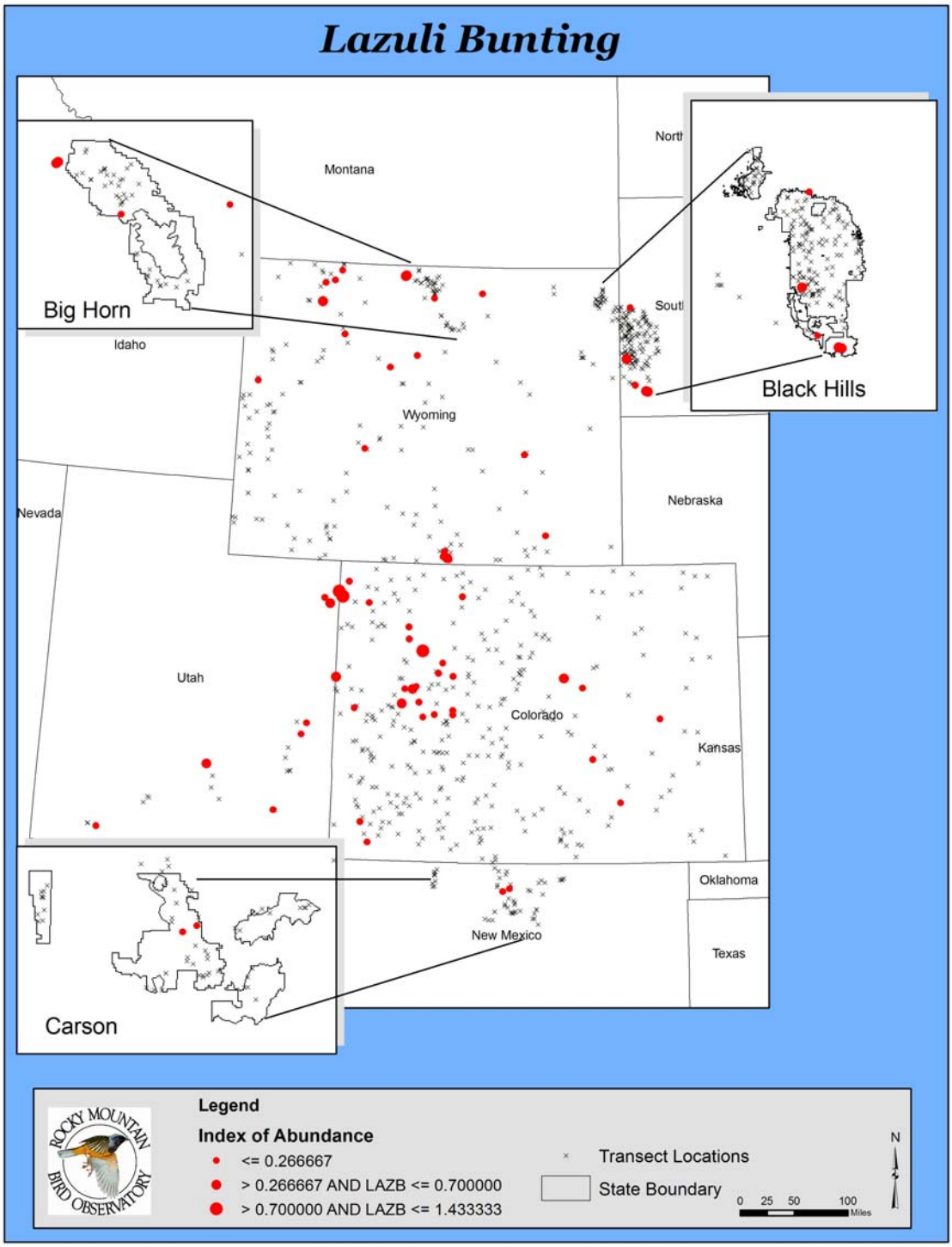
Habitat	D	LCL	UCL	CV	n	N
AS	ID	--	--	--	--	14
AT	ID	--	--	--	--	1
GR	ID	--	--	--	--	1
HR	11.61	2.97	45.44	74.7%	27	29
MC	ID	--	--	--	--	2
MS	5.02	2.35	10.69	39.1%	29	30
PJ	ID	--	--	--	--	13
SE	ID	--	--	--	--	7
SF	ID	--	--	--	--	1

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Lazuli Bunting among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – In Colorado, Lazuli Bunting is a widespread but seldom abundant species of areas dominated by deciduous shrubs (Kingery 1998). This species will hybridize with Indigo Buntings in Colorado and hybrids of these two species are reported frequently (Kingery 1998). Lazuli Bunting should be effectively monitored through point transects under MCB in high-elevation riparian and montane shrubland habitat.


Lazuli Bunting
Montana
North
South
Idaho
Wyoming
Nebraska
Nevada
Utah
Colorado
Kansas
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.266667
> 0.266667 AND LAZB <= 0.700000
> 0.700000 AND LAZB <= 1.433333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Dickcissel
(Spiza americana)

PIF Species of Continental Concern

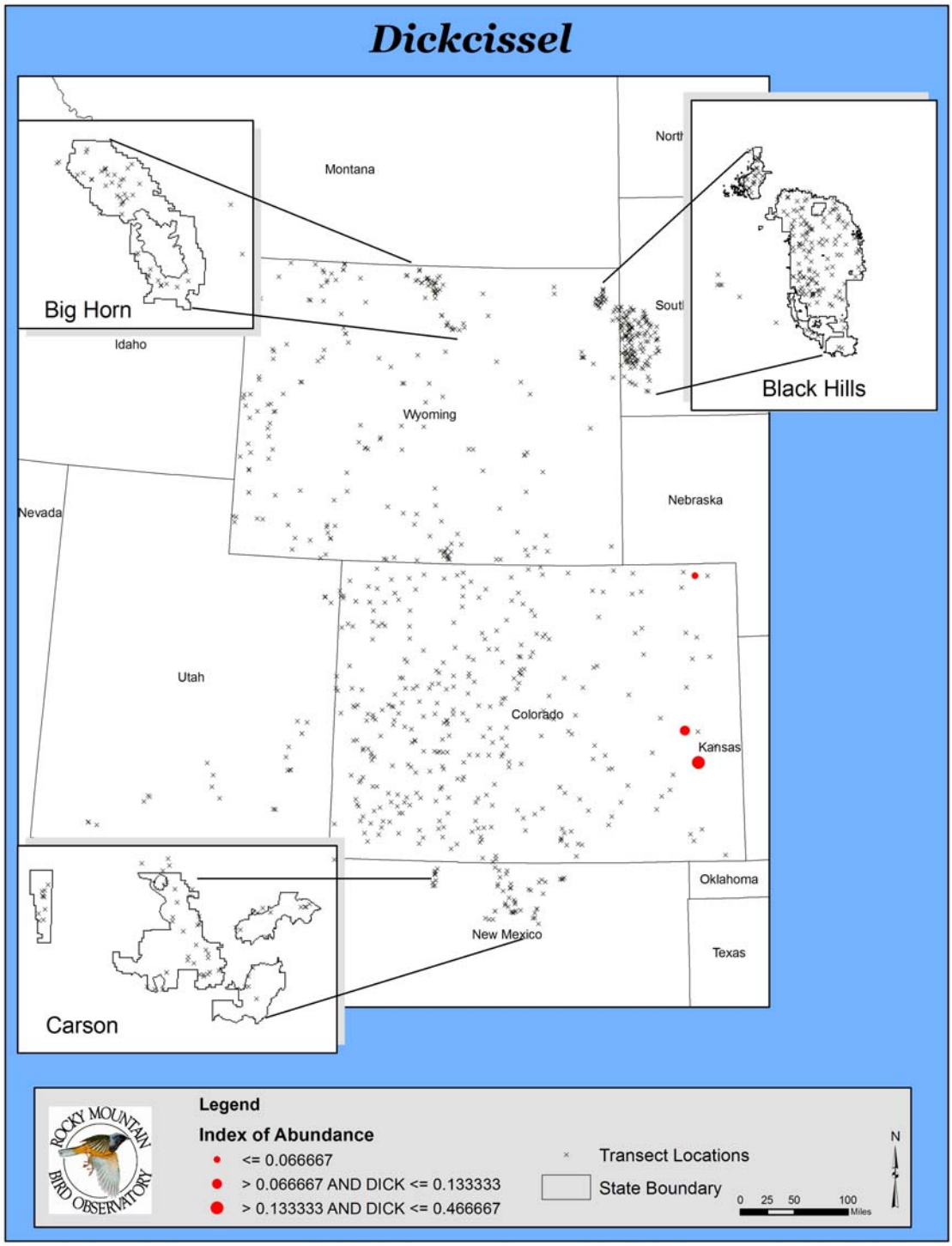
In 2005, we detected 11 Dickcissels in three habitats on the MCB project. We did not detect this species on any of the other RMBO point-count transect monitoring projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Dickcissel for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
GR	ID	--	--	--	--	7
SA	ID	--	--	--	--	3
WE	ID	--	--	--	--	1

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – In Colorado, Dickcissel is inconsistently found in the eastern prairie regions of the state and often breeds in alfalfa, clover and timothy fields (Kingery 1998). The occurrence of Dickcissel in Colorado is irregular and depends on precipitation (Kingery 1998). Due to its irregularity in the state, it is unlikely that we will be able to effectively monitor Dickcissel through point transects under MCB. The RMBO section-survey program, however, is collecting sufficient data to effectively monitor this species in eastern Colorado.


Dickcissel
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.066667
> 0.066667 AND DICK <= 0.133333
> 0.133333 AND DICK <= 0.466667
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

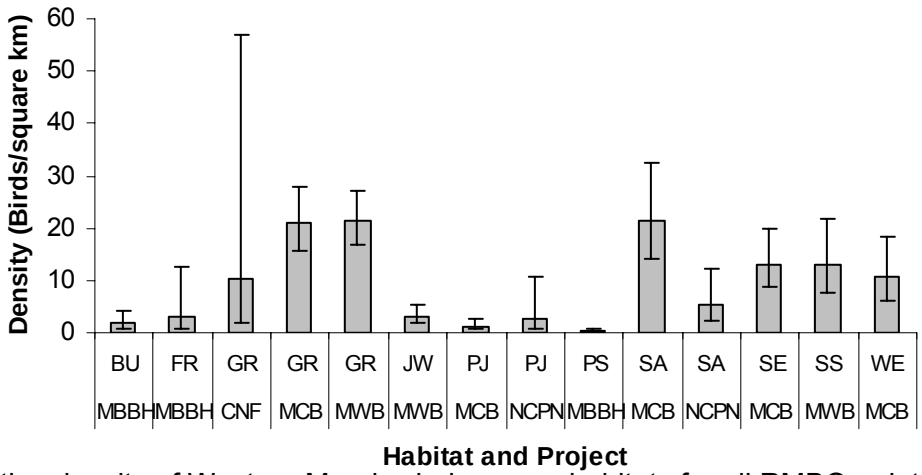
Western Meadowlark
(Sturnella neglecta)
PIF Regional Stewardship Species

In 2005, we detected 2249 Western Meadowlarks in ten habitats and were able to calculate density estimates in five habitats on the MCB project. Overall, Western Meadowlark was recorded on all five RMBO monitoring projects in 2005 and we were able to calculate density estimates for this species in at least one habitat for all five projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Western Meadowlark for the MCB monitoring project, 2005.

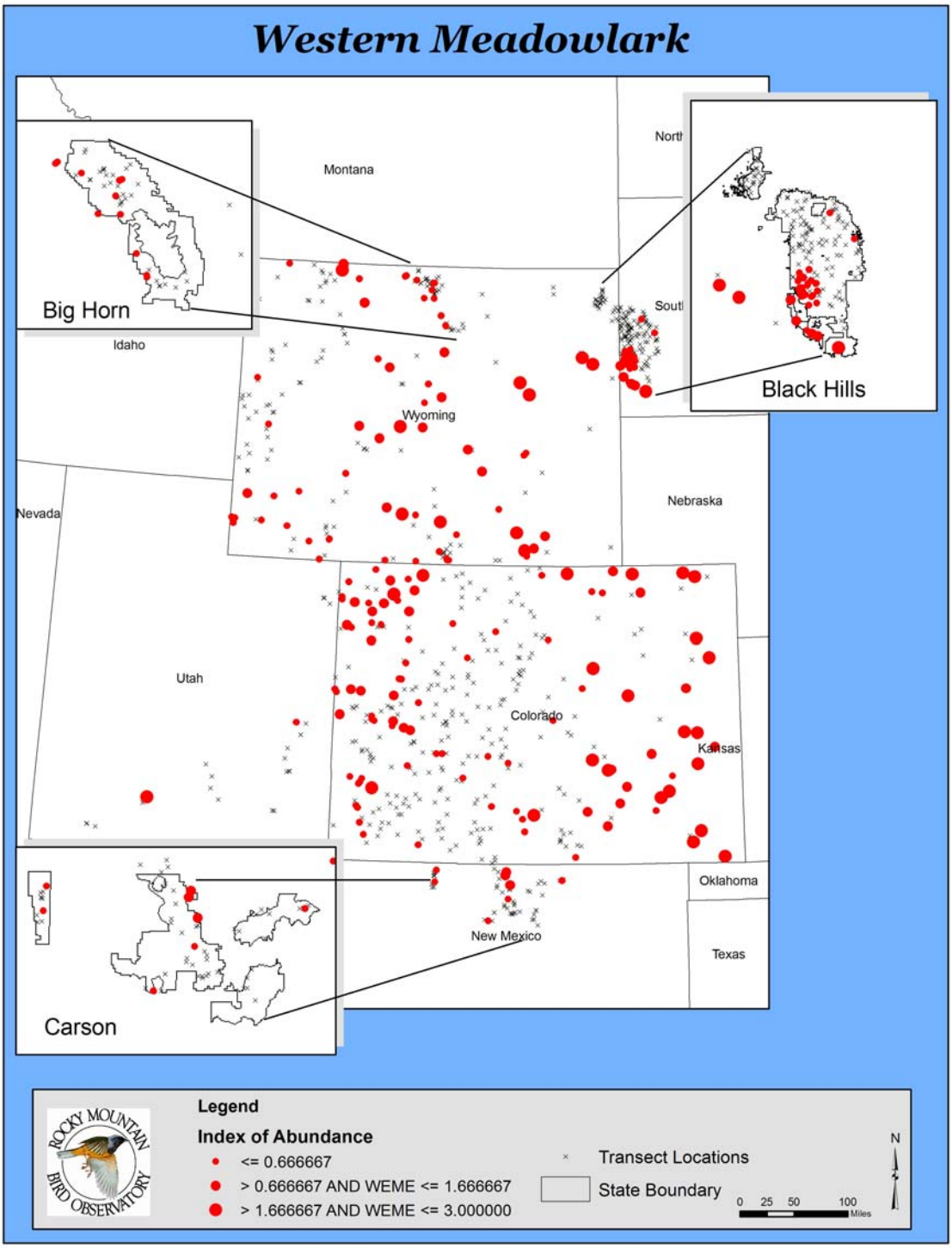
Habitat	D	LCL	UCL	CV	n	N
GR	20.86	15.68	27.75	14.3%	1027	1050
HR	ID	--	--	--	--	1
MC	ID	--	--	--	--	1
MS	ID	--	--	--	--	22
PJ	1.30	0.67	2.50	33.4%	54	57
PP	ID	--	--	--	--	11
SA	21.49	14.22	32.48	20.5%	565	596
SE	13.15	8.76	19.74	20.4%	460	473
SF	ID	--	--	--	--	2
WE	10.58	6.13	18.26	27.8%	35	36

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Western Meadowlark among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – In Colorado, Western Meadowlark nests primarily in native grasslands, semi-desert shrublands, and sage shrublands (Kingery 1998). Western Meadowlark should be effectively monitored under MCB through point-transects in five habitats. The RMBO section-survey program also is collecting sufficient data to effectively monitor this species in eastern Colorado.


Western Meadowlark
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.666667
> 0.666667 AND WEME <= 1.666667
> 1.666667 AND WEME <= 3.000000
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Brown-capped Rosy-Finch

(Leucosticte australis)

CDOW - Species of Greatest Conservation Need
PIF Species of Continental Concern
PIF Species of Regional Concern
PIF Regional Stewardship Species
CO-PIF Physiographic Region 62 Priority Species

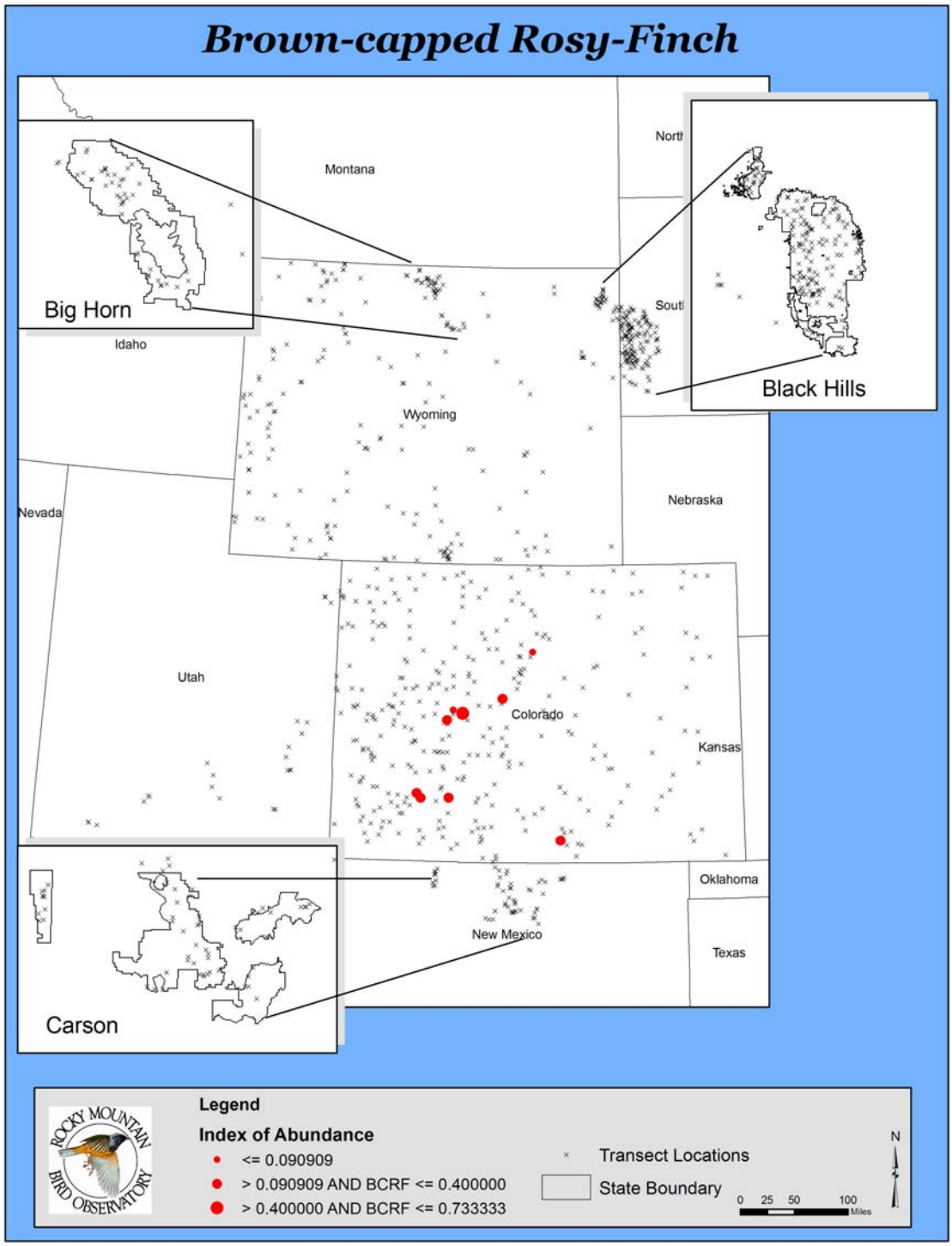
We detected 51 Brown-capped Rosy-Finches in alpine tundra on the MCB project in 2005, and in sufficient numbers to calculate a density estimate. We did not record it on any other RMBO point-count transect monitoring project; however, we do not survey alpine tundra, the breeding habitat for this species, on any other project, plus it is nearly a Colorado endemic.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Brown-capped Rosy-Finch for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
AT	2.23	0.94	5.32	45.4%	27	51

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Brown-capped Rosy-Finch breeds only above timberline in cliffy areas that are difficult to survey (Kingery 1998). The breeding range of this species is found almost entirely in Colorado as it is considered a rare breeder in southern Wyoming and it is unknown whether or not it breeds in northern New Mexico (Kingery 1998). The National Audubon Society places this species on its WatchList, and MCB is one of the few, if not the only, monitoring projects in North America that effectively monitors this species.


Brown-capped Rosy-Finch
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.090909
> 0.090909 AND BCRF <= 0.400000
> 0.400000 AND BCRF <= 0.733333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Cassin's Finch

(Carpodacus cassinii)

CDOW - Species of Greatest Conservation Need
PIF Species of Regional Concern

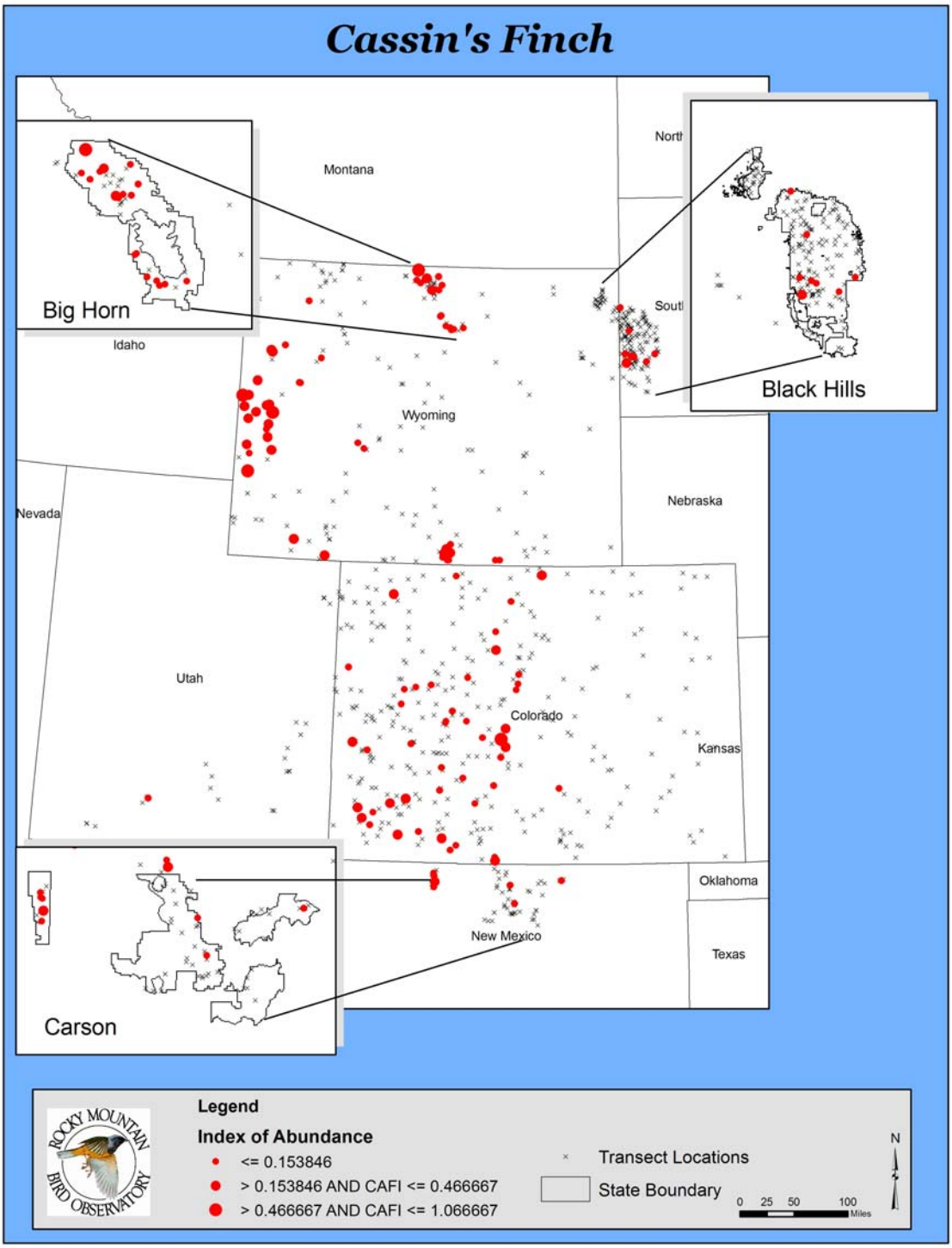
We detected 117 Cassin's Finches in nine habitats on the MCB project in 2005 and recorded it on all other RMBO point-count transect monitoring projects. However, we were able to calculate a density estimate only in ponderosa pine habitat on the MCB project.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Cassin's Finch for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
AS	ID	--	--	--	--	7
AT	ID	--	--	--	--	16
HR	ID	--	--	--	--	2
MC	ID	--	--	--	--	12
MS	ID	--	--	--	--	4
PJ	ID	--	--	--	--	17
PP	18.33	8.18	41.10	42.0%	32	42
SA	ID	--	--	--	--	7
SF	ID	--	--	--	--	10

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – Cassin's Finch nests in all coniferous forests, though breed in pinyon-juniper habitat only rarely, and prefers high-elevation conifers. If we continue to detect this species in sufficient numbers in future years, Cassin's Finch should be effectively monitored through point transects in ponderosa pine under MCB.


Cassin's Finch
Montana
North
South
Idaho
Wyoming
Nebraska
Nevada
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.153846
> 0.153846 AND CAFI <= 0.466667
> 0.466667 AND CAFI <= 1.066667
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Red Crossbill

(Loxia curvirostra)

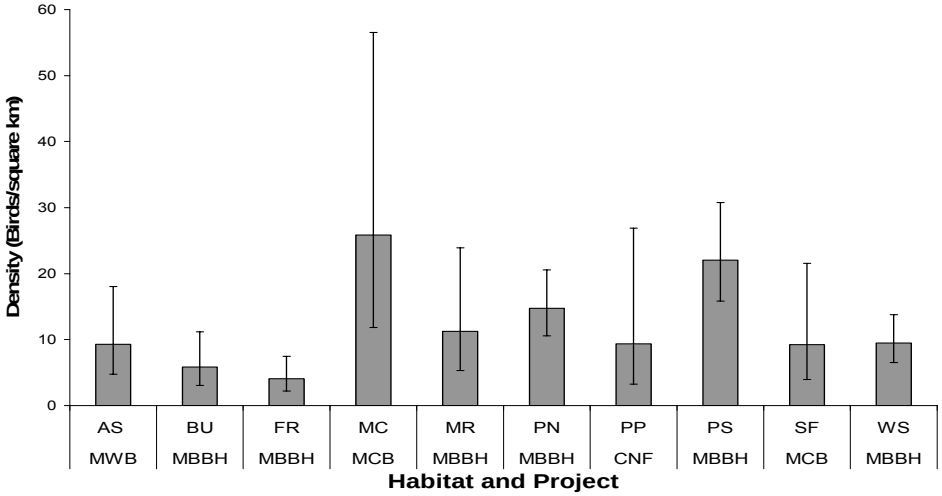
CDOW - Species of Greatest Conservation Need

We detected 217 Red Crossbills in seven habitats on the MCB project in 2005 and calculated a density estimate in mixed conifer and spruce-fir habitats. We detected Red Crossbills on all of the other RMBO monitoring projects except NCPN on which, we do not survey the appropriate habitat. We were able to calculate a density estimate for Red Crossbill also in at least on habitat on the MBBH, MWB and MBCNF projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Red Crossbill for the MCB monitoring project, 2005.

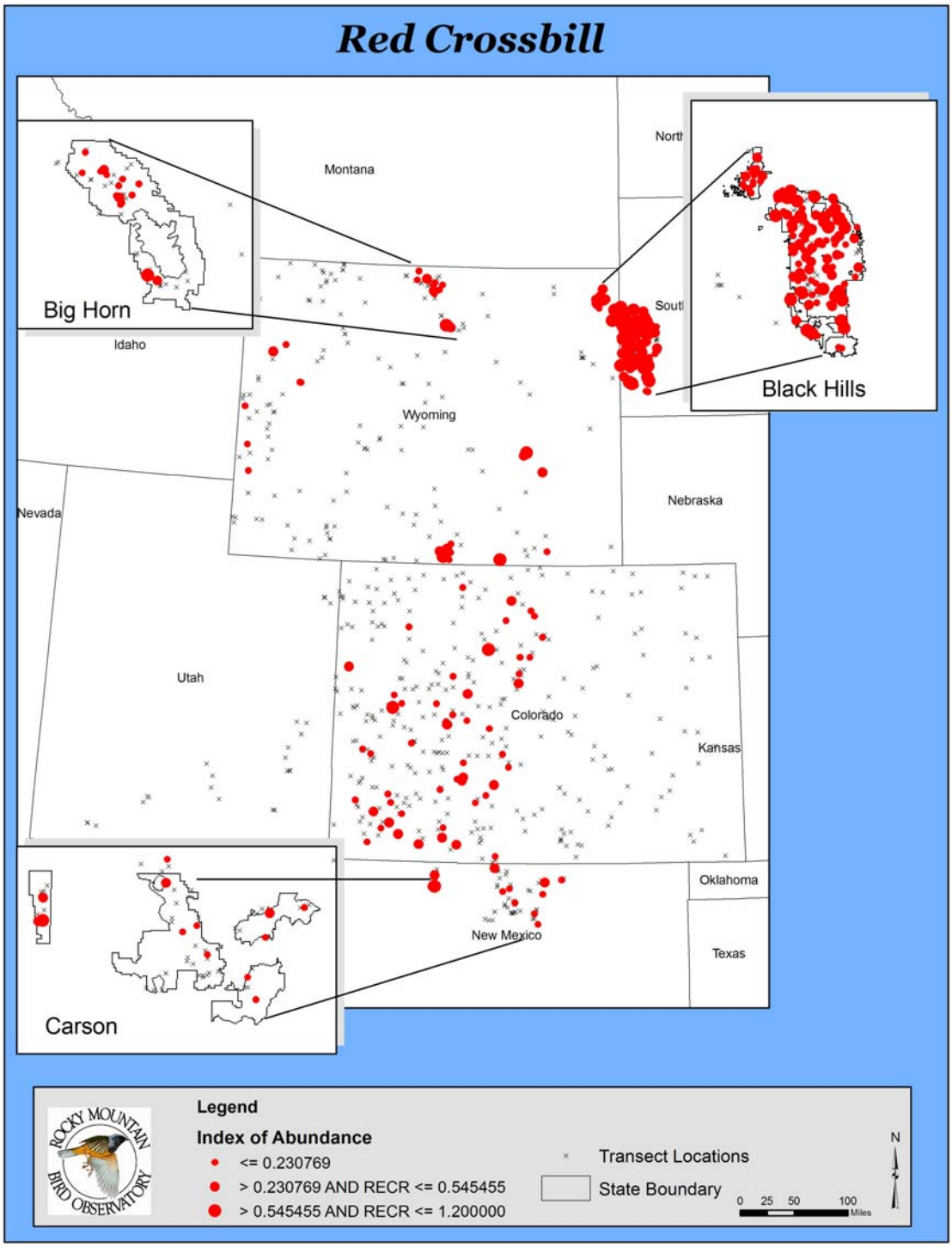
Habitat	D	LCL	UCL	CV	n	N
AS	ID	--	--	--	--	13
AT	ID	--	--	--	--	2
HR	ID	--	--	--	6	30
MC	25.86	11.83	56.54	40.7%	29	71
MS	ID	--	--	--	--	6
PP	ID	--	--	--	12	44
SF	9.26	3.97	21.58	44.3%	39	51

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Western Meadowlark among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – Red Crossbills have been separated into different "types" based on their dependence on a particular species of conifer (Kingery 1998). In Colorado, Red Crossbills use Douglas-fir, ponderosa pine and lodgepole pine (Kingery 1998). Red Crossbill should be effectively monitored through point transects under MCB in mixed conifer and spruce-fir habitats.


Red Crossbill
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.230769
> 0.230769 AND RECR <= 0.545455
> 0.545455 AND RECR <= 1.200000
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Pine Siskin
(Carduelis pinus)

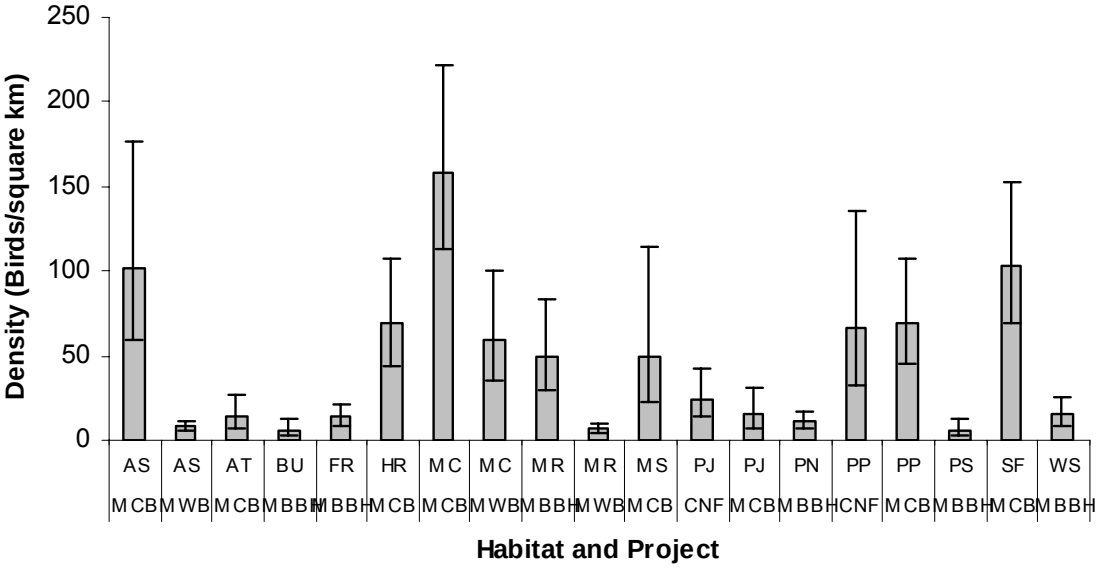
PIF Species of Regional Concern
PIF Regional Stewardship Species

We detected 1259 Pine Siskins in eleven habitats and estimated densities in eight habitats for the MCB project. Overall, we detected this species on all RMBO point-count transect monitoring projects in 2005 and calculated density estimates in at least one habitat on three other projects.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Pine Siskin for the MCB monitoring project, 2005.

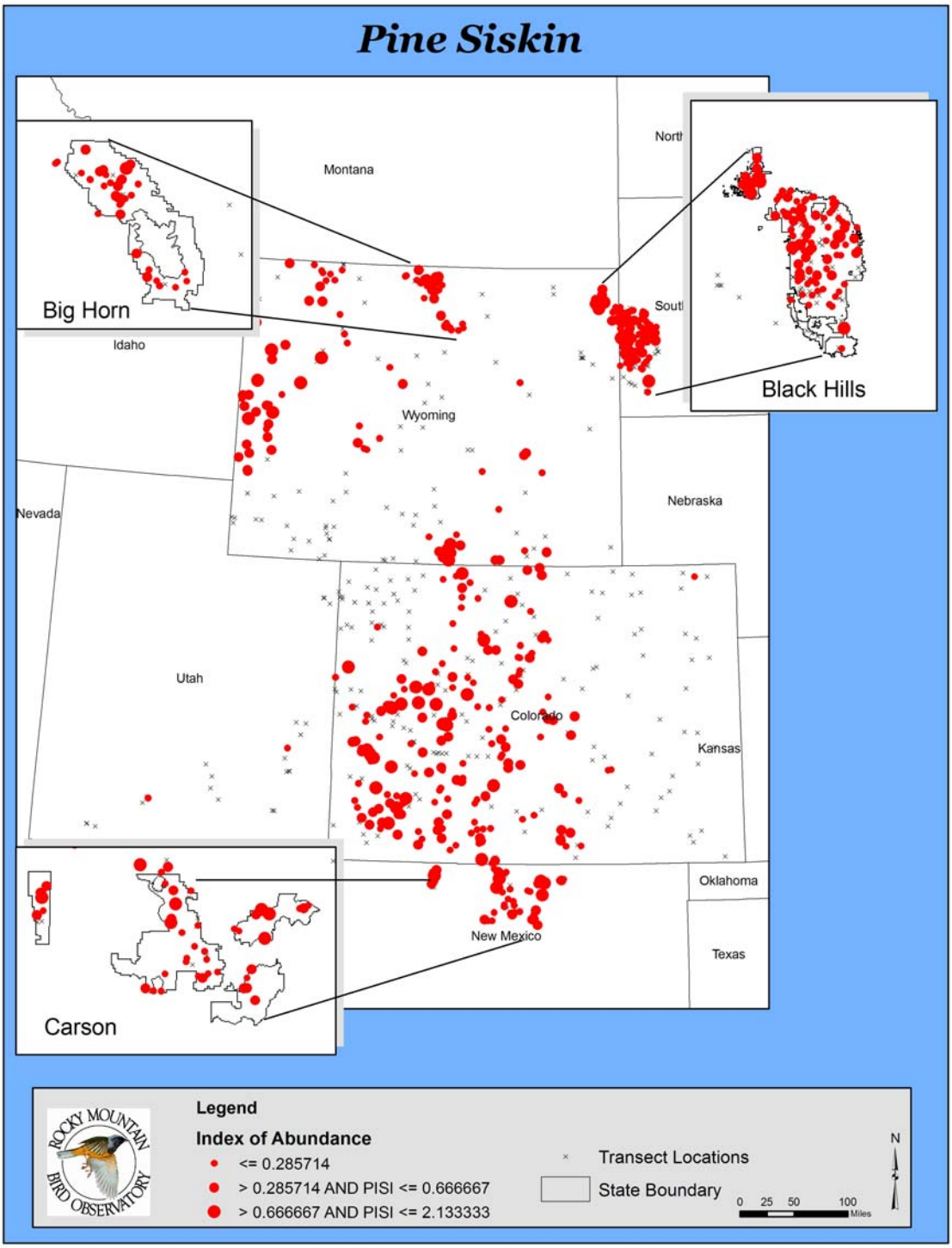
Habitat	D	LCL	UCL	CV	n	N
AS	101.89	58.81	176.51	28.1%	109	141
AT	13.82	7.25	26.34	33.2%	45	61
HR	68.79	44.01	107.50	22.3%	131	197
MC	158.79	113.42	222.31	17.1%	159	221
MS	50.12	22.06	113.83	42.0%	98	130
PJ	15.58	7.69	31.57	36.4%	37	60
PP	69.79	45.46	107.15	21.9%	122	195
SA	ID	--	--	--	--	7
SE	ID	--	--	--	--	10
SF	102.50	68.75	152.81	20.3%	163	234
WE	ID	--	--	--	--	3

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.



Relative density of Pine Siskin among habitats for all RMBO point-count transect monitoring projects, 2005.

Summary – Pine Siskin nests in a variety habitats, especially coniferous forests. Pine Siskin should be effectively monitored through point transects in a range of habitats under MCB.


Pine Siskin
Montana
Idaho
Wyoming
Nevada
Utah
Colorado
Kansas
Nebraska
Oklahoma
Texas
New Mexico
Big Horn
Black Hills
Carson
Legend
Index of Abundance
<= 0.285714
> 0.285714 AND PISI <= 0.666667
> 0.666667 AND PISI <= 2.133333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

Evening Grosbeak

(Coccothraustes vespertinus)

CDOW - Species of Greatest Conservation Need

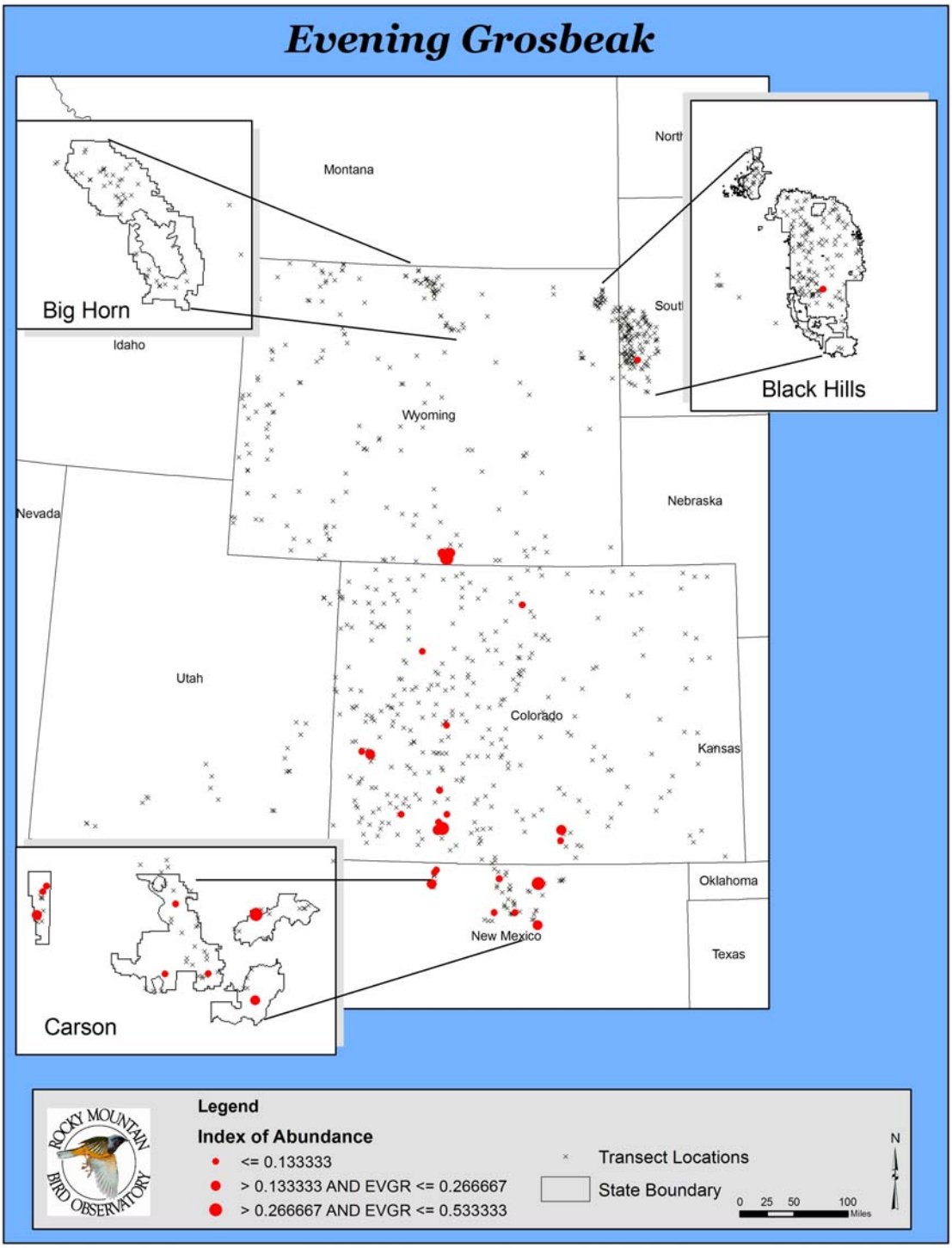
We detected 24 Evening Grosbeaks in four habitats on the MCB project in 2005. We also recorded Evening Grosbeak on the MBBH, MWB and MBCNF projects; however, we were unable to calculate a density estimate in any habitat on any project.

Total number of independent detections, number of individuals, and habitat-specific density estimates for Evening Grosbeak for the MCB monitoring project, 2005.

Habitat	D	LCL	UCL	CV	n	N
AT	ID	--	--	--	--	1
HR	ID	--	--	--	--	4
MC	ID	--	--	--	--	15
SF	ID	--	--	--	--	4

D = Density (birds/square kilometer); LCL = lower 95% confidence interval of the density; UCL = upper 95% confidence interval of the density; CV(%) = coefficient of variation of the density; n = number of independent detections; N = number of individuals; ID = insufficient data.

Summary – In Colorado, Evening Grosbeak nests primarily in coniferous forests, especially ponderosa pine, but also spruce-fir and the species responds positively to spruce budworm outbreaks (Kingery 1998). Evening Grosbeak will probably not be monitored through point transects in any one habitat or across habitats under MCB. Given interest though, with several years' data, we may be able to pool data across years and habitats and weight observations by habitat area, to generate a global detection function for this species and thereby generate an annual statewide density estimate that may be robust enough for population-trend monitoring.


Evening Grosbeak
Montana
North
South
Big Horn
Idaho
Wyoming
Black Hills
Nevada
Nebraska
Utah
Colorado
Kansas
Oklahoma
New Mexico
Texas
Carson
Legend
Index of Abundance
<= 0.133333
> 0.133333 AND EVGR <= 0.266667
> 0.266667 AND EVGR <= 0.533333
Transect Locations
State Boundary
0 25 50 100
Miles
N
ROCKY MOUNTAIN BIRD OBSERVATORY

APPENDIX B. BIRDS DETECTED ON POINT TRANSECTS – SPECIES AND TOTALS

List of all bird species observed in Colorado from 2003-2005, with management designations and species totals.

	Special Management Designation[2]								Total #individuals observed per habitat[4], 2005												Total #individuals observed per year (in all habitats surveyed[5])		
Common Name[1]	BLM	CO	CDOW	PIF	CO-PIF	USFS	USFWS	status[3]	AS	AT	GR	HR	MC	MS	PJ	PP	SA	SE	SF	WE	2003	2004	2005
Canada Goose								B	0	0	6	0	0	0	3	2	78	9	2	36	193	110	136
Wood Duck								B	0	0	0	0	0	0	0	0	0	0	0	0	7	10	0
Gadwall								B	0	0	7	2	0	0	0	0	2	0	0	42	45	54	53
American Wigeon								B	0	0	0	0	0	0	0	0	0	0	0	5	1	11	5
Mallard								B	3	0	8	12	0	7	0	0	8	7	1	59	145	160	105
Blue-winged Teal								B	0	0	0	0	0	0	0	0	2	0	0	23	10	7	25
Cinnamon Teal								B	0	0	0	0	0	0	0	0	0	0	0	33	29	8	33
Northern Shoveler								B	0	0	0	0	0	0	0	0	0	0	0	19	6	5	19
Northern Pintail			SGCN					B	0	0	0	0	0	0	0	0	0	1	0	10	0	4	11
American Green-winged Teal								B	0	0	0	0	0	0	0	0	0	0	0	0	9	7	0
Redhead								B	0	0	0	0	0	0	0	0	0	0	0	21	29	2	21
Ring-necked Duck								B	2	0	0	0	0	1	0	0	0	0	0	3	20	7	6
Lesser Scaup			SGCN					B	0	0	0	0	0	0	0	0	0	0	1	10	5	7	11
Common Goldeye								TM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Common Merganser								B	0	0	0	3	0	2	0	0	0	0	0	0	33	13	5
Ruddy Duck								B	0	0	0	0	0	0	0	0	0	0	0	21	27	19	21
Chukar								B	0	0	0	0	0	0	0	0	0	1	0	0	2	1	1
Ring-necked Pheasant								B	0	0	10	0	0	0	1	0	32	6	0	7	39	41	56
Greater Sage-Grouse	SS	SC	SGCN	CC, RC	PR 62 &87	R2SS		B	0	0	0	0	0	0	0	0	1	0	0	0	1	4	1
White-tailed Ptarmigan			SGCN		PR 62	R2SS	16	B	0	10	0	0	0	0	0	0	0	0	0	0	8	14	10
Blue Grouse			SGCN	CC	PR 62			B	0	1	0	0	4	1	0	2	0	0	1	0	16	51	9
Greater Prairie-Chicken			SGCN	CC, RC	PR 36	R2SS	N,18	B	0	0	10	0	0	0	0	0	3	0	0	0	6	0	13

Common Name[1]	Special Management Designation[2]							status[3]	Total #individuals observed per habitat[4], 2005												Total #individuals observed per year (in all habitats surveyed[5])		
	BLM	CO	CDOW	PIF	CO-PIF	USFS	USFWS		AS	AT	GR	HR	MC	MS	PJ	PP	SA	SE	SF	WE	2003	2004	2005
Wild Turkey								B	0	0	1	0	1	0	1	0	0	0	0	0	1	6	3
Scaled Quail			SGCN					B	0	0	0	0	0	0	0	0	0	0	0	0	21	16	0
Gambel's Quail								B	0	0	0	0	0	0	0	0	0	0	0	0	15	13	0
Northern Bobwhite								B	0	0	0	0	0	0	0	0	0	0	0	2	30	30	2
Pied-billed Grebe								B	0	0	0	0	0	0	0	0	0	0	0	12	8	2	12
Eared Grebe			SGCN					B	0	0	0	0	0	0	0	0	0	0	0	15	4	14	15
Western Grebe			SGCN					B	0	0	0	0	0	0	0	0	2	0	0	5	1	1	7
Clark's Grebe								B	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
American White Pelican	SS		SGCN					B	0	0	0	0	0	0	0	0	0	0	0	12	12	14	12
Double-crested Cormorant								B	0	0	0	0	0	0	0	0	0	0	0	9	6	3	9
American Bittern			SGCN			R2SS		B	0	0	0	0	0	0	0	0	0	0	0	3	6	3	3
Great Blue Heron								B	0	0	1	0	0	4	1	1	2	3	0	10	56	54	22
Snowy Egret			SGCN					B	0	0	0	0	0	0	0	0	0	0	0	2	1	5	2
Cattle Egret								B	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Green Heron								B	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Black-crowned Night-Heron								B	0	0	0	0	0	0	0	0	0	0	0	3	10	25	3
White-faced Ibis	SS		SGCN					B	0	0	0	0	0	0	0	0	0	150	0	20	1	16	170
Turkey Vulture								B	0	0	0	0	5	4	0	8	1	2	0	0	220	119	20
Osprey			SGCN					B	0	0	0	0	0	0	0	0	0	0	0	0	1	6	0
Bald Eagle			SGCN					B	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Northern Harrier			SGCN	RC	PR 36 & 87	R2SS	N,16,18	B	0	0	1	0	0	115	0	0	3	6	0	9	15	9	134
Sharp-shinned Hawk								B	1	0	0	1	0	0	2	0	0	0	0	0	3	10	4
Cooper's Hawk								B	0	0	1	0	3	2	0	1	0	0	0	0	4	14	7
Northern Goshawk	SS		SGCN			R2SS		B	2	0	0	0	0	0	0	0	0	0	0	0	0	6	2
Swainson's Hawk			SGCN	CC, RC, RS	PR 36		N,16	B	2	0	6	0	0	0	0	0	1	5	1	3	20	23	18
Red-tailed Hawk								B	4	0	2	1	0	16	4	6	1	10	3	5	47	64	52
Ferruginous Hawk	SS	SC	SGCN	RC, RS	PR 36	R2SS	N,16,18	B	0	0	2	0	0	0	0	0	0	2	0	0	5	2	4
Golden Eagle			SGCN	RC			16	B	1	2	0	0	1	0	2	0	0	5	0	0	21	17	11

Common Name[1]	Special Management Designation[2]							status[3]	Total #individuals observed per habitat[4], 2005												Total #individuals observed per year (in all habitats surveyed[5])		
	BLM	CO	CDOW	PIF	CO-PIF	USFS	USFWS		AS	AT	GR	HR	MC	MS	PJ	PP	SA	SE	SF	WE	2003	2004	2005
American Kestrel								B	3	0	2	2	1	3	1	4	7	10	0	2	45	47	35
Peregrine Falcon		SC	SGCN		PR 62 & 87	R2SS	N,16,18	B	0	1	0	0	0	0	0	0	0	0	0	1	0	3	2
Prairie Falcon			SGCN	RC	PR 36		N,16,18	B	0	1	0	0	0	1	0	0	0	1	0	0	7	5	3
Black Rail							N	B	0	0	0	0	0	0	0	0	0	0	0	2	4	7	2
Virginia Rail								B	0	0	0	0	0	0	0	0	0	0	0	14	5	9	14
Sora								B	0	0	0	1	0	1	0	0	0	0	0	22	10	3	24
unknown rail									0	0	0	0	0	0	0	0	0	0	0	0	8	4	0
American Coot								B	3	0	0	1	0	0	0	0	29	0	0	88	82	45	121
Sandhill Crane			SGCN					B	0	0	0	0	0	0	0	0	0	0	0	0	49	5	0
Killdeer								B	1	0	43	0	0	0	1	0	34	21	0	28	161	133	128
Mountain Plover			SGCN				N,16,18	B	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0
Black-necked Stilt								B	0	0	0	0	0	0	0	0	0	0	0	6	1	0	6
American Avocet								B	0	0	0	0	0	0	0	0	0	0	0	10	36	14	10
Solitary Sandpiper							N,16,18	TM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
Willet					PR 62			B	0	0	0	0	0	0	0	0	0	0	0	2	1	2	2
Spotted Sandpiper								B	1	1	1	33	0	2	0	1	2	0	3	4	125	109	48
Upland Sandpiper			SGCN		PR 36		N	B	0	0	3	0	0	0	0	0	3	0	0	0	5	2	6
Long-billed Curlew	SS	SC	SGCN		PR 36	R2SS	N,18	B	0	0	8	0	0	0	0	0	0	1	0	0	6	4	9
Wilson's Snipe								B	1	0	0	21	2	1	0	0	8	0	2	13	45	35	48
Wilson's Phalarope			SGCN				N,16	B	0	0	0	0	0	0	0	0	0	0	0	15	39	29	15
Franklin's Gull								B	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
Ring-billed Gull								B	0	0	0	0	0	0	0	0	0	0	0	5	0	13	5
California Gull							N	VB	0	0	0	0	0	0	0	0	0	0	0	2	4	2	2
Forster's Tern			SGCN					B	0	0	0	0	0	0	0	0	0	0	0	4	0	23	4
Rock Pigeon								B	0	0	0	0	0	0	0	0	0	20	0	0	47	17	20
Band-tailed Pigeon			SGCN	CC	PR 62 &87			B	0	0	0	0	0	3	0	2	0	0	0	0	8	11	5
Eurasian Collared-Dove								B	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Mourning Dove								B	1	0	237	3	21	41	180	59	153	224	0	64	767	1075	983
Black-billed Cuckoo								VB	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

Common Name[1]	Special Management Designation[2]							status[3]	Total #individuals observed per habitat[4], 2005												Total #individuals observed per year (in all habitats surveyed[5])		
	BLM	CO	CDOW	PIF	CO-PIF	USFS	USFWS		AS	AT	GR	HR	MC	MS	PJ	PP	SA	SE	SF	WE	2003	2004	2005
Yellow-billed Cuckoo			SGCN				N,16	B	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Great Horned Owl								B	1	0	0	0	0	2	0	0	0	0	0	0	3	5	3
Northern Pygmy-Owl								B	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Burrowing Owl		T	SGCN	RC, RS	PR 36 & 87	R2SS**	N,16,18	B	0	0	5	0	0	0	0	0	1	1	0	1	11	5	8
Boreal Owl								B	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Common Nighthawk				RC			N,16	B	0	0	12	4	0	3	6	23	8	0	0	2	31	70	58
Common Poorwill					PR 87			B	0	0	0	0	0	0	0	0	0	0	0	0	1	4	0
Black Swift			SGCN					B	0	0	0	0	0	0	0	0	0	0	0	0	12	2	0
Chimney Swift								B	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0
White-throated Swift			SGCN	CC, RS	PR 87			B	0	0	0	0	25	4	19	1	28	1	0	0	26	129	78
Black-chinned Hummingbird			SGCN		PR 87			B	0	0	0	0	0	5	8	0	0	6	0	1	16	42	20
Calliope Hummingbird								TM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Broad-tailed Hummingbird			SGCN	RS	PR 62			B	40	46	0	118	70	130	47	83	29	3	40	2	230	502	608
Rufous Hummingbird			SGCN				N	TM	0	14	0	0	0	0	0	0	0	0	4	0	0	7	18
Belted Kingfisher								B	0	0	0	1	0	1	0	0	1	0	0	1	23	26	4
Lewis's Woodpecker			SGCN	CC, RC, CS, RS	PR 36, 62, & 87	R2SS	N,16,18	B	1	0	0	0	0	0	0	0	0	0	0	0	6	3	1
Red-headed Woodpecker				CC, RC			N	B	0	0	0	0	0	0	0	0	3	0	0	0	9	3	3
Red-bellied Woodpecker								B	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0
Williamson's Sapsucker			SGCN	CS, RS	PR 62		N,16	B	5	0	0	2	48	0	0	28	0	0	20	0	19	151	103
Red-naped Sapsucker			SGCN		PR 62		N	B	68	1	0	56	24	16	0	7	0	0	1	1	58	209	174
Ladder-backed Woodpecker								B	0	0	1	0	0	0	0	0	0	0	0	0	2	0	1

Common Name[1]	Special Management Designation[2]							status[3]	Total #individuals observed per habitat[4], 2005												Total #individuals observed per year (in all habitats surveyed[5])		
	BLM	CO	CDOW	PIF	CO-PIF	USFS	USFWS		AS	AT	GR	HR	MC	MS	PJ	PP	SA	SE	SF	WE	2003	2004	2005
Downy Woodpecker								B	6	0	0	0	5	3	0	2	0	0	0	0	17	53	16
Hairy Woodpecker								B	28	0	0	8	31	16	6	22	0	0	30	0	40	311	141
American Three-toed Woodpecker			SGCN			R2SS		B	1	1	0	0	1	0	0	9	0	0	19	0	3	60	31
unknown woodpecker									0	0	0	0	0	0	0	0	0	0	0	0	13	6	0
Northern Flicker								B	61	3	1	44	44	76	13	77	6	11	31	3	121	314	370
Olive-sided Flycatcher			SGCN	CC	PR 62	R2SS	N	B	6	3	0	9	7	6	2	13	0	0	4	0	16	77	50
Western Wood-Pewee								B	93	0	0	31	45	54	11	176	6	3	14	4	172	539	437
Willow Flycatcher			SGCN	CC, RC				B	1	0	0	17	0	0	0	0	0	0	0	0	12	8	18
Least Flycatcher								VB	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Hammond's Flycatcher					PR 62			B	9	1	0	6	23	1	0	12	0	0	13	0	93	88	65
Gray Flycatcher			SGCN		PR 87			B	0	0	0	0	0	11	162	1	2	4	0	0	84	198	180
Dusky Flycatcher			SGCN					B	50	29	0	47	22	203	18	99	15	0	6	0	268	553	489
Cordilleran Flycatcher			SGCN	RS	PR 62			B	5	0	0	17	27	6	1	4	0	0	17	0	45	161	77
Black Phoebe								B	0	0	0	0	0	0	0	0	0	0	0	0	3	7	0
Eastern Phoebe								B	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Say's Phoebe				RS				B	0	0	9	0	0	1	0	0	0	4	0	0	30	64	14
Ash-throated Flycatcher								B	0	0	1	0	0	8	115	3	1	20	0	0	77	115	148
Great-crested Flycatcher								B	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0
Cassin's Kingbird					PR 87			B	0	0	2	0	0	0	1	0	0	6	0	0	16	2	9
Western Kingbird					PR 87			B	0	0	74	0	0	5	1	0	33	78	0	16	235	152	207
Eastern Kingbird								B	0	0	7	0	0	0	0	0	4	1	0	13	101	82	25
Scissor-tailed Flycatcher								B	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Loggerhead Shrike			SGCN	RC	PR 87	R2SS	N	B	0	0	8	0	0	0	0	0	6	7	0	0	25	20	21

Common Name[1]	Special Management Designation[2]							status[3]	Total #individuals observed per habitat[4], 2005												Total #individuals observed per year (in all habitats surveyed[5])		
	BLM	CO	CDOW	PIF	CO-PIF	USFS	USFWS		AS	AT	GR	HR	MC	MS	PJ	PP	SA	SE	SF	WE	2003	2004	2005
White-eyed Vireo							N,18	VB	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Gray Vireo			SGCN	CC, RC, RS	PR 87		N,16	B	0	0	0	0	0	0	10	0	0	0	0	0	15	41	10
Plumbeous Vireo				RS				B	0	0	0	0	10	30	69	85	1	0	0	0	58	216	195
Warbling Vireo				RS				B	485	0	0	108	228	322	6	165	12	0	31	1	764	1066	1358
Red-eyed Vireo								B	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1
Gray Jay								B	6	1	0	3	0	0	0	0	0	0	38	0	11	156	48
Steller's Jay								B	30	0	0	15	96	21	4	121	0	0	30	0	74	267	317
Blue Jay								B	0	0	0	0	1	0	0	0	2	1	0	1	49	31	5
Western Scrub-Jay								B	0	0	0	0	0	15	44	2	1	2	0	0	53	45	64
Pinyon Jay			SGCN	CC, RC, CS, RS	PR 87		16	B	0	0	0	0	2	0	102	1	7	30	0	0	91	208	142
Clark's Nutcracker				CS, RS				B	5	21	0	5	77	5	19	15	2	0	29	0	249	206	178
Black-billed Magpie				RS				B	0	0	1	4	4	72	29	4	41	28	0	2	183	222	185
American Crow								B	2	2	1	4	3	17	18	10	5	0	2	2	73	104	66
Chihuahuan Raven				RS				B	0	0	12	0	0	0	0	0	0	7	0	0	7	11	19
Common Raven								B	12	18	0	10	21	21	87	49	33	60	14	2	175	412	327
Horned Lark					PR 87			B	0	249	1443	0	0	0	0	0	239	435	0	4	1561	1745	2370
Purple Martin			SGCN		PR 62	R2SS		B	6	0	0	6	0	4	0	4	0	0	0	0	15	23	20
Tree Swallow								B	21	0	0	44	0	25	2	1	4	0	0	12	89	142	109
Violet-green Swallow				RS	PR 62			B	138	7	0	92	84	183	86	127	10	49	7	11	265	603	794
Northern Rough-winged Swallow								B	0	0	2	0	2	7	2	0	0	12	0	3	92	99	28
Bank Swallow								B	0	0	0	0	0	0	0	0	0	2	0	14	124	170	16
Cliff Swallow								B	0	0	9	22	2	4	31	0	19	168	0	54	368	602	309
Barn Swallow								B	1	0	11	0	0	6	3	1	6	27	0	15	88	62	70
unknown swallow									0	0	0	0	0	0	0	0	0	0	0	0	19	0	0
Black-capped Chickadee								B	3	0	0	4	4	29	11	4	0	0	1	0	84	113	56

Common Name[1]	Special Management Designation[2]							status[3]	Total #individuals observed per habitat[4], 2005												Total #individuals observed per year (in all habitats surveyed[5])		
	BLM	CO	CDOW	PIF	CO-PIF	USFS	USFWS		AS	AT	GR	HR	MC	MS	PJ	PP	SA	SE	SF	WE	2003	2004	2005
Mountain Chickadee								B	109	6	0	49	219	30	39	148	2	0	207	1	172	848	810
Juniper Titmouse			SGCN	RC, RS	PR 87		N,16,18	B	0	0	0	0	0	0	33	0	0	0	0	0	34	52	33
Bushtit								B	8	0	0	0	0	1	37	0	0	1	0	0	43	105	47
Red-breasted Nuthatch								B	32	0	0	3	87	4	11	26	0	0	28	0	57	386	191
White-breasted Nuthatch								B	10	0	0	0	16	9	10	90	0	0	3	0	30	185	138
Pygmy Nuthatch			SGCN	RC		R2SS		B	1	0	0	0	1	1	0	80	0	0	4	0	0	281	87
Brown Creeper						R2SS		B	6	0	0	0	11	2	0	6	0	0	19	0	18	120	44
Rock Wren				RS				B	0	4	7	0	1	2	34	5	20	41	1	0	123	159	115
Canyon Wren				RC				B	0	0	0	0	0	4	6	0	0	0	0	0	9	12	10
Bewick's Wren								B	0	0	0	0	0	7	140	0	7	4	0	0	126	197	158
House Wren								B	180	1	1	24	86	144	4	109	5	2	6	3	509	716	565
Marsh Wren								B	0	0	0	0	0	0	0	0	0	0	0	38	122	38	38
American Dipper			SGCN		PR 62			B	0	0	0	2	0	1	0	0	0	0	0	0	8	8	3
Golden-crowned Kinglet								B	1	0	0	3	3	0	0	0	0	0	48	0	11	60	55
Ruby-crowned Kinglet								B	148	21	0	134	172	19	7	60	2	0	364	1	293	975	928
Blue-gray Gnatcatcher								B	0	0	0	0	2	53	118	11	10	7	0	0	80	270	201
Eastern Bluebird								B	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0
Western Bluebird				RS	PR 87			B	0	0	0	0	2	9	0	87	0	0	0	0	9	101	98
Mountain Bluebird				RC, CS, RS				B	30	20	0	5	12	33	148	74	25	13	21	0	192	398	381
Townsend's Solitaire								B	15	12	0	1	50	9	3	68	0	0	9	0	40	181	167
Veery			SGCN					B	0	0	0	3	0	0	0	0	0	0	0	0	1	5	3
Swainson's Thrush								B	2	0	0	16	0	6	0	0	0	0	0	0	33	185	24
Hermit Thrush								B	148	17	0	38	145	45	23	121	0	0	336	0	228	881	873
American Robin								B	248	137	1	248	192	248	47	178	45	5	186	13	693	1571	1548
Gray Catbird								B	0	0	0	0	1	10	0	0	0	0	0	0	18	31	11
Northern Mockingbird								B	0	0	36	0	0	0	0	0	5	100	0	0	135	70	141
Sage Thrasher								B	0	0	0	0	0	0	0	0	269	44	0	2	180	241	315

Common Name[1]	Special Management Designation[2]							status[3]	Total #individuals observed per habitat[4], 2005												Total #individuals observed per year (in all habitats surveyed[5])		
	BLM	CO	CDOW	PIF	CO-PIF	USFS	USFWS		AS	AT	GR	HR	MC	MS	PJ	PP	SA	SE	SF	WE	2003	2004	2005
Brown Thrasher								B	0	0	0	0	0	0	0	0	2	0	0	2	20	15	4
Curve-billed Thrasher			SGCN					B	0	0	1	0	0	0	0	0	0	3	0	0	0	1	4
European Starling								B	0	0	134	0	0	2	0	1	14	15	0	5	176	183	171
American Pipit					PR 62			B	0	490	1	0	0	0	0	0	0	0	9	0	515	632	500
Cedar Waxwing								B	0	0	0	0	1	5	0	0	7	0	0	1	16	19	14
Orange-crowned Warbler								B	30	3	0	8	35	121	17	23	0	0	1	0	156	261	238
Virginia's Warbler				CC, RC, RS	PR 62 &87		16	B	4	0	0	0	22	166	45	78	1	0	0	0	159	344	316
Yellow Warbler				RC				B	5	0	2	51	8	117	1	0	5	3	0	26	238	293	218
Yellow-rumped Warbler								B	252	15	0	101	231	25	2	127	0	0	279	1	365	979	1033
Black-throated Gray Warbler			SGCN	RC	PR 87		16	B	0	0	0	0	0	5	212	1	0	0	0	0	79	220	218
Grace's Warbler				CC, RC	PR 62 & 87		N,16	B	0	0	0	0	0	2	0	62	0	0	0	0	1	22	64
American Redstart								B	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
Ovenbird								B	0	0	0	0	2	0	0	0	0	0	0	0	0	4	2
MacGillivray's Warbler					PR 62			B	26	1	0	48	26	70	5	11	2	0	3	0	88	200	192
Common Yellowthroat								B	0	0	0	0	0	1	0	0	6	1	0	98	182	152	106
Wilson's Warbler					PR 62			B	8	24	0	141	0	3	0	0	0	0	12	0	185	238	188
Yellow-breasted Chat								B	0	0	0	0	0	6	0	0	0	3	0	1	54	55	10
Western Tanager								B	75	0	0	31	240	54	22	189	0	0	37	0	226	592	648
Green-tailed Towhee				CS, RS	PR 62			B	53	0	1	22	74	481	73	121	207	8	10	0	471	1008	1050
Spotted Towhee								B	0	0	0	0	13	216	160	58	13	5	3	0	318	605	468
Canyon Towhee								B	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
Cassin's Sparrow			SGCN	RC, RS	PR 36	R2SS	N,18	B	0	0	189	0	0	0	0	0	136	11	0	0	491	296	336
Rufous-crowned Sparrow								B	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
Chipping								B	28	14	1	15	104	96	203	137	5	7	54	0	209	712	664

Common Name[1]	Special Management Designation[2]							status[3]	Total #individuals observed per habitat[4], 2005												Total #individuals observed per year (in all habitats surveyed[5])		
	BLM	CO	CDOW	PIF	CO-PIF	USFS	USFWS		AS	AT	GR	HR	MC	MS	PJ	PP	SA	SE	SF	WE	2003	2004	2005
Sparrow																							
Clay-colored Sparrow								TM	0	0	2	0	0	0	0	0	0	0	0	0	1	0	2
Brewer's Sparrow			SGCN	CC, RC	PR 62 & 87	R2SS	N	B	2	6	54	6	3	17	27	0	573	180	3	5	744	739	876
Field Sparrow								B	0	0	0	0	0	0	0	0	5	0	0	0	0	4	5
Black-chinned Sparrow				CC				VB	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Vesper Sparrow			SGCN					B	9	1	10	10	5	32	30	26	261	110	3	0	260	401	497
Lark Sparrow				RC				B	0	0	65	0	0	7	23	0	97	207	0	2	255	293	401
Black-throated Sparrow				RC				B	0	0	0	0	0	0	2	0	0	1	0	0	0	2	3
Sage Sparrow			SGCN	RC	PR 62 & 87	R2SS	16	B	0	0	0	0	0	0	0	0	43	20	0	0	42	83	63
Lark Bunting			SGCN	RC, CS, RS	PR 36	R2SS	18	B	0	0	840	0	0	0	0	0	97	56	0	0	1358	887	993
Savannah Sparrow								B	0	4	0	44	0	0	0	1	2	0	1	7	62	83	59
Grasshopper Sparrow				RC, CS, RS	PR 36	R2SS	N	B	0	0	196	0	0	0	0	0	80	2	0	1	215	146	279
Fox Sparrow								B	3	21	0	55	0	8	0	0	0	0	0	0	283	66	87
Song Sparrow								B	3	0	0	39	3	24	0	1	2	1	0	22	137	172	95
Lincoln's Sparrow								B	83	94	0	568	10	12	0	2	0	1	78	0	545	925	848
White-crowned Sparrow								B	46	749	0	384	1	11	0	0	0	1	59	0	702	1244	1251
unknown sparrow									0	0	0	0	0	0	0	0	0	0	0	0	3	2	0
Dark-eyed Junco								B	254	38	0	90	235	18	3	197	2	0	340	0	315	1372	1177
McCown's Longspur			SGCN	CC, CS, RS	PR 36	R2SS	N, 18	B	0	0	129	0	0	0	0	0	0	0	0	0	107	179	129
Chestnut-collared Longspur			SGCN	RC			N, 16, 18	B	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Northern Cardinal								B	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1

Common Name[1]	Special Management Designation[2]							status[3]	Total #individuals observed per habitat[4], 2005												Total #individuals observed per year (in all habitats surveyed[5])		
	BLM	CO	CDOW	PIF	CO-PIF	USFS	USFWS		AS	AT	GR	HR	MC	MS	PJ	PP	SA	SE	SF	WE	2003	2004	2005
Rose-breasted Grosbeak								VB	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Black-headed Grosbeak								B	10	0	0	10	30	161	37	30	3	0	0	0	227	335	281
Blue Grosbeak								B	0	0	3	0	0	1	3	0	6	21	0	1	59	45	35
Lazuli Bunting			SGCN		PR 62			B	10	1	1	29	1	30	11	0	0	7	1	0	45	78	91
Indigo Bunting								B	0	0	0	0	0	0	0	0	0	0	0	0	1	5	0
Dickcissel				CC			N	B	0	0	7	0	0	0	0	0	3	0	0	1	1	5	11
Bobolink			SGCN					B	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Red-winged Blackbird								B	0	0	24	27	0	1	2	6	17	40	0	580	912	646	697
Western Meadowlark				RS				B	0	0	1048	1	1	22	56	11	595	473	2	36	1797	1432	2245
Yellow-headed Blackbird								B	0	0	0	0	0	0	0	0	1	1	0	185	283	110	187
Brewer's Blackbird								B	1	0	34	7	0	14	18	6	81	21	0	21	134	153	203
Common Grackle								B	0	0	10	0	0	0	0	0	18	12	0	13	150	134	53
Great-tailed Grackle								B	0	0	0	0	0	0	0	0	0	0	0	21	14	1	21
Brown-headed Cowbird								B	7	0	25	20	11	92	53	36	63	27	1	38	402	543	373
Orchard Oriole								B	0	0	0	0	0	0	0	0	3	0	0	12	55	47	15
Bullock's Oriole								B	0	0	9	1	0	4	0	0	7	46	0	7	148	75	74
Baltimore Oriole								B	0	0	0	0	0	0	0	0	0	0	0	2	8	1	2
Brown-capped Rosy-Finch			SGCN	CC, CS, RS	PR 62			B	0	33	0	0	0	0	0	0	0	0	0	0	31	80	33
Pine Grosbeak								B	3	6	0	10	0	0	0	0	0	0	26	0	14	94	45
Cassin's Finch			SGCN	RC				B	7	15	0	2	10	1	10	38	7	0	10	0	22	94	100
House Finch								B	0	0	1	0	0	2	67	0	3	14	0	2	47	127	89
Red Crossbill			SGCN					B	13	2	0	30	71	6	0	44	0	0	51	0	22	799	217
White-winged Crossbill								VB	0	0	0	0	0	0	0	0	0	0	1	0	0	11	1
Pine Siskin				RC, RS				B	141	57	0	197	215	129	59	191	7	5	234	3	142	1493	1238
Lesser Goldfinch								B	0	0	0	0	7	3	3	0	0	3	0	0	11	58	16
American Goldfinch								B	0	0	0	0	4	5	0	0	4	2	0	3	61	88	18

Common Name[1]	Special Management Designation[2]							status[3]	Total #individuals observed per habitat[4], 2005												Total #individuals observed per year (in all habitats surveyed[5])		
	BLM	CO	CDOW	PIF	CO-PIF	USFS	USFWS		AS	AT	GR	HR	MC	MS	PJ	PP	SA	SE	SF	WE	2003	2004	2005
Evening Grosbeak			SGCN					B	0	1	0	4	15	0	0	0	0	0	4	0	20	11	24
House Sparrow								B	0	0	1	0	0	0	0	0	2	1	0	1	9	14	5

[1]Common names are from the A.O.U. Check-list of North American Birds, Seventh Edition (2003)

[2]Special management designations: BLM=Bureau of Land Management, SS=Bureau of Land Management Sensitive Species; CO=Colorado Threatened or Endangered Species List, T=Threatened Species, SC=State Candidate; CDOW= Colorado's Comprehensive Wildlife Conservation Strategy, SGCN=Species of Greatest Conservation Need; PIF=Partners In Flight Species Assessment Database 2005, BCR 16 & 18 Species of Concern, CC=Conservation Concern, CS=Continental Stewardship, RC=Regional Concern, RS=Regional Stewardship; CO-PIF=Colorado Partners In Flight, PR 36=Physiographic Region 36, PR 62=Physiographic Region 62, PR 87=Physiographic Region 87; USFS=United States Forest Service, R2SS=USFS Region 2 Sensitive Species, **=western Colorado population; USFWS=United State Fish and Wildlife Service, N=Birds of Conservation Concern Nationally, 16=Bird of Conservation Concern for BCR 16, 18=Bird of Conservation Concern for BCR 18

[3]Residency status: B=(probably) breeds; VB=vagrant, possibly breeding, TM=transient migrant

[4]Habitats: AS=aspen; AT=alpine tundra; GR=grassland; HR=high-elevation riparian; MC=mixed conifer; MS=montane shrubland; PJ=pinyon-juniper; PP=ponderosa pine; SA=sage shrubland; SE=semidesert shrubland; SF=spruce-fir; WE=wetland

[5]The number and types of habitats surveyed each year may vary as well as the number of transects surveyed per habitat