



Landbird Monitoring in the Chihuahuan Desert Network

2014 Annual Report

Natural Resource Technical Report NPS/CHDN/NRTR—2014/928



ON THE COVER

Scaled Quail (*Callipepla squamata*) at Big Bend National Park, 2014. Photo by Moez Ali.

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Acronyms

AMIS	Amistad National Recreation Area
BIBE	Big Bend National Park
CAVE	Carlsbad Caverns National Park
CHDN	Chihuahuan Desert Inventory & Monitoring Network
FODA	Fort Davis National Historic Site
GUMO	Guadalupe Mountains National Park
NHS	National Historic Site
NM	National Monument
NP	National Park
NPS	National Park Service
NRA	National Recreation Area
RMBO	Rocky Mountain Bird Observatory
WHSA	White Sands National Monument

Acknowledgments

The data management team at Sonoran Desert Network assisted with this report by managing and summarizing the 2014 data.

Executive Summary

In 2014, landbirds were surveyed within six of seven Chihuahuan Desert Inventory & Monitoring Network (CHDN) parks. Sample points were located along a transect for linear features (e.g., most riparian habitats) or a grid for areal features. Eighty transects or grids were surveyed in 2014. 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 May, 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 generally conducted once for each transect or grid when there was ample area to survey. For Guadalupe Mountains and Carlsbad Caverns National Parks (NP), there was only enough habitat to establish one riparian transect in each park, so we surveyed each transect two times on different days to increase sample size. We also surveyed the grid at Fort Davis National Historic Site (NHS) twice, due to the small size of the park.

We conducted a total of 1,033 point counts on 80 transects or grids. Of these, 829 point counts were conducted in grassland habitat and 204 were conducted in riparian habitat. We recorded a total of 10,506 individual birds of 170 species during our point counts. Amistad National Recreation Area (NRA) had the highest number of individual birds counted ($n = 3,996$). Fort Davis NHS had the lowest number of birds counted ($n = 514$). The number of species observed varied widely among the parks surveyed. We observed the greatest number of species at Amistad NRA ($n = 119$), and the fewest at Fort Davis NHS and White Sands National Monument (NM; $n = 53$). The number of individuals or species observed is influenced not only by the number of points and visits, but also by the size and diversity of available habitats. Black-throated Sparrow was the species counted in the highest number within the CHDN ($n = 803$), followed by Northern Mockingbird ($n = 592$) and Cliff Swallow ($n = 547$). Fifteen species (i.e., Ash-throated Flycatcher, Black-throated Sparrow, Cactus Wren, Chipping Sparrow, Green-tailed Towhee, House Finch, Ladder-backed Woodpecker, Lark Sparrow, Mourning Dove, Northern Mockingbird, Scott's Oriole, Turkey Vulture, White-winged Dove, Wilson's Warbler, and Yellow-rumped Warbler) were observed at all six parks. Ten of the fifteen species were also recorded at all of the parks in 2013. New species, previously unverified in a given park, were recorded for four parks, but some of the species were recorded outside of the point count surveys. The new species were: Lucy's Warbler, Brown Thrasher, and Ring-necked Pheasant at Amistad NRA; Streak-backed Oriole (a vagrant from Mexico, observed outside of surveys) at Carlsbad Caverns NP; Painted Bunting at Guadalupe Mountains NP; and Northern Cardinal, Tennessee Warbler, and Steller's Jay at White Sands NM (latter two recorded outside of point count surveys).

1 Introduction

1.1 Background

The mission of the National Park Service (NPS) is to preserve “unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations.” Protecting and managing some of our nation’s most significant natural resources requires knowledge of the condition of ecosystems and species that occur in national parks. In order to better meet this mission, the Inventory & Monitoring (I&M) Program was established to determine status and trends in ecological resources (NPS 1992). Established in 2001, the Chihuahuan Desert Inventory & Monitoring Network (CHDN) includes seven parks in the northern Chihuahuan Desert in southern New Mexico and west Texas (Table 1.1). Six of the seven parks are representative of the Northern Chihuahuan Subregion of the Chihuahuan Desert Ecoregion. The exception is Amistad National Recreation Area (NRA), which is situated primarily within the Tamaulipan Thornscrub (Mezquital) Ecoregion of southern Texas and northeastern Mexico, but it is also influenced by both the Chihuahuan Desert and Edwards Plateau Ecoregions (NPS, CHDN 2010).

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 CHDN parks. Landbirds are a conspicuous component of many ecosystems, and they 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 1985; 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 (e.g., climate, vegetation; Dale and Beyeler 2001) that may assist in relating changes in the bird community to other environmental factors. Such a broad-based approach is now being undertaken by the CHDN (NPS, CHDN 2010) and other organizations/initiatives (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 are 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, long-

Table 1.1. Parks in the Chihuahuan Desert Inventory & Monitoring Network (CHDN)

Park	Park Acronym	Area (Acres)	Area (Hectares)
Amistad National Recreation Area	AMIS	57,292	23,195
Big Bend National Park	BIBE	801,863	324,641
Carlsbad Caverns National Park	CAVE	46,766	18,934
Fort Davis National Historic Site	FODA	474	192
Guadalupe Mountains National Park	GUMO	86,416	34,986
White Sands National Monument	WHSA	143,733	58,191
Rio Grande Wild and Scenic River	RIGR	5,164	2,091

standing recreational pastime in the U.S., and it forms the basis of a large and sustainable industry (Sekercioglu 2002).

The CHDN began monitoring birds in Spring 2010, following a pilot season in 2009. This effort is now part of a collaboration among the Southern Plains, Sonoran Desert, and Chihuahuan Desert networks, as well as the U.S. Fish and Wildlife Service and Tucson Audubon Society, to interpret monitoring information in a more comprehensive manner across the southwestern U.S.

1.2 Program Goals and Objectives

The overall goal of the CHDN 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, described below, that are complementary and together provide a comprehensive assessment of changing bird populations and communities. However, 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 a broader ecological context.

1.2.1 Objective 1: Occupancy

We will estimate the proportion of points occupied for those breeding birds with sufficient data. Occupancy is a measure of presence 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 breeding species. In the field, we will use the point-transect distance-sampling method, and for subsequent analyses, we will use 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. The methods are robust, and they are widely accepted for estimating landbird abundance (Buckland et al. 2001). With reasonable effort, we will likely be able to estimate density annually only for the most common species in larger parks.

2 Methods

2.1 Spatial and Temporal Design

2.1.1 Sampling design

The details of our sampling design and field methods are presented in Powell et al. (2007) and Beaupré et al. (2013). 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.

In 2013, we surveyed landbirds within six of the seven CHDN parks; sampling was not conducted in the Rio Grande Wild and Scenic River. With the exception of Fort Davis National Historic Site (NHS) and White Sands National Monument (NM), all parks were stratified by grassland and riparian habitat classes. In Guadalupe Mountains and Carlsbad Caverns National Parks (NP), riparian area was limited to McKittrick Canyon and Rattlesnake Springs, respectively. Sample locations were selected randomly within habitat classes using a design that creates a spatially-balanced distribution of points. Fort Davis NHS does not contain sufficient riparian habitat to warrant a riparian transect. Because of the small area encompassed by Fort Davis NHS, sample points were placed in a grid to provide coverage of the entire site; the grid encompasses grasslands with scattered patches of upland scrub and woodland. Sample points in the CHDN were located along a transect for linear features (e.g., most riparian habitats) or a grid for areal features.

A total of 80 unique transects or grids were surveyed in 2014 (Table 2.1.1). Most transects/grids in the CHDN parks were sampled one time, using the sampling methods described in Pavlacky et al. (2012). In these relatively large parks of the CHDN, a hierarchical multi-scale occupancy approach was used (Pavlacky et al. 2012; Nichols et al. 2008; Kendall and White 2009). Multiple sampling visits were conducted at Fort Davis NHS and riparian transects at Carlsbad Caverns NP and Guadalupe Mountains NP, following methodology by Powell et al. (2007).

Table 2.1.1. Number of transects or grids of each habitat class surveyed in each CHDN park unit, 2014

Park unit	Grassland	Riparian
Amistad NRA	9	10
Big Bend NP	20	10
Carlsbad Caverns NP	8	1
Fort Davis NHS	1	--
Guadalupe Mountains NP	10	1
White Sands NM	10	--

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. 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 species (e.g., migrants) may not have been adequately surveyed because of this restricted window. Although migrants are 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 CHDN parks.



Ladder-backed Woodpecker (*Picoides scalaris*) was observed at all six parks monitored in the CHDN in 2014.

The timing of breeding varies among species and depends on a number of factors, including latitude and elevation. The window of primary breeding and sampling was from April through May, 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). A point-transect is a line transect of zero length (i.e., a point) (Buckland et al. 2001). For density estimates, the method involves measuring the linear distance to individual birds while standing for a predetermined period of time at a fixed point in space (Figure 2.2). For groups of birds, we measured the distance to the group and estimated the number of birds in the group. Measuring the distance to each bird allows the observer to approximate density via a species-specific detection function that accounts for variation in detectabil-

ity due to surveyor, environmental, or weather-related factors (Buckland et al. 2001; Diefenbach et al. 2003).

We conducted six-minute point-counts at each point along the transect or grid and used a range-finder to measure the radial distance to each bird or flock detected. Six-minute counts are consistent with region-wide bird monitoring efforts being conducted by Rocky Mountain Bird Observatory (RMBO) and its partners, as well as with monitoring efforts by U.S. Fish and Wildlife Service and Tucson Audubon Society.

All birds detected at a given point were recorded. After counts were completed, observers used a handheld GPS (Global Positioning System) unit to locate successive survey points. While walking between points, observers recorded any species previously unconfirmed in a particular park.

As previously noted, most CHDN transects or grids were surveyed once, with the exception of the grassland grid at Fort Davis NHS and the riparian transects at Carlsbad Caverns and Guadalupe Mountains National Parks, which were visited twice.

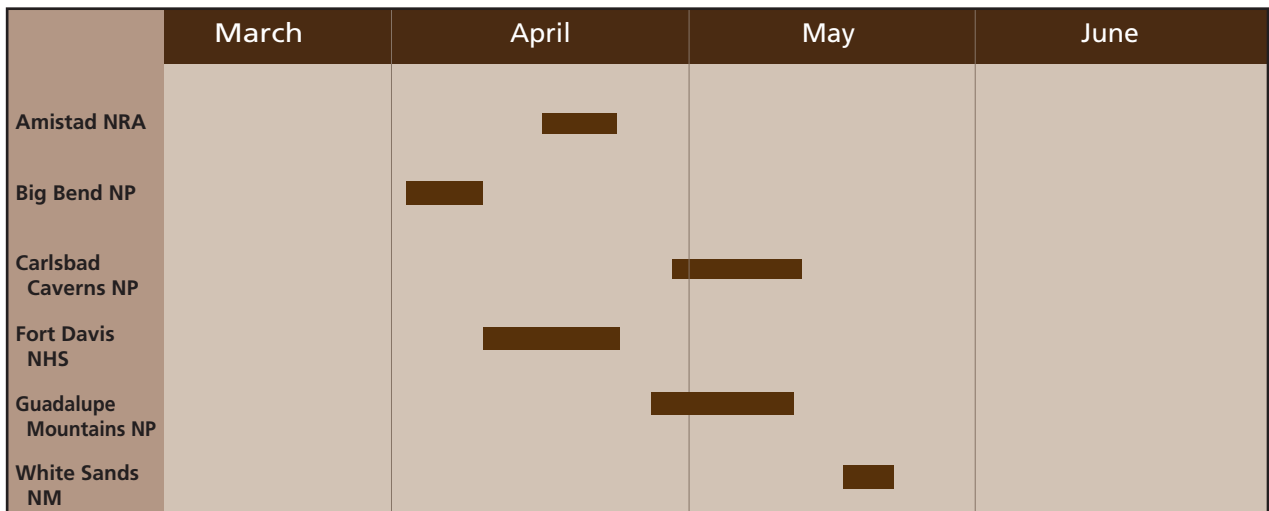


Figure 2.1.2. Dates when sampling was conducted in CHDN parks, 2014.

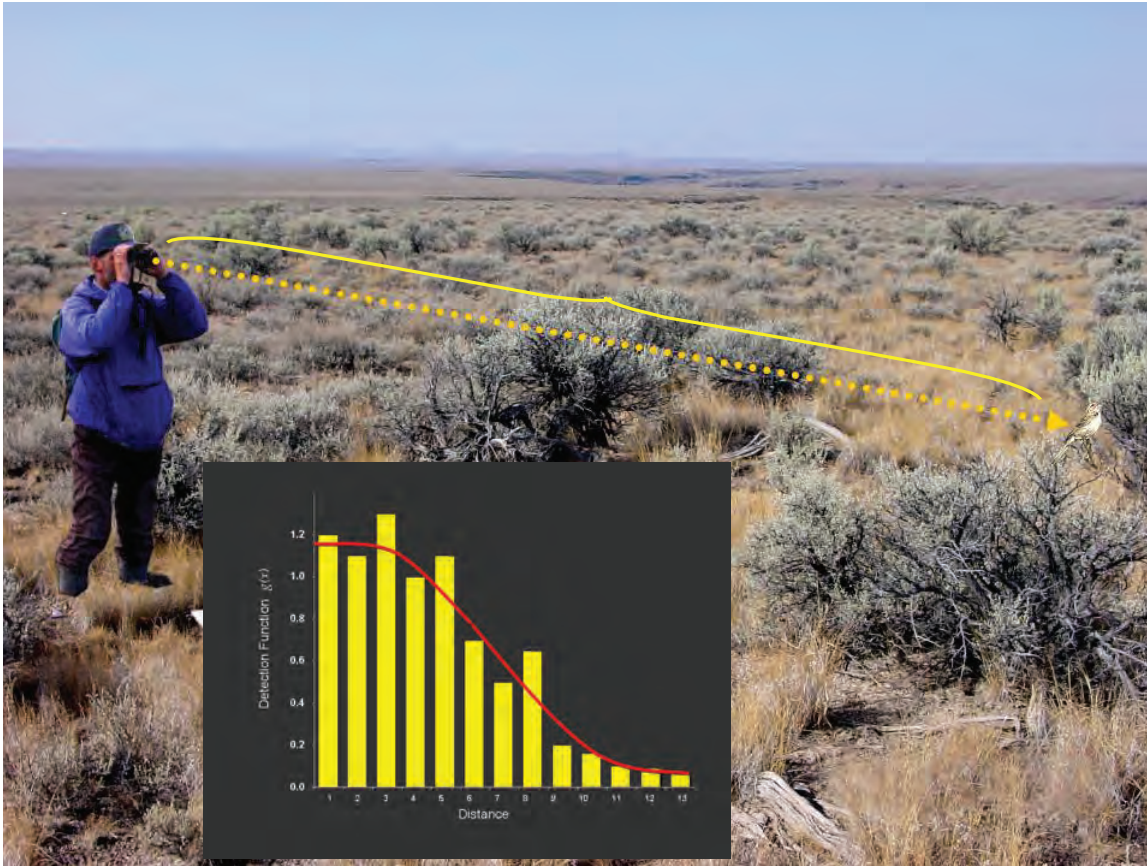


Figure 2.2. Distance sampling works by estimating a detection profile (graph) as a function of distance from which either individual or groups of birds are observed from the transect.

3 Results and Discussion

We conducted a total of 1,033 point counts (the number of counts from a given point during a given sampling occasion) on 80 transects or grids (Table 3-1). Of these, 829 point counts were conducted in grassland habitats and 204 point counts were conducted in riparian habitats. We recorded a total of 10,506 individual birds of 170 species during our point counts.

Amistad National Recreation Area (NRA) had the highest number of individual birds counted ($n = 3,996$), while Fort Davis National Historic Site (NHS) had the lowest number of birds counted ($n = 514$). We observed the greatest number of species at Amistad NRA ($n = 119$), and the fewest at Fort Davis NHS and White Sands National Monument (NM; $n = 53$) (Table 3-2). Although species richness and community composition will be estimated in our synthesis reports (following the 2015 sampling season), observations suggest that these varied widely among the parks surveyed. The number of individuals or species counted is influenced not only by the number of points and visits, but also by the size and diversity of available habitats.

Black-throated Sparrow was the species counted in the highest number within the CHDN ($n = 803$) (see Table 3-3), followed by Northern Mockingbird ($n = 592$) and Cliff Swallow ($n = 547$). Fifteen species (i.e., Ash-throated Flycatcher, Black-throated Sparrow, Cactus Wren, Chipping Sparrow, Green-tailed Towhee, House Finch, Ladder-backed Woodpecker, Lark Sparrow, Mourning Dove, Northern Mockingbird, Scott's

Table 3-2. Number of species observed in each habitat class at each park, 2014

Park	Species detected		
	Grassland	Riparian	Total ¹
Amistad NRA	76	107	119
Big Bend NP	49	79	97
Carlsbad Caverns NP	45	37	68
Fort Davis NHS	52	--	52
Guadalupe Mountains NP	63	46	85
White Sands NM	53	--	53
Total¹	124	146	170

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. Numbers do not include incidental observations.

Oriole, Turkey Vulture, White-winged Dove, Wilson's Warbler, and Yellow-rumped Warbler) were observed at all six parks (Table 3-4). Ten of the fifteen species were also recorded at all of the parks in 2013. New species, previously unverified in a given park, were recorded for four parks, but some of the species were recorded outside of the point count surveys. The new species were Lucy's Warbler, Brown Thrasher, and Ring-necked Pheasant at Amistad NRA, Streak-backed Oriole (a vagrant from Mexico, observed outside of surveys) at Carlsbad Caverns NP, Painted Bunting at Guadalupe Mountains NP, and Northern Cardinal, Tennessee Warbler, and Steller's Jay at White Sands NM (latter two outside of point counts).

Table 3-1. The number of point counts (# of counts from a given point during a given sampling occasion) and individual birds counted in each habitat class at each CHDN park, 2014

Park	Grassland		Riparian		Total birds counted
	# Point counts	Birds counted	# Point counts	Birds counted	
Amistad NRA	111	1,855	79	2,141	3,996
Big Bend NP	289	2,403	78	975	3,378
Carlsbad Caverns NP	85	647	15	155	802
Fort Davis NHS	45	514	--	--	514
Guadalupe Mountains NP	139	939	32	231	1,170
White Sands NM	160	646	--	--	646
Total	829	7,004	204	3,502	10,506

Note: The riparian habitats in Carlsbad Caverns NP and Guadalupe Mountains NP, and the grassland habitat at Fort Davis NHS, were sampled twice; all other transects or grids were sampled once.

Table 3-3. Total number of individual birds observed of each species during surveys in all CHDN parks, 2014

Common name	# of birds	Common name	# of birds
Black-throated Sparrow	803	Loggerhead Shrike	54
Northern Mockingbird	592	Summer Tanager	50
Cliff Swallow	547	Vermilion Flycatcher	48
Turkey Vulture	475	Say's Phoebe	46
Ash-throated Flycatcher	399	Killdeer	45
Mourning Dove	376	Bank Swallow	43
Cactus Wren	370	Blue Grosbeak	43
Pyrrhuloxia	294	Ladder-backed Woodpecker	43
White-winged Dove	269	Chihuahuan Raven	40
Scaled Quail	241	Yellow-breasted Chat	40
House Finch	235	Black-chinned Hummingbird	37
Bell's Vireo	234	Northern Rough-winged Swallow	36
Rock Wren	200	Common Yellowthroat	33
Chipping Sparrow	192	Common Raven	31
Northern Cardinal	181	Horned Lark	30
Yellow-rumped Warbler	180	Black-crested Titmouse	29
Brewer's Sarrow	178	Golden-fronted Woodpecker	28
Cassin's Sparrow	164	Great Blue Heron	28
Cedar Waxwing	152	House Wren	28
Lark Sparrow	147	Lucy's Warbler	28
Canyon Wren	140	Wilson's Warbler	28
Red-winged Blackbird	134	Black Phoebe	26
Rufous-crowned Sparrow	134	Common Ground-Dove	25
Canyon Towhee	131	Spotted Towhee	25
White-crowned Sparrow	128	Clay-colored Sparrow	24
Scott's Oriole	127	Eastern Meadowlark	24
Verdin	121	Western Tanager	24
Brown-headed Cowbird	119	White-throated Swift	24
Cave Swallow	102	Broad-tailed Hummingbird	23
Black-tailed Gnatcatcher	84	Orchard Oriole	23
Greater Roadrunner	79	Marsh Wren	22
Eurasian Collared-Dove	74	Violet-green Swallow	21
Green-tailed Towhee	71	Great-tailed Grackle	20
Western Kingbird	71	Lincoln's Sparrow	20
Lark Bunting	64	Macgillivray's Warbler	20
Bewick's Wren	63	Lesser Nighthawk	19
Black Vulture	61	Plumbeous Vireo	19
Blue-gray Gnatcatcher	60	American Goldfinch	18
Barn Swallow	58	Cassin's Kingbird	18
Curve-billed Thrasher	54	Lesser Goldfinch	17
Double-crested Cormorant	54	Western Wood-Pewee	17

Table 3-3. Total number of individual birds observed of each species during surveys in all CHDN parks, 2014, cont.

Common name	# of birds	Common name	# of birds
House Sparrow	16	Montezuma Quail	3
Swainson's Hawk	16	Northern Bobwhite	3
Carolina Wren	15	Olive Sparrow	3
Painted Bunting	14	Osprey	3
Vesper Sparrow	14	Yellow Warbler	3
Red-tailed Hawk	13	American Kestrel	2
Black-headed Grosbeak	12	American White Pelican	2
Blue-winged Teal	11	American Wigeon	2
Brewer's Blackbird	11	Brown-crested Flycatcher	2
Crissal Thrasher	11	Bufflehead	2
Northern Shoveler	11	Canvasback	2
Ruby-crowned Kinglet	11	Cinnamon Teal	2
Bushtit	10	Common Poorwill	2
Greater Yellowlegs	10	Cooper's Hawk	2
Northern Harrier	10	Couch's Kingbird	2
Wild Turkey	9	Phainopepla	2
Belted Kingfisher	8	Sharp-shinned Hawk	2
Hooded Oriole	8	Townsend's Solitaire	2
Nashville Warbler	8	Virginia's Warbler	2
Orange-crowned Warbler	8	White-breasted Nuthatch	2
Spotted Sandpiper	8	Acorn Woodpecker	1
American Pipit	7	Bronzed Cowbird	1
Purple Martin	7	Burrowing Owl	1
Bullock's Oriole	6	Caspian Tern	1
Cassin's Vireo	6	Chimney Swift	1
Gadwall	6	Cordilleran Flycatcher	1
Gray Flycatcher	6	Crested Caracara	1
Mallard	6	Gray Hawk	1
Snowy Egret	6	Great Egret	1
Warbling Vireo	6	Green Kingfisher	1
Black-chinned Sparrow	5	Inca Dove	1
Field Sparrow	5	Least Flycatcher	1
Western Scrub-Jay	5	Least Sandpiper	1
American Coot	4	Lucifer Hummingbird	1
Brown Thrasher	4	Neotropic Cormorant	1
Hermit Thrush	4	Pine Siskin	1
Scissor-tailed Flycatcher	4	Red-eyed Vireo	1
Dusky Flycatcher	3	Ring-billed Gull	1
Gambel's Quail	3	Ring-necked Duck	1
Grace's Warbler	3	Ring-necked Pheasant	1
Great Horned Owl	3	Ruddy Duck	1
Lazuli Bunting	3	Savannah Sparrow	1
		Solitary Sandpiper	1

Common name	# of birds
Townsend's Warbler	1
Tree Swallow	1
White-faced Ibis	1
<i>Unidentified birds</i>	724
Total	10,506

Note: Species are listed in rank order from those counted in the highest numbers to those counted in the lowest numbers. Number of birds is the total number of individuals counted. Unidentified birds were included in the total number of birds recorded during surveys, but these birds were not included in counts of the number of species observed per park. Incidental sightings (i.e., species identified by our birding team, but not as part of our regular survey) are not included in this table, but are included in individual park species tables if the species was newly recorded for the park.



Wilson's Warbler (*Wilsonia pusilla*), one of 15 species observed at every CHDN park during surveys in 2014.

Table 3-4. Parks where each species was observed, April and May 2014

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Acorn Woodpecker	<i>Melanerpes formicivorus</i>		o	o	●	o	o
American Avocet	<i>Recurvirostra americana</i>	o	o	o			o
American Bittern	<i>Botaurus lentiginosus</i>	o	o	o		o	
American Coot	<i>Fulica americana</i>	●	●	o		o	o
American Crow	<i>Corvus brachyrhynchos</i>			o			o
American Dipper	<i>Cinclus mexicanus</i>		o	o		o	
American Goldfinch	<i>Spinus tristis</i>	●	●	●	●	●	o
American Kestrel	<i>Falco sparverius</i>	●	o	o	o	●	o
American Pipit	<i>Anthus rubescens</i>	●	●	o		o	o
American Redstart	<i>Setophaga ruticilla</i>	o	o	o		o	o
American Robin	<i>Turdus migratorius</i>	o	o	o	o	o	o
American Tree Sparrow	<i>Spizella arborea</i>			o		o	o
American White Pelican	<i>Pelecanus erythrorhynchos</i>	●	o	o			o
American Wigeon	<i>Anas americana</i>	●	o	o		o	o
American Woodcock	<i>Scolopax minor</i>		o	o			
Anhinga	<i>Anhinga anhinga</i>	o	o				
Anna's Hummingbird	<i>Calypte anna</i>		o	o		o	
Aplomado Falcon	<i>Falco femoralis</i>		o			o	
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	●	●	●	●	●	●
Aztec Thrush	<i>Ridgwayia pinicola</i>		o				
Baird's Sandpiper	<i>Calidris bairdii</i>	o	o	o			o
Baird's Sparrow	<i>Ammodramus bairdii</i>		o	o			o
Bald Eagle	<i>Haliaeetus leucocephalus</i>	o	o	o		o	
Baltimore Oriole	<i>Icterus galbula</i>	o	o	o		o	
Band-tailed Pigeon	<i>Patagioenas fasciata</i>		o	o		o	
Bank Swallow	<i>Riparia riparia</i>	●	o	o			●
Barn Owl	<i>Tyto alba</i>	o	o	o			o
Barn Swallow	<i>Hirundo rustica</i>	●	o	●	●	●	●
Bay-breasted Warbler	<i>Dendroica castanea</i>		o	o			
Bell's Vireo	<i>Vireo bellii</i>	●	●	●		o	o
Belted Kingfisher	<i>Megaceryle alcyon</i>	●	●	o		●	o
Berylline Hummingbird	<i>Amazilia beryllina</i>		o				
Bewick's Wren	<i>Thryomanes bewickii</i>	●	●	●	●	●	o

Table 3-4. Parks where each species was observed, April and May 2014, cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Black Phoebe	<i>Sayornis nigricans</i>	●	●	●	○	●	○
Black Tern	<i>Chlidonias niger</i>	○	○	○			○
Black Vulture	<i>Coragyps atratus</i>	●	●			○	
Black-and-white Warbler	<i>Mniotilta varia</i>	○	○	○		○	○
Black-bellied Plover	<i>Pluvialis squatarola</i>	○					○
Black-bellied Whistling-Duck	<i>Dendrocygna autumnalis</i>	○	○	○			
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>		○	○			
Black-billed Magpie	<i>Pica hudsonia</i>			○		○	
Blackburnian Warbler	<i>Dendroica fusca</i>		○	○			
Black-capped Vireo	<i>Vireo atricapilla</i>		○	○			
Black-chinned Hummingbird	<i>Archilochus alexandri</i>	●	●	●	●	●	○
Black-chinned Sparrow	<i>Spizella atrogularis</i>		○	○	●	●	○
Black-crested Titmouse	<i>Baeolophus atricristatus</i>	○	○		●	○	
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	○	○	○			○
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	○	○	●	○	●	●
Black-legged Kittiwake	<i>Rissa tridactyla</i>		○				
Black-necked Stilt	<i>Himantopus mexicanus</i>	○	○	○			○
Blackpoll Warbler	<i>Dendroica striata</i>		○	○			
Black-tailed Gnatcatcher	<i>Poliophtila melanura</i>	●	●	○	●	●	○
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>	○	○	○		○	○
Black-throated Gray Warbler	<i>Dendroica nigrescens</i>		○	○		○	○
Black-throated Green Warbler	<i>Dendroica virens</i>		○	○			
Black-throated Sparrow	<i>Amphispiza bilineata</i>	●	●	●	●	●	●
Black-vented Oriole	<i>Icterus wagleri</i>		○				
Blue Grosbeak	<i>Passerina caerulea</i>	●	○	●	○	●	●
Blue Jay	<i>Cyanocitta cristata</i>		○	○		○	
Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>	●	●	○	●	●	○
Blue-headed Vireo	<i>Vireo solitarius</i>		○	○		○	
Blue-throated Hummingbird	<i>Lampornis clemenciae</i>		○	○		○	
Blue-winged Teal	<i>Anas discors</i>	●	●	○			○

● = species detected in 2014 survey

○ = species not detected in 2014 survey but previously documented in the park, including species that migrate through or winter in the park

Table 3-4. Parks where each species was observed, April and May 2014, cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Blue-winged Warbler	<i>Vermivora cyanoptera</i>		o	o			
Bobolink	<i>Dolichonyx oryzivorus</i>	o		o			
Bonaparte's Gull	<i>Chroicocephalus philadelphia</i>	o	o				o
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	●	o	o	●	●	o
Brewer's Sparrow	<i>Spizella breweri</i>	●	●	●	o	●	●
Broad-billed Hummingbird	<i>Cynanthus latirostris</i>		o	o		o	
Broad-tailed Hummingbird	<i>Selasphorus platycercus</i>		o	●	●	●	●
Broad-winged Hawk	<i>Buteo platypterus</i>		o	o			
Bronzed Cowbird	<i>Molothrus aeneus</i>	o	o	o	o	●	o
Brown Creeper	<i>Certhia americana</i>		o	o		o	o
Brown Pelican	<i>Pelecanus occidentalis</i>	o	o				o
Brown Thrasher	<i>Toxostoma rufum</i>	●	●	o		o	o
Brown-crested Flycatcher	<i>Myiarchus tyrannulus</i>	o	●		o	o	
Brown-headed Cowbird	<i>Molothrus ater</i>	●	●	●	o	●	●
Bufflehead	<i>Bucephala albeola</i>	●	o	o		o	o
Bullock's Oriole	<i>Icterus bullockii</i>	●	o	o	o	o	●
Burrowing Owl	<i>Athene cunicularia</i>	o	o	o		o	●
Bushtit	<i>Psaltiriparus minimus</i>	o	o	o	●	●	
Cactus Wren	<i>Campylorhynchus brunneicapillus</i>	●	●	●	●	●	●
Calliope Hummingbird	<i>Stellula calliope</i>		o	o	o	o	
Canada Goose	<i>Branta canadensis</i>		o	o			o
Canada Warbler	<i>Wilsonia canadensis</i>		o	o			
Canvasback	<i>Aythya valisineria</i>	●	o	o			o
Canyon Towhee	<i>Melospiza fusca</i>	●	●	●	●	●	o
Canyon Wren	<i>Catherpes mexicanus</i>	●	●	●	●	●	o
Cape May Warbler	<i>Dendroica tigrina</i>		o	o			
Carolina Wren	<i>Thryothorus ludovicianus</i>	●	●	o		o	
Caspian Tern	<i>Hydroprogne caspia</i>	●					
Cassin's Finch	<i>Carpodacus cassinii</i>		o	o	o	o	o
Cassin's Kingbird	<i>Tyrannus vociferans</i>	o	o	●	●	●	●
Cassin's Sparrow	<i>Peucaea cassinii</i>	●	o	●	●	●	●
Cassin's Vireo	<i>Vireo cassinii</i>		o	o		●	
Cattle Egret	<i>Bubulcus ibis</i>	o	o	o		o	o

Table 3-4. Parks where each species was observed, April and May 2014, cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Cave Swallow	<i>Petrochelidon fulva</i>	●	●	●	○	○	
Cedar Waxwing	<i>Bombycilla cedrorum</i>	●	○	○	○	○	○
Cerulean Warbler	<i>Dendroica cerulea</i>		○	○			
Chestnut-collared Longspur	<i>Calcarius ornatus</i>	○	○	○		○	○
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>		○	○		○	○
Chihuahuan Raven	<i>Corvus cryptoleucus</i>	●	●	○	●	●	●
Chimney Swift	<i>Chaetura pelagica</i>	●	○	○			
Chipping Sparrow	<i>Spizella passerina</i>	●	●	●	●	●	●
Cinnamon Teal	<i>Anas cyanoptera</i>	●	○	○			○
Clark's Grebe	<i>Aechmophorus clarkii</i>	○					
Clark's Nutcracker	<i>Nucifraga columbiana</i>		○	○	○	○	
Clay-colored Sparrow	<i>Spizella pallida</i>	●	○	○	○	○	○
Clay-colored Thrush	<i>Turdus grayi</i>		○				
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	●	●	○	○	●	○
Colima Warbler	<i>Oreothlypis crissalis</i>		○			○	
Common Black-Hawk	<i>Buteogallus anthracinus</i>		○	○	○	○	
Common Gallinule ¹	<i>Gallinula galeata</i>	○	○	○			
Common Goldeneye	<i>Bucephala clangula</i>		○	○			
Common Grackle	<i>Quiscalus quiscula</i>		○	○		○	○
Common Ground-Dove	<i>Columbina passerina</i>	●	●	○			○
Common Loon	<i>Gavia immer</i>	○	○				○
Common Merganser	<i>Mergus merganser</i>		○	○			○
Common Moorhen	<i>Gallinula chloropus</i>		○	○			
Common Nighthawk	<i>Chordeiles minor</i>	○	○	○	○	○	○
Common Poorwill	<i>Phalaenoptilus nuttallii</i>	○	●	○		○	●
Common Raven	<i>Corvus corax</i>	●	●	○	●	●	○
Common Yellowthroat	<i>Geothlypis trichas</i>	●	●	●		●	○
Connecticut Warbler	<i>Oporornis agilis</i>			○			
Cooper's Hawk	<i>Accipiter cooperii</i>	○	●	○	●	○	○
Cordilleran Flycatcher	<i>Empidonax occidentalis</i>		○	○	○	●	○

● = species detected in 2014 survey

○ = species not detected in 2014 survey but previously documented in the park, including species that migrate through or winter in the park

¹ The American Ornithologists' Union common name for this species was Common Moorhen until 2011

Table 3-4. Parks where each species was observed, April and May 2014, cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Costa's Hummingbird	<i>Calypte costae</i>		o				
Couch's Kingbird	<i>Tyrannus couchii</i>	●	o				
Crescent-chested Warbler	<i>Oreothlypis superciliosa</i>		o				
Crested Caracara	<i>Caracara cheriway</i>	●	o				
Crissal Thrasher	<i>Toxostoma crissale</i>		●	o		●	●
Curve-billed Thrasher	<i>Toxostoma curvirostre</i>	●	●	o	●	●	●
Dark-eyed Junco	<i>Junco hyemalis</i>		o	o	o	o	o
Dickcissel	<i>Spiza americana</i>	o	o	o		o	o
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	●	o	o			
Downy Woodpecker	<i>Picoides pubescens</i>			o		o	
Dunlin	<i>Calidris alpina</i>		o				
Dusky Flycatcher	<i>Empidonax oberholseri</i>		●	●	o	●	o
Dusky-capped Flycatcher	<i>Myiarchus tuberculifer</i>		o	o			
Eared Grebe	<i>Podiceps nigricollis</i>	o	o	o			o
Eastern Bluebird	<i>Sialia sialis</i>		o	o		o	
Eastern Kingbird	<i>Tyrannus tyrannus</i>		o	o			
Eastern Meadowlark	<i>Sturnella magna</i>	o	o	o	o	●	●
Eastern Phoebe	<i>Sayornis phoebe</i>	o	o	o		o	
Eastern Screech-Owl	<i>Megascops asio</i>	o	o				
Eastern Towhee	<i>Pipilo erythrophthalmus</i>			o		o	
Eastern Wood-Pewee	<i>Contopus virens</i>	o	o	o			
Elegant Trogon	<i>Trogon elegans</i>		o				
Elf Owl	<i>Micrathene whitneyi</i>	o	o	o		o	
Eurasian Collared-Dove	<i>Streptopelia decaocto</i>	●	●	●	●	o	o
Eurasian Wigeon	<i>Anas penelope</i>	o					
European Starling	<i>Sturnus vulgaris</i>	o	o	o	o	o	o
Evening Grosbeak	<i>Coccothraustes vespertinus</i>		o	o		o	o
Fan-tailed Warbler	<i>Euthlypis lachrymosa</i>		o				
Ferruginous Hawk	<i>Buteo regalis</i>	o	o	o		o	o
Ferruginous Pygmy-Owl	<i>Glaucidium brasilianum</i>		o				
Field Sparrow	<i>Spizella pusilla</i>	●	o	o		o	
Flame-colored Tanager	<i>Piranga bidentata</i>		o				
Flammulated Owl	<i>Otus flammeolus</i>		o	o		o	

Table 3-4. Parks where each species was observed, April and May 2014, cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Forster's Tern	<i>Sterna forsteri</i>	o	o				o
Fox Sparrow	<i>Passerella iliaca</i>	o	o	o			
Franklin's Gull	<i>Leucophaeus pipixcan</i>	o	o				o
Gadwall	<i>Anas strepera</i>	●	●	o			o
Gambel's Quail	<i>Callipepla gambelii</i>		●			o	●
Golden Eagle	<i>Aquila chrysaetos</i>	o	o	o	o	o	o
Golden-cheeked Warbler	<i>Dendroica chrysoparia</i>		o				
Golden-crowned Kinglet	<i>Regulus satrapa</i>	o	o	o		o	
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>		o	o		o	
Golden-fronted Woodpecker	<i>Melanerpes aurifrons</i>	●	●				
Golden-winged Warbler	<i>Vermivora chrysoptera</i>		o	o			
Grace's Warbler	<i>Dendroica graciae</i>		o	o		●	
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	o	o	o	o	o	
Gray Catbird	<i>Dumetella carolinensis</i>		o	o		o	o
Gray Flycatcher	<i>Empidonax wrightii</i>		o	●	o	●	●
Gray Hawk	<i>Buteo nitidus</i>		●	o	o		
Gray Vireo	<i>Vireo vicinior</i>		o	o		o	o
Gray-cheeked Thrush	<i>Catharus minimus</i>		o	o			o
Great Blue Heron	<i>Ardea herodias</i>	●	●	o	o	o	o
Great Crested Flycatcher	<i>Myiarchus crinitus</i>		o	o			
Great Egret	<i>Ardea alba</i>	●	o	o		o	o
Great Horned Owl	<i>Bubo virginianus</i>	o	●	o	o	o	o
Great Kiskadee	<i>Pitangus sulphuratus</i>	o	o	o			
Greater Pewee	<i>Contopus pertinax</i>		o	o	o	o	
Greater Roadrunner	<i>Geococcyx californianus</i>	●	●	●	o	●	●
Greater White-fronted Goose	<i>Anser albifrons</i>	o	o				
Greater Yellowlegs	<i>Tringa melanoleuca</i>	●	o	o			o
Great-tailed Grackle	<i>Quiscalus mexicanus</i>	●	●	o	o	o	o
Green Heron	<i>Butorides virescens</i>	o	o	o			o
Green Kingfisher	<i>Chloroceryle americana</i>	●	o				

● = species detected in 2014 survey

o = species not detected in 2014 survey but previously documented in the park, including species that migrate through or winter in the park

Table 3-4. Parks where each species was observed, April and May 2014, cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Green-tailed Towhee	<i>Pipilo chlorurus</i>	●	●	●	●	●	●
Green-winged Teal	<i>Anas crecca</i>	o	o	o		o	o
Groove-billed Ani	<i>Crotophaga sulcirostris</i>	o	o	o			
Gull-billed Tern	<i>Gelochelidon nilotica</i>	o					
Hairy Woodpecker	<i>Picoides villosus</i>			o		o	
Hammond's Flycatcher	<i>Empidonax hammondi</i>		o	o		o	
Harris's Hawk	<i>Parabuteo unicinctus</i>	o	o	o		o	
Harris's Sparrow	<i>Zonotrichia querula</i>		o	o			o
Hepatic Tanager	<i>Piranga flava</i>		o	o	o	o	o
Hermit Thrush	<i>Catharus guttatus</i>	o	o	o	o	●	●
Hermit Warbler	<i>Dendroica occidentalis</i>		o	o		o	
Herring Gull	<i>Larus argentatus</i>	o				o	
Hooded Merganser	<i>Lophodytes cucullatus</i>	o	o	o			
Hooded Oriole	<i>Icterus cucullatus</i>	●	o	●		o	o
Hooded Warbler	<i>Wilsonia citrina</i>		o	o		o	o
Horned Grebe	<i>Podiceps auritus</i>	o					o
Horned Lark	<i>Eremophila alpestris</i>	o	o	o	o	o	●
House Finch	<i>Carpodacus mexicanus</i>	●	●	●	●	●	●
House Sparrow	<i>Passer domesticus</i>	●	o	o	●	o	o
House Wren	<i>Troglodytes aedon</i>	●	●	●	o	●	o
Hutton's Vireo	<i>Vireo huttoni</i>		o	o		o	
Inca Dove	<i>Columbina inca</i>	o	●	o			o
Indigo Bunting	<i>Passerina cyanea</i>	o	o	o	o	o	o
Interior Least Tern	<i>Sterna antillarum athalassos</i>	o					
Juniper Titmouse	<i>Baeolophus ridgwayi</i>			o	o	o	
Kentucky Warbler	<i>Oporornis formosus</i>		o	o		o	o
Killdeer	<i>Charadrius vociferus</i>	●	●	●	o	o	o
King Rail	<i>Rallus elegans</i>		o				
Ladder-backed Woodpecker	<i>Picoides scalaris</i>	●	●	●	●	●	●
Lark Bunting	<i>Calamospiza melanocorys</i>	o	●	o	o	●	●
Lark Sparrow	<i>Chondestes grammacus</i>	●	●	●	●	●	●
Laughing Gull	<i>Leucophaeus atricilla</i>	o	o				
Lawrence's Goldfinch	<i>Spinus lawrencei</i>					o	

Table 3-4. Parks where each species was observed, April and May 2014, cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHS
Lazuli Bunting	<i>Passerina amoena</i>		●	●		o	o
Le Conte's Sparrow	<i>Ammodramus leconteii</i>	o	o	o			
Least Bittern	<i>Ixobrychus exilis</i>		o	o			
Least Flycatcher	<i>Empidonax minimus</i>	o	●	o			
Least Grebe	<i>Tachybaptus dominicus</i>		o				
Least Sandpiper	<i>Calidris minutilla</i>	o	●	o			o
Least Tern	<i>Sterna antillarum</i>		o				o
Lesser Goldfinch	<i>Spinus psaltria</i>	●	●	●	●	o	●
Lesser Nighthawk	<i>Chordeiles acutipennis</i>	●	●	●	o	●	●
Lesser Prairie-Chicken	<i>Tympanuchus pallidicinctus</i>			o			
Lesser Scaup	<i>Aythya affinis</i>	o	o	o			o
Lesser Yellowlegs	<i>Tringa flavipes</i>	o	o	o			o
Lewis's Woodpecker	<i>Melanerpes lewis</i>		o	o		o	
Lincoln's Sparrow	<i>Melospiza lincolnii</i>	●	●	o	o	o	o
Little Blue Heron	<i>Egretta caerulea</i>	o	o				
Loggerhead Shrike	<i>Lanius ludovicianus</i>	●	●	●	o	●	●
Long-billed Curlew	<i>Numenius americanus</i>	o	o	o			o
Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>	o	o	o			o
Long-billed Thrasher	<i>Toxostoma longirostre</i>	o	o	o			
Long-eared Owl	<i>Asio otus</i>		o	o			
Louisiana Waterthrush	<i>Parkesia motacilla</i>		o	o			
Lucifer Hummingbird	<i>Calothorax lucifer</i>		●	o			
Lucy's Warbler	<i>Oreothlypis luciae</i>	●	●	●			o
MacGillivray's Warbler	<i>Oporornis tolmiei</i>	●	o	●	o	●	●
Magnificent Hummingbird	<i>Eugenes fulgens</i>		o	o		o	
Magnolia Warbler	<i>Dendroica magnolia</i>		o	o		o	
Mallard	<i>Anas platyrhynchos</i>	●	●	o		o	o
Marbled Godwit	<i>Limosa fedoa</i>						o
Marsh Wren	<i>Cistothorus palustris</i>	●	●	o		o	o

● = species detected in 2014 survey

o = species not detected in 2014 survey but previously documented in the park, including species that migrate through or winter in the park

Table 3-4. Parks where each species was observed, April and May 2014, cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
McCown's Longspur	<i>Rhynchophanes mccownii</i>	o		o		o	
Merlin	<i>Falco columbarius</i>	o	o	o		o	o
Mexican Jay	<i>Aphelocoma ultramarina</i>		o				
Mississippi Kite	<i>Ictinia mississippiensis</i>		o	o			
Montezuma Quail	<i>Cyrtonyx montezumae</i>		o	o	●	o	
Mountain Bluebird	<i>Sialia currucoides</i>	o	o	o	o	o	o
Mountain Chickadee	<i>Poecile gambeli</i>		o	o		o	o
Mourning Dove	<i>Zenaida macroura</i>	●	●	●	●	●	●
Mourning Warbler	<i>Oporornis philadelphia</i>		o				
Nashville Warbler	<i>Oreothlypis ruficapilla</i>	o	●	o		●	o
Neotropic Cormorant	<i>Phalacrocorax brasilianus</i>	●	o	o			
Northern Beardless-Tyrannulet	<i>Camptostoma imberbe</i>			o			
Northern Bobwhite	<i>Colinus virginianus</i>	●		●		o	
Northern Cardinal	<i>Cardinalis cardinalis</i>	●	●	●	●	o	●
Northern Flicker	<i>Colaptes auratus</i>	o	o	o	o	o	o
Northern Goshawk	<i>Accipiter gentilis</i>		o	o		o	
Northern Harrier	<i>Circus cyaneus</i>	o	●	o	o	●	o
Northern Mockingbird	<i>Mimus polyglottos</i>	●	●	●	●	●	●
Northern Parula	<i>Parula americana</i>		o	o		o	o
Northern Pintail	<i>Anas acuta</i>	o	o	o		o	o
Northern Pygmy-Owl	<i>Glaucidium gnoma</i>		o			o	
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	●	●	o		o	o
Northern Saw-whet Owl	<i>Aegolius acadicus</i>		o			o	
Northern Shoveler	<i>Anas clypeata</i>	●	●	o			o
Northern Shrike	<i>Lanius excubitor</i>					o	
Northern Waterthrush	<i>Parkesia noveboracensis</i>		o	o		o	o
Olive Sparrow	<i>Arremonops rufivirgatus</i>	●					
Olive Warbler	<i>Peucedramus taeniatus</i>		o				
Olive-sided Flycatcher	<i>Contopus cooperi</i>		o	o	o	o	o
Orange-crowned Warbler	<i>Oreothlypis celata</i>	●	●	o	o	o	o
Orchard Oriole	<i>Icterus spurius</i>	●	o	●	o	o	o
Osprey	<i>Pandion haliaetus</i>	●	●	o		o	
Ovenbird	<i>Seiurus aurocapilla</i>		o	o			o

Table 3-4. Parks where each species was observed, April and May 2014, cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Pacific Loon	<i>Gavia pacifica</i>	o					
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>					o	
Painted Bunting	<i>Passerina ciris</i>	●	o	●	o	●	o
Painted Redstart	<i>Myioborus pictus</i>		o	o		o	
Palm Warbler	<i>Dendroica palmarum</i>		o	o			o
Pectoral Sandpiper	<i>Calidris melanotos</i>	o	o				
Peregrine Falcon	<i>Falco peregrinus</i>	o	o	o		o	o
Phainopepla	<i>Phainopepla nitens</i>		o	●	●	o	o
Philadelphia Vireo	<i>Vireo philadelphicus</i>		o	o			
Pied-billed Grebe	<i>Podilymbus podiceps</i>	o	o	o			o
Pine Grosbeak	<i>Pinicola enucleator</i>					o	
Pine Siskin	<i>Spinus pinus</i>	o	o	●	o	o	o
Pine Warbler	<i>Dendroica pinus</i>		o	o			
Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>		o	o		o	o
Piratic Flycatcher	<i>Legatus leucophaius</i>		o	o			
Plumbeous Vireo	<i>Vireo plumbeus</i>	o	o	o	●	●	o
Prairie Falcon	<i>Falco mexicanus</i>		o	o		o	o
Prairie Warbler	<i>Dendroica discolor</i>		o	o			
Prothonotary Warbler	<i>Protonotaria citrea</i>		o	o	o		
Purple Finch	<i>Carpodacus purpureus</i>		o	o		o	
Purple Gallinule	<i>Porphyrio martinica</i>		o				
Purple Martin	<i>Progne subis</i>	●	o	o		o	o
Pygmy Nuthatch	<i>Sitta pygmaea</i>		o	o		o	
Pyrrhuloxia	<i>Cardinalis sinuatus</i>	●	●	●	●	●	o
Red Crossbill	<i>Loxia curvirostra</i>		o	o		o	
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>			o			
Red-breasted Merganser	<i>Mergus serrator</i>	o	o				
Red-breasted Nuthatch	<i>Sitta canadensis</i>		o	o	o	o	o
Reddish Egret	<i>Egretta rufescens</i>	o	o				
Red-eyed Vireo	<i>Vireo olivaceus</i>		o	o		●	o

● = species detected in 2014 survey

o = species not detected in 2014 survey but previously documented in the park, including species that migrate through or winter in the park

Table 3-4. Parks where each species was observed, April and May 2014, cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Red-faced Warbler	<i>Cardellina rubrifrons</i>		o	o		o	
Redhead	<i>Aythya americana</i>	o	o	o			o
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>		o	o			o
Red-naped Sapsucker	<i>Sphyrapicus nuchalis</i>		o	o		o	o
Red-necked Phalarope	<i>Phalaropus lobatus</i>			o			o
Red-shouldered Hawk	<i>Buteo lineatus</i>	o	o	o			
Red-tailed Hawk	<i>Buteo jamaicensis</i>	●	●	o	●	●	●
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	●	●	●		o	o
Ring-billed Gull	<i>Larus delawarensis</i>	●	o	o		o	o
Ringed Kingfisher	<i>Megaceryle torquata</i>	o					
Ring-necked Duck	<i>Aythya collaris</i>	o	●	o		o	o
Ring-necked Pheasant	<i>Phasianus colchicus</i>	●		o		o	
Rock Pigeon	<i>Columba livia</i>	o	o	o		o	o
Rock Wren	<i>Salpinctes obsoletus</i>	●	●	●	●	●	o
Roseate Spoonbill	<i>Platalea ajaja</i>	o	o				
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>		o	o		o	o
Rose-throated Becard	<i>Pachyrhamphus aglaiae</i>		o				
Ross's Goose	<i>Chen rossii</i>		o				
Rough-legged Hawk	<i>Buteo lagopus</i>		o	o		o	o
Royal Tern	<i>Thalasseus maximus</i>	o					
Ruby-crowned Kinglet	<i>Regulus calendula</i>	●	●	●	●	●	o
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	o	o			o	
Ruddy Duck	<i>Oxyura jamaicensis</i>	●	o	o			o
Ruddy Ground-Dove	<i>Columbina talpacoti</i>		o	o			
Rufous Hummingbird	<i>Selasphorus rufus</i>		o	o	o	o	o
Rufous-backed Robin	<i>Turdus rufopalliat</i>		o				
Rufous-capped Warbler	<i>Basileuterus rufifrons</i>	o	o				
Rufous-crowned Sparrow	<i>Aimophila ruficeps</i>	●	●	●	●	●	o
Rusty Blackbird	<i>Euphagus carolinus</i>		o	o		o	
Sage Sparrow	<i>Amphispiza belli</i>		o	o		o	o
Sage Thrasher	<i>Oreoscoptes montanus</i>	o	o	o		o	o
Sanderling	<i>Calidris alba</i>						o
Sandhill Crane	<i>Grus canadensis</i>	o	o	o		o	o

Table 3-4. Parks where each species was observed, April and May 2014, cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Savannah Sparrow	<i>Passerculus sandwichensis</i>	o	●	o	o	o	o
Say's Phoebe	<i>Sayornis saya</i>	●	●	●	●	●	o
Scaled Quail	<i>Callipepla squamata</i>	●	●	●	o	●	●
Scarlet Tanager	<i>Piranga olivacea</i>		o	o		o	o
Scissor-tailed Flycatcher	<i>Tyrannus forficatus</i>	●	o	o			o
Scott's Oriole	<i>Icterus parisorum</i>	●	●	●	●	●	●
Sedge Wren	<i>Cistothorus platensis</i>	o	o	o			
Semipalmated Plover	<i>Charadrius semipalmatus</i>	o					o
Semipalmated Sandpiper	<i>Calidris pusilla</i>	o		o			o
Sharp-shinned Hawk	<i>Accipiter striatus</i>	o	o	o	o	●	●
Short-eared Owl	<i>Asio flammeus</i>		o	o			o
Short-tailed Hawk	<i>Buteo brachyurus</i>		o	o			
Slate-throated Redstart	<i>Myioborus miniatus</i>		o				
Smith's Longspur	<i>Calcarius pictus</i>		o				
Snow Bunting	<i>Plectrophenax nivalis</i>		o				
Snow Goose	<i>Chen caerulescens</i>	o	o	o			o
Snowy Egret	<i>Egretta thula</i>	●	o	o		o	o
Snowy Plover	<i>Charadrius alexandrinus</i>	o					o
Solitary Sandpiper	<i>Tringa solitaria</i>	●	o	o			o
Song Sparrow	<i>Melospiza melodia</i>	o	o	o	o	o	o
Sora	<i>Porzana carolina</i>	o	o	o			o
Spotted Owl ²	<i>Strix occidentalis</i>			o ²		o ²	
Spotted Sandpiper	<i>Actitis macularius</i>	●	●	o		o	o
Spotted Towhee	<i>Pipilo maculatus</i>	●	o	o	o	●	o
Sprague's Pipit	<i>Anthus spragueii</i>	o	o	o			
Steller's Jay	<i>Cyanocitta stelleri</i>		o	o	o	o	● ³
Stilt Sandpiper	<i>Calidris himantopus</i>						o
Streak-backed Oriole	<i>Icterus pustulatus</i>			● ⁴			

● = species detected in 2014 survey

o = species not detected in 2014 survey but previously documented in the park, including species that migrate through or winter in the park

² = the Spotted Owls in these CHDN parks belong to the Mexican subspecies (*Strix occidentalis lucida*)

³ = species was recorded at White Sands NM for the first time in 2014 during the area search (outside of regular surveys)

⁴ = species was recorded for the first time in 2014 by the park biologist at the same time as but outside of surveys

Table 3-4. Parks where each species was observed, April and May 2014, cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Sulphur-bellied Flycatcher	<i>Myiodynastes luteiventris</i>		o				
Summer Tanager	<i>Piranga rubra</i>	●	●	●	●	o	o
Swainson's Hawk	<i>Buteo swainsoni</i>	●	●	o	o	●	●
Swainson's Thrush	<i>Catharus ustulatus</i>	o	o	o		o	o
Swainson's Warbler	<i>Limnothlypis swainsonii</i>		o	o			
Swallow-tailed Kite	<i>Elanoides forficatus</i>		o				
Swamp Sparrow	<i>Melospiza georgiana</i>	o	o	o		o	
Tennessee Warbler	<i>Oreothlypis peregrina</i>		o	o			● ³
Thick-billed Kingbird	<i>Tyrannus crassirostris</i>		o	o			
Townsend's Solitaire	<i>Myadestes townsendi</i>		o	●	o	●	o
Townsend's Warbler	<i>Dendroica townsendi</i>		o	o	o	●	o
Tree Swallow	<i>Tachycineta bicolor</i>	o	o	●			o
Tricolored Heron	<i>Egretta tricolor</i>	o	o	o			
Tropical Kingbird	<i>Tyrannus melancholicus</i>		o				
Tropical Parula	<i>Parula pitiayumi</i>		o	o			
Tufted Flycatcher	<i>Mitrephanes phaeocercus</i>		o				
Tundra Swan	<i>Cygnus columbianus</i>		o	o			
Turkey Vulture	<i>Cathartes aura</i>	●	●	●	●	●	●
Upland Sandpiper	<i>Bartramia longicauda</i>	o	o	o			
Varied Bunting	<i>Passerina versicolor</i>	o	o	o		o	
Varied Thrush	<i>Ixoreus naevius</i>		o	o		o	
Veery	<i>Catharus fuscescens</i>		o				
Verdin	<i>Auriparus flaviceps</i>	●	●	o	o	●	●
Vermilion Flycatcher	<i>Pyrocephalus rubinus</i>	●	●	●	●	o	o
Vesper Sparrow	<i>Pooecetes gramineus</i>	●	●	●	o	o	o
Violet-crowned Hummingbird	<i>Amazilia violiceps</i>	o	o				
Violet-green Swallow	<i>Tachycineta thalassina</i>		●	o	●	●	●
Virginia Rail	<i>Rallus limicola</i>	o	o	o			o
Virginia's Warbler	<i>Oreothlypis virginiae</i>		o	o	o	●	o
Warbling Vireo	<i>Vireo gilvus</i>		o	o		●	●
Western Bluebird	<i>Sialia mexicana</i>		o	o	o	o	o
Western Grebe	<i>Aechmophorus occidentalis</i>	o		o			o
Western Kingbird	<i>Tyrannus verticalis</i>	●	●	●	o	●	●

Table 3-4. Parks where each species was observed, April and May 2014, cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Western Meadowlark	<i>Sturnella neglecta</i>	o	o	o	o	o	o
Western Sandpiper	<i>Calidris mauri</i>	o	o	o			o
Western Screech-Owl	<i>Megascops kennicottii</i>	o	o	o		o	o
Western Scrub-Jay	<i>Aphelocoma californica</i>		o	o	●	●	o
Western Tanager	<i>Piranga ludoviciana</i>	o	o	●	o	●	●
Western Wood-Pewee	<i>Contopus sordidulus</i>		o	o	o	●	●
Whimbrel	<i>Numenius phaeopus</i>		o				
Whip-poor-will	<i>Caprimulgus vociferus</i>		o	o		o	
White Ibis	<i>Eudocimus albus</i>		o	o			
White-breasted Nuthatch	<i>Sitta carolinensis</i>		o	o	o	●	
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	●	●	●	o	●	●
White-eared Hummingbird	<i>Hylocharis leucotis</i>		o			o	
White-eyed Vireo	<i>Vireo griseus</i>	o	o	o			
White-faced Ibis	<i>Plegadis chihi</i>	●	o	o			o
White-rumped Sandpiper	<i>Calidris fuscicollis</i>						o
White-tailed Hawk	<i>Buteo albicaudatus</i>		o				
White-tailed Kite	<i>Elanus leucurus</i>		o	o			
White-throated Sparrow	<i>Zonotrichia albicollis</i>		o	o	o	o	o
White-throated Swift	<i>Aeronautes saxatalis</i>	●	o	o	o	●	o
White-tipped Dove	<i>Leptotila verreauxi</i>		o				
White-winged Dove	<i>Zenaida asiatica</i>	●	●	●	●	●	●
Wild Turkey	<i>Meleagris gallopavo</i>	o	o	●		o	
Willet	<i>Tringa semipalmata</i>	o	o	o			o
Williamson's Sapsucker	<i>Sphyrapicus thyroideus</i>		o	o		o	o
Willow Flycatcher	<i>Empidonax traillii</i>		o	o ⁵		o	o
Wilson's Phalarope	<i>Phalaropus tricolor</i>	o	o	o			o
Wilson's Snipe	<i>Gallinago delicata</i>	o	o	o		o	o
Wilson's Warbler	<i>Wilsonia pusilla</i>	●	●	●	●	●	●
Winter Wren	<i>Troglodytes hiemalis</i>	o	o	o		o	
Wood Duck	<i>Aix sponsa</i>	o	o	o		o	

● = species detected in 2014 survey

o = species not detected in 2014 survey but previously documented in the park, including species that migrate through or winter in the park

⁵ = Willow Flycatchers at CAVE belong to the Southwestern subspecies (*Empidonax traillii extimus*)

Table 3-4. Parks where each species was observed, April and May 2014, cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Wood Thrush	<i>Hylocichla mustelina</i>		o				o
Worm-eating Warbler	<i>Helmitheros vermivorum</i>	o	o	o			o
Yellow Grosbeak	<i>Pheucticus chrysopleus</i>					o	
Yellow Rail	<i>Coturnicops noveboracensis</i>		o				
Yellow Warbler	<i>Dendroica petechia</i>	•	•	o	o	o	o
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>		o				
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>		o	o		o	
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	o	o	o	o	o	
Yellow-breasted Chat	<i>Icteria virens</i>	•	•	•		•	o
Yellow-crowned Night-Heron	<i>Nyctanassa violacea</i>	o	o	o			
Yellow-eyed Junco	<i>Junco phaeonotus</i>		o			o	
Yellow-green Vireo	<i>Vireo flavoviridis</i>		o	o			
Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>	o	o	o	o	o	o
Yellow-rumped Warbler	<i>Dendroica coronata</i>	•	•	•	•	•	•
Yellow-throated Vireo	<i>Vireo flavifrons</i>	o	o	o		o	
Yellow-throated Warbler	<i>Dendroica dominica</i>	o	o	o			o
Zone-tailed Hawk	<i>Buteo albonotatus</i>	o	o	o	o	o	

• = species detected in 2014 survey

o = species not detected in 2014 survey but previously documented in the park, including species that migrate through or winter in the park

¹ = The American Ornithologists' Union common name for this species was Common Moorhen until 2011

² = the Spotted Owls in these CHDN parks belong to the Mexican subspecies (*Strix occidentalis lucida*)

³ = Willow Flycatchers at CAVE belong to the Southwestern subspecies (*Empidonax traillii extimus*)

⁴ = species was recorded for the first time in 2014 by the park biologist at the same time as but outside of surveys

⁵ = Willow Flycatchers at CAVE belong to the Southwestern subspecies (*Empidonax traillii extimus*)

3.1 Amistad National Recreation Area

3.1.1 2014 sampling

During April of 2014, we sampled 19 transects/grids at Amistad NRA (Figures 3.1.1-1, -2). We conducted 111 point counts on nine grids in grassland habitat and 79 point counts on 10 transects in riparian habitat (Table 3.1.1), for a total of 190 point counts at the park. Each point was surveyed once in 2014.

Note that the riparian area was restratified in 2012. We restratified the riparian habitat to include the Pecos and Devils Rivers, and to omit areas, for reasons of safety, along the Rio Grande.

3.1.2 Results

During 2014, 3,996 birds of 119 species were counted at Amistad NRA (Table 3.1.2). Cliff Swallow had the highest number of individuals counted in 2014 (13% of the total number of birds counted). The next species counted in the highest numbers were Northern Mockingbird (4%), Cedar Waxwing (4%), Black-throated Sparrow (4%), and Turkey Vulture (4%). Of the six parks surveyed, Amistad NRA had the greatest number of species counted overall, as well as the greatest number of species counted in grassland and in riparian habitat. Additionally, the greatest number of birds counted in any of the parks was in Amistad NRA. Three new species for the park (Lucy's Warbler, Brown Thrasher, and Ring-necked Pheasant) were observed during surveys in 2014. Also, Myrtle Warbler, a subspecies of Yellow-rumped Warbler, was recorded for the first time.

3.1.3 Field Observations

Three field crew and efficient coordination with the park staff escorts allowed for well-organized sampling of the 19 transects within a week. Lake levels were lower than in 2013, and although seven of the ten riparian transects still required boat and canoe access, they were mostly surveyed on foot along exposed shorelines; this allowed sampling of several points previously inaccessible. Despite a few mornings of chilly, windy, and light rainy weather, all surveys were completed on time without any rescheduling.

Despite the low water levels, a nice variety of waterfowl included Canvasback, Bufflehead, Cinnamon Teal, Blue-winged Teal, Gadwall, Ring-necked Duck, Mexican Mallard, Northern Shoveler, American Wigeon, and Ruddy Duck. The exposed shorelines and mudflats provided good habitat for numerous shorebirds, such as Greater Yellowlegs, Spotted Sandpiper, Solitary Sandpiper, and Least Sandpiper. Notable low-density species were Caspian Tern, American White Pelican, Cattle Egret, White-faced Ibis, Ring-billed Gull, Neotropic Cormorant, and Osprey. Riparian songbirds were well-represented, with territorial and breeding Bell's Vireo, Summer Tanager, Yellow-breasted Chat, Orchard Oriole, Painted Bunting, and Common Yellowthroat.

Several of the nine upland grids were also affected by the low water levels, as some previously inaccessible points were sampled. The exposed shorelines were rich with grasses and weeds adjacent to the dense thickets of dead trees, and this interface with the lush upland made for an interesting mix of microhabitats for several species. Wintering sparrows were especially numerous and mostly comprised of White-crowned Sparrow, Chipping Sparrow, Clay-colored Sparrow, and Brewer's Sparrow alongside less common Lark Sparrow, Vesper Sparrow, and Field Sparrow; both American Goldfinch and Lesser Goldfinch were also present. Common desert residents, such as Scaled Quail, Cactus Wren, Verdin, Black-throated Sparrow, Curve-billed Thrasher, Mourning Dove, Pyrrhuloxia, House Finch, and Northern Mockingbird, were observed nesting or with young. Cassin's Sparrow was recorded in surprisingly high numbers in suitable breeding habitat, but migrants were low in number and diversity; they included Wilson's Warbler, MacGillivray's Warbler, Orange-crowned Warbler, Black-headed Grosbeak, and Western Tanager. Notable low-density species were Spotted Towhee, Couch's Kingbird, Great Kiskadee, Olive Sparrow, Green Kingfisher, Crested Caracara, Brown Thrasher, Ring-necked Pheasant, Northern Bobwhite, Inca Dove, Common Nighthawk, and White-eyed Vireo.

Table 3.1.1. Habitat class, number of points, and sampling dates for each transect or grid at Amistad NRA, 2014

Transect/Grid	Habitat class	# points	# visits	Visit Date
CH-AM2	Grassland	12	1	4/23/2014
CH-AM3	Grassland	13	1	4/21/2014
CH-AM4	Grassland	12	1	4/20/2014
CH-AM5	Grassland	11	1	4/19/2014
CH-AM6	Grassland	16	1	4/20/2014
CH-AM7	Grassland	15	1	4/19/2014
CH-AM8	Grassland	10	1	4/18/2014
CH-AM9	Grassland	12	1	4/22/2014
CH-AM10	Grassland	10	1	4/22/2014
CH-AMRI1	Riparian	4	1	4/18/2014
CH-AMRI3	Riparian	12	1	4/16/2014
CH-AMRI5	Riparian	6	1	4/21/2014
CH-AMRI6	Riparian	10	1	4/17/2014
CH-AMRI7	Riparian	9	1	4/16/2014
CH-AMRI8	Riparian	7	1	4/16/2014
CH-AMRI9	Riparian	7	1	4/21/2014
CH-AMRI12	Riparian	8	1	4/22/2014
CH-AMRI13	Riparian	9	1	4/17/2014
CH-AMRI17	Riparian	7	1	4/17/2014



Cedar Waxwing (*Bombycilla cedrorum*) was one of the species recorded in the highest numbers at the park in 2014.

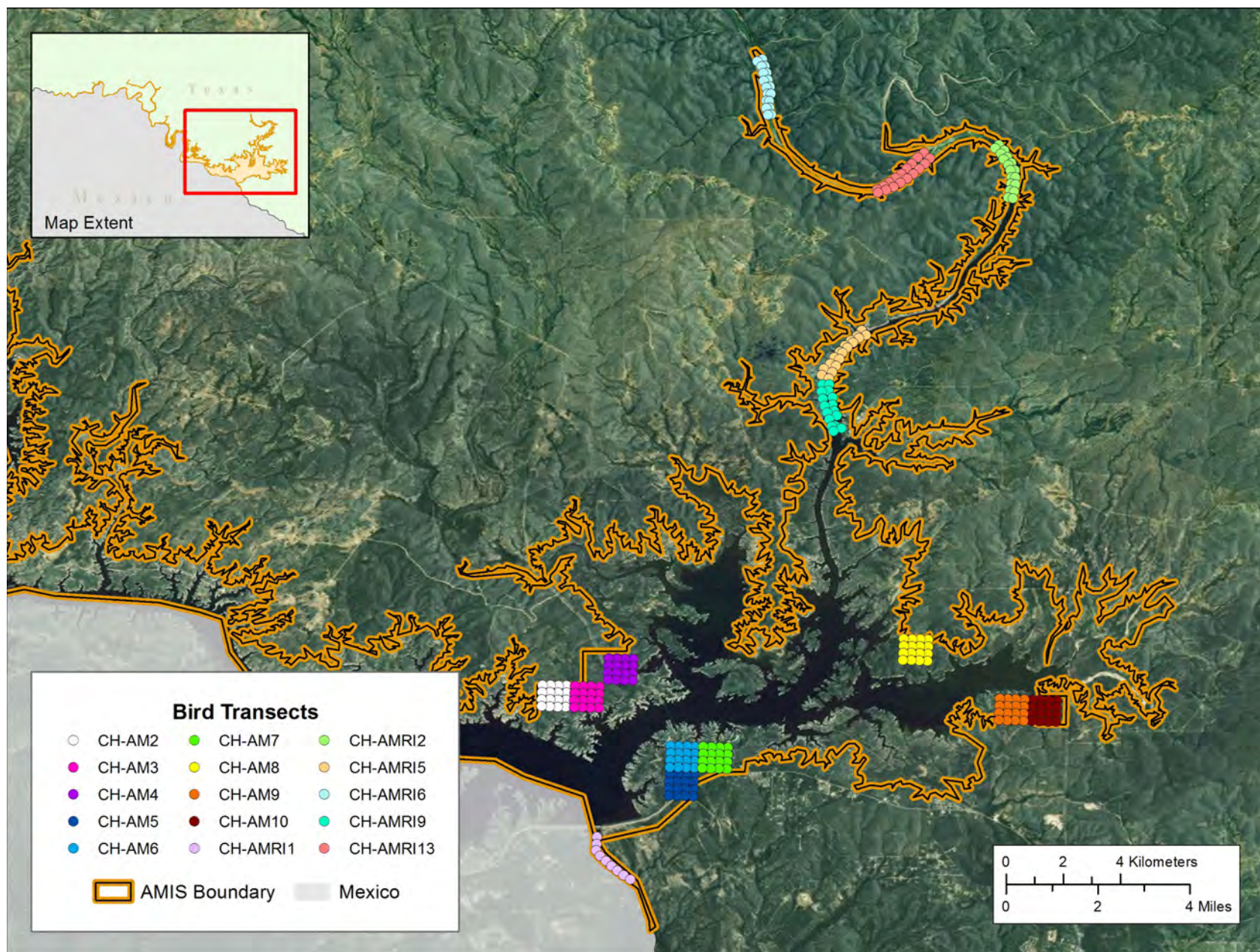


Figure 3.1.1-1. Point locations targeted for annual sampling at Amistad NRA, East.

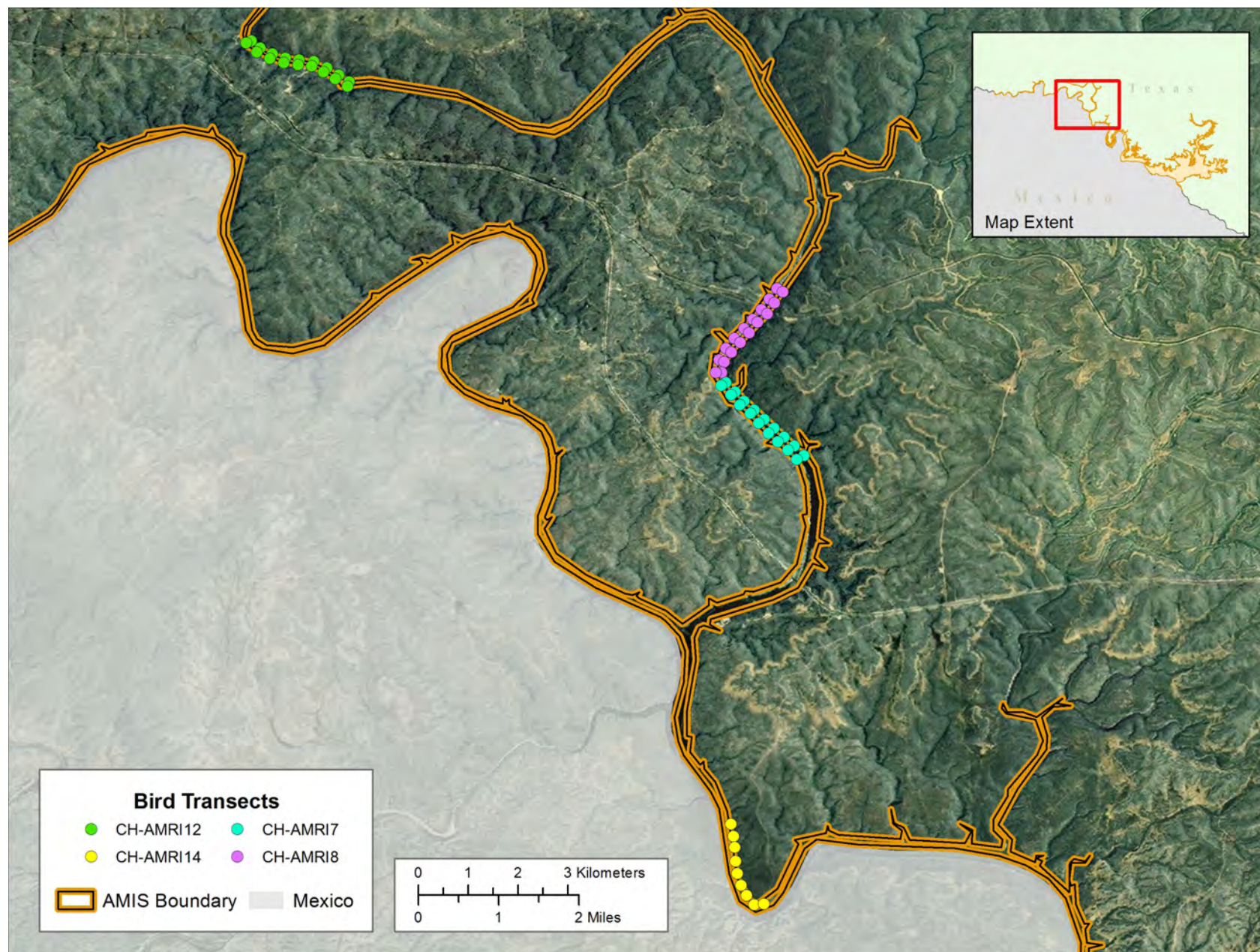


Figure 3.1.1-2. Point locations targeted for annual sampling at Amistad NRA, West.

Table 3.1.2 Number of birds counted of each species in each habitat class, Amistad NRA, 2014.

Species	Habitat class		# of birds counted	
	Grassland	Riparian	Total	% of total
Cliff Swallow	49	470	519	13
Northern Mockingbird	140	13	153	4
Cedar Waxwing	2	150	152	4
Black-throated Sparrow	141	8	149	4
Turkey Vulture	54	88	142	4
Red-winged Blackbird	31	100	131	3
Chipping Sparrow	92	32	124	3
Pyrrhuloxia	114	5	119	3
Bell's Vireo	58	48	106	3
Lark Sparrow	93	11	104	3
Northern Cardinal	48	53	101	3
Cactus Wren	84	9	93	2
White-winged Dove	48	40	88	2
Brown-headed Cowbird	59	23	82	2
Cassin's Sparrow	80	---	80	2
Ash-throated Flycatcher	51	25	76	2
Canyon Wren	---	71	71	2
Rufous-crowned Sparrow	61	4	65	2
Double-crested Cormorant	---	54	54	1
Scaled Quail	38	16	54	1
Verdin	38	7	45	1
Bewick's Wren	27	17	44	1
Mourning Dove	32	12	44	1
Barn Swallow	12	30	42	1
Bank Swallow	---	41	41	1
Killdeer	26	13	39	1
Eurasian Collared-dove	26	7	33	1
Vermilion Flycatcher	17	16	33	1
Black Vulture	12	20	32	1
Rock Wren	2	30	32	1
Summer Tanager	1	30	31	1
House Finch	12	18	30	1
Yellow-breasted Chat	1	27	28	1
Blue Grosbeak	19	8	27	1
Canyon Towhee	23	4	27	1
Yellow-rumped Warbler	2	24	26	1
Golden-fronted Woodpecker	4	21	25	1
Great Blue Heron	4	21	25	1
Clay-colored Sparrow	21	3	24	1
Northern Rough-winged Swallow	2	22	24	1
Orchard Oriole	14	8	22	1

Table 3.1.2. Number of birds counted of each species in each habitat class, Amistad NRA, 2014, cont.

Species	Habitat class		# of birds counted	
	Grassland	Riparian	Total	% of total
Brewer's Sparrow	17	4	21	1
White-crowned Sparrow	13	7	20	1
Great-tailed Grackle	8	10	18	0
Common Yellowthroat	---	14	14	0
White-throated Swift	---	14	14	0
House Wren	7	6	13	0
Carolina Wren	6	6	12	0
Curve-billed Thrasher	11	---	11	0
Painted Bunting	1	10	11	0
Western Kingbird	5	6	11	0
Black-chinned Hummingbird	---	10	10	0
Greater Yellowlegs	---	10	10	0
Say's Phoebe	3	7	10	0
Scott's Oriole	7	3	10	0
Blue-winged Teal	---	9	9	0
House Sparrow	---	9	9	0
Ladder-backed Woodpecker	7	2	9	0
Lincoln's Sparrow	1	8	9	0
Black-tailed Gnatcatcher	6	2	8	0
Hooded Oriole	1	6	7	0
Purple Martin	3	4	7	0
Spotted Sandpiper	---	7	7	0
Vesper Sparrow	4	3	7	0
Black Phoebe	---	6	6	0
Snowy Egret	---	6	6	0
Common Ground-dove	2	3	5	0
Common Raven	1	4	5	0
Field Sparrow	5	---	5	0
Lesser Nighthawk	5	---	5	0
Loggerhead Shrike	4	1	5	0
Red-tailed Hawk	---	5	5	0
Brewer's Blackbird	4	---	4	0
Bullock's Oriole	3	1	4	0
Mallard	---	4	4	0
Orange-crowned Warbler	2	2	4	0
Scissor-tailed Flycatcher	3	1	4	0
Brown Thrasher	---	3	3	0
Cave Swallow	---	3	3	0
Green-tailed Towhee	1	2	3	0
Lucy's Warbler	---	3	3	0

Table 3.1.2. Number of birds counted of each species in each habitat class, Amistad NRA, 2014, cont.

Species	Habitat class		# of birds counted	
	Grassland	Riparian	Total	% of total
Marsh Wren	---	3	3	0
Northern Shoveler	---	3	3	0
Olive Sparrow	1	2	3	0
Ruby-crowned Kinglet	2	1	3	0
Swainson's Hawk	1	2	3	0
American White Pelican	2	---	2	0
American Wigeon	---	2	2	0
Belted Kingfisher	1	1	2	0
Bufflehead	---	2	2	0
Canvasback	---	2	2	0
Cinnamon Teal	---	2	2	0
Couch's Kingbird	2	---	2	0
Gadwall	---	2	2	0
Greater Roadrunner	2	---	2	0
Northern Bobwhite	1	1	2	0
Osprey	---	2	2	0
Yellow Warbler	---	2	2	0
American Coot	---	1	1	0
American Goldfinch	---	1	1	0
American Kestrel	---	1	1	0
American Pipit	---	1	1	0
Blue-gray Gnatcatcher	1	---	1	0
Caspian Tern	1	---	1	0
Chihuahuan Raven	---	1	1	0
Chimney Swift	---	1	1	0
Crested Caracara	1	---	1	0
Great Egret	---	1	1	0
Green Kingfisher	---	1	1	0
Lesser Goldfinch	---	1	1	0
Macgillivray's Warbler	---	1	1	0
Myrtle Warbler	1	---	1	0
Neotropic Cormorant	---	1	1	0
Ring-billed Gull	---	1	1	0
Ring-necked Pheasant	1	---	1	0
Ruddy Duck	---	1	1	0
Solitary Sandpiper	---	1	1	0
Spotted Towhee	---	1	1	0
White-faced Ibis	---	1	1	0
Wilson's Warbler	---	1	1	0
<i>Unidentified Swallow</i>	<i>50</i>	<i>227</i>	<i>277</i>	<i>7</i>
<i>Unidentified Bird</i>	<i>36</i>	<i>36</i>	<i>72</i>	<i>2</i>

Table 3.1.2. Number of birds counted of each species in each habitat class, Amistad NRA, 2014, cont.

Species	Habitat class		# of birds counted	
	Grassland	Riparian	Total	% of total
<i>Unidentified Blackbird</i>	50	---	50	1
<i>Unidentified Sparrow</i>	23	10	33	1
<i>Unidentified Duck</i>	---	11	11	0
<i>Unidentified Vireo</i>	---	7	7	0
<i>Unidentified Hummingbird</i>	---	5	5	0
<i>Unidentified Raven</i>	4	1	5	0
<i>Unidentified Dove</i>	3	---	3	0
<i>Unidentified Gull</i>	2	---	2	0
<i>Unidentified Raptor</i>	2	---	2	0
<i>Unidentified Oriole</i>	1	---	1	0
Grand Total	1,855	2,141	3,996	100

Note: New species that have not previously been verified for the park are shown in bold and shaded. Species are listed in rank order from those counted in the highest numbers to those counted in the lowest numbers. 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 exclude observations of species flying overhead and not using the habitat.

3.2 Big Bend National Park

3.2.1 2014 sampling

During April of 2014, we sampled 30 transects/grids at Big Bend NP (Figures 3.2.1-1 to 3.2.1-3). We conducted 289 point counts on 20 grids in grassland habitat and 78 point counts on 10 transects in riparian habitat (Table 3.2.1), for a total of 367 point counts at the park. Each point was surveyed one time in 2014.

3.2.2 Results

During 2014, 3,378 birds of 97 species were counted at Big Bend NP (Table 3.2.2). Black-throated Sparrow had the highest number of individuals counted (9% of the total number of birds counted). The species was observed primarily in grassland habitat. Species observed in the next highest numbers were Cactus Wren (7%), Turkey Vulture (7%), Mourning Dove (6%), Ash-throated Flycatcher (5%), and Pyrrhuloxia (5%). No new species were recorded for the park during surveys, but Myrtle Warbler, a subspecies of Yellow-rumped Warbler, was recorded for the first time.

3.2.3 Field Observations

Four field crew sampled the 30 transects within the first week and a half of April, simultaneously surveying in two teams in the northern and southern sections of the park. This was efficient for the timing of the surveys and for field safety, especially along the Rio Grande where security was a concern this year. Drought conditions continued and, with poor winter rains, the park was very dry. A few days of very chilly mornings and windy conditions did not affect the survey schedule, and all transects were completed on time.

The 20 grassland transects were characterized by high numbers of territorial and breeding common desert residents, such as Black-throated Sparrow, Verdin, Cactus Wren, Mourning Dove, Scaled Quail, and Northern Mockingbird, alongside numerous migrant breeders including White-winged Dove, Ash-throated Flycatcher, and Scott's Oriole. Wintering species diversity was high, although overall numbers were low,



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Mourning Dove (*Zenaida macroura*) was among the top four species recorded in the highest numbers at Big Bend NP in 2014.

and included White-crowned Sparrow, Chipping Sparrow, Brewer's Sparrow, Vesper Sparrow, Lark Sparrow, Lark Bunting, and Green-tailed Towhee. Desert washes with limited xeroriparian vegetation hosted a few migrants whose diversity and numbers were also low; these included Lazuli Bunting, Wilson's Warbler, Orange-crowned Warbler, Western Tanager, and Black-headed Grosbeak.

The 10 riparian transects along the Rio Grande had an interesting mix of species, and although diversity and numbers seemed low, several notable uncommon species were recorded. These included Couch's Kingbird, Brown Thrasher, Carolina Wren, Lucifer Hummingbird, Dusky Flycatcher, Least Flycatcher, Cassin's Vireo, Inca Dove, American Pipit, and Gambel's Quail. Migrating kettles of Turkey Vultures and Black Vultures were common, with occasional Swainson's Hawk, Cooper's Hawk, Red-tailed Hawk, and Osprey present. The common riparian species were Lucy's Warbler, Common Ground-Dove, Cave Swallow, White-winged Dove, Bell's Vireo, Northern Cardinal, Marsh Wren, and Eurasian Collared-Dove. In contrast, overall numbers of Gray Hawk, Yellow-breasted Chat, Yellow Warbler, Golden-fronted Woodpecker, Bewick's Wren, and Black-chinned Hummingbird seemed quite low, as they are regular breeders.

Table 3.2.1. Habitat class, number of points, and sampling dates for each transect or grid at Big Bend NP, 2014

Transect/Grid	Habitat class	# points	# visits	Visit Date
CH-BB1	Grassland	15	1	4/5/2014
CH-BB2	Grassland	15	1	4/3/2014
CH-BB3	Grassland	16	1	4/7/2014
CH-BB4	Grassland	6	1	4/8/2014
CH-BB5	Grassland	16	1	4/9/2014
CH-BB6	Grassland	14	1	4/3/2014
CH-BB7	Grassland	15	1	4/6/2014
CH-BB8	Grassland	13	1	4/2/2014
CH-BB9	Grassland	12	1	4/9/2014
CH-BB10	Grassland	16	1	4/6/2014
CH-BB11	Grassland	16	1	4/5/2014
CH-BB12	Grassland	15	1	4/4/2014
CH-BB13	Grassland	16	1	4/4/2014
CH-BB14	Grassland	16	1	4/7/2014
CH-BB15	Grassland	16	1	4/8/2014
CH-BB16	Grassland	14	1	4/2/2014
CH-BB17	Grassland	14	1	4/8/2014
CH-BB18	Grassland	12	1	4/4/2014
CH-BB19	Grassland	16	1	4/5/2014
CH-BB20	Grassland	16	1	4/2/2014
CH-BIRI1	Riparian	9	1	4/6/2014
CH-BIRI2	Riparian	8	1	4/4/2014
CH-BIRI3	Riparian	6	1	4/2/2014
CH-BIRI5	Riparian	8	1	4/3/2014
CH-BIRI6	Riparian	6	1	4/6/2014
CH-BIRI8	Riparian	11	1	4/8/2014
CH-BIRI9	Riparian	4	1	4/5/2014
CH-BIRI14	Riparian	8	1	4/7/2014
CH-BIRI16	Riparian	8	1	4/7/2014
CH-BIRI17	Riparian	10	1	4/3/2014

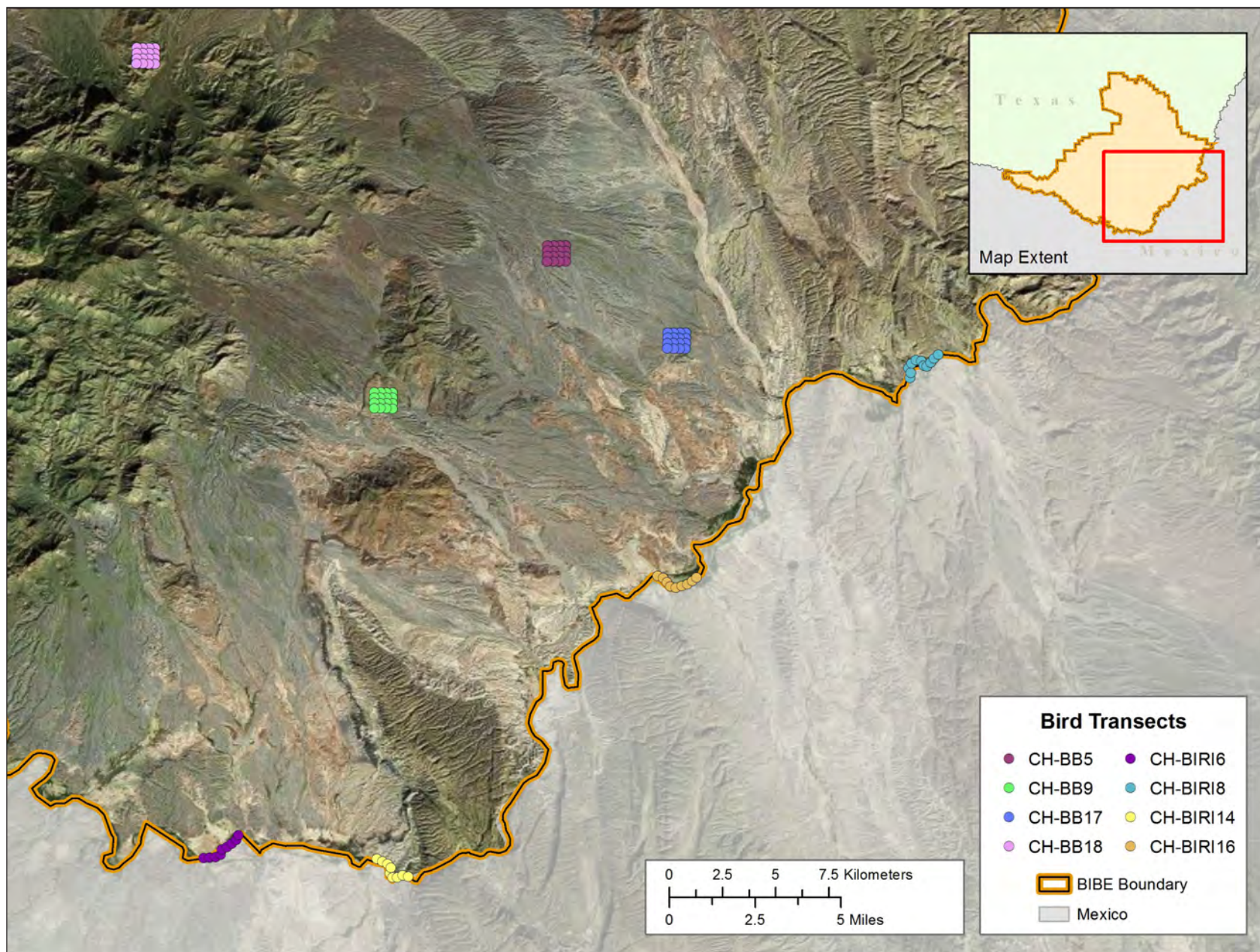


Figure 3.2.1-1. Point locations targeted for annual sampling at Big Bend NP, East.

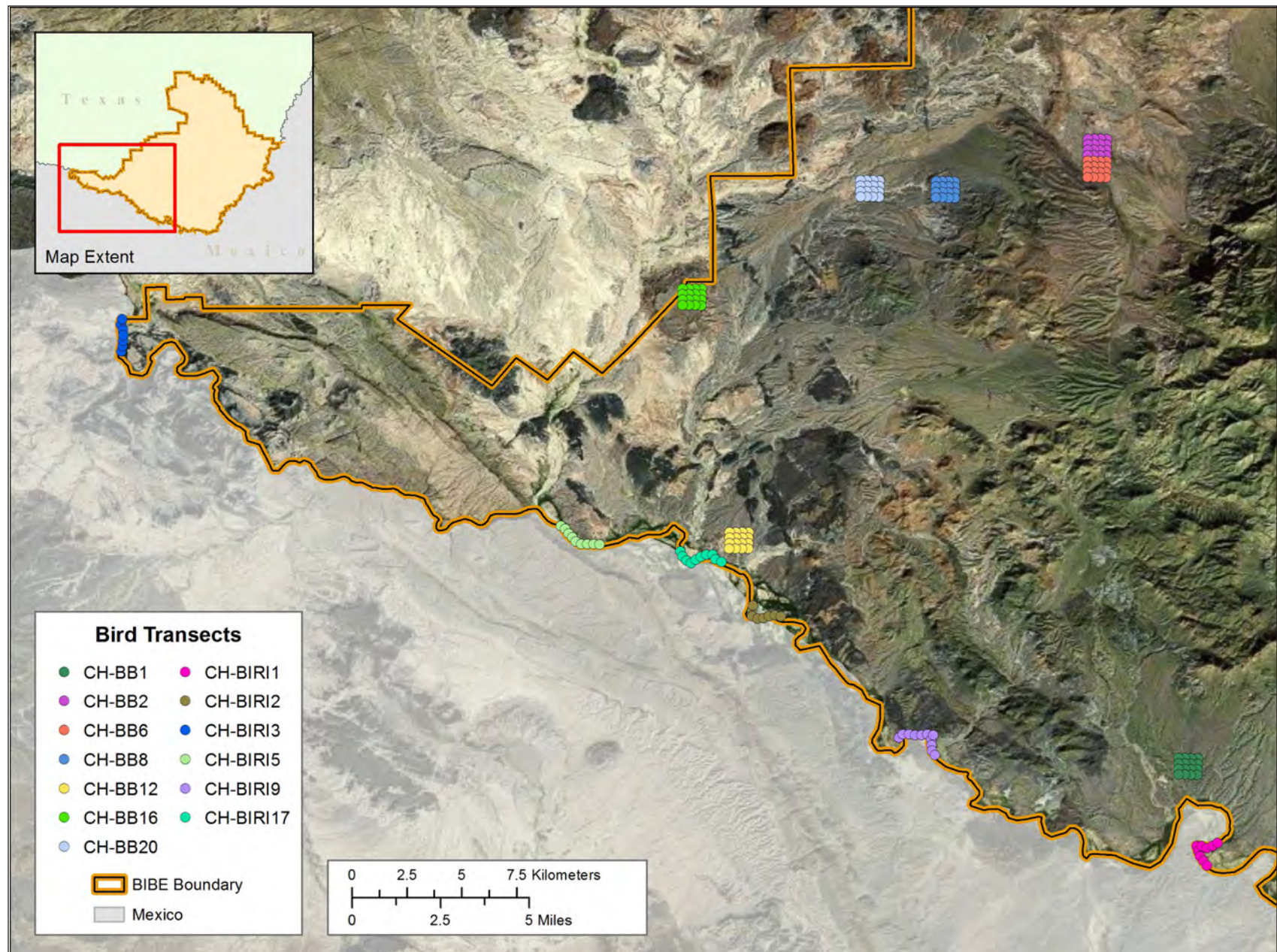


Figure 3.2.1-2. Point locations targeted for annual sampling at Big Bend NP, West.

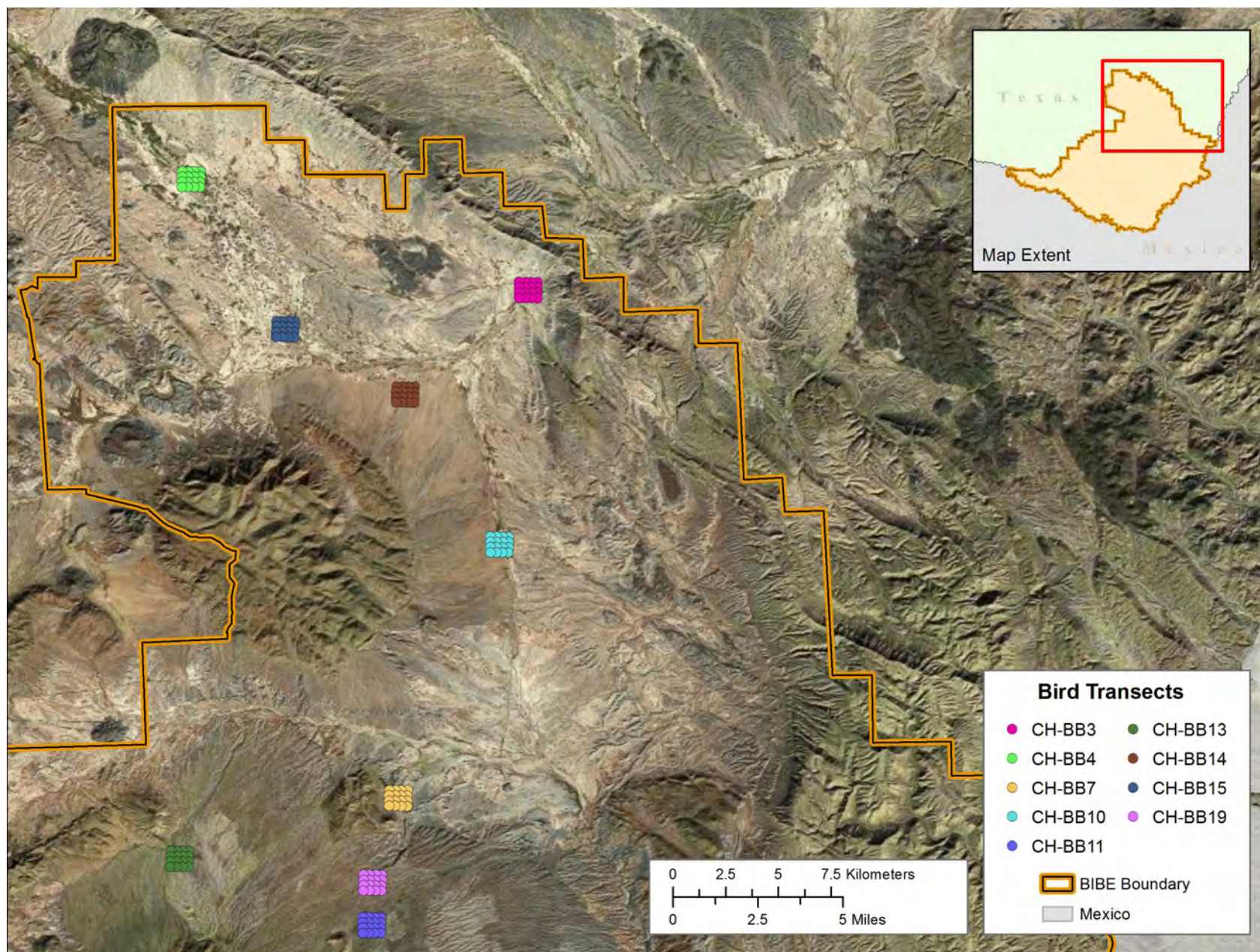


Figure 3.2.1-3. Point locations targeted for annual sampling at Big Bend NP, North.

Table 3.2.2. Number of birds counted of each species in each habitat class, Big Bend NP, 2014

Species	Habitat class		# of birds counted	
	Grassland	Riparian	Total	% of total
Black-throated Sparrow	301	15	316	9
Cactus Wren	241	---	241	7
Turkey Vulture	185	36	221	7
Mourning Dove	130	66	196	6
Ash-throated Flycatcher	119	48	167	5
Pyrrhuloxia	149	10	159	5
Northern Mockingbird	121	12	133	4
White-winged Dove	42	84	126	4
House Finch	106	19	125	4
Bell's Vireo	45	74	119	4
Rock Wren	91	12	103	3
Yellow-rumped Warbler	18	72	90	3
Brewer's Sparrow	61	16	77	2
Scaled Quail	73	---	73	2
Black-tailed Gnatcatcher	63	8	71	2
Greater Roadrunner	60	8	68	2
White-crowned Sparrow	33	35	68	2
Northern Cardinal	---	67	67	2
Canyon Towhee	55	6	61	2
Verdin	47	5	52	2
Blue-gray Gnatcatcher	44	6	50	1
Scott's Oriole	42	1	43	1
Cave Swallow	---	39	39	1
Curve-billed Thrasher	37	---	37	1
Loggerhead Shrike	31	---	31	1
Chihuahuan Raven	29	1	30	1
Green-tailed Towhee	30	---	30	1
Black Vulture	25	4	29	1
Say's Phoebe	18	6	24	1
Lucy's Warbler	---	23	23	1
Common Raven	19	2	21	1
Common Ground-dove	---	20	20	1
Eurasian Collared-dove	---	20	20	1
Marsh Wren	---	19	19	1
Ladder-backed Woodpecker	9	8	17	1
Lark Bunting	17	---	17	1
Black Phoebe	---	15	15	0
Common Yellowthroat	---	14	14	0
Lesser Goldfinch	2	10	12	0
Northern Rough-winged Swallow	---	12	12	0
American Goldfinch	---	11	11	0

Table 3.2.2. Number of birds counted of each species in each habitat class, Big Bend NP, 2014, cont.

Species	Habitat class		# of birds counted	
	Grassland	Riparian	Total	% of total
Lincoln's Sparrow	---	11	11	0
Canyon Wren	3	6	9	0
Northern Harrier	8	---	8	0
Northern Shoveler	---	8	8	0
Vermilion Flycatcher	---	8	8	0
Black-chinned Hummingbird	---	7	7	0
American Pipit	---	6	6	0
Chipping Sparrow	6	---	6	0
Vesper Sparrow	5	1	6	0
Belted Kingfisher	---	5	5	0
Killdeer	---	5	5	0
Rufous-crowned Sparrow	5	---	5	0
Summer Tanager	---	5	5	0
Crissal Thrasher	4	---	4	0
Gadwall	---	4	4	0
Orange-crowned Warbler	1	3	4	0
American Coot	---	3	3	0
Bewick's Wren	3	---	3	0
Carolina Wren	---	3	3	0
Cliff Swallow	---	3	3	0
Golden-fronted Woodpecker	---	3	3	0
Great Blue Heron	---	3	3	0
Great Horned Owl	1	2	3	0
Lark Sparrow	---	3	3	0
Red-tailed Hawk	3	---	3	0
Ruby-crowned Kinglet	1	2	3	0
Western Kingbird	3	---	3	0
Wilson's Warbler	---	3	3	0
Blue-winged Teal	---	2	2	0
Brown-crested Flycatcher	---	2	2	0
Brown-headed Cowbird	1	1	2	0
Gambel's Quail	---	2	2	0
Great-tailed Grackle	---	2	2	0
House Wren	---	2	2	0
Lazuli Bunting	2	---	2	0
Mallard	---	2	2	0
Nashville Warbler	---	2	2	0
Red-winged Blackbird	---	2	2	0
Swainson's Hawk	2	---	2	0
Yellow-breasted Chat	---	2	2	0
Brown Thrasher	---	1	1	0

Table 3.2.2. Number of birds counted of each species in each habitat class, Big Bend NP, 2014, cont.

Species	Habitat class		# of birds counted	
	Grassland	Riparian	Total	% of total
Common Poorwill	1	---	1	0
Cooper's Hawk	1	---	1	0
Dusky Flycatcher	---	1	1	0
Gray Hawk	---	1	1	0
Inca Dove	---	1	1	0
Least Flycatcher	---	1	1	0
Least Sandpiper	---	1	1	0
Lesser Nighthawk	1	---	1	0
Lucifer Hummingbird	---	1	1	0
Osprey	---	1	1	0
Ring-necked Duck	---	1	1	0
Savannah Sparrow	---	1	1	0
Spotted Sandpiper	---	1	1	0
Violet-green Swallow	---	1	1	0
Yellow Warbler	---	1	1	0
Unidentified Bird	72	5	77	2
Unidentified Swallow	---	37	37	1
Unidentified Raven	11	---	11	0
Unidentified Sparrow	9	1	10	0
Unidentified Raptor	8	---	8	0
Unidentified Flycatcher	3	---	3	0
Unidentified Hummingbird	3	---	3	0
Unidentified Warbler	---	2	2	0
Unidentified Dove	1	---	1	0
Unidentified Meadowlark	1	---	1	0
Unidentified Woodpecker	1	---	1	0
Total	2,403	975	3,378	100

Note: New species that have not previously been verified for the park are shown in bold and shaded. Species are listed in rank order from those counted in the highest numbers to those counted in the lowest numbers. 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 exclude observations of species flying overhead and not using the habitat.

3.3 Carlsbad Caverns National Park

3.3.1 2014 sampling

During late April and May of 2014, we sampled nine transects/grids at Carlsbad Caverns NP (Figure 3.3.1). We conducted 85 point counts on eight grids in grassland habitat and 15 point counts on one transect in riparian habitat (Table 3.3.1). The grassland grids were visited once in 2014, but the riparian transect, along the drainage of Rattlesnake Springs, was visited twice. We conducted a total of 100 point counts at the park.

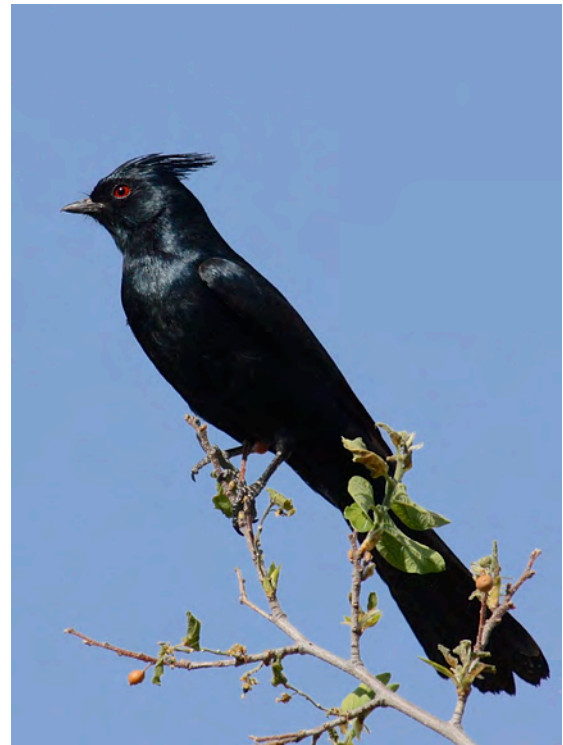
3.3.2 Results

During 2014, 802 birds of 68 species were counted at Carlsbad Caverns NP (Table 3.3.2). Scaled Quail (10%) had the highest number of individuals counted (10% of the total number of birds counted). The next species observed in relatively high numbers were Black-throated Sparrow (9%), Northern Mockingbird (9%), Cave Swallow (7%), Cassin's Sparrow (6%), and Turkey Vulture (6%). No new species were recorded for the park during the surveys. However, Streak-backed Oriole was documented by the park biologist at the same time as the surveys (see the last paragraph of Section 3.3.3).

3.3.3 Field Observations

Two field crew surveyed the nine transects within a week, with one person completing the bulk of the surveys alone. A few days of windy weather did not affect the survey schedule, and all transects were completed without rescheduling.

The eight upland transects with their varied habitats hosted good numbers of resident breeder Scaled Quail, Black-throated Sparrow, Northern Mockingbird, Rufous-crowned Sparrow, and House Finch, most observed nesting or with young. Migrant breeders, such as Ash-throated Flycatcher and Cassin's Sparrow, were also numerous, but overall migrants were scarce, with MacGillivray's the most common, and Western Tanager, Black-headed Grosbeak, Dusky Flycatcher, Wilson's Warbler, and Broad-tailed Hummingbird recorded in very low numbers. Numbers of wintering sparrows and finches were also quite low, but interesting upland species included Townsend's Solitaire, Phainopepla, and



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Phainopepla (*Phainopepla nitens*) was one of the species recorded in upland habitat at Carlsbad Caverns NP in 2014.

Loggerhead Shrike. The traditional Cave Swallow colony had dozens of active nests, and the impressive dawn emergence flights were still regular.

The riparian transect at Rattlesnake Springs was the most productive, with good diversity and numbers of breeders and migrants congregating in the varied habitats. Common species included Bell's Vireo, Brown-headed Cowbird, Summer Tanager, Yellow-breasted Chat, and Vermilion Flycatcher, with Painted Bunting, Lucy's Warbler and Orchard Oriole present in fewer numbers. Notable uncommon species included Cassin's Vireo, Northern Shoveler, Snowy Egret, Northern Bobwhite, White-eyed Vireo, Wild Turkey, and Myrtle Warbler – a first for the park. A Short-eared Owl was a rare incidental sighting, but much more exciting was a Streak-backed Oriole, a vagrant from Mexico, that had been present for several weeks and was well-documented by the park biologist. It was still present while the surveys were ongoing, and although the field crew did not record it on the surveys or as an incidental, it is a new species for the park.

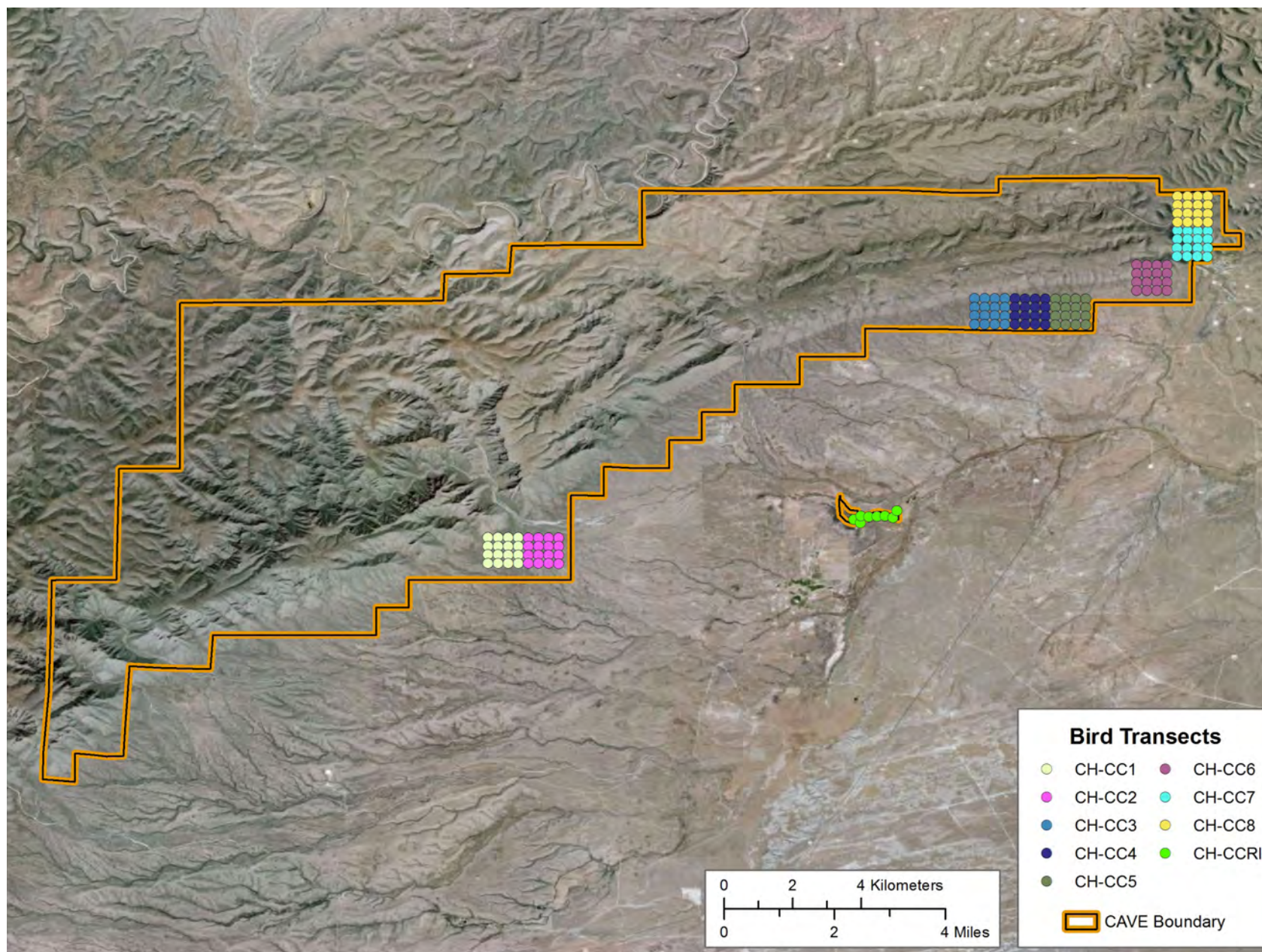


Figure 3.3.1. Point locations targeted for annual sampling at Carlsbad Caverns NP.

Table 3.3.1. Habitat class, number of points, and sampling dates for each transect or grid at Carlsbad Caverns NP, 2014

Transect/Grid	Habitat class	# points	# visits	Visit 1	Visit 2
CH-CC1	Grassland	10	1	5/6/2014	--
CH-CC2	Grassland	10	1	5/7/2014	--
CH-CC3	Grassland	10	1	5/8/2014	--
CH-CC4	Grassland	10	1	5/9/2014	--
CH-CC5	Grassland	11	1	5/10/2014	--
CH-CC6	Grassland	8	1	5/11/2014	--
CH-CC7	Grassland	10	1	5/6/2014	--
CH-CC8	Grassland	16	1	5/7/2014	--
CH-CCRI	Riparian	15 ¹	2	4/28/2014	5/13/2014

¹ A total of 15 points were sampled- 8 on Visit 1 and 7 on Visit 2.

Table 3.3.2. Number of birds counted of each species in each habitat class, Carlsbad Caverns NP, 2014

Species	Habitat class		# of birds counted	
	Grassland	Riparian	Total	% of total
Scaled Quail	82	---	82	10
Black-throated Sparrow	75	---	75	9
Northern Mockingbird	64	5	69	9
Cave Swallow	60	---	60	7
Cassin's Sparrow	51	---	51	6
Turkey Vulture	46	5	51	6
Ash-throated Flycatcher	29	6	35	4
Rufous-crowned Sparrow	34	---	34	4
Brown-headed Cowbird	8	19	27	3
House Finch	23	3	26	3
Mourning Dove	17	7	24	3
Lark Sparrow	20	---	20	2
Yellow-rumped Warbler	12	2	14	2
Green-tailed Towhee	12	1	13	2
Summer Tanager	---	13	13	2
Bell's Vireo	---	9	9	1
Brewer's Sparrow	8	1	9	1
Wild Turkey	---	9	9	1
Canyon Towhee	8	---	8	1
Macgillivray's Warbler	8	---	8	1
White-winged Dove	---	8	8	1
Wilson's Warbler	2	6	8	1

Table 3.3.2. Number of birds counted of each species in each habitat class, Carlsbad Caverns NP, 2014, cont.

Species	Habitat class		# of birds counted	
	Grassland	Riparian	Total	% of total
Yellow-breasted Chat	---	8	8	1
Blue Grosbeak	7	---	7	1
Canyon Wren	7	---	7	1
Rock Wren	7	---	7	1
Chipping Sparrow	3	3	6	1
House Wren	6	---	6	1
Northern Cardinal	---	6	6	1
Vermilion Flycatcher	---	6	6	1
Western Kingbird	5	1	6	1
White-crowned Sparrow	5	1	6	1
Cassin's Kingbird	---	4	4	0
Common Yellowthroat	---	4	4	0
Scott's Oriole	4	---	4	0
American Goldfinch	---	3	3	0
Bewick's Wren	3	---	3	0
Eurasian Collared-dove	---	3	3	0
Greater Roadrunner	3	---	3	0
Ladder-backed Woodpecker	2	1	3	0
Say's Phoebe	3	---	3	0
Barn Swallow	---	2	2	0
Black Phoebe	---	2	2	0
Black-chinned Hummingbird	---	2	2	0
Black-headed Grosbeak	2	---	2	0
Cactus Wren	2	---	2	0
Gray Flycatcher	2	---	2	0
Lesser Nighthawk	2	---	2	0
Lucy's Warbler	---	2	2	0
Painted Bunting	---	2	2	0
Pyrrhuloxia	2	---	2	0
Broad-tailed Hummingbird	1	---	1	0
Dusky Flycatcher	1	---	1	0
Hooded Oriole	---	1	1	0
Killdeer	1	---	1	0
Lazuli Bunting	---	1	1	0
Lesser Goldfinch	1	---	1	0
Loggerhead Shrike	1	---	1	0
Northern Bobwhite	---	1	1	0
Orchard Oriole	---	1	1	0
Phainopepla	1	---	1	0
Pine Siskin	---	1	1	0
Red-winged Blackbird	---	1	1	0

Table 3.3.2. Number of birds counted of each species in each habitat class, Carlsbad Caverns NP, 2014, cont.

Species	Habitat class		# of birds counted	
	Grassland	Riparian	Total	% of total
Ruby-crowned Kinglet	1	---	1	0
Townsend's Solitaire	1	---	1	0
Tree Swallow	---	1	1	0
Vesper Sparrow	1	---	1	0
Western Tanager	1	---	1	0
Streak-backed Oriole (incidental) ¹	---	---	---	---
<i>Unidentified Sparrow</i>	10	---	10	1
<i>Unidentified Bird</i>	3	2	5	1
<i>Unidentified Egrets</i>	---	1	1	0
<i>Unidentified Wren</i>	---	1	1	0
Total	647	155	802	100

Note: New species that have not previously been verified for the park are shown in bold and shaded. Species are listed in rank order from those counted in the highest numbers to those counted in the lowest numbers. 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 exclude observations of species flying overhead and not using the habitat.

¹ This species was not detected during surveys or by the survey crew incidental to surveys. It was observed and documented by the park biologist.

3.4 Fort Davis National Historic Site

3.4.1 2014 sampling

During April of 2014, we sampled one grid at Fort Davis NHS (Figure 3.4.1) twice (visits were 15 days apart); we conducted a total of 45 point counts in the park (Table 3.4.1).

3.4.2 Results

During 2014, 514 birds of 53 species were counted at Fort Davis NHS (Table 3.4.2). Canyon Wren had the highest number of individuals counted (8% of the total number of birds counted). The next species observed in the highest numbers were White-winged Dove (8%), Turkey Vulture (8%), Rock Wren (7%), Black-crested Titmouse (6%), and Canyon Towhee (5%). No new species were recorded for the park in 2014.

3.4.3 Field Observations

Four field crew in two teams surveyed the one grassland transect on two dates, splitting the 26 points into two manageable sections given the challenging terrain and vegetation of the steep, rugged hills. This approach allowed for a safe and timely route for repeat surveys of the com-

bination of points distributed over both flat and rugged terrain. Moderate winds did not affect the survey schedule, and the transect was completed on both dates without any rescheduling.

Common breeders were quite numerous, especially desert resident species of the hilly and wooded grassland habitat, such as Black-crested Titmouse, Canyon Wren, Black-throated Sparrow, Rock Wren, and Canyon Towhee. Notable low-density species of this habitat included Montezuma Quail, Acorn Woodpecker, Plumbeous Vireo, and Black-chinned Sparrow. Low numbers of several migrants were noted, such as Violet-green Swallow, American Goldfinch, Broad-tailed Hummingbird, and Wilson's Warbler. Wintering species were also scarce, with very few White-crowned Sparrow, Brewer's Sparrow, Green-tailed Towhee, Ruby-crowned Kinglet, and Yellow-rumped Warbler recorded.

The park's location adjacent to urban zones with ornamental plantings, deciduous trees, irrigation, and open areas attracts a wide variety of interesting species notable for the park bird list. These include Rock Pigeon, Eurasian Collared-Dove, European Starling, House Sparrow, Great-tailed Grackle, and Cooper's Hawk.



Scott's Oriole (*Icterus parisorum*) was observed in low numbers at Fort Davis NHS during 2014 surveys.

Table 3.4.1. Habitat class, number of points, and sampling dates for the grid at Fort Davis NHS, 2014

Transect/Grid	Habitat class	# points	# visits	Visit 1	Visit 2
CH-FODA	Grassland	45 ¹	2	4/9/2014	4/24/2014

¹ A total of 45 points were sampled- 23 on Visit 1 and 22 on Visit 2.

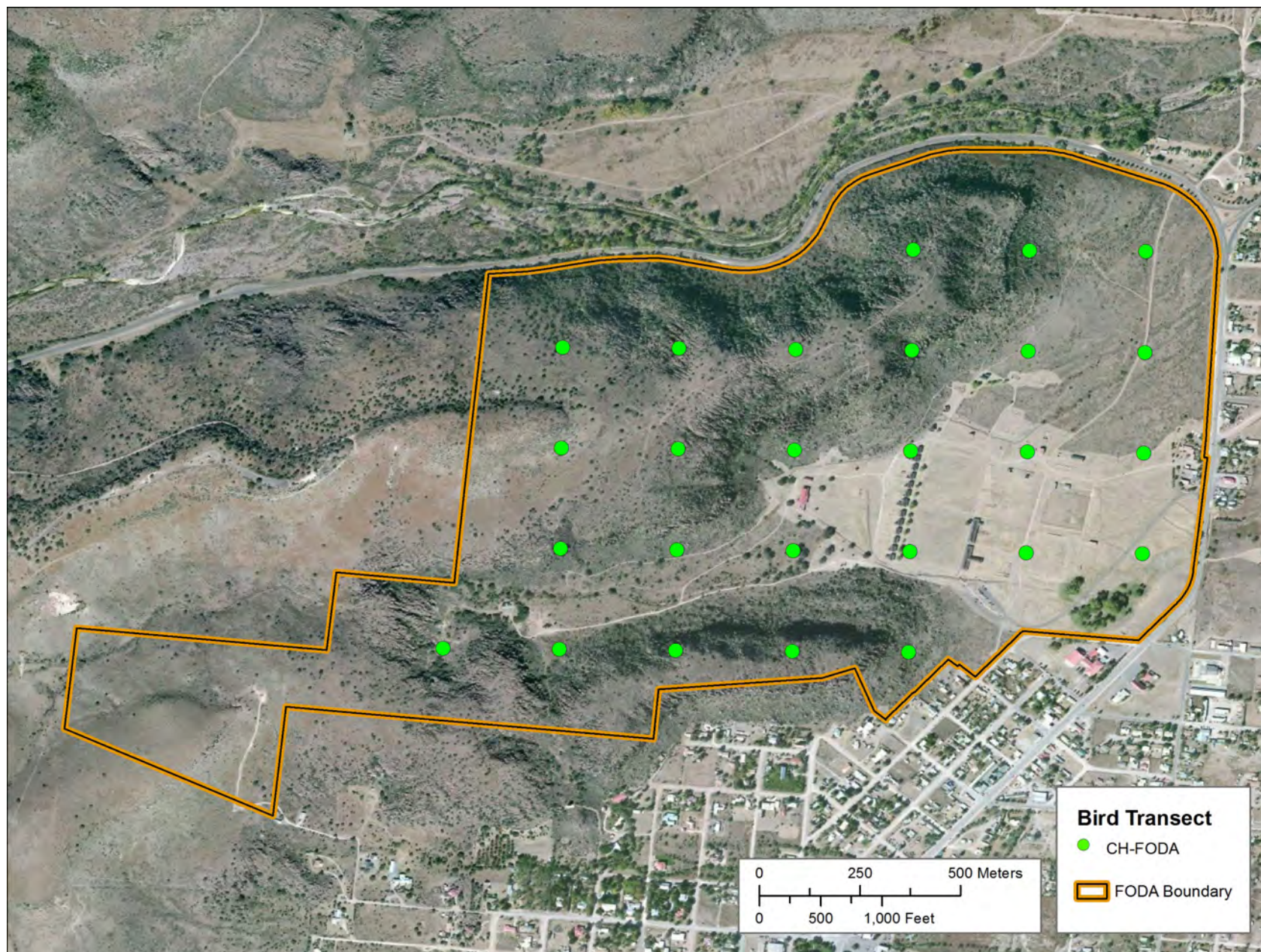


Figure 3.4.1. Point locations targeted for annual sampling at Fort Davis NHS.

Table 3.4.2. Number of birds counted of each species in each habitat class, Fort Davis NHS, 2014

Species	# of birds counted		Species	# of birds counted	
	Total (grassland)	% of total		Total (grassland)	% of total
Canyon Wren	43	8	Red-tailed Hawk	3	1
White-winged Dove	43	8	American Goldfinch	2	0
Turkey Vulture	39	8	Black-chinned Sparrow	2	0
Rock Wren	38	7	Black-tailed Gnatcatcher	2	0
Black-crested Titmouse	29	6	Blue-gray Gnatcatcher	2	0
Canyon Towhee	28	5	Cassin's Sparrow	2	0
Black-throated Sparrow	26	5	Green-tailed Towhee	2	0
Chipping Sparrow	26	5	Lesser Goldfinch	2	0
Mourning Dove	22	4	Ruby-crowned Kinglet	2	0
Eurasian Collared-dove	18	4	Scott's Oriole	2	0
Ash-throated Flycatcher	14	3	Violet-green Swallow	2	0
House Finch	13	3	Wilson's Warbler	2	0
Black-chinned Hummingbird	11	2	Acorn Woodpecker	1	0
Rufous-crowned Sparrow	11	2	Broad-tailed Hummingbird	1	0
Lark Sparrow	9	2	Cooper's Hawk	1	0
Cassin's Kingbird	8	2	Phainopepla	1	0
Barn Swallow	7	1	Plumbeous Vireo	1	0
Bewick's Wren	7	1	Summer Tanager	1	0
House Sparrow	7	1	Vermilion Flycatcher	1	0
Ladder-backed Woodpecker	7	1	<i>Unidentified Dove</i>	<i>1</i>	<i>0</i>
Bushtit	6	1	<i>Unidentified Hummingbird</i>	<i>8</i>	<i>2</i>
Say's Phoebe	6	1	<i>Unidentified Bird</i>	<i>6</i>	<i>1</i>
Yellow-rumped Warbler	6	1	<i>Unidentified Vireo</i>	<i>2</i>	<i>0</i>
Cactus Wren	5	1	<i>Unidentified Raptor</i>	<i>1</i>	<i>0</i>
Chihuahuan Raven	5	1	<i>Unidentified Sparrow</i>	<i>1</i>	<i>0</i>
Northern Cardinal	5	1	Total	514	100
Northern Mockingbird	5	1			
Western Scrub-Jay	4	1			
Brewer's Blackbird	3	1			
Common Raven	3	1			
Curve-billed Thrasher	3	1			
Montezuma Quail	3	1			
Pyrrhuloxia	3	1			

Note: New species that have not previously been verified for the park are shown in bold and shaded. Species are listed in rank order from those counted in the highest numbers to those counted in the lowest numbers. 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 exclude observations of species flying overhead and not using the habitat.

3.5 Guadalupe Mountains National Park

3.5.1 2014 sampling

During April and May of 2014, we sampled a total of 11 transects/grids at Guadalupe Mountains NP (Figure 3.5.1). We conducted 139 point counts on 10 grids in grassland habitat and 32 point counts on one transect in riparian habitat (Table 3.5.1); we conducted a total of 171 point counts at the park in 2014. The grassland grids were surveyed once, whereas the riparian transect was surveyed twice.

3.5.2 Results

During 2014, 1,170 birds of 85 species were counted at Guadalupe Mountains NP (Table 3.5.2). Northern Mockingbird had the highest number of individuals counted (9% of the total number of birds counted). Other species counted in relatively high numbers included Black-throated Sparrow (8%), Ash-throated Flycatcher (7%), Brewer's Sparrow (6%), Mourning Dove (5%), and Scott's Oriole (5%). One new species for the park was recorded in 2014 (Painted Bunting). Additionally, Myrtle Warbler, a subspecies of Yellow-rumped Warbler, was recorded for the first time.

3.5.3 Field Observations

Two field crew surveyed the 11 transects within one week, with one person completing the bulk of the surveys alone. Both crew worked together for safety and efficiency in the rugged backcountry, as several of the transects were remote and challenging. Wind was quite a factor on some days and several points were canceled due to very strong gusts, which also accounted for very few detections. All of the surveys were completed on time and none were rescheduled.

The 10 grassland transects were a mix of rocky upland desert scrub at the base of the mountains and flat open sand dune grassland in the low valleys. Common resident, desert species represented in both areas were Northern Mockingbird, Black-throated Sparrow, Mourning Dove, Scaled Quail, House Finch, Cactus Wren, and Loggerhead Shrike, most noted with young. Migrant



UNKNOWN, YELLOWSTONE NP PHOTO COLLECTION

Nests of Cliff Swallow (*Petrochelidon pyrrhonota*), one of the species observed at Guadalupe Mountains NP in 2014.

breeders such as Ash-throated Flycatcher, Scott's Oriole, and Cassin's Sparrow were detected in high numbers, while common wintering species included White-crowned Sparrow, Brewer's Sparrow, Chipping Sparrow, Lark Sparrow, and Lark Bunting. Desert washes with xeroriparian vegetation and sheltered habitats yielded low diversity and numbers of migrants; these included Nashville Warbler, MacGillivray's Warbler, Dusky Flycatcher, Hermit Thrush, Common Yellowthroat, Wilson's Warbler, and, surprisingly, a Belted Kingfisher in a dry wash miles away from any water. A male Painted Bunting was equally out of place and a new species for the park.

The riparian transect at McKittrick Canyon is in a unique, higher-elevation habitat with a flowing creek and lush riparian and mixed woodland vegetation. It hosts a diverse bird community with several species not recorded on the upland transects. These include Grace's Warbler, Bewick's Wren, Bushtit, Cordilleran Flycatcher, Western Scrub-Jay, and White-breasted Nuthatch, to name a few. Summer breeders and migrants are plentiful alongside resident species, and notable sightings included a vagrant Red-eyed Vireo, rare Myrtle Warbler, uncommon American Goldfinch, and Townsend's Solitaire. Common breeding species were Black-headed Grosbeak, Plumbeous Vireo, Spotted Towhee, Western Tanager, Broad-tailed Hummingbird, and Canyon Wren.

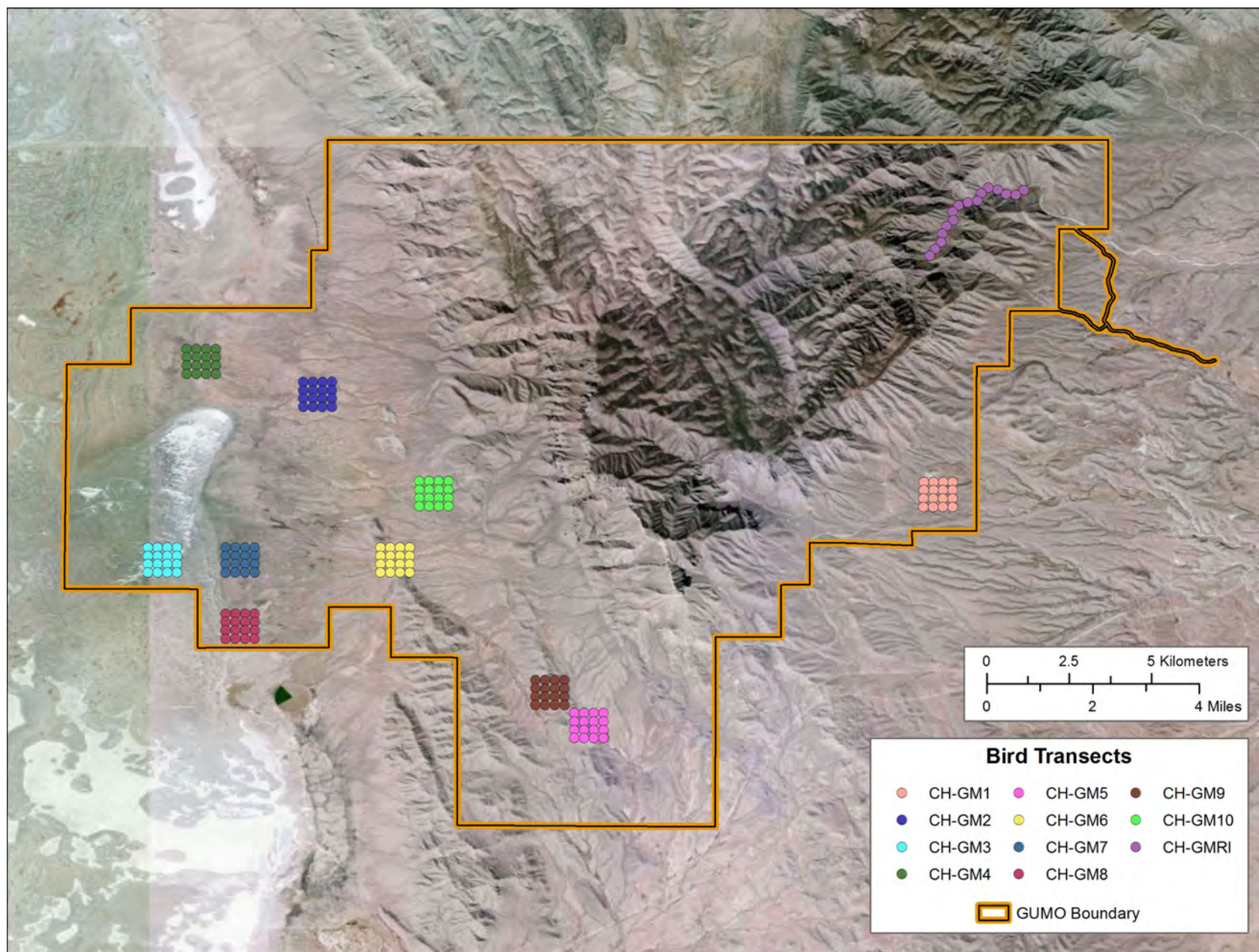


Figure 3.5.1. Point locations targeted for annual sampling at Guadalupe Mountains NP.

Table 3.5.1. Habitat class, number of points, and sampling dates for each transect or grid at Guadalupe Mountains NP, 2014

Transect/Grid	Habitat class	# points	# visits	Visit 1	Visit 2
CH-GM1	Grassland	13	1	4/26/2014	--
CH-GM2	Grassland	16	1	4/30/2014	--
CH-GM3	Grassland	7	1	5/1/2014	--
CH-GM4	Grassland	16	1	4/30/2014	--
CH-GM5	Grassland	13	1	4/29/2014	--
CH-GM6	Grassland	16	1	5/3/2014	--
CH-GM7	Grassland	16	1	5/5/2014	--
CH-GM8	Grassland	12	1	5/5/2014	--
CH-GM9	Grassland	14	1	4/29/2014	--
CH-GM10	Grassland	16	1	5/2/2014	--
CH-GMRI	Riparian	32 ¹	2	4/27/2014	5/12/2014

¹ A total of 32 points were sampled- 6 on each of the two visits.

Table 3.5.2. Number of birds counted of each species in each habitat class, Guadalupe Mountains NP, 2014

Species	Habitat class		# of birds counted	
	Grassland	Riparian	Total	% of total
Northern Mockingbird	109	1	110	9
Black-throated Sparrow	94	1	95	8
Ash-throated Flycatcher	64	15	79	7
Brewer's Sparrow	67	---	67	6
Mourning Dove	58	1	59	5
Scott's Oriole	54	1	55	5
Lark Bunting	46	---	46	4
Yellow-rumped Warbler	27	7	34	3
Chipping Sparrow	29	---	29	2
Scaled Quail	29	---	29	2
Cliff Swallow	25	---	25	2
Spotted Towhee	2	22	24	2
Cassin's Sparrow	23	---	23	2
Western Tanager	4	18	22	2
Turkey Vulture	19	2	21	2
White-crowned Sparrow	21	---	21	2
Green-tailed Towhee	20	---	20	2
Rock Wren	17	3	20	2
House Finch	18	1	19	2
Rufous-crowned Sparrow	10	9	19	2
Plumbeous Vireo	---	18	18	2
Violet-green Swallow	12	5	17	1

Table 3.5.2. Number of birds counted of each species in each habitat class, Guadalupe Mountains NP, 2014, cont.

Species	Habitat class		# of birds counted	
	Grassland	Riparian	Total	% of total
Western Kingbird	17	---	17	1
Broad-tailed Hummingbird	1	15	16	1
Cactus Wren	14	---	14	1
Verdin	13	---	13	1
Loggerhead Shrike	12	---	12	1
Pyrrhuloxia	11	---	11	1
Wilson's Warbler	4	7	11	1
Canyon Wren	---	10	10	1
Western Wood-Pewee	1	9	10	1
White-throated Swift	10	---	10	1
Lark Sparrow	9	---	9	1
Black-headed Grosbeak	---	8	8	1
Black-chinned Hummingbird	7	---	7	1
Blue-gray Gnatcatcher	3	4	7	1
Canyon Towhee	6	1	7	1
House Wren	4	3	7	1
Bewick's Wren	---	6	6	1
Brown-headed Cowbird	3	3	6	1
Cassin's Vireo	---	6	6	1
Ladder-backed Woodpecker	2	4	6	1
Nashville Warbler	6	---	6	1
Swainson's Hawk	5	---	5	0
Brewer's Blackbird	4	---	4	0
Bushtit	---	4	4	0
Cassin's Kingbird	1	3	4	0
Eastern Meadowlark	4	---	4	0
Lesser Nighthawk	4	---	4	0
Black Phoebe	---	3	3	0
Black-chinned Sparrow	---	3	3	0
Black-tailed Gnatcatcher	3	---	3	0
Crissal Thrasher	3	---	3	0
Grace's Warbler	---	3	3	0
Hermit Thrush	1	2	3	0
Say's Phoebe	3	---	3	0
Warbling Vireo	---	3	3	0
Blue Grosbeak	---	2	2	0
Chihuahuan Raven	2	---	2	0
Common Raven	2	---	2	0
Curve-billed Thrasher	2	---	2	0
Gray Flycatcher	1	1	2	0
Macgillivray's Warbler	2	---	2	0

Table 3.5.2. Number of birds counted of each species in each habitat class, Guadalupe Mountains NP, 2014, cont.

Species	Habitat class		# of birds counted	
	Grassland	Riparian	Total	% of total
Northern Harrier	2	---	2	0
Ruby-crowned Kinglet	---	2	2	0
Virginia's Warbler	---	2	2	0
White-breasted Nuthatch	---	2	2	0
White-winged Dove	---	2	2	0
Yellow-breasted Chat	---	2	2	0
American Goldfinch	---	1	1	0
American Kestrel	1	---	1	0
Barn Swallow	1	---	1	0
Belted Kingfisher	1	---	1	0
Bronzed Cowbird	1	---	1	0
Common Yellowthroat	1	---	1	0
Cordilleran Flycatcher	---	1	1	0
Dusky Flycatcher	1	---	1	0
Greater Roadrunner	1	---	1	0
Painted Bunting	1	---	1	0
Red-eyed Vireo	---	1	1	0
Red-tailed Hawk	1	---	1	0
Sharp-shinned Hawk	1	---	1	0
Townsend's Solitaire	---	1	1	0
Townsend's Warbler	---	1	1	0
Western Scrub-Jay	---	1	1	0
<i>Unidentified Sparrow</i>	6	5	11	1
<i>Unidentified Raven</i>	6	---	6	1
<i>Unidentified Bird</i>	3	2	5	0
<i>Unidentified Empidonax Flycatcher</i>	1	1	2	0
<i>Unidentified Swallow</i>	2	---	2	0
<i>Unidentified Hummingbird</i>	---	1	1	0
<i>Unidentified Kingbird</i>	---	1	1	0
<i>Unidentified Meadowlark</i>	1	---	1	0
<i>Unidentified Warbler</i>	---	1	1	0
Total	939	231	1,170	100

Note: New species that have not previously been verified for the park are shown in bold and shaded. Species are listed in rank order from those counted in the highest numbers to those counted in the lowest numbers. 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 exclude observations of species flying overhead and not using the habitat.

3.6 White Sands National Monument

3.6.1 2014 sampling

During May of 2014, we sampled 10 grids at White Sands NM (Figure 3.6.1). We conducted 160 point counts on 10 grids in grassland habitat (Table 3.6.1). Each point was surveyed once in 2014. As described below, we also conducted an area search of a cottonwood grove within the park to determine whether the area is used as a migrant stopover site.

3.6.2 Results

During 2014 surveys, 646 birds of 53 species were counted at White Sands NM (Table 3.6.2). Black-throated Sparrow had the highest number of individuals counted (22% of the total number of birds counted). The next species counted in the highest numbers were Northern Mockingbird (19%), Western Kingbird (5%), Mourning Dove (5%), Horned Lark (5%), and Ash-throated Flycatcher (4%). One new species was recorded during surveys in the park in 2014 (Northern Cardinal), and two new species were recorded during the area search (Tennessee Warbler and Steller's Jay).

3.6.3 Field Observations

Three field crew surveyed the 10 transects on a coordinated schedule to complete the 2014 field sampling season right on time. Despite missile testing closures and refining of field planning with the park staff escorts, all surveys were completed in less than a week within the desired sampling windows.

Most of the upland transects are flat, open grassland interspersed with some dunes; a few are truly in the dune field with little vegetation, and a few are similar to desert scrub with low trees and bushes with no dunes. All transects are exposed and heat up quickly late in the season, and bird

activity greatly reduces by mid-morning; however, all points can be sampled with ample time. Bird density and diversity is quite low, although a nice mix of resident breeders, wintering species, and spring migrants make for an interesting array of detections and surprising records for the park list.

Common resident species recorded in high numbers were Black-throated Sparrow, Northern Mockingbird, Mourning Dove, Horned Lark, House Finch, and Eastern Meadowlark. Migrant breeders were well-represented by Western Kingbird, Ash-throated Flycatcher, and Scott's Oriole. Wintering sparrows and finches (White-crowned Sparrow, Brewer's Sparrow, Chipping Sparrow, Lark Sparrow, and Lesser Goldfinch) were low in diversity and number. Surprisingly high numbers were notable for Cassin's Sparrow in suitable breeding habitat, as they may not always be present in some years. Interesting low-density species included Burrowing Owl, Sharp-shinned Hawk, Lark Bunting, Gambel's Quail, Olive-sided Flycatcher, and Common Poorwill.

In addition to the 10 transects, a habitat-specific area search was conducted in the large cottonwood grove in the dunes at Big Pedestal (1.5 miles south of the Visitor Center) to assess its suitability as a healthy stopover site for migrants seeking food and cover. The area search was conducted in 2013 and 2014 with impressive results, recording many migrant species (some new for the park) in this unique habitat not found elsewhere in the park. Currently, the area search results are used as Incidentals and contribute to the growing park list. Notable records from the 2014 area search include Tennessee Warbler, Steller's Jay (both being new species for the park), Blue-winged Teal, Cedar Waxwing, Common Yellowthroat, Eurasian Collared-Dove, Hermit Thrush, House Wren, Indigo Bunting, Lazuli Bunting, Townsend's Solitaire, and Yellow-headed Blackbird.

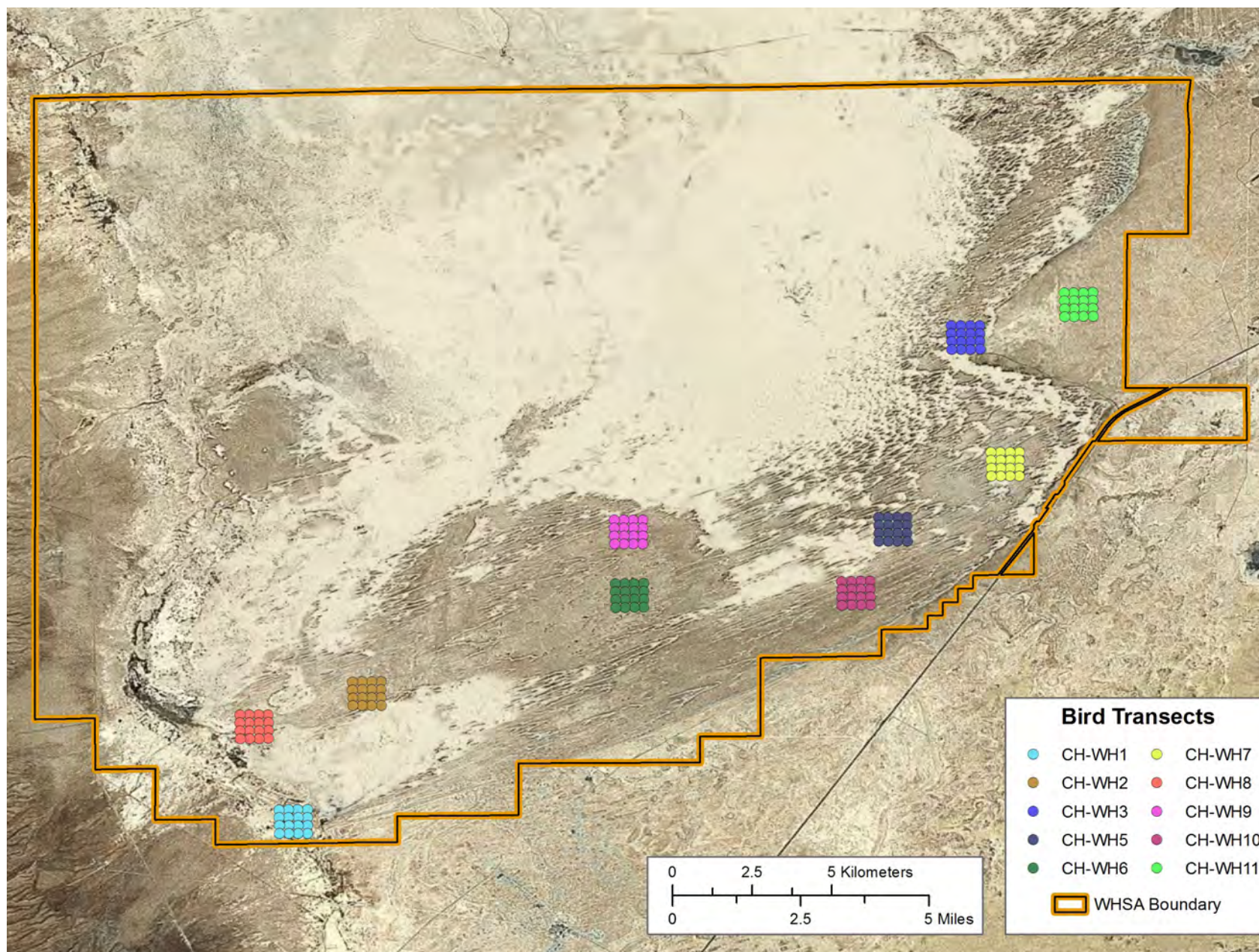


Figure 3.6.1. Point locations targeted for annual sampling at White Sands NM.



ROB BENNETTS

One Burrowing Owl (*Athene cunicularia*) was observed at White Sands NM in 2014.

Table 3.6.1. Habitat class, number of points, and sampling dates for each transect or grid at White Sands NM, 2014

Transect/Grid	Habitat class	# points	# visits	Visit Date
CH-WH1	Grassland	16	1	5/20/2014
CH-WH2	Grassland	16	1	5/20/2014
CH-WH3	Grassland	16	1	5/17/2014
CH-WH5	Grassland	16	1	5/22/2014
CH-WH6	Grassland	16	1	5/18/2014
CH-WH7	Grassland	16	1	5/17/2014
CH-WH8	Grassland	16	1	5/20/2014
CH-WH9	Grassland	16	1	5/18/2014
CH-WH10	Grassland	16	1	5/18/2014
CH-WH11	Grassland	16	1	5/17/2014

Table 3.6.2. Number of birds counted of each species in each habitat class, White Sands NM, 2014

Species	# of birds counted		Species	# of birds counted	
	Total (grassland)	% of total		Total (grassland)	% of total
Black-throated Sparrow	142	22	Chipping Sparrow	1	0
Northern Mockingbird	122	19	Common Poorwill	1	0
Western Kingbird	34	5	Curve-billed Thrasher	1	0
Mourning Dove	31	5	Gambel's Quail	1	0
Horned Lark	30	5	Hermit Thrush	1	0
Ash-throated Flycatcher	28	4	Ladder-backed Woodpecker	1	0
House Finch	22	3	Lark Bunting	1	0
Eastern Meadowlark	20	3	Lesser Goldfinch	1	0
Cactus Wren	15	2	Red-tailed Hawk	1	0
Scott's Oriole	13	2	Sharp-shinned Hawk	1	0
White-crowned Sparrow	13	2	Turkey Vulture	1	0
Verdin	11	2	Violet-green Swallow	1	0
Yellow-rumped Warbler	10	2	Western Tanager	1	0
Macgillivray's Warbler	9	1	Tennessee Warbler ¹ (incid.)	---	---
Cassin's Sparrow	8	1	Steller's Jay ¹ (incidental)	---	---
Blue Grosbeak	7	1	<i>Unidentified Bird</i>	22	3
Lesser Nighthawk	7	1	<i>Unidentified Kingbird</i>	5	1
Western Wood-Pewee	7	1	<i>Unidentified Hummingbird</i>	4	1
Barn Swallow	6	1	<i>Unidentified Empidonax</i>	1	0
Swainson's Hawk	6	1	<i>Flycatcher</i>		
Broad-tailed Hummingbird	5	1	<i>Unidentified Raven</i>	1	0
Greater Roadrunner	5	1	<i>Unidentified Sparrow</i>	1	0
Loggerhead Shrike	5	1	<i>Unidentified Swallow</i>	1	0
Brewer's Sparrow	4	1	<i>Unidentified Vireo</i>	1	0
Crissal Thrasher	4	1	Total	646	100
Green-tailed Towhee	3	0	<i>Note:</i> New species that have not previously been verified for the park are shown in bold and shaded. Species are listed in rank order from those counted in the highest numbers to those counted in the lowest numbers. 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 exclude observations of species flying overhead and not using the habitat. ¹ These species were not detected during point count surveys; they were recorded during the area search of the cottonwood grove. Both are new species for the park.		
Scaled Quail	3	0			
Warbling Vireo	3	0			
Wilson's Warbler	3	0			
Bank Swallow	2	0			
Black-headed Grosbeak	2	0			
Brown-headed Cowbird	2	0			
Bullock's Oriole	2	0			
Cassin's Kingbird	2	0			
Chihuahuan Raven	2	0			
Gray Flycatcher	2	0			
Lark Sparrow	2	0			
Northern Cardinal	2	0			
White-winged Dove	2	0			
Burrowing Owl	1	0			

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