Monitoring the Birds of the National Park Service, Northern Colorado Plateau Network (NCPN): Year 2

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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, Rocky Mountains, and Intermountain West.*

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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 the 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 partner, the National Park Service (NPS), implemented Year 1 of *Monitoring Birds of the National Park Service, Northern Colorado Plateau Network* (NCPN), 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 the NCPN. In the short term, this program provides information needed to effectively manage and conserve bird populations in the NCPN, by evaluating the spatial distribution, abundance, and important habitat associations for individual species. This cooperative project supports the NCPN's efforts to develop long-term natural resource monitoring plans for its park units. It also contributes to RMBO's Habitat-based Regional Monitoring Program, which currently includes 11 states in the Rocky Mountains and Great Plains regions.

The intent of the NCPN monitoring program was to establish 45 point-count transects (15 transects each in low-elevation riparian, pinyon-juniper, and sage shrubland habitats) within 11 different parks and to conduct those transects two times every year. In 2005, the 45 point-count transects were established and conducted (twice) for the first time (a total of 1333 point counts). In 2006, we were able to again conduct all of the transects twice for a total of 1336 point counts.

In 2006, we detected a total of 11,227 individual birds of 128 species on point-count transects. We detected 4,160 individual birds of 96 species in Low-elevation Riparian habitat, 3,124 individual birds of 81 species in Pinyon-Juniper habitat, and 3,943 individual birds of 103 species in sage shrubland habitat. The Distance analyses yielded robust results (CV of ≤ 50% in at least one habitat) for 40 bird species that should be effectively monitored under the current program in at least one of the three habitats surveyed.

ACKNOWLEDGEMENTS

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We sincerely thank Steve Garman, of the National Park Service, for the large part that he played in the development of the project, his continued involvement in the project, and for his logistical assistance before, during, and after the field season. This project, as any of our projects, would not have been possible without our dedicated crew of field biologists: Jason Beason, Sonia Daw, Coen Dexter, Michelle Giroir, and Matt Gracey, who spent many weeks in the field, many times under difficult conditions, conducting surveys and collecting data. We thank Chandman Sambuu for his efforts to integrate the data and improve the data quality and management; his efforts were essential to the successful completion of this report. We thank Jennifer Blakesley for providing her expertise in statistical analysis to this project. Finally we thank Chris White of the Rocky Mountain Bird Observatory for his careful review of this report.

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INTRODUCTION

Program History

In 1995 the Rocky Mountain Bird Observatory (RMBO), in conjunction with the Colorado Division of Wildlife (CDOW), the United States Forest Service (USFS), the Bureau of Land Management (BLM) and the National Park Service (NPS), began efforts to create and conduct a Colorado-wide program to monitor breeding-bird populations, entitled *Monitoring Colorado's Birds* (MCB). Since then, 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 its partner, the Black Hills National Forest (BHNF), RMBO implemented a habitat-based bird monitoring program in the Black Hills of South Dakota (Panjabi et al. 2001). In 2002, RMBO initiated a similar program in Wyoming entitled *Monitoring Wyoming's Birds* (MWB). 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 the forest. And, in 2005 RMBO began work with the National Park Service to monitor birds in 11 National Parks in three states (CO, WY, UT) in the Northern Colorado Plateau Inventory and Monitoring Network (NCPN).

We plan to 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 hope to 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

Birds can be excellent indicators of biological integrity and ecosystem health (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). 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.

Bird communities reflect an integration of a broad array of ecosystem conditions, including productivity, 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 other taxonomic groups for monitoring their populations. 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, 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. 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).

Effective conservation depends on adequate monitoring information. To date, resource managers have relied on data derived from the Breeding Bird Surveys (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 (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 (Robbins et al. 1986, Bohning-Gaese et al. 1993, Sauer et al. 1994, James et al. 1996, Thomas 1996). For these reasons, BBS data are generally insufficient to guide local or regional management decisions.

Given the 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 and the causes of declines 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 accessible, so that managers can make informed decisions to effectively conserve birds and their habitats.

Monitoring Objectives

RMBO's Habitat-based Regional Monitoring Program is 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 "early-warning" monitoring framework, the monitoring goals and progress. In the future, with the initial trend information, we hope to 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 birds, 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;
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

In April 2005, the National Park Service selected three habitats (low-elevation riparian, pinyon-juniper, and sage shrubland) in which to place 45 point-count transects. These habitats were selected by a panel of National Park Service resource managers on the basis of distinct avifaunal communities, as well as management questions associated with each on the NCPN. In 2005, RMBO staff established the 45 transects.

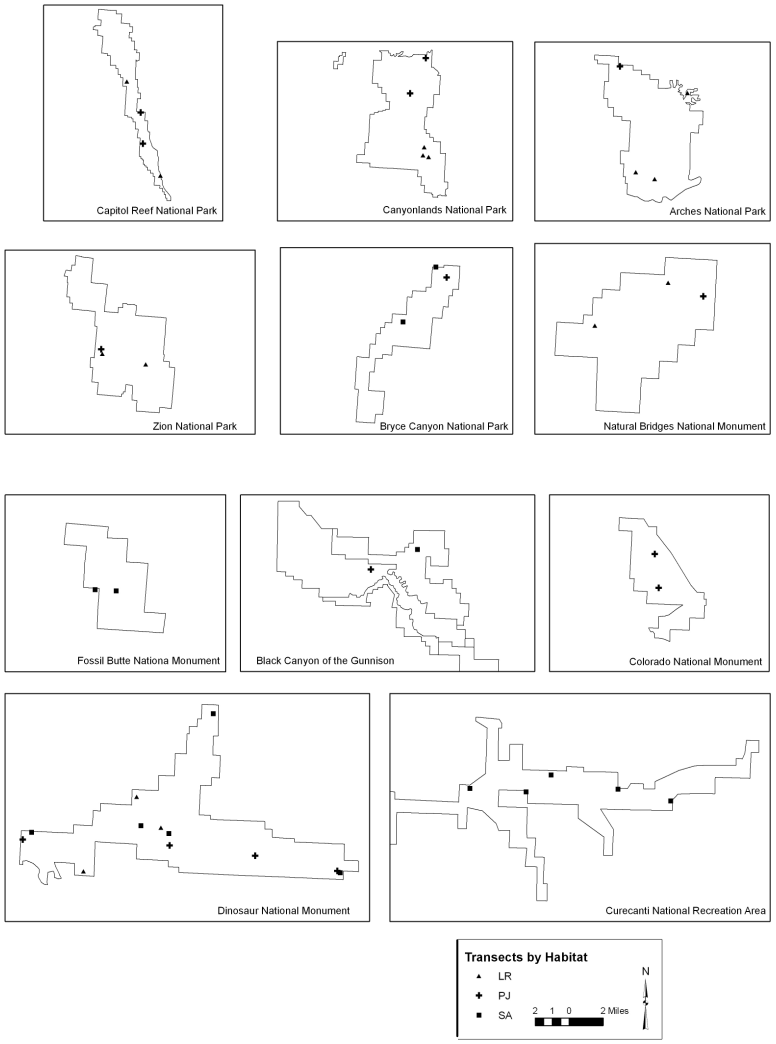

Figure 1. NCPN point-count transect locations within each park.

Low-elevation Riparian

This habitat is comprised mostly of Scattered stands of Fremont cottonwood (*Populus fremontii*) and boxelder (*Acre negundo*) along perennial streams, sometimes within deeply-cut canyons. Tamarisk (*Tamarix sp*), also called saltcedar, is an exotic species that has invaded much of the low-elevation riparian habitat of the western United States. While the NPS is working to eradicate tamarisk in many of its park units, it is still fairly common in this habitat type.

Pinyon-Juniper

Pinyon-juniper typically lies just above semidesert shrubland. It covers most of the ridges and mesas in the NCPN and is the most extensive habitat there. Pinyon-juniper varies in composition with various ratios of its two main components – pinyon pine (*Pinus edulis*) and juniper (*Juniperus* sp.).

Sage Shrubland

The sagebrush shrubland community occurs extensively on the Colorado Plateau. The stands of sage that we survey in the NCPN are generally narrow "fingers" of pure sage and our point-count stations are often near forests. The most common species of sagebrush in the NCPN are big sagebrush (*Artemisia tridentata*) and mountain sagebrush (*Artemisia frigida*).

Field Personnel

Six experienced biological technicians with excellent aural and visual bird-identification skills comprised the RMBO staff who executed the field component of NCPN in 2006. All technicians had at least two years of experience conducting bird monitoring, bringing with them considerable experience with point-count protocol and knowledge of the local birds. 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

Transect sites were selected during the winter of 2005, and ground-proofed that spring. The sites were randomly selected from a pool of randomly selected starting points that were accessible (not on plateaus with vertical cliffs) and large enough to accommodate transects of 15 point counts. All transects were established during the 2005 field season, and no changes were made to them in 2006

Point Transect Protocol

RMBO staff conducted point transects (Buckland et al. 1993) in order to sample bird populations in each habitat selected for monitoring. Each transect was surveyed by one observer following protocol established by Leukering (2000). 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. On the morning of the survey, the observer began the point transect at the first count station and then continued along the pre-selected bearings (established in 2005) for all remaining points.

Observers conducted 15 five-minute point counts at stations located at 250-m intervals along each point transect. In order to increase our sample size, we conducted each of the 45 transects two times (each visit was on a separate day). Observers recorded all bird detections 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 closer object.

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™ Global Positioning System units. All GPS data were logged in Universal Transverse Mercator (UTM) North American Datum 1983. 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 *MBCNF*: 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.

As a general rule, 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., grouse, swifts, swallows, finches, etc.) Both numbers may be useful, especially for low-density species, and thus both are reported in the "Species Accounts" section. 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. Also, since we conducted each transect two times, the number of individuals observed (N) may not be the number of "individual birds" in the area; some of the same individuals were likely counted on each of the visits.

RESULTS

In 2006, our second year of bird monitoring in the NCPN, we conducted a total of 1336 point counts along 45 point-count transects (all transects were conducted twice) in three habitats between 16 May and 20 June, 2006 (Table 1).

Table 1. Bird sampling periods and effort in each habitat in the Northern Colorado Plateau Network (NCPN), summer 2006.

Habitat	Dates Sampled	# point transects	# point counts
Low-Elevation Riparian	16 May – 20 June	15*	443
Pinyon-Juniper	16 May – 18 June	15*	443
Sage Shrubland	16 May – 15 June	15*	450
All habitats	**16 May – 20 June**	**45***	**1336**

*All transects were conducted twice.

We detected a total of 11,227 individual birds of 128 species on point-count transects. We detected 52 species in sufficient numbers (n > 29) to estimate density in at least one habitat, and we were able to estimate density in multiple habitats for many of those.

We detected 4,160 individual birds of 96 species in Low-elevation Riparian, 3,124 individual birds of 81 species in Pinyon-Juniper, and 3,943 individual birds of 103 species in sage shrubland (Table 2). Of the three habitats surveyed, the species richness (average number of species detected per transect and point count) was greatest in Low-elevation Riparian and least in Pinyon-Juniper (Table 2). While these numbers represent the richness of species and individuals that may be found in each habitat, we would like to note that some species were largely peripheral to the habitat from which they were detected. Thus, species richness as we present it in this report does not necessarily indicate that all of the species or individuals were actually using the habitat from which they were detected.

Table 2. Bird totals and species richness in habitats surveyed in the Northern Colorado Plateau Network (NCPN), summer 2006.

Habitat	# birds detected	Avg. # birds/point	# species detected	Avg. species per point	Avg. species per transect
Low-Elevation Riparian	4,160	9.4	96	6.3	26
Pinyon-Juniper	3,124	7.1	81	5.0	21
Sage Shrubland	3,943	8.8	103	5.4	23
All habitats	**11,227**	**8.4**	**128**	**5.6**	**23**

Low-Elevation Riparian (LR)

We conducted 443 point counts along 15 transects (conducted twice) in low-elevation riparian between 16 May and 20 June 2006 (Table 1). We detected a total of 4,160

individual birds in this habitat, with an average of 9.1 birds per point count (Table 2). We detected 96 species in this habitat with an average of 6.3 species per point count and 26 species per transect (Table 2).

The point transect data from low-elevation riparian yielded robust density estimates (CV<50%) for 25 species and moderately robust estimates (CV=50-75%) for eight additional species (Table 3). We should be able to effectively monitor these 33 species, which represent 34% of all species detected in low-elevation riparian.

Black-chinned Hummingbird, Violet-green Swallow, Spotted Towhee, Yellow Warbler, and Blue-gray Gnatcatcher had the highest estimated densities of all species detected in low-elevation riparian (listed in order of highest to lowest density). Twenty-three species – Black-chinned Hummingbird, Western Wood-Pewee, Say's Phoebe, Ash-throated Flycatcher, Plumbeous Vireo, Warbling Vireo, Common Raven, Violet-green Swallow, Rock Wren, Canyon Wren, House Wren, Virginia's Warbler, Yellow Warbler, Common Yellowthroat, Yellow-breasted Chat, Spotted Towhee, Song Sparrow, Black-headed Grosbeak, Blue Grosbeak, Lazuli Bunting, Brown-headed Cowbird, House Finch, and Lesser Goldfinch – had higher estimated densities in low-elevation riparian relative to the other two habitats surveyed. If density is assumed to be positively correlated with habitat quality, then low-elevation riparian provides optimal habitat for these species.

Table 3. Estimated densities of breeding birds in Low-elevation Riparian habitat in the Northern Colorado Plateau Network (NCPN), summer 2006[1].

Species	D	LCL	UCL	CV	n
Mourning Dove	10	7.0	15	23	121
White-throated Swift	9.3	4.5	19	44	41
Black-chinned Hummingbird	288	142	582	43	20
Western Wood-Pewee	3.8	1.7	8.3	48	32
Say's Phoebe	5.8	3.4	9.8	31	62
Ash-throated Flycatcher	17	13	24	17	241
Gray Vireo	3.0	1.3	6.6	48	34
Plumbeous Vireo	36	15	45	33	84
Warbling Vireo	9.3	4.5	19	44	41
Western Scrub-Jay	5.5	2.2	13	57	28
Common Raven	0.5	0.3	1.1	39	24
Violet-green Swallow	180	117	277	25	198
Juniper Titmouse	12	7.0	23	36	23
Bushtit	48	7.7	298	125	4
Rock Wren	11	7.2	17	26	104
Canyon Wren	3.0	1.8	5.1	30	67
Bewick's Wren	19	10	35	34	106
House Wren	7.0	2.3	20	68	43
Blue-gray Gnatcatcher	70	47	105	23	162
American Robin	2.3	1.0	4.9	46	25
Virginia's Warbler	41	16	105	60	39
Yellow Warbler	84	38	183	47	143

Table 3 cont. Estimated densities of breeding birds in Low-elevation Riparian habitat in the Northern Colorado Plateau Network (NCPN), summer 2006[1]

Species	D	LCL	UCL	CV	n
Black-throated Gray Warbler	18	11	30	29	91
Common Yellowthroat	35	12	103	69	26
Yellow-breasted Chat	7.5	2.5	22	69	48
Spotted Towhee	93	69	126	17	396
Black-throated Sparrow	6.0	2.9	12	43	54
Song Sparrow	19	8.0	45	52	58
Black-headed Grosbeak	5.6	2.4	13	53	27
Blue Grosbeak	7.7	3.4	17	49	26
Lazuli Bunting	58	27	78	46	132
Brown-headed Cowbird	12	5.1	29	55	26
Lesser Goldfinch	31	18	52	31	53

[1] *D* = estimated density (birds/km^2); *LCL* and *UCL* = lower and upper 90% confidence limits on *D*; *%CV* = percent coefficient of variation of *D*; *n* = number of observations used to estimate *D*.

Pinyon-Juniper (PJ)

We conducted 443 point counts along 15 transects (conducted twice) in pinyon-juniper between 16 May and 18 June 2006 (Table 1). We detected a total of 3,124 individual birds in this habitat, with an average of 7.1 birds per point count (Table 2). We detected a total of 81 species in this habitat with an average of 5.0 species per point count and 21 species per transect (Table 2).

The point-count transect data from pinyon-juniper yielded robust density estimates (CV<50%) for 20 species and moderately robust estimates (CV=50-75%) for five additional species (Table 4). We should be able to effectively monitor these 25 species, which represent 31% of all species detected in pinyon-juniper.

Blue-gray Gnatcatcher, Black-throated Warbler, Bushtit, Juniper Titmouse, and Bewick's Wren had the highest estimated densities of all species detected in pinyon-juniper. Seventeen species – Mourning Dove, White-throated Swift, Gray Flycatcher, Dusky Flycatcher, Gray Vireo, Western Scrub-Jay, Pinyon Jay, Juniper Titmouse, Bushtit, Bewick's Wren, Blue-gray Gnatcatcher, Mountain Bluebird, Yellow-rumped Warbler, Black-throated Gray Warbler, Western Tanager, Chipping Sparrow, and Black-throated Sparrow – had higher estimated densities in pinyon-juniper relative to the other two habitats surveyed. If density is assumed to be positively correlated with habitat quality, then pinyon-juniper provides optimal habitat for these species within the NCPN.

Table 4. Estimated densities of breeding birds in Pinyon-Juniper habitat in the Northern Colorado Plateau Network (NCPN), summer 2006[1].

Species	D	LCL	UCL	CV	n
Mourning Dove	12	8.4	19	24	227
White-throated Swift	15	7.3	34	47	100
Gray Flycatcher	25	14	44	33	101
Dusky Flycatcher	11	4.3	27	56	39
Ash-throated Flycatcher	13	9.8	19	20	136
Gray Vireo	5.7	3.0	11	39	75
Plumbeous Vireo	4.0	2.0	8.0	40	59
Western Scrub-Jay	12	7.0	21	34	42
Pinyon Jay	2.9	1.5	5.5	39	93
Common Raven	0.3	0.1	0.6	39	42
Violet-green Swallow	9.4	4.2	21	49	61
Juniper Titmouse	38	19	76	42	71
Bushtit	74	31	176	52	35
Rock Wren	3.2	1.8	5.6	32	104
Canyon Wren	0.2	0.1	0.7	62	26
Bewick's Wren	27	17	43	26	168
Blue-gray Gnatcatcher	130	75	227	34	98
Mountain Bluebird	10	3.1	34	78	32
American Robin	2.3	1.1	4.9	45	40
Virginia's Warbler	8.6	3.0	24	66	34
Audubon's Warbler	3.1	0.7	12	91	30
Black-throated Gray Warbler	79	58	109	18	407
Western Tanager	2.0	0.8	4.8	55	28
Spotted Towhee	19	9.8	40	43	76
Chipping Sparrow	26	15	44	31	65
Black-throated Sparrow	14	7.1	28	41	71
Western Meadowlark	1.4	0.3	6.1	103	37
House Finch	9.8	5.0	19	40	78

[1] *D* = estimated density (birds/km^2); *LCL* and *UCL* = lower and upper 90% confidence limits on *D*; *%CV* = percent coefficient of variation of *D*; *n* = number of observations used to estimate *D*.

Sage Shrubland (SA)

We conducted 450 point counts along 15 transects (conducted twice) in sage shrubland between 16 May and 20 June, 2006 (Table 1). We detected a total of 3,943 individual birds in this habitat, with an average of 8.8 birds per point count (Table 2). We detected 103 species in this habitat with an average of 5.4 species per point count and 23 species per transect (Table 2).

The point transect data from sage shrubland yielded robust density estimates (CV<50%) for 18 species and moderately robust estimates (CV=50-75%) for seven additional species (Table 5). We should be able to effectively monitor these 25 species, which represent 25% of all species detected in sage shrubland.

Brewer's Sparrow, Green-tailed Towhee, Vesper Sparrow, Lark Sparrow, and Chipping Sparrow had the highest estimated densities of all species detected in sage shrubland. Twelve species – Black-billed Magpie, Horned Lark, Cliff Swallow, American Robin, Sage Thrasher, Green-tailed Towhee, Brewer's Sparrow, Vesper Sparrow, Lark Sparrow, Sage Sparrow, Western Meadowlark, and Brewer's Sparrow – had higher estimated densities in sage shrubland relative to the other two habitats surveyed. If density is assumed to be positively correlated with habitat quality, then sage shrubland provides optimal habitat for these species.

Table 5. Estimated densities of breeding birds in Sage Shrubland habitat in the Northern Colorado Plateau Network (NCPN), summer 2006[1].

Species	D	LCL	UCL	CV	n
Mourning Dove	2.4	1.6	3.7	25	141
Dusky Flycatcher	4.5	2.0	10	50	62
Black-billed Magpie	2.2	1.3	3.7	30	95
Common Raven	0.2	0.1	0.6	54	46
Horned Lark	3.6	1.7	7.5	43	34
Violet-green Swallow	3.0	1.5	6.1	41	35
Cliff Swallow	6.5	2.7	16	56	33
Rock Wren	4.9	2.9	8.2	30	160
Mountain Bluebird	5.8	3.9	8.7	23	84
American Robin	3.8	2.0	7.4	39	81
Sage Thrasher	2.2	0.9	4.9	49	84
Virginia's Warbler	1.4	0.5	3.8	60	29
Audubon's Warbler	1.6	0.5	5.4	78	26
Black-throated Gray Warbler	1.6	0.5	4.6	66	24
Green-tailed Towhee	34	19	60	32	433
Spotted Towhee	5.0	2.7	9.4	37	79
Chipping Sparrow	7.8	4.3	14	35	59
Brewer's Sparrow	70	47	103	23	562
Vesper Sparrow	24	16	36	23	424
Lark Sparrow	9.6	4.7	19	41	108
Black-throated Sparrow	1.8	0.7	4.4	53	35
Sage Sparrow	1.9	0.6	5.7	68	31
Western Meadowlark	4.2	2.5	7.3	31	176
Brewer's Blackbird	6.4	3.4	12	37	42
Brown-headed Cowbird	2.3	1.1	4.9	46	25
House Finch	3.5	1.9	6.2	34	57

[1] *D* = estimated density (birds/km^2); *LCL* and *UCL* = lower and upper 90% confidence limits on *D*; *%CV* = percent coefficient of variation of *D*; *n* = number of observations used to estimate *D*.

DISCUSSION AND RECOMMENDATIONS

The National Park Service's specific project objective is to determine status and trends in breeding bird species density in low-elevation riparian, pinyon-juniper, and sagebrush habits. While determining bird population trends is a long-term goal, and we will not be able to make any statements about trends until after several years, in the short term, this program provides information needed to effectively manage and conserve bird populations in the NCPN, including the spatial distribution, abundance, and relationship to important habitat characteristics for each species.

RMBO typically uses the Partners in Flight (PIF) Plan as a guideline for bird conservation. PIF is a partnership of federal and state agencies, industry, non-governmental organizations, and many others, with the goal of conserving North American birds. In 1991, PIF began developing a formal species assessment process that could provide consistent, scientific evaluations of conservation status across all bird species in North America, and identify areas most important to the conservation of each species. This process applies quantitative rule sets to complex biological data on the population size, distribution, population trend, threats, and regional abundance of individual bird species to generate simple numerical scores that rank each species in terms of its biological vulnerability and regional status. The process results in global and regional conservation assessments of each bird species that, among other uses, can be used to objectively assign regional and continental conservation priorities among birds.

PIF identifies 50 bird species as "Important Species" for Bird Conservation in Region (BCR) 16, which includes almost all of the NCPN. It identifies 41 bird species as "Important Species" for Bird Conservation in Region (BCR) 10, which includes Fossil Butte National Monument. The USFWS identifies 45 species as "Birds of Conservation Concern" for Region 6 (Mountain-Prairie Region), and the NPS Southeast Utah Group identifies 1 bird species as "Endangered", two as "Threatened", and ten as "Species of Special Concern". In 2006, we collected data for 43 species that are on one or more of those lists. We also collected data for four additional species that the NPS Southeast Utah Group identifies as species of "Special Concern." For these 47 species, we provide detailed information about their regional distribution, conservation status, and natural history in the species accounts (Appendix A). Of the 47 species, 23 were detected in sufficient numbers to calculate a density estimate in at least one habitat on NCPN. We provide detailed information on the density estimates in the species accounts (Appendix A).

Prospects for Population Monitoring

The habitat-stratified point transects produced excellent results with low coefficients of variation (≤ 50%) for 40 bird species in at least one habitat surveyed in 2006. Thus we should be able to detect habitat-specific population trends for these species within our

maximum target of 30 years. These 40 species represent about 31% of *all species* detected in 2006, but they represent almost 93% of all *individual birds* observed. The other 69% of species (~7% of birds observed) fall into one of the following categories below:

1) Low-density, highly localized species;
2) Low-density, widespread species;
3) Irregular species;
4) Vagrant breeders;
5) Species that occur mainly outside the NCPN in other habitats;
6) Nocturnal species;
7) Wetland-obligate species; and
8) Species that are readily detectable only prior to late May.

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

1) Additional point transects in existing habitats;
2) Censusing small but localized populations;
3) Censusing 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 way to monitor the health of small populations of birds 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 that occur in low density, such as Golden Eagles and Prairie Falcons, monitoring could be achieved by locating as many active nests as possible and visiting each during the spring and summer as necessary to evaluate the outcome of each. Known nests would first be identified 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. Because relatively few nests exist for these species, this type of monitoring would probably require the equivalent effort of what is required for conducting point counts (i.e., one additional person in the field during the spring and early summer).

Because of the already extensive point transect effort undertaken each year, implementing additional field techniques to target other high-priority species can be done cost-effectively. Rocky Mountain Bird Observatory is open to discussing these options with the NCPN in the future.

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APPENDIX A. SPECIES ACCOUNTS

In this section we present a one-page account and a one-page map for each bird species detected in 2006 that is of management interest, as designated by the Partners in Flight (PIF).

All species accounts follow the same format with an overview of our findings, a table of the density estimates by habitat (providing there were sufficient data), and a map showing distribution of detections in NCPN. 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 geographic distribution maps in the accounts depict the locations and relative abundance (average number of birds detected per point count) of species of management interest that were detected on point transects in 2006. The location of each dot does not necessarily indicate the precise location of the point at which the species was observed, but rather the mid-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 be construed to suggest anything about the areas in which we did not conduct transects.* Finally, as a note of caution, species may seem more abundant in certain areas 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 network.

Greater Sage-Grouse
(*Centrocercus urophasianus*)

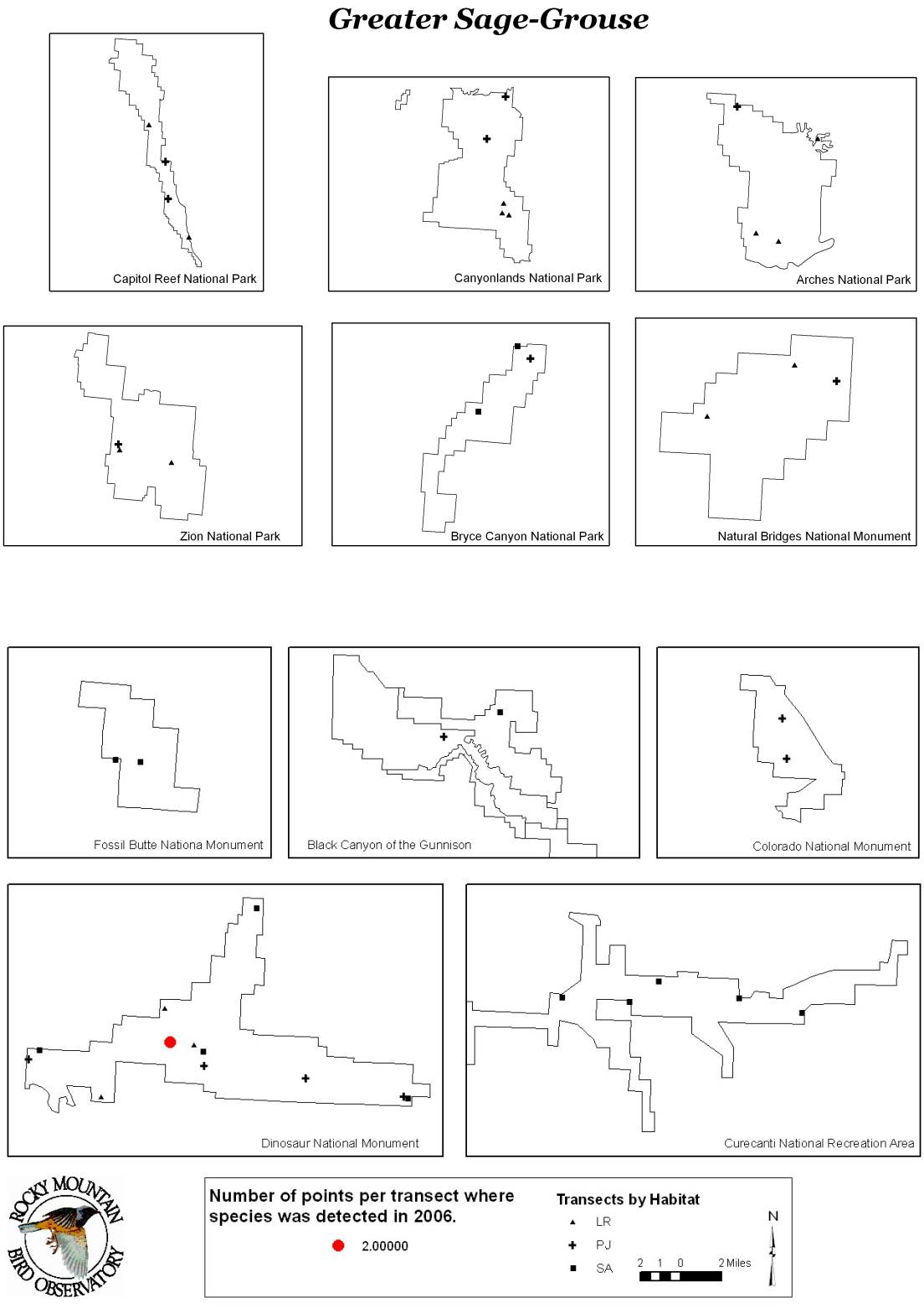
*PIF BCR 16 Species of Continental Concern and Regional Concern
*PIF BCR 10 Species of Continental Concern, Regional Concern, Continental Stewardship, and Regional Stewardship

Greater Sage-Grouse inhabit large, contiguous areas of sagebrush, and require tall grass within the sagebrush for nesting. It is believed that fences, overgrazing, and the removal of sagebrush have greatly reduced the numbers of Sage Grouse across its range. The species was recently proposed for listing under the Endangered Species Act (Righter et al. 2004). In 2006, we detected two individual Greater Sage Grouse in sage habitat on NCPN transects. This monitoring project does not target Greater Sage-Grouse or any gallinaceous birds, most of which are game species whose populations are monitored by state wildlife agencies.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Greater Sage Grouse on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Sage Shrubland	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.



Point-count transect locations and detections of Greater Sage Grouse on transects in NCPN, 2006.

Northern Harrier
(*Circus cyaneus*)

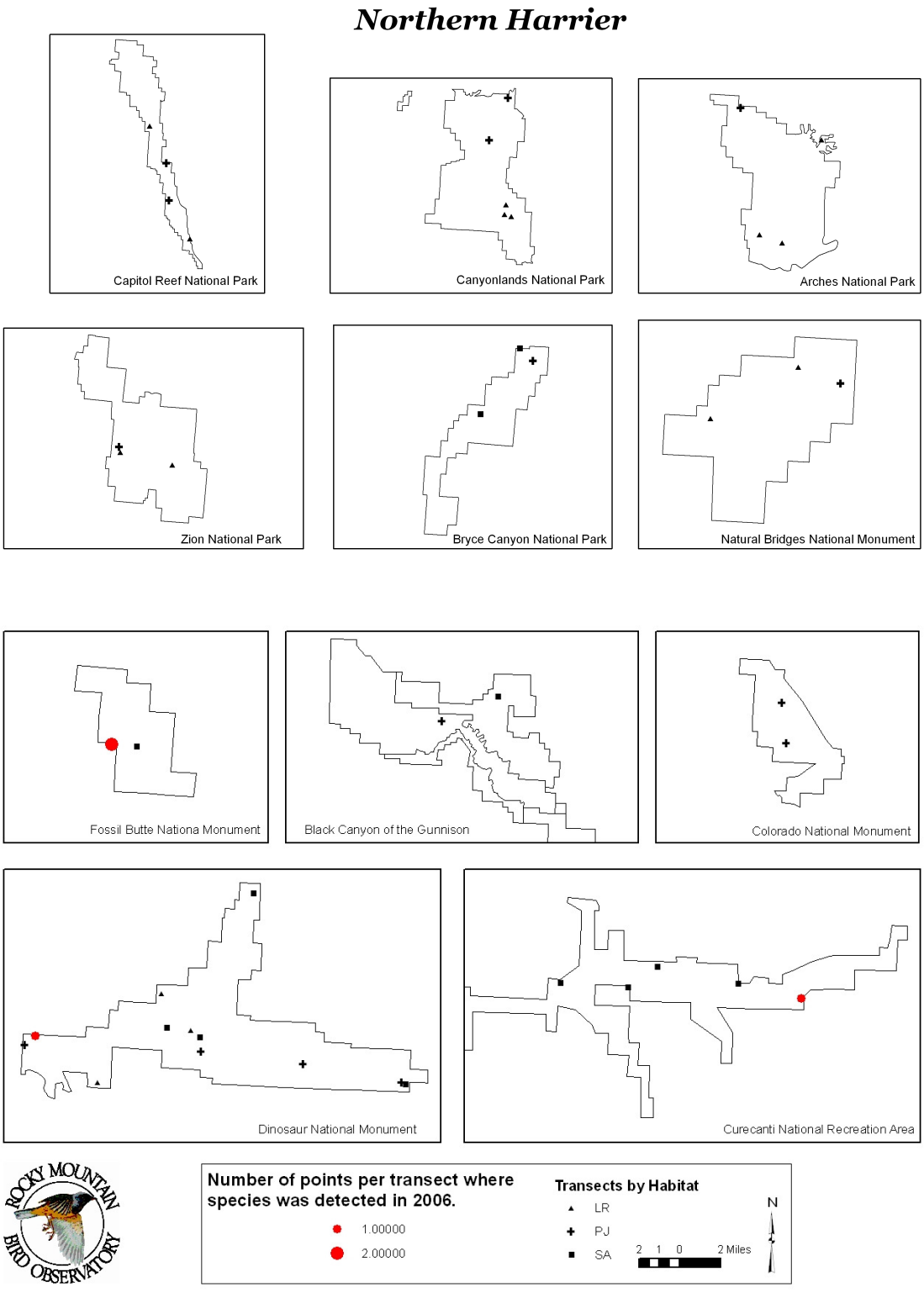
*PIF BCR 10 Species of Regional Concern
*USFWS Region 6 Bird of Conservation Concern

Northern Harriers nest in a wide variety of open grasslands and brushlands throughout the NCPN (Righter et al. 2004). In 2006, we detected four individual Northern Harriers in only one habitat on NCPN transects. Northern Harriers, like other raptors, are difficult to monitor using the point-transect protocol because of their low densities and large territories. Therefore, it is unlikely we will be able to effectively monitor Northern Harriers in any habitat that we survey in the NCPN. Effective monitoring would require a more intensive and focused effort.

Total number of detections, number of individuals, and habitat-specific density estimates for the Northern Harrier on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Sage Shrubland	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.



Point-count transect locations and detections of Northern Harriers on transects in NCPN, 2006.

Golden Eagle
(*Aquila chrysaetos*)

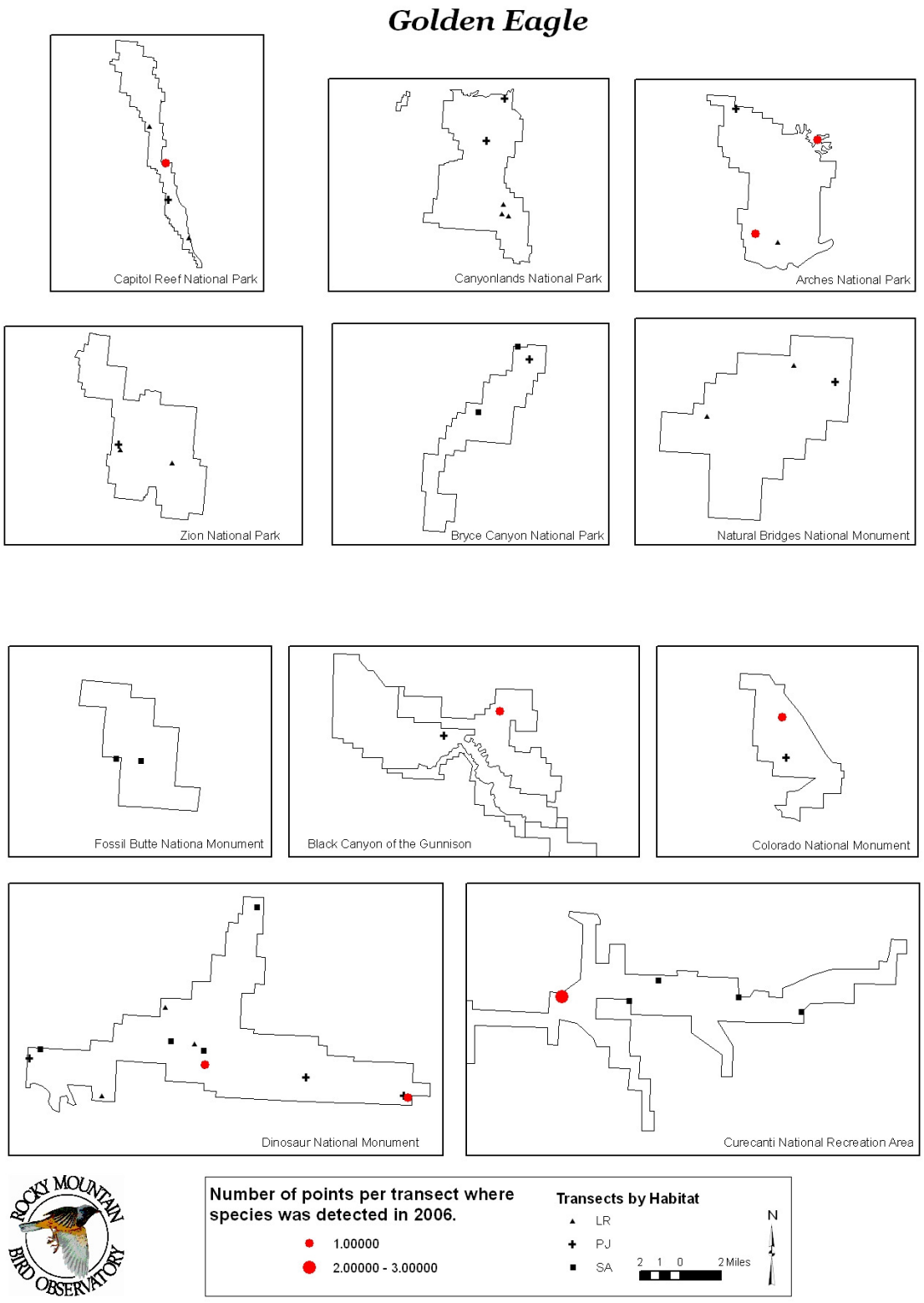
*PIF BCR 16 Species of Regional Concern
USFWS Bird of Conservation Concern

Golden Eagles nest throughout the Colorado Plateau region in cliff country, from desert canyons to high mesas (Righter et al. 2004). In 2006, we detected 10 individual Golden Eagles in three habitats on NCPN transects. Golden Eagles, like other raptors, are difficult to monitor using the point-transect protocol because of their low densities and large territories. Therefore, it is unlikely we will be able to effectively monitor Golden Eagles in any habitat that we survey in the NCPN. Effective monitoring would require a more intensive and focused effort.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Golden Eagle on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	ID	--	--	--	--	2
Pinyon-Juniper	ID	--	--	--	--	3
Sage Shrubland	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.



Point-count transect locations and detections of Golden Eagles on transects in NCPN, 2006.

Peregrine Falcon
(*Falco peregrinus*)

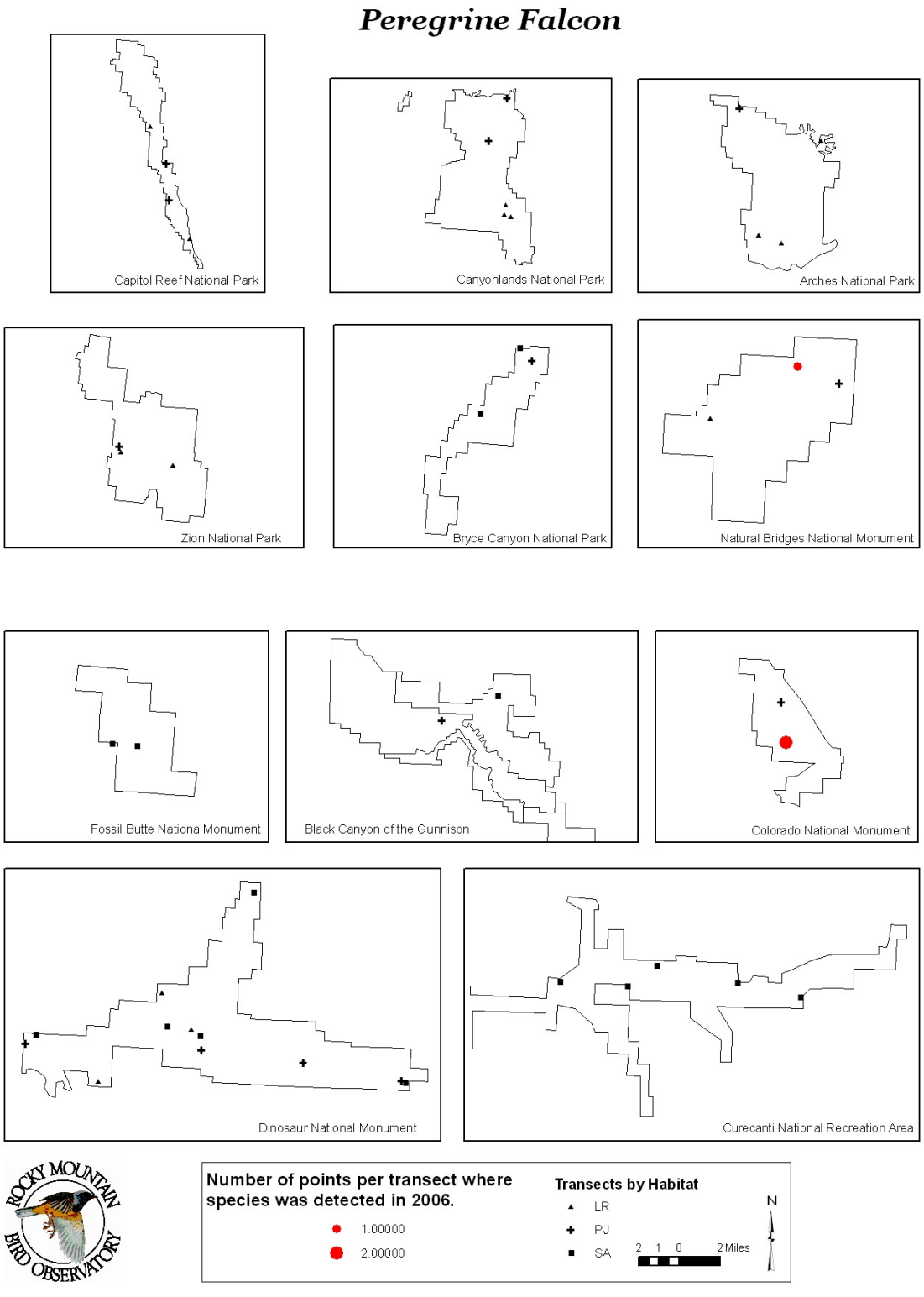
*USFWS Region 6 Bird of Conservation Concern

Peregrine Falcons nest throughout the Colorado Plateau region where towering cliffs, usually near water, are available. Once near extinction, its population in the region has recovered well (Righter et al. 2004). In 2006, we detected five individual Peregrine Falcons in two habitats on NCPN transects. Peregrine Falcons, like other raptors, are difficult to monitor using our point-transect protocol, because of their low densities and large territories. Therefore, it is unlikely we will be able to effectively monitor Peregrine Falcons in the NCPN. Effective monitoring would require a more intensive and focused effort, such as the ongoing monitoring projects in Dinosaur National Monument and other NCPN park units. We will, however, be able to track the status of this species on specific transects over time and provide supplemental information on its presence or absence.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Peregrine Falcon on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	ID	--	--	--	--	2
Pinyon-Juniper	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.



Point-count transect locations and detections of Peregrine Falcons on transects in NCPN, 2006.

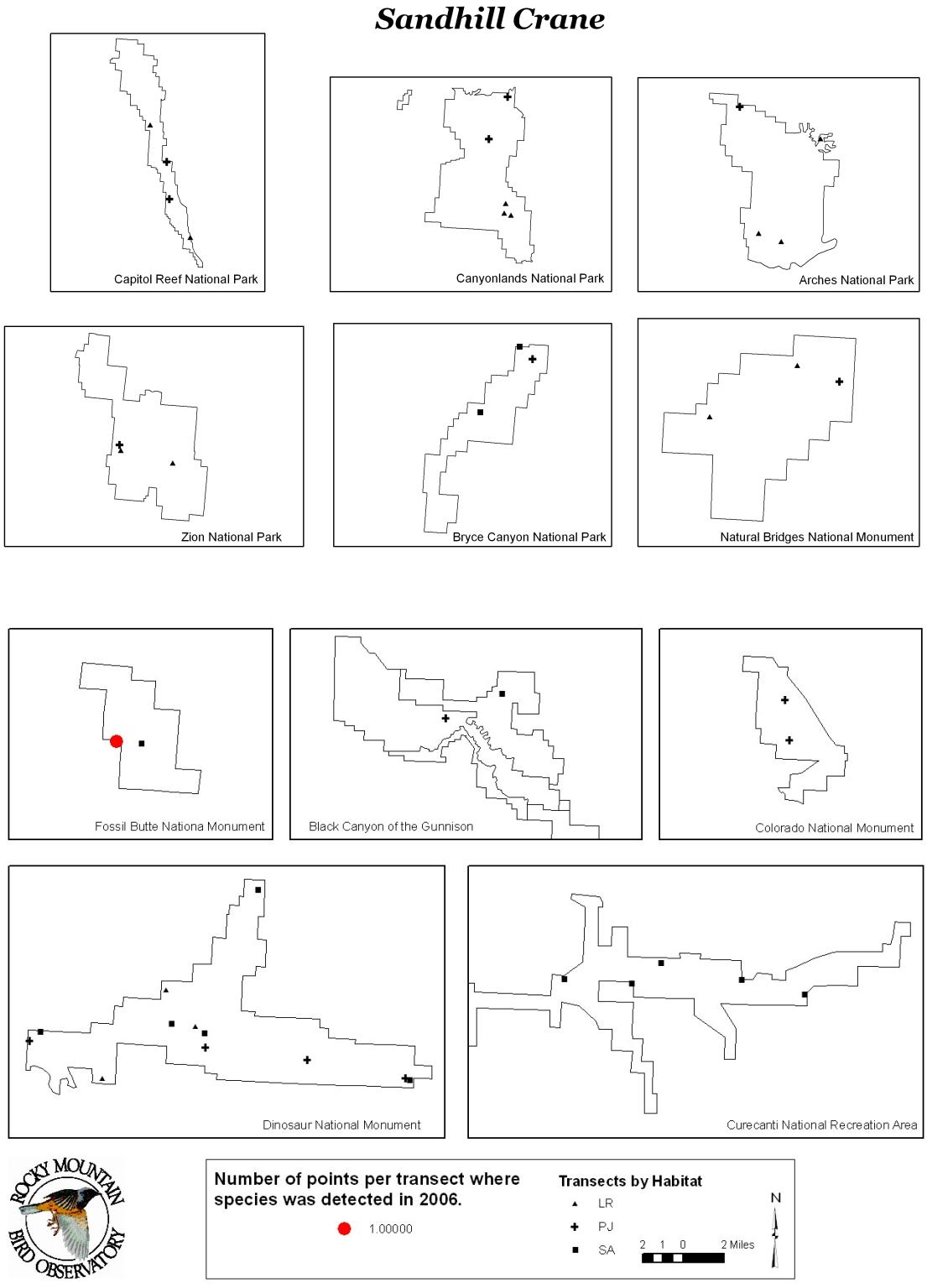
Sandhill Crane
(*Grus canadensis*)

In the western United States, Sandhill Cranes breed in marshes and wet grasslands (Righter et al. 2004). In 2006, we detected only one individual during a sage shrubland transect. The crane was detected aurally from a very long distance, and it is very doubtful that the bird was actually using the sage shrubland habitat. Given the species' breeding habits and preferred habitat, we will not be able to monitor it using point transect protocol. An intensive search for the species breeding colonies would be necessary.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Sandhill Crane on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Sage Shrubland	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.



Point-count transect locations and detections of Sandhill Cranes on transects in NCPN, 2006.

Yellow-billed Cuckoo
(*Coccyzus americanus*)

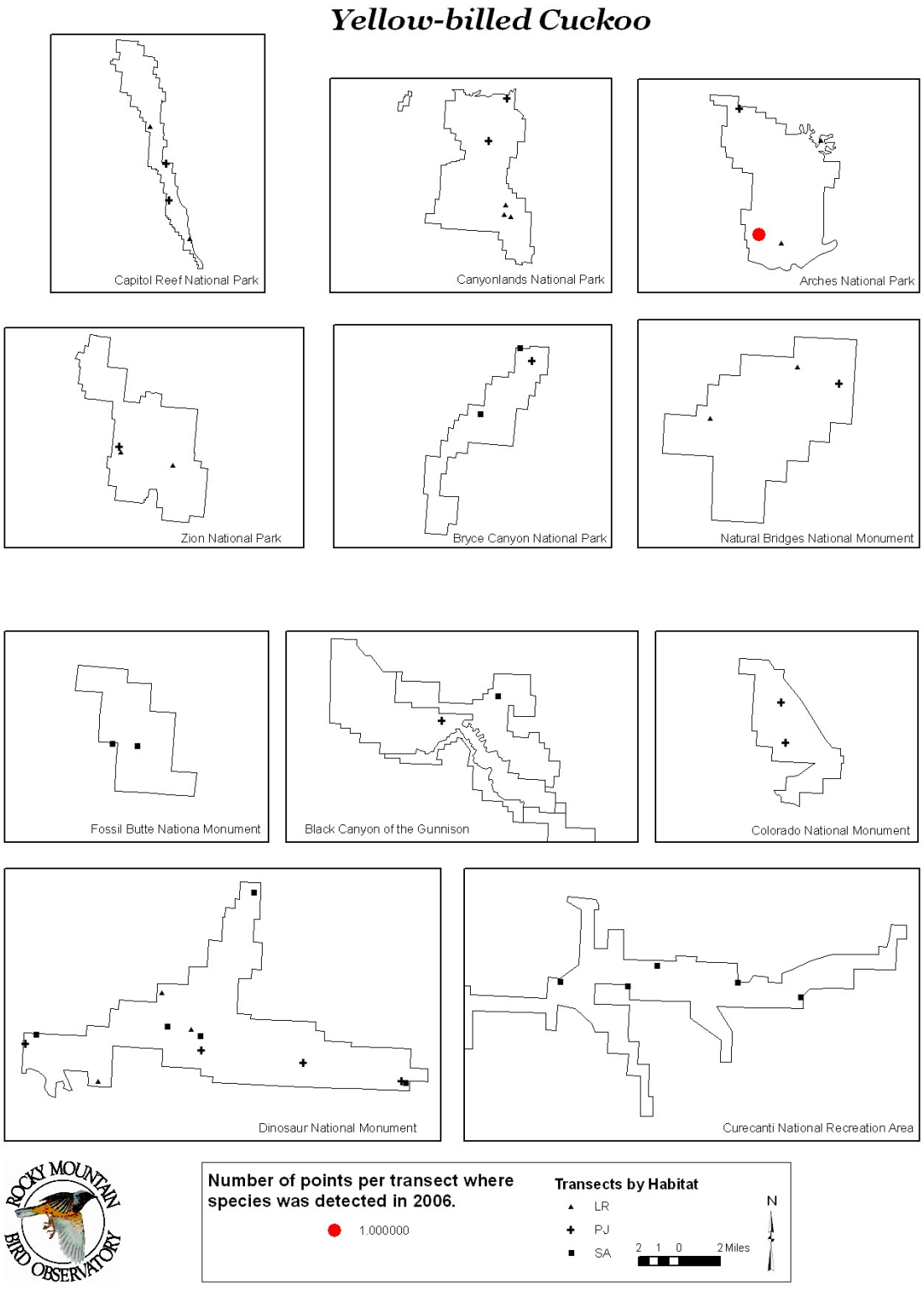
*NPS Southeast Utah Group Species of Special Concern

Populations of Yellow-billed Cuckoos in the western United States have declined significantly through the twentieth century, and now the species is extremely rare west of the Rocky Mountains. The species nests in old-growth cottonwoods of riparian woodlands with dense understories (Righter et al. 2004). In 2006, we detected one individual during a low-elevation riparian transect. Given the rarity of the species, it is unlikely that we will be able to obtain sufficient sample size to monitor the species in the NCPN. However, we should be able to determine site fidelity of the individual that was detected, determine if more individuals are present in the low-elevation riparian habitat, and possibly determine the species' breeding status in NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Yellow-billed Cuckoo on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	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.



Point-count transect locations and detections of Yellow-billed Cuckoos on transects in NCPN, 2006.

Short-eared Owl
(*Asio flammeus*)

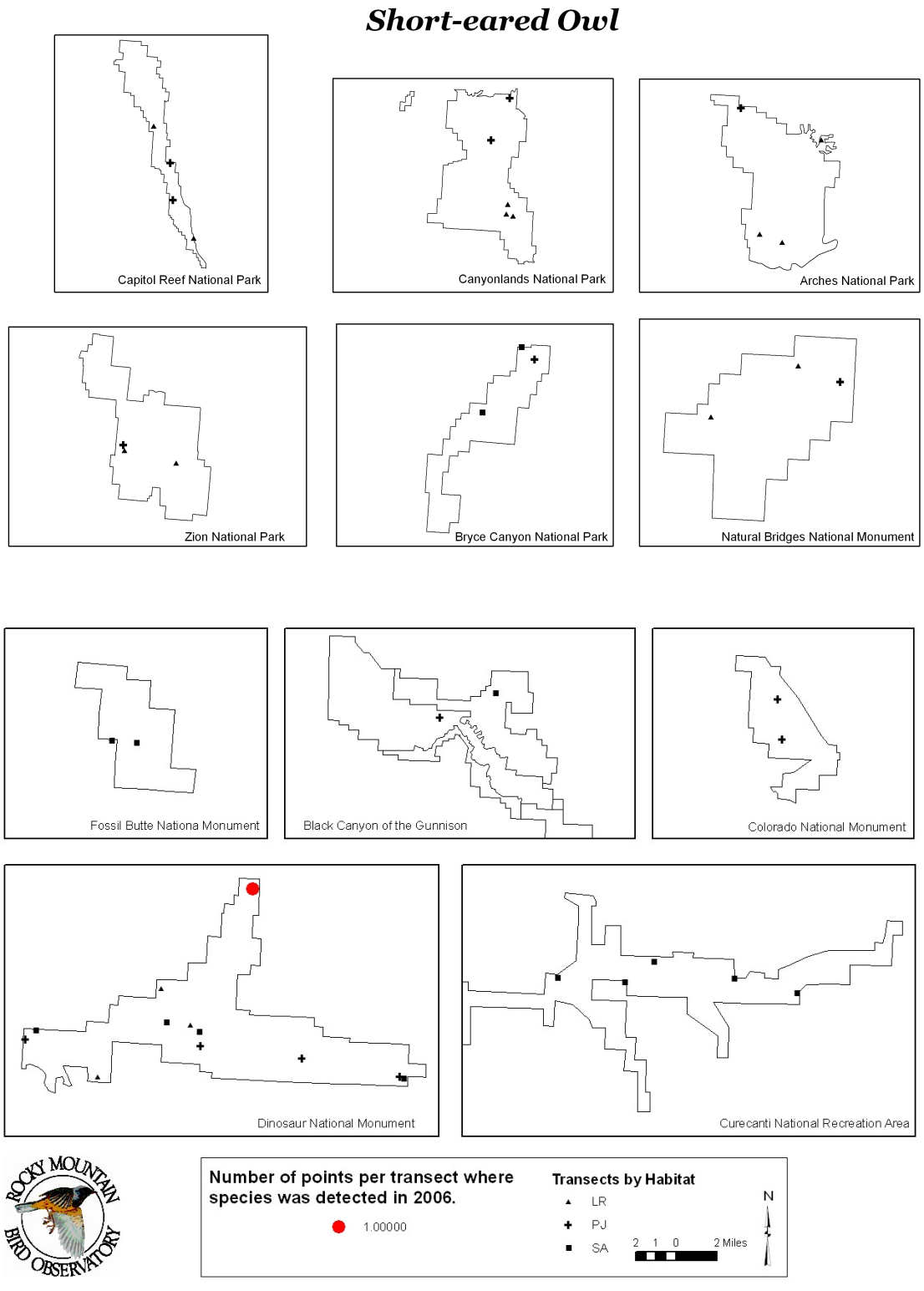
*PIF BCR 10 Species of Continental Concern
*USFWS Region 6 Species of Conservation Concern

Short-eared owls nest fairly commonly in the wetlands of northern Utah and southeastern Idaho. Reports of the species in the NCPN are very uncommon (Righter et al. 2004). In 2006, we detected four individuals on one transect in sage shrubland habitat. Given the rarity of the species, it is unlikely that we will be able to obtain sufficient sample size to monitor the species in the NCPN. However, we should be able to determine site fidelity of the individuals that were detected, determine if more individuals are present in the NCPN, and possibly determine the species' breeding status in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Short-eared Owl on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Sage Shrubland	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.



Point-count transect locations and detections of Short-eared Owls on transects in NCPN, 2006.

Common Nighthawk

(*Chordeiles minor*)

*PIF BCR 16 Species of Regional Concern

In 2006, we detected only two common Nighthawks on NCPN transects. Due to the Common Nighthawk's nocturnal behavior, it is unlikely that a point-transect program would sufficiently monitor the species' population trends. Evening or nighttime surveys may provide a means by which to track the species' population in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Common Nighthawk on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Sage Shrubland	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.

Point-count transect locations and detections of Common Nighthawks on transects in NCPN, 2006.

White-throated Swift
(*Aeronautes saxatalis)*

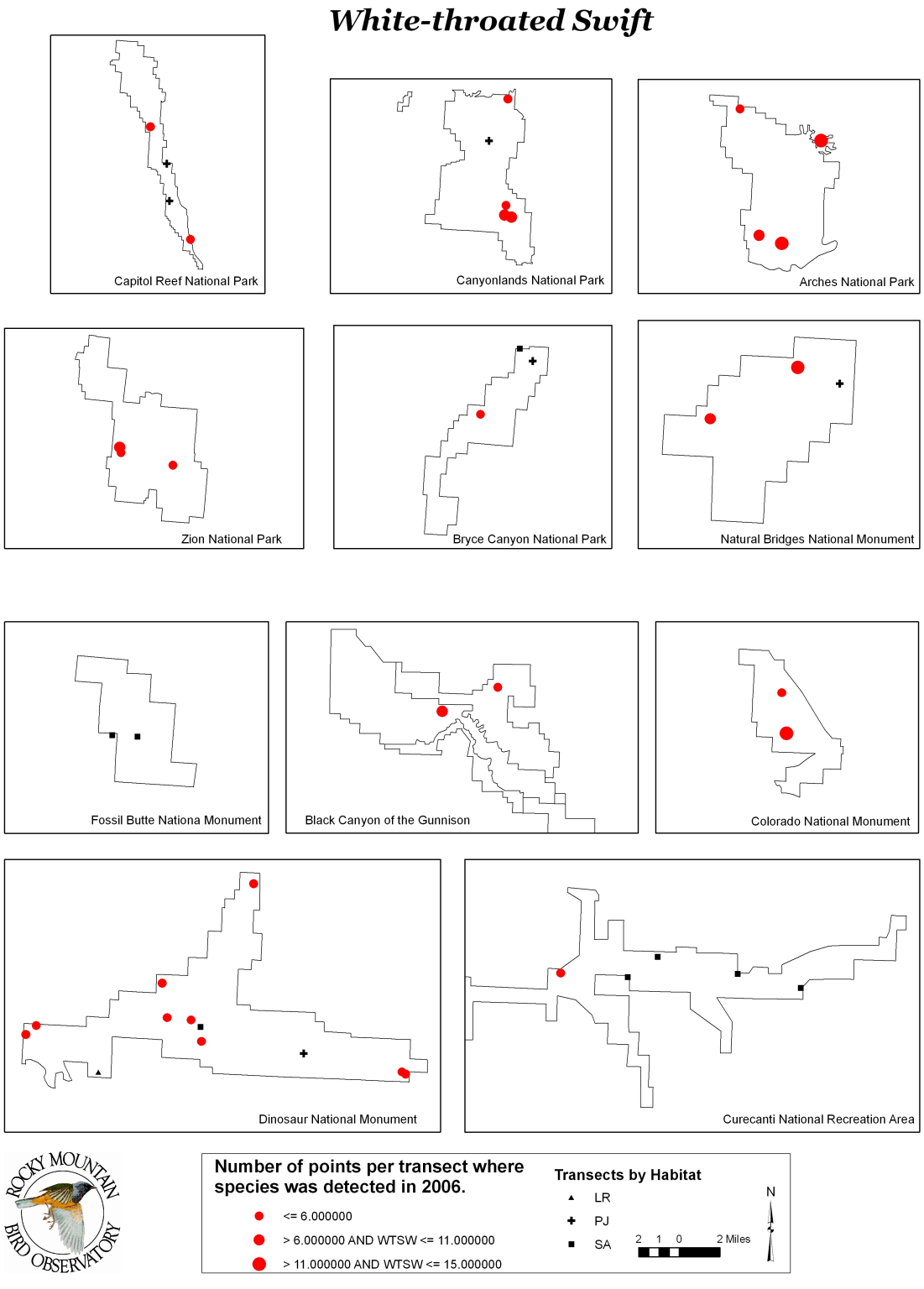
*PIF BCR 16 Species of Continental Concern and Regional Stewardship
*PIF BCR 10 Species of Continental Concern

White-throated Swifts typically nest on high cliffs in small colonies (Righter et al. 2004). In 2006, we detected 704 individual White-throated Swifts in three habitats on NCPN transects. If our 2005 and 2006 surveys are an indication of the species' distribution and abundance, we should be able to monitor the White-throated Swift in low-elevation riparian and pinyon-juniper habitats in the NCPN. However, because of the White-throated Swift's colonial nature, obtaining a reliable sample size from year to year may be difficult. A more reliable monitoring scheme for this species may require more intensive and focused effort involving censusing birds at known nesting sites and searching for new nesting sites in potential habitat.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the White-throated Swift on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	9.4	4.5	19	44%	41	484
Pinyon-Juniper	16	7.4	35	47%	100	177
Sage Shrubland	ID	--	--	--	--	43

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.



Point-count transect locations and detections of White-throated Swifts on transects in NCPN, 2006.

Broad-tailed Hummingbird
(*Selasphorus platycercus)*

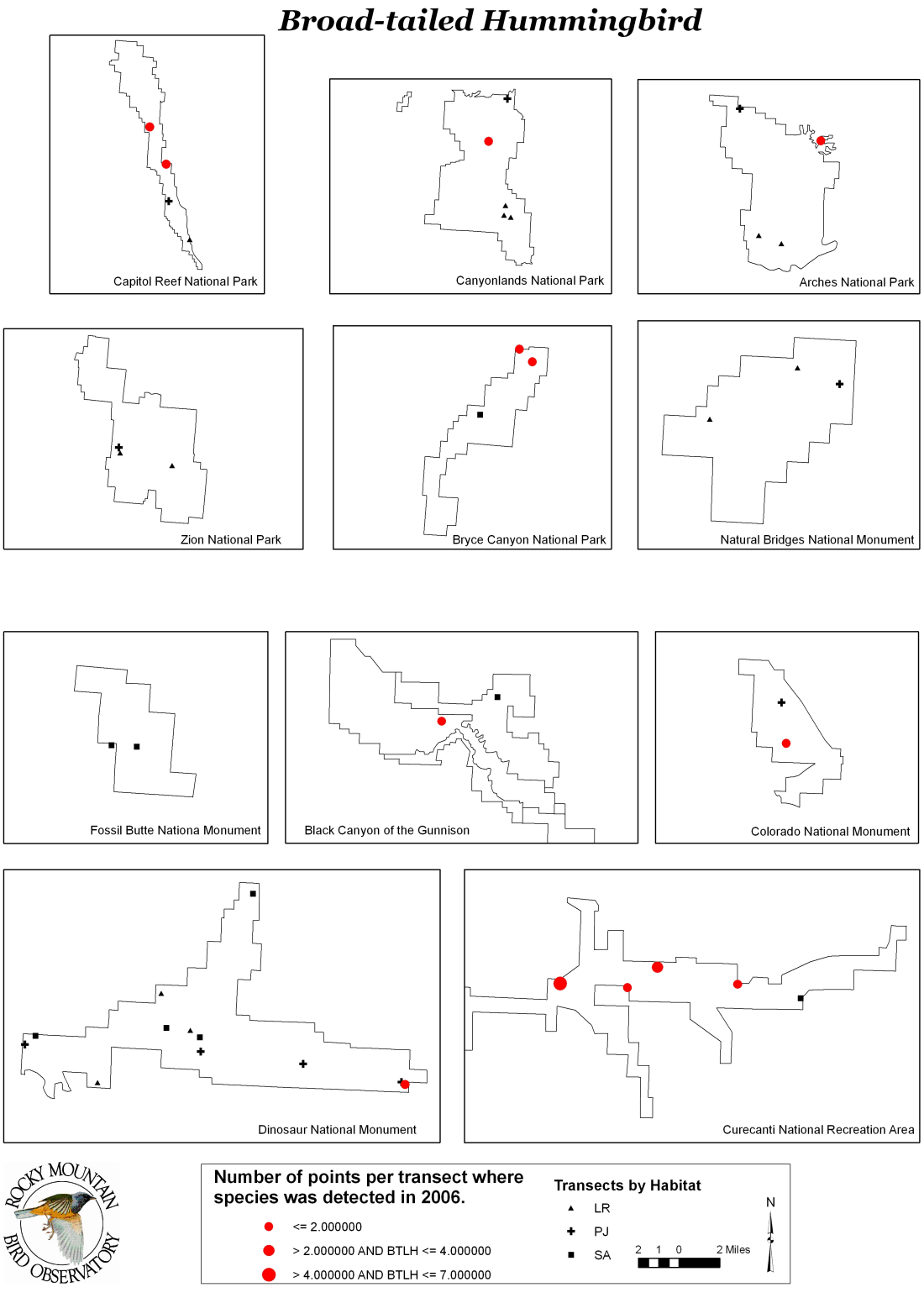
*PIF BCR 16 Species of Regional Stewardship

On the Colorado Plateau, Broad-tailed Hummingbirds inhabit a variety of forest types, wetlands, and riparian areas (Righter et al. 2004). In 2006, we detected 30 individual Broad-tailed Hummingbirds in three habitats on NCPN transects. We detected Broad-tailed Hummingbirds in largest numbers in sage shrubland habitat on NCPN transects, but most of those detections were from individuals using bordering habitats such as pinyon-juniper and riparian. If our 2005 and 2006 surveys are an indication of the species' distribution and abundance, we should be able to monitor the Broad-tailed Hummingbird in at least one habitat in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Broad-tailed Hummingbird on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	ID	--	--	--	--	2
Pinyon-Juniper	ID	--	--	--	--	6
Sage Shrubland	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.



Point-count transect locations and detections of Broad-tailed Hummingbirds on transects in NCPN, 2006.

Red-naped Sapsucker
(*Sphyrapicus nuchalis)*

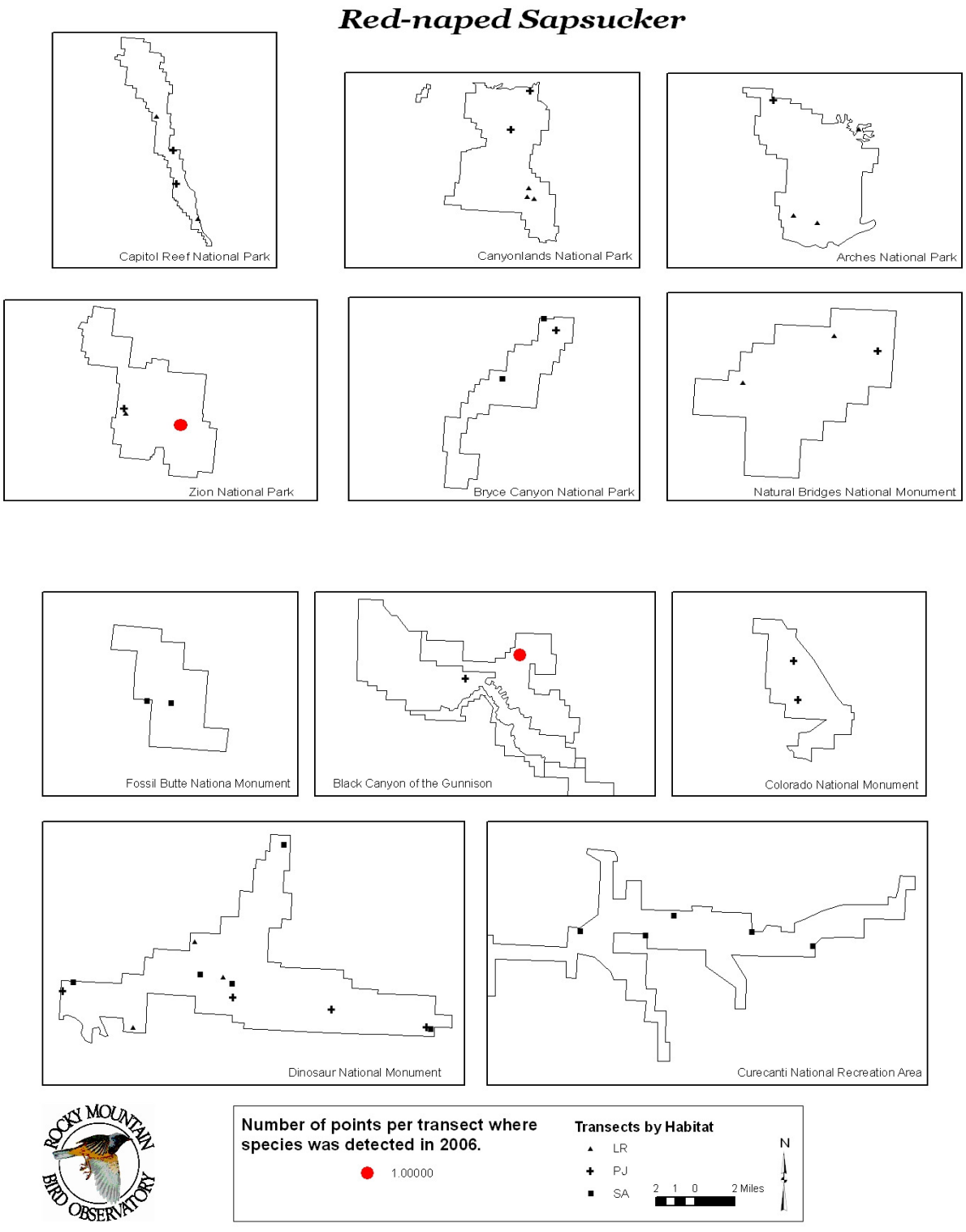
*PIF BCR 10 Species of Continental Stewardship and Regional Stewardship
*USFWS Region 6 Bird of Conservation Concern

Red-naped Sapsuckers nest throughout the western United States. The species nests primarily in aspen forests, but will also nest in cottonwoods (Righter et al. 2004). In 2006, we detected two individuals in two habitats. Given the species habitat preferences, it is unlikely that we will be able to obtain sufficient sample size to monitor the species in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Red-naped Sapsucker on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	ID	--	--	--	--	1
Sage Shrubland	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.



Point-count transect locations and detections of Red-naped Sapsuckers on transects in NCPN, 2006.

Olive-sided Flycatcher
(*Contopus cooperi*)

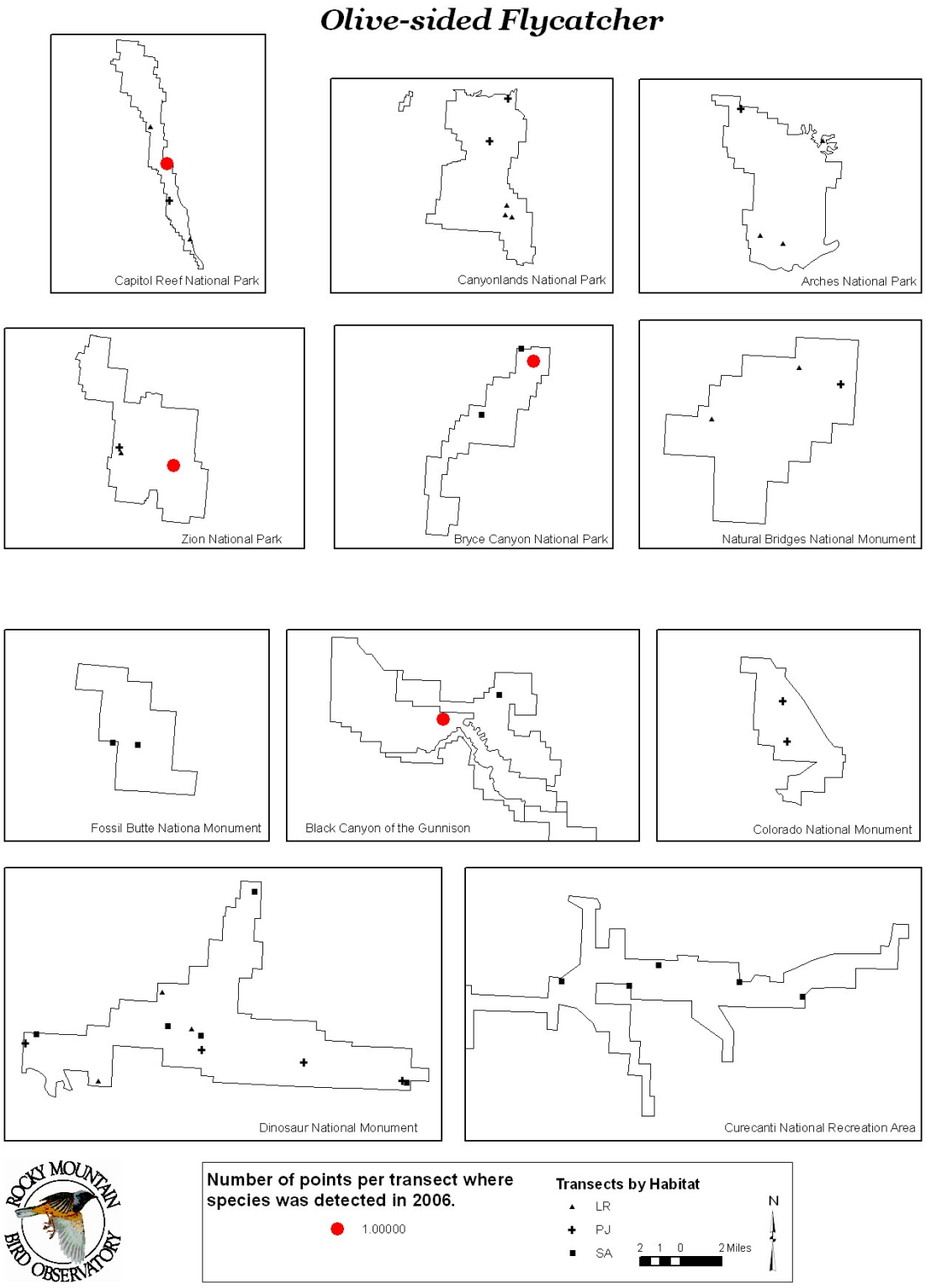
*PIF BCR 16 Species of Continental Concern
*PIF BCR 10 Species of Continental Concern and Regional Concern

Olive-sided Flycatchers occur throughout the Colorado Plateau region, but they are usually never abundant. They will utilize low-elevation pinyon-juniper stands for nesting when they provide adequate perches for singing and foraging, but they prefer high-elevation conifers (Righter et al. 2004). In 2006, we detected four individual Olive-sided Flycatchers in two habitats on NCPN transects. Most of our detections of the species on NCPN transects were from ponderosa pine stands on the periphery of low-elevation riparian and pinyon-juniper habitat that we were sampling. Given the specific habitat requirements of the Olive-sided Flycatcher, it is unlikely we will be able to monitor the species in any of the habitats that we currently survey in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Olive-sided Flycatcher on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	ID	--	--	--	--	1
Pinyon-Juniper	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.



Point-count transect locations and detections of Olive-sided Flycatchers on transects in NCPN, 2006.

Willow Flycatcher
(*Empidonax traillii*)

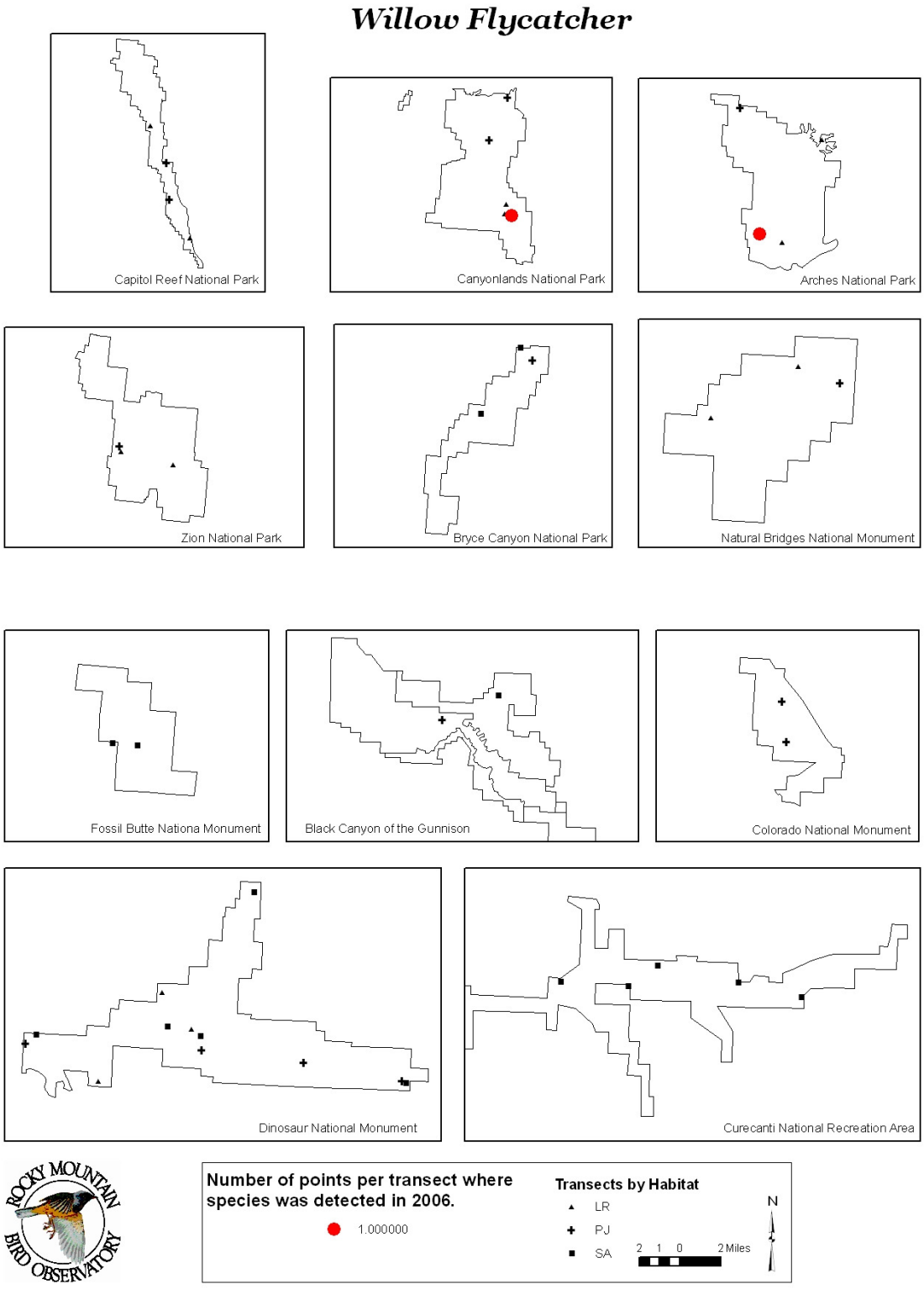
*PIF BCR 16 Species of Continental Concern and Regional Concern
*PIF BCR 10 Species of Continental Concern and Regional Stewardship

Willow Flycatchers nest in thick willow stands, usually adjacent to open, standing water (Righter et al. 2004). In 2006, we detected three Willow Flycatchers on NCPN transects. Since we do not sample any large stands of willow, it is unlikely that we will be able to monitor the Willow Flycatcher in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Willow Flycatcher on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	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.



Point-count transect locations and detections of Willow Flycatchers on transects in NCPN, 2006.

Dusky Flycatcher
(*Empidonax oberholseri*)

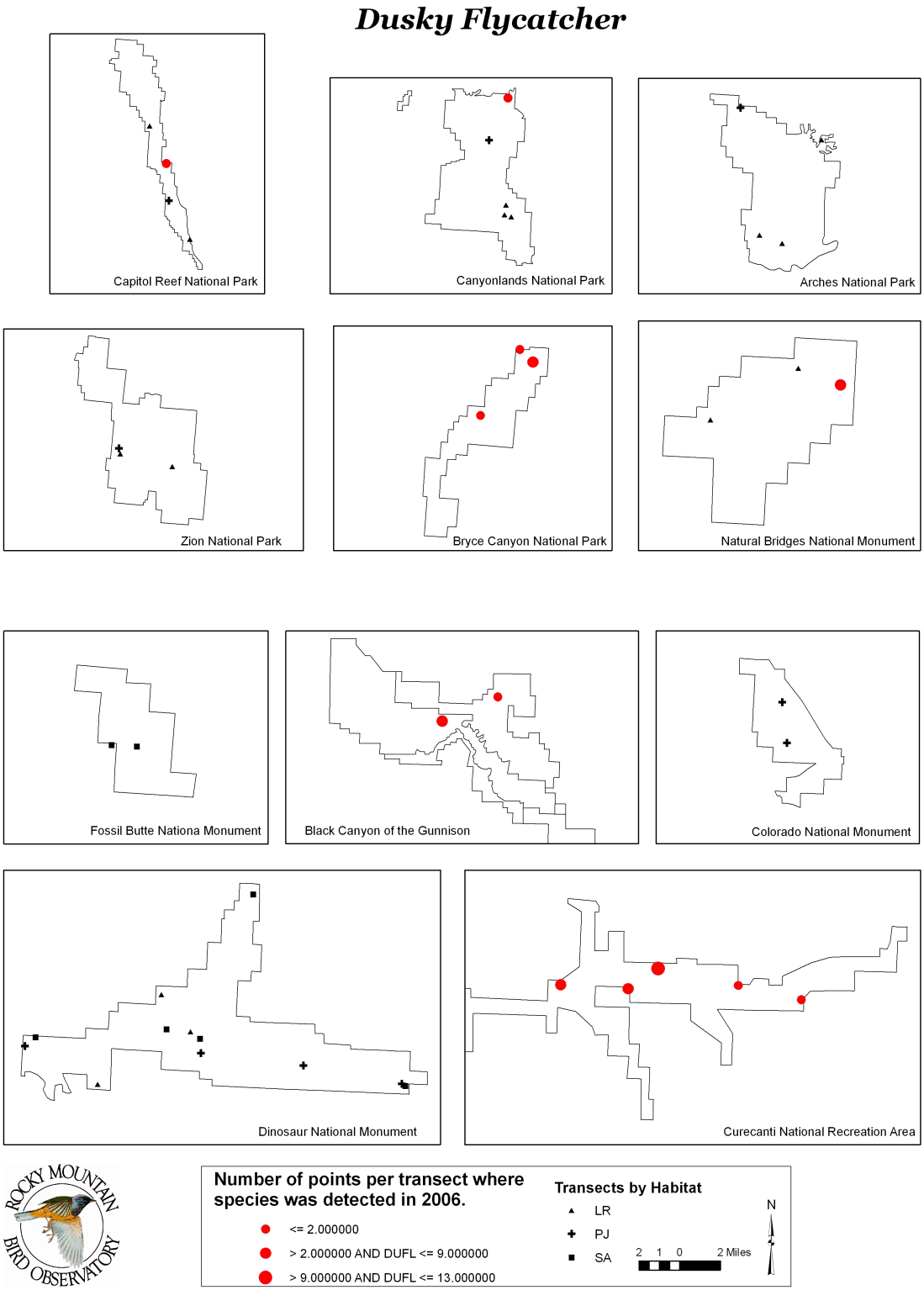
*PIF BCR 10 Species of Continental Stewardship and Regional Stewardship

Dusky Flycatchers nest in a variety of shrubby habitats, especially those with some Gamble oak component (Righter et al. 2004). In 2006, we detected 111 Dusky Flycatchers in two habitats on NCPN transects. If our 2005 and 2006 surveys are an indication of the species' distribution and abundance, we should be able to monitor the species in pinyon-juniper and sage shrubland habitats in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Dusky Flycatcher on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Pinyon-Juniper	11	4.4	28	57%	39	43
Sage Shrubland	4.6	2.0	11	50%	62	68

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.



Point-count transect locations and detections of Dusky Flycatchers on transects in NCPN, 2006.

Cordilleran Flycatcher
(*Empidonax occidentalis*)

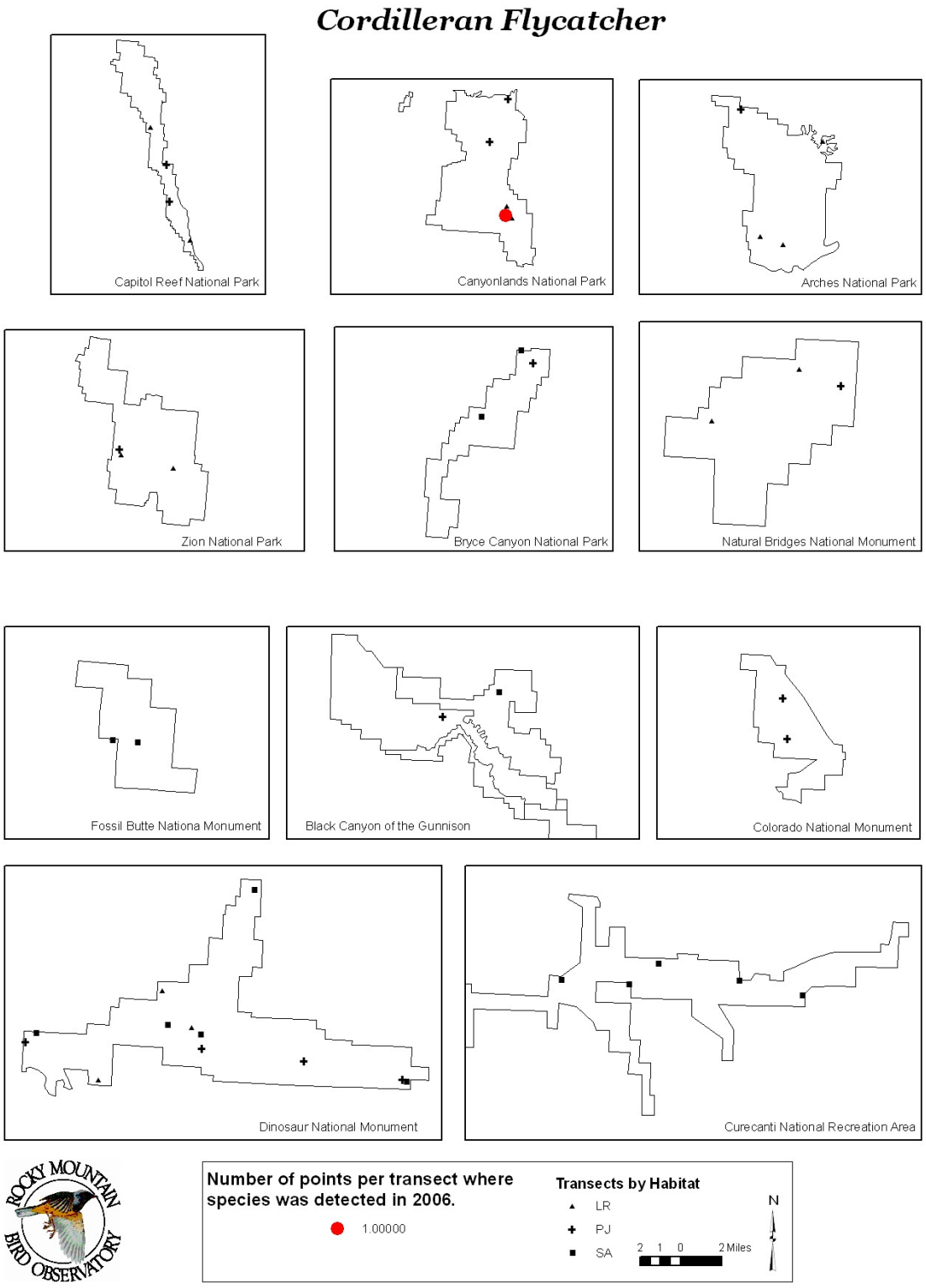
*PIF BCR 16 Species of Regional Stewardship

Cordilleran Flycatchers nest in forested areas with cliffs or rocky ledges and in riparian areas with available vertical surfaces. The species is also occasionally found in pinyon-juniper stands that have some element of deciduous vegetation (Righter et al. 2004). In 2006, we detected only one Cordilleran Flycatcher on NCPN transects. If our 2005 and 2006 surveys are an indication of the species' distribution and abundance, detections will be far too few to calculate density in any habitat that we survey in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Cordilleran Flycatchers on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	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.



Point-count transect locations and detections of Cordilleran Flycatchers on transects in NCPN, 2006.

Say's Phoebe
(*Sayornis saya)*

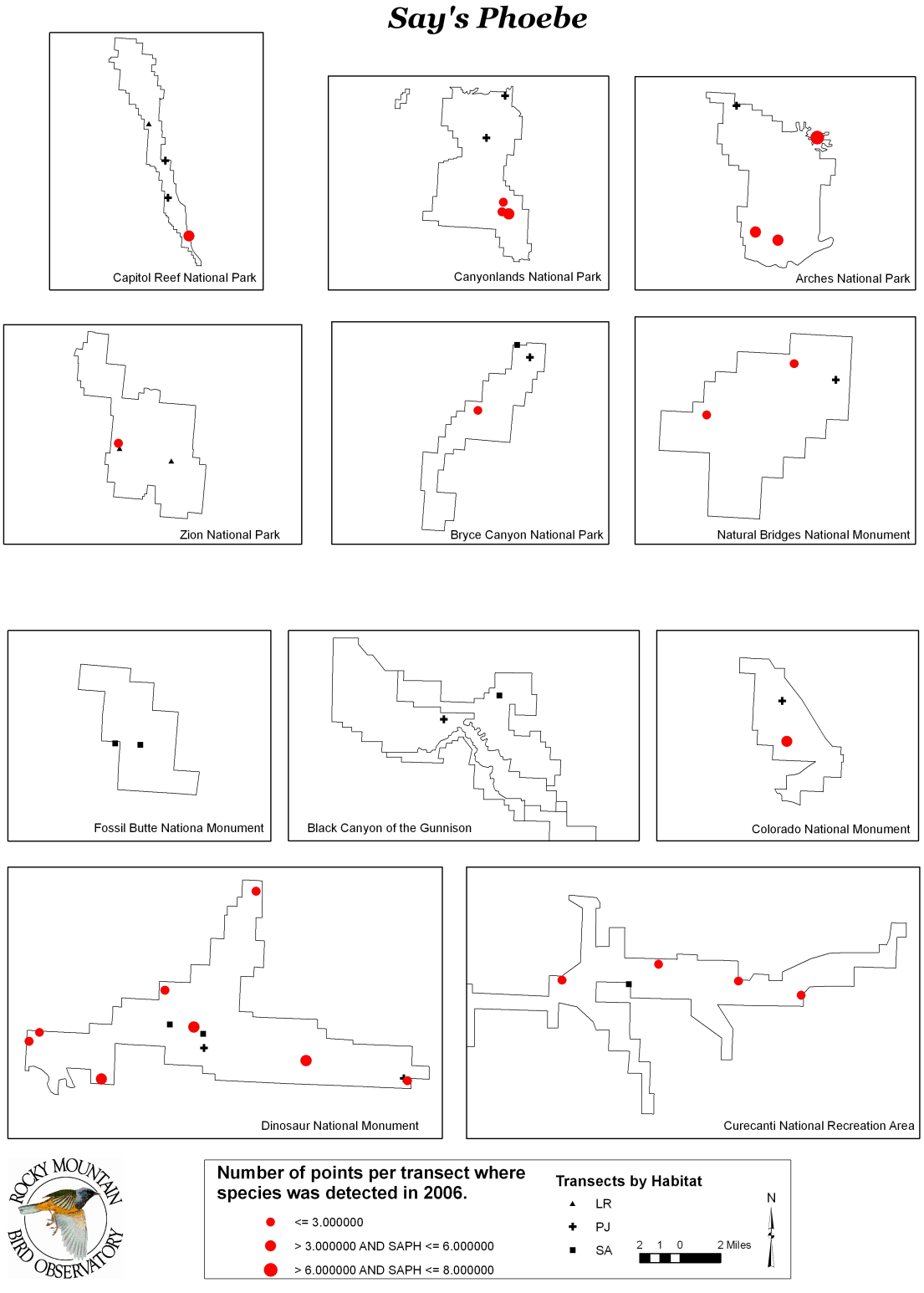
*PIF BCR 16 Species of Regional Stewardship

Say's Phoebes nest in niches and crevasses of cliffs and rocky outcrops in open shrubland habitats and along streams in those habitats (Righter et al. 2004). In 2006, we detected 98 individual Say's Phoebes in three habitats on NCPN transects. This species arrives on its breeding grounds earlier that most other migrants, and as a result, our surveys may miss the period when it is most actively singing. If our 2005 and 2006 surveys are an indication of the species' distribution and abundance, though, we should be able to monitor the Say's Phoebe in at least low-elevation riparian habitat in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Say's Phoebe on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	5.9	3.5	9.9	31%	62	67
Pinyon-Juniper	ID	--	--	--	--	15
Sage Shrubland	ID	--	--	--	--	16

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.



Point-count transect locations and detections of Say's Phoebes on transects in NCPN, 2006.

Loggerhead Shrike
(*Lanius ludovicianus*)

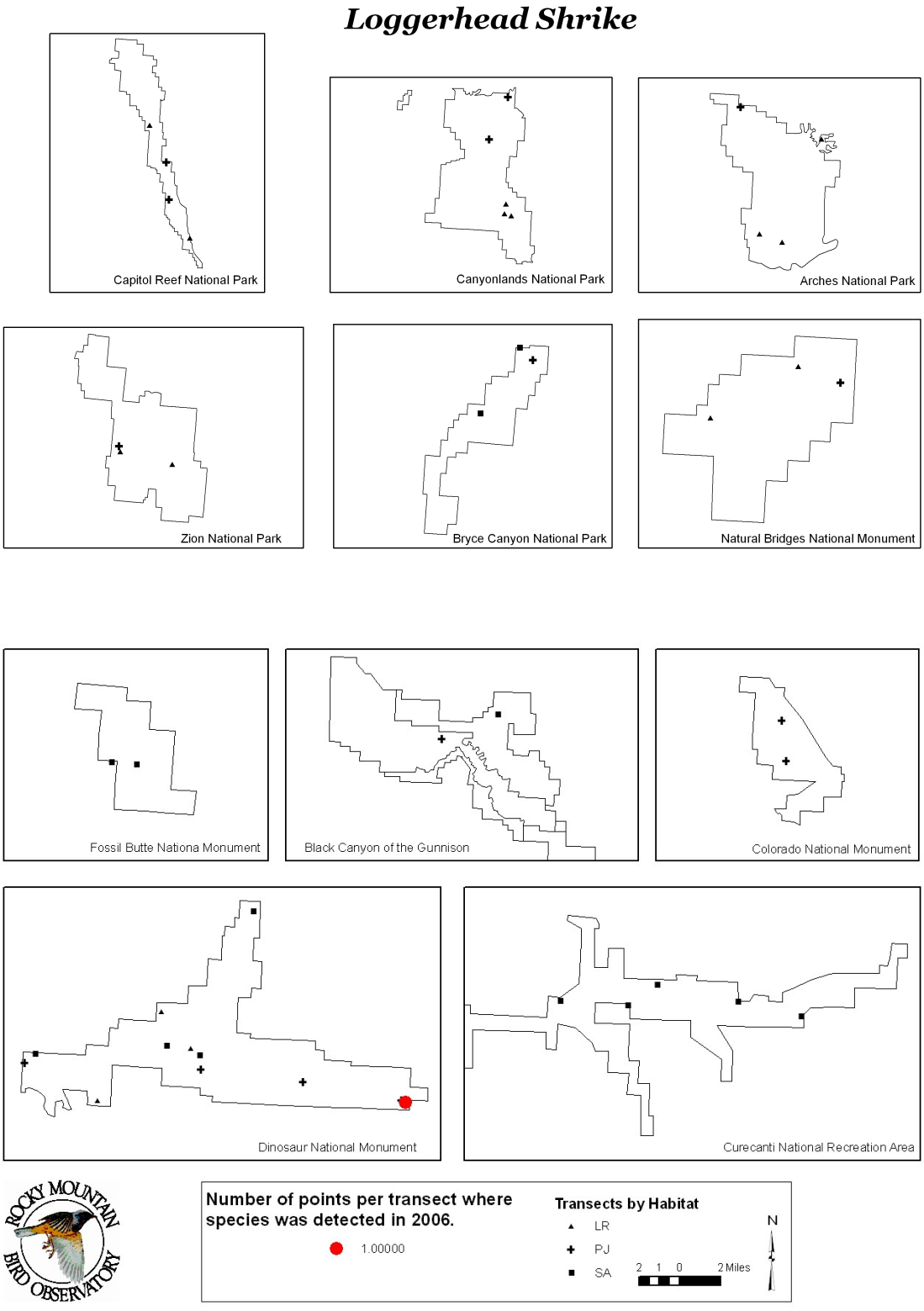
*PIF BCR 16 Species of Regional Concern
*PIF BCR 10 Species of Regional Concern
*USFWS Region 6 Bird of Conservation Concern

On the Colorado Plateau, Loggerhead Shrikes nest sparsely in desert shrublands (Righter et al. 2004). In 2006, we detected only one Loggerhead Shrike on NCPN transects. If our 2005 and 2006 surveys are an indication of the species' distribution and abundance, we will not be able to monitor the Loggerhead Shrike in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Loggerhead Shrike on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Sage Shrubland	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.



Point-count transect locations and detections of Loggerhead Shrikes on transects in NCPN, 2006.

Gray Vireo
(*Vireo vicinior)*

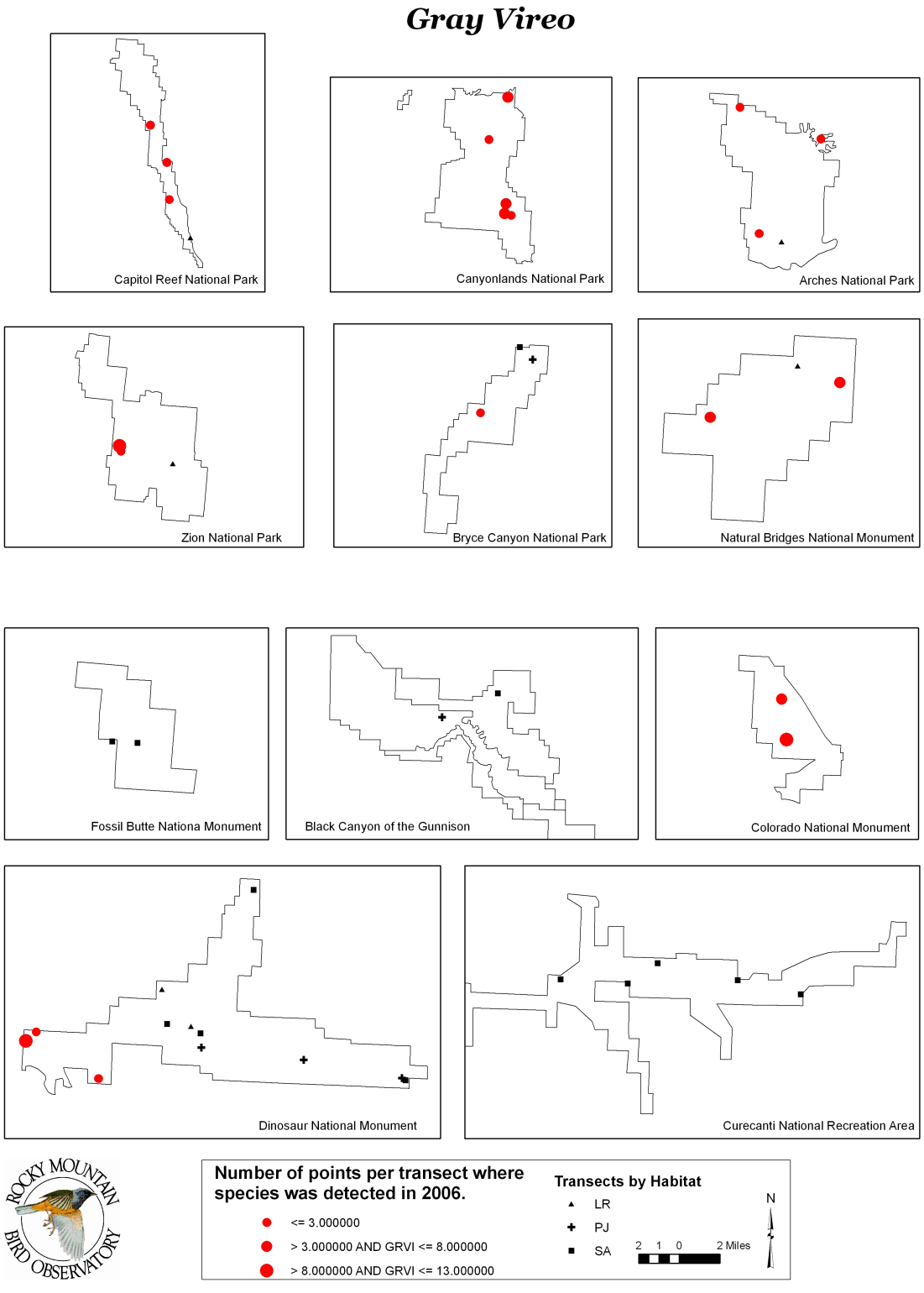
*PIF BCR 16 Species of Continental Concern, Regional Concern, and Regional Stewardship
*USFWS Region 6 Bird of Conservation Concern

Gray Vireos nest in arid pinyon-juniper habitat usually with a deciduous shrub component (Righter et al. 2004). In 2006, we detected 127 individual Gray Vireos in three habitats on NCPN transects. Most of our detections of Gray Vireos on NCPN transects were from pinyon-juniper habitat. The detections from low-elevation riparian and sage shrubland habitats were always associated with nearby pinyon-juniper. If our 2005 and 2006 surveys are an indication of the species' distribution and abundance, we should be able to monitor the Gray Vireo in pinyon-juniper habitat in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Gray Vireo on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	3.0	1.4	6.7	49%	34	38
Pinyon-Juniper	5.8	3.0	11	40%	75	83
Sage Shrubland	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.



Point-count transect locations and detections of Gray Vireos on transects in NCPN, 2006.

Plumbeous Vireo
(*Vireo plumbeus)*

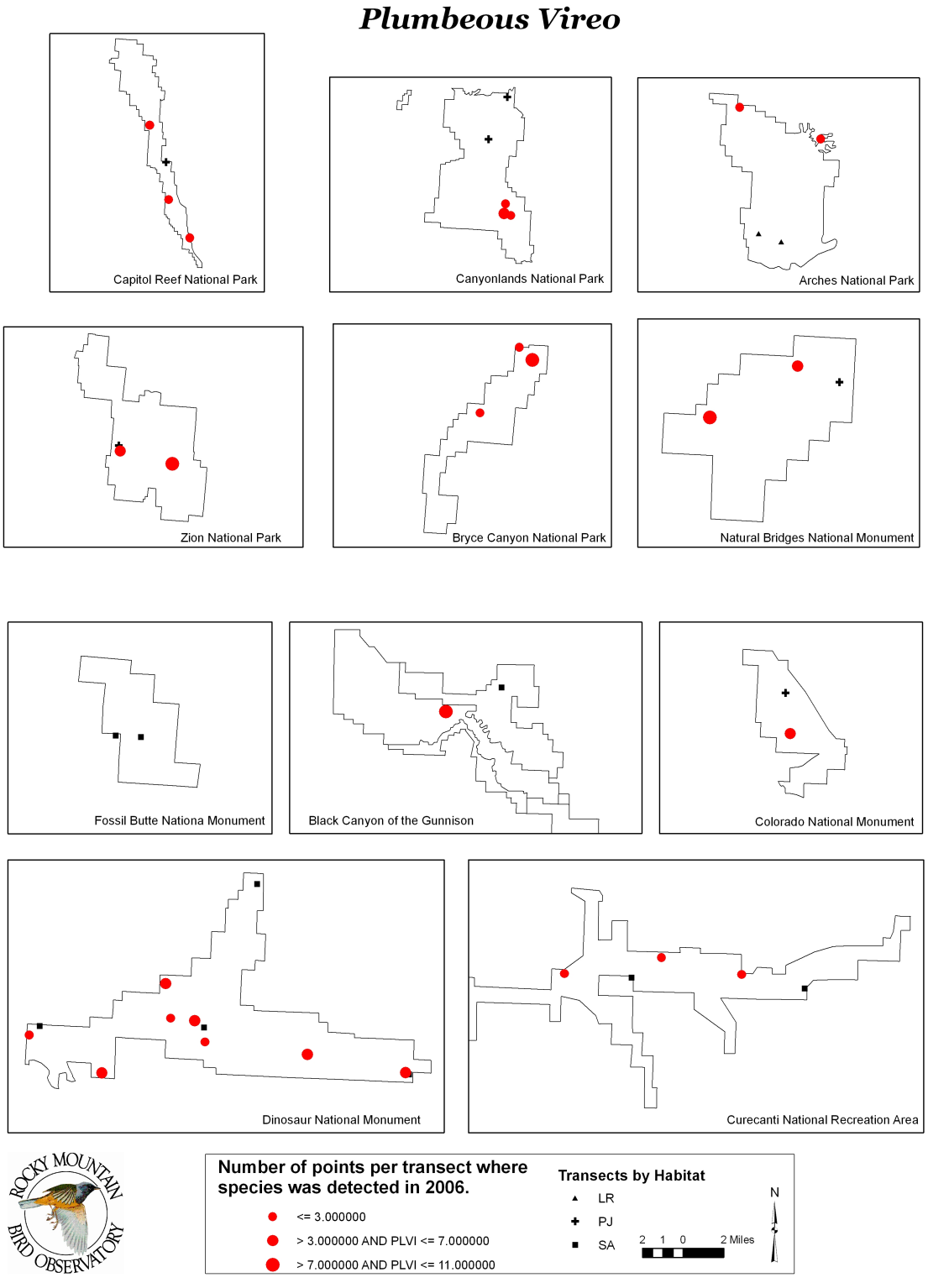
*PIF BCR 16 Species of Regional Stewardship

Plumbeous Vireos commonly nest throughout the Colorado Plateau region on ridges, mesas, mountain slopes, and plateaus. They nest most often in pinyon-juniper woodlands where they prefer the taller, denser stands. They also less frequently nest in riparian cottonwood habitats (Righter et al. 2004). In 2006, we detected 165 individual Plumbeous Vireos in three habitats on NCPN transects. If our 2005 and 2006 surveys are an indication of the species' distribution and abundance, we should be able to monitor the Plumbeous Vireo in low-elevation riparian and pinyon-juniper habitats in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Plumbeous Vireo on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	37	15	46	34%	84	93
Pinyon-Juniper	4.0	2.1	8.1	41%	59	61
Sage Shrubland	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.



Point-count transect locations and detections of Plumbeous Vireos on transects in NCPN, 2006.

Warbling Vireo
(*Vireo gilvus*)

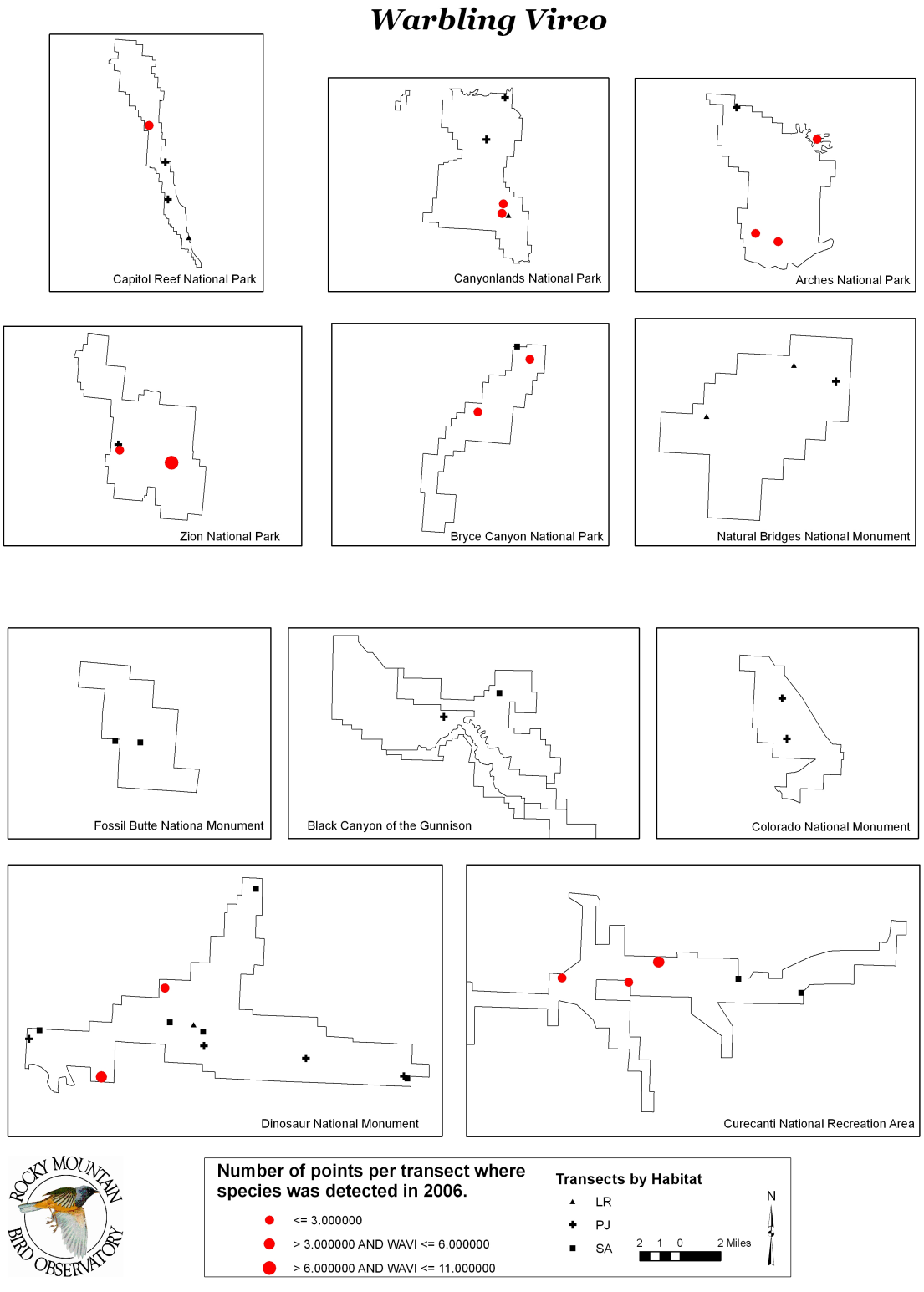
*PIF BCR 16 Species of Regional Stewardship

Warbling Vireos nest in a variety of habitats, including pinyon-juniper, and cottonwood galleries in riparian habitat (Righter et al. 2004). In 2006, we detected 58 individual Warbling Vireos in three habitats on NCPN transects. Although Warbling Vireos will breed in the low elevations of NCPN, it is much more common in higher-elevation deciduous forests. Given the specific habitat requirements of the Warbling Vireo, it is unlikely we will be able to monitor the species in any of the habitats that we currently survey in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Warbling Vireo on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	9.4	4.5	20	44%	41	47
Pinyon-Juniper	ID	--	--	--	--	1
Sage Shrubland	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.



Point-count transect locations and detections of Warbling Vireos on transects in NCPN, 2006.

Pinyon Jay

(*Gymnorhinus cyanocephalus)*

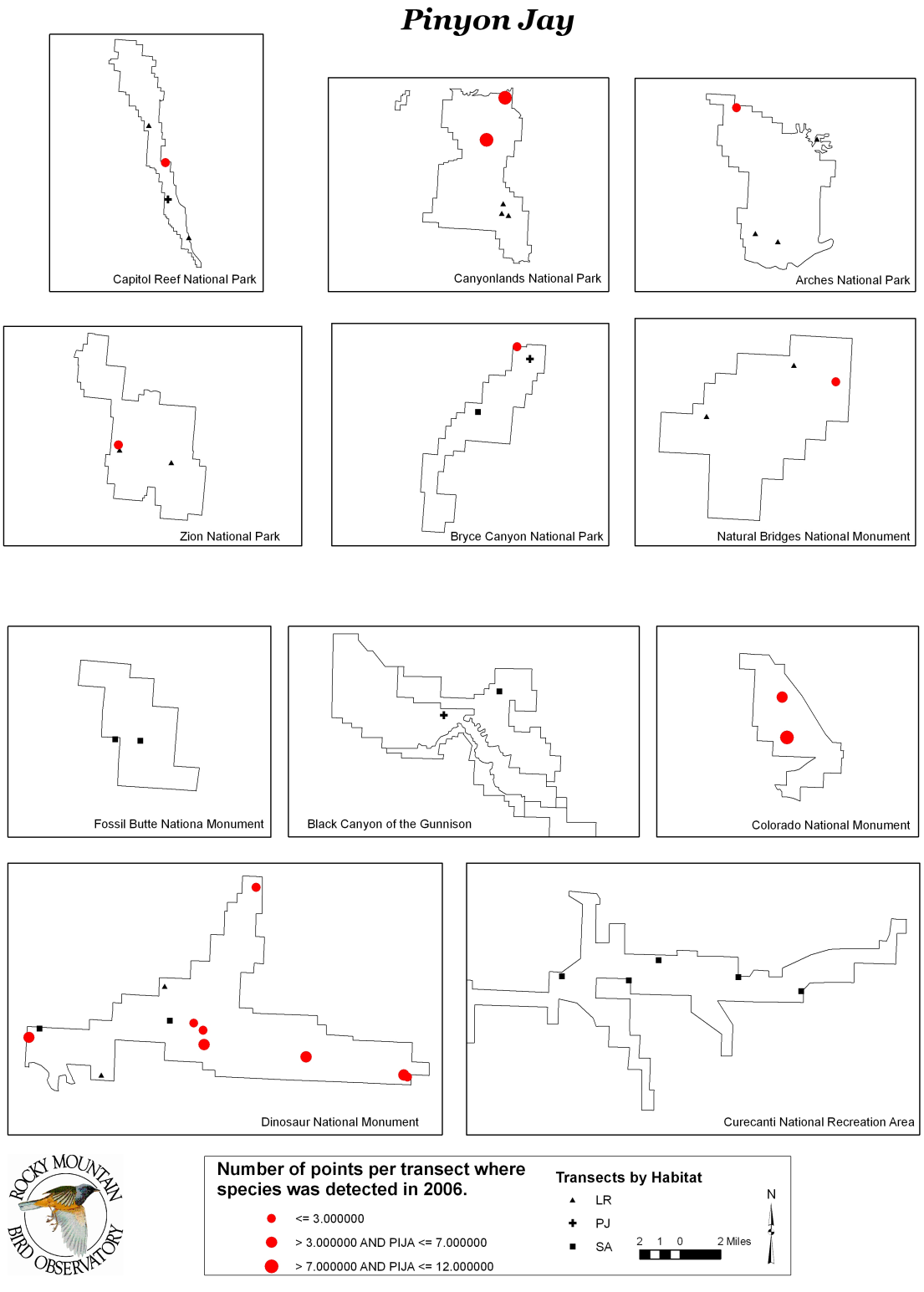
*PIF BCR Species of Continental Concern, Continental Stewardship, Regional Concern, and Regional Stewardship
*PIF BCR 10 Species of Continental Concern

Pinyon Jays are rarely found in habitats other than pinyon juniper. They are important for the overall health of pinyon forests as they cache (basically planting) large amounts of seeds. They frequently travel in large flocks, and it is rare to detect a single individual (Righter et al. 2004). In 2006, we detected 177 individual Pinyon Jays in three habitats on NCPN transects. If our 2005 and 2006 transects are an indication of the species' distribution and abundance, we should be able to monitor the Pinyon Jay in pinyon-juniper habitat in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Pinyon Jay on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	ID	--	--	--	--	1
Pinyon-Juniper	2.9	1.5	5.6	39%	93	151
Sage Shrubland	ID	--	--	--	--	25

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.



Point-count transect locations and detections of Pinyon Jays on transects in NCPN, 2006.

Clark's Nutcracker
(*Nucifraga columbiana*)

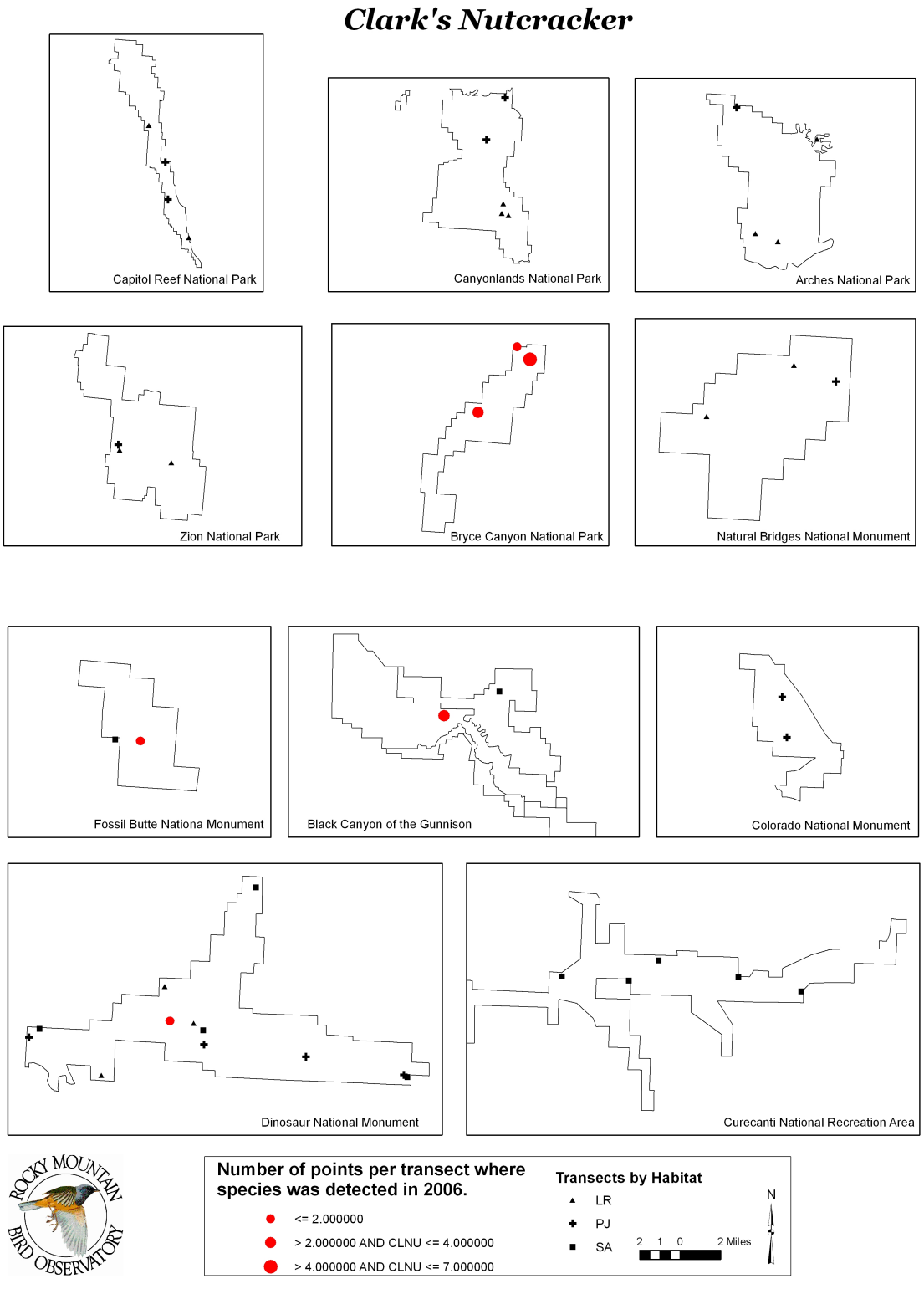
*PIF BCR 16 Species of Continental Stewardship and Regional Stewardship
*PIF BCR 10 Species of Continental Stewardship and Regional Stewardship

On the Colorado Plateau, Clark's Nutcrackers nest on mountain slopes and mesa tops, usually above 6,000 feet (Righter et al 2004). They travel long distances in search of food, which may explain our detections of the species in low elevations in the NCPN. In 2006, we detected 29 individual Clark's Nutcrackers in two habitats on NCPN transects. Clark's Nutcrackers typically breed in habitats that are higher than those that we survey on NCPN transects. Our detections were insufficient to calculate a density estimate in any habitat. It is unlikely that we will be able to monitor the species in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Clark's Nutcracker on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Pinyon-Juniper	ID	--	--	--	--	18
Sage Shrubland	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.



Point-count transect locations and detections of Clark's Nutcrackers on transects in NCPN, 2006.

Black-billed Magpie
(*Pica hudsonia*)

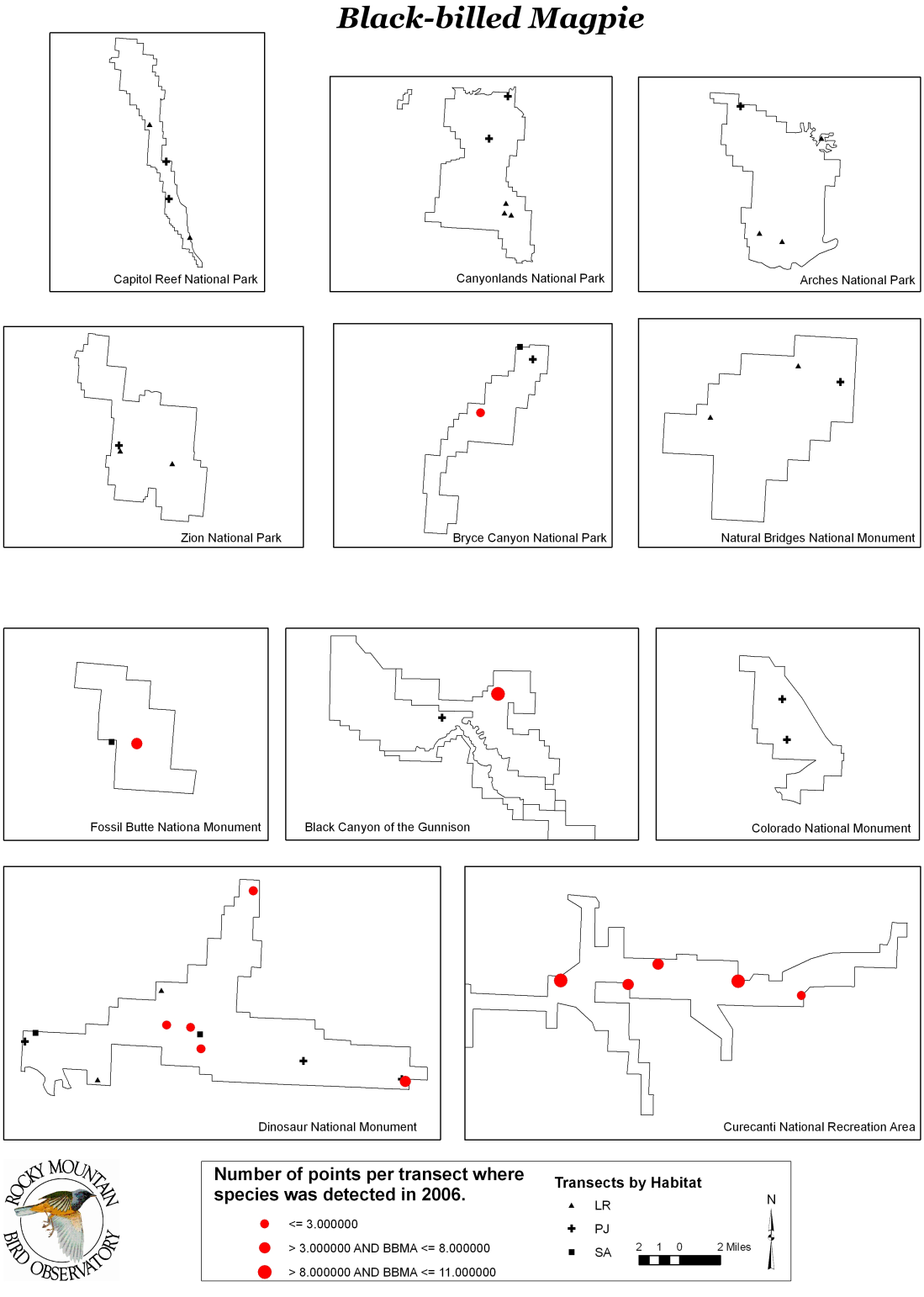
*PIF BCR 16 Species of Regional Stewardship

Black-billed Magpies occur throughout the Colorado Plateau region. Since they require a supply of mud to construct nests, they are most often found near water sources. They have adapted well to human disturbances, though, and are also often seen near development, particularly roads, where they forage for road-kill and refuse (Righter et al 2004). In 2006, we detected 122 individual Black-billed Magpies in 3 habitats on NCPN transects. Almost all of the detections were in sage shrubland habitat. Most of the detections, though, were from individuals in bordering habitats such as pinyon-juniper and riparian. If our 2005 and 2006 transects are an indication of the species' distribution and abundance, we should be able to monitor the Black-billed Magpie in at least one habitat in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Black-billed Magpie on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	ID	--	--	--	--	1
Pinyon-Juniper	ID	--	--	--	--	3
Sage Shrubland	2.3	1.4	3.7	30%	95	118

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.



Point-count transect locations and detections of Black-billed Magpies on transects in NCPN, 2006.

Violet-green Swallow
(*Tachycineta thalassina)*

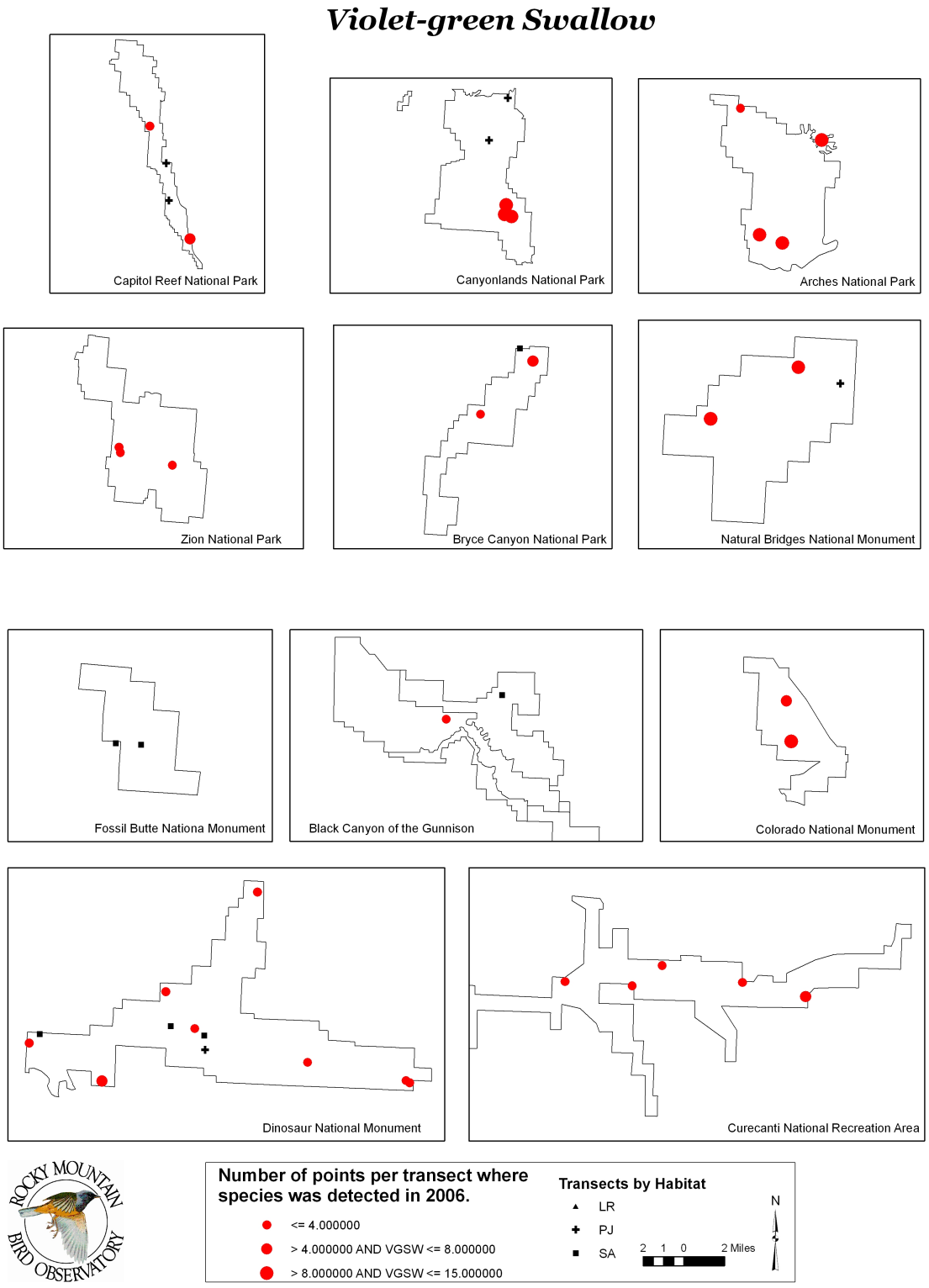
*PIF BCR 16 Species of Regional Stewardship

Violet-green Swallows often nest on cliffs, sometimes near White-throated Swifts. They will also nest in aspen stands or in ponderosa pine snags, often in association with Tree Swallows (Righter et al. 2004). In 2006, we detected 514 individual Violet-green Swallows in three habitats on NCPN transects. If our 2005 and 2006 transects are an indication of the species' distribution and abundance, we should be able to monitor the Violet-green Swallow in low-elevation riparian and pinyon-juniper habitats in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Violet-green Swallow on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	181	118	278	26%	198	389
Pinyon-Juniper	9.4	4.2	21	49%	61	77
Sage Shrubland	3.1	1.5	6.1	42%	35	48

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.



Point-count transect locations and detections of Violet-green Swallows on transects in NCPN, 2006.

Juniper Titmouse
(*Baeolophus ridgwayi)*

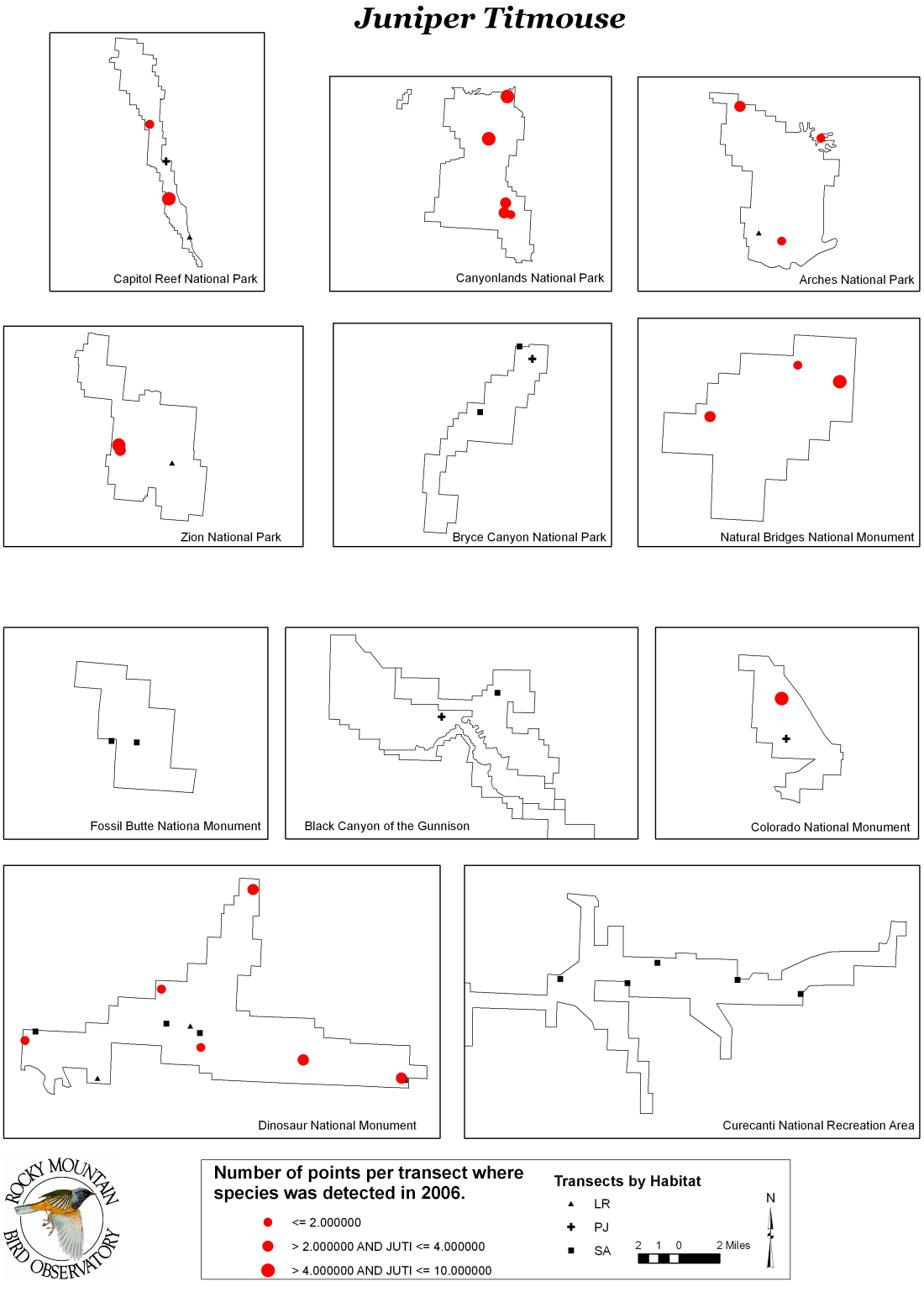
*PIF BCR 16 Species of Regional Concern

Common birds of the Colorado Plateau region, Juniper Titmice nest in knotholes or other natural cavities that occur abundantly in junipers (Righter et al. 2004). They begin nesting in early May, before most of our field work begins, so our detections of the species may not accurately represent its actual abundance in the NCPN. In 2006, we detected 120 individual Juniper Titmice in three habitats on NCPN transects. If our 2005 and 2006 transects are an indication of the species' distribution and abundance, we should be able to monitor the Juniper Titmouse in pinyon-juniper habitat and perhaps in low-elevation riparian habitat in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Juniper Titmouse on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	13	7.0	24	37%	23	30
Pinyon-Juniper	38	19	76	43%	71	83
Sage Shrubland	ID	--	--	--	--	7

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.



Point-count transect locations and detections of Juniper Titmice on transects in NCPN, 2006.

Pygmy Nuthatch
(*Sitta pygmaea*)

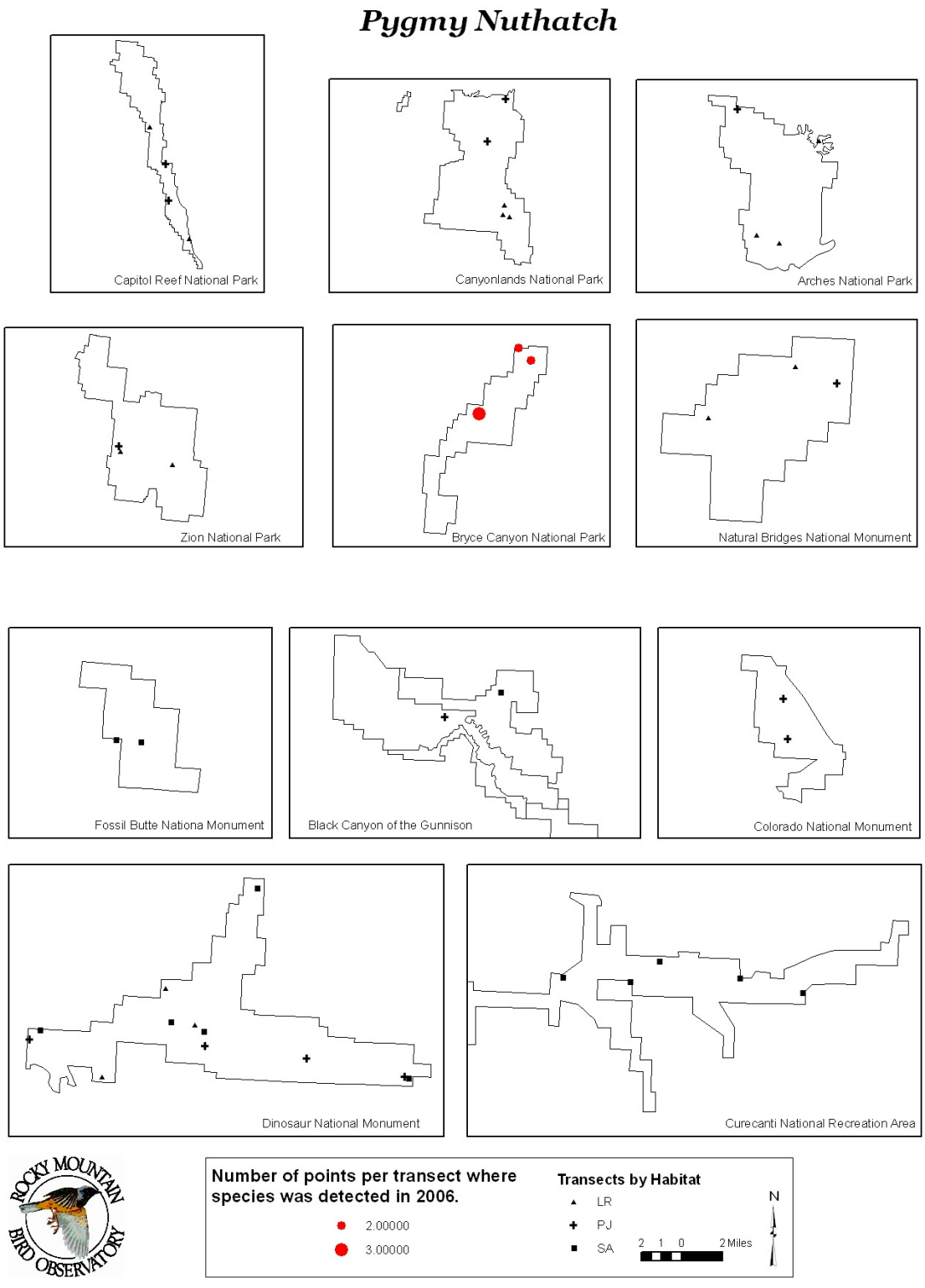
*PIF BCR 16 Species of Regional Concern

Pygmy Nuthatches are closely associated with ponderosa pine. Sometimes they will use other habitats, especially pinyon-juniper, but invariably these are within a short distance of ponderosa pine (Righter et al. 2004). In 2006, we detected 10 individual Pygmy Nuthatches in two habitats on NCPN transects. All of our detections of the species were from ponderosa pine bordering the habitats that we were surveying. Given the specific habitat requirements of the Pygmy Nuthatch, it is unlikely we will be able to monitor the species in any of the habitats that we currently survey in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Pygmy Nuthatch on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Pinyon-Juniper	ID	--	--	--	--	2
Sage Shrubland	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.



Point-count transect locations and detections of Pygmy Nuthatches on transects in NCPN, 2006.

Rock Wren
(*Salpinctes obsoletus)*

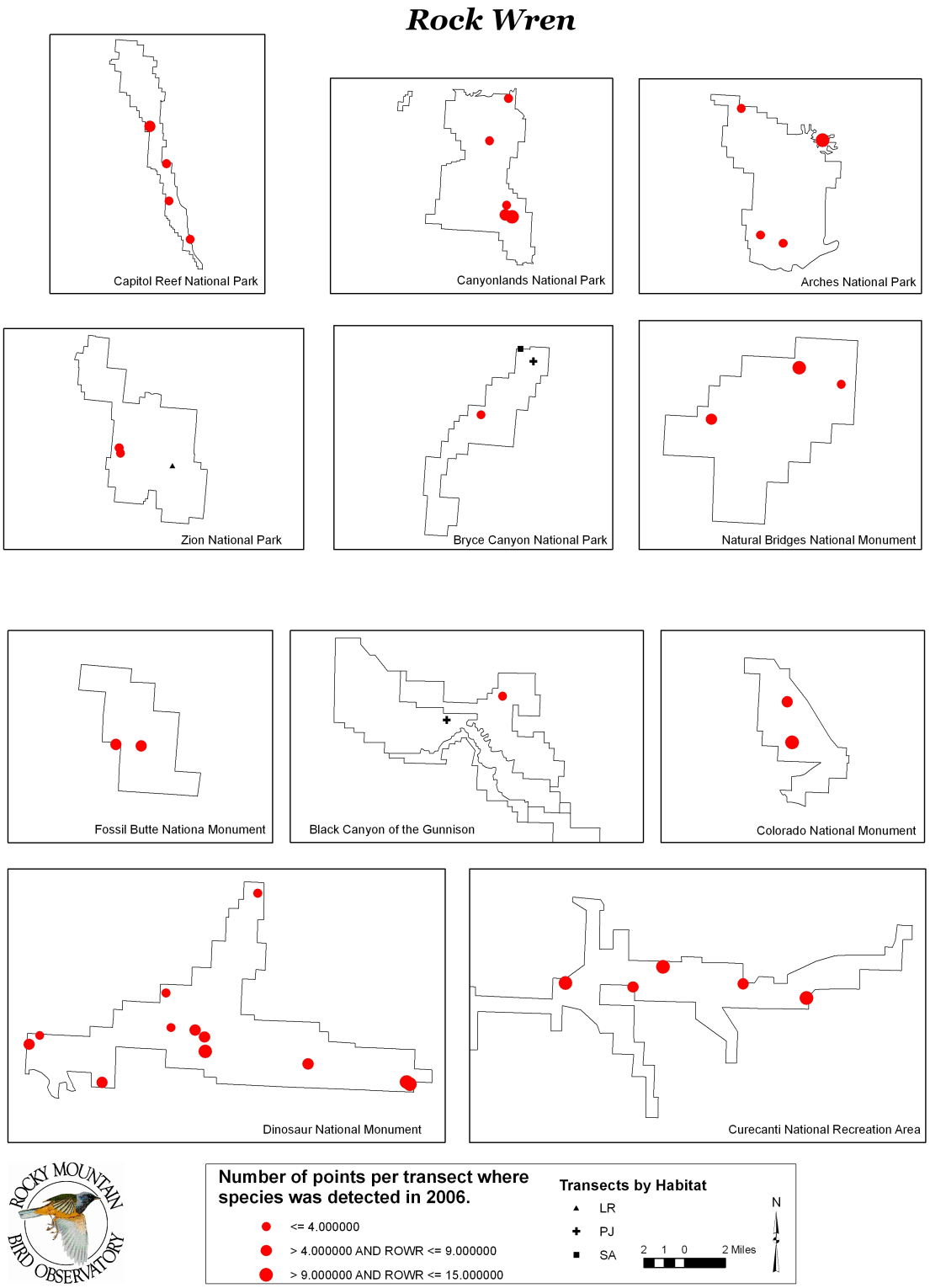
*PIF BCR 16 Species of Regional Stewardship

Rock Wrens typically inhabit rocky outcrops and slopes in open areas (Righter et al. 2004). In 2006, we detected 403 individual Rock Wrens in three habitats on NCPN transects. We detected the species in large numbers in all habitats that we surveyed in the NCPN. If 2005 and 2006 transects are an indication of the species' distribution and abundance, we should be able to monitor the Rock Wren in all three habitats that we survey in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Rock Wren on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	11	7.2	18	27%	104	109
Pinyon-Juniper	3.3	1.9	5.6	33%	104	116
Sage Shrubland	4.9	2.9	8.3	31%	160	178

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.



Point-count transect locations and detections of Rock Wrens on transects in NCPN, 2006.

Canyon Wren
(*Catherpes mexicanus)*

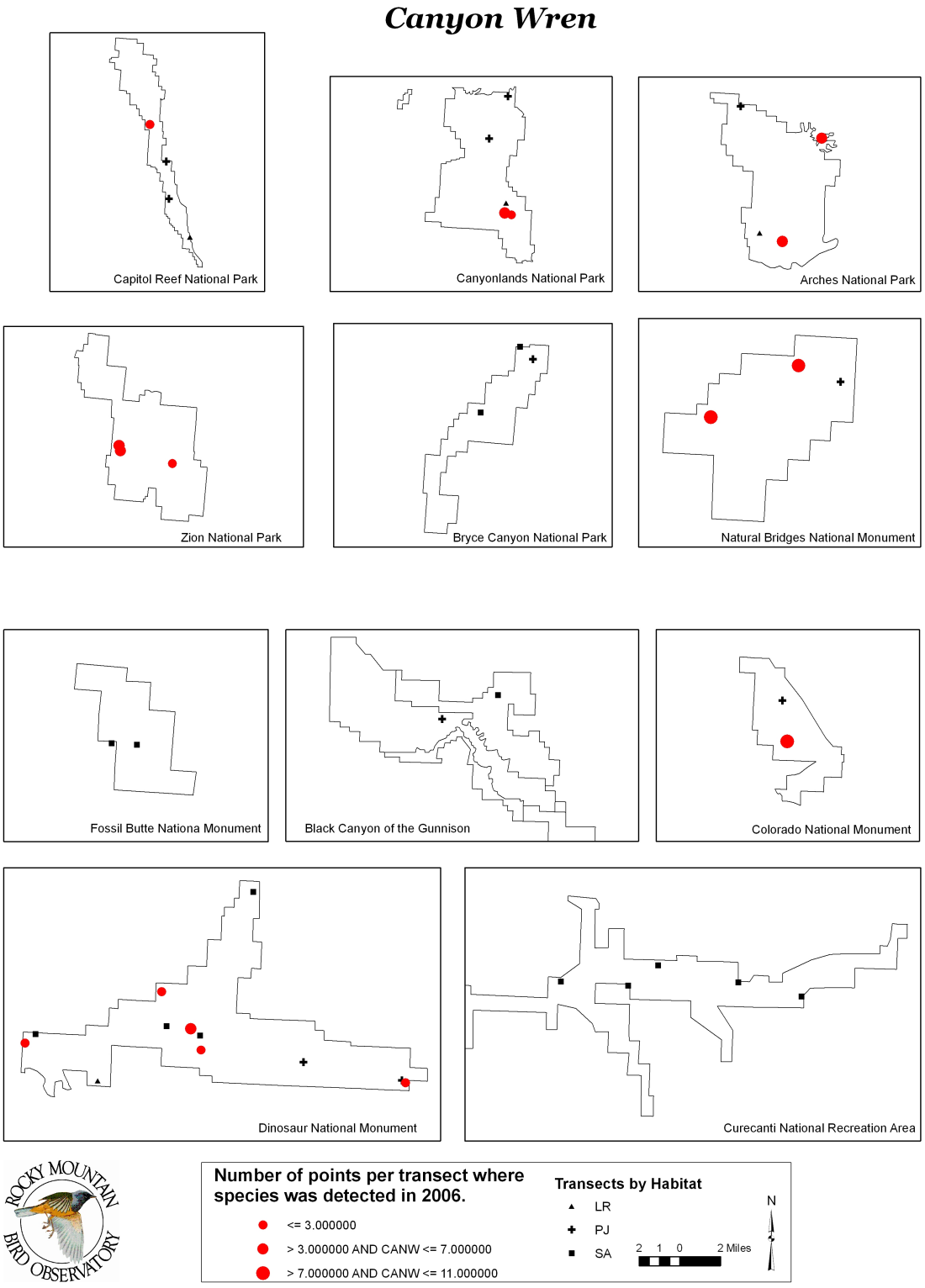
*PIF BCR 16 Species of Regional Concern

Canyon Wrens nest throughout the Colorado Plateau region on high cliffs, generally near streams or rivers, which carve out the canyons that they prefer (Righter et al. 2004). In 2006, we detected 105 individual Canyon Wrens in three habitats on NCPN transects. Most of our detections of Canyon Wrens were in low-elevation riparian habitat, where the steep canyon walls that the species prefers are prevalent. If 2005 and 2006 transects are an indication of the species distribution and abundance, we should be able to monitor the Canyon Wren in low-elevation riparian habitat in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Canyon Wren on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	3.1	1.8	5.1	30%	67	74
Pinyon-Juniper	0.3	0.1	0.7	63%	26	29
Sage Shrubland	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.



Point-count transect locations and detections of Canyon Wrens on transects in NCPN, 2006.

Bewick's Wren

(*Thryomanes bewickii*)

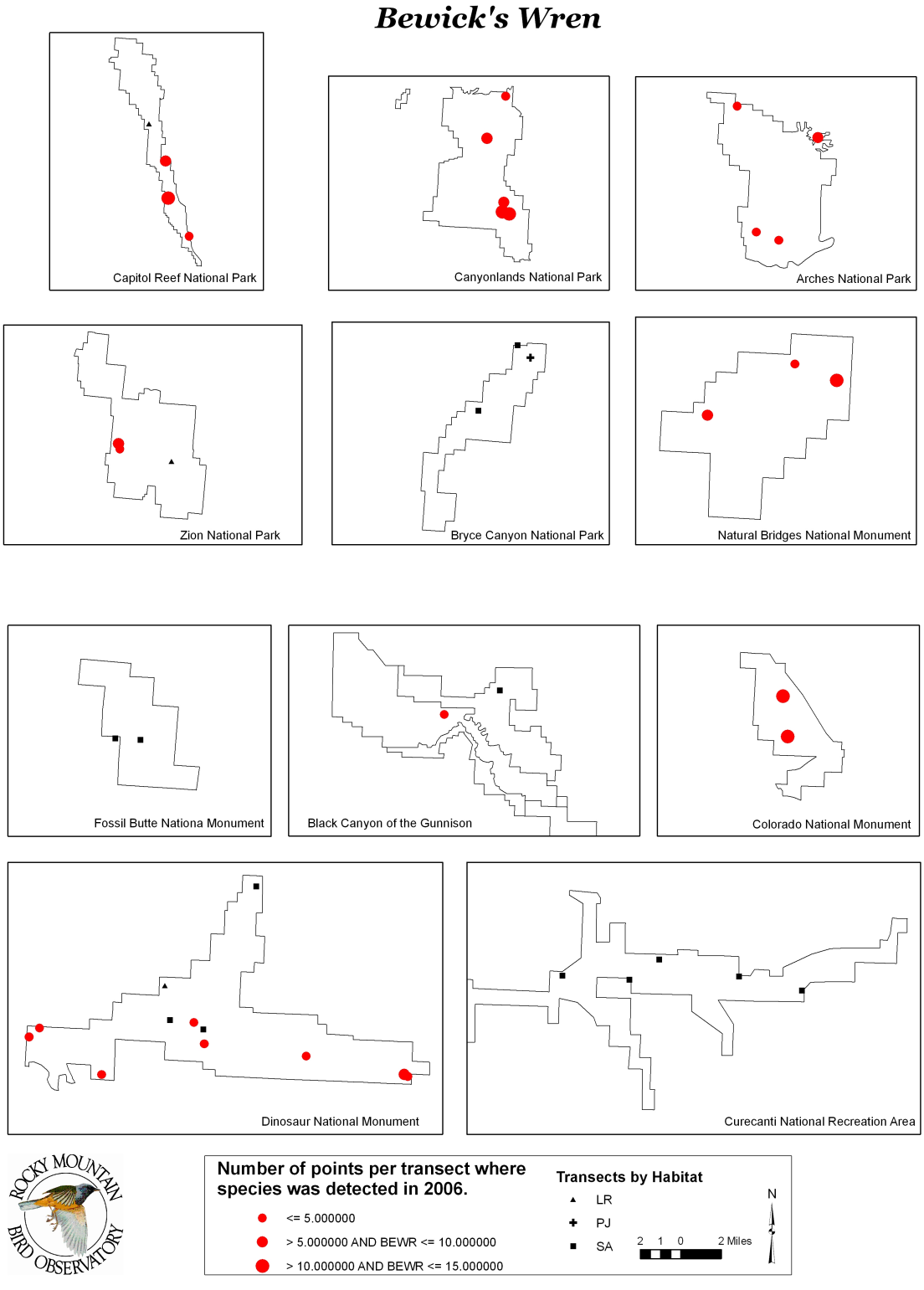
*USFWS Region 6 Bird of Conservation Concern

Bewick's Wrens occur throughout most of the Colorado Plateau region and breed in a variety of habitats that contain brush (Righter et al. 2004). The species was detected in greatest numbers in pinyon-juniper habitat, but was also common in low-elevation riparian habitat. In 2006, we detected 307 individual Bewick's Wrens in three habitats on NCPN transects. If our 2005 and 2006 transects are an indication of the species' distribution and abundance, we should be able to monitor the Bewick's Wren in both low-elevation riparian and pinyon-juniper habitats in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Bewick's Wren on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	20	11	35	35%	106	114
Pinyon-Juniper	28	18	44	27%	168	188
Sage Shrubland	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.



Point-count transect locations and detections of Bewick's Wrens on transects in NCPN, 2006.

American Dipper
(*Cinclus mexicanus*)

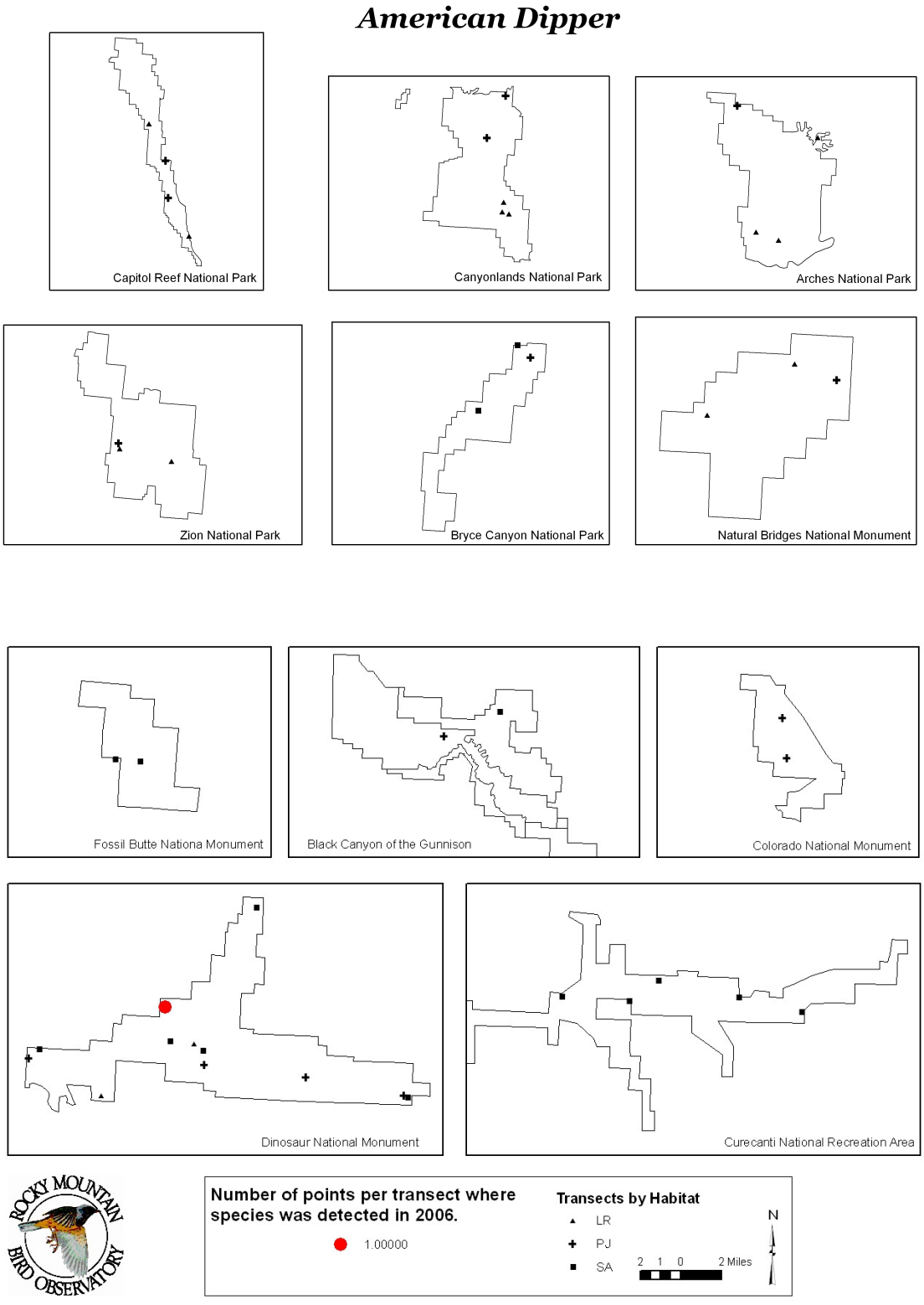
*PIF BCR 10 Species of Regional Stewardship

American Dippers nest along montane streams, normally at elevations of 7,000 to 11,000 feet. In the NCPN, they have been found on Jones Creek in Dinosaur National Monument. In 2006, we detected only one individual there. Given the species' habitat preferences, it is very unlikely that we will be able to obtain sufficient sample size to monitor the species in the NCPN. However, we should be able to determine site fidelity of the individuals that are detected, determine if more individuals are present in the NCPN, and possibly determine the species' breeding status in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the American Dipper on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	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.



Point-count transect locations and detections of American Dippers on transects in NCPN, 2006.

Western Bluebird
(*Sialia mexicana*)

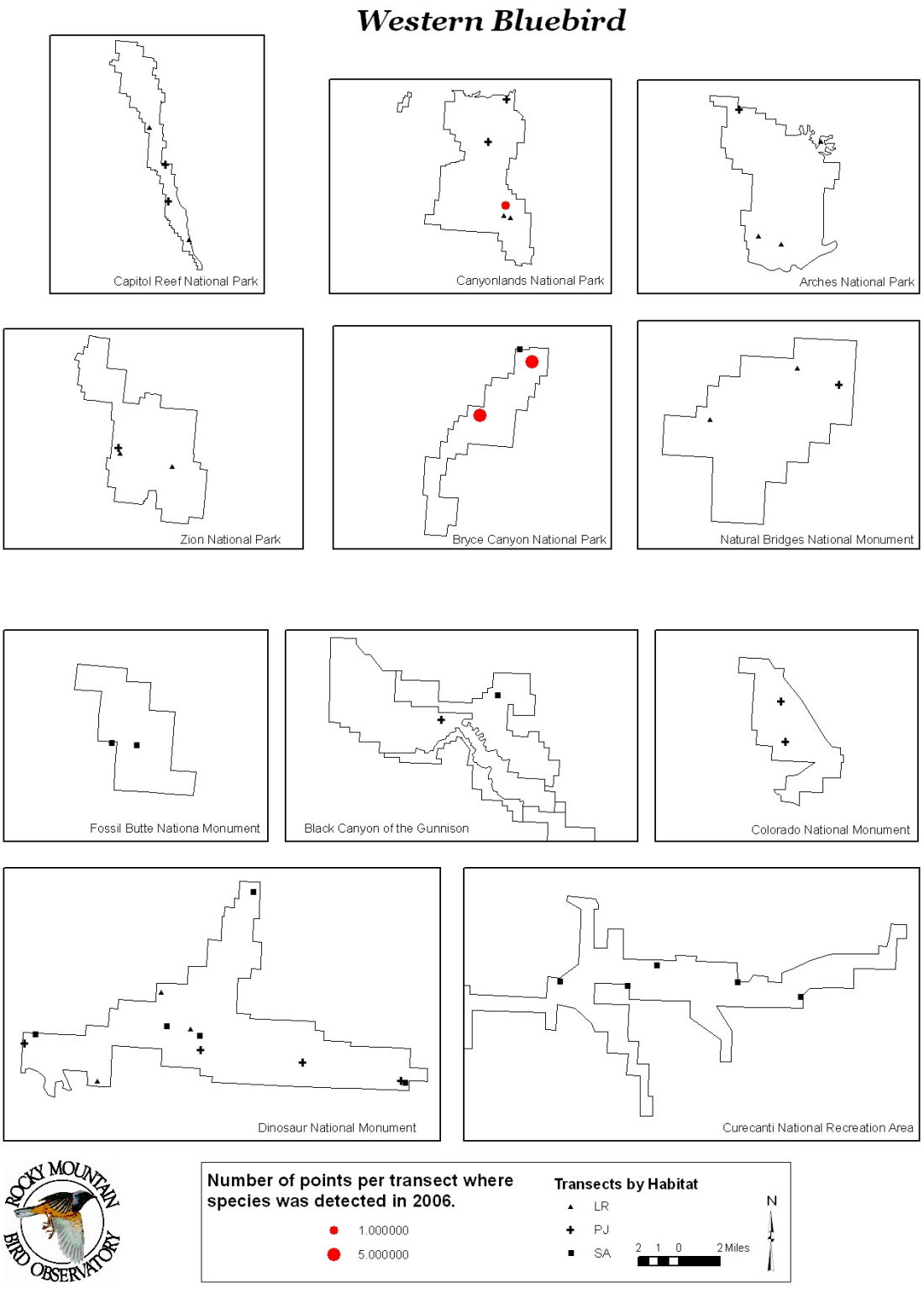
*PIF BCR 16 Species of Regional Stewardship

Western Bluebirds are cavity-nesters that prefer ponderosa pine forests but will also nest in pinyon-juniper habitat (Righter et al. 2004). In 2006, we detected 19 individual Western Bluebirds in three habitats on NCPN transects. Given the specific habitat requirements of the Western Bluebird, it is unlikely we will be able to monitor the species in any of the habitats that we currently survey in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Western Bluebird on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	ID	--	--	--	--	5
Pinyon-Juniper	ID	--	--	--	--	6
Sage Shrubland	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.



Point-count transect locations and detections of Western Bluebirds on transects in NCPN, 2006.

Mountain Bluebird
(*Salia currucoides)*

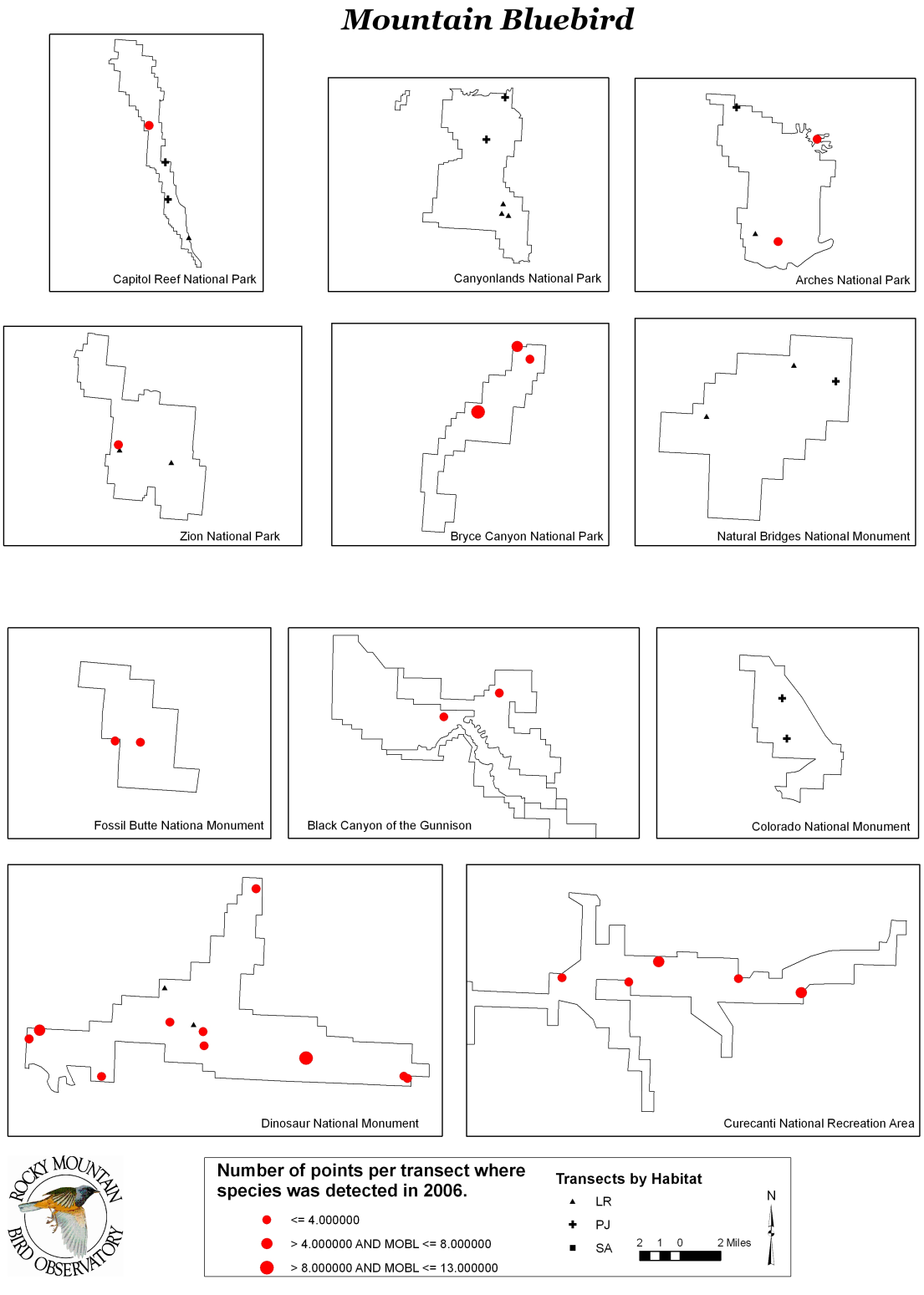
*PIF BCR 16 Species of Regional Concern, Continental Stewardship, and Regional Stewardship

Mountain Bluebirds are secondary cavity nesters that rely largely on cavities excavated by woodpeckers for nest sites (Righter et al 2004). In 2006, we detected 138 individual Mountain Bluebirds in three habitats on NCPN transects. While we detected the largest numbers of Mountain Bluebirds in sage shrubland habitat, most of those detections were related to bordering pinyon-juniper habitat. If our 2005 and 2006 transects are an indication of the species' distribution and abundance, we should be able to effectively monitor the Mountain Bluebird in pinyon-juniper and sage habitats in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Mountain Bluebird on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	ID	--	--	--	--	7
Pinyon-Juniper	10	3.1	34	78%	32	37
Sage Shrubland	5.9	3.9	8.7	24%	84	94

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.



Point-count transect locations and detections of Mountain Bluebirds on transects in NCPN, 2006.

Townsend's Solitaire
(*Myadestes townsendi)*

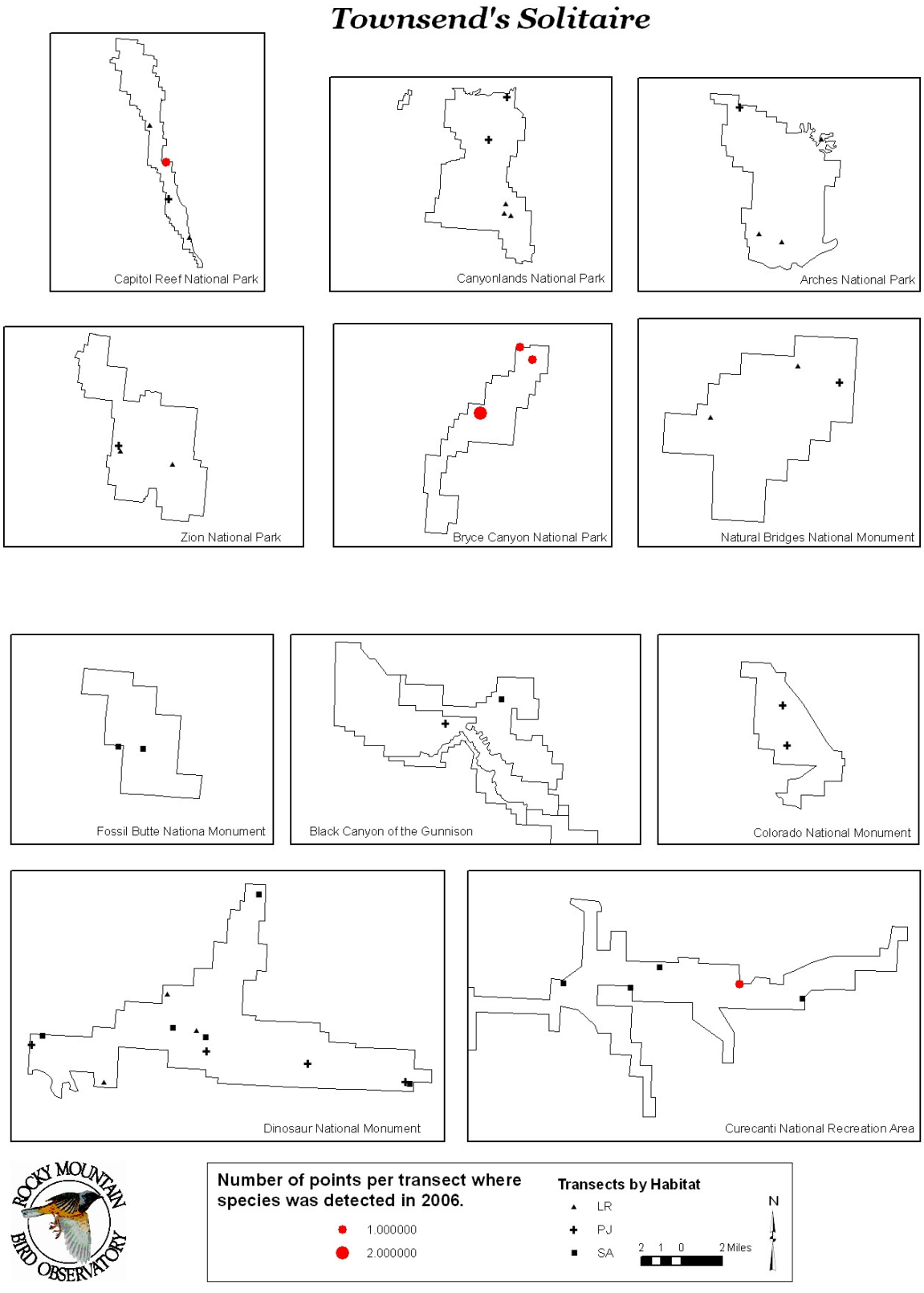
*PIF BCR 10 Species of Regional Stewardship

Townsend's Solitaires nest in all types of montane woodlands and forests. However, they generally prefer habitat higher in elevation than those that we sample in the NCPN. In 2006, we detected six individual Townsend's Solitaires in two habitat types. Given the species preference for montane habitats, it is unlikely that we will be able to monitor it on the NCPN in the habitats that we currently survey.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Townsend's Solitaire on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Pinyon-Juniper	ID	--	--	--	--	2
Sage Shrubland	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.



Point-count transect locations and detections of Townsend's Solitaires on transects in NCPN, 2006.

Virginia's Warbler
(*Vermivora virginiae)*

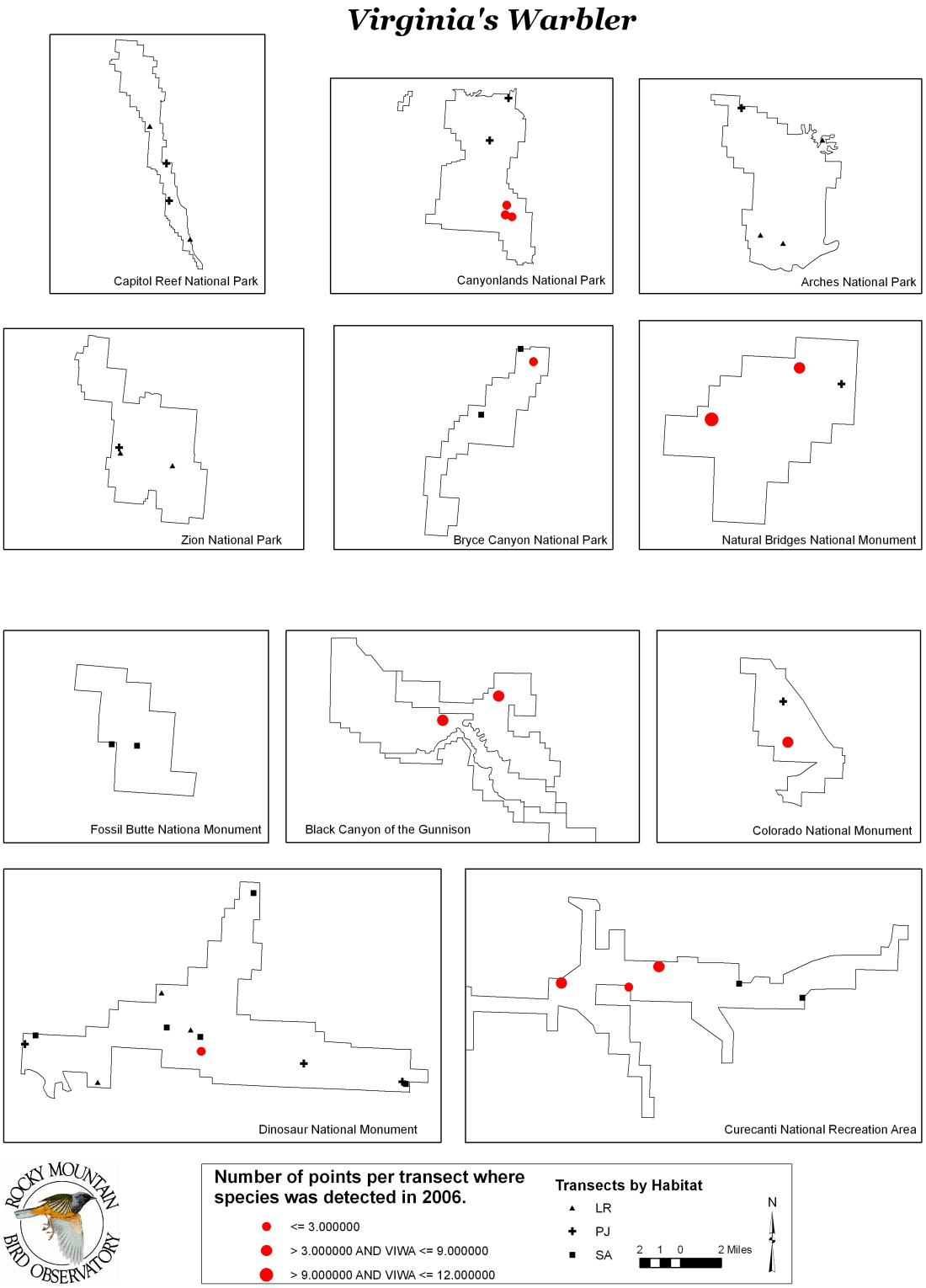
*PIF BCR 16 Species of Continental Concern, Regional Concern, and Regional Stewardship
*USFWS Region 6 Bird of Conservation Concern

Virginia's Warblers nest in dense shrublands, usually on the slopes of mesas and in open ravines (Righter et al. 2004). In 2006, we detected 109 individual Virginia's Warblers in three habitats on NCPN transects. If our 2005 and 2006 transects are an indication of the species' distribution and abundance, we may be able to monitor the Virginia's Warbler in all three habitats in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Virginia's Warbler on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	41	16	106	60%	39	41
Pinyon-Juniper	8.7	3.0	25	67%	34	36
Sage Shrubland	1.5	0.6	3.9	60%	29	32

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.



Point-count transect locations and detections of Virginia's Warblers on transects in NCPN, 2006.

Black-throated Gray Warbler
(*Dendroica nigrescens*)

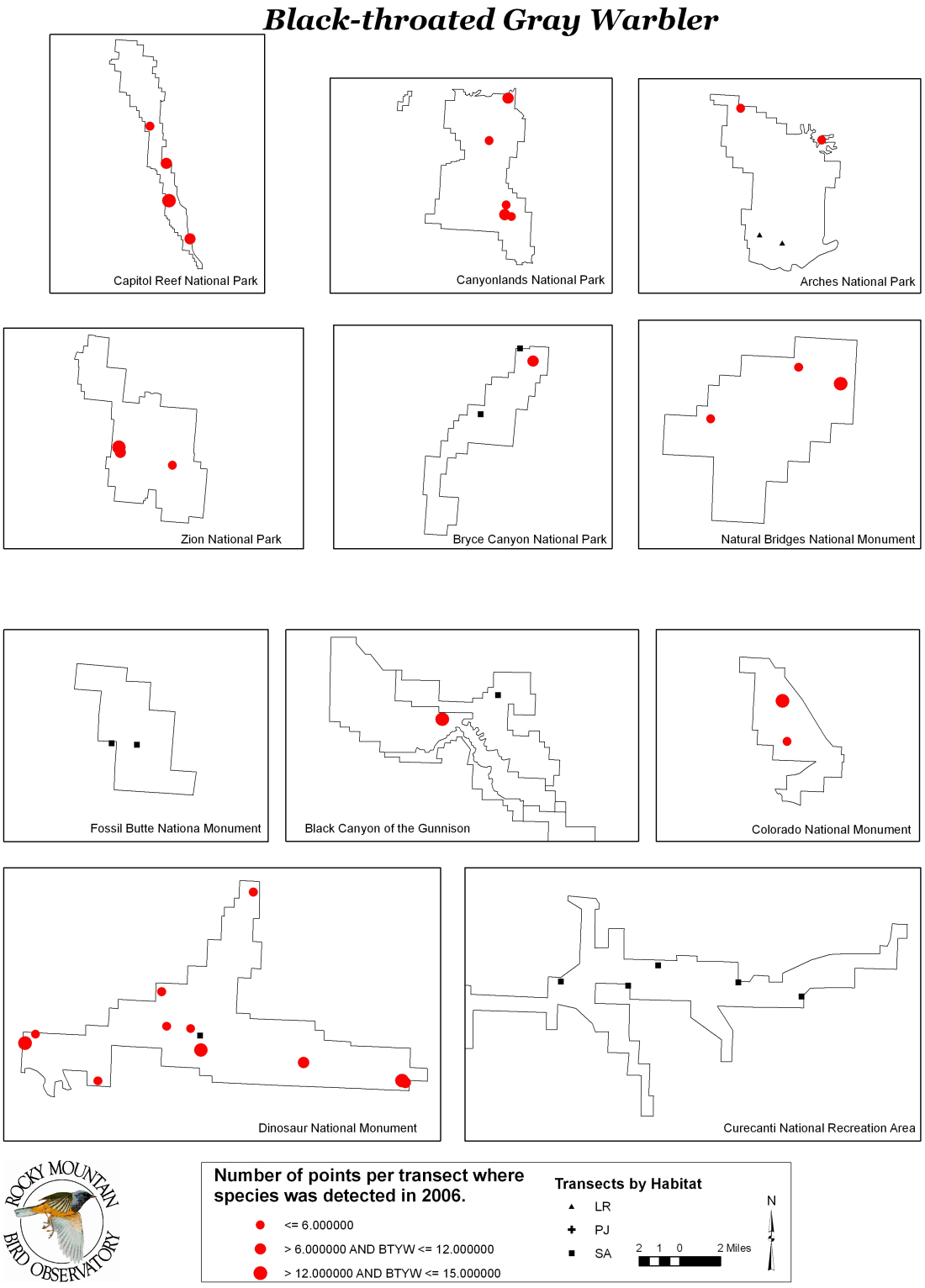
*PIF BCR 16 Species of Regional Concern

On the Colorado Plateau, Black-throated Gray Warblers prefer large stands of pinyon-dominated woodland. It is very rare to find the species outside of pinyon-juniper habitat during the breeding season (Righter et al 2004). In 2006, we detected 551 individual Black-throated Gray Warblers in three habitats on NCPN transects. In 2005 and 2006, the Black-throated Gray Warbler was the most abundant species in pinyon-juniper habitat in the NCPN. When the species was detected in either low-elevation riparian or sage shrubland habitat, there was always nearby pinyon-juniper habitat. We should have no problem monitoring the species in the NCPN. However, it should be noted that while we give density estimates for all three habitats, the estimates for sage shrubland and riparian are highly dependent upon pinyon-juniper stands bordering those habitats.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Black-throated Gray Warblers on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	19	12	31	30%	91	96
Pinyon-Juniper	80	58	110	19%	407	430
Sage Shrubland	1.6	0.6	4.6	67%	24	25

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.



Point-count transect locations and detections of Black-throated Gray Warblers on transects in NCPN, 2006.

Grace's Warbler
(*Dendroica graciae*)

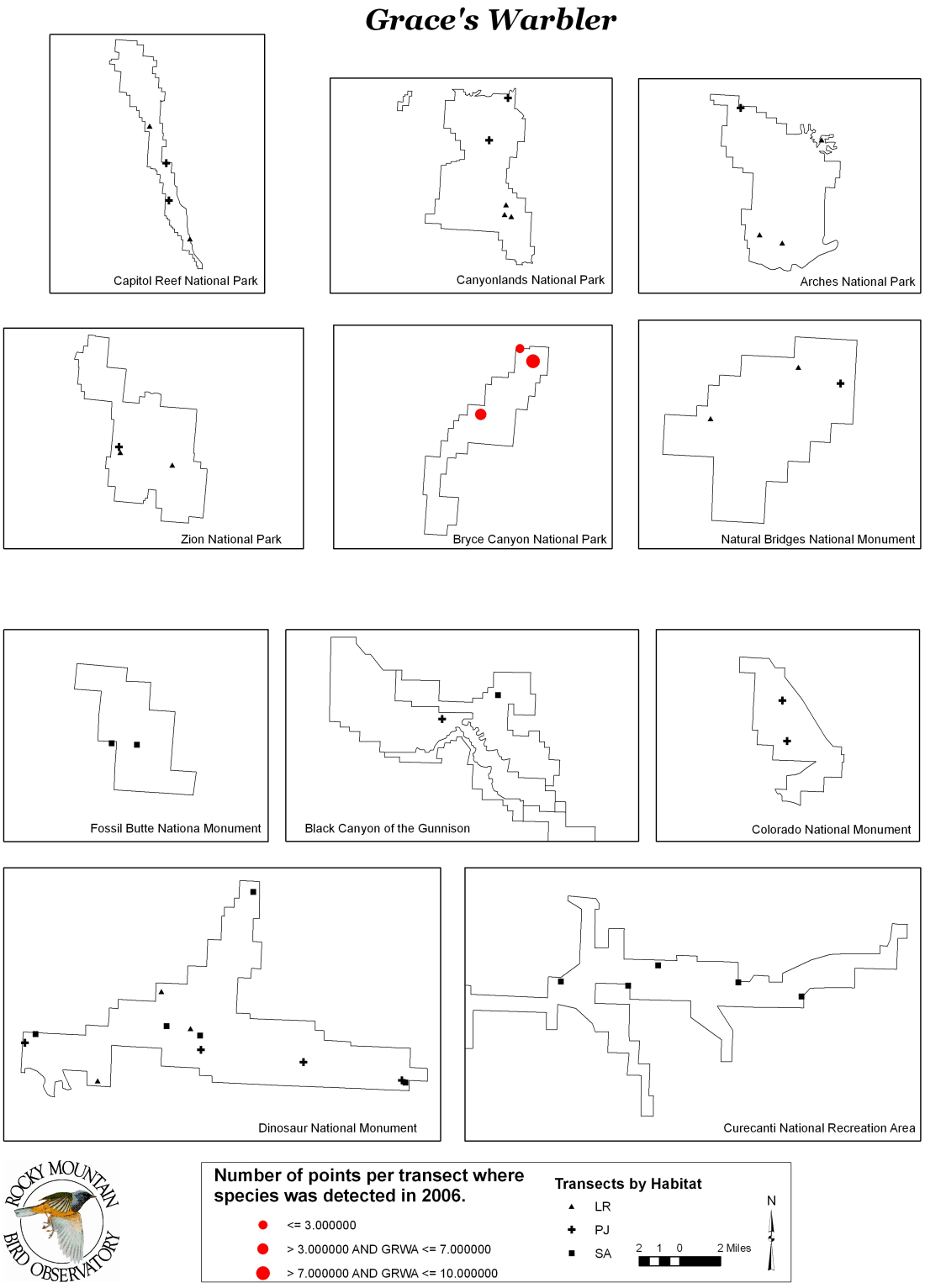
*PIF BCR 16 Species of Continental Concern and Regional Concern

Grace's Warblers nest in open, mature ponderosa pine forests that typically have understories of scrub oak (Righter et al. 2004). In 2006, we detected 31 individual Grace's Warblers in two habitats on NCPN transects. All of our detections of this species were from ponderosa pine stands bordering our sage shrubland and pinyon-juniper transects. Given this species' habitat requirements, it is unlikely that we will be able to monitor it in any of the habitats that we currently survey in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Grace's Warbler on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Pinyon-Juniper	ID	--	--	--	--	16
Sage Shrubland	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.



Point-count transect locations and detections of Grace's Warblers on transects in NCPN, 2006.

Common Yellowthroat
(*Geothlpis trichas)*

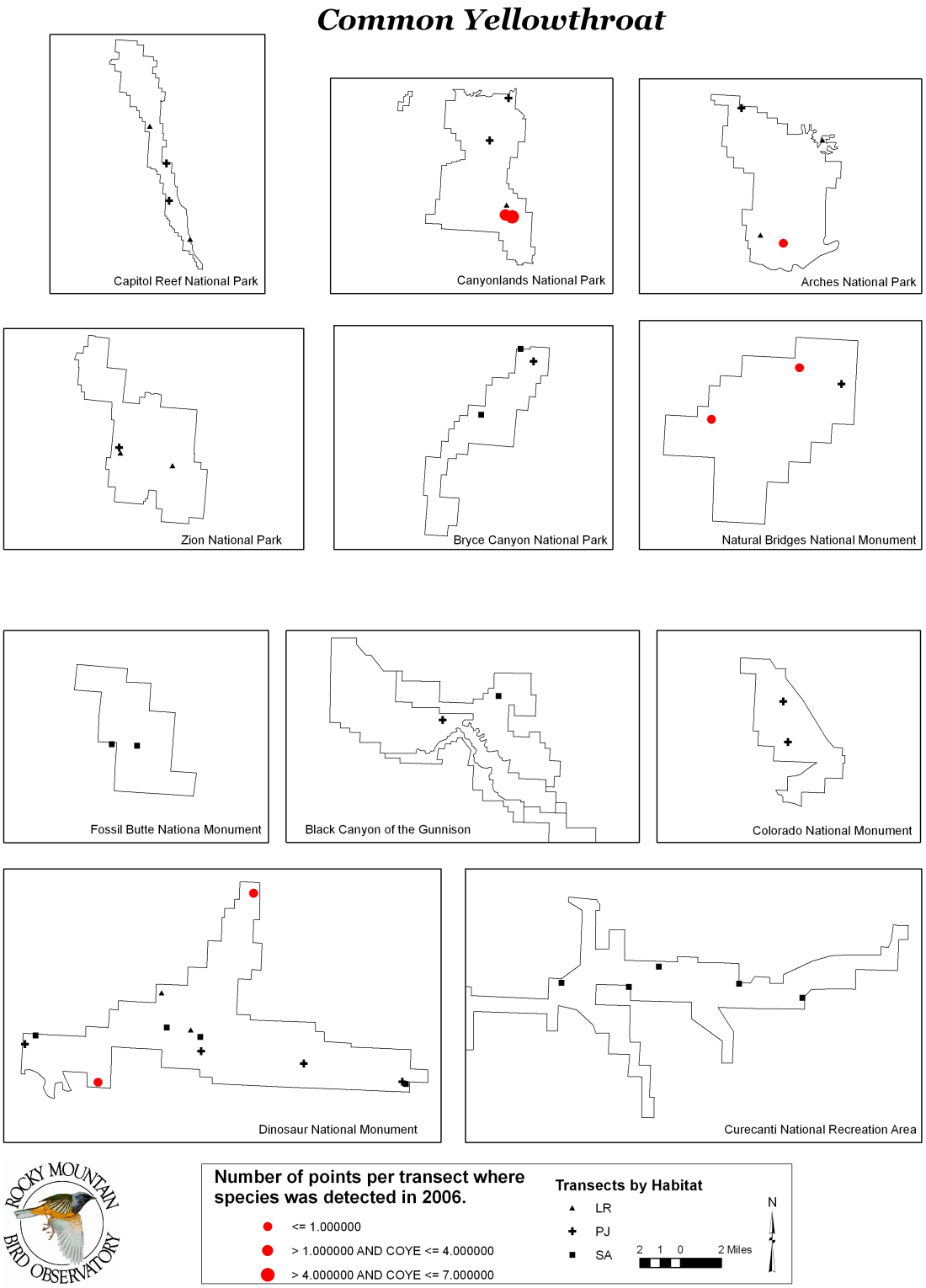
*NPS Southeast Utah Group Species of Special Concern

Common Yellowthroats nest in low-elevation valleys throughout the Colorado Plateau region. They nest primarily in cattail and bulrush marshes. In 2006, we detected 30 individual Common Yellowthroats in two habitats – all but one detection were in low-elevation riparian habitat. If our 2005 and 2006 transects are an indication of the species' distribution and abundance in the NCPN, we may be able to monitor it in low-elevation riparian habitat.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Common Yellowthroat on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	36	12	103	70%	26	29
Sage Shrubland	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.



Point-count transect locations and detections of Common Yellowthroats on transects in NCPN, 2006.

Green-tailed Towhee
(*Pipilo chlorurus)*

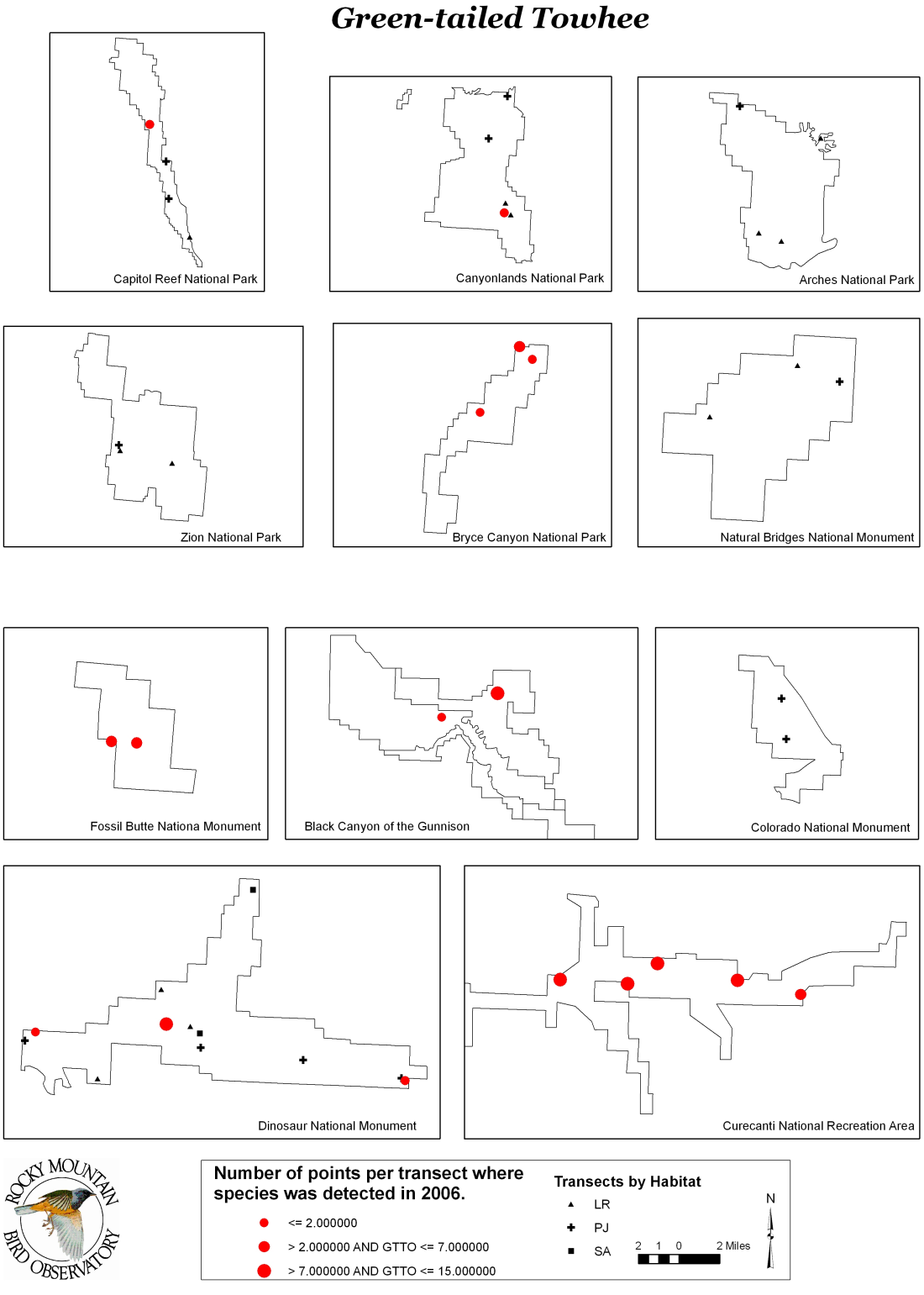
*PIF BCR 16 Species of Continental Stewardship and Regional stewardship

On the Colorado Plateau, Green-tailed Towhees are one of the most abundant breeding birds of sagebrush habitats (Righter et al. 2004). In 2006, we detected 463 individual Green-tailed Towhees in 3 habitats on NCPN transects; an overwhelming majority of the detections were in sage shrubland habitat. If our 2005 and 2006 transects are an indication of the species' distribution and abundance, we should have no problem monitoring the Green-tailed Towhee in sage shrubland habitat in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Green-tailed Towhee on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	ID	--	--	--	--	2
Pinyon-Juniper	ID	--	--	--	--	6
Sage Shrubland	35	20	61	33%	433	455

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.



Point-count transect locations and detections of Green-tailed Towhees on transects in NCPN, 2006.

Brewer's Sparrow
(*Spizella breweri)*

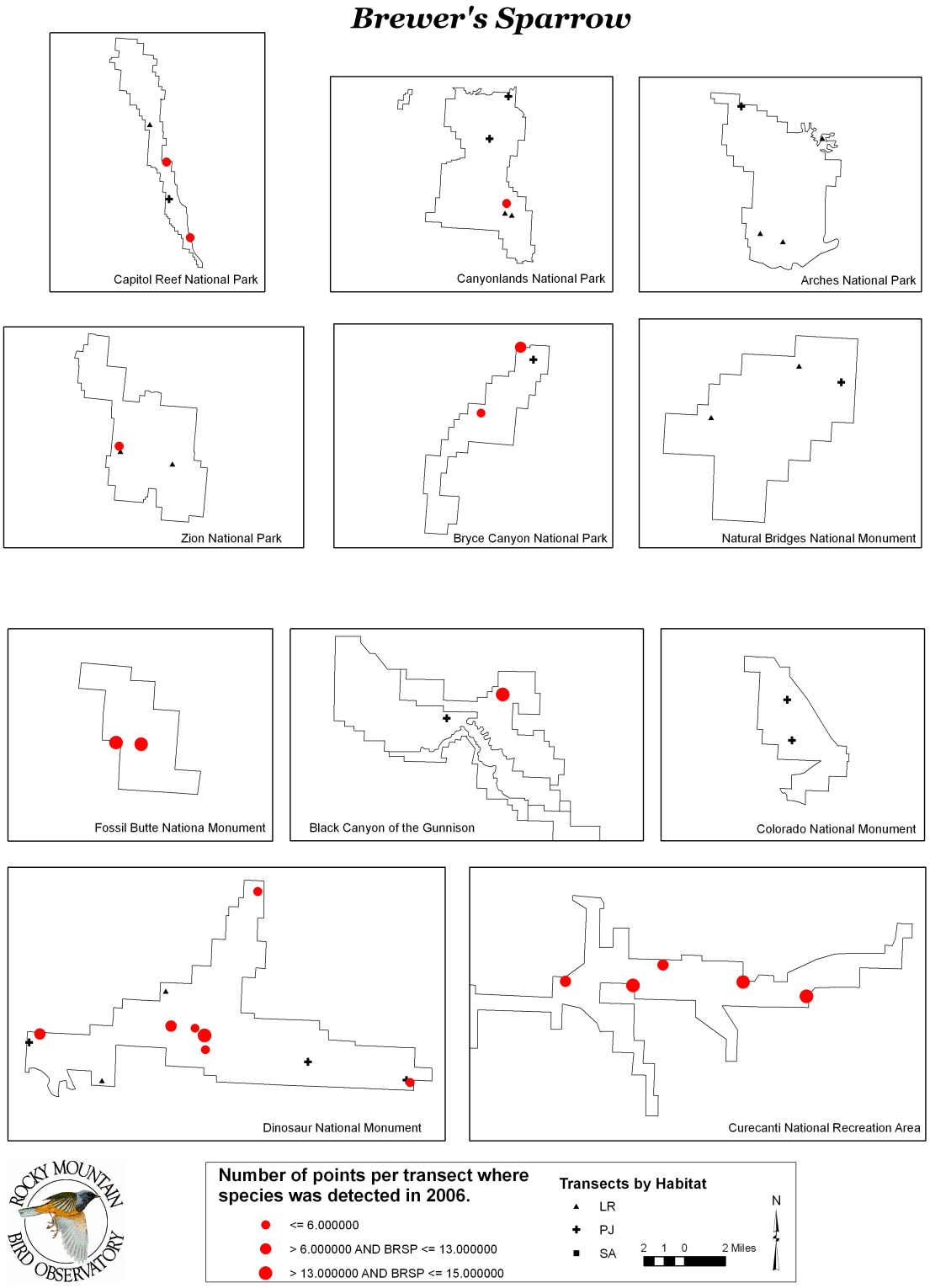
*PIF BCR 16 Species Continental Concern and Regional Concern
*PIF BCR 10 Species of Continental Concern and Regional Concern
*USFWS Region 6 Bird of Conservation Concern

On the Colorado Plateau, Brewer's Sparrows prefer sagebrush but will also breed in greasewood, rabbitbrush, and other shrubby habitats (Righter et al. 2004). In 2006, we detected 641 individual Brewer's Sparrows in three habitats on NCPN transects. We detected Brewer's Sparrows almost exclusively in sage habitat on NCPN transects. If our 2005 and 2006 transects are an indication of the species' distribution and abundance, we should have no problem monitoring the species in sage shrubland habitat in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Brewer's Sparrow on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	ID	--	--	--	--	3
Pinyon-Juniper	ID	--	--	--	--	7
Sage Shrubland	70	47	104	24%	562	631

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.



Point-count transect locations and detections of Brewer's Sparrows on transects in NCPN, 2006.

Black-chinned Sparrow
(*Spizella atrogularis*)

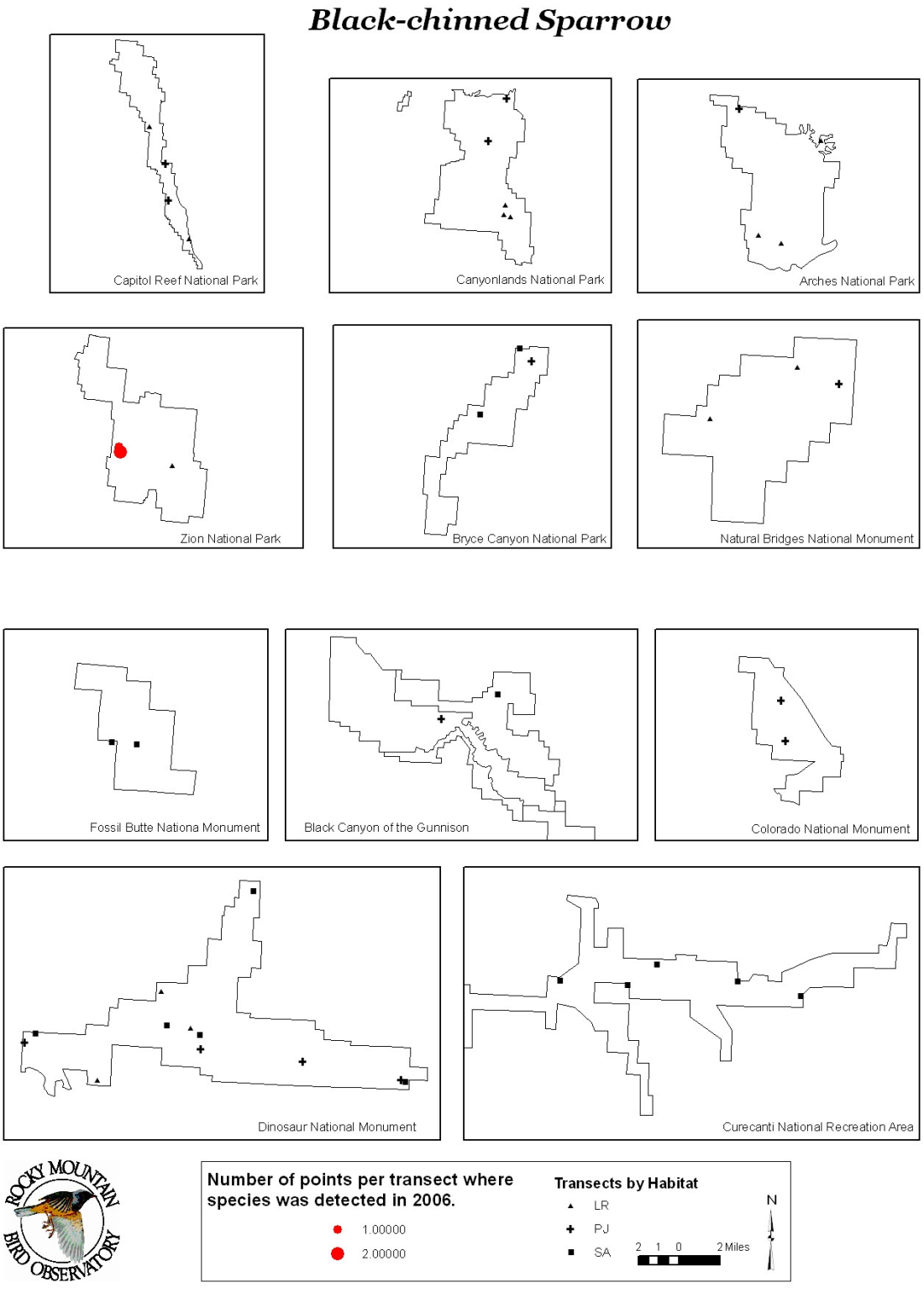
*PIF BCR 16 Species of Continental Concern

Black-chinned Sparrows prefer arid shrublands on rugged slopes that are often south-facing (Audubon 2002). The species is considered rare in the areas that we currently survey in the NCPN. In 2006, we detected six individual Black-chinned Sparrows in three habitats on NCPN transects. All of the Black-chinned Sparrow detections on NCPN transects were in Zion National Park, which is at the northern extreme of the species' normal breeding range. Due to its rarity in the NCPN, we will probably not be able to monitor the species, but we will continue to note its presence there. Repeat visits and nest searches at the locations that the species is detected could provide more information on the breeding status of this species in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Black-chinned Sparrow on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	ID	--	--	--	--	4
Pinyon-Juniper	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.



Point-count transect locations and detections of Black-chinned Sparrows on transects in NCPN, 2006.

Black-throated Sparrow
(*Amphispixza bilineata)*

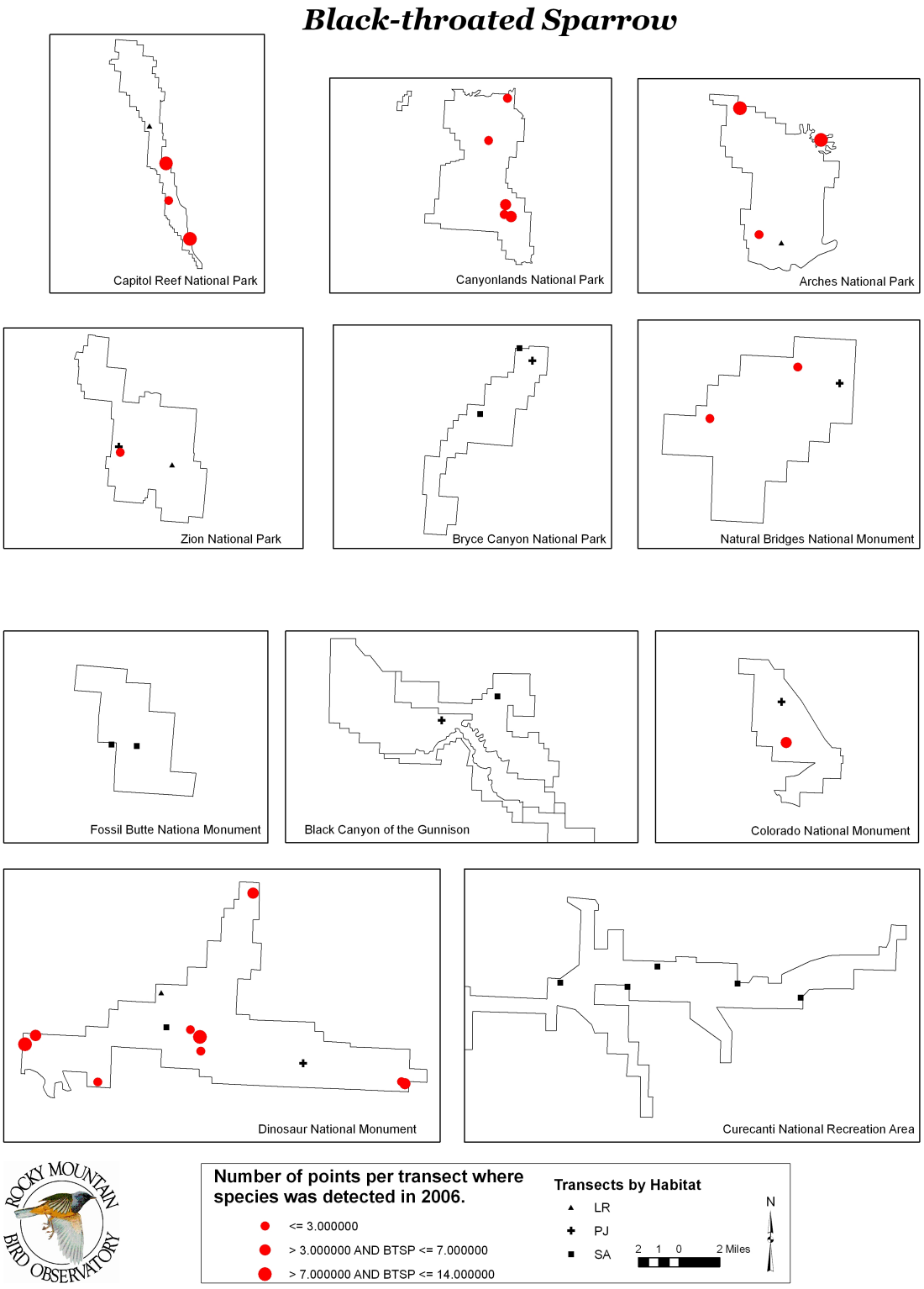
*PIF BCR 16 Species of Regional Concern

On the Colorado Plateau, Black-throated Sparrows nest in arid low-elevation habitats with widely scattered shrubs and trees (Righter et al. 2004). In 2006, we detected 178 individual Black-throated Sparrows in three habitats on NCPN transects. Although we detected Black-throated Sparrows in all three habitats, they were typically using very arid areas within those habitats. If our 2005 and 2006 transects are an indication of the species' distribution and abundance, we should be able to monitor the Black-throated Sparrow in pinyon-juniper and low-elevation riparian habitats, and perhaps sage shrubland habitat in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Black-throated Sparrow on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	6.1	3.0	13	44%	54	60
Pinyon-Juniper	14	7.2	29	41%	71	82
Sage Shrubland	ID	--	--	--	--	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



Point-count transect locations and detections of Black-throated Sparrows on transects in NCPN, 2006.

Sage Sparrow
(*Amphispiza belli)*

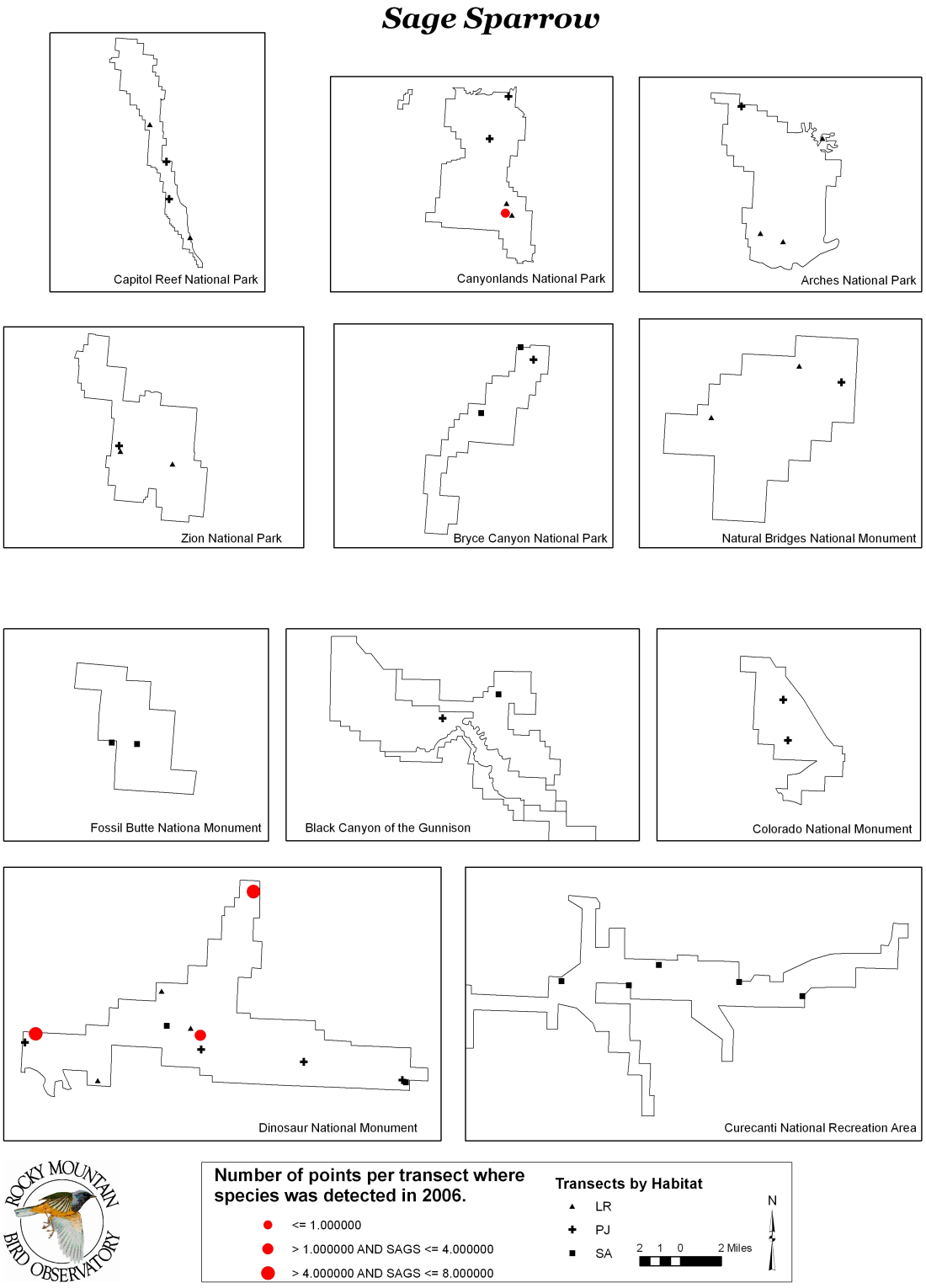
*PIF BCR 16 Species of Regional Concern

Sage Sparrows nest primarily in large, unbroken stands of sagebrush (Righter et al. 2004). In 2006, we detected 33 individual Sage Sparrows in two habitats on NCPN transects. All but one were detected in sage shrubland habitat. If our 2005 and 2006 transects are an indication of the species' distribution and abundance, we should be able to monitor the Sage Sparrow in sage shrubland habitat in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Sage Sparrow on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	ID	--	--	--	--	1
Sage Shrubland	2.0	0.7	5.7	69%	31	32

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.



Point-count transect locations and detections of Sage Sparrows on transects in NCPN, 2006.

Blue Grosbeak
(*Passerina caerulea*)

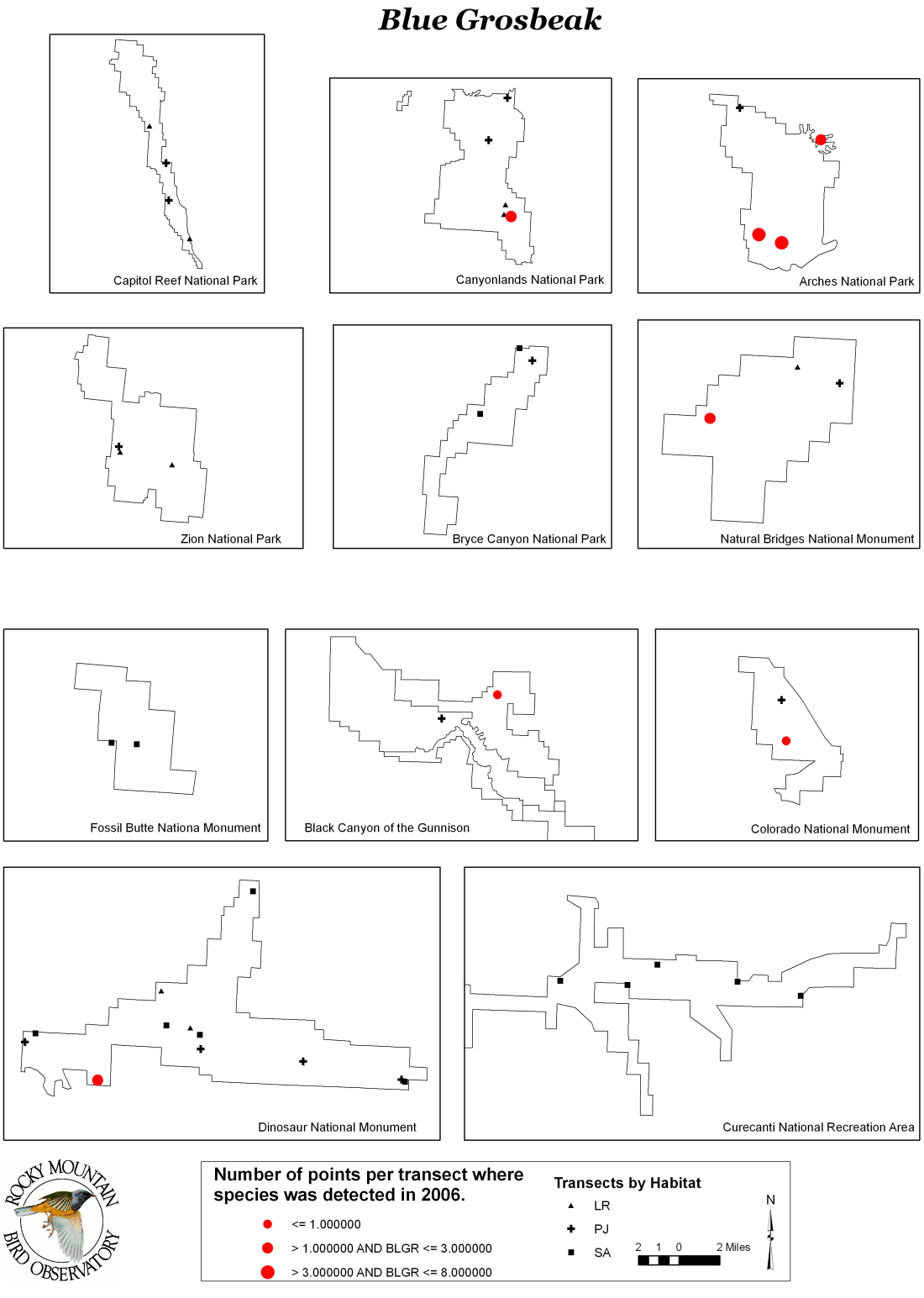
*NPS Southeast Utah Group Species of Special Concern

Blue Grosbeaks typically nest throughout the Colorado Plateau region at elevations below 6,000 feet. They prefer dense shrublands in low-elevation riparian habitat. In 2006, we detected 31 Blue Grosbeaks; all but two were detected in low-elevation riparian habitat. If our 2005 and 2006 transects are an indication of the species' distribution and abundance, we should be able to monitor it in low-elevation riparian habitat.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Blue Grosbeak on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	7.7	3.5	17	49%	26	29
Pinyon-Juniper	ID	--	--	--	--	1
Sage Shrubland	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.



Point-count transect locations and detections of Blue Grosbeaks on transects in NCPN, 2006.

Lazuli Bunting
(*Passerina amoena*)

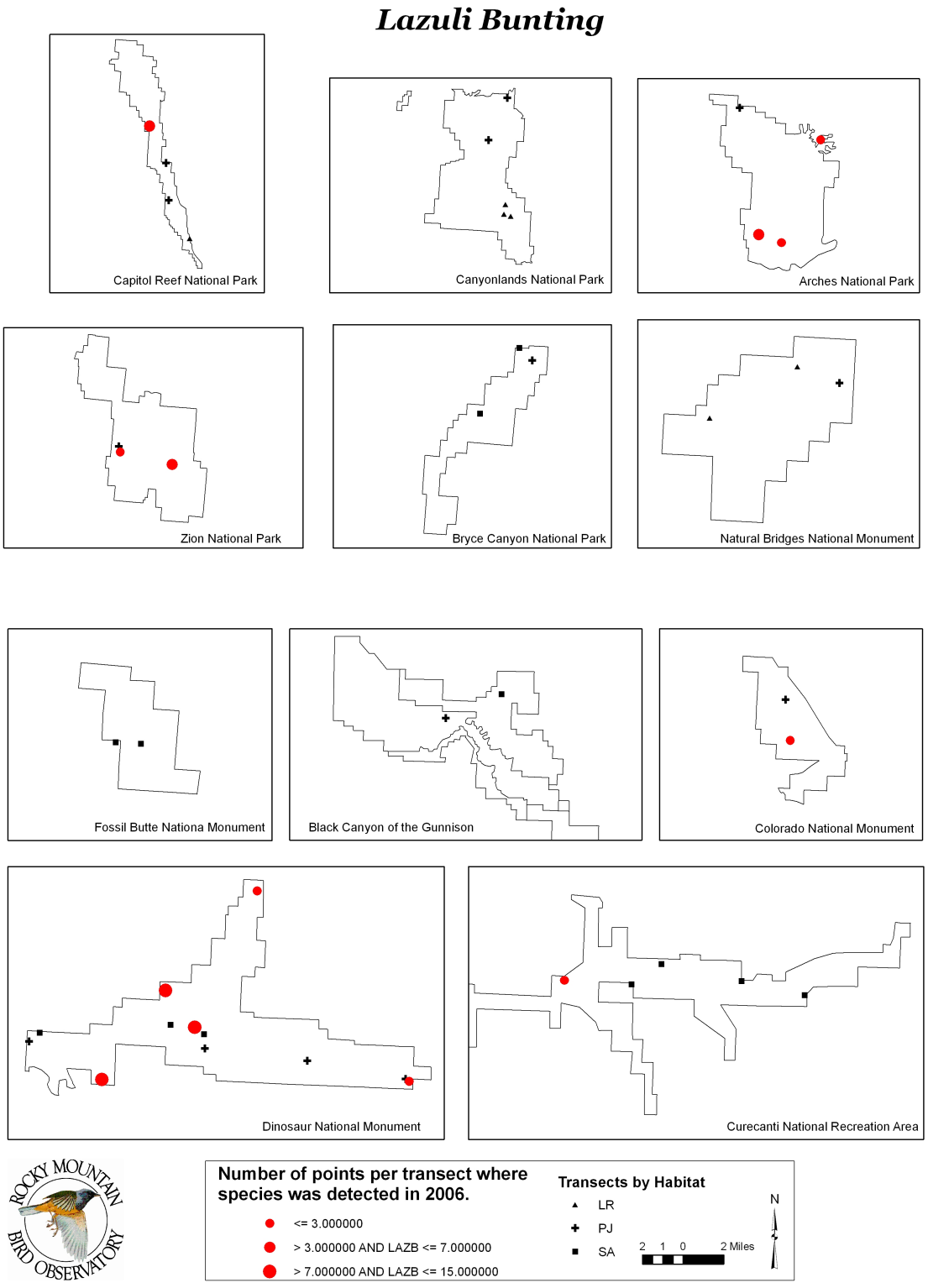
*PIF BCR 10 Species of Regional Stewardship

Lazuli Buntings nest throughout the Colorado Plateau region along rivers and streams. In 2006, we detected 157 individual Lazuli Buntings in three habitats in the NCPN; most were detected in low-elevation riparian habitat. If our 2005 and 2006 transects are an indication of the distribution and abundance of the species, we should have no problem monitoring it in low-elevation riparian habitat.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Lazuli Bunting on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	58	28	78	46%	132	149
Pinyon-Juniper	ID	--	--	--	--	1
Sage Shrubland	ID	--	--	--	--	7

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.



Point-count transect locations and detections of Lazuli Buntings on transects in NCPN, 2006.

Cassin's Finch
(*Carpodacus cassinii*)

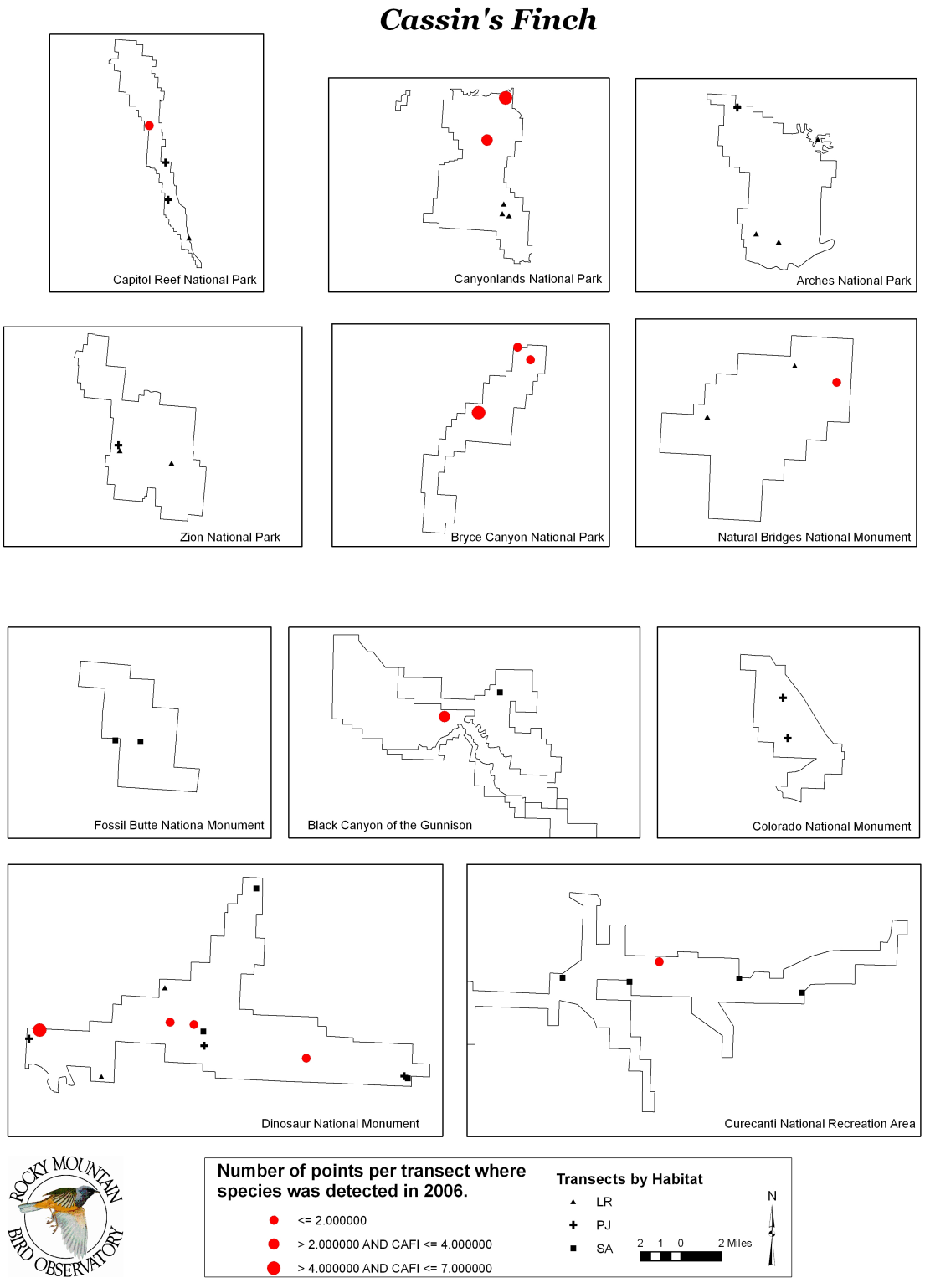
*PIF BCR 16 Species of Regional Concern
*PIF BCR 10 Species of Regional Concern, Continental Stewardship, and Regional Stewardship

Cassin's Finches nest in all coniferous forests, but they prefer high elevation conifers and are typically found above 7,000 feet during the breeding season (Righter et al. 2004). In 2006, we detected 39 individual Cassin's Finches in three habitats on NCPN transects. Given the specific habitat requirements of the Cassin's Finch, it is unlikely that we will be able to monitor the species in any of the habitats that we currently survey in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Cassin's Finches on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	ID	--	--	--	--	3
Pinyon-Juniper	ID	--	--	--	--	20
Sage Shrubland	ID	--	--	--	--	16

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.



Point-count transect locations and detections of Cassin's Finches on transects in NCPN, 2006.

Red Crossbill
(*Loxia curvirostra*)

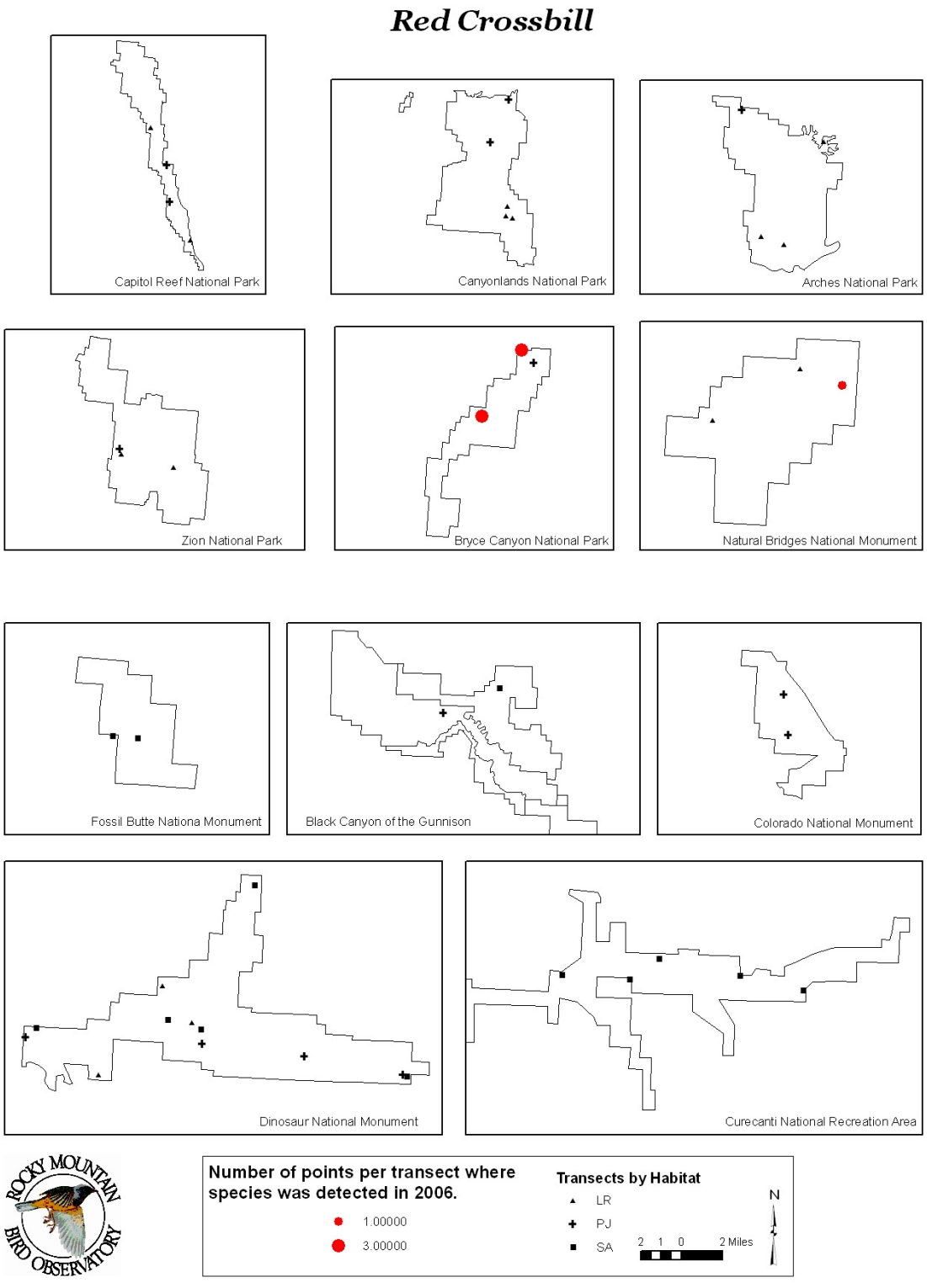
*PIF BCR 10 Species of Regional Stewardship

Red Crossbills breed irregularly throughout the Colorado Plateau region, typically in spruce-fir, ponderosa, and Douglas fir habitats, but they wander occasionally into other habitats including pinyon-juniper. In 2006, we detected 23 individual Red Crossbills. All but two detections were in sage shrubland habitat. All of the detections in sage shrubland habitat were from nearby stands of ponderosa pine. Given the specific habitat needs of the species, it is very unlikely that we will be able to monitor Red Crossbill in any of the habitats that we currently survey in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Red Crossbill on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Pinyon-Juniper	ID	--	--	--	--	2
Sage Shrubland	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.



Point-count transect locations and detections of Red Crossbills on transects in NCPN, 2006.

Pine Siskin
(*Carduelis pinus)*

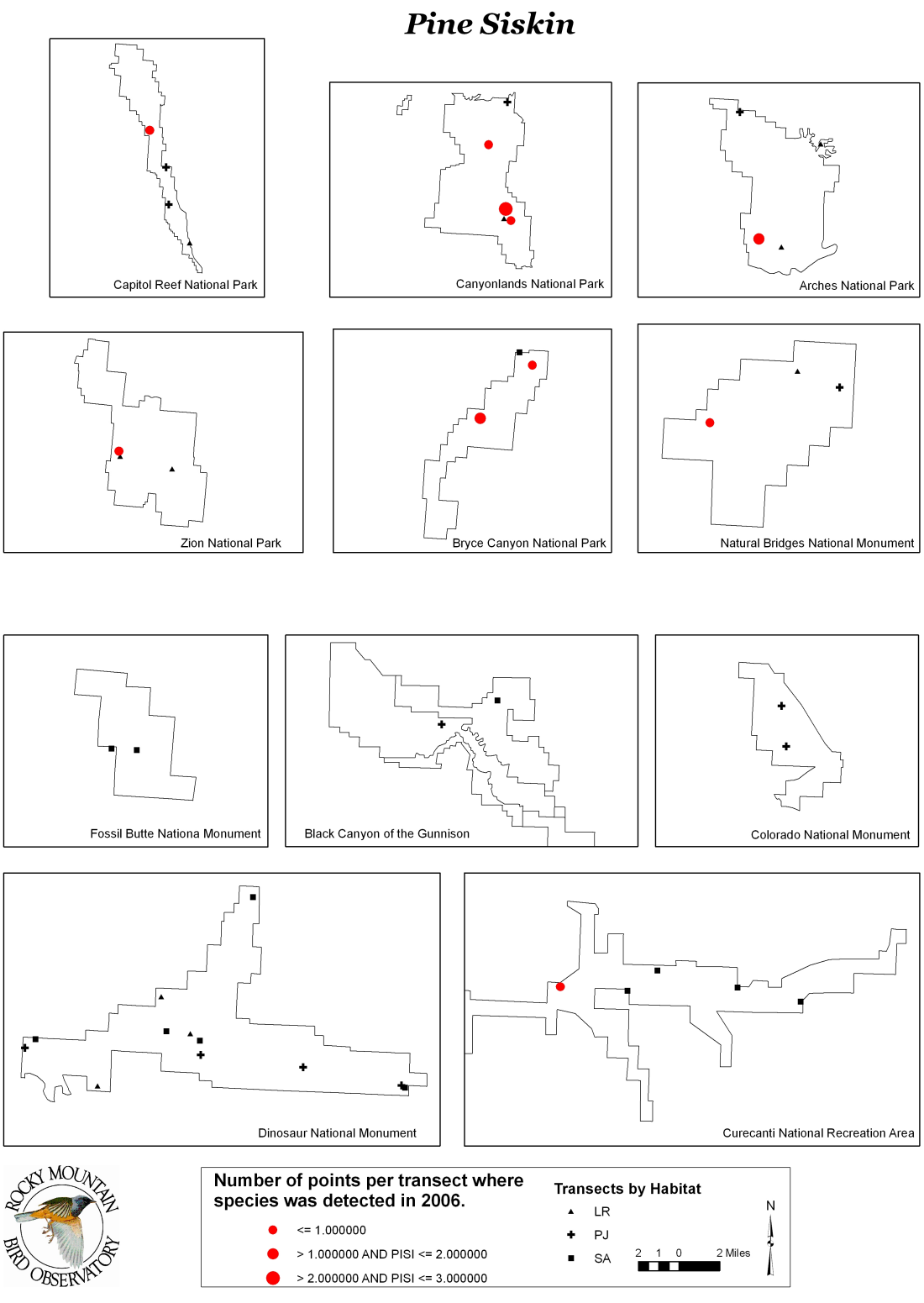
*PIF BCR 16 Species of Regional Concern and Regional Stewardship

Pine Siskins nest primarily in spruce-fir forests, but may use a variety of coniferous forests, including pinyon-juniper (Righter et al. 2004). In 2006, we detected 22 individual Pine Siskins in three habitats on NCPN transects. Given the specific habitat requirements of the Pine Siskin, it is unlikely we will be able to monitor the species in any of the habitats that we currently survey in the NCPN.

Total number of independent detections, number of individuals, and habitat-specific density estimates for the Pine Siskin on the NCPN monitoring project, 2006.

Habitat	D	LCL	UCL	CV	n	N
Low-elevation Riparian	ID	--	--	--	--	15
Pinyon-Juniper	ID	--	--	--	--	4
Sage Shrubland	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.



Point-count transect locations and detections of Pine Siskins on transects in NCPN, 2006.

APPENDIX B. List of all bird species observed during point-count transects in the Northern Colorado Plateau Network (NCPN), 2006, with management designation and species totals.

Common Name	Management Designation			Individuals Detected			
	PIF BCR 16	PIF BCR 10	USFWS	LR	PJ	SA	Total
Canada Goose				2	4	20	26
Gadwall				0	0	1	1
Mallard				6	0	10	16
Green-winged Teal				0	0	1	1
Common Merganser				0	0	6	6
Chukar				3	0	2	5
Greater Sage-Grouse	CC,RC	CC,RC,CS, RS		0	0	2	2
Wild Turkey				12	1	1	14
Gambel's Quail				0	13	2	15
Western Grebe				0	0	1	1
Great Blue Heron				0	0	3	3
Turkey Vulture				11	10	9	30
Northern Harrier		RC	BCC	0	0	4	4
Sharp-shinned Hawk				0	1	0	1
Cooper's Hawk				14	2	1	17
Red-tailed Hawk				2	8	7	17
Golden Eagle	RC		BCC	2	3	5	10
American Kestrel				2	0	8	10
Peregrine Falcon			BCC	2	3	0	5
Sandhill Crane				0	0	1	1
Killdeer				0	0	3	3
Spotted Sandpiper				2	0	0	2
California Gull				0	0	3	3
Rock Pigeon				0	5	0	5
Mourning Dove				162	247	165	574
Yellow-billed Cuckoo				1	0	0	1
Long-eared Owl				2	0	0	2
Short-eared Owl		CC	BCC	0	0	4	4
Common Nighthawk	RC			0	0	2	2
Common Poorwill				1	0	0	1
White-throated Swift	CC,RS	CC		484	177	43	704
Black-chinned Hummingbird				51	17	0	68
Broad-tailed Hummingbird	RS			2	6	22	30
Red-naped Sapsucker		CS,RS	BCC	1	0	1	2
Downy Woodpecker				2	4	5	11
Hairy Woodpecker				12	6	3	21
Northern Flicker				14	12	31	57
Olive-sided Flycatcher	CC	CC,RC		1	3	0	4
Western Wood-Pewee				36	2	6	44
Willow Flycatcher	CC,RC	CC,RS		3	0	0	3

Appendix B Cont. List of all bird species observed during point-count transects in the Northern Colorado Plateau Network (NCPN), 2006, with management designation and species totals..

Common Name	Management Designation			Individuals Detected			
	PIF BCR 16	PIF BCR 10	USFWS	LR	PJ	SA	Total
Gray Flycatcher				2	106	8	116
Dusky Flycatcher		CS,RS		0	43	68	111
Cordilleran Flycatcher	RS			1	0	0	1
Black Phoebe				16	0	0	16
Say's Phoebe	RS			67	15	16	98
Ash-throated Flycatcher				256	144	15	415
Cassin's Kingbird				2	0	0	2
Western Kingbird				5	0	0	5
Loggerhead Shrike	RC	RC	BCC	0	0	1	1
Gray Vireo	CC,RC,RS		BCC	38	83	6	127
Plumbeous Vireo	RS			93	61	11	165
Warbling Vireo	RS			47	1	10	58
Gray Jay				0	1	0	1
Steller's Jay				0	2	3	5
Western Scrub-Jay				32	50	8	90
Pinyon Jay	CC,RC,CS, RS	CC		1	151	25	177
Clark's Nutcracker	CS,RS	CS,RS		0	18	11	29
Black-billed Magpie	RS			1	3	118	122
American Crow				1	0	0	1
Common Raven				37	56	65	158
Horned Lark				0	1	40	41
Tree Swallow				20	6	14	40
Violet-green Swallow	RS			389	77	48	514
Northern Rough-winged Swallow				5	0	2	7
Cliff Swallow				1	0	65	66
Barn Swallow				0	0	2	2
Black-capped Chickadee				3	2	0	5
Mountain Chickadee				6	10	6	22
Juniper Titmouse	RC			30	83	7	120
Bushtit				81	56	3	140
Red-breasted Nuthatch				0	3	2	5
White-breasted Nuthatch				2	23	3	28
Pygmy Nuthatch	RC			0	2	8	10
Rock Wren	RS			109	116	178	403
Canyon Wren	RC			74	29	2	105
Bewick's Wren			BCC	114	188	5	307
House Wren				48	0	14	62
American Dipper		RS		1	0	0	1
Ruby-crowned Kinglet				0	3	1	4
Blue-gray Gnatcatcher				175	110	22	307
Western Bluebird	RS			5	6	8	19
Mountain Bluebird	RC,CS,RS			7	37	94	138
Townsend's Solitaire		RS		0	2	4	6

Appendix B Cont. List of all bird species observed during point-count transects in the Northern Colorado Plateau Network (NCPN), 2006, with management designation and species totals.

Common Name	Management Designation			Individuals Detected			
	PIF BCR 16	PIF BCR 10	USFWS	LR	PJ	SA	Total
Veery				0	0	1	1
Hermit Thrush				3	15	3	21
American Robin				27	42	87	156
Northern Mockingbird				5	4	16	25
Sage Thrasher				0	0	95	95
European Starling				2	5	14	21
Orange-crowned Warbler				1	0	1	2
Virginia's Warbler	CC,RC,RS		BCC	41	36	32	109
Yellow Warbler				159	0	16	175
Yellow-rumped Warbler				4	34	28	66
Black-throated Gray Warbler	RC			96	430	25	551
Grace's Warbler	CC,RC			0	16	15	31
MacGillivray's Warbler				8	1	0	9
Common Yellowthroat				29	0	1	30
Wilson's Warbler				4	0	0	4
Yellow-breasted Chat				54	0	4	58
Western Tanager				22	30	17	69
Green-tailed Towhee	CS,RS			2	6	455	463
Spotted Towhee				441	85	84	610
Chipping Sparrow				17	73	63	153
Brewer's Sparrow	CC,RC	CC,RC	BCC	3	7	631	641
Black-chinned Sparrow	CC			4	2	0	6
Vesper Sparrow				0	21	474	495
Lark Sparrow				17	22	118	157
Black-throated Sparrow	RC			60	82	36	178
Sage Sparrow	RC			1	0	32	33
Savannah Sparrow				0	0	1	1
Song Sparrow				66	0	10	76
White-crowned Sparrow				6	0	0	6
Dark-eyed Junco				4	11	4	19
Black-headed Grosbeak				31	14	9	54
Blue Grosbeak				30	1	1	32
Lazuli Bunting		RS		149	1	7	157
Indigo Bunting				1	0	0	1
Red-winged Blackbird				2	0	2	4
Western Meadowlark				3	41	195	239
Brewer's Blackbird				6	0	50	56
Brown-headed Cowbird				36	15	32	83
Bullock's Oriole				23	1	11	35
Cassin's Finch	RC	RC,CS,RS		3	20	16	39
House Finch				206	89	68	363
Red Crossbill		RS		0	2	21	23
Pine Siskin	RC,RS			15	4	3	22

Appendix B Cont. List of all bird species observed during point-count transects in the Northern Colorado Plateau Network (NCPN), 2006, with management designation and species totals.

Common Name	Management Designation			Individuals Detected			
	PIF BCR 16	PIF BCR 10	USFWS	LR	PJ	SA	Total
Lesser Goldfinch				75	2	0	77
American Goldfinch				5	0	0	5

[1] Common names are from the A.O.U. Check-list of North American Birds, Seventh Edition (2003).
[2] Special management designations: USFS=United States Forest Service, PIF=Partners In Flight (from the Species Assessment Database version 2005 found at www.rmbo.org, CC=Continental Concern Species, RC=Regional Concern Species, CS=Continental Stewardship Species, RS = Regional Stewardship Species, USFWS=U.S. Fish and Wildlife Service, BCC = Bird of Conservation Concern.
[4] Habitats: LR=Low-elevation Riparian; PJ=Pinyon-Juniper; SA=Sage Shrubland
[5] The number and types of habitats surveyed each year may vary.