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Landbird Monitoring in the Northern Colorado Plateau Network

2013 Field Season

Natural Resource Technical Report NPS/NCPN/NRTR—2014/890

ROCKY MOUNTAIN BIRD OBSERVATORY

ON THE COVER

From top left: marsh wren (©Bill Schmoker), Canyonlands National Park (©Jeff Birek), yellow-breasted chat (©Bill Schmoker). All used with permission.

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2013 Field Season

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Prepared by
Matthew McLaren
Rocky Mountain Bird Observatory
14500 Lark Bunting Lane
Brighton, CO 80603-8311

Editing and Design
Alice Wondrak Biel
Northern Colorado Plateau Network
National Park Service
P.O. Box 848
Moab, UT 84532

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Executive Summary

In 2013, staff from the Rocky Mountain Bird Observatory (RMBO), in cooperation with its partner, the National Park Service, completed the ninth year of a habitat-based landbird monitoring program in the Northern Colorado Plateau Network (NCPN). This program is designed to provide rigorous population trend data for most diurnal, regularly occurring breeding landbird species throughout the Northern Colorado Plateau Network. This population information is useful for land managers and supports the National Park Service's goal of long-term monitoring of biological indicators for network parks. The program is also consistent with goals emphasized by the U.S. North American Bird Conservation Initiative Committee (2007).

In 2013, RMBO biologists surveyed 45 locations within 11 NCPN units. Fifteen transects were located in each of three habitats of interest: low-elevation riparian, pinyon-juniper, and sage shrubland. To increase sample size, we attempted to sample each of the 45 survey locations twice during the breeding season. However, we were unable to complete the second visit to a survey site in Dinosaur National Monument after a large rockslide closed that area of the park.

We completed 89 of 90 (99%) assigned habitat-based surveys between May 12 and July 10. We recorded a total of 8,710 birds of 120 species. We detected 2,618 birds of 76 species in low-elevation riparian, 2,406 birds of 76 species in pinyon-juniper, and 3,686 birds of 102 species in sage shrubland habitat. We recorded six species that had not been detected as part of this monitoring program in previous years. American pipit, house sparrow, lesser scaup, marsh wren, and ruddy duck were recorded at Curecanti National Recreation Area (NRA), and a greater roadrunner was recorded at Zion National Park. Marsh wren was previously noted as Probably Present in Curecanti NRA, and should now be noted as Present.

In addition to the habitat-based surveys, we conducted eight point counts and eight area searches during two visits at Pipe Spring National Monument, using a modified monitoring design. We detected a total of 370 birds of 34 species at Pipe Spring National Monument. We detected 75 birds of 18 species during point counts and 296 birds and 16 additional species during nocturnal and diurnal area searches. Four species were detected for the first time on this project, but were not new species for the park: black-crowned night-heron, cliff swallow, Cooper's hawk, and red-tailed hawk.

Every year, we are able to provide more precise estimates for more species because we pool data across all previous years of the program. This year, we estimated densities of 61 species in at least one habitat. Of those 61 species, we have not previously obtained estimates for 10 species. The data yielded robust density estimates (coefficient of variation <50%) for 41 species in at least one habitat in 2013. We recorded 77 bird species that are of conservation or management concern throughout the NCPN and estimated densities for 29 of those species. The increase in the number of sensitive species compared to previous years was due, in part, to the addition of sensitive species as designated by Colorado Parks and Wildlife.

Author Information

ROCKY MOUNTAIN BIRD OBSERVATORY (RMBO)

Mission: To conserve birds and their habitats
Vision: Native bird populations are sustained in healthy ecosystems

Core Values

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

RMBO accomplishes its mission by:

- Monitoring long-term bird population trends to provide a scientific foundation for conservation action.
- Researching bird ecology and population response to anthropogenic and natural processes to evaluate and adjust management and conservation strategies using the best available science.
- Educating people of all ages through active, experiential programs that create an awareness and appreciation for birds.
- Fostering good stewardship on private and public lands through voluntary, cooperative partnerships that create win-win situations for wildlife and people.
- Partnering with state and federal natural resource agencies, private citizens, schools, universities, and other non-governmental organizations to build synergy and consensus for bird conservation.
- Sharing the latest information on bird populations, land management and conservation practices to create informed publics.
- Delivering bird conservation at biologically relevant scales by working across political and jurisdictional boundaries in western North America.

Acronyms

BCR	bird conservation region
CV	coefficient of variation
D	density
IMBCR	Integrated Monitoring in Bird Conservation Regions
LCL	lower confidence limit
LR	low-elevation riparian
n	number of independent detections used in analyses
NABCI	U.S. North American Bird Conservation initiative
NCPN	Northern Colorado Plateau Network
NPS	National Park Service
NRA	National Recreation Area
PIF	Partners in Flight
PISP	Pipe Spring National Monument
PJ	pinyon-juniper
NM	national monument
NP	national park
RMBO	Rocky Mountain Bird Observatory
SA	sage shrubland
UCL	upper confidence limit

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1 Introduction

1.1 Program history

In 2013, the Rocky Mountain Bird Observatory (RMBO), in cooperation with its partner, the National Park Service (NPS), completed the ninth year of a habitat-based landbird monitoring program in the Northern Colorado Plateau Network (NCPN). This program is designed to provide rigorous population trend data on most diurnal, regularly occurring breeding landbird species in 11 national parks in Colorado, Utah, and Wyoming. In addition to monitoring landbird populations, this program also supports the NCPN's efforts to develop long-term natural resource monitoring plans for its park units. Modeled after our Colorado habitat-based monitoring program (Leukering et al. 2005), the NCPN program is consistent with goals emphasized by the U.S. North American Bird Conservation Initiative (NABCI) Subcommittee (USNABCIMS 2007). We also sampled Pipe Spring National Monument (NM), in Arizona, for the fifth year, using a modified monitoring design.

1.2 Reasons for monitoring

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

The apparent large-scale declines of avian populations and the loss, fragmentation, and degradation of native habitats highlight the need for extensive and rigorous landbird monitoring programs (Rich et al. 2004; USNABCIC 2009). Population monitoring also helps to achieve the intent of legislation, such as the Migratory Bird Treaty Act (1918), National Environmental Policy Act (1969), Endangered Species Act (1973), National Forest Management Act (1976), and various state laws (Manley 1993; Sauer 1993).

1.3 Monitoring objectives

This program uses the Partners in Flight (PIF) Plan (Rich et al. 2004) 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 the most important focus areas for the conservation of each species. This process applies quantitative rule sets to data on population size, distribution, trends, threats, and regional abundance of birds to rank species in terms of biological vulnerability and regional status. The process results in global and regional conservation assessments of each bird species that can be used to objectively assign regional and continental conservation priorities among birds.

This landbird monitoring program is designed to provide population status and trend information for regularly occurring breeding landbird species within low-elevation riparian, pinyon-juniper, and sage shrubland habitats. Initially, the goal is to provide early warning information for all monitored species through a habitat-based approach to data collection. After establishing this monitoring framework, we anticipate that these data will prompt additional research to determine possible reasons for observed changes and enable better-informed management decisions.

We maintain a high-quality, online database of raw and summarized data that is accessible to collaborators and the public. These data can be used to generate decision support tools, such as population estimate models, help guide conservation efforts, and provide a better measure of conservation success.

2 Methods

2.1 Study area

In 2005, the NPS selected three habitats in which to implement landbird monitoring in the NCPN: low-elevation riparian (LR), pinyon-juniper (PJ), and sage shrubland (SA). A panel of NPS resource managers selected these habitats because they represent distinct bird communities and are associated with park management questions. During the spring and summer of 2005, RMBO staff established 45 transect locations (15 in each habitat, Figures 2-1 to 2-3). In 2009, we added four point count locations and four area inventories at Pipe Spring National Monument (Figure 2-4).

2.1.1 Habitats

2.1.1.1 Low-elevation riparian

This habitat comprises mostly scattered stands of Fremont cottonwood (*Populus fremontii*) and boxelder (*Acer negundo*) along perennial streams, sometimes within deeply cut canyons. Tamarisk (*Tamarix* spp.), also known as saltcedar, is an exotic species that has invaded much of the LR 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.

2.1.1.2 Pinyon-juniper

Pinyon-juniper habitat typically occurs at elevations just above 1,500 m in the study area. PJ is present on most of the ridges and mesas, and is the most extensive habitat in the NCPN. Pinyon pine (*Pinus edulis*) and juniper species (*Juniperus* spp.) are dominant in this habitat. The relative abundance and composition of these species can vary significantly, and PJ habitat sometimes contains a significant sage component.

2.1.1.3 Sage shrubland

The sagebrush shrubland community occurs extensively on the Colorado Plateau. The stands of sage surveyed 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*).

2.1.1.4 Pipe Spring National Monument

There are four point count stations in a mixture of pinyon-juniper, low-elevation riparian, and semidesert shrubland habitats at Pipe Spring NM. Semidesert shrubland habitat is a dry landscape containing shrubs but lacking a co-dominant grass component. Dominant shrubs may include greasewood, barberry, and saltbush. If sagebrush is present, it is not the dominant shrub or is co-dominant with another species. The ground-cover layer is typically dominated by bare ground and rock, with limited forbs and grasses present.

2.2 Sampling design

The NPS and RMBO selected survey sites during winter 2005. For PJ and SA habitats, we used GIS and the Southwest Regional Re-GAP Analysis Project to randomly select sites from a pool of habitat "stands" that were large enough to accommodate transects (Lowry et al. 2005). We excluded areas with >50% slope from the list of potential sites to ensure that selected stands could be accessed safely on foot. For LR survey sites, we limited our options to crossable streams, excluding the Colorado, Green, Gunnison, and Virgin rivers. Due to the limited amount of riparian habitat, we manually selected survey locations; RMBO staff ground-proofed riparian stands and established transects in 2005. While ground-proofing, we found that a few of the stands did not fit the selection criteria. In these cases, we chose replacement stands following the same protocol. We have surveyed these same locations every year since 2005. Point-count and area-search locations at Pipe Spring NM were placed in each distinct habitat represented in the monument as previously described, with attention paid to each location being spaced at least 250 m apart. Area-search start locations were selected in order to efficiently cover all areas of the monument. We have conducted the Pipe Spring NM point counts each year since 2009, and area searches each year since 2011.

2.3 Sampling methods

RMBO field biologists with excellent aural and visual bird-identification skills conducted field work in 2013. Prior to conducting surveys, technicians completed an intensive, seven-day training program to ensure full understanding of field protocols, review bird

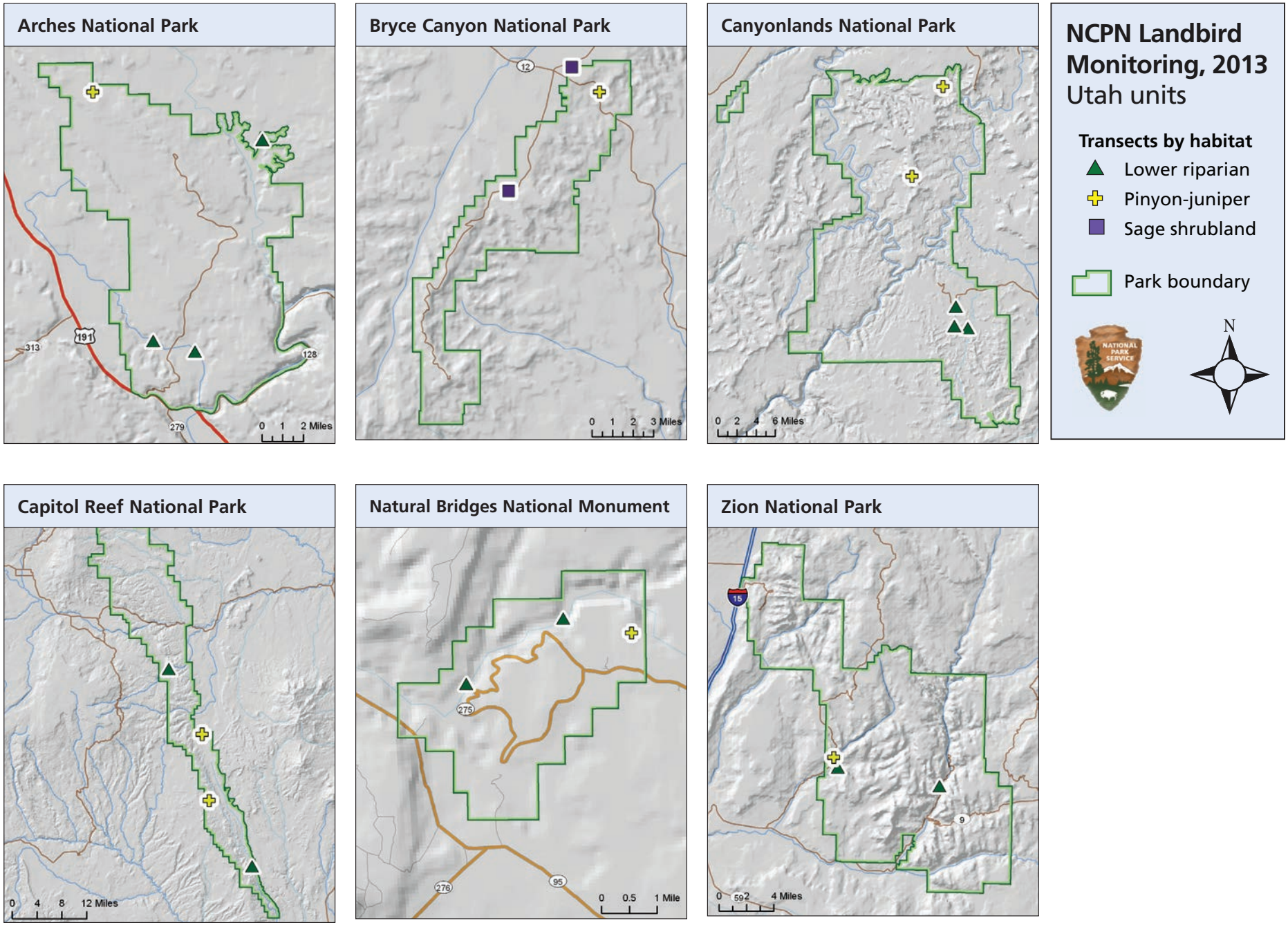

Figure 2-1. Transect locations by habitat, Utah units.

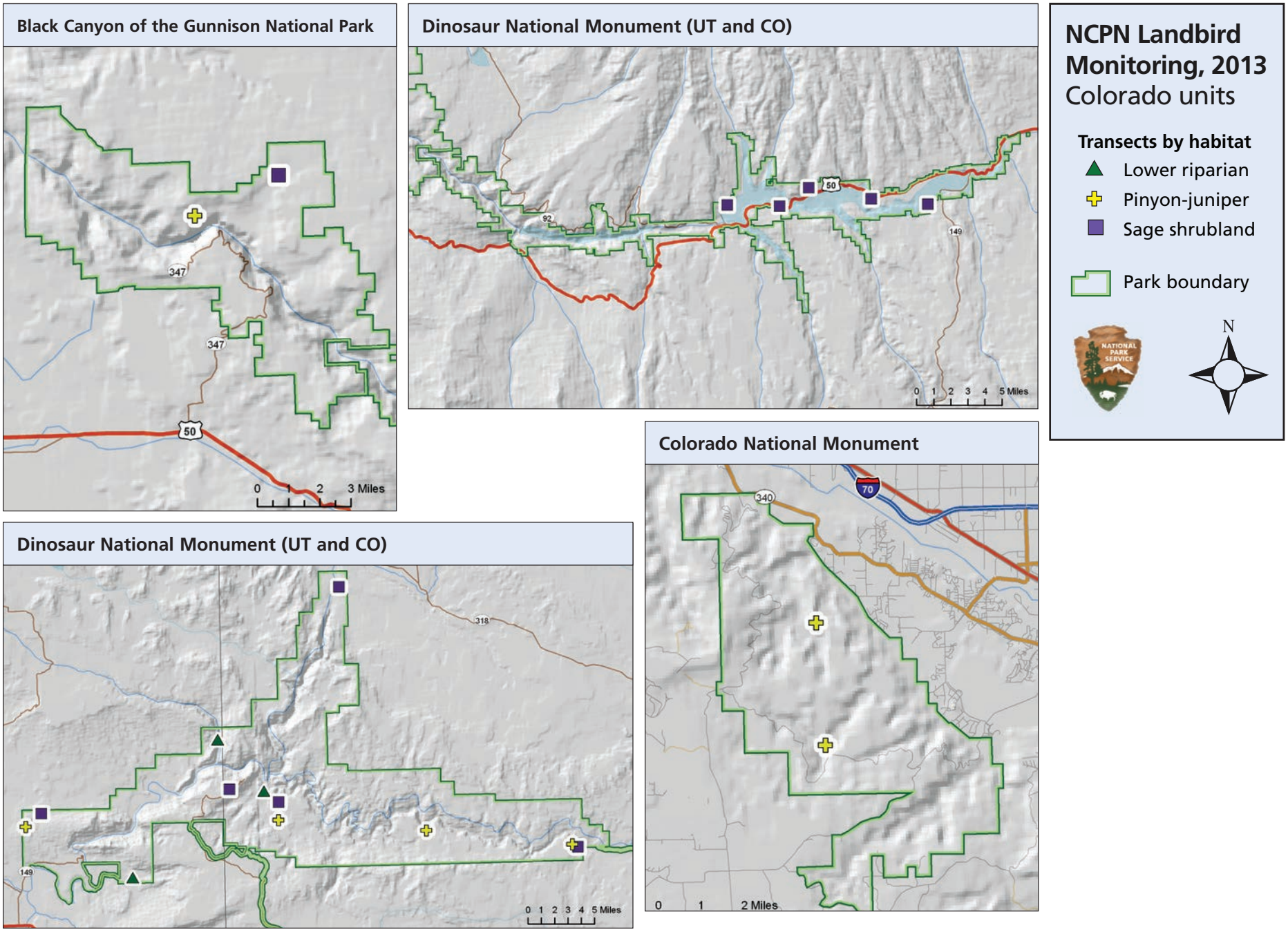

Figure 2-2. Transect locations by habitat, Colorado units.

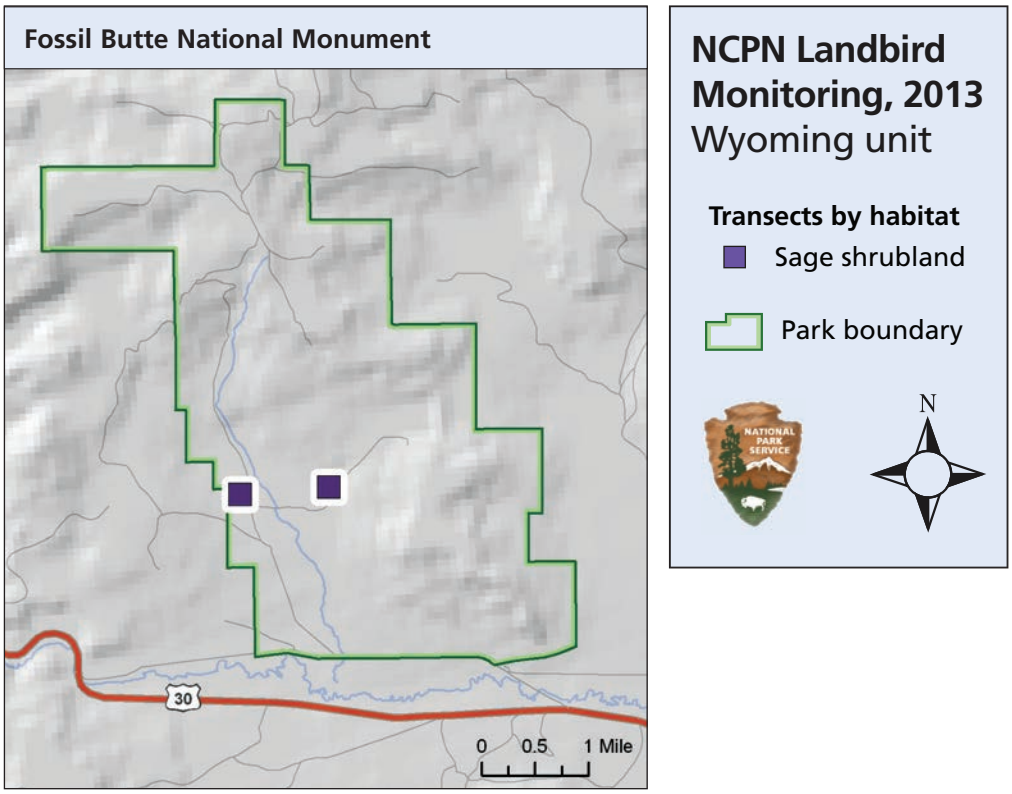

Figure 2-3. Transect locations, Fossil Butte National Monument.

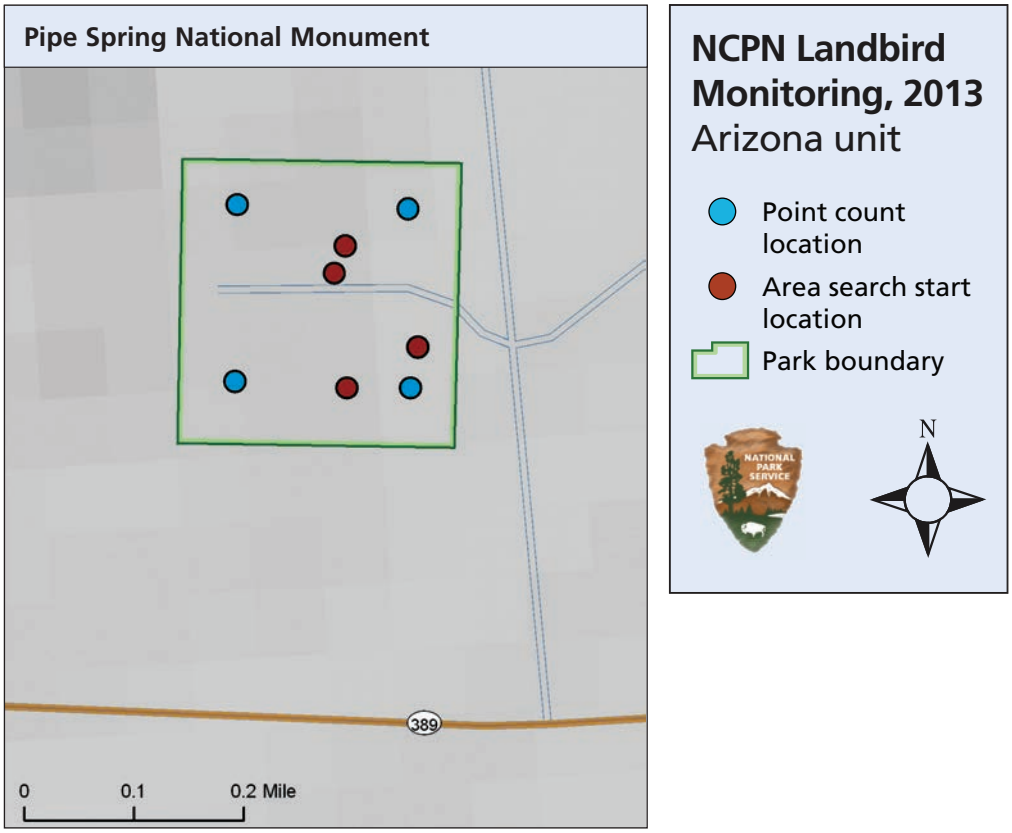

Figure 2-4. Point-count and area-search locations, Pipe Spring National Monument.

and plant identification, and practice distance estimation in a variety of habitats.

We sampled landbird populations in each habitat following the protocol created by Daw and others (2004) and modified by Hanni and others (2012). We surveyed all transects between one half-hour before and five hours after sunrise. We conducted up to 15 five-minute point counts at 250-m intervals along each transect. In order to increase our sample size, we surveyed all transect locations twice during the summer; each visit was on a separate day. At each point, we recorded all birds detected during the five-minute point count.

For every bird detected, we recorded species, sex, horizontal distance from the observer, minute, type of detection (e.g., call, song, visual), whether the bird was thought to be a migrant, and whether the observer was able to visually identify each record. Observers measured horizontal distances to each bird using laser rangefinders. When it was not possible to measure the distance to a bird, observers estimated distance by measuring to some nearby object.

Observers also recorded birds flying over but not using the immediate surrounding landscape. For distribution mapping purposes, observers recorded the presence of all rare or difficult-to-detect species encountered while traveling between points (e.g., woodpeckers, owls, raptors). We considered all non-independent detections of birds (i.e., flocks or pairs of conspecific birds together in close proximity) to be part of a "cluster," rather than separate independent observations. Observers recorded the number of birds detected within each cluster along with a letter code to distinguish between multiple clusters.

At the start and end of each transect, we recorded time, temperature, percent cloud cover, and precipitation type, and estimated the Beaufort scale wind-speed category. We navigated between points using hand-held global positioning system (GPS) units. All GPS data were recorded using Universal Transverse Mercator coordinates projected in North American Datum 1983. At each point, we recorded GPS accuracy, start time, and habitat information (within a 50-m radius). For habitat information, we recorded structural stage as well as types, relative abundance, percent coverage, and mean height of trees, shrubs, and groundcover. Additional information recorded included the number of snags and the presence or absence of a midstory, cliff/rock, prairie dog towns, prairie dogs, tamarisk, and tamarisk beetle. We recorded these data prior to beginning each point count.

For more detailed information about survey methods and vegetation data collection protocols, refer to RMBO's NCPN point transect protocol on our Avian Data Center website, http://rmbo.org/v3/avian/DataCollection.aspx. Links to past and current protocols and data sheets may be found there.

At Pipe Spring National Monument, the point-count surveys used the methods described above. We conducted two area searches at each of four locations within the monument. We conducted six diurnal area searches and two nocturnal area searches, beginning at dusk. Each diurnal area search has a specific start location and covers one of the following areas within the park: visitor center, riparian corridors, or horse corrals. The nocturnal area search is intended to cover the entire park. During area searches, the observer continuously walks throughout the monument, tallying all individual birds heard and seen and recording information about any breeding or flocking behavior.

2.4 Data analysis

Distance sampling theory was developed to account for the decreasing probability of detecting an object of interest (e.g., a bird) with increasing distance from the observer to the object (Buckland et al. 2001). Distance analysis relies on three critical assumptions: (1) all birds at and near the sampling location (distance = 0) are detected, (2) distances to birds are measured accurately, and (3) birds do not move in response to the observer's presence. These assumptions are reasonably well-met following the protocol (Hanni et al. 2012). We used the analysis software, Distance 6.0 (Thomas et al. 2010), to estimate detection probabilities using our point-count data. Analysis of distance data is accomplished by fitting a detection function to the distribution of recorded distances. The distribution of distances can be a function of characteristics

of the object (e.g., for birds, its size and color, movement, volume of song or call, and frequency of call), the sampling landscape (e.g., density of vegetation), and observer ability.

We estimated densities of species for which we obtained at least 80 independent detections within a habitat across all years. We excluded birds flying over and not using the immediate surrounding landscape, migrant birds, juvenile birds, and birds detected between points from analyses. We fit a half normal key function, uniform function, and hazard rate key function with cosine series expansions and a hazard rate key function with simple polynomial series expansion to the distribution of distances for each species (Buckland et al. 2001). We used Akaike's Information Criterion corrected for small sample size and model selection theory to select the most parsimonious detection function for each species (Burnham and Anderson 2002). We estimated variance in Distance using bootstrapping of transects within strata, rather than using empirical estimates. Empirical methods tend to underestimate variance from small sample sizes.

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

3 Results

In 2013, the ninth year of RMBO landbird monitoring in the NCPN, we conducted 1,061 point counts along 45 transects (44 of the 45 transect locations were surveyed twice) in three habitat types between May 12 and July 10, 2013 (Table 3-1). We were unable to complete the second visit to a survey site in Dinosaur National Monument after a large rockslide closed that area of the park. Seventy-nine percent of all point count locations were surveyed in 2013 (1,061 out of 1,350). There were several reasons why not all points were surveyed, including: running out of time/decreased bird activity (151 points), unsuitable weather (50 points), poor GPS reception (15 points), rivers that could not be safely crossed (12 points), and inability to hear well enough to detect birds due to background noise (8 points).

We recorded 8,710 birds of 120 species during habitat-based point counts (Table 3-2, Appendix A). We detected 2,618 birds of 76 species in low-elevation riparian, 2,406 birds of 76 species in pinyon-juniper, and 3,686 birds of 102 species in sage shrubland habitats. In 2013, we recorded six species in two parks where RMBO had not previously recorded them during habitat-based surveys: American pipit, house sparrow, lesser scaup, marsh wren, and ruddy duck were recorded at Curecanti NRA, and a greater roadrunner was recorded at Zion National Park. Marsh wren was defined as Probably Present in Curecanti NRA, and the rest of the new detections were already defined as Present by the National Park Service.

We detected 370 birds of 34 species during surveys in Pipe Spring National Monument. We detected 75 birds of 18 species during point counts and 296 birds and 16 additional species during the nocturnal and diurnal area searches of the monument. In 2013, we recorded four species that RMBO had not recorded at the monument in previous years: black-crowned night-heron, cliff swallow, Cooper's hawk, and red-tailed hawk.

Table 3-1. Bird sampling periods and effort by habitat in the Northern Colorado Plateau Network, 2013.

Habitat	Dates sampled	# survey locations*	# point counts
Low-elevation riparian	5/21/2013–7/7/2013	15	326
Pinyon juniper	5/14/2013–7/10/2013	15	337
Sage shrubland	5/12/2013–7/9/2013	15	398
All habitats	**5/12/2013–7/10/2013**	**45**	**1,061**

*Technicians surveyed 44 of 45 transect locations twice.

Table 3-2. Bird totals and averages by habitat in the Northern Colorado Plateau Network, 2013.

Habitat	# birds detected	Avg. # birds per transect	# species detected	Avg. # species per transect
Low-elevation riparian	2,618	90	76	24
Pinyon-juniper	2,406	80	76	23
Sage shrubland	3,686	123	102	28
All habitats	8,710	98	120	25

In 2013, we estimated densities of 61 species in at least one habitat. These 61 species represent 51% of species detected on transects in the NCPN during 2013 and 94% of birds observed on transects during 2013. The habitat-stratified data yielded robust density estimates (coefficient of variation [CV] <50%) for 41 species in at least one habitat in 2013.

RMBO recorded 77 species of conservation and management concern (priority species) throughout the NCPN (Appendix B). The increase in the number of priority species, compared to previous years, is due in part to the addition of sensitive species as designated by Colorado Parks and Wildlife. We estimated densities for 29 of these priority species.

3.1 Density estimates

3.1.1 Low-elevation riparian

We surveyed all 15 LR transects at least once, and 14 of 15 transects two times each in 2013. We estimated densities of 42 species, 16 of which were priority species, from 2005 to 2013. The data yielded robust density estimates (CV <50%) for 23 species and a moderately robust estimate (CV=50–75%) for 14 additional species (Table 3-3) in 2013. These 37 species represent 49% of all species detected and 94% of all individuals detected in LR habitat.

The following 10 species had the highest estimated densities in LR in 2013 (listed in order from highest to lowest density, with priority species bolded):

1. **Black-chinned hummingbird**
2. **Violet-green swallow**
3. Spotted towhee
4. Yellow warbler
5. Blue-gray gnatcatcher
6. **Lazuli bunting**
7. Lesser goldfinch
8. House finch
9. **White-throated swift**
10. Ash-throated flycatcher

The following 25 species had higher estimated densities in LR than in the other two habitats sampled in 2013 (listed in order from highest to lowest density):

1. **Black-chinned hummingbird**
2. **Violet-green swallow**
3. Spotted towhee
4. Yellow warbler
5. **Lazuli bunting**
6. Lesser goldfinch
7. **White-throated swift**
8. Ash-throated flycatcher
9. Yellow-breasted chat
10. Lucy's warbler
11. House wren
12. **Plumbeous vireo**
13. Blue grosbeak
14. Common yellowthroat
15. American robin
16. Song sparrow
17. **Warbling vireo**
18. Black-headed grosbeak
19. Black phoebe
20. Western wood-pewee
21. **Bewick's wren**
22. Common raven
23. **Say's phoebe**
24. Canyon wren
25. Bullock's oriole

Table 3-3. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in LR habitat in the NCPN, 2005–2013.

Species	Year	D	LCL	UCL	% CV	n
American robin	2005	4.51	1.51	8.23	47	16
	2006	7.04	2.76	12.46	42	25
	2007	7.01	2.67	12.32	42	26
	2008	8.31	3.24	14.89	43	31
	2009	1.58	0.30	3.33	65	5
	2010	5.27	0.59	11.03	62	17
	2011	4.17	1.2	7.91	50	14
	2012	3.98	0.88	7.81	59	12
	2013	7.36	2.28	14.16	50	20
Ash-throated flycatcher	2005	20.25	14.14	27.01	19	152
	2006	19.83	14.2	26.53	19	235
	2007	20.79	13.3	29.75	24	205
	2008	32.36	20.41	49.73	27	191
	2009	15.41	7.83	25.79	35	133
	2010	24.64	16.29	34.27	23	187
	2011	11.23	7.28	16.1	25	200
	2012	15.74	10.85	21.14	20	166
	2013	15.02	9.85	20.72	22	145
Bewick's wren	**2005**	**7.11**	**2.9**	**11.8**	**40**	**44**
	2006	**15.83**	**7.86**	**24.7**	**34**	**100**
	2007	**8.69**	**3.25**	**15.06**	**42**	**56**
	2008	**8.81**	**3.29**	**15.07**	**41**	**57**
	2009	**15.67**	**6.72**	**25.33**	**36**	**85**
	2010	**3.63**	**1.49**	**6.42**	**41**	**20**
	2011	**2.42**	**0.87**	**4.12**	**40**	**14**
	2012	**10.21**	**4.41**	**16.99**	**37**	**54**
	2013	**4.09**	**1.9**	**6.81**	**36**	**19**
Black phoebe	2005	4.73	0	11.66	79	10
	2006	4.42	0.37	11.4	81	10
	2007	8.91	0.69	22.21	84	19
	2008	3.81	0.00	8.89	74	9
	2009	9.27	0	19.07	64	20
	2010	1.02	0.00	2.43	74	2
	2011	0.98	0.00	2.80	99	2
	2012	5.41	1.17	10.97	60	10
	2013	5.44	0.00	13.50	79	9
Black-chinned hummingbird	**2005**	**118.5**	**63.11**	**200.15**	**37**	**28**
	2006	**147.04**	**72.94**	**259.06**	**40**	**35**
	2007	**86.19**	**41.98**	**143.46**	**38**	**22**
	2008	**91.86**	**49.47**	**155.25**	**36**	**23**
	2009	**109.6**	**51.27**	**198**	**41**	**23**
	2010	**63.63**	**34.26**	**108.32**	**37**	**14**
	2011	**77.95**	**39.84**	**137.27**	**38**	**18**
	2012	**118.94**	**61.59**	**195.39**	**37**	**23**

Table 3-3. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in LR habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
Black-chinned hummingbird, cont.	**2013**	**132.8**	**63.12**	**222.59**	**38**	**22**
Black-headed grosbeak	2005	3.49	0.44	8.1	75	11
	2006	6.72	3.25	10.69	34	22
	2007	3.63	1.25	6.78	48	12
	2008	5.06	1.89	8.65	41	17
	2009	6.17	0.84	13.56	62	17
	2010	3.18	0.62	6.79	59	9
	2011	4.04	1.56	6.89	41	12
	2012	5.85	2.94	9.28	33	16
	2013	4.25	1	9.16	61	10
Black-throated gray warbler	**2005**	**6.42**	**2.93**	**10.89**	**38**	**38**
	2006	**13.59**	**7.78**	**20.18**	**28**	**82**
	2007	**8.89**	**5.77**	**12.77**	**25**	**55**
	2008	**18.77**	**9.07**	**31.68**	**36**	**117**
	2009	**10.18**	**3.68**	**19.64**	**47**	**48**
	2010	**10.37**	**5.76**	**15.76**	**29**	**55**
	2011	**14.24**	**7.28**	**22.28**	**32**	**77**
	2012	**10.34**	**4.99**	**16.42**	**34**	**51**
	2013	**6.17**	**2.17**	**10.89**	**45**	**25**
Black-throated sparrow	2005	5.67	1.67	10.7	49	45
	2006	6.53	2.76	11.15	39	50
	2007	7.72	1.85	16.22	58	61
	2008	8.23	2.76	15.01	45	67
	2009	20.66	7.63	38.55	48	132
	2010	8.54	3.34	14.29	40	56
	2011	11.7	4.78	20.6	43	89
	2012	12.72	5.33	21.26	39	77
	2013	7.52	3.66	12.28	37	43
Blue grosbeak	2005	3.99	0.87	8.08	55	12
	2006	7.38	2.2	13.96	49	23
	2007	0.99	0	2.4	79	3
	2008	1.33	0.25	3.03	68	4
	2009	4.53	1.33	8.63	50	12
	2010	0.74	0	1.68	70	2
	2011	1.71	0.28	3.68	65	5
	2012	2.87	0.3	6.76	70	7
	2013	8.34	1.79	17.57	61	18
Blue-gray gnatcatcher	2005	47.25	33.44	61.77	18	103
	2006	64.19	43.01	88.87	22	142
	2007	47.98	32.81	64.87	20	109
	2008	55.56	34.83	79	25	127
	2009	125.16	88.07	165.06	19	223
	2010	81.58	59.7	104.23	16	162

Table 3-3. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in LR habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
Blue-gray gnatcatcher, cont.	2011	86.36	66.8	107.23	15	180
	2012	51.81	34.86	69.97	21	90
	2013	76.07	53.78	98.14	18	122
Broad-tailed hummingbird	**2005**	**22.69**	**9.72**	**41.02**	**44**	**25**
	2006	**1.76**	**0**	**3.97**	**70**	**2**
	2007	**2.76**	**0**	**6.56**	**73**	**3**
	2008	**6.99**	**1.59**	**14.1**	**57**	**8**
	2009	**4.29**	**0**	**11.07**	**86**	**4**
	2010	**24.82**	**11.66**	**44.24**	**41**	**24**
	2011	**3.79**	**0.86**	**8.19**	**61**	**4**
	2012	**6.43**	**0.9**	**13.67**	**62**	**6**
	2013	**7.41**	**1.88**	**15.67**	**58**	**6**
Brown-headed cowbird	2005	3.31	0.88	6.83	54	7
	2006	10.65	5.01	17.75	37	23
	2007	6.97	2.17	12.91	49	16
	2008	6.2	2.7	10.54	41	14
	2009	6.84	1.92	13.54	57	13
	2010	2.62	0.51	5.46	57	5
	2011	8.78	2.62	16.41	48	18
	2012	12.99	1.24	29.52	70	24
	2013	6.75	1.68	12.91	51	11
Bullock's oriole	2005	1.12	0.32	2.14	52	3
	2006	7.93	4.21	12.24	31	22
	2007	5.81	1.64	11.07	50	16
	2008	3.27	0.82	6.6	56	9
	2009	5.37	0.77	12.42	69	12
	2010	3.65	1.27	6.51	45	9
	2011	3.54	0.75	7.13	56	9
	2012	3.98	1.17	7.54	49	9
	2013	0.52	0	1.5	97	1
Bushtit	2005	17.35	9.63	26.75	31	17
	2006	52.06	31.98	77.27	27	53
	2007	10.72	4.18	19.45	44	11
	2008	4.97	0.99	9.62	54	5
	2009	16.15	6.64	26.67	38	14
	2010	--	--	--	--	0
	2011	--	--	--	--	0
	2012	2.34	0	5.25	68	2
	2013	8.05	0	21.71	87	6
Canyon wren	2005	1.51	0.73	2.44	35	30
	2006	3.1	1.7	4.78	31	61
	2007	1.85	0.83	3.08	37	37
	2008	1.31	0.29	2.62	57	26
	2009	1.38	0.48	2.49	46	23

Table 3-3. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in LR habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
Canyon wren, cont.	2010	0.06	0	0.17	100	1
	2011	0.48	0.15	0.85	44	9
	2012	0.73	0.25	1.4	49	12
	2013	0.9	0.18	1.82	56	13
Chipping sparrow	**2005**	**3.22**	**0.64**	**6.5**	**55**	**5**
	2006	**3.85**	**0.82**	**7.7**	**55**	**6**
	2007	**17.44**	**7.17**	**29.53**	**40**	**27**
	2008	**16.53**	**7.36**	**27.36**	**39**	**26**
	2009	**16.67**	**4.68**	**30.75**	**49**	**22**
	2010	**19.8**	**8.03**	**34.04**	**42**	**27**
	2011	**11.21**	**4.11**	**19.66**	**42**	**16**
	2012	**14.15**	**6.02**	**24.71**	**41**	**18**
	2013	**3.49**	**0**	**8.15**	**74**	**4**
Common raven	2005	2.51	1.33	3.92	32	16
	2006	1.59	0.46	3.26	58	10
	2007	1.97	0.85	3.33	40	13
	2008	5.36	2.31	9.64	43	34
	2009	1.3	0.4	2.46	50	7
	2010	4.31	1.42	7.67	44	24
	2011	2.18	1.14	3.37	32	13
	2012	1.13	0.3	2.24	54	6
	2013	3.6	1.6	6.06	38	17
Common yellowthroat	2005	7.29	2.06	14.79	53	9
	2006	15.38	4.01	30.97	53	19
	2007	14.92	0.68	33.76	69	19
	2008	3.16	0	9.04	105	4
	2009	16.84	2.54	39.44	68	18
	2010	8.94	0	21.87	77	10
	2011	7.81	1.09	15.49	57	9
	2012	8.62	0.89	19.7	69	9
	2013	8.17	0	23.76	95	7
Gray vireo	**2005**	**0.94**	**0.4**	**1.56**	**38**	**17**
	2006	**1.93**	**0.81**	**3.37**	**41**	**35**
	2007	**0.95**	**0.29**	**1.75**	**48**	**17**
	2008	**1.15**	**0.45**	**1.94**	**39**	**21**
	2009	**2.11**	**0.96**	**3.51**	**37**	**33**
	2010	**0.25**	**0.05**	**0.52**	**60**	**4**
	2011	**0.49**	**0.13**	**0.86**	**43**	**8**
	2012	**0.59**	**0.2**	**1**	**42**	**9**
	2013	**1.4**	**0.58**	**2.35**	**40**	**19**
House finch	2005	23.95	21.33	26.89	7	104
	2006	33.48	30.27	37.02	6	174
	2007	30.7	26.9	35.04	8	185

Table 3-3. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in LR habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
House finch, cont.	2008	31.73	28.32	35.55	7	185
	2009	27.59	22.97	33.13	11	161
	2010	20.94	18.1	24.21	9	104
	2011	12.89	5.84	28.47	51	117
	2012	13.82	8.34	22.89	31	77
	2013	18.81	15.91	22.25	10	74
House wren	2005	9.08	2.79	17.88	52	41
	2006	9.1	1.06	17.97	56	43
	2007	6.94	1.2	13.74	56	32
	2008	10.07	0.99	20.97	61	48
	2009	9.99	1.38	19.91	56	38
	2010	6.81	0	19.76	96	27
	2011	10.72	1.51	22.28	61	46
	2012	8.82	1.98	17.07	53	35
	2013	10.62	1.09	22.7	62	35
Juniper titmouse	**2005**	**7.97**	**3.41**	**13.52**	**39**	**28**
	2006	**6.79**	**3.25**	**10.58**	**34**	**24**
	2007	**10.41**	**5.94**	**15.46**	**29**	**38**
	2008	**10.6**	**5.4**	**16.82**	**33**	**39**
	2009	**9.25**	**3.02**	**17.06**	**47**	**28**
	2010	**5.38**	**1.89**	**9.29**	**42**	**17**
	2011	**5.68**	**2.7**	**8.98**	**35**	**19**
	2012	**2.93**	**1.35**	**4.65**	**35**	**9**
	2013	**4.06**	**1.42**	**7.11**	**43**	**11**
Lazuli bunting	**2005**	**64.3**	**52.75**	**78.39**	**12**	**154**
	2006	**57.4**	**45.88**	**71.8**	**13**	**138**
	2007	**48.5**	**39.51**	**59.53**	**12**	**167**
	2008	**61.61**	**49.6**	**76.52**	**13**	**153**
	2009	**60.13**	**44.7**	**80.88**	**18**	**156**
	2010	**53.74**	**43.3**	**66.69**	**13**	**150**
	2011	**19.17**	**14.56**	**25.23**	**17**	**109**
	2012	**26.58**	**20.74**	**34.08**	**15**	**95**
	2013	**42.87**	**33.35**	**55.09**	**15**	**86**
Lesser goldfinch	2005	10.79	4.23	18.49	41	22
	2006	21.97	11.99	33.43	31	45
	2007	40.35	22.7	61.91	31	88
	2008	25.97	9.58	46.88	49	49
	2009	37.94	16.46	62.66	37	70
	2010	14.81	5.32	26.27	43	30
	2011	15.94	8.16	24.83	32	30
	2012	19.09	6.74	34.13	46	33
	2013	18.97	10.71	28.97	30	33
Lucy's warbler	2005	0.39	0	1.14	98	1
	2006	--	--	--	--	0

Table 3-3. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in LR habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
Lucy's warbler, cont.	2007	3.06	0	7.92	85	8
	2008	5.56	1.14	10.93	54	15
	2009	10.39	2.55	20.73	56	22
	2010	1.28	0	2.99	73	3
	2011	4.81	1.88	8.24	41	12
	2012	9.45	2.72	17.68	49	21
	2013	11.24	2.25	21.58	52	22
Mourning dove	2005	9.33	4.84	15.45	35	73
	2006	15.7	10.05	22.44	24	114
	2007	17.96	11.03	25.54	25	140
	2008	10.95	4.72	18.46	39	91
	2009	5.19	2.81	7.95	30	35
	2010	14.61	8.7	21.36	27	96
	2011	10.48	5.87	16.38	32	73
	2012	7.5	4.26	10.99	28	43
	2013	10.97	4.95	17.79	36	50
Northern flicker	**2005**	**0.61**	**0.26**	**1.09**	**43**	**9**
	2006	**0.92**	**0.31**	**1.65**	**45**	**14**
	2007	**1.46**	**0.56**	**2.74**	**47**	**22**
	2008	**0.53**	**0.06**	**1.27**	**73**	**8**
	2009	**0.33**	**0.05**	**0.83**	**76**	**4**
	2010	**0.39**	**0.06**	**0.9**	**67**	**5**
	2011	**0.57**	**0.21**	**1.02**	**45**	**8**
	2012	**0.57**	**0.17**	**1.21**	**59**	**7**
	2013	**0.48**	**0.08**	**1.04**	**62**	**5**
Plumbeous vireo	**2005**	**11.26**	**6.56**	**15.93**	**47**	**52**
	2006	**18.23**	**9.79**	**27.14**	**50**	**85**
	2007	**13.52**	**7.59**	**18.9**	**52**	**63**
	2008	**9.93**	**6.09**	**13.76**	**45**	**48**
	2009	**16.75**	**9.66**	**24.86**	**44**	**67**
	2010	**17.85**	**10.03**	**25.33**	**47**	**74**
	2011	**8.22**	**5.1**	**11.58**	**42**	**36**
	2012	**8.43**	**4.52**	**12.86**	**46**	**33**
	2013	**10.37**	**3.96**	**18.37**	**60**	**36**
Rock wren	**2005**	**4.83**	**2.85**	**7.27**	**28**	**75**
	2006	**6.68**	**4.03**	**9.94**	**27**	**105**
	2007	**8.48**	**5.51**	**11.85**	**22**	**137**
	2008	**4.93**	**2.61**	**8.28**	**34**	**80**
	2009	**7.06**	**4.53**	**10.14**	**24**	**94**
	2010	**4.21**	**2.5**	**6.27**	**27**	**58**
	2011	**6.94**	**4.33**	**10.17**	**26**	**102**
	2012	**2.91**	**1.2**	**5**	**40**	**38**
	2013	**4.93**	**2.74**	**7.64**	**31**	**53**

Table 3-3. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in LR habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
Say's phoebe	**2005**	**3.22**	**2.11**	**4.52**	**23**	**41**
	2006	**4.8**	**2.74**	**7.49**	**31**	**61**
	2007	**2.81**	**1.81**	**3.95**	**23**	**37**
	2008	**3.95**	**1.91**	**6.37**	**35**	**51**
	2009	**4.8**	**2.09**	**8.21**	**40**	**51**
	2010	**2.3**	**1.04**	**3.88**	**38**	**25**
	2011	**5.44**	**2.91**	**8.33**	**30**	**64**
	2012	**2.63**	**1.44**	**3.93**	**29**	**26**
	2013	**3.39**	**1.88**	**5.21**	**30**	**32**
Song sparrow	2005	17.4	3.96	38.4	61	44
	2006	20.46	5.67	37.6	48	53
	2007	17.26	4.27	31.81	48	45
	2008	13.51	4.5	24.22	43	36
	2009	10.82	0	24.34	66	25
	2010	2.98	0	8.42	97	7
	2011	10.43	1.91	21.13	57	25
	2012	10.27	2.01	21.78	62	22
	2013	6.91	1.07	14.16	59	13
Spotted towhee	2005	43.44	37.22	50.7	9	212
	2006	108.63	93.12	126.72	9	402
	2007	57.51	49.75	66.5	9	262
	2008	44.06	38.39	50.57	8	197
	2009	89.34	76.4	104.48	9	289
	2010	66.99	51.3	87.48	16	278
	2011	50.41	36.35	69.9	20	290
	2012	95.62	83.84	109.07	8	283
	2013	105.56	87.23	127.76	11	330
Violet-green swallow	**2005**	**57.54**	**40.16**	**75.75**	**19**	**68**
	2006	**184.71**	**111.19**	**269.36**	**26**	**156**
	2007	**104.86**	**66.39**	**150.9**	**25**	**93**
	2008	**139.37**	**86.05**	**207.76**	**27**	**86**
	2009	**125.44**	**80.01**	**173.32**	**23**	**112**
	2010	**60.4**	**38.77**	**85.23**	**23**	**63**
	2011	**36.72**	**21.17**	**55.07**	**27**	**33**
	2012	**127.12**	**70.64**	**202.01**	**32**	**87**
	2013	**118.87**	**75.13**	**165.01**	**23**	**81**
Virginia's warbler	**2005**	**7.25**	**3.07**	**12.35**	**39**	**25**
	2006	**11.84**	**2.53**	**23.92**	**56**	**41**
	2007	**8.65**	**4.17**	**14.21**	**35**	**31**
	2008	**17.81**	**9.86**	**26.87**	**29**	**64**
	2009	**0.66**	**0**	**1.87**	**96**	**2**
	2010	**8.22**	**3.81**	**13.51**	**36**	**26**
	2011	**4.33**	**1.84**	**7.37**	**40**	**14**
	2012	**10.98**	**1.58**	**21.72**	**56**	**34**

Table 3-3. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in LR habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
Virginia's warbler, cont.	**2013**	**5.13**	**1.31**	**9.66**	**49**	**14**
Warbling vireo	**2005**	**4.84**	**1.81**	**8.88**	**45**	**19**
	2006	**9.95**	**4.46**	**17**	**40**	**40**
	2007	**6.54**	**2.43**	**11.8**	**44**	**27**
	2008	**7.43**	**4.26**	**10.69**	**27**	**31**
	2009	**5.4**	**1.99**	**9.34**	**43**	**19**
	2010	**5.84**	**0**	**14.93**	**90**	**21**
	2011	**3.82**	**1.18**	**7.15**	**49**	**14**
	2012	**5.45**	**1.6**	**10.4**	**49**	**19**
	2013	**6.89**	**2.56**	**12.56**	**46**	**20**
Western scrub-jay	2005	3.43	1.68	5.64	36	18
	2006	4.74	2.22	8.26	40	25
	2007	4.01	1.81	6.6	36	22
	2008	4.03	1.01	8.87	61	22
	2009	2.4	0.56	4.95	55	11
	2010	3.09	0.99	5.94	51	14
	2011	4	1.72	6.65	39	20
	2012	3.36	1.63	5.99	39	15
	2013	4.51	2.09	7.91	41	18
Western tanager	2005	1.84	0.43	3.89	63	7
	2006	4.84	2.54	7.71	36	19
	2007	1.76	0.23	3.97	67	7
	2008	2.8	0.86	5.48	51	11
	2009	0.88	0.22	1.81	59	3
	2010	4.49	2.01	8.57	48	15
	2011	2.25	0.71	4.24	50	8
	2012	3.09	1.4	5.44	40	10
	2013	1.39	0	3.23	72	4
Western wood-pewee	2005	4	1.9	6.67	37	27
	2006	4.83	1.71	8.51	45	33
	2007	5	1.52	9.85	51	34
	2008	4.59	1.02	9.88	63	31
	2009	4.76	1.45	9.26	49	28
	2010	2.29	0.3	4.95	63	14
	2011	2.53	1.06	4.28	40	16
	2012	3.32	1.03	6.51	50	19
	2013	4.47	1.52	8.4	48	22
White-throated swift	**2005**	**30.03**	**17.94**	**43.84**	**27**	**103**
	2006	**49.41**	**27.04**	**75.62**	**30**	**127**
	2007	**61.87**	**36.45**	**91.46**	**27**	**190**
	2008	**35.86**	**18.43**	**56.36**	**33**	**86**
	2009	**15.09**	**7.58**	**23.78**	**34**	**73**
	2010	**11.24**	**4.48**	**19.65**	**41**	**50**

Table 3-3. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in LR habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
White-throated swift, cont.	**2011**	**14.84**	**6.82**	**24.59**	**37**	**46**
	2012	**13.36**	**5.36**	**22.96**	**41**	**42**
	2013	**17.05**	**5.08**	**31.98**	**47**	**33**
Yellow warbler	2005	65.29	55.67	76.57	10	131
	2006	79.31	60.8	103.46	16	135
	2007	45.32	37.25	55.13	12	113
	2008	86	66.55	111.13	16	142
	2009	142.16	112.86	179.08	13	220
	2010	66.7	45.74	97.26	23	179
	2011	47.74	37.3	61.1	15	127
	2012	83.73	66.96	104.71	13	172
	2013	82.82	67.58	101.49	12	130
Yellow-breasted chat	2005	6.04	0.84	15.76	78	37
	2006	7.68	1.69	16.91	67	51
	2007	6.17	0.86	14.51	74	42
	2008	4.99	1.38	9.24	50	32
	2009	7.69	3.2	13.67	42	43
	2010	8.83	3.5	15.66	43	50
	2011	7.42	1.97	15.04	54	45
	2012	10.29	2.55	21.46	60	56
	2013	11.33	3.11	23.18	57	55
Yellow-rumped warbler	2005	2.15	0.48	4.33	57	4
	2006	1.1	0	2.32	65	2
	2007	1.6	0	3.53	69	3
	2008	4.25	0.45	10.57	77	8
	2009	1.99	0	4.64	75	3
	2010	27.22	12.07	42.57	33	43
	2011	15.86	5.05	28.94	46	26
	2012	7.9	2.65	14.25	46	12
	2013	0.71	0	2.04	98	1

Dashes indicate the sample size was insufficient for estimating density. Priority species are bolded.

3.1.2 Pinyon-juniper

We surveyed all 15 PJ transects two times each in 2013. We estimated densities of 40 species, 21 of which were priority species, from 2005 to 2013. The 2013 data yielded robust density estimates (CV <50%) for 21 species and a moderately robust estimate (CV=50–75%) for 12 additional species (Table 3-4). These 33 species represent 43% of all species and 84% of all individuals detected in PJ habitat.

The following ten species had the highest estimated densities in PJ in 2013 (listed in order from highest to lowest density, with priority species bolded):

1. Blue-gray gnatcatcher
2. **Black-throated gray warbler**
3. **Juniper titmouse**
4. House finch
5. Spotted towhee
6. Mourning dove
7. **Chipping sparrow**
8. **Gray flycatcher**
9. **Gray vireo**
10. Black-throated sparrow

The following 20 species had higher estimated densities in PJ compared to the other two habitats sampled in 2013 (listed in order from highest to lowest density):

1. Blue-gray gnatcatcher
2. **Black-throated gray warbler**
3. **Juniper titmouse**
4. House finch
5. Bushtit
6. Mourning dove
7. **Chipping sparrow**
8. **Gray flycatcher**
9. **Gray vireo**
10. Black-throated sparrow
11. **Mountain bluebird**
12. **Pinyon jay**
13. **Virginia's warbler**
14. Brown-headed cowbird
15. Western scrub-jay
16. **Mountain chickadee**
17. White-breasted nuthatch
18. **Grace's warbler**
19. Western tanager
20. Hermit thrush

Table 3-4. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in PJ habitat in the NCPN, 2005–2013.

Species	Year	D	LCL	UCL	% CV	n
American robin	2005	1.91	0.91	3.10	34	27
	2006	2.67	1.02	4.99	47	37
	2007	2.67	0.59	6.47	70	36
	2008	1.93	0.21	4.68	72	25
	2009	1.10	0.00	2.61	76	14
	2010	0.85	0.07	1.79	63	12
	2011	2.72	1.26	4.76	40	33
	2012	1.00	0.35	1.83	45	13
	2013	1.61	0.43	3.06	52	17
Ash-throated flycatcher	2005	9.05	6.62	11.83	17	122
	2006	9.72	6.46	13.20	21	130
	2007	9.38	6.01	12.93	22	125
	2008	9.65	6.41	13.29	22	120
	2009	9.44	6.35	12.56	20	109
	2010	6.71	4.74	8.75	18	87
	2011	7.53	5.62	9.84	17	89
	2012	6.18	4.13	8.37	21	76
	2013	8.53	5.90	11.79	21	86
Bewick's wren	**2005**	**18.74**	**13.77**	**23.11**	**71**	**136**
	2006	**18.63**	**10.46**	**27.01**	**80**	**134**
	2007	**15.85**	**7.91**	**23.34**	**104**	**115**
	2008	**14.94**	**7.07**	**24.16**	**45**	**102**
	2009	**12.19**	**7.68**	**16.46**	**51**	**79**
	2010	**3.13**	**1.18**	**5.12**	**87**	**22**
	2011	**4.04**	**1.95**	**6.10**	**84**	**26**
	2012	**7.89**	**4.13**	**12.20**	**42**	**55**
	2013	**3.51**	**1.25**	**6.08**	**139**	**19**
Black-chinned hummingbird	**2005**	**30.04**	**8.52**	**59.64**	**55**	**9**
	2006	**39.19**	**10.18**	**79.60**	**56**	**12**
	2007	**43.62**	**9.68**	**91.70**	**59**	**13**
	2008	**10.62**	**0.00**	**25.92**	**72**	**3**
	2009	**58.13**	**30.17**	**103.49**	**38**	**16**
	2010	**44.20**	**10.53**	**88.88**	**57**	**13**
	2011	**15.09**	**4.63**	**29.19**	**50**	**4**
	2012	**36.00**	**12.22**	**71.50**	**55**	**10**
	2013	**21.53**	**6.61**	**40.67**	**50**	**5**
Black-headed grosbeak	2005	0.35	0.00	0.88	79	4
	2006	1.03	0.00	2.47	75	12
	2007	1.22	0.00	3.22	88	15
	2008	0.65	0.00	1.63	83	7
	2009	1.04	0.09	2.43	74	12
	2010	0.62	0.00	1.79	98	7
	2011	1.44	0.59	2.32	37	15

Table 3-4. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in PJ habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
Black-headed grosbeak, cont.	2012	1.19	0.09	2.61	64	13
	2013	1.50	0.10	3.19	65	13
Black-throated gray warbler	2005	103.27	56.50	188.76	38	264
	2006	82.14	66.92	100.82	12	346
	2007	87.11	68.96	110.03	14	319
	2008	56.65	46.54	68.97	12	338
	2009	100.23	77.14	130.22	16	348
	2010	49.21	40.17	60.28	12	259
	2011	41.03	35.43	47.52	9	294
	2012	60.66	46.44	79.25	16	269
	2013	38.87	26.63	56.71	23	117
Black-throated sparrow	2005	6.20	2.50	10.76	41	40
	2006	10.84	4.23	18.80	42	66
	2007	14.60	4.92	27.30	48	93
	2008	11.55	2.76	24.58	60	69
	2009	13.79	5.94	22.37	36	76
	2010	9.96	5.14	15.69	32	62
	2011	11.16	5.03	18.31	37	59
	2012	14.21	7.59	22.22	32	85
	2013	12.57	5.78	20.48	37	57
Blue-gray gnatcatcher	2005	71.42	48.33	97.04	21	130
	2006	51.19	30.16	75.65	27	94
	2007	70.06	48.55	95.38	20	127
	2008	59.75	36.75	86.35	25	101
	2009	138.80	107.56	172.38	14	220
	2010	78.54	54.27	106.91	20	140
	2011	89.33	69.64	109.47	14	143
	2012	77.45	56.09	98.55	17	131
	2013	83.10	55.96	116.69	23	114
Brown-headed cowbird	2005	4.66	1.80	7.96	41	15
	2006	3.64	0.92	6.96	52	12
	2007	4.79	1.32	9.66	55	15
	2008	3.37	0.91	6.87	55	10
	2009	5.72	2.46	9.59	38	17
	2010	2.29	0.00	5.98	88	7
	2011	2.39	0.44	4.89	56	7
	2012	5.97	2.58	10.63	42	18
	2013	5.00	1.14	10.10	56	12
Bushtit	2005	83.90	43.69	139.03	35	33
	2006	65.87	41.00	96.90	27	26
	2007	34.94	14.70	59.57	40	14
	2008	19.02	4.35	39.44	58	7
	2009	98.38	51.72	152.92	31	36

Table 3-4. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in PJ habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
Bushtit, cont.	2010	--	--	--	--	0
	2011	2.89	0.00	8.08	99	1
	2012	21.17	7.41	37.33	42	8
	2013	16.97	6.72	28.88	41	5
Canyon wren	2005	0.37	0.14	0.84	59	15
	2006	0.55	0.07	1.14	59	22
	2007	0.60	0.12	1.44	69	24
	2008	0.12	0.00	0.34	85	5
	2009	0.36	0.02	0.83	69	15
	2010	0.08	0.02	0.17	65	3
	2011	0.17	0.00	0.46	85	6
	2012	0.09	0.00	0.27	102	4
	2013	0.12	0.00	0.37	105	4
Chipping sparrow	2005	20.01	11.87	30.45	29	70
	2006	15.51	9.49	23.10	27	53
	2007	22.61	12.26	34.53	31	75
	2008	27.99	16.48	41.50	27	88
	2009	48.87	21.52	81.07	37	134
	2010	28.77	16.43	45.07	31	92
	2011	34.02	22.32	46.80	22	102
	2012	30.23	15.46	47.85	34	94
	2013	13.41	5.05	23.47	42	34
Common raven	2005	0.68	0.39	1.01	27	35
	2006	0.29	0.15	0.47	33	19
	2007	1.08	0.67	1.57	25	68
	2008	0.63	0.37	0.94	28	38
	2009	0.37	0.14	0.67	44	27
	2010	1.07	0.63	1.58	28	66
	2011	1.12	0.72	1.62	25	59
	2012	0.35	0.17	0.55	34	20
	2013	0.87	0.36	1.59	44	35
Dusky flycatcher	2005	3.31	0.23	7.76	76	12
	2006	9.95	2.35	20.25	56	35
	2007	7.69	1.07	16.67	61	28
	2008	13.42	1.84	32.57	75	40
	2009	4.14	0.00	9.83	73	14
	2010	4.43	0.00	10.91	75	16
	2011	4.05	0.49	8.04	57	13
	2012	7.53	1.76	14.60	52	26
	2013	9.65	0.00	19.55	62	25
Grace's warbler	2005	0.80	0.53	1.21	25	6
	2006	1.62	1.07	2.46	25	12
	2007	2.69	1.76	4.09	26	20

Table 3-4. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in PJ habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
Grace's warbler, cont.	2008	1.15	0.76	1.75	25	8
	2009	2.49	1.63	3.78	26	17
	2010	1.52	1.00	2.31	25	11
	2011	2.61	1.72	3.96	26	17
	2012	1.56	1.03	2.36	25	11
	2013	0.53	0.35	0.81	25	3
Gray flycatcher	2005	22.68	16.29	29.55	17	116
	2006	17.46	10.74	24.74	25	86
	2007	16.66	8.67	25.33	32	85
	2008	22.03	11.77	33.72	29	100
	2009	39.64	25.50	55.46	24	179
	2010	25.23	19.05	32.62	16	123
	2011	25.62	17.41	34.90	21	113
	2012	21.42	13.29	30.49	25	101
	2013	13.19	8.54	18.47	23	49
Gray vireo	2005	5.94	3.66	8.44	24	76
	2006	5.02	2.43	8.35	36	64
	2007	5.76	3.23	8.70	29	74
	2008	7.68	4.24	11.51	29	91
	2009	11.46	8.73	14.28	15	137
	2010	8.85	5.62	12.02	22	112
	2011	8.06	4.72	11.65	27	92
	2012	8.81	5.64	12.06	23	109
	2013	13.19	7.22	20.49	30	128
Green-tailed towhee	2005	2.21	0.56	4.12	48	14
	2006	0.99	0.00	2.32	72	6
	2007	3.62	0.00	10.08	87	23
	2008	1.81	0.16	4.42	74	10
	2009	0.82	0.00	1.92	77	5
	2010	0.49	0.12	1.00	57	3
	2011	2.59	0.15	6.61	79	14
	2012	1.49	0.15	3.75	76	8
	2013	1.50	0.18	3.27	64	7
Hermit thrush	2005	0.34	0.28	0.41	12	7
	2006	0.54	0.44	0.66	12	11
	2007	0.05	0.04	0.06	12	1
	2008	--	--	--	--	0
	2009	0.43	0.35	0.52	12	8
	2010	0.61	0.50	0.74	12	12
	2011	2.01	1.48	2.73	18	36
	2012	1.39	1.12	1.74	13	27
	2013	0.06	0.05	0.08	12	1

Table 3-4. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in PJ habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
House finch	2005	17.89	15.05	21.27	10	94
	2006	10.51	8.92	12.39	10	69
	2007	27.10	21.38	34.35	14	146
	2008	15.63	10.69	22.87	23	128
	2009	21.05	18.04	24.55	9	136
	2010	11.36	7.01	18.39	30	101
	2011	14.00	8.56	22.88	30	148
	2012	20.56	17.67	23.93	9	113
	2013	23.69	14.46	38.82	30	108
Juniper titmouse	2005	18.27	12.02	25.26	23	74
	2006	15.85	9.00	23.00	28	68
	2007	17.11	8.16	27.91	35	75
	2008	20.09	11.01	29.68	28	85
	2009	46.44	30.49	61.98	21	186
	2010	32.57	22.10	44.96	22	138
	2011	25.81	15.50	38.00	27	99
	2012	21.44	14.93	28.53	20	86
	2013	25.35	16.05	37.05	26	78
Lark sparrow	2005	2.42	0.64	4.67	51	20
	2006	2.19	0.12	6.28	93	17
	2007	2.13	0.12	4.68	67	19
	2008	1.64	0.25	3.41	60	13
	2009	2.24	0.47	4.68	59	17
	2010	2.12	0.20	5.44	79	17
	2011	3.84	0.79	7.92	58	27
	2012	2.40	0.51	4.86	56	19
	2013	3.71	0.57	8.32	66	24
Mountain bluebird	2005	9.53	2.46	19.87	57	61
	2006	5.13	0.78	13.35	79	31
	2007	5.62	1.24	11.93	60	36
	2008	5.46	1.22	11.46	58	33
	2009	5.52	0.83	13.04	74	32
	2010	6.57	1.67	13.62	60	39
	2011	4.31	0.62	9.59	65	25
	2012	4.82	1.25	9.65	53	29
	2013	8.12	0.80	21.81	86	37
Mountain chickadee	2005	4.78	0.85	9.86	58	19
	2006	2.46	0.73	4.71	51	9
	2007	2.64	0.74	5.44	56	10
	2008	2.68	0.22	6.39	76	9
	2009	3.92	0.27	8.46	63	13
	2010	1.08	0.00	2.97	92	4
	2011	7.74	0.74	17.05	63	26

Table 3-4. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in PJ habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
Mountain chickadee, cont.	2012	4.50	0.50	10.92	74	16
	2013	4.41	0.00	9.54	66	13
Mourning dove	2005	11.42	6.90	16.64	27	141
	2006	12.39	7.66	18.17	26	154
	2007	13.88	6.88	22.68	34	171
	2008	13.54	8.96	19.08	23	162
	2009	8.24	4.44	12.20	29	98
	2010	12.84	8.03	18.23	24	156
	2011	10.21	6.37	14.33	24	116
	2012	6.92	3.80	10.51	30	79
	2013	14.54	9.47	20.69	23	125
Northern flicker	2005	0.52	0.12	1.12	63	11
	2006	0.46	0.13	0.94	56	10
	2007	0.77	0.12	1.74	66	17
	2008	0.10	0.00	0.25	78	2
	2009	0.42	0.04	1.06	78	9
	2010	0.90	0.29	1.79	54	19
	2011	0.83	0.26	1.69	54	16
	2012	0.56	0.10	1.19	62	11
	2013	0.94	0.04	2.64	93	14
Pinyon jay	2005	1.80	0.86	2.99	36	38
	2006	4.55	1.74	7.81	41	64
	2007	6.35	2.90	10.57	38	90
	2008	1.68	0.46	3.43	57	22
	2009	2.39	1.23	3.88	34	41
	2010	6.87	3.53	11.64	35	96
	2011	2.72	0.77	4.90	47	33
	2012	2.13	0.62	3.97	50	27
	2013	6.93	1.35	14.89	63	41
Plumbeous vireo	2005	7.37	3.33	12.05	37	64
	2006	5.51	2.29	9.60	41	47
	2007	5.58	2.66	9.04	35	48
	2008	5.61	2.32	9.30	37	45
	2009	5.62	1.15	11.30	56	42
	2010	10.16	5.05	16.10	33	85
	2011	10.41	6.37	14.68	24	78
	2012	4.04	0.42	8.15	60	32
	2013	3.37	1.13	6.05	44	22
Rock wren	2005	4.67	2.85	6.73	27	85
	2006	4.77	2.70	7.33	30	86
	2007	4.84	3.00	7.12	26	87
	2008	6.11	3.05	9.68	33	102

Table 3-4. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in PJ habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
Rock wren, cont.	2009	6.37	3.32	10.08	33	99
	2010	2.62	1.37	4.15	31	46
	2011	5.50	3.35	7.84	25	88
	2012	1.51	0.75	2.41	33	26
	2013	4.47	2.13	7.06	33	59
Say's phoebe	2005	1.80	1.55	2.09	9	28
	2006	0.57	0.50	0.65	8	9
	2007	0.50	0.44	0.58	8	8
	2008	0.74	0.65	0.85	8	11
	2009	0.96	0.83	1.10	8	14
	2010	1.23	1.07	1.41	8	19
	2011	1.22	1.06	1.40	8	17
	2012	0.40	0.35	0.46	8	6
	2013	0.75	0.65	0.86	8	9
Spotted towhee	2005	14.67	8.30	22.16	29	82
	2006	12.30	4.90	20.52	38	69
	2007	19.68	8.01	33.37	40	113
	2008	8.90	3.64	14.89	40	47
	2009	19.33	8.65	31.82	36	99
	2010	13.67	5.87	22.90	38	74
	2011	23.97	10.64	39.57	38	115
	2012	19.97	8.79	33.41	39	104
	2013	23.05	9.73	38.27	37	99
Vesper sparrow	2005	0.58	0.00	1.53	89	9
	2006	0.96	0.00	2.27	75	15
	2007	0.96	0.00	2.44	82	15
	2008	0.43	0.00	1.08	84	6
	2009	0.98	0.06	2.68	93	13
	2010	1.32	0.00	3.22	78	20
	2011	1.73	0.00	4.94	95	25
	2012	1.44	0.00	3.45	77	23
	2013	2.11	0.00	5.27	87	26
Violet-green swallow	2005	8.84	4.05	14.49	38	32
	2006	13.01	4.26	24.24	47	48
	2007	16.82	5.44	30.96	47	58
	2008	15.25	5.60	28.15	45	40
	2009	10.74	5.68	17.05	32	31
	2010	8.60	2.90	16.87	51	29
	2011	8.81	4.61	13.64	33	21
	2012	15.19	8.46	22.50	28	45
	2013	9.13	3.62	16.68	44	24
Virginia's warbler	2005	10.58	3.98	19.44	46	53
	2006	6.76	0.64	14.65	67	35

Table 3-4. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in PJ habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
Virginia's warbler, cont.	2007	5.46	0.91	11.85	63	27
	2008	5.05	1.34	9.81	52	24
	2009	4.33	0.77	8.90	60	20
	2010	10.02	3.28	18.65	48	50
	2011	11.61	2.33	25.76	64	50
	2012	10.18	1.76	21.95	63	46
	2013	5.89	0.99	11.91	57	22
Western meadowlark	2005	2.19	0.14	5.54	82	40
	2006	1.12	0.00	3.20	100	20
	2007	1.34	0.00	3.98	113	21
	2008	0.85	0.00	2.32	90	14
	2009	1.09	0.00	3.16	100	17
	2010	0.23	0.00	0.57	81	4
	2011	1.99	0.10	4.57	70	34
	2012	0.48	0.00	1.20	78	8
	2013	0.62	0.00	1.85	101	8
Western scrub-jay	2005	5.92	4.85	7.22	12	28
	2006	7.05	5.75	8.63	12	32
	2007	6.60	5.35	8.14	13	29
	2008	7.74	6.25	9.59	13	33
	2009	3.59	2.89	4.46	13	15
	2010	6.16	4.98	7.62	13	26
	2011	4.71	3.82	5.80	13	19
	2012	1.74	1.30	2.33	17	7
	2013	4.63	3.73	5.75	13	16
Western tanager	2005	1.17	0.23	2.41	58	16
	2006	1.81	0.76	2.92	44	22
	2007	2.34	0.76	4.30	59	28
	2008	1.37	0.08	3.02	67	15
	2009	0.65	0.09	1.30	79	7
	2010	1.45	0.17	3.44	73	17
	2011	1.81	0.11	3.77	65	20
	2012	3.03	0.32	6.41	66	36
	2013	1.41	0.00	3.21	77	13
White-breasted nuthatch	2005	2.88	0.40	6.50	68	15
	2006	2.94	0.67	6.85	66	14
	2007	5.09	0.79	13.85	80	22
	2008	2.00	0.16	5.00	79	9
	2009	1.77	0.21	4.28	76	8
	2010	2.26	0.15	6.14	93	12
	2011	2.51	0.21	5.62	71	11
	2012	4.40	0.40	9.54	64	21
	2013	3.50	0.87	7.91	63	13

Table 3-4. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in PJ habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
White-throated swift	2005	14.11	6.37	23.53	38	66
	2006	20.02	5.53	37.72	48	82
	2007	20.52	10.47	32.16	32	95
	2008	18.09	6.92	32.27	43	67
	2009	8.15	4.30	12.78	32	36
	2010	6.01	2.21	10.75	44	25
	2011	16.16	2.77	15.31	1220	28
	2012	13.44	6.32	22.54	37	53
	2013	12.30	3.56	20.46	383	27
Yellow-rumped warbler	2005	1.90	1.64	2.19	9	11
	2006	4.48	3.78	5.31	10	26
	2007	1.92	1.66	2.22	9	11
	2008	2.43	2.09	2.82	9	13
	2009	0.19	0.16	0.22	8	1
	2010	1.44	1.25	1.65	8	8
	2011	4.69	4.03	5.45	9	24
	2012	1.29	1.12	1.48	8	7
	2013	0.69	0.60	0.79	8	3

Dashes indicate the sample size was insufficient for estimating density. Priority species are bolded.

3.1.3 Sage shrubland

We surveyed all 15 SA transects twice in 2013. We estimated densities of 40 species, 24 of which were priority species, from 2005 to 2013. The 2013 data yielded robust density estimates (CV <50%) for 23 species and a moderately robust estimate (CV=50–75%) for 15 additional species (Table 3-5). These 38 species represent 37% of all species and 89% of all individuals detected in SA habitat.

The following ten species had the highest estimated densities in SA in 2013 (listed in order from highest to lowest density, with priority species bolded):

1. **Brewer's sparrow**
2. **Green-tailed towhee**
3. **Vesper sparrow**
4. **Broad-tailed hummingbird**
5. **Violet-green swallow**
6. Blue-gray gnatcatcher
7. Lark sparrow
8. **Dusky flycatcher**
9. Cliff swallow
10. Spotted towhee

The following 16 species had higher estimated densities in SA compared to the other two habitats sampled in 2013 (listed in order from highest to lowest density):

1. **Brewer's sparrow**
2. **Green-tailed towhee**
3. **Vesper sparrow**
4. **Broad-tailed hummingbird**
5. Lark sparrow
6. **Dusky flycatcher**
7. Cliff swallow
8. **Rock wren**
9. Brewer's blackbird
10. Western meadowlark
11. **Sage thrasher**
12. Yellow-rumped warbler
13. **Horned lark**
14. **Black-billed magpie**
15. **Northern flicker**
16. **Sage sparrow**

Table 3-5. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in SA habitat in the NCPN, 2005–2013.

Species	Year	D	LCL	UCL	% CV	n
American robin	2005	2.33	1.26	3.63	33	35
	2006	4.36	2.02	7.57	40	68
	2007	3.14	1.37	6.00	48	50
	2008	2.22	1.11	3.69	37	33
	2009	1.89	0.73	3.32	43	27
	2010	2.95	1.45	5.10	39	46
	2011	3.59	1.69	5.90	36	55
	2012	3.69	2.04	5.95	34	59
	2013	3.03	1.84	4.65	29	42
Ash-throated flycatcher	2005	0.88	0.21	1.82	56	12
	2006	0.66	0.16	1.37	65	9
	2007	1.10	0.17	2.76	78	14
	2008	0.79	0.15	1.72	63	10
	2009	0.17	0.00	0.52	109	2
	2010	0.81	0.19	1.64	58	11
	2011	0.75	0.20	1.51	55	10
	2012	0.71	0.15	1.42	61	10
	2013	1.23	0.08	2.75	67	15
Black-billed magpie	**2005**	**2.72**	**0.95**	**4.76**	**44**	**62**
	2006	**2.75**	**1.69**	**4.04**	**27**	**85**
	2007	**1.61**	**0.86**	**2.43**	**29**	**45**
	2008	**1.33**	**0.57**	**2.26**	**38**	**40**
	2009	**0.97**	**0.27**	**1.87**	**51**	**29**
	2010	**1.32**	**0.61**	**2.12**	**36**	**44**
	2011	**1.70**	**0.68**	**3.04**	**42**	**50**
	2012	**1.34**	**0.51**	**2.23**	**39**	**45**
	2013	**1.50**	**0.71**	**2.40**	**35**	**36**
Black-throated gray warbler	**2005**	**2.67**	**0.77**	**5.18**	**52**	**25**
	2006	**1.34**	**0.28**	**2.75**	**56**	**13**
	2007	**1.36**	**0.08**	**3.21**	**70**	**13**
	2008	**1.88**	**0.30**	**4.03**	**62**	**18**
	2009	**3.77**	**0.88**	**7.28**	**51**	**33**
	2010	**1.62**	**0.43**	**3.06**	**51**	**15**
	2011	**2.33**	**0.37**	**4.66**	**56**	**22**
	2012	**1.06**	**0.18**	**2.26**	**61**	**10**
	2013	**0.11**	**0.00**	**0.34**	**108**	**1**
Black-throated sparrow	2005	0.71	0.10	1.64	70	9
	2006	2.24	0.59	4.29	50	29
	2007	1.42	0.34	2.77	53	18
	2008	0.25	0.00	0.62	80	3
	2009	1.92	0.00	5.23	90	23
	2010	0.57	0.07	1.15	61	7
	2011	0.57	0.16	1.12	54	7

Table 3-5. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in SA habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
Black-throated sparrow, cont.	2012	2.59	0.15	6.22	72	31
	2013	1.55	0.27	3.19	60	18
Blue-gray gnatcatcher	2005	9.60	3.24	17.43	47	28
	2006	5.82	3.00	9.76	35	17
	2007	3.97	1.25	7.28	48	12
	2008	14.69	8.11	22.98	32	40
	2009	13.16	4.94	25.23	49	34
	2010	15.22	7.84	25.12	35	44
	2011	10.46	4.63	17.96	39	30
	2012	11.90	4.74	23.13	47	34
	2013	13.01	6.16	22.24	38	34
Brewer's blackbird	2005	0.78	0.13	1.57	57	5
	2006	6.20	2.72	10.39	39	40
	2007	2.57	0.78	4.72	48	17
	2008	1.35	0.00	4.08	100	8
	2009	4.62	0.16	11.05	74	25
	2010	2.86	1.24	4.81	39	18
	2011	3.39	0.76	7.44	64	22
	2012	3.04	0.30	7.27	73	19
	2013	5.34	1.05	12.50	72	31
Brewer's sparrow	**2005**	**103.17**	**64.87**	**148.60**	**25**	**461**
	2006	**77.35**	**44.99**	**118.84**	**30**	**497**
	2007	**67.07**	**42.42**	**97.32**	**26**	**436**
	2008	**58.97**	**34.54**	**86.28**	**27**	**368**
	2009	**103.78**	**62.59**	**146.94**	**25**	**551**
	2010	**73.18**	**52.77**	**95.18**	**18**	**542**
	2011	**63.01**	**39.08**	**108.16**	**34**	**529**
	2012	**65.49**	**46.58**	**85.97**	**19**	**397**
	2013	**109.10**	**69.62**	**154.47**	**24**	**471**
Broad-tailed hummingbird	**2005**	**10.14**	**1.93**	**21.42**	**62**	**20**
	2006	**7.25**	**1.14**	**15.69**	**69**	**15**
	2007	**6.90**	**1.01**	**15.29**	**71**	**15**
	2008	**13.31**	**3.55**	**31.06**	**75**	**23**
	2009	**7.66**	**1.03**	**18.32**	**77**	**13**
	2010	**4.96**	**1.99**	**9.39**	**47**	**10**
	2011	**2.57**	**0.83**	**5.06**	**56**	**5**
	2012	**5.63**	**2.16**	**10.22**	**49**	**11**
	2013	**20.28**	**4.73**	**37.95**	**52**	**38**
Brown-headed cowbird	2005	0.70	0.21	1.35	51	4
	2006	4.46	2.10	7.69	39	26
	2007	2.02	0.65	3.81	48	12
	2008	2.73	1.27	4.59	39	15
	2009	1.57	0.33	3.27	64	8
	2010	1.05	0.16	2.20	64	6

Table 3-5. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in SA habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
Brown-headed cowbird, cont.	2011	2.10	0.88	3.51	39	12
	2012	3.27	1.26	5.75	44	19
	2013	2.67	0.39	6.28	70	14
Chipping sparrow	**2005**	**5.05**	**2.24**	**8.47**	**38**	**29**
	2006	**8.58**	**4.03**	**13.68**	**34**	**50**
	2007	**7.90**	**2.39**	**14.71**	**46**	**46**
	2008	**6.78**	**1.16**	**13.70**	**56**	**38**
	2009	**7.38**	**2.76**	**13.10**	**42**	**38**
	2010	**16.44**	**9.10**	**25.49**	**32**	**93**
	2011	**7.60**	**3.25**	**12.34**	**36**	**44**
	2012	**11.45**	**4.56**	**19.14**	**39**	**68**
	2013	**8.04**	**3.29**	**14.11**	**41**	**42**
Cliff swallow	2005	12.83	8.65	19.03	23	19
	2006	9.11	7.66	10.82	10	20
	2007	4.77	3.60	6.32	16	8
	2008	--	--	--	--	3
	2009	--	--	--	--	0
	2010	1.33	1.14	1.55	9	3
	2011	26.02	12.32	54.94	43	11
	2012	3.08	2.64	3.58	9	7
	2013	9.66	7.98	11.69	12	19
Common raven	2005	0.28	0.06	0.58	58	4
	2006	0.55	0.15	0.95	43	8
	2007	1.76	0.99	2.58	30	26
	2008	0.87	0.43	1.38	35	12
	2009	--	--	--	--	0
	2010	1.04	0.45	1.76	39	15
	2011	1.96	1.09	3.01	29	28
	2012	0.89	0.22	1.67	49	13
	2013	0.46	0.16	0.79	43	6
Dusky flycatcher	**2005**	**2.98**	**2.46**	**3.59**	**11**	**30**
	2006	**5.15**	**4.26**	**6.23**	**12**	**53**
	2007	**5.44**	**4.48**	**6.61**	**12**	**55**
	2008	**7.08**	**5.81**	**8.62**	**12**	**68**
	2009	**8.07**	**6.59**	**9.89**	**12**	**74**
	2010	**6.64**	**5.50**	**8.03**	**12**	**67**
	2011	**6.74**	**5.59**	**8.12**	**11**	**67**
	2012	**5.42**	**4.50**	**6.52**	**11**	**55**
	2013	**10.99**	**8.82**	**13.70**	**13**	**100**
Grace's warbler	**2005**	**0.54**	**0.00**	**1.18**	**68**	**6**
	2006	**1.00**	**0.00**	**2.33**	**72**	**12**
	2007	**1.21**	**0.00**	**2.74**	**71**	**14**
	2008	**1.08**	**0.00**	**2.64**	**75**	**12**
	2009	**0.44**	**0.00**	**1.26**	**97**	**5**

Table 3-5. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in SA habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
Grace's warbler, cont.	2010	0.52	0.00	1.35	84	6
	2011	1.34	0.00	3.09	72	15
	2012	0.66	0.00	1.40	65	8
	2013	0.53	0.00	1.33	79	6
Gray flycatcher	2005	1.88	0.82	3.21	39	23
	2006	0.63	0.08	1.34	61	8
	2007	0.56	0.00	1.42	84	7
	2008	1.07	0.00	2.79	86	12
	2009	2.29	0.54	4.75	56	23
	2010	1.80	0.55	3.27	46	23
	2011	1.76	0.48	3.28	50	21
	2012	0.62	0.07	1.38	65	7
	2013	0.27	0.00	0.63	72	3
Green-tailed towhee	2005	27.60	16.40	41.49	28	271
	2006	38.06	18.72	61.93	35	389
	2007	28.23	14.36	44.07	33	283
	2008	23.64	12.66	35.95	30	227
	2009	26.59	12.16	42.43	35	242
	2010	18.45	10.24	27.45	28	185
	2011	28.53	15.02	43.29	30	278
	2012	45.88	24.28	69.77	31	456
	2013	42.10	21.51	63.98	30	375
Horned lark	2005	2.61	0.88	4.88	46	26
	2006	3.07	1.23	5.14	40	30
	2007	3.70	1.25	6.39	42	37
	2008	2.02	0.38	4.43	69	18
	2009	4.94	1.12	9.02	47	42
	2010	2.96	0.85	5.70	50	29
	2011	2.89	0.91	5.21	47	28
	2012	2.17	0.47	4.34	54	22
	2013	1.54	0.00	3.59	74	13
House finch	2005	0.29	0.08	0.57	54	3
	2006	4.92	2.75	7.36	29	52
	2007	2.88	0.88	5.46	51	29
	2008	3.15	1.69	4.82	32	31
	2009	4.74	0.82	10.56	65	44
	2010	1.84	0.95	2.88	32	19
	2011	1.77	0.83	2.83	35	18
	2012	3.38	1.98	5.03	28	35
	2013	2.25	0.97	3.70	38	21
House wren	2005	0.71	0.00	1.58	73	12
	2006	0.44	0.05	0.94	62	8
	2007	--	--	--	--	0
	2008	0.25	0.06	0.45	45	4

Table 3-5. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in SA habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
House wren, cont.	2009	0.61	0.12	1.23	57	9
	2010	0.66	0.00	1.49	71	11
	2011	1.09	0.32	2.05	49	18
	2012	0.63	0.00	1.39	66	11
	2013	1.90	0.50	3.96	57	28
Lark sparrow	2005	8.79	2.58	16.24	48	84
	2006	9.71	3.95	16.19	39	91
	2007	6.53	2.02	11.90	48	61
	2008	2.65	0.61	5.33	54	24
	2009	12.64	2.16	25.41	57	113
	2010	8.03	2.97	14.18	42	72
	2011	10.62	3.73	18.14	42	98
	2012	11.62	5.10	19.63	39	110
	2013	12.58	3.41	23.69	51	103
Lazuli bunting	**2005**	**0.85**	**0.11**	**1.86**	**65**	**7**
	2006	**0.59**	**0.11**	**1.18**	**55**	**5**
	2007	**0.49**	**0.00**	**1.16**	**76**	**4**
	2008	**--**	**--**	**--**	**--**	**0**
	2009	**9.05**	**0.91**	**20.08**	**68**	**73**
	2010	**4.60**	**1.12**	**8.20**	**48**	**38**
	2011	**2.40**	**0.49**	**4.62**	**53**	**20**
	2012	**2.88**	**0.90**	**5.74**	**53**	**24**
	2013	**1.17**	**0.20**	**2.40**	**58**	**9**
Mountain bluebird	**2005**	**6.23**	**5.67**	**6.84**	**6**	**58**
	2006	**7.58**	**7.09**	**8.10**	**4**	**77**
	2007	**7.87**	**7.28**	**8.51**	**5**	**80**
	2008	**7.28**	**6.72**	**7.89**	**5**	**65**
	2009	**7.07**	**6.05**	**8.26**	**9**	**51**
	2010	**7.63**	**7.10**	**8.21**	**4**	**75**
	2011	**8.15**	**7.17**	**9.26**	**8**	**60**
	2012	**7.08**	**6.47**	**7.75**	**5**	**67**
	2013	**7.55**	**6.88**	**8.27**	**6**	**65**
Mourning dove	2005	2.33	2.15	2.53	5	55
	2006	4.21	3.88	4.57	5	101
	2007	2.57	2.37	2.78	5	63
	2008	2.96	2.71	3.24	5	69
	2009	3.01	2.63	3.45	8	61
	2010	3.68	3.34	4.06	6	89
	2011	2.36	2.20	2.54	4	56
	2012	1.71	1.58	1.84	5	41
	2013	5.39	4.87	5.97	6	104
Northern flicker	**2005**	**0.89**	**0.46**	**1.40**	**33**	**14**
	2006	**1.49**	**0.73**	**2.47**	**35**	**24**
	2007	**0.88**	**0.35**	**1.55**	**42**	**14**

Table 3-5. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in SA habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
Northern flicker, cont.	2008	0.40	0.12	0.75	48	6
	2009	1.14	0.33	2.20	51	16
	2010	1.52	0.83	2.38	31	24
	2011	1.59	0.86	2.50	32	25
	2012	1.93	0.91	3.26	37	31
	2013	1.20	0.63	1.96	33	17
Pinyon jay	2005	0.29	0.00	0.77	87	12
	2006	0.23	0.02	0.56	77	9
	2007	0.13	0.00	0.36	90	6
	2008	0.31	0.04	0.76	75	13
	2009	0.10	0.00	0.27	86	4
	2010	0.46	0.04	1.15	79	19
	2011	0.17	0.00	0.52	109	7
	2012	0.60	0.04	1.60	83	24
	2013	0.16	0.02	0.37	73	6
Plumbeous vireo	2005	0.82	0.16	1.70	57	11
	2006	0.68	0.25	1.20	44	9
	2007	0.40	0.06	0.96	75	5
	2008	0.16	0.00	0.37	71	2
	2009	1.28	0.14	2.86	64	15
	2010	1.57	0.31	3.53	62	19
	2011	0.64	0.21	1.15	45	8
	2012	0.67	0.17	1.31	52	9
	2013	1.55	0.49	2.91	49	18
Rock wren	2005	3.91	3.66	4.17	4	78
	2006	7.21	6.53	7.97	6	147
	2007	3.48	3.22	3.77	5	71
	2008	4.36	4.03	4.73	5	83
	2009	3.52	3.29	3.77	4	64
	2010	3.00	2.83	3.19	4	60
	2011	6.14	5.62	6.72	5	121
	2012	2.69	2.54	2.84	3	54
	2013	6.10	5.36	6.95	8	108
Sage sparrow	2005	2.44	0.20	5.64	69	29
	2006	1.96	0.08	4.89	76	24
	2007	2.58	0.00	5.86	73	29
	2008	1.70	0.00	4.81	96	19
	2009	2.27	0.10	5.08	68	22
	2010	0.26	0.00	0.56	69	3
	2011	1.48	0.18	3.17	62	17
	2012	0.78	0.17	1.56	55	9
	2013	0.28	0.08	0.56	54	3
Sage thrasher	2005	2.88	2.60	3.19	6	73
	2006	2.78	2.51	3.08	6	71

Table 3-5. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in SA habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
Sage thrasher, cont.	**2007**	**2.67**	**2.46**	**2.90**	**5**	**70**
	2008	**5.39**	**4.68**	**6.21**	**8**	**131**
	2009	**4.66**	**4.16**	**5.22**	**7**	**109**
	2010	**5.37**	**4.69**	**6.14**	**8**	**138**
	2011	**4.65**	**4.06**	**5.32**	**8**	**118**
	2012	**2.09**	**1.91**	**2.28**	**5**	**54**
	2013	**3.36**	**3.07**	**3.68**	**5**	**78**
Say's phoebe	**2005**	**0.62**	**0.25**	**1.09**	**43**	**10**
	2006	**0.86**	**0.44**	**1.36**	**34**	**14**
	2007	**0.42**	**0.13**	**0.81**	**49**	**7**
	2008	**0.99**	**0.19**	**2.19**	**66**	**15**
	2009	**1.05**	**0.22**	**2.14**	**60**	**15**
	2010	**1.16**	**0.33**	**2.27**	**52**	**19**
	2011	**1.93**	**0.94**	**3.08**	**35**	**31**
	2012	**0.68**	**0.21**	**1.36**	**54**	**11**
	2013	**1.24**	**0.50**	**2.18**	**42**	**18**
Spotted towhee	2005	5.07	4.26	6.03	11	55
	2006	5.41	4.57	6.40	10	61
	2007	4.43	3.75	5.24	10	50
	2008	6.46	5.44	7.67	10	68
	2009	4.08	3.44	4.84	10	41
	2010	6.88	5.78	8.18	11	75
	2011	8.64	7.22	10.34	11	95
	2012	6.38	5.38	7.57	10	70
	2013	9.32	7.75	11.22	11	93
Vesper sparrow	**2005**	**28.21**	**22.91**	**34.74**	**13**	**267**
	2006	**23.23**	**19.10**	**28.26**	**12**	**359**
	2007	**39.80**	**29.53**	**53.65**	**18**	**404**
	2008	**45.24**	**34.01**	**60.18**	**17**	**368**
	2009	**49.78**	**38.33**	**64.66**	**15**	**412**
	2010	**47.32**	**38.22**	**58.60**	**12**	**478**
	2011	**34.59**	**27.88**	**42.91**	**13**	**503**
	2012	**42.55**	**34.33**	**52.74**	**12**	**497**
	2013	**38.33**	**31.56**	**46.54**	**12**	**357**
Violet-green swallow	**2005**	**5.98**	**2.65**	**10.59**	**42**	**14**
	2006	**10.97**	**3.77**	**21.25**	**51**	**26**
	2007	**5.29**	**2.07**	**9.34**	**44**	**13**
	2008	**5.87**	**2.39**	**10.40**	**45**	**13**
	2009	**8.73**	**2.70**	**16.40**	**51**	**19**
	2010	**6.33**	**3.15**	**10.41**	**37**	**15**
	2011	**9.43**	**4.78**	**15.80**	**37**	**22**
	2012	**14.51**	**7.04**	**24.46**	**39**	**35**
	2013	**17.91**	**7.32**	**31.15**	**41**	**39**

Table 3-5. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in SA habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
Virginia's warbler	**2005**	**1.34**	**0.33**	**2.57**	**51**	**23**
	2006	**1.72**	**0.49**	**3.16**	**48**	**30**
	2007	**1.01**	**0.00**	**2.81**	**95**	**17**
	2008	**2.48**	**0.23**	**5.70**	**69**	**40**
	2009	**1.35**	**0.23**	**2.86**	**64**	**21**
	2010	**1.47**	**0.22**	**3.23**	**61**	**25**
	2011	**1.22**	**0.32**	**2.39**	**53**	**21**
	2012	**0.69**	**0.06**	**1.52**	**65**	**12**
	2013	**1.60**	**0.48**	**2.93**	**47**	**25**
Warbling vireo	**2005**	**1.41**	**0.18**	**3.22**	**67**	**17**
	2006	**0.81**	**0.18**	**1.63**	**59**	**10**
	2007	**1.73**	**0.08**	**3.88**	**67**	**22**
	2008	**0.19**	**0.00**	**0.55**	**98**	**2**
	2009	**0.28**	**0.00**	**0.66**	**69**	**3**
	2010	**0.77**	**0.19**	**1.52**	**54**	**9**
	2011	**1.43**	**0.22**	**2.90**	**59**	**16**
	2012	**1.04**	**0.24**	**2.15**	**64**	**12**
	2013	**0.88**	**0.18**	**1.89**	**62**	**9**
Western meadowlark	2005	5.18	4.43	6.06	9	128
	2006	5.97	5.16	6.92	9	153
	2007	4.96	4.24	5.79	9	127
	2008	7.03	5.76	8.57	12	168
	2009	8.41	6.71	10.55	13	189
	2010	5.50	4.73	6.38	9	138
	2011	8.96	7.36	10.91	12	222
	2012	7.28	6.25	8.48	9	180
	2013	5.08	4.27	6.03	10	110
Western tanager	2005	0.49	0.03	1.11	68	13
	2006	0.57	0.03	1.58	88	15
	2007	0.82	0.07	1.81	67	23
	2008	0.67	0.00	1.64	82	19
	2009	0.69	0.07	1.60	70	18
	2010	0.47	0.07	1.12	68	13
	2011	0.15	0.03	0.31	64	4
	2012	0.28	0.00	0.60	67	8
	2013	0.75	0.03	1.65	64	19
White-throated swift	**2005**	**1.35**	**0.00**	**3.89**	**97**	**4**
	2006	**3.58**	**0.97**	**8.52**	**71**	**11**
	2007	**3.60**	**1.11**	**7.79**	**61**	**12**
	2008	**5.68**	**0.55**	**18.25**	**105**	**14**
	2009	**2.06**	**0.29**	**4.98**	**76**	**6**
	2010	**3.58**	**1.25**	**8.16**	**63**	**11**
	2011	**--**	**--**	**--**	**--**	**0**

Table 3-5. Estimated densities per km² (D), lower and upper 95% confidence limits on D (LCL, UCL), percent coefficient of variation of estimates (%CV), and number of independent detections used in analyses (n) of breeding birds in SA habitat in the NCPN, 2005–2013, cont.

Species	Year	D	LCL	UCL	% CV	n
White-throated swift, cont.	**2012**	**6.13**	**1.33**	**13.95**	**64**	**20**
	2013	**1.77**	**0.23**	**4.29**	**72**	**5**
Yellow-rumped warbler	2005	1.15	0.13	2.36	58	9
	2006	2.35	0.00	5.15	67	19
	2007	1.52	0.24	3.17	59	13
	2008	1.46	0.27	2.86	56	11
	2009	0.97	0.12	2.23	70	7
	2010	0.38	0.00	1.17	99	3
	2011	1.67	0.24	3.40	58	13
	2012	1.67	0.00	3.88	70	13
	2013	2.43	0.95	4.46	44	17

Dashes indicate the sample size was insufficient for estimating density. Priority species are bolded.

3.2 Pipe Spring National Monument

We detected a total of 370 birds of 34 species in Pipe Spring NM in 2013 (Appendix A). Since 2009, we have detected 1,390 birds of 58 species at the monument (Table 3-6). In 2013, we recorded four species that had not been recorded by this program in previous years: black-crowned night-heron, cliff swallow, Cooper's hawk, and red-tailed hawk.

Table 3-6. Number of individuals observed by survey method and year in Pipe Spring National Monument, 2009–2013.

	Number of Individuals observed, 2009–2012		Number of individuals observed, 2013		Total
Species	Point count	Area search*	Point count	Area search	
American kestrel		**1**	**4**	**7**	**12**
American robin	3				3
Ash-throated flycatcher	21	11	1	2	35
Barn swallow	2				2
Bewick's wren	**9**	**9**	**2**	**12**	**32**
Black phoebe	6	9	1	5	21
Black-crowned night-heron			1	11	12
Black-chinned hummingbird	**2**				**2**
Black-headed grosbeak	4	1			5
Black-throated gray warbler	**4**	**1**			**5**
Black-throated sparrow	73	18	10	14	115
Blue grosbeak	4	2		2	8
Blue-gray gnatcatcher	2			1	3
Brewer's sparrow	**2**				**2**
Broad-tailed hummingbird		**1**			**1**
Brown-headed cowbird	14	11		3	28
Bullock's oriole	21	10	3	7	41
Canyon wren	2				2
Cassin's kingbird	37	10	10	17	74
Cliff swallow				1	1
Common poorwill		**1**			**1**
Common raven	33	12		1	46
Cooper's hawk				**1**	**1**
Downy woodpecker	1				1
Eurasian collared-dove	29	29	12	41	111
European starling	21	23		50	94
Gambel's quail	31	14	5	13	63
Gray vireo	**3**				**3**
Great horned owl		1			1
Hairy woodpecker		1			1
House finch	73	47	11	20	151
House sparrow	6	30	2	22	60
Juniper titmouse	**8**			**1**	**9**
Lark sparrow	1	15		6	22
Lazuli bunting		**5**			**5**
Lesser goldfinch	11	8			19

Table 3-6. Number of individuals observed by survey method and year in Pipe Spring National Monument, 2009–2013, cont.

Species	Number of Individuals observed, 2009–2012		Number of individuals observed, 2013		Total
	Point count	Area search*	Point count	Area search	
Mallard		1			1
Mallard (domestic)				8	8
Mourning dove	19	6		1	26
Northern mockingbird	26	4	1		31
Northern rough-winged swallow	10	1			11
Peregrine falcon	**3**		**2**		**5**
Pine siskin	**2**	**24**			**26**
Red-tailed hawk				1	1
Red-winged blackbird	1				1
Rock wren	**15**		**4**	**1**	**20**
Sage thrasher	**1**				**1**
Say's phoebe	**18**	**6**		**9**	**33**
Spotted towhee	5		1		6
Summer tanager	1				1
Violet-green swallow	**12**	**19**	**1**	**24**	**56**
Warbling vireo		**2**		**1**	**3**
Western kingbird	28	15	4	7	54
Western scrub-jay	2			5	7
Western tanager	3	2		2	7
White-crowned sparrow	10	27			37
White-throated swift	**20**	**3**			**23**
Yellow warbler	7	30			37
Yellow-rumped warbler	1	2			3
Total	**607**	**412**	**75**	**296**	**1,390**

* RMBO did not begin conducting area searches in Pipe Spring NM until 2011. Priority species are bolded.

4 Discussion

The objective of this project is to determine the population status and trends of breeding landbird species in low-elevation riparian, pinyon-juniper, and sage shrubland habitats of NCPN park units. The density estimates presented for 2005–2013 in this report replace the estimates provided in the reports for 2005–2012. For most species, each year of additional data will improve our ability to accurately estimate densities of the species that occupy the NCPN.

In this report, we present density estimates for blue grosbeak, broad-tailed hummingbird, and northern flicker in LR for the first time. We also had a sufficient number of detections to estimate the density of black-chinned hummingbird in PJ habitat for the first time, and to estimate densities of ash-throated flycatcher, cliff swallow, Grace's warbler, house wren, plumbeous vireo, and white-throated swift in SA habitat for the first time. We recorded one species (marsh wren, in Curecanti NRA), that was previously designated as Probably Present by the National Park Service and should now be noted as Present.

With each year of additional data, RMBO is able to provide density estimates for more species in each habitat. It is important to note that we provide estimates for species with 80 detections in a stratum regardless of in which habitat they were recorded. For example, we provide density estimates for Grace's warbler in sage shrubland even though this species does not regularly occur in this habitat. All of the Grace's warblers recorded on SA surveys were recorded on two survey sites located within thin strips of sage shrubland surrounded by pinyon-juniper forests. Although the Grace's warblers detected on these surveys were most likely located in the surrounding PJ habitat and not within the narrow strip of SA, we present these estimates because we believe the information is useful for park managers, even if the species is being detected in surrounding habitats and not the target habitat (SA, in this instance).

For the first time in three years, we did not conduct trend analyses for data collected this year. We recommend waiting 3–5 years before conducting trend analyses again. As additional years of data accumulate, trend analysis will become less sensitive to short-term fluctuations in population density and long-term trends underlying annual fluctuations will be revealed.

In 2007, the NABCI monitoring subcommittee outlined recommendations for improving monitoring programs (NABCI 2007). NABCI recommended that bird-monitoring programs should integrate an adaptive-management approach into the monitoring process to incorporate management and conservation priorities. This goal is not practical for the goals and scope of the NCPN monitoring program; however, we hope that trends identified in this early warning program will lead to increased research and projects on species that are experiencing declines.

The NABCI's second recommendation was to coordinate landbird monitoring among organizations and across spatial scales to make monitoring more efficient and effective. RMBO continues to work with a variety of federal, state, and local agencies throughout 13 states. We monitor landbirds through a spatially balanced study design called Integrated Monitoring in Bird Conservation Regions (IMBCR), using bird conservation regions (BCRs) as our sampling frame. In 2014, we will survey portions of 16 BCRs in Utah for the second year using the IMBCR design. Post-stratifying these data by habitat would allow comparison between BCR-based surveys and NCPN surveys in Utah.

A third recommendation of the NABCI monitoring subcommittee was to maintain bird population monitoring data in modern data management systems. RMBO's Avian Data Center meets this recommendation by providing density estimates, distribution maps, species counts, and monitoring reports to land managers and the public. In addition, RMBO is a partner of the Avian Knowledge Network, whose goal is to compile bird-monitoring data from various contributor organizations, organize them into one format, and make this data available to land managers, scientists, and the public for decisionmaking, research, and educational purposes.

The IMBCR monitoring program continues to grow, adding new partners and expanding its geographical range. The NCPN may want to re-evaluate the feasibility and benefits of switching to the IMBCR design in future years, particularly if RMBO begins to conduct more surveys in Utah using this design. The IMBCR design better meets the goals of the NABCI monitoring subcommittee. The spatially balanced study design is more statistically rigorous and would allow us to analyze data at a variety of spatial scales. In 2013, we surveyed three transects within the NCPN

(as part of the Monitoring the Birds of Colorado program) utilizing this study design. In larger parks, such as Dinosaur NM and Canyonlands National Park, NCPN could adopt this design in sagebrush and pinyon-juniper habitats. Low-elevation riparian habitat would require special consideration, as a 16-point grid may not adequately sample this habitat. Transitioning NCPN monitoring to a grid-based design would allow managers of network parks to compare density estimates of species on their lands to those on surrounding landscapes surveyed by RMBO.

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Appendix A. Bird Species Observed During Surveys, 2005–2013

Table A-1. Bird species observed during surveys in the Northern Colorado Plateau Network, with species totals by habitat for 2013, and yearly species totals for 2005–2013.

	# of individuals observed per habitat, 2013				# of individuals observed per year and total (all habitats), 2005–2013									
Species	**LR**	**PJ**	**SA**	**PISP***	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**Total**
American crow	2	2			12	1	2	4	2	2			4	27
American dipper					1	1	1	2	1			3		**9**
American goldfinch	1	2	1		14	5	9	7	9	35	13	18	4	114
American kestrel	**1**	**1**	**8**	**4**	**10**	**10**	**11**	**9**	**10**	**13**	**20**	**19**	**10**	**112**
American pipit			1										1	1
American robin	24	27	70		104	156	144	131	66	101	142	102	121	1,067
American wigeon			3									4	3	7
Ash-throated flycatcher	187	126	26	1	302	415	360	358	466	378	378	380	339	3,376
Bank swallow							2	1		1				**4**
Barn swallow			11		1	2	3	1	2		4	6	11	30
Belted kingfisher							1							1
Bewick's wren	**27**	**20**	**1**	**2**	**240**	**307**	**197**	**205**	**222**	**51**	**50**	**134**	**48**	**1,454**
Black phoebe	12			1	12	16	30	13	35	6	7	26	12	157
Black-billed magpie	**3**	**1**	**108**		109	122	63	54	54	74	105	75	**112**	**768**
Black-capped chickadee					1	5	4		2	1	4	4		21
Black-chinned hummingbird	**27**	**6**	**1**		51	68	53	53	105	53	71	66	34	554
Black-chinned sparrow	**1**				**9**	**6**	**4**		**14**	**4**	**3**		**1**	**41**
Black-crowned night-heron				1										
Black-headed grosbeak	11	13	5		27	54	37	37	46	34	42	59	29	365
Black-throated gray warbler	**32**	**152**	**1**		**397**	**552**	**458**	**567**	**647**	**425**	**507**	**435**	**185**	**4,173**
Black-throated sparrow	53	75	23	10	114	178	194	151	335	172	226	240	151	1,761
Blue grosbeak	41		2		14	32	6	6	31	3	8	28	43	171
Blue-gray gnatcatcher	155	137	38		347	307	296	337	557	427	441	302	330	3,344
Blue-winged teal					1									1
Bobolink											1			**1**
Brewer's blackbird			49		10	56	29	10	38	42	41	31	49	306
Brewer's sparrow	**2**	**1**	**537**		599	641	600	538	722	663	686	476	540	5,465
Broad-tailed hummingbird	**6**	**4**	**43**		**68**	**30**	**48**	**76**	**29**	**78**	**25**	**31**	**53**	**438**
Brown creeper											1			1
Brown-headed cowbird	17	19	19		55	83	51	47	65	24	93	99	55	572

Table A-1. Bird species observed during surveys in the Northern Colorado Plateau Network, with species totals by habitat for 2013, and yearly species totals for 2005–2013, cont.

	# of individuals observed per habitat, 2013				# of individuals observed per year and total (all habitats), 2005–2013									
Species	**LR**	**PJ**	**SA**	**PISP***	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**Total**
Bullock's oriole	1		5	3	7	35	19	13	15	27	24	22	6	168
Bushtit	30	37	3		190	140	53	30	95	11	1	29	70	619
California gull					13	3						1		17
Canada goose	8		16		36	26	149	117	75	54	59	38	24	578
Canyon wren	13	4			52	105	70	37	57	7	18	26	17	389
Cassin's finch		8	8		**4**	**39**	**14**	**14**	**2**	**4**	**18**	**12**	**16**	**123**
Cassin's kingbird		7		10		2			1			6	7	16
Cedar waxwing							3	1	1					5
Chipping sparrow	**5**	**54**	51		**156**	**155**	**196**	**218**	**287**	**286**	**289**	**252**	**110**	**1,949**
Chukar		1				5	7		2	3		3	1	21
Clark's nutcracker	**12**	**47**	**59**		65	29	26	17	34	7	10	17	118	323
Cliff swallow			55		189	66	49	87		7	104	18	55	575
Common merganser	3		2		6	6	10	4	1			6	5	38
Common nighthawk		3	2		2	2	1	2	6	17	3	10	5	48
Common poorwill					**1**	**1**	**1**			**2**		**1**		**6**
Common raven	38	56	68		141	158	199	171	145	193	211	110	162	1,490
Common yellowthroat	16		5		13	30	29	9	34	17	23	30	21	206
Cooper's hawk	**7**				17	17	14	5	8	15	10	14	7	107
Cordilleran flycatcher					**4**	**1**	**2**	**3**	**3**	**3**	**1**	**2**		**19**
Dark-eyed junco		3	3		40	19	47	35	4	3	8	2	6	164
Downy woodpecker					5	11	3	8	14	1	8	3		53
Dusky flycatcher		25	105		51	111	99	136	108	98	100	91	130	924
Dusky grouse					**1**		**1**							**2**
Eared grebe									**1**					**1**
Eastern kingbird											2			2
Eurasian collared-dove				12			1				2			3
European starling			1		15	21	11	17		36	14	8	1	123
Evening grosbeak		1	1				1				2	2	2	7
Ferruginous hawk										**1**				**1**
Gadwall			3		2	1	4				3		3	13
Gambel's quail		7		5	9	15		1				6	7	38

Table A-1. Bird species observed during surveys in the Northern Colorado Plateau Network, with species totals by habitat for 2013, and yearly species totals for 2005–2013, cont.

	# of individuals observed per habitat, 2013				# of individuals observed per year and total (all habitats), 2005–2013									
Species	**LR**	**PJ**	**SA**	**PISP***	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**Total**
Golden eagle					8	10	4	6	1			7		36
Grace's warbler		**3**	**8**		**15**	**31**	**40**	**31**	**26**	**19**	**33**	**23**	**11**	**229**
Gray flycatcher	**3**	**53**	**4**		**160**	**116**	**108**	**142**	**265**	**227**	**158**	**127**	**60**	**1,363**
Gray vireo	**23**	**149**	**10**		**137**	**128**	**104**	**150**	**251**	**163**	**121**	**155**	**182**	**1,391**
Great blue heron	1				10	3	3	3	1	6	3	2	1	32
Great horned owl					3			1		1		1		6
Greater roadrunner		1											1	1
Greater sage-grouse					19	2	1					5		27
Green-tailed towhee		**7**	**407**		**350**	**463**	**364**	**302**	**330**	**220**	**385**	**526**	**414**	**3,354**
Green-winged teal			2			1							2	3
Hairy woodpecker	15	7	1		13	21	22	17	28	21	20	30	23	195
Hammond's flycatcher							9	9	21		1			**40**
Hermit thrush		5			15	21	2		24	14	46	28	5	155
Horned lark			17		31	41	43	23	50	32	29	23	**17**	**289**
House finch	112	166	28	11	286	363	446	429	569	328	396	373	306	3,496
House sparrow			3	2									3	3
House wren	39	2	40		59	62	39	55	61	48	88	67	81	560
Indigo bunting	4		1			1			6			6	5	18
Juniper titmouse	**14**	**104**	**11**		147	120	138	159	**271**	**198**	**154**	**125**	**129**	**1,441**
Killdeer			5		4	3	2	3	5	1		2	5	25
Lark bunting											**2**			**2**
Lark sparrow	8	31	148		140	157	104	51	181	150	159	159	187	1,288
Lazuli bunting	**110**	**5**	**13**		**183**	**157**	**226**	**190**	**284**	**253**	**190**	**156**	**128**	**1,767**
Lesser goldfinch	39	5	6		47	77	120	87	186	50	63	55	50	735
Lesser scaup			**2**										**2**	**2**
Lincoln's sparrow		1			1			2	1				1	5
Loggerhead shrike			3		3	1		1		5		2	3	**15**
Long-eared owl						2								2
Lucy's warbler	32				1		11	20	46	7	24	42	32	183
Macgillivray's warbler	2				3	9	3	4	7	11		**3**	**2**	**42**
Mallard	3		10		2	16	3	17	5	4	9	5	13	74
Marsh wren			1										1	1

Table A-1. Bird species observed during surveys in the Northern Colorado Plateau Network, with species totals by habitat for 2013, and yearly species totals for 2005–2013, cont.

	# of individuals observed per habitat, 2013				# of individuals observed per year and total (all habitats), 2005–2013									
Species	**LR**	**PJ**	**SA**	**PISP***	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**Total**
Mountain bluebird	**1**	**62**	**79**		160	138	179	116	145	151	156	131	142	1,318
Mountain chickadee	**1**	**16**	**1**		**34**	**22**	**25**	**14**	**26**	**8**	**36**	**25**	**18**	**208**
Mourning dove	99	248	166		426	573	520	402	282	437	332	219	513	3,704
Northern flicker	**5**	15	39		50	57	58	22	50	73	64	63	59	496
Northern goshawk								**1**						**1**
Northern harrier					**2**	**4**	**5**	**6**	**2**	**9**	**2**	**7**		**37**
Northern mockingbird	2	10	2	1		25	11	17	22	24	21	34	14	168
Northern pintail												4		**4**
Northern rough-winged swallow	3		5		7	7	6	8	19	5	12	7	8	79
Northern shoveler							4							4
Olive-sided flycatcher					16	4	4	2	18		2			**46**
Orange-crowned warbler	2		1		2	2	2	2		2	3	3	3	19
Osprey					1			1			1			3
Peregrine falcon	**5**	**2**	**3**	**2**	**5**	**5**	**7**	**10**	**1**	**7**	**5**	**2**	**10**	**52**
Phainopepla		3							3			5	3	11
Pine siskin	**1**	**9**	**24**		4	22	4	17	16	18	69	12	34	196
Pinyon jay	**1**	**133**	**10**		**122**	**177**	**229**	**74**	**97**	**327**	**112**	**153**	**144**	**1,435**
Plumbeous vireo	**43**	**24**	**21**		**147**	**165**	**139**	**131**	**150**	**216**	**158**	**84**	**88**	**1,278**
Prairie falcon			**1**		**2**			**2**	**1**	**1**	**3**		**1**	**10**
Pygmy nuthatch		**8**	**5**		**13**	**10**	**23**	**7**	**10**	**9**	**26**	**12**	**13**	**123**
Red crossbill		**9**	**2**		**1**	**23**	**11**		**23**	**6**	**3**	**9**	**11**	**87**
Red-breasted nuthatch		**8**	**1**		**11**	**5**	**7**	**1**	**2**	**1**	**5**		**9**	**41**
Red-naped sapsucker						**2**		**1**	**2**			**1**		**6**
Red-tailed hawk	2		6		12	17	11	9	12	5	8	10	8	92
Red-winged blackbird			17			4	1	2	1	1	8	11	17	45
Ring-billed gull							2							2
Rock pigeon					2	5	3			3	3	6		22
Rock wren	**65**	**67**	**123**	**4**	**315**	**403**	**349**	**303**	**417**	**254**	**366**	**163**	**255**	2,825
Ruby-crowned kinglet		**1**	**1**		**4**	**4**	**3**	**9**	**11**	**10**	**7**	**8**	**2**	**58**
Ruddy duck			2										2	2
Sage sparrow			9		43	33	31	21	41	10	18	12	9	218

Table A-1. Bird species observed during surveys in the Northern Colorado Plateau Network, with species totals by habitat for 2013, and yearly species totals for 2005–2013, cont.

	# of individuals observed per habitat, 2013				# of individuals observed per year and total (all habitats), 2005–2013									
Species	**LR**	**PJ**	**SA**	**PISP***	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**Total**
Sage thrasher			**100**		**93**	**95**	**88**	**156**	**128**	**150**	**131**	**60**	**100**	**1,001**
Sandhill crane						**1**		**2**	**1**			**1**		**5**
Savannah sparrow						1	1					2		4
Say's phoebe	**41**	**11**	**21**		102	98	63	94	116	89	125	**65**	**73**	**825**
Scott's oriole	1	5					1	5	6			8	6	26
Sharp-shinned hawk						1	1	2						4
Short-eared owl						4			1					**5**
Song sparrow	17		3		62	76	69	62	39	10	45	29	20	412
Spotted sandpiper	2				1	2	7		3	8			2	23
Spotted towhee	390	110	125	1	432	610	500	405	541	548	619	537	625	4,817
Steller's jay		4	10		5	5	16	9	5	9	3	2	14	68
Swainson's thrush									1					1
Townsend's solitaire		**8**	**1**		**5**	**6**	**13**	**6**	**19**	**12**	**12**	**12**	**9**	**94**
Tree swallow			**4**		**3**	**40**	**28**	**102**	**5**	**2**	**88**	**1**	**4**	**273**
Turkey vulture	10		2		25	30	29	9	19	24	22	31	12	201
Veery						1								1
Vesper sparrow		**29**	**417**		**381**	**495**	**489**	**472**	**483**	**609**	**675**	**571**	**446**	**4,621**
Violet-green swallow	**272**	**37**	**61**	**1**	**283**	**514**	**546**	**429**	**414**	**295**	**366**	**466**	**370**	**3,683**
Virginia's warbler	**17**	**26**	**29**		**122**	**109**	**102**	**161**	**46**	**123**	**100**	**110**	**72**	**945**
Warbling vireo	**26**	**7**	**10**		**44**	**58**	**67**	**51**	**39**	**32**	**35**	**45**	**43**	**414**
Western bluebird	9	6	16		17	19	20	18	29	9	22	17	31	182
Western grebe			10			1					2		**10**	**13**
Western kingbird	9	7	3	3	2	5	2	6	24	11	4	17	19	90
Western meadowlark	1	14	169		229	239	182	213	282	227	312	267	184	2,135
Western screech-owl					1									1
Western scrub-jay	34	35	12		117	90	80	85	59	86	78	58	81	734
Western tanager	6	14	20		45	69	72	59	45	57	41	61	40	489
Western wood-pewee	27	1	9		40	44	64	44	56	28	25	30	37	368
White-breasted nuthatch	1	19	8		27	28	30	17	23	27	24	34	28	238
White-crowned sparrow			5			6	4	16	2	3	3	13	5	52
White-faced ibis					1									1
White-throated swift	**136**	**74**	**15**		**573**	**676**	**815**	**514**	**348**	**295**	**389**	**375**	**225**	**4,210**

Table A-1. Bird species observed during surveys in the Northern Colorado Plateau Network, with species totals by habitat for 2013, and yearly species totals for 2005–2013, cont.

	# of individuals observed per habitat, 2013				# of individuals observed per year and total (all habitats), 2005–2013									
Species	**LR**	**PJ**	**SA**	**PISP***	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**Total**
Wild turkey	4				6	14	2	7	17	10	11	13	4	84
Williamson's sapsucker			1		1		1	1				2	1	6
Willow flycatcher					**1**	**3**	**3**		**1**			**3**		**11**
Wilson's warbler						**4**		**3**	**3**	**6**	**1**	**2**		**19**
Yellow warbler	169		22		158	175	155	182	292	255	191	283	191	1,882
Yellow-billed cuckoo						1								**1**
Yellow-breasted chat	74	3	24		52	58	54	49	72	89	63	100	101	638
Yellow-rumped warbler	2	3	17		26	66	32	51	15	75	101	46	22	434
Total	**2,618**	**2,408**	**3,687**	**74**	**9,387**	**11,201**	**10,574**	**9,642**	**11,455**	**9,803**	**10,567**	**9,411**	**8,710**	**90,750**

*PISP species numbers include point-count data only.

Habitats: LR=Low-Elevation Riparian; PJ=Pinyon-Juniper; SA=Sage Shrubland; PISP=Pipe Spring National Monument.

Priority species are bolded.

Appendix B. Priority Species Observed on Transects, 2005–2013

Table B-1. Priority species observed on transects in the Northern Colorado Plateau Network with conservation and management designations and species totals per habitat, 2005–2013.

	Management designations							Number of individuals observed per habitat, 2005–2013			
	State agencies		USFWS[3]			Partners in Flight[4]					
Species	CPW[1]	UDWR[2]	BCR 10	BCR 16	Region 6	BCR 10	BCR 16	LR[5]	PJ[6]	SA[7]	PISP[8]
American dipper	SGCN					RS,UCS		9			
American kestrel						RC		16	10	86	4
Bank swallow						CBSD	CBSD	1	1	2	
Belted kingfisher						CBSD	CBSD	1			
Bewick's wren					BCC			556	868	30	11
Black-billed magpie						UCS		7	21	740	
Black-chinned hummingbird	SGCN							376	155	23	2
Black-chinned sparrow							CBSD,UCC	19	21	1	
Black-throated gray warbler	SGCN						RC	656	3,298	219	4
Bobolink	SGCN	WSC				UCC,CBSD		1			
Brewer's sparrow	SGCN		BCC	BCC		RC,CBSD	RC,CBSD	36	79	5,350	2
Broad-tailed hummingbird	SGCN						UCS,RS	109	114	215	
Cassin's finch	SGCN		BCC	BCC	BCC	UCS,UCC,RC,RS,CBSD	UCC,RC,CBSD	8	71	44	
Chipping sparrow						UCS,RC,RS		283	1,056	610	
Clark's nutcracker						UCS,RS	UCS,RC,RS	46	127	150	
Common nighthawk						CBSD	RC,CBSD	2	36	10	
Common poorwill							RC	1	3	2	
Cooper's hawk							UCS,RS	75	22	10	
Cordilleran flycatcher	SGCN						UCS,RS	15	4		
Dusky flycatcher	SGCN					UCS		33	246	645	
Dusky grouse	SGCN					UCS,RS	UCS,RS			2	
Eared grebe	SGCN									1	
Evening grosbeak	SGCN					RC		1	2	4	
Ferruginous hawk	SGCN,SC	WSC	BCC	BCC	BCC	RC	RC			1	
Golden eagle	SGCN			BCC	BCC		RC	4	16	16	
Grace's warbler	SGCN			BCC			UCS,RS	3	127	99	
Gray flycatcher	SGCN							74	1,137	152	
Gray vireo	SGCN			BCC	BCC		UCC,UCS,RC,RS	205	1,119	67	3
Greater sage-grouse	SGCN,SC	FCS				UCC,UCS,TNC,RC,RS	TNC,UCC,RC			27	

Table B-1. Priority species observed on transects in the Northern Colorado Plateau Network with conservation and management designations and species totals per habitat, 2005–2013, cont.

	Management designations							Number of individuals observed per habitat, 2005–2013			
	State agencies		USFWS[3]			Partners in Flight[4]					
Species	CPW[1]	UDWR[2]	BCR 10	BCR 16	Region 6	BCR 10	BCR 16	LR[5]	PJ[6]	SA[7]	PISP[8]
Green-tailed towhee							UCS,RS	27	107	3,220	
Hammond's flycatcher						UCS		1	34	5	
Horned lark						CBSD	CBSD		6	283	
Juniper titmouse	SGCN			BCC			UCS,RS	269	1,121	51	8
Lark bunting	SGCN					CBSD		2			
Lazuli bunting	SGCN					UCS	UCS,RC,RS	1,453	85	229	
Lesser scaup	SGCN									2	
Loggerhead shrike	SGCN		BCC		BCC	CBSD	RC,CBSD	1	6	8	
Macgillivray's warbler						UCS		21	8	13	
Mountain bluebird						UCS	UCS,RC,RS	58	472	788	
Mountain chickadee						UCS		15	154	39	
Northern flicker						UCS,CBSD	UCS,CBSD,RS	78	115	257	
Northern goshawk	SGCN	CAS				UCS,RS				1	
Northern harrier	SGCN							10		27	
Northern pintail	SGCN									4	
Olive-sided flycatcher	SGCN		BCC			TNC,UCC,RC	TNC,UCC,RC	1	10	35	
Osprey	SGCN								2	1	
Peregrine falcon	SGCN,SC		BCC	BCC	BCC			29	16	7	5
Pine siskin						UCS,RS,CBSD	UCS,RS,CBSD	56	69	71	2
Pinyon jay	SGCN			BCC	BCC	TNC,UCC,RC	RC,RS,TNC,UCC,UCS	67	1,054	314	
Plumbeous vireo							UCS,RS	598	554	126	
Prairie falcon	SGCN			BCC	BCC		RC	4		6	
Pygmy nuthatch	SGCN						UCS,RS		63	60	
Red crossbill	SGCN								42	45	
Red-breasted nuthatch						UCS		1	22	18	
Red-naped sapsucker	SGCN					UCS,RS		5		1	
Rock wren						CBSD	UCS,RS,CBSD	957	899	969	19
Ruby-crowned kinglet						UCS		11	37	10	
Sage sparrow	SGCN		BCC		BCC	RC	RC	3		215	
Sage thrasher			BCC		BCC				1	1,000	1
Sandhill crane	SGCN,SC									5	

Table B-1. Priority species observed on transects in the Northern Colorado Plateau Network with conservation and management designations and species totals per habitat, 2005–2013, cont.

	Management designations							Number of individuals observed per habitat, 2005–2013			
	State agencies		USFWS[3]			Partners in Flight[4]					
Species	CPW[1]	UDWR[2]	BCR 10	BCR 16	Region 6	BCR 10	BCR 16	LR[5]	PJ[6]	SA[7]	PISP[8]
Say's phoebe							UCS	484	165	176	18
Short-eared owl	SGCN	WSC			BCC	RC,CBSD				5	
Swainson's thrush						UCS			1		
Townsend's solitaire						UCS,RS		5	57	32	
Tree swallow						UCS		121	22	130	
Veery	SGCN			BCC						1	
Vesper sparrow	SGCN					RC		6	186	4,429	
Violet-green swallow							UCS	2,582	610	491	13
Virginia's warbler	SGCN						UCC,UCS,RS	320	394	231	
Warbling vireo						UCS	UCS	264	39	111	
Western grebe	SGCN									13	
White-faced ibis	SGCN									1	
White-throated swift	SGCN							2,571	1,339	300	20
Williamson's sapsucker	SGCN		BCC			UCS,RS	UCS,RS		1	5	
Willow flycatcher	SGCN,FES,SE		FES,BCC	FES,BCC	FES,BCC	UCS,RS		10	1		
Wilson's warbler						CBSD	CBSD	19			
Yellow-billed cuckoo	SGCN,SC	FCS	BCC	BCC				1			

[1] CPW=Colorado Parks and Wildlife. FCS=Federal Candidate Species, FTS=Federally Threatened Species, FES=Federally Endangered Species, SGCN=Species of Greatest Conservation Need, SC=State Special Concern (Colorado Parks and Wildlife 2008).

[2] UDWR=Utah Division of Wildlife Resources. FCS=Federal Candidate Species, FTS=Federally Threatened Species, FES=Federally Endangered Species, CAS=Conservation Agreement Species, WSC=Wildlife Species of Concern (Utah Division of Wildlife Resources 2011).

[3]USFWS=U.S. Fish and Wildlife Service. BCR10=Bird Conservation Region 10 (Northern Rockies), BCR 16=Bird Conservation Region 16 (Southern Rockies/Colorado Plateau), FES=Federally Endangered Species, BCC=Bird of Conservation Concern for Region 6 (Mountain-Prairie Region) (U.S. Fish and Wildlife Service 2008)

[4]Partners In Flight: BCR10=Bird Conservation Region 10, BCR 16=Bird Conservation Region 16, TNC=Tri-National Concern Species, UCC=U.S.-Canada Concern Species, CBSD=Common Bird in Steep Decline, UCS=U.S.–Canada Stewardship Species (Partners in Flight 2012)

[5]LR=Low-Elevation Riparian.

[6]PJ=Pinyon-Juniper.

[7] SA=Sage Shrubland.

[8] PISP=Pipe Spring National Monument. Numbers for PISP include the point count data only.

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National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science
1201 Oak Ridge Drive, Suite 150
Fort Collins, Colorado 80525

www.nature.nps.gov