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Natural Resource Program Center

Landbird Monitoring in the Sonoran Desert Network

Annual Report, 2009

Natural Resource Technical Report NPS/SODN/NRTR—2010/372

ON THE COVER

Gambel's quails (*Callipepla gambelii*). Photo ©Robert Shantz.

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The spotted towhee (*Pipilo maculatus*) was the most commonly detected species at Gila Cliff Dwellings NM in 2009. 23

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Acronyms

CAGR	Casa Grande Ruins National Monument
CHIR	Chiricahua National Monument
CORO	Coronado National Memorial
FOBO	Fort Bowie National Historic Site
GICL	Gila Cliff Dwellings National Monument
MOCA	Montezuma Castle National Monument
MOCC	Montezuma Castle National Monument–Castle unit
MOWE	Montezuma Castle National Monument–Well unit
NM	national monument
NP	national park
NPS	National Park Service
ORPI	Organ Pipe Cactus National Monument
RMBO	Rocky Mountain Bird Observatory
SAGE	Saguaro National Park–Rincon Mountain District
SAGU	Saguaro National Park
SAGW	Saguaro National Park–Tucson Mountain District
SODN	Sonoran Desert Network
TONT	Tonto National Monument
TUMA	Tumacácori National Historical Park
TUZI	Tuzigoot National Monument

Executive Summary

In 2009, landbirds were surveyed within all 11 SODN parks. Sample points were located along a transect for linear features (e.g., most riparian habitats) or a grid for area features. A total of 40 transects or grids were surveyed in 2009. Survey efforts were focused on the breeding season, when increased territorial behavior by songbirds results in higher detection rates and greater sampling efficiency. The window of primary breeding and, therefore, sampling was from April through June, with adjustments made for individual park visits based on latitude and elevation. We used point-transect surveys to estimate and monitor landbird population parameters. Surveys were conducted twice for each transect or grid to facilitate estimates of occupancy, which rely on an encounter-history matrix derived from repeated visits, rather than a detection function to account for detectability.

We sampled a total of 280 points on 40 transects or grids. Of these, 189 points were sampled in upland habitats and 91 in riparian habitats. We recorded a total of 11,576 birds of 163 species on our survey points, with an additional 496 birds detected as flyovers. Saguaro National Park (SAGU) had the highest number of birds detected (n = 3,661), but also had the highest number of survey points. Casa Grande Ruins National Monument (CAGR) had the lowest number of birds detected (n = 198). Similarly, we observed the greatest number of species at SAGU (n = 120) and the fewest at CAGR (n = 25). Species richness and community composition varied widely among the parks surveyed. Gila woodpeckers were the most commonly detected species within the SODN (n = 677), followed closely by white-winged doves (n = 626). Seventeen species were detected only once during our surveys, and several others were detected only a few times. Five species (ash-throated flycatcher, Bewick's wren, black-chinned hummingbird, common raven, and mourning dove) were detected at all 11 parks, whereas numerous species were detected at one or very few parks. New species were recorded for seven parks, with as many as five new species recorded for Gila Cliff Dwellings National Monument.

Changes were made to the protocol this year. The Rocky Mountain Bird Observatory (RMBO), our primary cooperator for this project, will now manage the bird monitoring data. Other networks using RMBO also use this service and have found it to be efficient and effective. This will also enable SODN data to be in the same database as those of several other networks and organizations, which in turn allows for a more comprehensive regional assessment. We also anticipate a few minor changes to our field approach: we are considering adding an additional revisit to each transect or grid; we will change our approach to recording detections while walking from one sample point to the next; and we will reduce our survey time at each sample point from eight to six minutes.

1 Introduction

1.1 Background

The mission of the National Park Service is to manage park resources "unimpaired for future generations." Protecting and managing some of our nation's most significant natural resources requires basic knowledge of the condition of ecosystems and species that occur in national parks. In order to better meet this mission, the Inventory & Monitoring Program was established to determine status and trends in ecological resources (NPS 1992). Established in 2001, the Sonoran Desert Inventory and Monitoring Network (SODN) includes 11 parks in southern Arizona and New Mexico. Collectively, these parks are representative of most of the ecological communities present within the Sonoran Desert and Apache Highlands Ecoregions (NPS 2005).

Monitoring changes in landbird population and community parameters can be an important element of a comprehensive, long-term monitoring program, such as that being implemented for the SODN parks. Landbirds are a conspicuous component of many ecosystems and have high body temperatures, rapid metabolisms, and occupy high trophic levels. As such, changes in landbird populations may be indicators of changes in the biotic or abiotic components of the environment upon which they depend (Canterbury et al. 2000, Bryce et al. 2002). Relative to other vertebrates, landbirds are also highly detectable and can be efficiently surveyed with the use of numerous standardized methods (Bibby et al. 2000, Buckland et al. 2001).

Birds select habitat based on the presence of behavioral cues triggered by the environment (Hutto 1985a; Alcock 2005). In some environments, however, especially those that vary unpredictably, habitat may not be saturated and changes in resources may not always be tracked by changes in animal populations (Wiens 1985). In these situations, relating changes in bird populations to environmental features can be complex, especially when confounded by time lags that are characteristic of site-tenacious bird species. Additional complications occur if birds respond more sensitively to environmental change than we can detect and when cyclical environmental changes result in erratic changes in population size that are ultimately inconsequential. However, the utility of monitoring landbirds is strengthened by concurrent monitoring of a broad suite of environmental parameters (Dale and Beyeler 2001) that may assist with elucidating changes in the bird community to other environmental factors. Such a broad-based approach is now being undertaken by the SODN I&M program (National Park Service 2008) and other broad-based monitoring approaches (e.g., Ringold et al. 1996; Stevens and Gold 2003; Barrows et al. 2005).

Perhaps the most compelling reason to monitor landbird communities is that birds themselves are inherently valuable. The high aesthetic and spiritual values that humans place on native wildlife is acknowledged in the agency's Organic Act: "to conserve . . . the wild life therein . . . unimpaired for the enjoyment of future generations." Birdwatching, in particular, is a popular, longstanding recreational pastime in the U.S., and forms the basis of a large and sustainable industry (Sekercioglu 2002).

The SODN began monitoring birds in spring 2007; this effort is now part of a collaboration among the Southern Plains, Sonoran Desert, and Chihuahuan Desert networks.

1.2 Program Goals and Objectives

The overall goal of the SODN landbird monitoring program is to detect biologically significant changes in population parameters over time. This collaborative program is intended to maximize the strength of inferences within the context of finite resources. The monitoring design is a multitiered, flexible framework that will enable efficient estimation and monitoring of population parameters, periodic evaluation of assumptions, and the opportunity for adaptation to meet additional needs.

We have selected three primary monitoring objectives that are complementary and together provide a comprehensive assessment of changing bird populations and communities.

1.2.1 Objective 1: Occupancy

We will estimate the proportion of points occupied for most species in most parks. Occupancy is a measure of presence or absence of a species in space that indicates changes in the distribution of a species when evaluated across time. Recent advancements in occupancy theory and modeling have provided sound justification of its application in monitoring programs (MacKenzie et al. 2003; Field et al. 2005; MacKenzie et al. 2006).

1.2.2 Objective 2: Bird species richness and composition

We will estimate parameters related to community dynamics, particularly species richness and species composition. Monitoring the richness and composition of native communities of concern, and the changes occurring within and among these communities, provides a valuable complement to population-based parameters. Species richness data are essential to understanding the effects of changing landscapes on native biodiversity. Species composition helps us to understand the effects of management and other changes by assessing which species are or are not responding to changes in the environment.

1.2.3 Objective 3: Density (when feasible)

We will estimate density of the most-common species using the point-transect distance-sampling method at fixed points and subsequent analyses using the Distance program (Thomas et al. 2005). Provided that assumptions are reasonably met, distance-sampling methods allow researchers to model a detection function that adjusts for imperfect detectability and is a robust, widely accepted method for estimating landbird abundance (Buckland et al. 2001). With reasonable effort, we will likely only be able to estimate density annually for the most-common species in larger parks.

1.3 Reporting

These objectives focus on long-term changes and trends, and monitoring must be conducted for a number of years before meaningful estimates related to trends are feasible. Consequently, it is neither practical nor useful to conduct comprehensive analyses for each objective on an annual basis. Instead, we will provide annual basic data summaries and, once every five years, a comprehensive synthesis report that will go into much greater depth, including analyses for all objectives and interpretations in broader ecological context.

Field methods for estimating all three primary objectives are essentially the same; analyses and evaluation procedures used to estimate trends will differ.

2 Methods

2.1 Methods

2.1.1 Sampling design

The details of our sampling design and field methods are presented in Powell and others (in review). Our intention for monitoring landbirds extends beyond the birds themselves, and includes a broader vision of landbirds as indicators of the ecosystems they inhabit. This dual purpose influences our sampling design, especially in light of our funding and logistical limitations. In some cases, trade-offs have been made to accommodate particular habitat types or park resources that are considered particularly important to a given park.

We stratified most parks by mesic riparian and upland sites, although SODN parks contain a wide range of upland vegetation (and, by extension, bird) communities. The dominant vegetation communities represented by upland areas in SODN parks can be further stratified into roughly four types: desert, semi-desert grassland, pine–oak forest and woodland, and mixed conifer forest (Table 2.1.1-1).

In 2009, we surveyed landbirds within all 11 SODN parks. Sample points were located along a transect for linear features (e.g., most riparian habitats) or a grid for area features. A total of 40 transects or grids were surveyed in 2009 (Table 2.1.1-2). In most parks, we used sites selected with methodology outlined in Powell and others (2007). Exceptions occurred at Organ Pipe Cactus NM and Saguaro NP, because of safety concerns related to undocumented immigration and smuggling. Details of these exceptions are presented in Powell and others (in review).

2.1.2 Seasonal timing of surveys

During the breeding season, increased territorial behavior by songbirds results in higher detection rates and greater sampling efficiency. Additionally, occupancy estimates assume that a bird detected is present for the entire period being surveyed (in this case, both survey periods). Thus, our surveys were focused on the primary breeding season in order to account for the greatest number of species in each park, recognizing that some

Table 2.1.1-2. Number of transects surveyed in each SODN park unit, 2009.

Park unit	Riparian	Upland
CAGR	--	1
CHIR	--	4
CORO	--	3
FOBO	1	1
GICL	1	--
MOCA	2	1
MOWE	1	--
ORPI	2	4
SAGE	1	7
SAGW	--	5
TONT	1	1
TUMA	2	--
TUZI	2	--

Table 2.1.1-1. Vegetation types by park.

Vegetation types	Parks
Desert	• Casa Grande Ruins National Monument (CAGR) • Fort Bowie National Historic Site (FOBO) • Montezuma Castle National Monument (MOCA) • Organ Pipe Cactus National Monument (ORPI) • Saguaro National Park–Tucson Mountain District (SAGW), and • at <4,000 feet in Saguaro National Park–Rincon Mountain District (SAGE), Tonto National Monument (TONT), Tumacácori National Historical Park (TUMA), and Tuzigoot National Monument (TUZI).
Semi-desert grassland	• Coronado National Memorial (CORO) and • some areas of Chiricahua National Monument (CHIR) and SAGE.
Pine-oak forest and woodland	• CHIR and SAGE at 4,000–6,000 feet.
Mixed conifer forest	• Gila Cliff Dwellings National Monument (GICL), and • at >6,000 feet in CHIR and SAGE.

species (e.g., migrants) may not have been adequately surveyed because of this restricted window. Although migrants are certainly an important component of bird communities, their presence can be highly variable and substantially influenced by external factors. Focusing on the breeding population is expected to provide the most reliable information about changes in bird populations related to changes in condition of SODN parks.

The timing of breeding varies among species and depends on a number of factors, including latitude and elevation. Birds at southern latitudes and lower elevations tend to breed earlier than those at higher latitudes and elevations. Consequently, parks with a wide elevation range (e.g., SAGU) also had a wide range of sampling dates. The window of primary breeding and sampling was from April through June, with adjustments, as described above, for individual park visits based on latitude and elevation (Figure 2.1.2).

2.2 Bird Surveys

We used point-transect surveys to estimate and monitor landbird population parameters (Buckland et al. 2001). The point-transect approach evolved from the variable circular plot approach (Reynolds et al. 1980) and distance sampling of line transects (Burnham et al. 1980), where points are considered as a transect with zero distance (Buckland et al. 2001). For density estimates, the method involves estimating the linear distance to individual birds while standing for a predetermined period of time at a fixed point in space (Figure 2.2). Estimating the distance to each bird allows the observer to approximate density via a species-specific detection function that accounts for variation in detectability due to surveyor, environmental, or weather-related factors (Buckland et al. 2001; Diefenbach et al. 2003).

All birds were recorded, regardless of detection distance from the surveyor—including birds flying over observers. After counts were completed, observers used a handheld GPS unit to locate successive survey points. While walking between points, observers searched for species not recorded during the count period.

Surveys were conducted twice for each transect or grid to facilitate occupancy estimates, which rely on an encounter-history matrix derived from repeated visits, rather than a detection function to account for detectability.

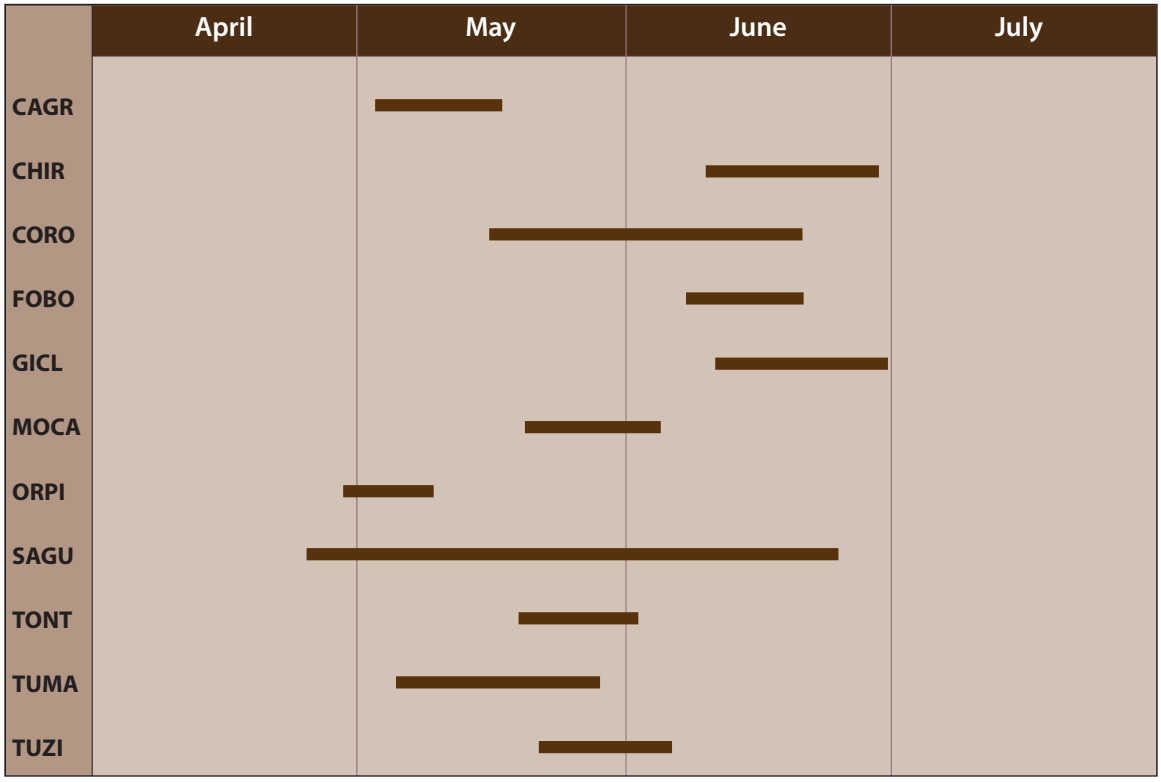

Figure 2.1.2. Dates when sampling was conducted in SODN parks, 2009.

We spent eight minutes at each point along the transect or grid and used a rangefinder to estimate the linear distance to each bird detected. Our current protocol of spending eight minutes per site will be reduced to six minutes in future years, to be consistent with other efforts being conducted by RMBO and to increase efficiency by allowing more points to be surveyed.

2.3 Additional Monitoring to Augment Bird Sampling

It is well known that landbird populations are particularly influenced by changes in vegetation structure and composition (Holmes and Sherry 2001; Krueper et al. 2003). Considering environmental data, such as vegetation, will allow us to aggregate (i.e., to stratify, post-hoc) survey sites that share similar characteristics. For this purpose, we will use data collected through the network's vegetation monitoring efforts. We will also use other data (e.g., climate) collected by SODN and other organizations as covariates when assessing population trends for birds. Finally, landbird population parameters, coupled with detailed environmental information, can be used to build habitat-association models (e.g., Manley et al. 2004) that can inform conservation efforts and scientific inquiry throughout the region.

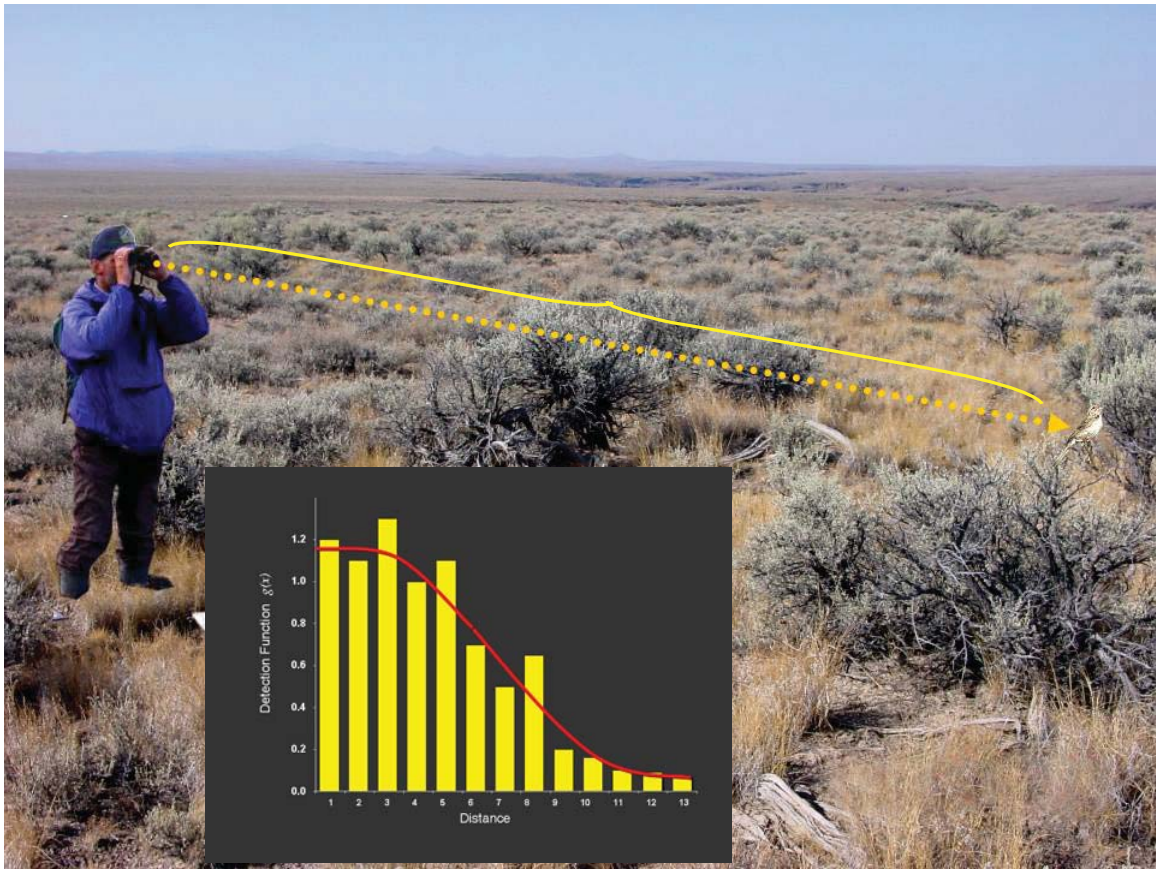

Figure 2.2. Distance sampling works by estimating a detection profile (graph) as a function of distance from which either individual or groups of birds are observed from the transect.

3 Results and Discussion

We sampled a total of 280 points on 40 transects or grids (Table 3-1). Of these, 189 points were sampled in upland habitats and 91 in riparian habitats. We recorded a total of 11,576 birds of 163 species on our survey points, with an additional 496 birds detected as flyovers.

Saguaro NP had the highest number of birds detected (n = 3,661), but also had the highest number of survey points. Casa Grande Ruins NM had the lowest number of birds detected (n = 198). Similarly, we observed the greatest number of species at SAGU (n = 121) and the fewest at CAGR (n = 26) (Table 3-2). Species richness and community composition varied widely among the parks surveyed. The number of individuals or species detected is influenced not only by the number of survey points, but also by the size and diversity of available habitats.

Gila woodpeckers were the most commonly detected species within the Sonoran Desert Network (n = 677), followed closely by white-winged doves (n = 626) (see Appendix A). Seventeen species were detected only once during surveys, and several others were detected only a few times.

Five species (ash-throated flycatcher, Bewick's wren, black-chinned hummingbird, common raven, and mourning dove) were detected at all 11 parks, whereas numerous species were detected at one or very few parks (see Appendix A).

Table 3-2. Number of species observed in each habitat class at each park, 2009.

Park	Species detected		
	Upland	Riparian	Total[1]
Casa Grande Ruins NM	25	--	25
Chiricahua NM	64	--	64
Coronado NMem	63	--	63
Fort Bowie NHS	30	45	52
Gila Cliff Dwellings NM	--	56	56
Montezuma Castle NM	45	63	70
Organ Pipe Cactus NM	46	46[2]	57
Saguaro NP	104	58	121
Tonto NM	38	48	58
Tumacácori NHP	--	69	69
Tuzigoot NM	--	62	62
Total[1]	**140**	**128**	**163**

[1] Totals do not necessarily equal the sum of the numbers shown for parks or habitat classes, as a single species may have been observed in more than one park or habitat class.

[2] Riparian habitat sampled at ORPI was xeroriparian, thus not directly comparable to more mesic habitats.

Table 3-1. Numbers of survey points and birds detected in each habitat class at each SODN park, 2009.

Park	Upland		Riparian		Total detections
	Survey points	Birds detected	Survey points	Birds detected	
Casa Grande Ruins NM	9	198	na	na	198
Chiricahua NM	27	877	na	na	877
Coronado NMem	22	668	na	na	668
Fort Bowie NHS	7	194	8	261	455
Gila Cliff Dwellings NM	na	na	7	313	313
Montezuma Castle NM	8	358	19	1,002	1,360
Organ Pipe Cactus NM	28	904	14	694	1,598
Saguaro NP	80	3,126	8	535	3,661
Tonto NM	8	339	7	336	675
Tumacácori NHP	na	na	14	1,074	1,074
Tuzigoot NM	na	na	14	697	697
Total	**189**	**6,664**	**91**	**4,912**	**11,576**

3.1 Casa Grande Ruins National Monument

3.1.1 2009 sampling

During 2009, we sampled nine survey points on one grid at CAGR (Figure 3.1.1). The single grid was in upland (desert scrub) habitat. Each point was surveyed twice in May (Table 3.1.1).

3.1.2 Results and discussion

During 2009, 198 birds of 25 species were detected at CAGR (Table 3.1.2). Great-tailed grackles were the most commonly detected species, accounting for 15% of total detections, followed by mourning doves (14%), red-winged blackbirds (14%), and Gambel's quails (11%). A new species recorded for the national monument this year was the Eurasian collared-dove (however, because this species was observed as an incidental sighting, it is not listed in our survey results).

The desert upland transect here continues to show variation in the number and diversity of birds. It is influenced by adjacent agricultural fields and presence or absence of surface water in the surrounding ditches, in some years attracting waders, such as great blue herons; and great, snowy, or cattle egrets. In some years, mixed blackbird flocks can overwhelm the sky with thousands of birds, mostly as flyovers or just outside the park. This may also be the case with several species of doves. Great-tailed grackles, brown-headed cowbirds, and Brewer's and red-winged blackbirds are most numerous, and white-winged and mourning doves and house finches are quite common. Ash-throated flycatcher, black-throated sparrow, Gila woodpecker, and verdin are most prominent in the open desert scrub, and the few large mesquites and palo verdes attract Lucy's warblers, Bewick's wrens, and Anna's hummingbirds. The resident burrowing and great horned owls continue to breed, and western screech and elf owls are present at night.

Table 3.1.1. Habitat type, number of survey points, and sampling dates for each transect or grid at Casa Grande Ruins NM, 2009.

Transect/Grid	Survey points	Habitat type	Visit 1	Visit 2
U	9	Upland (desert scrub)	05/04/2009	05/16/2009

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The great-tailed grackle (*Quiscalus mexicanus*) was the most commonly detected species at Casa Grande Ruins NM in 2009.

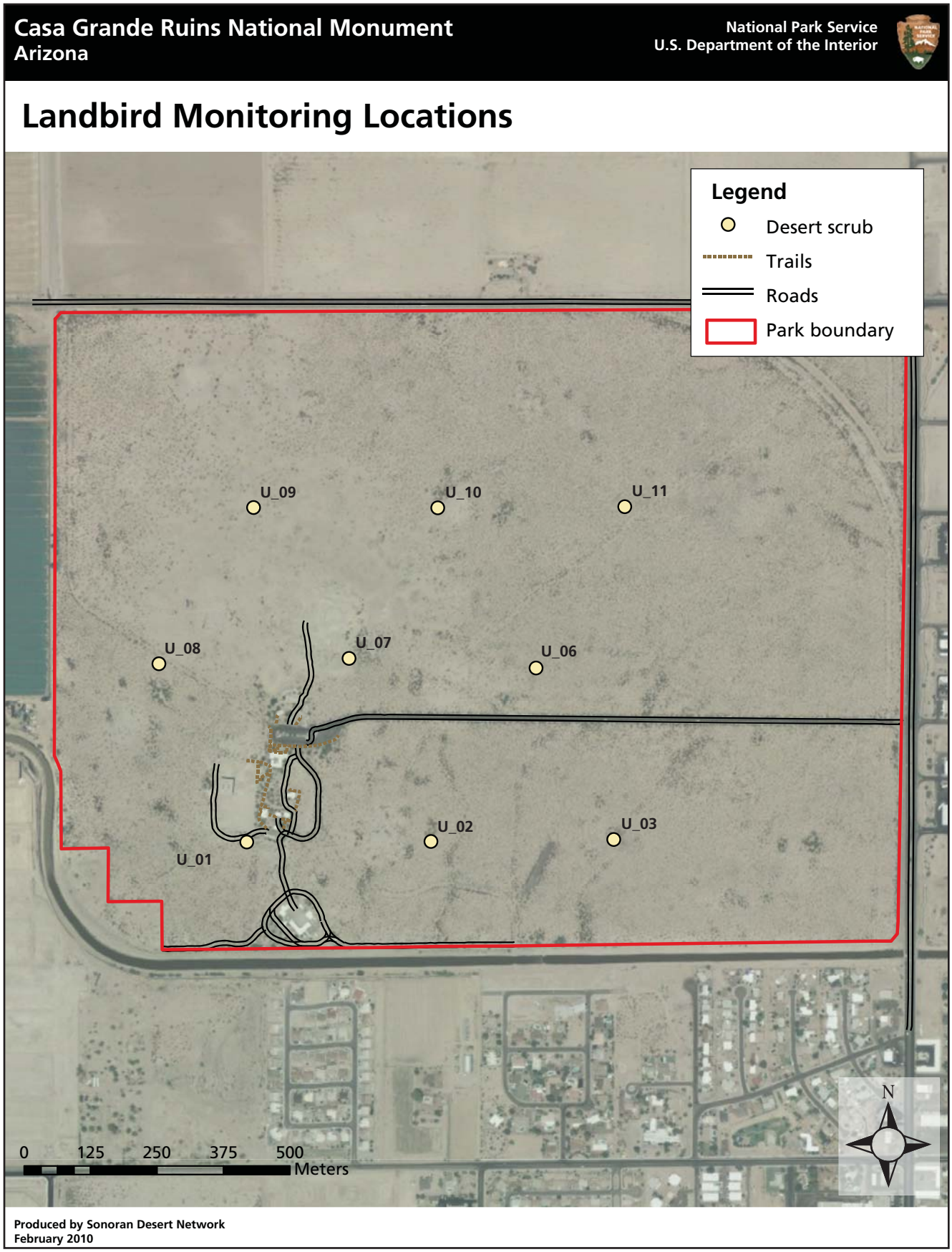

Figure 3.1.1. Point locations sampled at Casa Grande Ruins National Monument, 2009.

Table 3.1.2. Number of detections of each species, Casa Grande Ruins NM, 2009.

Species	Detections: Total (desert scrub habitat)	Detections: % of total
Great-tailed grackle	30	15
Mourning dove	28	14
Gambel's quail	27	14
European starling	21	11
House finch	19	10
House sparrow	16	8
Ash-throated flycatcher	10	5
Gilded flicker	7	4
Anna's hummingbird	7	4
Killdeer	5	3
Red-winged blackbird	4	2
Brown-headed cowbird	3	2
Bullock's oriole	3	2
American kestrel	3	2
Burrowing owl	2	1
Cliff swallow	2	1
White-winged dove	2	1
Black-chinned hummingbird	1	1
Common poorwill	1	1
Common raven	1	1
Lark sparrow	1	1
Lesser goldfinch	1	1
Lesser nighthawk	1	1
Red-tailed hawk	1	1
Unknown bird	*1*	*1*
Verdin	1	1
Total	**198**	**100**

Number of birds is the total number of individuals counted in each habitat, not including flyovers. Species are listed in rank order of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values do not include observations of species flying overhead that were not observed using the habitat (flyovers) or incidental sightings not on sample points. Percentages may not add up to 100 due to rounding.

3.2 Chiricahua National Monument

3.2.1 2009 sampling

During 2009, 27 survey points were sampled along four transects at CHIR (Figure 3.2.1). All transects were in the upland habitat class of either grassland savanna or woodland habitat types. Each point was surveyed twice in June (Table 3.2.1).

3.2.2 Results and discussion

During 2009, 877 birds of 64 species were detected at CHIR (Table 3.2.2). Bushtits were the most commonly detected species, accounting for 11% of total detections. Bewick's wrens (9%), spotted towhees (8%), black-throated gray warblers (6%), rufous-crowned sparrows (6%), white-throated swifts (5%), bridled titmice (4%), and canyon wrens (4%). No new species were recorded for the monument in 2009.

The most exciting news at the park was the discovery of a male eared quetzal a week before the surveys were conducted. The eared quetzal, formerly known as the eared trogon, is a rare neotropical vagrant from the sky islands of Mexico. It has occurred in the U.S only a handful of times, mostly in the higher conifer ridges of the Chiricahua Mountains adjacent to the park. The bird was seen by several skilled, credible birders, but despite diligent searching during and after surveys, was not detected again. However, the sighting constitutes a valid record for the park.

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The bushtit (*Psaltriparus minimus*) was the most commonly detected species at Chiricahua NM in 2009.

Table 3.2.1. Habitat type, number of survey points, and sampling dates for each transect or grid, Chiricahua NM, 2009.

Transect/Grid	Habitat class	Habitat type	Survey points	Visit 1	Visit 2
High1	Upland	Woodland	6	6/9/2009	6/28/2009
High2	Upland	Woodland	7	6/9/2009	6/28/2009
Mid1	Upland	Grassland/Savanna	7	6/8/2009	6/27/2009
Mid2	Upland	Grassland/Savanna	7	6/8/2009	6/27/2009

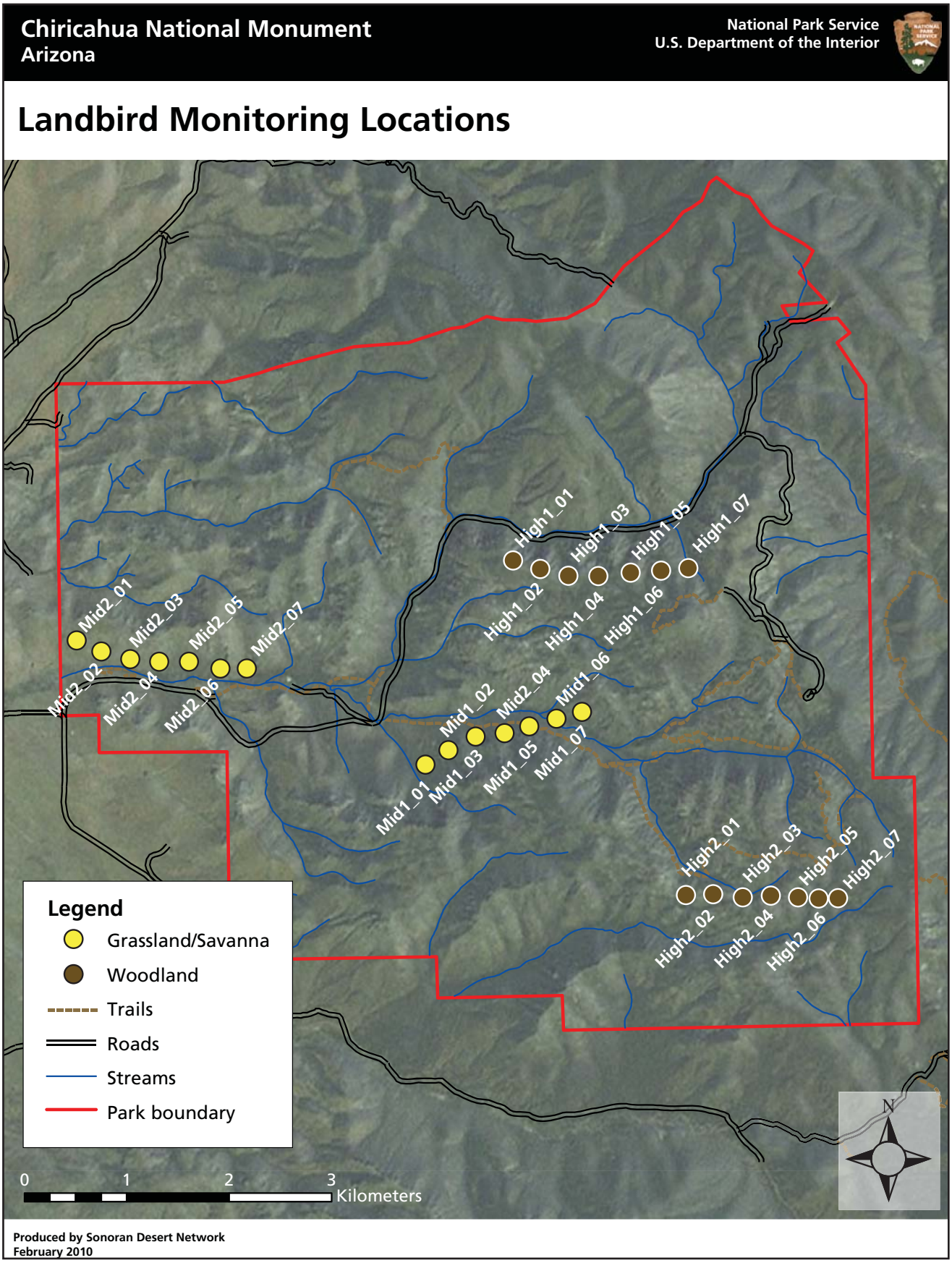

Figure 3.2.1. Point locations sampled at Chiricahua National Monument, 2009.

Table 3.2.2. Number of detections of each species in each habitat type, Chiricahua NM, 2009.

Species	Habitat type		Detections	
	Grassland/ Savanna	Woodland	Total	% of total
Bushtit	26	69	95	11
Bewick's wren	34	42	76	9
Spotted towhee	22	50	72	8
Black-throated gray warbler	25	30	55	6
Rufous-crowned sparrow	42	12	54	6
White-throated swift	19	23	42	5
Bridled titmouse	30	7	37	4
Canyon wren	14	17	31	4
Ash-throated flycatcher	18	10	28	3
Black-headed grosbeak	15	9	24	3
Mexican jay	17	6	23	3
Hutton's vireo	14	7	21	2
Blue-gray gnatcatcher	9	10	19	2
Dusky-capped flycatcher	14	4	18	2
Western wood-pewee	8	10	18	2
Mexican chickadee	5	12	17	2
Northern flicker	9	7	16	2
Hepatic tanager	5	9	14	2
White-breasted nuthatch	11	3	14	2
Rock wren	5	6	11	1
Scott's oriole	9	2	11	1
Acorn woodpecker	10		10	1
Arizona woodpecker	9	1	10	1
Brown-crested flycatcher	10		10	1
Turkey vulture	10		10	1
Violet-green swallow	3	7	10	1
Cassin's kingbird	9		9	1
Black-chinned hummingbird	7	1	8	1
Cactus wren	7		7	1
Chipping sparrow	7		7	1
Mourning dove	4	3	7	1
Plumbeous vireo	5	2	7	1
American robin	2	4	6	1
Painted redstart	6		6	1
White-winged dove	6		6	1

Table 3.2.2. Number of detections of each species in each habitat type, Chiricahua NM, 2009, cont.

Species	Habitat type		Detections	
	Grassland/ Savanna	Woodland	Total	% of total
Chihuahuan raven	4	1	5	1
Ladder-backed woodpecker	4	1	5	1
Virginia's warbler	2	3	5	1
Zone-tailed hawk	1	3	4	0
Black-chinned sparrow		3	3	0
Brown-headed cowbird	3		3	0
Canyon towhee	2	1	3	0
Northern mockingbird	3		3	0
Summer tanager	3		3	0
Unknown bird	*2*	*1*	*3*	*0*
Western scrub-jay	3		3	0
Western tanager	2	1	3	0
Anna's hummingbird	2		2	0
Botteri's sparrow	1	1	2	0
Brown creeper	2		2	0
Greater roadrunner		2	2	0
Hermit thrush	2		2	0
White-throated sparrow		2	2	0
Band-tailed pigeon		1	1	0
Black rail	1		1	0
Black-throated sparrow	1		1	0
Blue grosbeak	1		1	0
Broad-tailed hummingbird		1	1	0
Common raven	1		1	0
Gambel's quail	1		1	0
Juniper titmouse		1	1	0
Magnificent hummingbird		1	1	0
Phainopepla	1		1	0
Red-tailed hawk	1		1	0
Steller's jay		1	1	0
Wild turkey		1	1	0
Total	**489**	**388**	**877**	**100**

Number of birds is the total number of individuals counted in each habitat, not including flyovers. Species are listed in rank order of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values do not include observations of species flying overhead that were not observed using the habitat (flyovers) or incidental sightings not on sample points. Percentages may not add up to 100 due to rounding.

3.3 Coronado National Memorial

3.3.1 2009 sampling

During 2009, 22 survey points were sampled along three transects at CORO (Figure 3.3.1). All transects were in the upland habitat class of either grassland savanna or woodland habitat types. Each point was surveyed twice in May or June (Table 3.3.1).

3.3.2 Results and discussion

During 2009, 668 birds of 63 species were detected at CORO (Table 3.3.2). Spotted towhees were the most commonly detected species, accounting for 7% of total detections. Ash-throated flycatchers (7%), Bewick's wrens (7%), rufous-crowned sparrows (6%), white-winged doves (4%), white-throated swifts (4%), and bridled titmice (4%) were also common. No new species were detected in the park in 2009.

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The spotted towhee (*Pipilo maculatus*) was the most commonly detected species at Coronado NMem in 2009.

The lush mesquite grassland habitat stretching toward the international border fence was teeming with breeding species, most notably Cassin's and Botteri's sparrows and eastern meadowlarks, but nesting loggerhead shrikes were also worth noting. Montezuma quail seemed abundant in the park, ranging from the grasslands to oak scrub higher on the surrounding hills, and were frequently detected in calling coveys (but rarely seen). Western scrub-jays seemed to be restricted by the east–west divide of Montezuma Pass atop the ridge, only favoring the west slope in small flocks and absent elsewhere. Numerous singing black-chinned sparrows were notable in the grassy oak slopes among abundant rufous-crowned sparrows, spotted towhees, and Bewick's wrens, which were most prominent in the habitat. Yellow-billed cuckoo was noted as a migrant along the narrow sycamore-lined riparian canyon, as were other migrant warblers, flycatchers, vireos, tanagers, grosbeaks, and thrushes. Most notable was a female Lucifer hummingbird, tending a nest with two eggs, found by the park biologist after the surveys concluded. The Lucifer hummingbird is a rare Mexican hummingbird with a very small breeding range in southeastern Arizona, and it is more expected from the moister canyons a few miles to the north.

Table 3.3.1. Habitat type, number of survey points, and sampling dates for each transect or grid, Coronado NMem, 2009.

Transect/Grid	Habitat class	Habitat type	Survey points	Visit 1	Visit 2
401	Upland	Grassland/Savanna	8	5/16/2009	6/20/2009
402	Upland	Woodland	7	5/15/2009	6/18/2009
502	Upland	Grassland/Savanna	7	5/17/2009	6/19/2009

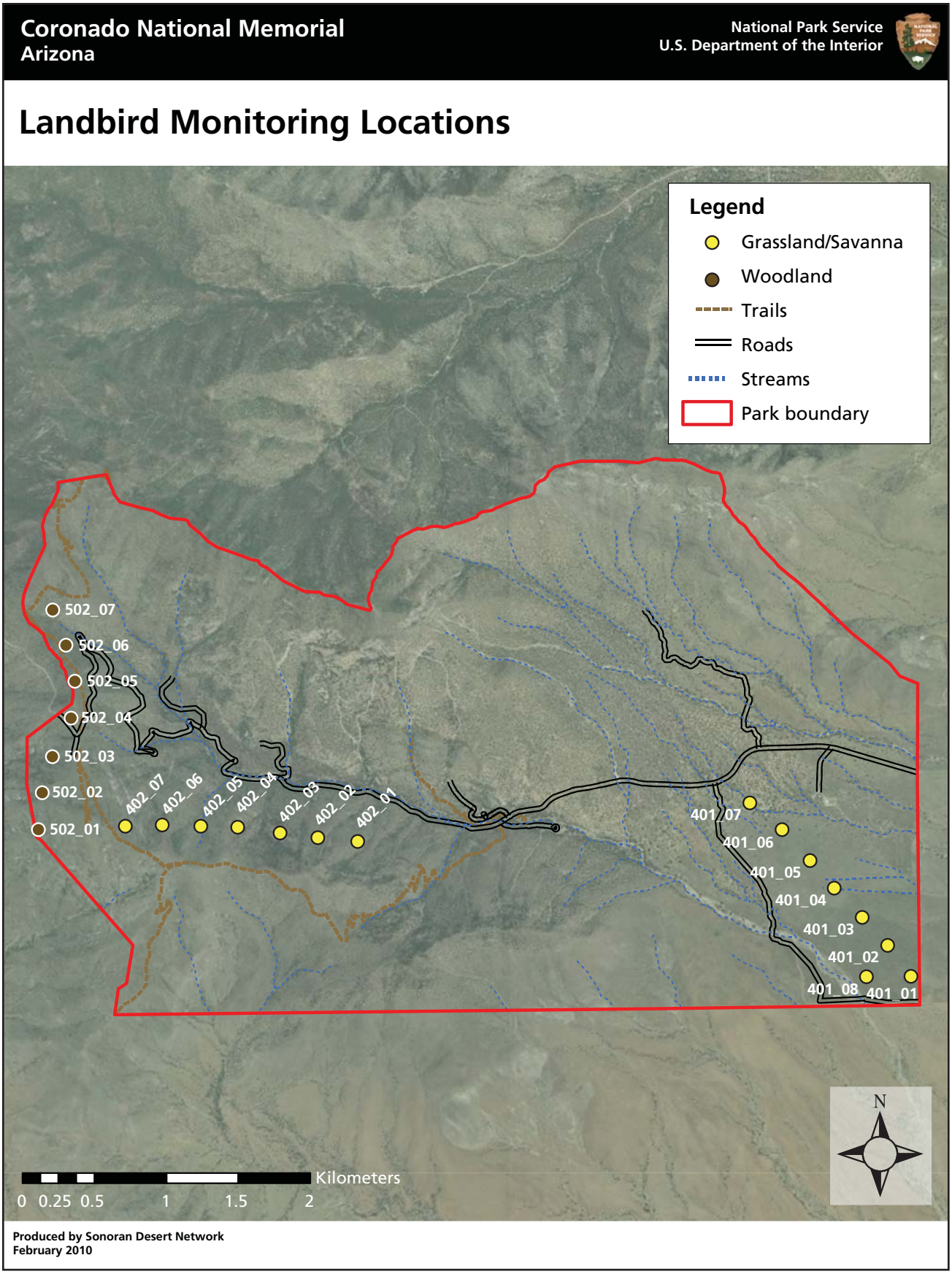

Figure 3.3.1. Point locations sampled at Coronado National Memorial, 2009.

Table 3.3.2. Number of detections of each species in each habitat type, Coronado NMem, 2009.

Species	Habitat type		Detections	
	Grassland/ Savanna	Woodland	Total	% of total
Spotted towhee	25	23	48	7
Ash-throated flycatcher	35	10	45	7
Bewick's wren	29	15	44	7
Mexican jay	26	15	41	6
Rufous-crowned sparrow	17	21	38	6
White-winged dove	19	8	27	4
White-throated swift	14	12	26	4
Bridled titmouse	20	4	24	4
Bushtit	7	16	23	3
Mourning dove	22	1	23	3
Scott's oriole	16	7	23	3
Canyon towhee	8	12	20	3
Western kingbird	20		20	3
Canyon wren	10	7	17	3
Eastern meadowlark	15		15	2
House finch	7	7	14	2
Botteri's sparrow	13		13	2
Western tanager	10	3	13	2
Black-headed grosbeak	3	9	12	2
Cactus wren	4	8	12	2
Montezuma quail	8	3	11	2
Black-throated gray warbler	8	1	9	1
Brown-crested flycatcher	7	2	9	1
Cassin's kingbird		9	9	1
Northern mockingbird	8		8	1
Western scrub-jay	1	7	8	1
Greater roadrunner	5	2	7	1
Rock wren		7	7	1
Brown-headed cowbird	6		6	1
Bullock's oriole	6		6	1
Common raven	5	1	6	1
Painted redstart	5	1	6	1
Black-chinned hummingbird	2	2	4	1
Black-throated sparrow	3	1	4	1
Broad-tailed hummingbird	1	3	4	1
Curve-billed thrasher		4	4	1
Red-tailed hawk	4		4	1
Unknown bird	*2*	*2*	*4*	*1*
Arizona woodpecker	3		3	0
Black-chinned sparrow	2	1	3	0

Table 3.3.2. Number of detections of each species in each habitat type, Coronado NMem, 2009, cont.

Species	Habitat type		Detections	
	Grassland/ Savanna	Woodland	Total	% of total
Dusky-capped flycatcher	1	2	3	0
Hepatic tanager	1	2	3	0
Hutton's vireo	3		3	0
Ladder-backed woodpecker	2	1	3	0
Lesser goldfinch	3		3	0
Say's phoebe	3		3	0
Western wood-pewee	2	1	3	0
White-breasted nuthatch	1	2	3	0
Zone-tailed hawk	2	1	3	0
Chihuahuan raven	2		2	0
Phainopepla	2		2	0
Turkey vulture	2		2	0
Violet-green swallow	2		2	0
Virginia's warbler		2	2	0
Wilson's warbler	2		2	0
Acorn woodpecker	1		1	0
Anna's hummingbird		1	1	0
Cassin's sparrow	1		1	0
Chipping sparrow	1		1	0
Great horned owl	1		1	0
Loggerhead shrike	1		1	0
Northern flicker	1		1	0
Plumbeous vireo	1		1	0
Worm-eating warbler		1	1	0
Total	**431**	**237**	**668**	**100**

Number of birds is the total number of individuals counted in each habitat, not including flyovers. Species are listed in rank order of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values do not include observations of species flying overhead that were not observed using the habitat (flyovers) or incidental sightings not on sample points. Percentages may not add up to 100 due to rounding.

3.4 Fort Bowie National Historic Site

3.4.1 2009 sampling

During 2009, 15 survey points we sampled on two transects or grids at FOBO (Figure 3.4.1). One transect was in the riparian habitat class and one grid was in the desert scrub habitat type (upland). Each point was surveyed twice in June (Table 3.4.1).

3.4.2 Results and discussion

During 2009, 455 birds of 52 species were detected at FOBO (Table 3.4.2). The northern mockingbird was the most commonly detected species, accounting for 11% of total detections. Black-throated sparrows (9%), white-winged doves (8%), rufous-crowned sparrows (6%), ash-throated flycatchers (5%), and Bewick's wrens (4%) were also common. One new species, the indigo bunting, was documented during the surveys.

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The northern mockingbird (*Mimus polyglottos*) was the most commonly detected species at Fort Bowie NHS in 2009.

The lush riparian stretch of Siphon Canyon is a good migrant trap, and several nesting resident species continue to use it, attracted to the flowing spring at its upper reaches. Cooper's hawk, Crissal thrasher, broad-billed and black-chinned hummingbirds, northern mockingbird, summer tanager, Bell's vireo, Cassin's and western kingbirds, common raven, and zone-tailed hawk nested in similar territories as in the previous year. The blooming desert willow is a magnet to migrant hummingbirds, most notably the broad-tailed, which can be obvious with its metallic wing-trills. The gray vireo pair that nested along the creek last year was present again, with the male singing on territory but the nest not located. The large communal roost of turkey vultures was again quite healthy. Western scrub-jays were seen in small groups, and a pair of golden eagles was detected soaring over the hills (but did not seem tied to the area for nesting). Interesting was the continued presence of migrant Pacific-slope flycatchers quite late into the season, a phenomenon observed by other birders elsewhere in the region.

Table 3.4.1. Habitat type, number of survey points, and sampling dates for each transect or grid, Fort Bowie NHS, 2009.

Transect/Grid	Habitat class	Habitat type	Survey points	Visit 1	Visit 2
SPN	Riparian	Riparian	8	6/7/2009	6/26/2009
UpW	Upland	Grassland/Savanna	7	6/7/2009	6/26/2009

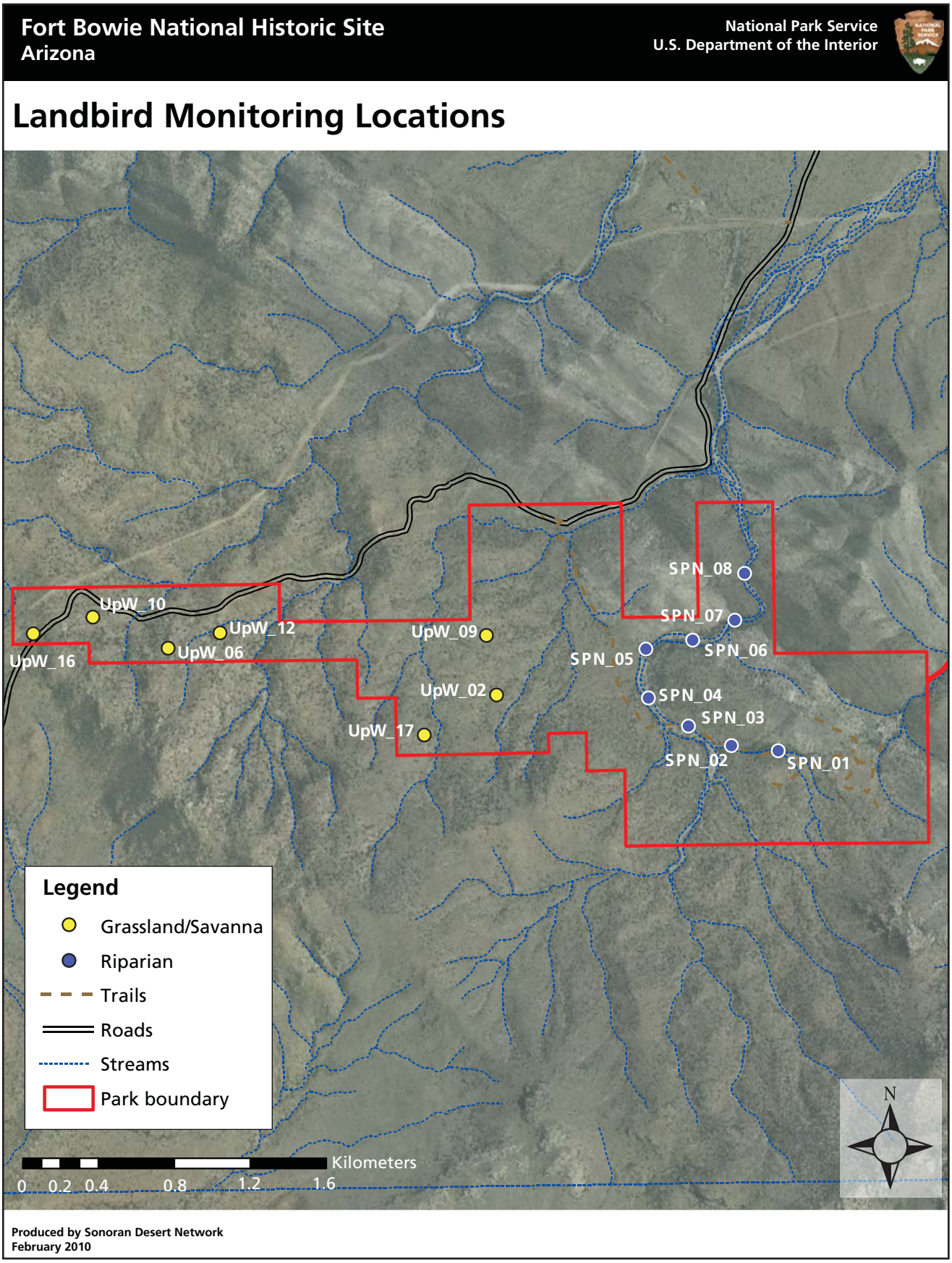

Figure 3.4.1. Point locations sampled at Fort Bowie National Historic Site, 2009.

Table 3.4.2. Number of detections of each species in each habitat type, Fort Bowie NHS, 2009.

Species	Habitat type		Detections	
	Grassland/ Savanna	Riparian	Total	% of total
Northern mockingbird	38	13	51	11
Black-throated sparrow	23	16	39	9
White-winged dove	15	20	35	8
Rufous-crowned sparrow	16	11	27	6
Ash-throated flycatcher	16	9	25	5
Bewick's wren	7	13	20	4
Canyon towhee	2	16	18	4
Cassin's kingbird	9	5	14	3
Brown-headed cowbird	8	5	13	3
Western scrub-jay	3	10	13	3
Northern cardinal		12	12	3
Black-chinned hummingbird		10	10	2
Gambel's quail	4	6	10	2
Lucy's warbler	2	8	10	2
Scott's oriole	5	5	10	2
Verdin		10	10	2
Cactus wren	2	7	9	2
House finch	5	3	8	2
Ladder-backed woodpecker	4	4	8	2
Mourning dove	5	3	8	2
Blue grosbeak		7	7	2
Bushtit		7	7	2
Turkey vulture		7	7	2
Broad-billed hummingbird		6	6	1
Summer tanager		6	6	1
Unknown bird	*6*		*6*	*1*
Crissal thrasher		5	5	1
Hooded oriole		5	5	1
Rock wren	2	3	5	1
Bullock's oriole	2	2	4	1
Canyon wren	1	3	4	1
Montezuma quail	3	1	4	1
Say's phoebe	3	1	4	1
Black-headed grosbeak		3	3	1
Black-throated gray warbler	3		3	1
Common raven	3		3	1
Indigo bunting		**3**	**3**	**1**
Black-chinned sparrow	2		2	0
Brown-crested flycatcher	1	1	2	0
Curve-billed thrasher		2	2	0

Table 3.4.2. Number of detections of each species in each habitat type, Fort Bowie NHS, 2009, cont.

Species	Habitat type		Detections	
	Grassland/ Savanna	Riparian	Total	% of total
Greater roadrunner		2	2	0
Phainopepla		2	2	0
Warbling vireo		2	2	0
Zone-tailed hawk		2	2	0
Broad-tailed hummingbird		1	1	0
Costa's hummingbird		1	1	0
Eastern meadowlark	1		1	0
Gila woodpecker		1	1	0
Lesser goldfinch	1		1	0
Northern flicker	1		1	0
Spotted towhee	1		1	0
Western tanager		1	1	0
Western wood-pewee		1	1	0
Total	**194**	**261**	**455**	**100**

New species for the park are shown in bold and shaded.

Number of birds is the total number of individuals counted in each habitat, not including flyovers. Species are listed in rank order of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values do not include observations of species flying overhead that were not observed using the habitat (flyovers) or incidental sightings not on sample points. Percentages may not add up to 100 due to rounding.

3.5 Gila Cliff Dwellings National Monument

3.5.1 2009 sampling

During 2009, seven survey points were sampled along one transect at GICL (Figure 3.5.1). The single transect was in riparian habitat. Each point was surveyed twice in June (Table 3.5.1).

3.5.2 Results and discussion

During 2009, 313 birds of 56 species were detected at GICL (Table 3.5.2). Spotted towhees were the most commonly detected species, accounting for 12% of total detections. House wrens (8%), American robins (5%), bushtits (5%), violet-green swallows (5%), black-headed grosbeaks (5%), and warbling vireos (5%) were also common. Five new species were recorded during the surveys (shown in bold, Table 3.5.2).

The riparian transect was very productive, and bird detections were quite high and diverse there. A mix of lush riparian and open pine-oak juniper scrub bird communities along the transect was quite interesting, with species like Abert's towhee, yellow warbler, and song sparrows detected at the same survey point as Virginia's warbler, greater pewee, and northern flicker. The great blue heron rookery was active with several nests with eggs and young, and a common black-hawk and pair of common mergansers were present along a suitable foraging stretch of creek. A pair of peregrine falcons was seen soaring above the cliff dwellings but did not indicate nesting. A singing yellow-throated vireo, an eastern vagrant, was also notable for the park.

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The spotted towhee (*Pipilo maculatus*) was the most commonly detected species at Gila Cliff Dwellings NM in 2009.

Table 3.5.1. Habitat type, number of survey points, and sampling dates for each transect or grid, Gila Cliff Dwellings NM, 2009.

Transect/Grid	Habitat class	Habitat type	Survey points	Visit 1	Visit 2
RIP	Riparian	Riparian	7	6/10/2009	6/29/2009

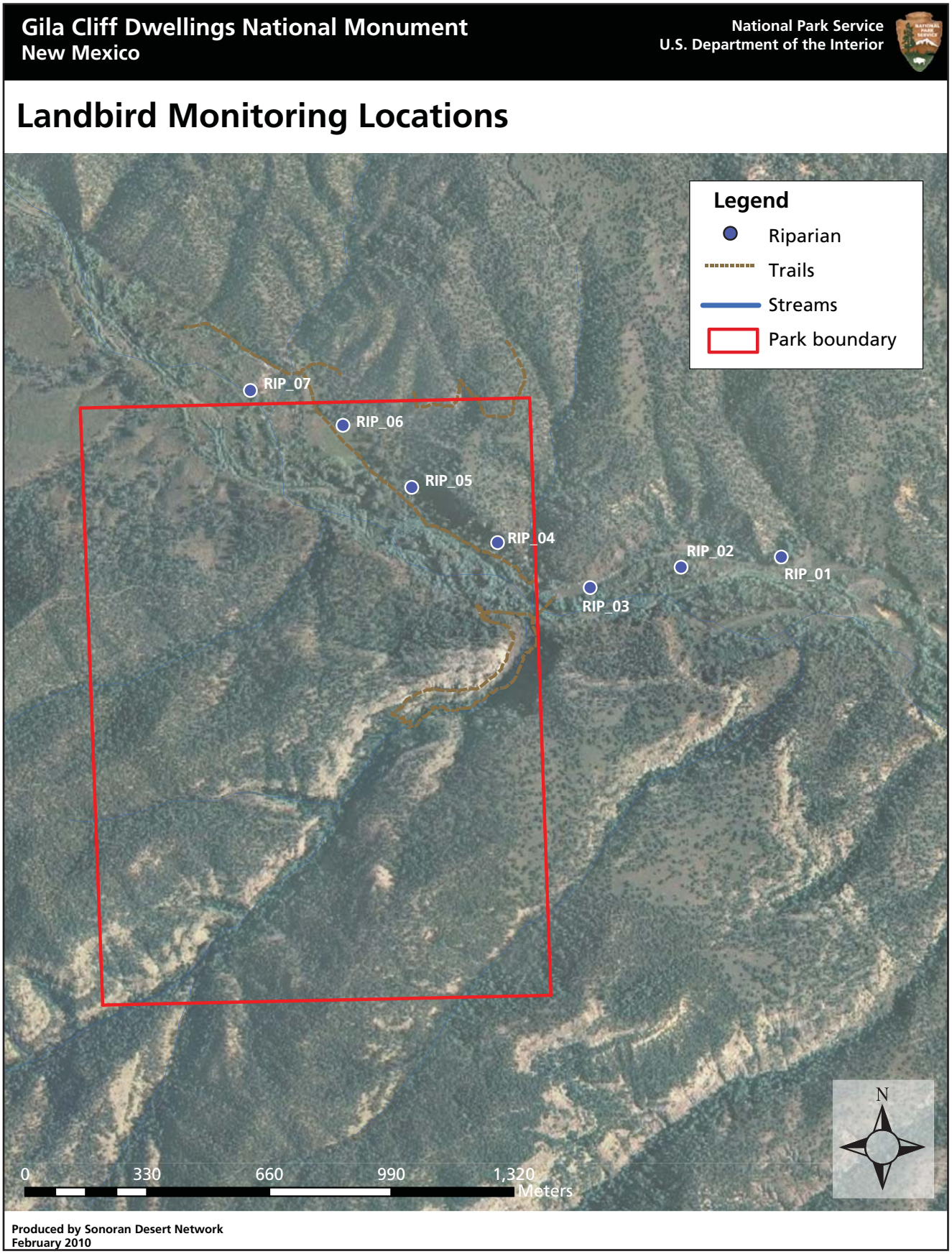

Figure 3.5.1. Point locations sampled at Gila Cliff Dwellings National Monument, 2009.

Table 3.5.2. Number of detections of each species, Gila Cliff Dwellings NM, 2009.

Species	Detections: Total (riparian habitat)	Detections: % of total
Spotted towhee	36	12
House wren	24	8
American robin	17	5
Bushtit	17	5
Violet-green swallow	17	5
Black-headed grosbeak	16	5
Warbling vireo	15	5
Mourning dove	13	4
Yellow-breasted chat	13	4
Northern flicker	11	4
Bewick's wren	10	3
Bridled titmouse	8	3
Blue grosbeak	7	2
Yellow warbler	7	2
Common raven	6	2
Say's phoebe	6	2
Western wood-pewee	6	2
Lesser goldfinch	5	2
Ash-throated flycatcher	4	1
Brown-headed cowbird	4	1
Cassin's kingbird	4	1
Common yellowthroat	4	1
Cordilleran flycatcher	4	1
Steller's jay	4	1
Virginia's warbler	4	1
White-winged dove	**4**	**1**
Acorn woodpecker	3	1
Black-throated gray warbler	3	1
Greater roadrunner	3	1
Hairy woodpecker	3	1
Pygmy nuthatch	3	1
Bullock's oriole	2	1
Hepatic tanager	2	1
Plumbeous vireo	2	1
Purple martin	2	1
Rufous-crowned sparrow	**2**	**1**
Summer tanager	**2**	**1**
White-breasted nuthatch	2	1
American redstart	1	0
Black phoebe	1	0
Black-chinned hummingbird	1	0
Blue-gray gnatcatcher	1	0
Canyon wren	1	0
Cliff swallow	1	0
Gray flycatcher	1	0
Great blue heron	1	0
House finch	1	0
Indigo bunting	1	0
Lazuli bunting	1	0
Lucy's warbler	1	0
Montezuma quail	1	0
Painted redstart	1	0
Red-faced warbler	1	0
Rock wren	1	0
Song sparrow	**1**	**0**
Western scrub-jay	1	0
Greater pewee	**Incidental**	**--**
Total	**313**	**100**

New species for the park are shown in bold and shaded.

Number of birds is the total number of individuals counted in each habitat, not including flyovers. Species are listed in rank order of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values do not include observations of species flying overhead that were not observed using the habitat (flyovers) or incidental sightings not on sample points. Percentages may not add up to 100 due to rounding.

3.6 Montezuma Castle National Monument

3.6.1 2009 sampling

During 2009, 27 survey points were sampled on four transects at MOCA (Figures 3.6.1-1 and 3.6.1-2). Three transects were located at the Castle Unit: two in riparian habitats and one in upland desert scrub. The one transect at the Well Unit was in riparian habitat. Each point was surveyed twice in May or June (Table 3.6.1).

3.6.2 Results and discussion

During 2009, 1,360 birds of 70 species were detected at MOCA (Tables 3.6.2-1 and 3.6.2-2).

Overall, the house finch was the most commonly detected species, followed by the Bewick's wren, Lucy's warbler, and brown-crested flycatcher. At the Castle Unit, the most commonly detected species was the house finch, accounting for 10% of the detections. Bewick's wrens (8%), Lucy's warblers (7%), brown-crested flycatchers (6%), and ash-throated flycatchers (6%), were also common. At the Well Unit, the most commonly detected species were yellow warblers, brown-crested flycatchers, Gila woodpeckers, and Lucy's warblers, each accounting for 7% of detections. One new species was documented for the monument in 2009: the yellow-throated vireo.

Wet Beaver Creek at the Castle Unit was lower than previous years—some sections of the creek were dry—but riparian bird activity remained high, with many resident species actively nesting and numerous migrants streaming through. Bell's vireo, yellow-breasted chat, Abert's towhee, song sparrow, summer tanager, and Bewick's wren were notably prominent. Several pairs of common black-hawks were found nesting along the transect, and a pair of common mergansers was suspected nesting along the same lush stretch of creek where they have nested in recent years. Yellow-billed cuckoos were present in suitable nesting habitat later in the season.

An exciting find at the Well Unit was a calling territorial male elegant trogon, which was detected on surveys and seen briefly; its voice was recorded for documentation. This may have been the same individual that was calling at the Castle Unit in the previous year. This constitutes the northernmost record for this colorful tropical species from Mexico, which is usually found in moist canyons of the border mountains in southeastern Arizona. A singing male yellow-throated vireo, an eastern vagrant, was recorded and photographed along the transect; it was observed there for several weeks. Equally interesting were records of the dusky-capped flycatcher and northern beardless-tyrannulet, two tropical border range species which seem to have been pushing further north in recent years. An interesting side note are the pairs of breeding sulphur-bellied flycatchers and thick-billed kingbirds found north of the park, in similar riparian habitats, in recent years. These observations may indicate that closer attention to neotropical migratory species that may occur in the parks is warranted.

Table 3.6.1. Habitat type, number of survey points, and sampling dates for each transect or grid, Montezuma Castle NM, 2009.

Transect/Grid	Habitat class	Habitat type	Survey points	Visit 1	Visit 2
R1 (Castle Unit)	Riparian	Riparian	6	5/20/2009	6/4/2009
R2 (Castle Unit)	Riparian	Riparian	6	5/19/2009	6/4/2009
Up1 (Castle Unit)	Upland	Desert scrub	8	5/20/2009	6/3/2009
R (Well Unit)	Riparian	Riparian	7	5/19/2009	6/3/2009

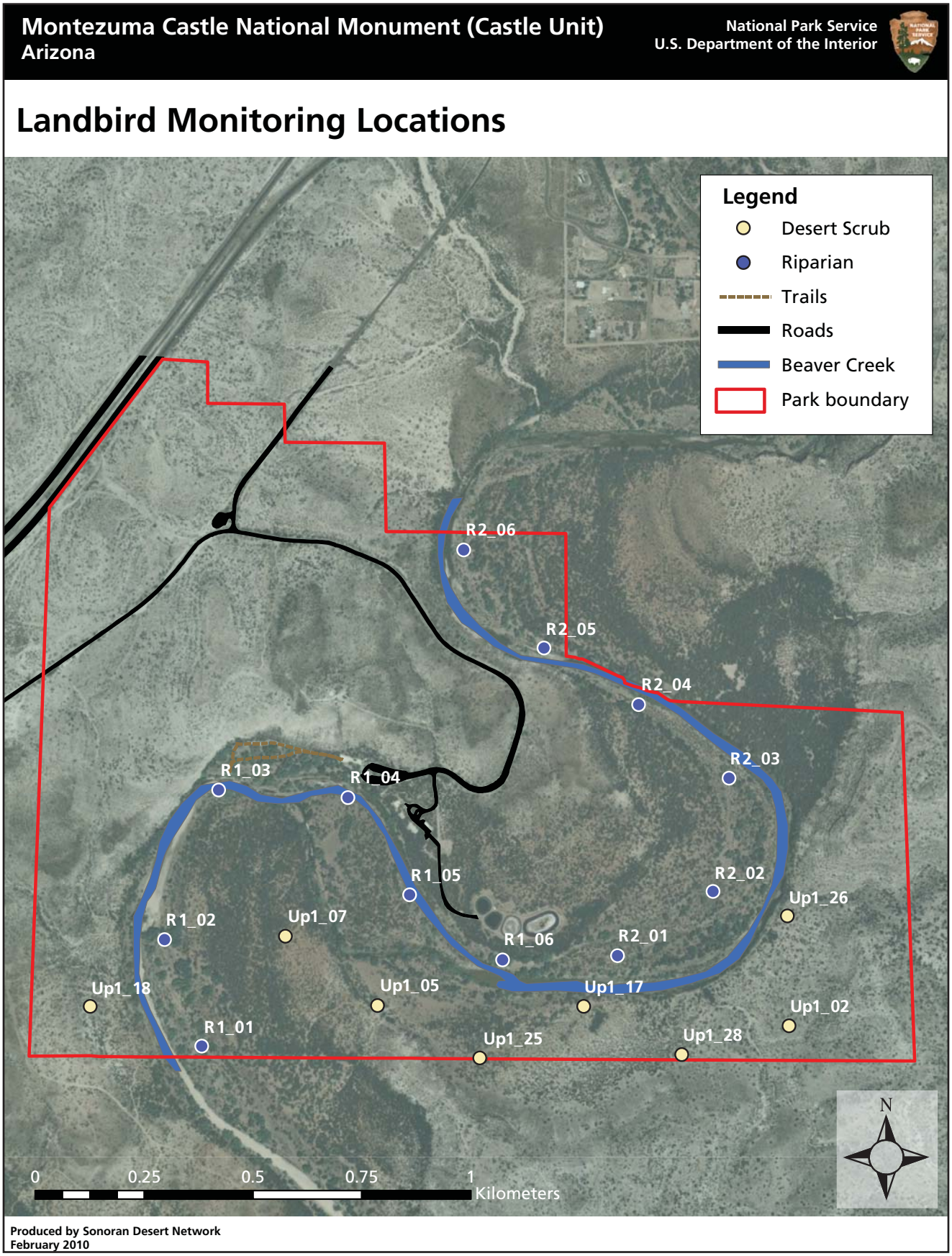

Figure 3.6.1-1. Point locations sampled at Montezuma Castle National Monument, Castle Unit, 2009.

Table 3.6.2-1. Number of detections of each species in each habitat type, Montezuma Castle NM–Castle Unit, 2009.

Species	Habitat type		Detections	
	Desert scrub	Riparian	Total	% of total
House finch	41	56	97	10
Bewick's wren	28	54	82	8
Lucy's warbler	29	46	75	7
Brown-crested flycatcher	14	49	63	6
Ash-throated flycatcher	29	32	61	6
Gambel's quail	25	27	52	5
Mourning dove	17	35	52	5
Brown-headed cowbird	14	27	41	4
Yellow warbler	6	33	39	4
Gila woodpecker	8	26	34	3
Yellow-breasted chat	14	17	31	3
Warbling vireo	11	17	28	3
Black-throated sparrow	25	2	27	3
White-throated swift		26	26	3
Phainopepla	10	14	24	2
Lesser goldfinch	6	16	22	2
Summer tanager	7	15	22	2
Blue grosbeak	10	11	21	2
Violet-green swallow	1	18	19	2
Bullock's oriole	9	9	18	2
Abert's towhee	2	13	15	1
Ladder-backed woodpecker	2	11	13	1
Cassin's kingbird	2	9	11	1
Western kingbird	2	9	11	1
Black-chinned hummingbird	1	9	10	1
Verdin	5	5	10	1
Common yellowthroat	4	4	8	1
Mallard		8	8	1
Northern rough-winged swallow	5	3	8	1
Common raven	3	3	6	1
Northern mockingbird	3	3	6	1
Rock wren	2	4	6	1
Bridled titmouse		5	5	0
Great blue heron		5	5	0
Hooded oriole		5	5	0
Northern cardinal	1	4	5	0
Canyon towhee	2	2	4	0
Rufous-crowned sparrow	4		4	0
Bell's vireo	2	1	3	0
Black-headed grosbeak		3	3	0

Table 3.6.2-1. Number of detections of each species in each habitat type, Montezuma Castle NM–Castle Unit, 2009, cont.

Species	Habitat type		Detections	
	Desert scrub	Riparian	Total	% of total
Black-tailed gnatcatcher	3		3	0
Wilson's warbler	2	1	3	0
Broad-tailed hummingbird	1	1	2	0
Canyon wren		2	2	0
Song sparrow	1	1	2	0
Western wood-pewee		2	2	0
Belted kingfisher	1		1	0
Black phoebe		1	1	0
Cliff swallow		1	1	0
Cooper's hawk		1	1	0
Gray flycatcher		1	1	0
Killdeer		1	1	0
Lazuli bunting		1	1	0
Macgillivray's warbler	1		1	0
Northern flicker	1		1	0
Orange-crowned warbler		1	1	0
Red-tailed hawk	1		1	0
Say's phoebe	1		1	0
Turkey vulture	1		1	0
Western bluebird		1	1	0
White-winged dove	1		1	0
Total	**358**	**651**	**1,009**	**100**

Number of birds is the total number of individuals counted in each habitat, not including flyovers. Species are listed in rank order of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values do not include observations of species flying overhead that were not observed using the habitat (flyovers) or incidental sightings not on sample points. Percentages may not add up to 100 due to rounding.

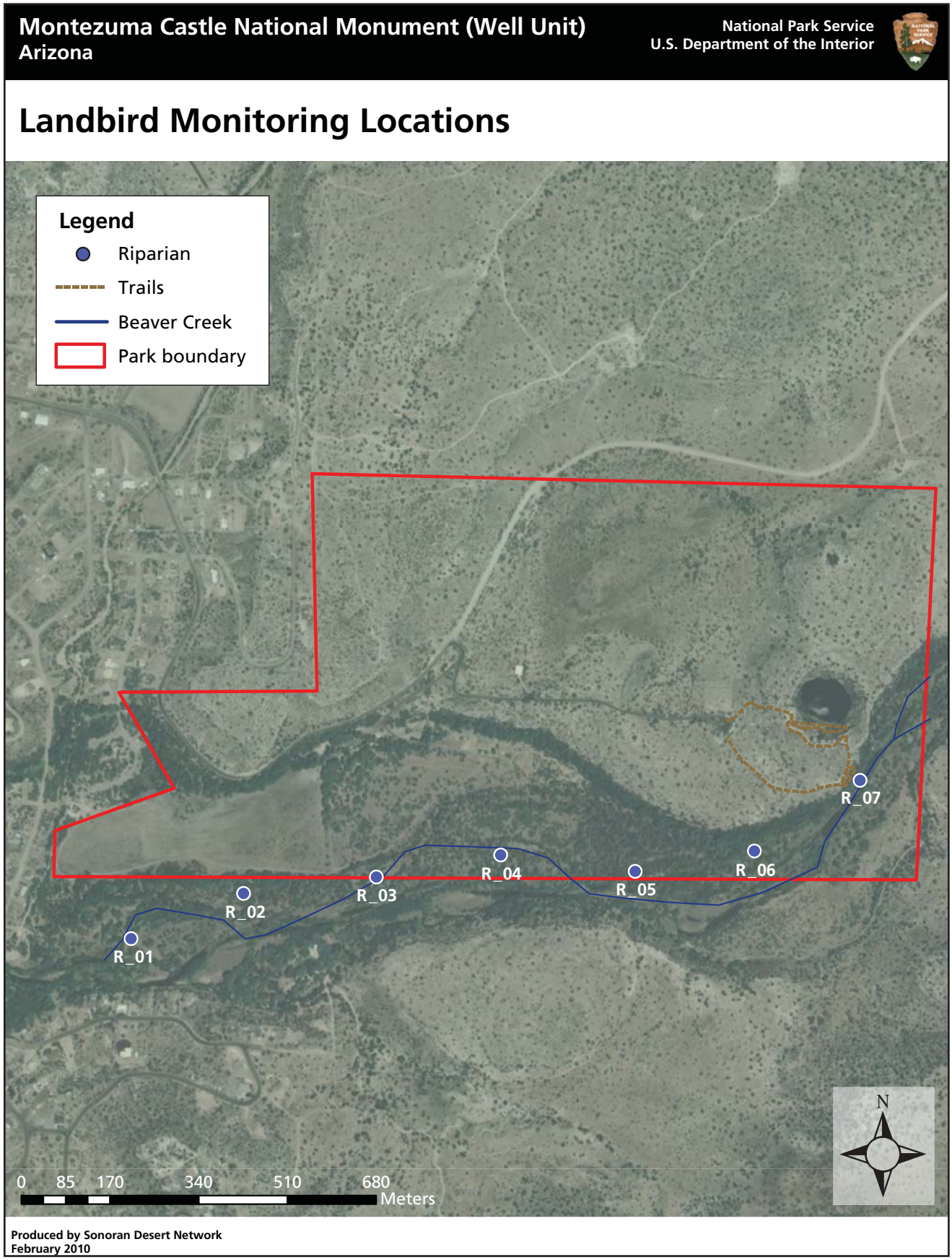

Figure 3.6.1-2. Point locations sampled at Montezuma Castle National Monument, Well Unit, 2009.

Table 3.6.2-2. Number of detections of each species in each habitat type, Montezuma Castle NM–Well Unit, 2009.

Species	Detections: Total (riparian habitat)	Detections: % of total
Yellow warbler	26	7
Brown-crested flycatcher	25	7
Gila woodpecker	24	7
Lucy's warbler	23	7
Mourning dove	20	6
Bewick's wren	18	5
Abert's towhee	14	4
Yellow-breasted chat	14	4
Song sparrow	13	4
Black-chinned hummingbird	12	3
Brown-headed cowbird	12	3
Western wood-pewee	12	3
House finch	11	3
Summer tanager	10	3
Bullock's oriole	9	3
Lesser goldfinch	9	3
Phainopepla	9	3
Ladder-backed woodpecker	8	2
Blue grosbeak	7	2
Bridled titmouse	7	2
Cassin's kingbird	7	2
Black-headed grosbeak	6	2
Common black-hawk	5	1
Northern cardinal	5	1
Canyon wren	4	1
Gambel's quail	4	1
Northern rough-winged swallow	4	1
Ash-throated flycatcher	3	1
European starling	3	1
Warbling vireo	3	1
Western kingbird	3	1
Black phoebe	2	1
Hooded oriole	2	1
Verdin	2	1
Vermilion flycatcher	2	1
Wilson's warbler	2	1
Anna's hummingbird	1	0
Common yellowthroat	1	0
Lazuli bunting	1	0
Northern flicker	1	0
Red-tailed hawk	1	0
Red-winged blackbird	1	0
Rock wren	1	0
Western tanager	1	0
White-breasted nuthatch	1	0
Yellow-billed cuckoo	1	0
Yellow-throated vireo	**1**	**0**
Total	**351**	**100**

New species for the park are shown in bold.

Number of birds is the total number of individuals counted in each habitat, not including flyovers. Species are listed in rank order of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values do not include observations of species flying overhead that were not observed using the habitat (flyovers) or incidental sightings not on sample points. Percentages may not add up to 100 due to rounding.

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The house finch (*Carpodacus mexicanus*) was one of the most commonly detected species at Montezuma Castle NM in 2009.

3.7 Organ Pipe Cactus National Monument

3.7.1 2009 sampling

During 2009, 42 survey points were sampled on six transects at ORPI (Figure 3.7.1). Two transects were in riparian (xeroriparian) habitats and four were in upland (desert scrub) habitats. Each point was surveyed twice in April or May (Table 3.7.1).

3.7.2 Results and discussion

During 2009, 1,598 birds of 57 species were detected at ORPI (Table 3.7.2). White-winged doves were the most commonly detected species, accounting for 14% of total detections. Gila woodpeckers (11%), ash-throated flycatchers (9%), cactus wrens (8%), Gambel's quails (7%), and verdins (7%) were also common. No new species were detected in the park in 2009.

Large numbers of migrant warblers were noted in several habitats along the transects, most notably in desert riparian washes lined with ironwood and willow, where Lucy's, Virginia's, Wilson's, Townsend's, black-throated gray, orange-crowned, yellow-rumped, and a few yellow warblers streamed through. White-winged doves and Gila woodpeckers were abundant throughout the park, and resident desert species, such as cactus wrens, curve-billed thrashers, black-throated sparrows, Costa's hummingbirds, and verdins, were actively nesting. An exhausted male indigo bunting, an interesting migrant this far west, spent a full day feeding and resting under a flowering palo verde tree at the park staff housing area; it was documented with a photograph and written account. Crissal thrashers were noted nesting in a desert wash, and a possible LeConte's thrasher was briefly seen in suitable habitat by the park biologist. The species is known to occur and breed in the park, but it has not been detected on recent surveys. Bendire's thrashers are also present but have gone undetected on survey routes in suitable habitat. At night, numerous elf owls, common poorwills, and lesser nighthawks were frequently heard in the surrounding desert.

Table 3.7.1. Habitat type, number of survey points, and sampling dates for each transect or grid, Organ Pipe Cactus NM, 2009.

Transect/Grid	Habitat class	Habitat type	Survey points	Visit 1	Visit 2
R1	Riparian	Xeroriparian	7	4/29/2009	5/7/2009
R2	Riparian	Xeroriparian	7	4/30/2009	5/8/2009
U1	Upland	Desert scrub	7	4/28/2009	5/6/2009
U12	Upland	Desert scrub	7	4/29/2009	5/7/2009
U4	Upland	Desert scrub	7	4/30/2009	5/8/2009
U5	Upland	Desert scrub	7	4/28/2009	5/6/2009

MARIETTA COLLEGE/ DAVE MCSHAFFREY

The white-winged dove (*Zenaida asiatica*) was the most commonly detected species at Organ Pipe Cactus NM in 2009.

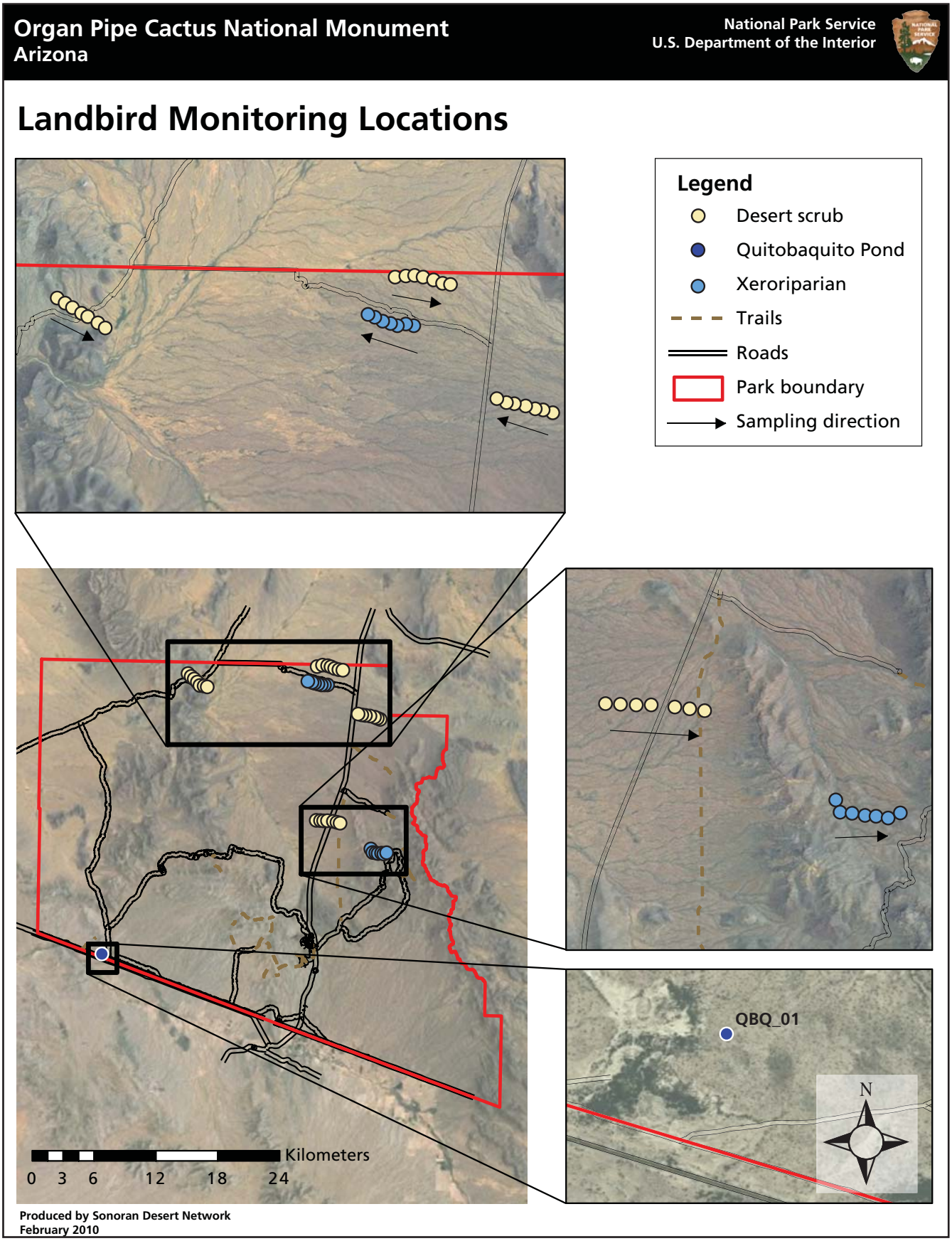

Figure 3.7.1. Point locations sampled at Organ Pipe Cactus National Monument, 2009.

Table 3.7.2. Number of detections of each species in each habitat type, Organ Pipe Cactus NM, 2009.

Species	Habitat type		Detections	
	Desert scrub	Xeroriparian	Total	% of total
White-winged dove	141	90	231	14
Gila woodpecker	94	76	170	11
Gambel's quail	62	73	135	8
Ash-throated flycatcher	86	48	134	8
Phainopepla	61	56	117	7
Cactus wren	72	44	116	7
Verdin	56	55	111	7
Curve-billed thrasher	49	36	85	5
Black-tailed gnatcatcher	40	28	68	4
Scott's oriole	38	18	56	4
Gilded flicker	22	25	47	3
Mourning dove	27	11	38	2
Black-throated sparrow	24	11	35	2
Brown-crested flycatcher	23	10	33	2
Canyon towhee	4	18	22	1
House finch	11	11	22	1
Wilson's warbler	10	11	21	1
Townsend's warbler	1	16	17	1
Black-headed grosbeak	6	5	11	1
Bewick's wren	8		8	1
Bullock's oriole	6	2	8	1
Greater roadrunner	5	3	8	1
Gray flycatcher	3	4	7	0
Loggerhead shrike	7		7	0
Western kingbird	7		7	0
American kestrel	3	2	5	0
Ladder-backed woodpecker	4	1	5	0
Northern mockingbird	4	1	5	0
Brewer's sparrow		4	4	0
Brown-headed cowbird	2	2	4	0
Costa's hummingbird		4	4	0
Lazuli bunting	3	1	4	0
Lucy's warbler	4		4	0
Northern cardinal	2	2	4	0
Pyrrhuloxia	2	2	4	0
Unknown bird	*4*		*4*	*0*
Warbling vireo		4	4	0
Great horned owl	2	1	3	0
Green-tailed towhee		3	3	0
Western tanager		3	3	0

Table 3.7.2. Number of detections of each species in each habitat type, Organ Pipe Cactus National Monument, 2009, cont.

Species	Habitat type		Detections	
	Desert scrub	Xeroriparian	Total	% of total
Crissal thrasher	1	1	2	0
Harris's hawk		2	2	0
Orange-crowned warbler	1	1	2	0
Pacific-slope flycatcher	1	1	2	0
Red-tailed hawk	1	1	2	0
Virginia's warbler		2	2	0
Black-chinned hummingbird	1		1	0
Black-throated gray warbler		1	1	0
Blue-gray gnatcatcher		1	1	0
Canyon wren	1		1	0
Common raven	1		1	0
Hermit thrush	1		1	0
Hooded oriole	1		1	0
Nashville warbler		1	1	0
Ruby-crowned kinglet	1		1	0
Sharp-shinned hawk		1	1	0
Turkey vulture	1		1	0
Western wood-pewee		1	1	0
Total	**904**	**694**	**1,598**	**100**

Number of birds is the total number of individuals counted in each habitat, not including flyovers. Species are listed in rank order of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values do not include observations of species flying overhead that were not observed using the habitat (flyovers) or incidental sightings not on sample points. Percentages may not add up to 100 due to rounding.

3.8 Saguaro National Park

3.8.1 2009 sampling

During 2009, 88 survey points were sampled on 13 transects at SAGU (Figures 3.8.1-1 and 3.8.1-2). Eight transects were in the Rincon Mountain District. Seven of these were in the upland habitat class: four in desert scrub, two in forest, and one on woodland habitat types. The eighth was in the riparian habitat class. The other five transects, all in upland desert scrub habitat, were in the Tucson Mountain District. Each point was surveyed twice in April, May, or June, depending on habitat type and elevation (Table 3.8.1).

3.8.2 Results and discussion

During 2009, 3,661 birds of 120 species were detected at SAGU (Tables 3.8.2-1 and 3.8.2-2).

The Gila woodpecker was the most commonly detected species, accounting for 10% of total detections. White-winged doves and cactus wrens were also common. At SAGE, 2,212 birds of 117 species were detected. Species detected in the highest numbers were Gila woodpecker (6%), white-winged dove (6%), cactus wren (5%), ash-throated flycatcher (4%), and Gambel's quail (4%). At SAGW, 1,449 birds of 48 species were detected. Species detected in the highest numbers were Gila woodpecker (15% of total detections), white-winged dove (10%), cactus wren (10%),

Gambel's quail (8%), ash-throated flycatcher (8%), and curve-billed thrasher (7%). One new species, the crested caracara, was documented at the park in 2009 (however, because this species was observed as an incidental sighting, it is not listed in our survey results).

Rincon Creek was flowing quite well, with large pools of surface water. Most of the usually dormant riparian vegetation was quite lush, attracting large numbers of migrants passing though the desert lowlands. As expected, nesting Lucy's warblers were very common along the creek, and species such as black phoebe and belted kingfisher were also noted; they have been absent in recent dry years. Bell's vireo, yellow-breasted chat, and yellow warbler, which also had been absent in recent years during the ongoing drought, were present in small numbers. Yellow-billed cuckoo was seen later in the season and suspected to be nesting in the large sycamores. Gray and zone-tailed hawks nested along the more lush upper reaches of the creek west of the transect, and several nesting vermilion flycatchers were common at the creek along the transect.

The upland desert transects at both SAGE and SAGW teemed with actively nesting resident species, most notably cactus wrens, Gila woodpeckers, black-throated sparrows, verdins, and curve-billed thrashers. A singing migrant gray vireo was a nice addition to the surveys, as it is a rare local breeder in the higher-elevation oak-juniper hills. Nesting Harris's hawks were in the same area as in previous years, and the active prairie falcon nest was occupied.

The high-elevation transects in the upper Rincon Mountains of SAGE were quite productive for oak-conifer species, and many breeders were detected on nesting territoryes or in pairs exhibiting breeding behavior. Cumulative bird lists from the four transects included sightings from the Manning Camp, Grass Shack, and Douglas Springs campgrounds, and notable birds included nesting Cooper's hawks and peregrine falcons, a juvenile band-tailed pigeon, an eastern vagrant rose-breasted grosbeak male, blue-throated and magnificent hummingbirds, and greater pewee. Expected breeders in lush pine-oak habitat included red-faced, Grace's, olive and Virginia's warblers, painted redstart, spotted towhee, hermit thrush, American robin, western tanager, black-headed grosbeak, yellow-eyed junco, western bluebird, hairy woodpecker, pygmy and red-breasted nuthatches, plumbeous vireo, violet-green swallow, and broad-tailed hummingbird. Nocturnal species included northern pygmy-owl, flammulated owl, spotted owl, western screech-owl, whip-poor-will, and common poorwill.

Table 3.8.1. Habitat type, number of survey points, and sampling dates for each transect or grid, Saguaro NP, 2009.

Transect/Grid	Habitat class	Habitat type	Survey points	Visit 1	Visit 2
SAGE-008	Upland	Desert scrub	7	4/26/2009	5/29/2009
SAGE-107	Upland	Woodland	5	5/30/2009	6/23/2009
SAGE-112	Upland	Desert scrub	7	5/1/2009	5/25/2009
SAGE-113	Upland	Forest	7	5/31/2009	6/24/2009
SAGE-115	Upland	Desert scrub	7	5/1/2009	5/22/2009
SAGE-139	Upland	Desert scrub	6	5/3/2009	5/24/2009
SAGE-191	Upland	Forest	7	5/31/2009	6/24/2009
SAGE-LRC	Riparian	Riparian	8	4/24/2009	5/29/2009
SAGW-204	Upland	Desert scrub	7	4/28/2009	5/13/2009
SAGW-212	Upland	Desert scrub	6	5/2/2009	5/12/2009
SAGW-213	Upland	Desert scrub	7	5/2/2009	5/14/2009
SAGW-238	Upland	Desert scrub	6	5/3/2009	5/15/2009
SAGW-239	Upland	Desert scrub	8	4/29/2009	5/11/2009

ALAN AND ELAINE WILSON (WILDLIFENORTHAMERICA.COM)

The Gila woodpecker (*Melanerpes uropygialis)* was one of the most commonly detected species at Saguaro NP in 2009.

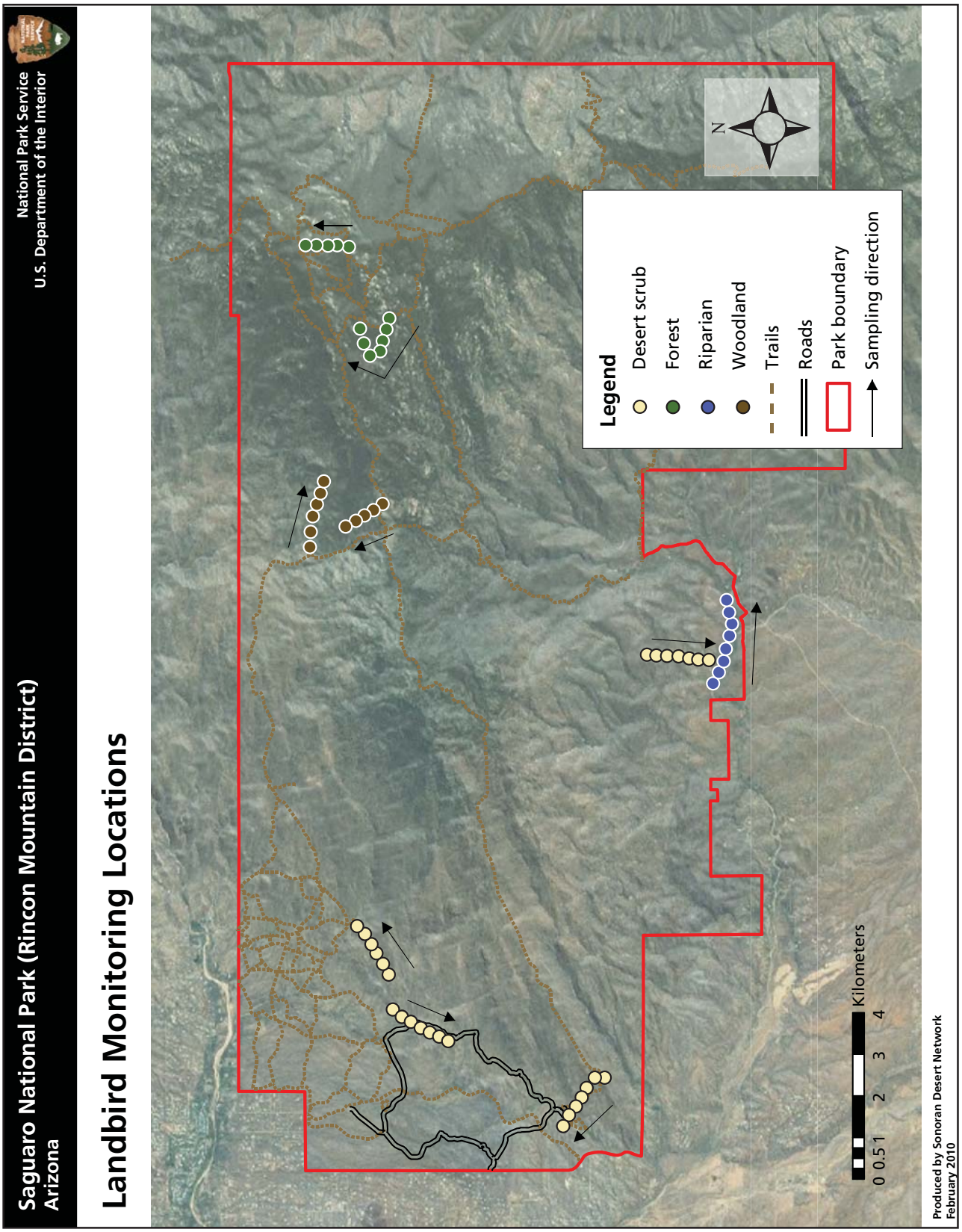

Figure 3.8.1-1. Point locations sampled at Saguaro National Park, Rincon Mountain District, 2009.

Table 3.8.2-1. Number of detections of each species in each habitat type, Saguaro NP–Rincon Mountain District, 2009.

Species	Habitat type				Detections	
	Desert scrub	Forest	Riparian	Woodland	Total	% of total
Gila woodpecker	105	33		138	6	
White-winged dove	83	40	4	127	6	
Cactus wren	99	20		119	5	
Ash-throated flycatcher	63	21	13	97	4	
Gambel's quail	59	36		95	4	
Lucy's warbler	39	48		87	4	
Curve-billed thrasher	50	13		63	3	
Black-throated sparrow	54	6		60	3	
House finch	35	21	3	59	3	
Mourning dove	35	17	2	54	2	
Verdin	34	17		51	2	
Northern cardinal	32	18		50	2	
Gilded flicker	42	7		49	2	
Yellow-eyed junco		44			44	2
Bewick's wren		4	23	13	40	2
Canyon towhee	28	8	3	39	2	
House wren		38	1		39	2
Spotted towhee		13		25	38	2
Rufous-winged sparrow	27	10		37	2	
Brown-crested flycatcher	31	5		36	2	
Black-headed grosbeak	6	16	2	6	30	1
Purple martin	10	19		29	1	
Western tanager	3	20		5	28	1
Steller's jay		25			25	1
White-breasted nuthatch		24		1	25	1
Ladder-backed woodpecker	14	10		24	1	
Black-tailed gnatcatcher	23			23	1	
Violet-green swallow		21		2	23	1
American robin		21			21	1
Cordilleran flycatcher		20			20	1
Pygmy nuthatch		20			20	1
Yellow-rumped warbler		19			19	1
Bell's vireo	1	17		18	1	
Lesser goldfinch	5	13		18	1	
Pyrrhuloxia	18			18	1	
Hermit thrush		17			17	1
Mountain chickadee		17			17	1
Rufous-crowned sparrow	11		6	17	1	
Phainopepla	7	9		16	1	
Red-faced warbler		16			16	1
Vermilion flycatcher		16		16	1	

Table 3.8.2-1. Number of detections of each species in each habitat type, Saguaro NP–Rincon Mountain District, 2009, cont.

Species	Habitat type				Detections	
	Desert scrub	Forest	Riparian	Woodland	Total	% of total
Greater roadrunner	13		2	15	1	
Scott's oriole	13		2	15	1	
Grace's warbler		14			14	1
Turkey vulture		14		14	1	
Black-chinned hummingbird	7	4	2	13	1	
Blue grosbeak	3	10		13	1	
Brown-headed cowbird	8	4	1	13	1	
Western wood-pewee		12		1	13	1
Cassin's kingbird		12		12	1	
Gray flycatcher	11	1		12	1	
Mexican jay			12	12	1	
Abert's towhee		11		11	0	
Blue-gray gnatcatcher	2		9	11	0	
Wilson's warbler	8	3		11	0	
Bushtit			10	10	0	
Canyon wren	4	3	1	2	10	0
Green-tailed towhee	7	3		10	0	
Hairy woodpecker		10			10	0
Western scrub-jay			10	10	0	
Band-tailed pigeon		9			9	0
Black-throated gray warbler		1		8	9	0
Costa's hummingbird	9			9	0	
Greater pewee		9			9	0
Northern flicker		8	1		9	0
Acorn woodpecker		8			8	0
Plumbeous vireo	1	7			8	0
Red-tailed hawk	4	2	2		8	0
Bridled titmouse			7	7	0	
Broad-tailed hummingbird	1	5	1		7	0
Summer tanager		7		7	0	
Virginia's warbler	1	5		1	7	0
Black-chinned sparrow			6	6	0	
Common raven	4	1		1	6	0
Hutton's vireo		3		3	6	0
Olive warbler		6			6	0
Yellow warbler		6		6	0	
Anna's hummingbird		1	4	5	0	
Bullock's oriole	4	1		5	0	
Dusky-capped flycatcher		3		2	5	0
Hooded oriole	5			5	0	
Lazuli bunting	3	1		4	0	

Table 3.8.2-1. Number of detections of each species in each habitat type, Saguaro NP–Rincon Mountain District, 2009, cont.

Species	Habitat type				Detections	
	Desert scrub	Forest	Riparian	Woodland	Total	% of total
Northern mockingbird	3	1		4	0	
Rock wren	4			4	0	
Unknown bird	4			4	0	
Arizona woodpecker		1		2	3	0
Brown creeper		3			3	0
Great horned owl	2	1		3	0	
Hepatic tanager		1		2	3	0
Juniper titmouse			3	3	0	
Townsend's warbler	3			3	0	
Western kingbird	1	2		3	0	
White-crowned sparrow		3		3	0	
American kestrel	2			2	0	
Broad-billed hummingbird		2		2	0	
Chipping sparrow		2		2	0	
Gray vireo	2			2	0	
Lincoln's sparrow		2		2	0	
Orange-crowned warbler	1	1		2	0	
Painted redstart		2			2	0
Warbling vireo		2			2	0
Western bluebird		2			2	0
Belted kingfisher		1		1	0	
Cassin's vireo	1			1	0	
Crissal thrasher		1		1	0	
Gray hawk		1		1	0	
Indigo bunting		1		1	0	
Lark sparrow		1		1	0	
Magnificent hummingbird		1			1	0
Montezuma quail			1	1	0	
Northern beardless-tyrannulet		1		1	0	
Red-naped sapsucker		1			1	0
Say's phoebe		1		1	0	
Whip-poor-will		1			1	0
Whiskered screech-owl		1			1	0
White-throated swift			1	1	0	
Wild turkey		1			1	0
Yellow-breasted chat		1		1	0	
Total	**1,041**	**461**	**535**	**175**	**2,212**	**100**

Number of birds is the total number of individuals counted in each habitat, not including flyovers. Species are listed in rank order of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values do not include observations of species flying overhead that were not observed using the habitat (flyovers) or incidental sightings not on sample points. Percentages may not add up to 100 due to rounding.

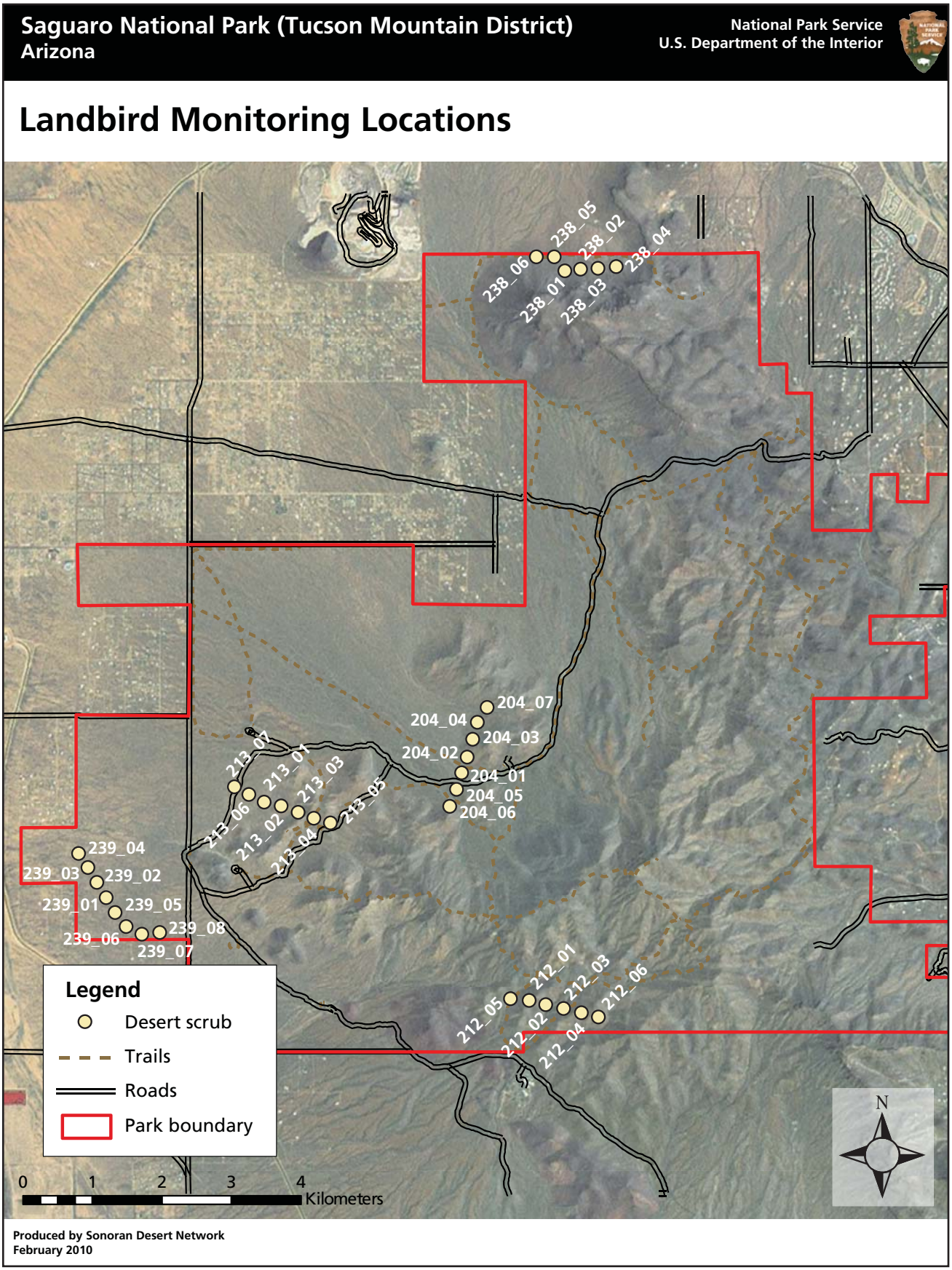

Figure 3.8.1-1. Point locations sampled at Saguaro National Park, Tucson Mountain District, 2009.

Table 3.8.2-2. Number of detections of each species in each habitat type, Saguaro NP–Tucson Mountain District, 2009.

Species	Detections: Total (desert scrub habitat)	Detections: % of total
Gila woodpecker	214	15
White-winged dove	144	10
Cactus wren	140	10
Gambel's quail	110	8
Ash-throated flycatcher	109	8
Curve-billed thrasher	103	7
Mourning dove	67	5
Black-throated sparrow	61	4
Verdin	61	4
House finch	60	4
Black-tailed gnatcatcher	53	4
Gilded flicker	48	3
Brown-crested flycatcher	46	3
White-throated swift	46	3
Pyrrhuloxia	24	2
Canyon towhee	23	2
Brown-headed cowbird	20	1
Bullock's oriole	10	1
Common raven	10	1
Ladder-backed woodpecker	10	1
Canyon wren	9	1
Rufous-winged sparrow	9	1
Scott's oriole	9	1
Lucy's warbler	7	0
Harris's hawk	6	0
Lesser goldfinch	6	0
Northern cardinal	6	0
Rufous-crowned sparrow	4	0
Great horned owl	3	0
Rock wren	3	0
Unknown bird	*3*	*0*
Black-chinned hummingbird	2	0
Blue-gray gnatcatcher	2	0
Northern mockingbird	2	0
Phainopepla	2	0
Prairie falcon	2	0
Red-tailed hawk	2	0
Turkey vulture	2	0
American kestrel	1	0
Anna's hummingbird	1	0
Black-headed grosbeak	1	0
Broad-tailed hummingbird	1	0
Common poorwill	1	0
Greater roadrunner	1	0
Green-tailed towhee	1	0
Lazuli bunting	1	0
Plumbeous vireo	1	0
Purple martin	1	0
Townsend's warbler	1	0
Total	**1,449**	**100**

Number of birds is the total number of individuals counted in each habitat, not including flyovers. Species are listed in rank order of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values do not include observations of species flying overhead that were not observed using the habitat (flyovers) or incidental sightings not on sample points. Percentages may not add up to 100 due to rounding.

3.9 Tonto National Monument

3.9.1 2009 sampling

During 2009, 15 survey points were sampled on two transects at TONT (Figure 3.9.1). One transect was in riparian habitat and the other in upland (desert scrub) habitat. Each point was surveyed twice in May or June (Table 3.9.1).

3.9.2 Results and discussion

During 2009, 675 birds of 58 species were detected at TONT (Table 3.9.2). The black-throated sparrow was the most commonly detected species, accounting for 12% of total detections. Gambel's quails (7%), ash-throated flycatchers (6%), cactus wrens (6%), mourning doves (5%), and Bell's vireos (5%) were also common. The Eurasian collared-dove was detected in the monument for the first time during the 2009 surveys.

The small but lush riparian section continued to host the most migrant activity, with several species favoring the cool shade and flowing water: Swainson's thrush, lazuli bunting, indigo bunting, western tanager, black-headed grosbeak, and black-throated gray and Townsend's warblers. The resident pair of nesting Cooper's hawks was again tending to an active nest in the same tree. A singing, migrant, gray vireo was noted on the upland desert transects. The park staff housing area continued to draw many birds, such as nesting hooded orioles, Say's phoebes, western kingbirds, American kestrels, Crissal thrashers, Bell's vireos, common ravens, and pyrrhuloxias. The cliff dwelling ruins again housed nesting turkey vultures, zone-tailed hawks, and white-throated swifts.

Table 3.9.1. Habitat type, number of survey points, and sampling dates for each transect or grid, Tonto NM, 2009.

Transect/Grid	Habitat class	Habitat type	Survey points	Visit 1	Visit 2
RIP	Riparian	Riparian	7	5/18/2009	6/2/2009
UpW	Upland	Desert scrub	8	5/18/2009	6/2/2009

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The black-throated sparrow (*Amphispiza bilineata*) was the most commonly detected species at Tonto NM in 2009.

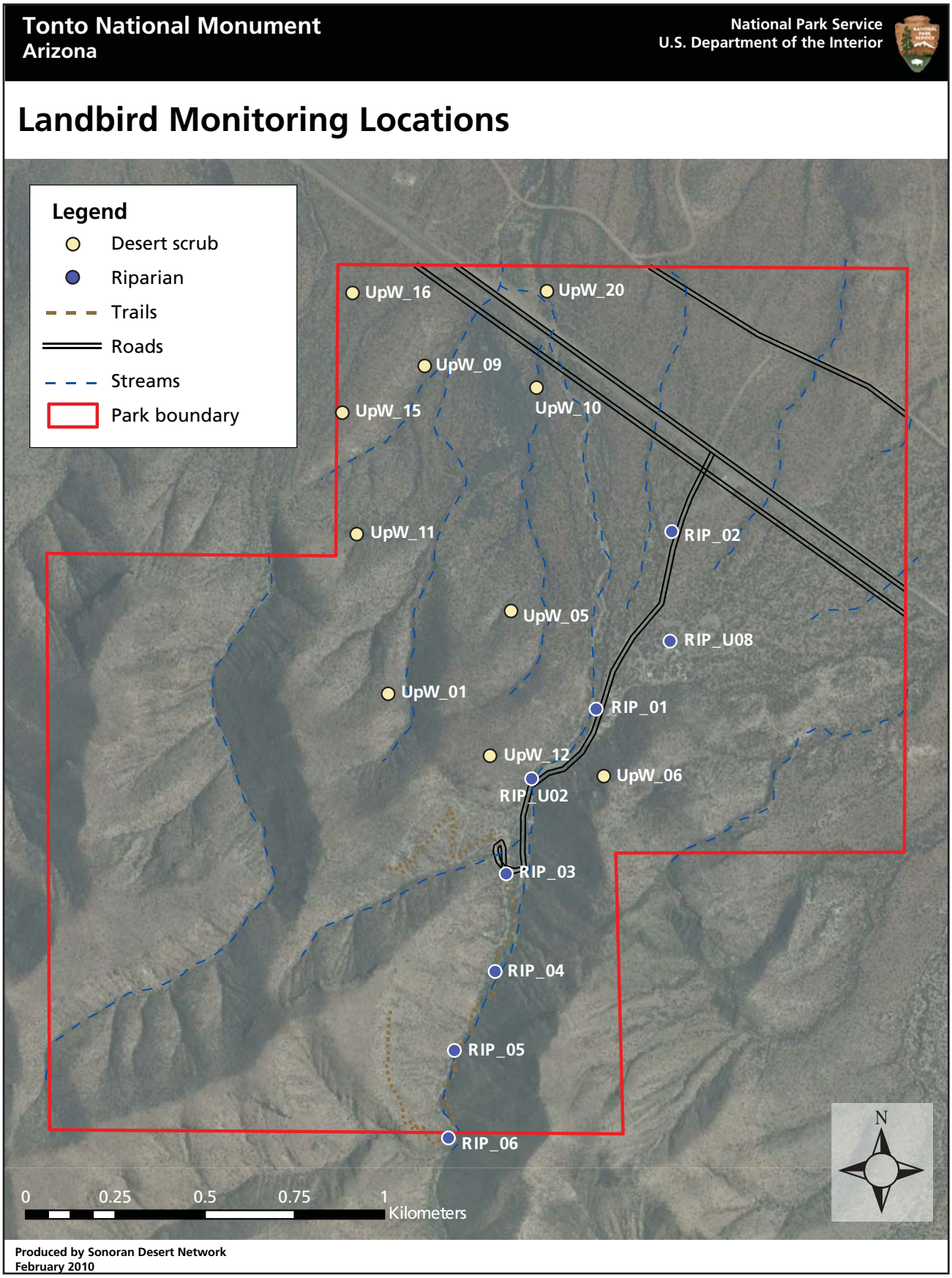

Figure 3.9.1. Point locations sampled at Tonto National Monument, 2009.

Table 3.9.2. Number of detections of each species in each habitat type, Tonto NM, 2009.

Species	Habitat type		Detections	
	Desert scrub	Riparian	Total	% of total
Black-throated sparrow	62	18	80	12
Gambel's quail	40	8	48	7
Ash-throated flycatcher	27	15	42	6
Cactus wren	14	25	39	6
Mourning dove	21	16	37	5
Bell's vireo	12	21	33	5
House finch	15	18	33	5
Northern mockingbird	21	11	32	5
Gila woodpecker	6	17	23	3
Canyon towhee	6	15	21	3
Verdin	9	11	20	3
Curve-billed thrasher	9	8	17	3
Lucy's warbler	14	2	16	2
Brown-crested flycatcher	6	8	14	2
Northern cardinal	5	9	14	2
Black-tailed gnatcatcher	10	3	13	2
Hooded oriole		13	13	2
Phainopepla	6	6	12	2
Turkey vulture		11	11	2
Scott's oriole	6	4	10	1
White-winged dove	7	3	10	1
Common raven	9		9	1
Costa's hummingbird	1	8	9	1
White-throated swift		9	9	1
Canyon wren		8	8	1
Rock wren		8	8	1
Bewick's wren	5	2	7	1
Black-chinned hummingbird	3	4	7	1
Rufous-crowned sparrow	1	6	7	1
Blue-gray gnatcatcher		6	6	1
Brown-headed cowbird		6	6	1
Lesser goldfinch	1	5	6	1
Say's phoebe		6	6	1
Bullock's oriole	4	1	5	1
Ladder-backed woodpecker	1	4	5	1
Black-headed grosbeak		4	4	1
Greater roadrunner	3	1	4	1
Summer tanager		4	4	1
Western kingbird	3	1	4	1
Western tanager	3		3	0

Table 3.9.2. Number of detections of each species in each habitat type, Tonto National Monument, 2009, cont.

Species	Habitat type		Detections	
	Desert scrub	Riparian	Total	% of total
American kestrel		2	2	0
Eurasian collared-dove	**2**		**2**	**0**
Black-chinned sparrow	1		1	0
Blue grosbeak		1	1	0
Crissal thrasher	1		1	0
Gilded flicker	1		1	0
Indigo bunting		1	1	0
Lazuli bunting		1	1	0
Lesser nighthawk	1		1	0
Plumbeous vireo	1		1	0
Red-tailed Hawk		1	1	0
Unknown hummingbird	1		1	0
Warbling vireo		1	1	0
Western wood-pewee		1	1	0
Wilson's warbler		1	1	0
Yellow warbler		1	1	0
Yellow-breasted chat	1		1	0
Zone-tailed hawk		1	1	0
Total	**339**	**336**	**675**	**100**

New species for the park is shown in bold and shaded.

Number of birds is the total number of individuals counted in each habitat, not including flyovers. Species are listed in rank order of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values do not include observations of species flying overhead that were not observed using the habitat (flyovers) or incidental sightings not on sample points. Percentages may not add up to 100 due to rounding.

3.10 Tumacácori National Historical Park

3.10.1 2009 sampling

During 2009, 14 survey points were sampled on two transects at TUMA (Figure 3.10.1). Both transects were in riparian habitat. Each point was surveyed twice in May (Table 3.10.1).

3.10.2 Results and discussion

During 2009, 1,074 birds of 69 species were detected at TUMA (Table 3.10.2). Lark sparrows were the most commonly detected species, accounting for 17% of total detections. There were only seven individual recordings of these birds, but a total of 182 lark sparrows were recorded. Gila woodpeckers (6%), phainopeplas (6%), brown-crested flycatchers (5%), and Lucy's warblers (5%) were also common. Three new species were recorded during our surveys (shown in bold, Table 3.10.2).

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Lucy's warbler (*Vermivora luciae*) was one of the most commonly detected species at Tumacácori NHP in 2009.

Bird detections were surprisingly high on the east transect, despite the recent crown fire that burned the cottonwood gallery forest on the east bank. Yellow-breasted chats, Abert's towhees, Bell's vireos, and Bewick's wrens were exploiting the newly vegetated undergrowth. Large numbers of flocking lark sparrows, blue grosbeaks, and varied buntings were also common in the open dirt patches. Thick-billed and tropical kingbirds were noted nesting in the cottonwoods (they have been absent in some recent years), and gray hawks were more prominent. Yellow-billed cuckoos were seen nesting later in the summer, after the surveys were conducted. An eastern vagrant yellow-throated vireo was detected singing on surveys, and its voice was recorded.

A flurry of exciting bird reports continued from this birding hotspot throughout the year, as many local birders regularly covered portions of the park and its adjacent riparian corridor along the flowing Santa Cruz River. The fall and winter were particularly interesting, with numerous reports of rare species cropping up within weeks of each other. These included an immature male rose-throated becard, a Mexican rarity not recorded in southeastern Arizona in over three years; a rare lowland and riparian record for a male white-eared hummingbird; a rufous-backed robin and a pair of ruddy ground-doves visiting from Mexico; and two varied thrushes, from the Pacific coastal mountains, that lingered at fruiting pyrracantha bushes all winter long. Other interesting birds were an eastern vagrant hooded warbler and rose-breasted grosbeak, a wintering Lewis's woodpecker, summer and hepatic tanagers, and a gray hawk. A rare lowland and riparian record for Steller's jay was also noted in late winter. Of interest just downstream of the park, on the Santa Cruz River to the north, were a Baltimore oriole and a Tennessee and chestnut-sided warbler, all eastern vagrants that could occur in the park during migration.

Table 3.10.1. Habitat type, number of survey points, and sampling dates for each transect or grid, Tumacácori NHP, 2009.

Transect/Grid	Habitat class	Habitat type	Survey points	Visit 1	Visit 2
Est	Riparian	Riparian	7	5/5/2009	5/26/2009
Wst	Riparian	Riparian	7	5/5/2009	5/27/2009

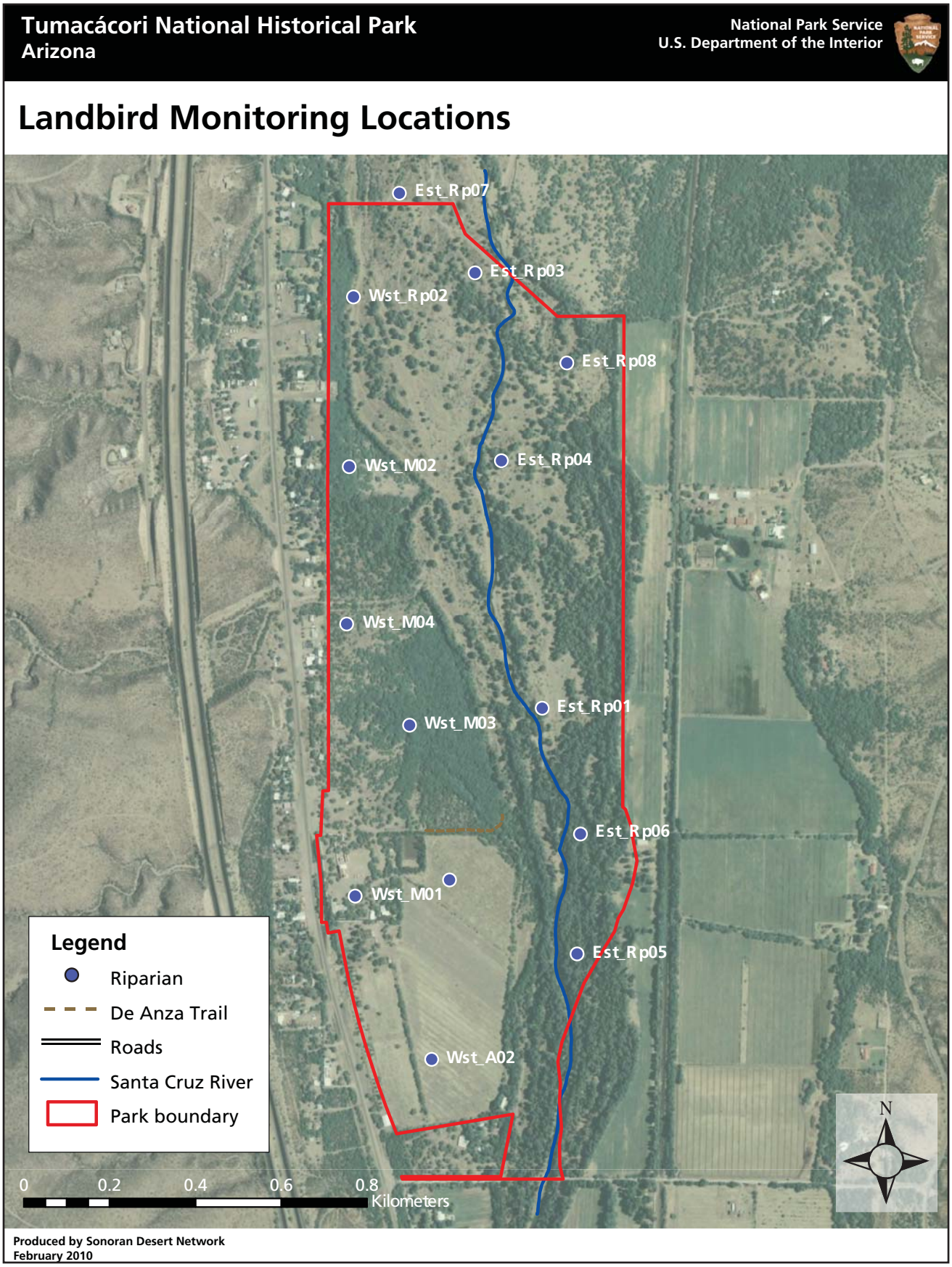

Figure 3.10.1. Point locations sampled at Tumacácori National Historical Park, 2009.

Table 3.10.2. Number of detections of each species in each habitat type, Tumacácori NHP, 2009.

Species	Detections: Total (riparian habitat)	Detections: % of total
Lark sparrow	182	17
Gila woodpecker	62	6
Phainopepla	61	6
Brown-crested flycatcher	57	5
Lucy's warbler	49	5
Bewick's wren	40	4
White-winged dove	38	4
Summer tanager	36	3
Vermilion flycatcher	34	3
Yellow-breasted chat	33	3
House finch	32	3
Ash-throated flycatcher	27	3
Brown-headed cowbird	27	3
Yellow warbler	24	2
Bell's vireo	23	2
Lesser goldfinch	21	2
Bridled titmouse	20	2
Northern cardinal	20	2
Cassin's kingbird	17	2
Song sparrow	15	1
Lazuli bunting	14	1
Cedar waxwing	13	1
Chipping sparrow	13	1
Dusky-capped flycatcher	13	1
Ladder-backed woodpecker	13	1
Abert's towhee	12	1
Broad-billed hummingbird	11	1
Blue grosbeak	10	1
Bullock's oriole	10	1
Gray hawk	9	1
Mourning dove	9	1
Wilson's warbler	9	1
Cliff swallow	8	1
Northern rough-winged swallow	8	1
Black-chinned hummingbird	7	1
Common raven	7	1
Tropical kingbird	7	1
Barn swallow	6	1
Black-headed grosbeak	6	1
Great-tailed grackle	6	1
Turkey vulture	6	1
White-crowned sparrow	6	1
Common ground-dove	5	0
Verdin	5	0
Gambel's quail	4	0
Rufous-winged sparrow	4	0
Northern beardless-tyrannulet	3	0
Pacific-slope flycatcher	3	0
Warbling vireo	3	0
Black phoebe	2	0
Black-throated sparrow	2	0
European starling	2	0
Gilded flicker	2	0
Hooded oriole	2	0
House sparrow	2	0
Blue-gray gnatcatcher	1	0
Broad-tailed hummingbird	1	0
Costa's hummingbird	1	0
Eurasian collared-dove	**1**	**0**
Gray flycatcher	1	0
Northern mockingbird	1	0
Red-winged blackbird	1	0
Say's phoebe	1	0
Townsend's warbler	1	0
Western kingbird	1	0
Western tanager	1	0
Western wood-pewee	1	0
White-breasted nuthatch	1	0
Yellow-throated vireo	**1**	**0**
Tree swallow	**incidental**	**--**
Total	**1,074**	**100**

New species for the park are shown in bold.

Number of birds is the total number of individuals counted in each habitat, not including flyovers. Species are listed in rank order of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values do not include observations of species flying overhead that were not observed using the habitat (flyovers) or incidental sightings not on sample points. Percentages may not add up to 100 due to rounding.

3.11 Tuzigoot National Monument

3.11.1 2009 sampling

During 2009, 14 survey points were sampled on two transects at TUZI (Figure 3.11.1). Both transects were in riparian habitats. Each point was surveyed twice in May (Table 3.11.1).

3.11.2 Results and discussion

During 2009, 697 birds of 62 species were detected at TUZI (Table 3.11.2). Red-winged blackbirds were the most commonly detected species, accounting for 15% of total detections. House finches (7%), Gambel's quails (6%), phainopeplas (6%), mourning doves (5%), common yellowthroats (4%), brown-headed cowbirds (4%), and yellow-breasted chats (4%) were also common. No new species were recorded during the surveys.

Tavasci Marsh continues to draw unusual species because of its unique marsh habitat and open water adjacent to the lush riparian corridor of cottonwoods and willows. Several interesting rail species have been detected over the years, and the marshbird monitoring team (conducting surveys at the same time as our landbird surveys) noted Virginia rail, sora, least bittern, and common moorhen. Also, there is always the possibility of an oddity, such as the rare clapper rail or black rail, which have been recorded in the past. Black-crowned night-herons, great blue herons, and green herons were noted breeding at the marsh, and double-crested cormorants and belted kingfishers were also present, along with scores of breeding red-winged blackbirds.

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Red-winged blackbirds (*Agelaius phoeniceus*) were the most commonly detected species at Tuzigoot NM in 2009.

The riparian transect hosted some unusual species for the Verde Valley, notably Inca and white-winged doves, which are quite interesting for the park. A male broad-billed hummingbird appeared briefly at the park staff housing area, well north of its regular range in southeastern Arizona; it has, however, been seen at the park in past years and could be a returning wanderer. Common black-hawks continued to nest along the lush stretch of cottonwoods and willows, and a group of two male and two female wood ducks was also noteworthy.

Table 3.11.1. Habitat type, number of survey points, and sampling dates for each transect or grid, Tuzigoot NM, 2009.

Transect/Grid	Habitat class	Habitat type	Survey points	Visit 1	Visit 2
Est	Riparian	Riparian	7	5/5/2009	5/26/2009
Wst	Riparian	Riparian	7	5/5/2009	5/27/2009

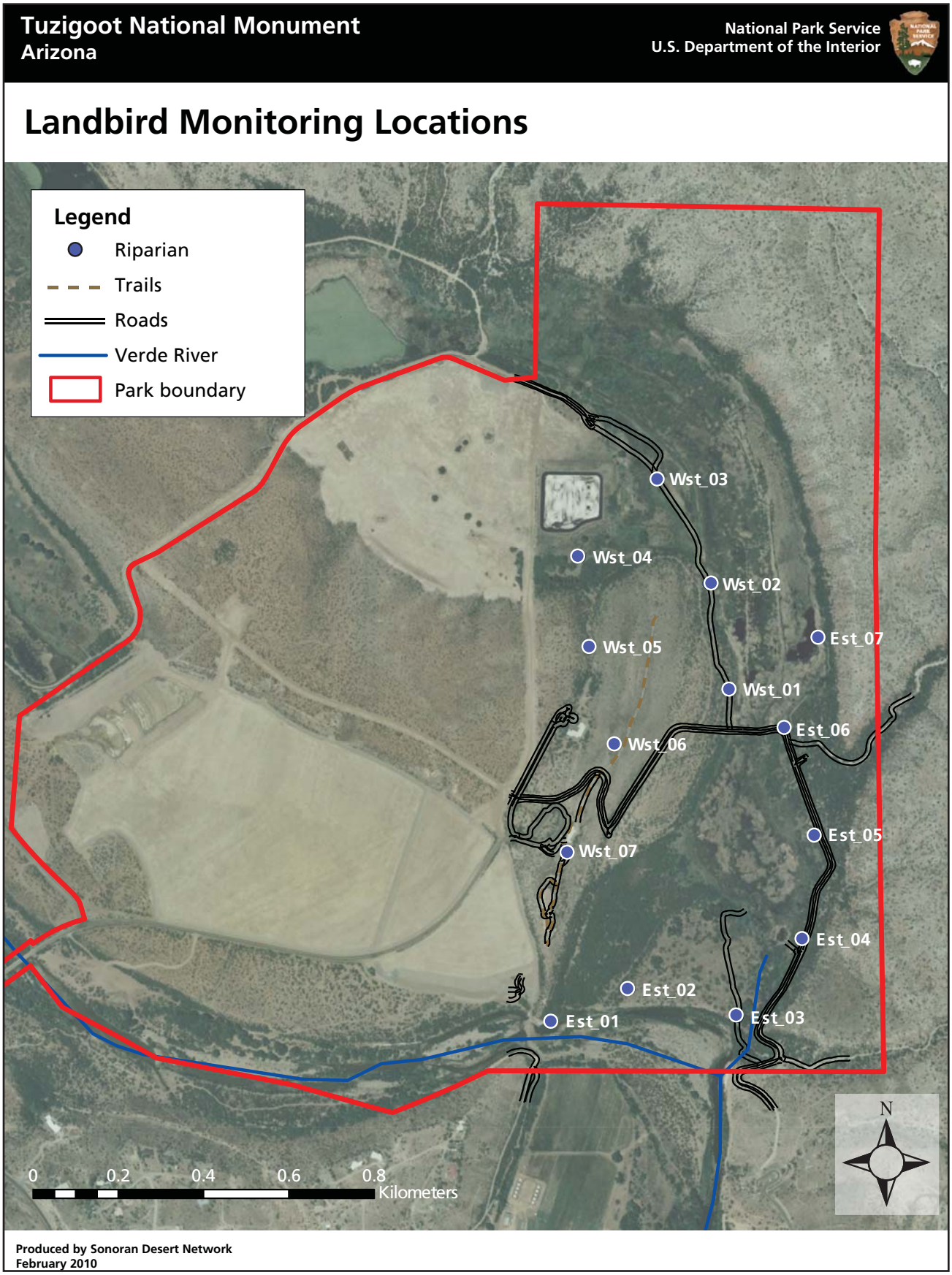

Figure 3.11.1. Point locations sampled at Tuzigoot National Monument, 2009.

Table 3.11.2. Number of detections of each species in each habitat type, Tuzigoot NM, 2009.

Species	Detections: Total (riparian habitat)	Detections: % of total
Red-winged blackbird	105	15
House finch	52	7
Gambel's quail	41	6
Phainopepla	41	6
Mourning dove	37	5
Common yellowthroat	30	4
Brown-headed cowbird	29	4
Yellow-breasted chat	29	4
Lucy's warbler	27	4
Brown-crested flycatcher	24	3
Lesser goldfinch	20	3
Song sparrow	17	2
Abert's towhee	16	2
Bullock's oriole	15	2
Yellow warbler	15	2
Northern rough-winged swallow	14	2
Ash-throated flycatcher	13	2
Northern mockingbird	13	2
Summer tanager	13	2
Gila woodpecker	11	2
Bewick's wren	10	1
Common raven	10	1
Black-chinned hummingbird	9	1
Blue grosbeak	8	1
Ladder-backed woodpecker	7	1
Northern cardinal	7	1
Cliff swallow	6	1
Verdin	6	1
Say's phoebe	5	1
Vermilion flycatcher	5	1
Violet-green swallow	5	1
Warbling vireo	5	1
Canyon towhee	4	1
Great-tailed grackle	4	1
Black-throated sparrow	3	0
Cassin's kingbird	3	0
Eurasian collared-dove	3	0
Lazuli bunting	3	0
Red-tailed hawk	3	0
Virginia rail	3	0
Bushtit	2	0
Rock wren	2	0
Scott's oriole	2	0
Western tanager	2	0
American coot	1	0
Anna's hummingbird	1	0
Barn swallow	1	0
Bell's vireo	1	0
Black phoebe	1	0
Bridled titmouse	1	0
Broad-tailed hummingbird	1	0
Common black-hawk	1	0
Crissal thrasher	1	0
Green-tailed towhee	1	0
House sparrow	1	0
Killdeer	1	0
Lesser nighthawk	1	0
Northern flicker	1	0
Western wood-pewee	1	0
White-faced ibis	1	0
White-winged dove	1	0
Wilson's warbler	1	0
Total	**697**	**100**

Number of birds is the total number of individuals counted in each habitat, not including flyovers. Species are listed in rank order of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values do not include observations of species flying overhead that were not observed using the habitat (flyovers) or incidental sightings not on sample points. Percentages may not add up to 100 due to rounding.

3.12 Changes to the Protocol

3.12.1 Data management

In the future, the Rocky Mountain Bird Observatory (RMBO), our primary cooperator for this project, will manage the bird monitoring data associated with it. Other networks using RMBO also use this service and have found it to be efficient and effective. This will also enable SODN data to be stored in the same database as that of several other networks and organizations, which in turn allows for a more comprehensive regional assessment. SODN and its parks will have easy access to the data through the RMBO Avian Data Center, http://www.rmbo.org/public/monitoring/CountsEffort.aspx. We expect this change to take effect in late 2010, after we have finalized our approach for QA/QC, handing of sensitive species, and other unresolved data-management issues.

3.12.2 Field methods

A few minor changes to our field approach will also be made. First, we are currently weighing the advantages against the cost of adding an additional revisit to each transect or grid. Some preliminary analyses have indicated that a substantial gain in precision results from having three visits to each transect, rather than two.

We also will limit the species we record while walking from one sample point to the next to a small list of noteworthy species, as these detections provide little advantage to our overall analysis.

Finally, we will reduce our survey time at each sample point from eight to six minutes. This will be more consistent with the approach used by RMBO and other networks, and should enable more points to be sampled per transect or grid.

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Appendix A. Supplemental Information

Table A1. Total number of detections on survey points of each species in all SODN parks, 2009.

Common name	Detections
Gila woodpecker	677
White-winged dove	626
Ash-throated flycatcher	595
Gambel's quail	521
Cactus wren	442
House finch	399
Mourning dove	393
Bewick's wren	355
Brown-crested flycatcher	319
Black-throated sparrow	312
Lucy's warbler	299
Phainopepla	287
Verdin	277
Curve-billed thrasher	274
Spotted towhee	195
Lark sparrow	184
Brown-headed cowbird	181
Black-tailed gnatcatcher	160
Bushtit	154
Canyon towhee	154
Gilded flicker	154
Rufous-crowned sparrow	153
White-throated swift	150
Scott's oriole	136
Red-winged blackbird	134
Northern mockingbird	125
Northern cardinal	123
Yellow-breasted chat	122
Yellow warbler	118
Black-headed grosbeak	116
Lesser goldfinch	112
Bridled titmouse	109
Summer tanager	103
Ladder-backed woodpecker	101
Bullock's oriole	95
Canyon wren	87
Cassin's kingbird	86
Black-chinned hummingbird	85
Black-throated gray warbler	80
Bell's vireo	78
Mexican jay	76
Violet-green swallow	76
Blue grosbeak	75
Abert's towhee	68
Common raven	66
House wren	63
Warbling vireo	63
Western wood-pewee	59
Vermilion flycatcher	57
Western tanager	55
Turkey vulture	54
Rufous-winged sparrow	50
Wilson's warbler	50
Western kingbird	49
Rock wren	48
Song sparrow	48
Pyrrhuloxia	46
White-breasted nuthatch	46
American robin	44
Yellow-eyed junco	44
Common yellowthroat	43
Greater roadrunner	42
Blue-gray gnatcatcher	41
Northern flicker	41
Great-tailed grackle	40
Dusky-capped flycatcher	39
Western scrub-jay	35
Northern rough-winged swallow	34
Hooded oriole	33
Purple martin	32
Hutton's vireo	30
Lazuli bunting	30
Steller's jay	30
Say's phoebe	27
Unknown bird	25
Cordilleran flycatcher	24
Costa's hummingbird	24
Red-tailed hawk	24
Chipping sparrow	23
Pygmy nuthatch	23
Acorn woodpecker	22
Gray flycatcher	22

Table A1. Total number of detections on survey points of each species in all SODN parks, 2009, cont.

Common name	Detections
Hepatic tanager	22
House sparrow	22
Townsend's warbler	22
European starling	21
Hermit thrush	20
Plumbeous vireo	20
Virginia's warbler	20
Broad-billed hummingbird	19
Cliff swallow	19
Yellow-rumped warbler	19
Broad-tailed hummingbird	18
Mexican chickadee	17
Montezuma quail	17
Mountain chickadee	17
Red-faced warbler	17
Anna's hummingbird	16
Arizona woodpecker	16
Eastern meadowlark	16
Black-chinned sparrow	15
Botteri's sparrow	15
Green-tailed towhee	15
Painted redstart	15
Grace's warbler	14
Cedar waxwing	13
Hairy woodpecker	13
American kestrel	12
Band-tailed pigeon	10
Crissal thrasher	10
Gray hawk	10
Great horned owl	10
Zone-tailed hawk	10
Greater pewee	9
White-crowned sparrow	9
Harris's hawk	8
Loggerhead shrike	8
Mallard	8
Barn swallow	7
Black phoebe	7
Chihuahuan raven	7
Tropical kingbird	7
Common black-hawk	6
Eurasian collared-dove	6
Great blue heron	6
Indigo bunting	6
Killdeer	6
Olive warbler	6
Brown creeper	5
Common ground-dove	5
Orange-crowned warbler	5
Pacific-slope flycatcher	5
Brewer's sparrow	4
Juniper titmouse	4
Northern beardless-tyrannulet	4
Lesser nighthawk	3
Virginia rail	3
Western bluebird	3
Belted kingfisher	2
Burrowing owl	2
Common poorwill	2
Gray vireo	2
Lincoln's sparrow	2
Magnificent hummingbird	2
Prairie falcon	2
White-throated sparrow	2
Wild turkey	2
Yellow-throated vireo	2
American coot	1
American redstart	1
Black rail	1
Cassin's sparrow	1
Cassin's vireo	1
Cooper's hawk	1
Macgillivray's warbler	1
Nashville warbler	1
Red-naped sapsucker	1
Ruby-crowned kinglet	1
Sharp-shinned hawk	1
Unknown hummingbird	1
Whip-poor-will	1
Whiskered screech-owl	1
White-faced ibis	1
Worm-eating warbler	1
Yellow-billed cuckoo	1
Total	**11,576**

Species are listed in rank order from most to least commonly detected.

Table A2. Parks where each species was detected, 2009.

Common name	Scientific name	CAGR	CHIR	CORO	FOBO	GICL	MOCA	ORPI	SAGU	TONT	TUMA	TUZI
Abert's towhee	*Pipilo aberti*						•		•		•	•
Acorn woodpecker	*Melanerpes formicivorus*		•	•		•			•			
American coot	*Fulica americana*											•
American kestrel	*Falco sparverius*	•						•	•	•		
American redstart	*Setophaga ruticilla*					•						
American robin	*Turdus migratorius*		•			•			•			
Anna's hummingbird	*Calypte anna*	•	•	•			•		•			•
Arizona woodpecker	*Picoides arizonae*		•	•					•			
Ash-throated flycatcher	*Myiarchus cinerascens*	•	•	•	•	•	•	•	•	•	•	•
Band-tailed pigeon	*Patagioenas fasciata*		•						•			
Barn swallow	*Hirundo rustica*										•	•
Bell's vireo	*Vireo bellii*						•		•	•	•	•
Belted kingfisher	*Megaceryle alcyon*						•		•			
Bewick's wren	*Thryomanes bewickii*		•	•	•	•	•	•	•	•	•	•
Black phoebe	*Sayornis nigricans*					•	•				•	•
Black-chinned hummingbird	*Archilochus alexandri*	•	•	•	•	•	•	•	•	•	•	•
Black-chinned sparrow	*Spizella atrogularis*		•	•	•				•	•		
Black-headed grosbeak	*Pheucticus melanocephalus*		•	•	•	•	•	•	•	•	•	
Black-tailed gnatcatcher	*Polioptila melanura*						•	•	•	•		
Black-throated gray warbler	*Dendroica nigrescens*		•	•	•	•		•	•			
Black-throated sparrow	*Amphispiza bilineata*		•	•	•		•	•	•	•	•	•
Blue grosbeak	*Passerina caerulea*		•		•	•	•		•	•	•	•
Blue-gray gnatcatcher	*Polioptila caerulea*		•			•		•	•	•	•	
Botteri's sparrow	*Aimophila botterii*		•	•								
Brewer's sparrow	*Spizella breweri*							•				
Bridled titmouse	*Baeolophus wollweberi*		•	•		•	•		•		•	•
Broad-billed hummingbird	*Cynanthus latirostris*				•				•		•	
Broad-tailed hummingbird	*Selasphorus platycercus*		•	•	•		•		•		•	•
Brown creeper	*Certhia americana*		•						•			
Brown-crested flycatcher	*Myiarchus tyrannulus*		•	•	•		•	•	•	•	•	•
Brown-headed cowbird	*Molothrus ater*	•	•	•	•	•	•	•	•	•	•	•
Bullock's oriole	*Icterus bullockii*	•		•	•	•	•	•	•	•	•	•
Burrowing owl	*Athene cunicularia*	•										
Bushtit	*Psaltriparus minimus*		•	•	•	•			•			•
Cactus wren	*Campylorhynchus brunneicapillus*		•	•	•			•	•	•		
Canyon towhee	*Pipilo fuscus*		•	•	•		•	•	•	•		•
Canyon wren	*Catherpes mexicanus*		•	•	•	•	•	•	•	•		
Cassin's kingbird	*Tyrannus vociferans*		•	•	•	•	•		•		•	•
Cassin's sparrow	*Aimophila cassinii*			•								
Cassin's vireo	*Vireo cassinii*								•			
Cedar waxwing	*Bombycilla cedrorum*										•	

Table A2. Parks where each species was detected, 2009, cont.

Common name	Scientific name	CAGR	CHIR	CORO	FOBO	GICL	MOCA	ORPI	SAGU	TONT	TUMA	TUZI
Chihuahuan raven	*Corvus cryptoleucus*		•	•								
Chipping sparrow	*Spizella passerina*		•	•					•		•	
Cliff swallow	*Petrochelidon pyrrhonota*	•				•	•				•	•
Common black-hawk	*Buteogallus anthracinus*						•					•
Common ground-dove	*Columbina passerina*										•	
Common poorwill	*Phalaenoptilus nuttallii*	•							•			
Common raven	*Corvus corax*	•	•	•	•	•	•	•	•	•	•	•
Common yellowthroat	*Geothlypis trichas*					•	•					•
Cooper's hawk	*Accipiter cooperii*						•					
Cordilleran flycatcher	*Empidonax occidentalis*					•			•			
Costa's hummingbird	*Calypte costae*				•			•	•	•	•	
Crissal thrasher	*Toxostoma crissale*				•			•	•	•		•
Curve-billed thrasher	*Toxostoma curvirostre*			•	•			•	•	•		
Dusky-capped flycatcher	*Myiarchus tuberculifer*		•	•					•		•	
Eastern meadowlark	*Sturnella magna*			•	•							
Eurasian collared-dove	*Streptopelia decaocto*									•	•	•
European starling	*Sturnus vulgaris*	•					•				•	
Gambel's quail	*Callipepla gambelii*	•	•		•		•	•	•	•	•	•
Gila woodpecker	*Melanerpes uropygialis*				•		•	•	•	•	•	•
Gilded flicker	*Colaptes chrysoides*	•						•	•	•	•	
Grace's warbler	*Dendroica graciae*								•			
Gray flycatcher	*Empidonax wrightii*					•	•	•	•		•	
Gray hawk	*Buteo nitidus*								•		•	
Gray vireo	*Vireo vicinior*								•			
Great blue heron	*Ardea herodias*					•	•					
Great horned owl	*Bubo virginianus*			•				•	•			
Greater pewee	*Contopus pertinax*								•			
Greater roadrunner	*Geococcyx californianus*		•	•	•	•		•	•	•		
Great-tailed grackle	*Quiscalus mexicanus*	•									•	•
Green-tailed towhee	*Pipilo chlorurus*							•	•			•
Hairy woodpecker	*Picoides villosus*					•			•			
Harris's hawk	*Parabuteo unicinctus*							•	•			
Hepatic tanager	*Piranga flava*		•	•		•			•			
Hermit thrush	*Catharus guttatus*		•					•	•			
Hooded oriole	*Icterus cucullatus*				•		•	•	•	•	•	
House finch	*Carpodacus mexicanus*	•		•	•	•	•	•	•	•	•	•
House sparrow	*Passer domesticus*	•									•	•
House wren	*Troglodytes aedon*					•			•			
Hutton's vireo	*Vireo huttoni*		•	•					•			
Indigo bunting	*Passerina cyanea*				•	•			•	•		
Juniper titmouse	*Baeolophus ridgwayi*		•						•			

Table A2. Parks where each species was detected, 2009, cont.

Common name	Scientific name	CAGR	CHIR	CORO	FOBO	GICL	MOCA	ORPI	SAGU	TONT	TUMA	TUZI
Killdeer	*Charadrius vociferus*	•					•					•
Ladder-backed woodpecker	*Picoides scalaris*		•	•	•		•	•	•	•	•	•
Lark sparrow	*Chondestes grammacus*	•							•		•	
Lazuli bunting	*Passerina amoena*					•	•	•	•	•	•	•
Lesser goldfinch	*Spinus psaltria*	•		•	•	•	•		•	•	•	•
Lesser nighthawk	*Chordeiles acutipennis*	•								•		•
Lincoln's sparrow	*Melospiza lincolnii*								•			
Loggerhead shrike	*Lanius ludovicianus*			•				•				
Lucy's warbler	*Vermivora luciae*				•	•	•	•	•	•	•	•
MacGillivray's warbler	*Oporornis tolmiei*						•					
Magnificent hummingbird	*Eugenes fulgens*		•						•			
Mallard	*Anas platyrhynchos*						•					
Mexican chickadee	*Poecile sclateri*		•									
Mexican jay	*Aphelocoma ultramarina*		•	•					•			
Montezuma quail	*Cyrtonyx montezumae*			•	•	•			•			
Mountain chickadee	*Poecile gambeli*								•			
Mourning dove	*Zenaida macroura*	•	•	•	•	•	•	•	•	•	•	•
Nashville warbler	*Vermivora ruficapilla*							•				
Northern beardless-tyrannulet	*Camptostoma imberbe*								•		•	
Northern cardinal	*Cardinalis cardinalis*				•		•	•	•	•	•	•
Northern flicker	*Colaptes auratus*		•	•	•	•	•		•			•
Northern mockingbird	*Mimus polyglottos*		•	•	•		•	•	•	•	•	•
Northern rough-winged swallow	*Stelgidopteryx serripennis*						•				•	•
Olive warbler	*Peucedramus taeniatus*								•			
Orange-crowned warbler	*Vermivora celata*						•	•	•			
Pacific-slope flycatcher	*Empidonax difficilis*							•			•	
Painted redstart	*Myioborus pictus*		•	•		•			•			
Phainopepla	*Phainopepla nitens*		•	•	•		•	•	•	•	•	•
Plumbeous vireo	*Vireo plumbeus*		•	•		•			•	•		
Prairie falcon	*Falco mexicanus*								•			
Purple martin	*Progne subis*					•			•			
Pygmy nuthatch	*Sitta pygmaea*					•			•			
Pyrrhuloxia	*Cardinalis sinuatus*							•	•			
Red-faced warbler	*Cardellina rubrifrons*					•			•			
Red-naped sapsucker	*Sphyrapicus nuchalis*								•			
Red-tailed hawk	*Buteo jamaicensis*	•	•	•			•	•	•	•		•
Red-winged blackbird	*Agelaius phoeniceus*	•					•				•	•
Rock wren	*Salpinctes obsoletus*		•	•	•	•	•		•	•		•
Ruby-crowned kinglet	*Regulus calendula*							•				
Rufous-crowned sparrow	*Aimophila ruficeps*		•	•	•	•	•		•	•		
Rufous-winged sparrow	*Aimophila carpalis*								•		•	

Table A2. Parks where each species was detected, 2009, cont.

Common name	Scientific name	CAGR	CHIR	CORO	FOBO	GICL	MOCA	ORPI	SAGU	TONT	TUMA	TUZI
Say's phoebe	*Sayornis saya*			•	•	•	•		•	•	•	•
Scott's oriole	*Icterus parisorum*		•	•	•			•	•	•		•
Sharp-shinned hawk	*Accipiter striatus*							•				
Song sparrow	*Melospiza melodia*					•	•				•	•
Spotted towhee	*Pipilo maculatus*		•	•	•	•			•			
Steller's jay	*Cyanocitta stelleri*		•			•			•			
Summer tanager	*Piranga rubra*		•		•	•	•		•	•	•	•
Townsend's warbler	*Dendroica townsendi*							•	•		•	
Tropical kingbird	*Tyrannus melancholicus*										•	
Turkey vulture	*Cathartes aura*		•	•	•		•	•	•	•	•	
Verdin	*Auriparus flaviceps*	•			•		•	•	•	•	•	•
Vermilion flycatcher	*Pyrocephalus rubinus*						•		•		•	•
Violet-green swallow	*Tachycineta thalassina*		•	•		•	•		•			•
Virginia rail	*Rallus limicola*											•
Virginia's warbler	*Vermivora virginiae*		•	•		•		•	•			
Warbling vireo	*Vireo gilvus*				•	•	•	•	•	•	•	•
Western bluebird	*Sialia mexicana*						•		•			
Western kingbird	*Tyrannus verticalis*			•			•	•	•	•	•	
Western scrub-jay	*Aphelocoma californica*		•	•	•	•			•			
Western tanager	*Piranga ludoviciana*		•	•	•		•	•	•	•	•	•
Western wood-pewee	*Contopus sordidulus*		•	•	•	•	•	•	•	•	•	•
Whip-poor-will	*Caprimulgus vociferus*								•			
Whiskered screech-owl	*Megascops trichopsis*								•			
White-breasted nuthatch	*Sitta carolinensis*		•	•		•	•		•		•	
White-crowned sparrow	*Zonotrichia leucophrys*								•		•	
White-faced Ibis	*Plegadis chihi*											•
White-throated sparrow	*Zonotrichia albicollis*		•									
White-throated swift	*Aeronautes saxatalis*		•	•			•		•	•		
White-winged dove	*Zenaida asiatica*	•	•	•	•	•	•	•	•	•	•	•
Wild turkey	*Meleagris gallopavo*		•						•			
Wilson's warbler	*Wilsonia pusilla*			•			•	•	•	•	•	•
Worm-eating warbler	*Helmitheros vermivorum*			•								
Yellow warbler	*Dendroica petechia*					•	•		•	•	•	•
Yellow-billed cuckoo	*Coccyzus americanus*						•					
Yellow-breasted chat	*Icteria virens*					•	•		•	•	•	•
Yellow-eyed junco	*Junco phaeonotus*								•			
Yellow-rumped warbler	*Dendroica coronata*								•			
Yellow-throated vireo	*Vireo flavifrons*						•				•	
Zone-tailed hawk	*Buteo albonotatus*		•	•	•					•		

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

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