



Landbird Monitoring in the Chihuahuan Desert Network

2016 Annual Report

Natural Resource Data Series NPS/CHDN/NRDS—2017/1117



ON THE COVER

Swainson's Hawk (*Buteo swainsoni*) is known to occur at all of the CHDN parks. Photo by John Muller.

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The National Park Service, Natural Resource Stewardship and Science office in Fort Collins, Colorado, publishes a range of reports that address natural resource topics. These reports are of interest and applicability to a broad audience in the National Park Service and others in natural resource management, including scientists, conservation and environmental constituencies, and the public.

The Natural Resource Data Series is intended for the timely release of basic data sets and data summaries. Care has been taken to assure accuracy of raw data values, but a thorough analysis and interpretation of the data has not been completed. Consequently, the initial analyses of data in this report are provisional and subject to change.

All manuscripts in the series receive the appropriate level of peer review to ensure that the information is scientifically credible, technically accurate, appropriately written for the intended audience, and designed and published in a professional manner. This report received formal peer review by subject-matter experts who were not directly involved in the collection, analysis, or reporting of the data, and whose background and expertise put them on par technically and scientifically with the authors of the information.

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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
TAS	Tucson Audubon Society
WHSA	White Sands National Monument

Executive Summary

In 2016, landbirds were surveyed within all of the 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. Seventy-one unique transects or grids were surveyed in 2016. 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 Carlsbad Caverns National Park (NP), there was only enough habitat to establish one riparian transect, so we surveyed the transect two times on different days to increase sample size. The riparian transect at Guadalupe Mountains NP was not surveyed in 2016, because it was affected by a wildfire that closed off McKittrick Canyon. 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 883 point counts on 71 transects or grids. Of these, 755 point counts were conducted in grassland habitat and 128 were conducted in riparian habitat. We recorded a total of 9,162 birds of 134 species during our point counts. Big Bend NP had the highest number of birds counted ($n = 2,841$), while Fort Davis NHS had the lowest number of birds counted ($n = 451$). Although species richness and community composition will be estimated in our synthesis reports, observations suggest that these estimates varied widely among the parks surveyed. We observed the greatest number of species at Big Bend NP ($n = 90$), and the fewest at Fort Davis NHS ($n = 35$). The number of birds 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 numbers within the CHDN ($n = 1,215$), followed by Northern Mockingbird ($n = 711$), Cactus Wren ($n = 588$), and Scaled Quail ($n = 451$). Ten species (i.e., Black-throated Sparrow, Cactus Wren, Greater Roadrunner, House Finch, Lesser Goldfinch, Mourning Dove, Northern Mockingbird, Pyrrhuloxia, Summer Tanager, and White-winged Dove) were observed at all parks surveyed. Six of the ten species were also recorded at all of the parks in 2014. New species, previously unverified in a given park, were not recorded for any of the parks in 2016.

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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 six park units in New Mexico and west Texas: Amistad National Recreation Area (NRA), Big Bend National Park (NP), Carlsbad Caverns NP, Fort Davis National Historic Site (NHS), Guadalupe Mountains NP, and White Sands National Monument (NM), plus the Rio Grande Wild and Scenic River, administered by Big Bend NP (Table 1.1). Six of the seven parks are representative of the Northern Chihuahuan Subregion of the Chihuahuan Desert Ecoregion. The exception is Amistad 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 popu-

lations may be indicators of change 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

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	WWSA	143,733	58,191
Rio Grande Wild and Scenic River	RIGR	5,164	2,091

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-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 the spring of 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 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 2016, we surveyed landbirds within all of the CHDN parks. With the exception of Fort Davis NHS and White Sands NM, all parks were stratified by grassland and riparian habitat classes. In Guadalupe Mountains NP and Carlsbad Caverns NP, riparian area was limited to McKittrick Canyon and Rattlesnake Springs, respectively (but the riparian transect in Guadalupe Mountains NP was not sampled in 2016 due to a wildfire closure). 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 CHDN parks were located along a transect for linear features (e.g., most riparian habitats) or a grid for areal features. A total of 71 unique transects or grids were surveyed in 2016 (Table 2.1.1). Samples were replicated either spatially or temporally. Most transects/grids in the CHDN parks were sampled one time (spatial replicates), 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). Parks or habitats too small to enable spatial replication (i.e., at Fort Davis NHS and the riparian transect at Carlsbad Caverns NP) were replicated temporally via multiple sampling visits

Table 2.1.1. Number of transects or grids of each habitat class surveyed in each CHDN park unit, 2016

Park unit	Grassland	Riparian
Amistad NRA	9	9
Big Bend NP	18	5
Carlsbad Caverns NP	8	1
Fort Davis NHS	1	–
Guadalupe Mountains NP	10	–
White Sands NM	10	–

at each point following methodology of Powell et al. (2007).

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



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Black-throated Sparrow (*Amphispiza bilineata*) was observed at all parks monitored in the CHDN in 2016.

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.

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 detectability 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 rangefinder 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 the Bird Conservancy of the Rockies (formerly 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 transects or grids were surveyed once, with the exception of the grassland grid at Fort Davis NHS and the riparian transect at Carlsbad Caverns NP, which were visited twice.

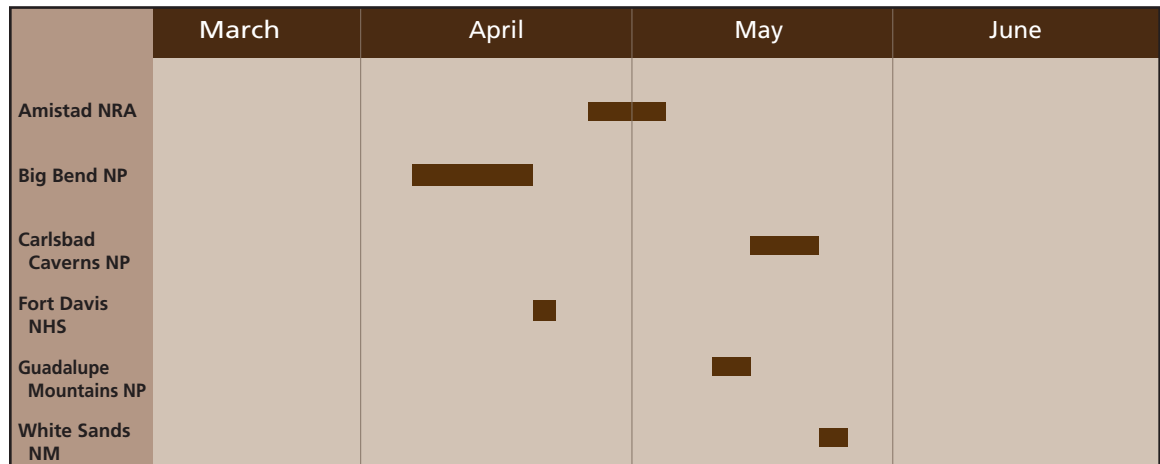


Figure 2.1.2. Dates when sampling was conducted in CHDN parks in 2016.

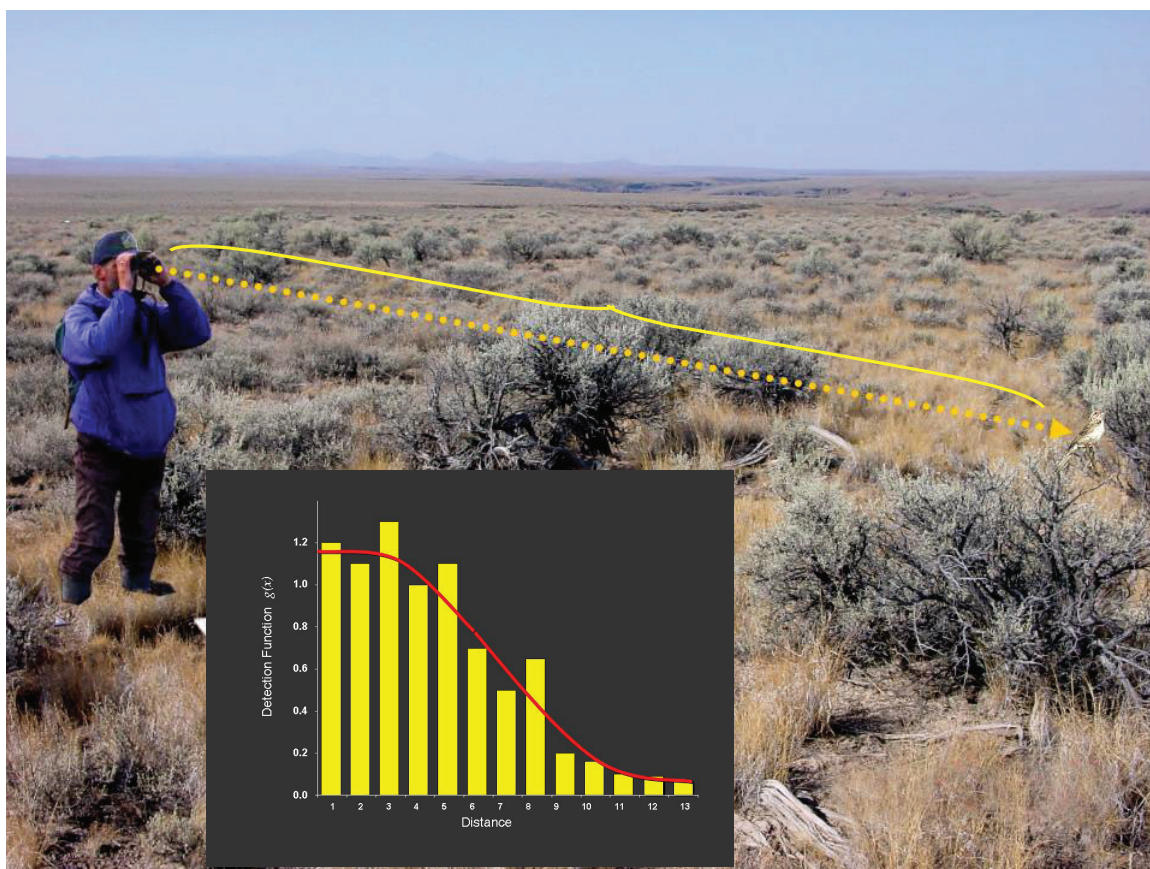


Figure 2.2. Distance sampling works by estimating a detection profile (graph) as a function of distance from which either individual or groups of birds are observed from the transect.

3 Results and Discussion

Note that in this chapter we provide a basic summary of the 2016 monitoring results- not results based on detailed statistical analyses (which will be provided at a later date). In this chapter, we report on the “number of birds” counted. Note that these numbers are overestimates in some cases, because the same individual bird may be counted from multiple points on the same grid. The statistical analyses to be conducted in the future will account for these overestimate situations.

We conducted a total of 883 point counts (the number of counts from a given point during a given sampling occasion) on 71 transects or grids within the CHDN in 2016. Of these, 755 point counts were conducted in grassland habitats and 128 point counts were conducted in riparian habitats (Table 3-1). We recorded a total of 9,162 birds of 134 species during our point counts.

In 2016, Big Bend NP had the greatest number of birds counted (n = 2,841), while Fort Davis NHS had the smallest number of birds counted (n = 451). We observed the greatest number of species at Big Bend NP (n = 90), and the smallest number at Fort Davis NHS (n = 35; Table 3-2). Although species richness and community composition will be estimated in our synthesis reports, observations suggest that these estimates varied widely among the parks surveyed. The number of birds or species counted is influenced not only by the number of points and visits, but also by the size and diversity of available habitats.

Table 3-2. Number of species observed in each habitat class at each park, 2016

Park	Species detected		
	Grassland	Riparian	Total ¹
Amistad NRA	51	57	68
Big Bend NP	55	70	90
Carlsbad Caverns NP	46	49	74
Fort Davis NHS	35	–	35
Guadalupe Mountains NP	39	–	39
White Sands NM	42	–	42
Total¹	99	104	134

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.

Black-throated Sparrow was the species counted in the highest numbers within the CHDN (n = 1,215), followed by Northern Mockingbird (n = 711), Cactus Wren (n = 588), Scaled Quail (n = 451), and Turkey Vulture (n = 381; see Table 3-3). Ten species (i.e., Black-throated Sparrow, Cactus Wren, Greater Roadrunner, House Finch, Lesser Goldfinch, Mourning Dove, Northern Mockingbird, Pyrrhuloxia, Summer Tanager, and White-winged Dove) were observed at all CHDN parks surveyed (see Table 3-4). Six of the ten species were also recorded at all of the parks in 2014. New species, previously unverified in a given park, were not recorded for any of the CHDN parks in 2016.

Table 3-1. The number of point counts (# of counts from a given point during a given sampling occasion) and birds counted in each habitat class at each CHDN park, 2016

Park	Grassland		Riparian		Total birds counted
	# Point counts	Birds counted	# Point counts	Birds counted	
Amistad NRA	92	1,395	68	883	2,278
Big Bend NP	247	2,161	44	680	2,841
Carlsbad Caverns NP	112	1,475	16	492	1,967
Fort Davis NHS	36	451	–	–	451
Guadalupe Mountains NP	116	1,029	–	–	1,029
White Sands NM	152	596	–	–	596
Total	755	7,107	128	2,055	9,162

Note: The riparian habitat at Carlsbad Caverns NP and the grassland habitat at Fort Davis NHS were sampled twice (and the number of point counts shown in these two cases is the total number counted). All other transects or grids were sampled once.

Table 3-3. Total number of birds observed of each species during surveys in all CHDN parks, 2016

Common name	# of Birds	Common name	# of Birds
Black-throated Sparrow	1,215	Canyon Towhee	37
Northern Mockingbird	711	Common Yellowthroat	35
Cactus Wren	588	Tree Swallow	33
Scaled Quail	451	Vermilion Flycatcher	33
Turkey Vulture	381	Lark Bunting	32
Ash-throated Flycatcher	307	Summer Tanager	31
Mourning Dove	273	Lesser Nighthawk	29
Pyrrhuloxia	254	Blue-gray Gnatcatcher	27
Scott's Oriole	249	Yellow-rumped Warbler	27
Bell's Vireo	219	Barn Swallow	23
Rufous-crowned Sparrow	219	Ladder-backed Woodpecker	19
Northern Cardinal	211	Lucy's Warbler	19
White-winged Dove	206	Northern Rough-winged Swallow	19
Cassin's Sparrow	182	Orchard Oriole	19
House Finch	159	Black-chinned Hummingbird	16
Verdin	137	Northern Bobwhite	16
Canyon Wren	134	Lesser Goldfinch	15
Black-tailed Gnatcatcher	127	Western Tanager	15
Rock Wren	102	Audubon's Warbler	14
Western Kingbird	102	Yellow Warbler	14
Yellow-breasted Chat	88	Great Blue Heron	13
Cave Swallow	86	Vesper Sparrow	13
Chipping Sparrow	80	White-crowned Sparrow	13
Brewer's Sparrow	77	Wilson's Warbler	13
Brewer's Blackbird	76	Black Phoebe	12
Brown-headed Cowbird	72	Clay-colored Sparrow	12
Greater Roadrunner	68	Horned Lark	12
Black Vulture	65	Eastern Meadowlark	11
Blue Grosbeak	55	Killdeer	11
Great-tailed Grackle	52	Say's Phoebe	11
Painted Bunting	51	Bullock's Oriole	9
Curve-billed Thrasher	48	Crissal Thrasher	9
Western Wood-Pewee	47	Golden-fronted Woodpecker	9
Wild Turkey	47	Green-tailed Towhee	9
Cliff Swallow	44	Lark Sparrow	8
Eurasian Collared-Dove	44	Red-tailed Hawk	8
Chihuahuan Raven	42	House Sparrow	7
Red-winged Blackbird	39	MacGillivray's Warbler	7
Cassin's Kingbird	38	Scissor-tailed Flycatcher	7
Loggerhead Shrike	38	Common Ground-Dove	6
Bewick's Wren	37	Green-winged Teal	6

Table 3-3. Total number of birds observed of each species during surveys in all CHDN parks, 2016, cont.

Common name	# of Birds	Common name	# of Birds
Mallard	6	Inca Dove	1
Swainson's Hawk	6	Least Flycatcher	1
White-throated Swift	6	Myrtle Warbler	1
Carolina Wren	5	Orange-crowned Warbler	1
Crested Caracara	5	Peregrine Falcon	1
Blue-winged Teal	4	Phainopepla	1
Dusky Flycatcher	4	Sharp-shinned Hawk	1
Gray Hawk	4	Spotted Towhee	1
Hooded Oriole	4	Violet-green Swallow	1
Northern Shoveler	4	Warbling Vireo	1
Osprey	4	Unidentified birds	938
Pine Siskin	4	Total	9,162
American Pipit	3	<i>Note:</i> 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 birds 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 were newly recorded for the park.	
Black-crested Titmouse	3		
Common Raven	3		
House Wren	3		
Lazuli Bunting	3		
Least Sandpiper	3		
Lincoln's Sparrow	3	Northern Mockingbird (<i>Mimus polyglottos</i>) was the second most commonly observed species in the CHDN in 2016.	
Spotted Sandpiper	3		
Yellow-billed Cuckoo	3		
Yellow-headed Blackbird	3		
Zone-tailed Hawk	3		
American Kestrel	2		
Common Poorwill	2		
Great Egret	2		
Great Horned Owl	2		
Marsh Wren	2		
Swamp Sparrow	2		
American Goldfinch	1		
American Robin	1		
Belted Kingfisher	1		
Black-headed Grosbeak	1		
Brown Thrasher	1		
Common Grackle	1		
Common Nighthawk	1		
Cooper's Hawk	1		
Gambel's Quail	1		
Gray Vireo	1		
Great Kiskadee	1		
Green Kingfisher	1		
Hermit Thrush	1		

Table 3-4. Species observed by park in April and May 2016 (+) or previously (o)

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Acorn Woodpecker	<i>Melanerpes formicivorus</i>		o	o	o	o	o
American Avocet	<i>Recurvirostra americana</i>	o	o	o			o
American Bittern	<i>Botaurus lentiginosus</i>	o	o	o			
American Coot	<i>Fulica americana</i>	o	o	o		o	
American Crow	<i>Corvus brachyrhynchos</i>			o			
American Dipper	<i>Cinclus mexicanus</i>		o	o		o	
American Goldfinch	<i>Spinus tristis</i>	o	o	+	o	o	o
American Kestrel	<i>Falco sparverius</i>	o	+	o	o	o	o
American Pipit	<i>Anthus rubescens</i>	o	+	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
American Tree Sparrow	<i>Spizella arborea</i>			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			
Aplomado Falcon	<i>Falco femoralis</i>		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			
Baird's Sparrow	<i>Ammodramus bairdii</i>		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	o			o
Barn Owl	<i>Tyto alba</i>	o	o	o			
Barn Swallow	<i>Hirundo rustica</i>	+	o	+	+	o	+
Bay-breasted Warbler	<i>Dendroica castanea</i>		o	o			
Bell's Vireo	<i>Vireo bellii</i>	+	+	+		o	o
Belted Kingfisher	<i>Megasceryle alcyon</i>	o	+	o		o	

Table 3-4. Species observed by park in April and May 2016 (+) or previously (o), cont.

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

Table 3-4. Species observed by park in April and May 2016 (+) or previously (o), cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Blue-winged Teal	<i>Anas discors</i>	o	+	o			o
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				
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	o	+	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	o	o	o	o
Broad-winged Hawk	<i>Buteo platypterus</i>		o	o			
Bronzed Cowbird	<i>Molothrus aeneus</i>	o	o	o	o	o	o
Brown Creeper	<i>Certhia americana</i>		o	o		o	o
Brown Pelican	<i>Pelecanus occidentalis</i>	o	o				
Brown Thrasher	<i>Toxostoma rufum</i>	+	o	o		o	o
Brown-crested Flycatcher	<i>Myiarchus tyrannulus</i>	o	o				
Brown-headed Cowbird	<i>Molothrus ater</i>	+	+	+	o	o	o
Bufflehead	<i>Bucephala albeola</i>	o	o	o			
Bullock's Oriole	<i>Icterus bullockii</i>	o	o	+	o	o	+
Burrowing Owl	<i>Athene cunicularia</i>	o	o	o		o	o
Bushtit	<i>Psaltiriparus minimus</i>	o	o	o	o	o	
Cactus Wren	<i>Campylorhynchus brunneicapillus</i>	+	+	+	+	+	+
Calliope Hummingbird	<i>Stellula calliope</i>		o	o		o	
Canada Goose	<i>Branta canadensis</i>		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	+	+	+	+	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>	o					
Cassin's Finch	<i>Carpodacus cassinii</i>		o	o	o	o	o
Cassin's Kingbird	<i>Tyrannus vociferans</i>	o	+	+	+	o	o

Table 3-4. Species observed by park in April and May 2016 (+) or previously (o), cont.

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

Table 3-4. Species observed by park in April and May 2016 (+) or previously (o), cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Cordilleran Flycatcher	<i>Empidonax occidentalis</i>		o	o	o	o	o
Costa's Hummingbird	<i>Calypte costae</i>		o				
Couch's Kingbird	<i>Tyrannus couchii</i>	o	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
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	o	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			
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	
Ferruginous Pygmy-Owl	<i>Glaucidium brasilianum</i>		o				

Table 3-4. Species observed by park in April and May 2016 (+) or previously (o), cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Field Sparrow	<i>Spizella pusilla</i>	o	o	o		o	
Flame-colored Tanager	<i>Piranga bidentata</i>		o				
Flammulated Owl	<i>Otus flammeolus</i>		o	o		o	
Forster's Tern	<i>Sterna forsteri</i>	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	o			
Gambel's Quail	<i>Callipepla gambelii</i>		+			o	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>	+	o				
Golden-winged Warbler	<i>Vermivora chrysoptera</i>		o	o			
Grace's Warbler	<i>Dendroica graciae</i>		o	o		o	
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	o	o	o	o	o	
Gray Catbird	<i>Dumetella carolinensis</i>		o	o		o	
Gray Flycatcher	<i>Empidonax wrightii</i>		o	o	o	o	o
Gray Hawk	<i>Buteo nitidus</i>		o	+	o		
Gray Vireo	<i>Vireo vicinior</i>		+	o		o	
Gray-cheeked Thrush	<i>Catharus minimus</i>		o	o			o
Great Blue Heron	<i>Ardea herodias</i>	+	+	o	o	o	
Great Crested Flycatcher	<i>Myiarchus crinitus</i>		o	o			
Great Egret	<i>Ardea alba</i>	+	o	o		o	
Great Horned Owl	<i>Bubo virginianus</i>	+	o	o	o	o	o
Great Kiskadee	<i>Pitangus sulphuratus</i>	+	o	o			
Greater Pewee	<i>Contopus pertinax</i>		o	o		o	
Greater Roadrunner	<i>Geococcyx californianus</i>	+	+	+	+	+	+
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

Table 3-4. Species observed by park in April and May 2016 (+) or previously (o), cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Green Heron	<i>Butorides virescens</i>	o	o	o			o
Green Kingfisher	<i>Chloroceryle americana</i>	+	o				
Green-tailed Towhee	<i>Pipilo chlorurus</i>	o	+	+	o	+	o
Green-winged Teal	<i>Anas crecca</i>	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 hammondii</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	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					
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	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
Juniper Titmouse	<i>Baeolophus ridgwayi</i>			o		o	
Kentucky Warbler	<i>Oporornis formosus</i>		o	o		o	o
Killdeer	<i>Charadrius vociferus</i>	+	+	o	o	o	o
King Rail	<i>Rallus elegans</i>		o				
Ladder-backed Woodpecker	<i>Picoides scalaris</i>	+	+	+	o	o	o
Lark Bunting	<i>Calamospiza melanocorys</i>	o	+	o	o	+	+

Table 3-4. Species observed by park in April and May 2016 (+) or previously (o), cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Lark Sparrow	<i>Chondestes grammacus</i>	+	+	+	o	o	o
Laughing Gull	<i>Leucophaeus atricilla</i>	o	o				
Lawrence's Goldfinch	<i>Spinus lawrencei</i>					o	
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			
Least Tern	<i>Sterna antillarum</i>	o1	o				
Lesser Goldfinch	<i>Spinus psaltria</i>	+	+	+	+	+	+
Lesser Nighthawk	<i>Chordeiles acutipennis</i>	+	+	+	o	+	+
Lesser Prairie-Chicken	<i>Tympanuchus pallidicinctus</i>			o			
Lesser Scaup	<i>Aythya affinis</i>	o	o	o			
Lesser Yellowlegs	<i>Tringa flavipes</i>	o	o	o			
Lewis's Woodpecker	<i>Melanerpes lewis</i>		o	o		o	
Lincoln's Sparrow	<i>Melospiza lincolnii</i>	o	+	o	o	o	o
Little Blue Heron	<i>Egretta caerulea</i>	o	o				
Loggerhead Shrike	<i>Lanius ludovicianus</i>	o	+	o	o	+	+
Long-billed Curlew	<i>Numenius americanus</i>	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	o			
Lucy's Warbler	<i>Oreothlypis luciae</i>	o	+	+			o
MacGillivray's Warbler	<i>Oporornis tolmiei</i>	o	+	+	o	o	+
Magnificent Hummingbird	<i>Eugenes fulgens</i>		o	o		o	
Magnolia Warbler	<i>Dendroica magnolia</i>		o	o			
Mallard	<i>Anas platyrhynchos</i>	+	+	o		o	
Marbled Godwit	<i>Limosa fedoa</i>						o

Table 3-4. Species observed by park in April and May 2016 (+) or previously (o), cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Marsh Wren	<i>Cistothorus palustris</i>	o	+	o		o	
McCown's Longspur	<i>Rhynchophanes mccownii</i>	o		o			
Merlin	<i>Falco columbarius</i>	o	o	o		o	
Mexican Jay	<i>Aphelocoma ultramarina</i>		o				
Mexican Whip-poor-will	<i>Antrostomus arizonae</i>		o	o		o	
Mississippi Kite	<i>Ictinia mississippiensis</i>		o	o			
Montezuma Quail	<i>Cyrtonyx montezumae</i>		o	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		o	o
Neotropic Cormorant	<i>Phalacrocorax brasilianus</i>	o	o	o			
Northern Beardless-Tyrannulet	<i>Camptostoma imberbe</i>			o			
Northern Bobwhite	<i>Colinus virginianus</i>	+		o		o	
Northern Cardinal	<i>Cardinalis cardinalis</i>	+	+	+	+	o	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	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			
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>	o					
Olive Warbler	<i>Peucedramus taeniatus</i>		o				
Olive-sided Flycatcher	<i>Contopus cooperi</i>		o	o	o	o	o

Table 3-4. Species observed by park in April and May 2016 (+) or previously (o), cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Orange-crowned Warbler	<i>Oreothlypis celata</i>	o	+	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
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			
Pectoral Sandpiper	<i>Calidris melanotos</i>	o	o				
Peregrine Falcon	<i>Falco peregrinus</i>	o	+	o		o	
Phainopepla	<i>Phainopepla nitens</i>		o	o	+	o	o
Philadelphia Vireo	<i>Vireo philadelphicus</i>		o	o			
Pied-billed Grebe	<i>Podilymbus podiceps</i>	o	o	o			
Pine Grosbeak	<i>Pinicola enucleator</i>					o	
Pine Siskin	<i>Spinus pinus</i>	o	+	+	o	o	+
Pine Warbler	<i>Dendroica pinus</i>		o	o			
Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>		o	o		o	
Piratic Flycatcher	<i>Legatus leucophaeus</i>		o	o			
Plumbeous Vireo	<i>Vireo plumbeus</i>	o	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			
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			
Pygmy Nuthatch	<i>Sitta pygmaea</i>		o	o		o	
Pyrrhuloxia	<i>Cardinalis sinuatus</i>	+	+	+	+	+	+
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				

Table 3-4. Species observed by park in April and May 2016 (+) or previously (o), cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
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	o
Red-faced Warbler	<i>Cardellina rubrifrons</i>		o	o		o	
Redhead	<i>Aythya americana</i>	o	o	o			
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>		o	o			
Red-naped Sapsucker	<i>Sphyrapicus nuchalis</i>		o	o		o	o
Red-necked Phalarope	<i>Phalaropus lobatus</i>			o			
Red-shouldered Hawk	<i>Buteo lineatus</i>	o	o	o			
Red-tailed Hawk	<i>Buteo jamaicensis</i>	o	+	+	o	o	o
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	+	o	o		o	o
Ring-billed Gull	<i>Larus delawarensis</i>	o	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		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>Pachyramphus aglaiae</i>		o				
Ross's Goose	<i>Chen rossii</i>		o				
Rough-legged Hawk	<i>Buteo lagopus</i>		o	o		o	
Royal Tern	<i>Thalasseus maximus</i>	o					
Ruby-crowned Kinglet	<i>Regulus calendula</i>	o	o	o	o	o	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 rufopalliatus</i>		o				
Rufous-capped Warbler	<i>Basileuterus rufifrons</i>	o	o				
Rufous-crowned Sparrow	<i>Aimophila ruficeps</i>	+	+	+	+	+	

Table 3-4. Species observed by park in April and May 2016 (+) or previously (o), cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Rusty Blackbird	<i>Euphagus carolinus</i>		o	o			
Sagebrush Sparrow	<i>Artemisiospiza nevadensis</i>		o	o		o	o
Sage Thrasher	<i>Oreoscoptes montanus</i>	o	o	o		o	o
Sandhill Crane	<i>Grus canadensis</i>	o	o	o		o	o
Savannah Sparrow	<i>Passerculus sandwichensis</i>	o	o	o	o	o	o
Say's Phoebe	<i>Sayornis saya</i>	o	+	+	o	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			
Scott's Oriole	<i>Icterus parisorum</i>	o	+	+	+	+	+
Sedge Wren	<i>Cistothorus platensis</i>	o	o	o			
Semipalmated Plover	<i>Charadrius semipalmatus</i>	o					
Semipalmated Sandpiper	<i>Calidris pusilla</i>	o		o			
Sharp-shinned Hawk	<i>Accipiter striatus</i>	o	+	o	o	o	o
Short-eared Owl	<i>Asio flammeus</i>		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			
Snowy Egret	<i>Egretta thula</i>	o	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>			o2		o2	
Spotted Sandpiper	<i>Actitis macularius</i>	o	+	o		o	
Spotted Towhee	<i>Pipilo maculatus</i>	o	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	o3
Streak-backed Oriole	<i>Icterus pustulatus</i>			+4			

Table 3-4. Species observed by park in April and May 2016 (+) or previously (o), 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>	+	+	+	+	+	+
Swainson's Hawk	<i>Buteo swainsoni</i>	o	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	
Tennessee Warbler	<i>Oreothlypis peregrina</i>		o	o			o
Thick-billed Kingbird	<i>Tyrannus crassirostris</i>		o	o			
Townsend's Solitaire	<i>Myadestes townsendi</i>		o	o	o	o	o
Townsend's Warbler	<i>Dendroica townsendi</i>		o	o	o	o	o
Tree Swallow	<i>Tachycineta bicolor</i>	+	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>	+	+	+	+	+	o
Upland Sandpiper	<i>Bartramia longicauda</i>	o	o	o			
Varied Bunting	<i>Passerina versicolor</i>	o	o	o			
Varied Thrush	<i>Ixoreus naevius</i>		o	o		o	
Veery	<i>Catharus fuscescens</i>		o				
Verdin	<i>Auriparus flaviceps</i>	+	+	+	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	o	o	o
Virginia Rail	<i>Rallus limicola</i>	o	o	o			
Virginia's Warbler	<i>Oreothlypis virginiae</i>		o	o	o	o	o
Warbling Vireo	<i>Vireo gilvus</i>		o	+		o	o
Western Bluebird	<i>Sialia mexicana</i>		o	o	o	o	o

Table 3-4. Species observed by park in April and May 2016 (+) or previously (o), cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Western Grebe	<i>Aechmophorus occidentalis</i>	o		o			
Western Kingbird	<i>Tyrannus verticalis</i>	+	+	+	o	+	+
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	
Western Tanager	<i>Piranga ludoviciana</i>	o	o	+	o	+	+
Western Wood-Pewee	<i>Contopus sordidulus</i>		o	+	o	+	+
Whimbrel	<i>Numenius phaeopus</i>		o				
White Ibis	<i>Eudocimus albus</i>		o	o			
White-breasted Nuthatch	<i>Sitta carolinensis</i>		o	o	o	o	
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	o	+	+	o	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-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			
Williamson's Sapsucker	<i>Sphyrapicus thyroideus</i>		o	o		o	
Willow Flycatcher	<i>Empidonax traillii</i>		o	o5			
Wilson's Phalarope	<i>Phalaropus tricolor</i>	o	o	o			
Wilson's Snipe	<i>Gallinago delicata</i>	o	o	o		o	
Wilson's Warbler	<i>Wilsonia pusilla</i>	o	+	+	o	o	o
Winter Wren	<i>Troglodytes hiemalis</i>	o	o	o		o	
Wood Duck	<i>Aix sponsa</i>	o	o	o		o	
Wood Thrush	<i>Hylocichla mustelina</i>		o				
Woodhouse's Scrub-Jay ⁶	<i>Aphelocoma woodhouseii</i> ⁶		o	o	o	o	

Table 3-4. Species observed by park in April and May 2016 (+) or previously (o), cont.

Common name	Scientific name	AMIS	BIBE	CAVE	FODA	GUMO	WHSA
Worm-eating Warbler	<i>Helmitheros vermivorum</i>	o	o	o		o	o
Yellow Rail	<i>Coturnicops noveboracensis</i>		o				
Yellow Warbler	<i>Setophaga petechia</i>	o	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		
Yellow-breasted Chat	<i>Icteria virens</i>	+	+	+		o	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
Yellow-rumped Warbler ⁷	<i>Setophaga coronata</i> ⁷	+	+	+	+	o	+
Yellow-throated Vireo	<i>Vireo flavifrons</i>	o	o	o		o	
Yellow-throated Warbler	<i>Dendroica dominica</i>	o	o	o			
Zone-tailed Hawk	<i>Buteo albonotatus</i>	+	+	o	o	o	

+ = species detected in 2016 survey

o = species not detected in 2016 survey but previously documented in the park (by any credible source), including species that may migrate through or winter in the park

Note: this table does not include subspecies, but subspecies may be mentioned in the individual park tables.

¹ = the Least Terns at Amistad NRA are Interior Least Terns (*Sterna antillarum athalassos*)

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 an 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 not during) surveys

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

⁶ = In 2016, Western Scrub-Jay was split into two species, Woodhouse's Scrub-Jay and California Scrub-Jay

⁷ = This species entry includes both subspecies (Audubon's Warbler [*Setophaga coronata auduboni*] and Myrtle Warbler [*S. c. coronata*])

3.1 Amistad National Recreation Area

3.1.1 2016 sampling

During April and May of 2016, we sampled 18 transects/grids at Amistad NRA (Figures 3.1.1-1 and 3.1.1-2). We conducted 92 point counts on nine grids in grassland habitat and 68 point counts on nine transects in riparian habitat (Table 3.1.1), for a total of 160 point counts at the park. Each point was surveyed once in 2016.

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 2016, 2,278 birds of 68 species were counted at Amistad NRA (Table 3.1.2). Cassin's Sparrow and Northern Mockingbird had the highest number of birds counted in 2016 (7% of the total number of birds counted each). The next most counted species were Black-throated Sparrow (5%), Northern Cardinal (5%), and Turkey Vulture (5%). Out of the CHDN parks in 2016, Amistad NRA had the second greatest number of birds counted overall, as well as the greatest number of birds counted in riparian habitat. No new species were recorded for the park in 2016.

3.1.3 Field observations

Note that the field observations described in this section may include general observations of the

field sampling crew while at the park, in addition to observations made during the actual surveys.

Upland transects featured large numbers of sparrows, with the greatest amount of detections equally split between Black-throated, Rufous-crowned, and Cassin's sparrows (note that "detections" may consist of observations of one bird or groups of birds). Brewer's and Clay-colored sparrows were also detected, but to a lesser extent. Desert residents, Pyrrhuloxia, Bell's Vireo, Eurasian Collared-Dove, White-winged Dove, Blue-gray Gnatcatcher, and Northern Mockingbird, were also commonly observed in these areas. Amistad NRA also features a more noticeable and active population of Lesser Nighthawk; they were detected more here than in any other park.

Riparian transects featured high species diversity. Painted Bunting, Yellow-breasted Chat, Vermilion Flycatcher, Bewick's Wren, Orchard Oriole, Northern Bobwhite, Killdeer, Cliff Swallow, and Great Blue Heron were all commonly observed in riparian areas. Great-tailed Grackle, Yellow-headed Blackbird, Great Horned Owl, Least Sandpiper, and Yellow-billed Cuckoo (not observed on surveys), were lesser detected species. A few Mexican species, including Green Kingfisher, Crested Caracara, and Great Kiskadee, were observed during surveys. Also, a Common Loon yodeling loudly in Rough Canyon, and an American Avocet eating peacefully on a mudflat in the Pecos River, were two notably unexpected detections; both of these species were observed incidentally during the survey period.



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Killdeer (*Charadrius vociferus*) was observed in both grassland and riparian habitat in 2016 at Amistad NRA.

Table 3.1.1. Habitat class, number of points, and sampling dates for each transect or grid at Amistad NRA, 2016

Transect/Grid	Habitat class	# Points	# Visits	Visit date
CH-AM2	Grassland	10	1	4/28/2016
CH-AM3	Grassland	9	1	4/28/2016
CH-AM4	Grassland	8	1	5/04/2016
CH-AM5	Grassland	9	1	4/30/2016
CH-AM6	Grassland	12	1	4/30/2016
CH-AM7	Grassland	12	1	5/04/2016
CH-AM8	Grassland	9	1	4/26/2016
CH-AM9	Grassland	12	1	5/01/2016
CH-AM10	Grassland	11	1	5/01/2016
CH-AMRI1	Riparian	2	1	4/26/2016
CH-AMRI3	Riparian	8	1	5/02/2016
CH-AMRI5	Riparian	6	1	4/29/2016
CH-AMRI6	Riparian	18	1	5/02/2016
CH-AMRI7	Riparian	6	1	5/03/2016
CH-AMRI8	Riparian	8	1	5/03/2016
CH-AMRI9	Riparian	7	1	4/29/2016
CH-AMRI13	Riparian	9	1	4/27/2016
CH-AMRI17	Riparian	4	1	4/27/2016

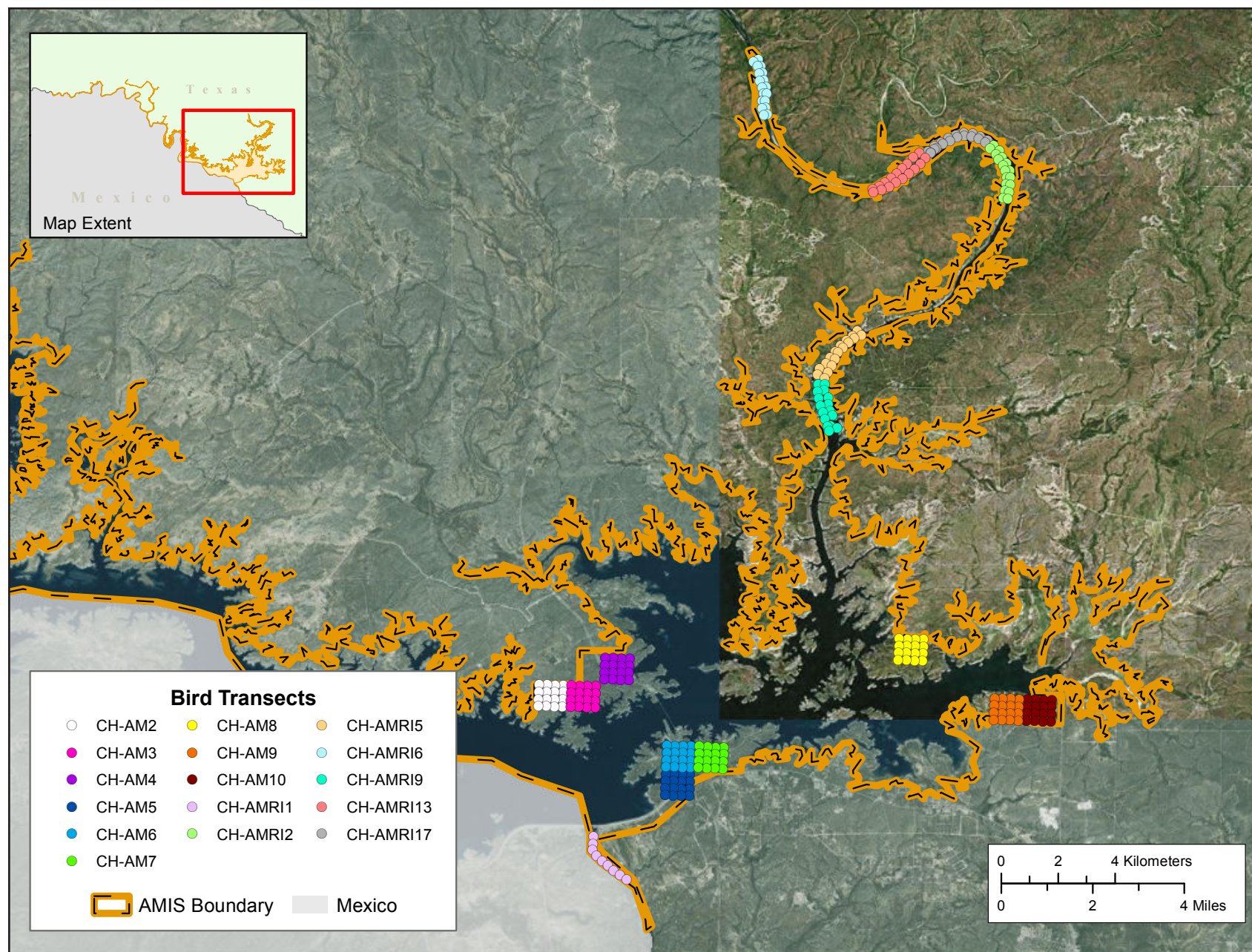


Figure 3.1.1-1. Point locations targeted for annual sampling at Amistad NRA, East.

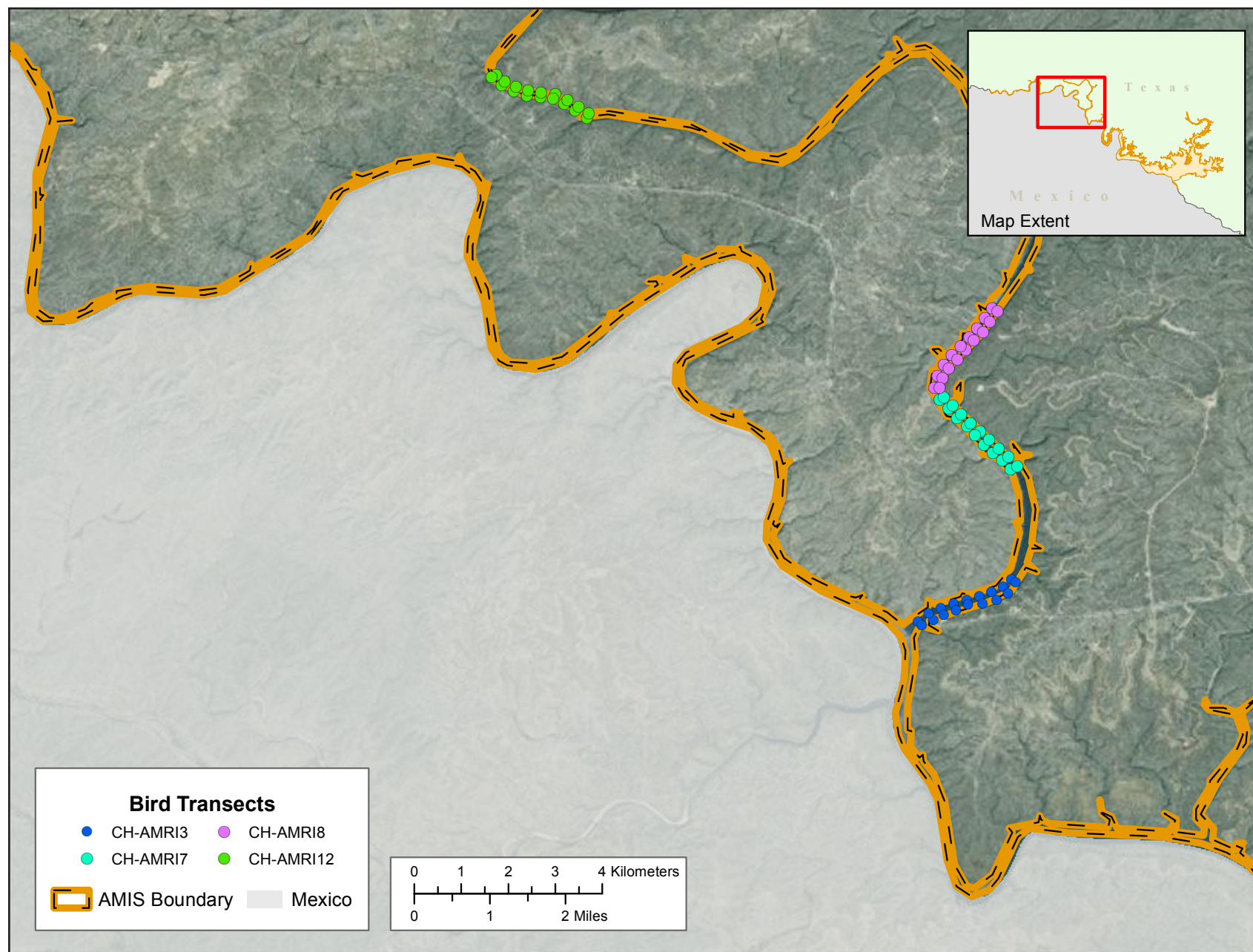


Figure 3.1.1-2. Point locations targeted for annual sampling at Amistad NRA, West.

Table 3.1.2 Number of birds counted of each species in each habitat class, Amistad NRA, 2016

Species	Habitat class		# of Birds counted	
	Grassland	Riparian	Total	% of total
Cassin's Sparrow	164	–	164	7
Northern Mockingbird	135	28	163	7
Black-throated Sparrow	107	13	120	5
Northern Cardinal	60	59	119	5
Turkey Vulture	50	68	118	5
Bell's Vireo	30	39	69	3
Cactus Wren	61	5	66	3
Black Vulture	11	52	63	3
Canyon Wren	–	59	59	3
Rufous-crowned Sparrow	39	17	56	2
White-winged Dove	35	20	55	2
Mourning Dove	21	32	53	2
Scaled Quail	32	12	44	2
Yellow-breasted Chat	10	31	41	2
Pyrrhuloxia	36	3	39	2
Red-winged Blackbird	6	33	39	2
Brown-headed Cowbird	21	17	38	2
Painted Bunting	17	18	35	2
Ash-throated Flycatcher	17	17	34	1
Tree Swallow	24	9	33	1
Cliff Swallow	21	9	30	1
Great-tailed Grackle	18	8	26	1
Rock Wren	3	22	25	1
Bewick's Wren	11	9	20	1
Eurasian Collared-Dove	6	12	18	1
Blue-gray Gnatcatcher	11	6	17	1
Lesser Nighthawk	12	4	16	1
Northern Bobwhite	14	2	16	1
Vermilion Flycatcher	2	13	15	1
Orchard Oriole	6	8	14	1
Chipping Sparrow	12	1	13	1
Clay-colored Sparrow	12	–	12	1
Western Kingbird	6	4	10	0
Golden-fronted Woodpecker	4	5	9	0
Killdeer	3	6	9	0
Chihuahuan Raven	–	8	8	0
House Finch	6	2	8	0
Great Blue Heron	–	7	7	0

Table 3.1.2. Number of birds counted of each species in each habitat class, Amistad NRA, 2016, cont.

Species	Habitat class		# of Birds counted	
	Grassland	Riparian	Total	% of total
Northern Rough-winged Swallow	5	2	7	0
Scissor-tailed Flycatcher	7	–	7	0
Vesper Sparrow	7	–	7	0
Summer Tanager	1	5	6	0
Crested Caracara	5	–	5	0
Verdin	2	3	5	0
Brewer's Sparrow	4	–	4	0
Carolina Wren	–	4	4	0
Common Yellowthroat	–	4	4	0
Ladder-backed Woodpecker	2	2	4	0
Lesser Goldfinch	1	3	4	0
Yellow-rumped Warbler	–	4	4	0
Lark Sparrow	3	–	3	0
Least Sandpiper	–	3	3	0
Osprey	–	3	3	0
Black Phoebe	–	2	2	0
Blue Grosbeak	–	2	2	0
Common Ground-Dove	–	2	2	0
Great Egret	1	1	2	0
Great Horned Owl	–	2	2	0
Hooded Oriole	1	1	2	0
Mallard	–	2	2	0
Barn Swallow	–	1	1	0
Brown Thrasher	1	–	1	0
Curve-billed Thrasher	1	–	1	0
Great Kiskadee	1	–	1	0
Greater Roadrunner	–	1	1	0
Green Kingfisher	–	1	1	0
Inca Dove	1	–	1	0
Zone-tailed Hawk	–	1	1	0
<i>Unidentified bird</i>	<i>206</i>	<i>129</i>	<i>335</i>	<i>15</i>
<i>Unidentified sparrow</i>	<i>71</i>	<i>13</i>	<i>84</i>	<i>4</i>
<i>Unidentified swallow</i>	<i>25</i>	<i>16</i>	<i>41</i>	<i>2</i>
<i>Unidentified dove</i>	<i>20</i>	<i>1</i>	<i>21</i>	<i>1</i>
<i>Unidentified duck</i>	<i>4</i>	<i>8</i>	<i>12</i>	<i>1</i>
<i>Unidentified raven</i>	<i>–</i>	<i>3</i>	<i>3</i>	<i>0</i>
<i>Unidentified hummingbird</i>	<i>–</i>	<i>2</i>	<i>2</i>	<i>0</i>
<i>Unidentified warbler</i>	<i>–</i>	<i>2</i>	<i>2</i>	<i>0</i>

Table 3.1.2. Number of birds counted of each species in each habitat class, Amistad NRA, 2016, cont.

Species	Habitat class		# of Birds counted	
	Grassland	Riparian	Total	% of total
<i>Unidentified blackbird</i>	1	–	1	0
<i>Unidentified hawk</i>	–	1	1	0
<i>Unidentified oriole</i>	1	–	1	0
<i>Unidentified vireo</i>	–	1	1	0
<i>Unidentified woodpecker</i>	1	–	1	0
Total	1,395	883	2,278	100

Note: New species that have not previously been verified for the park (if any) 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.



GARY KRAMER, USFWS

Greater Roadrunner (*Geococcyx californianus*) was observed one time at Amistad NRA during 2016 surveys.

3.2 Big Bend National Park

3.2.1 2016 sampling

During April of 2016, we sampled 23 transects/grids at Big Bend NP (Figures 3.2.1-1 to 3.2.1-3). We conducted 247 point counts on 18 grids in grassland habitat and 44 point counts on five transects in riparian habitat (Table 3.2.1), for a total of 291 point counts at the park. Each point was surveyed one time in 2016.

3.2.2 Results

During 2016, 2,841 birds of 90 species were counted at Big Bend NP (Table 3.2.2). Black-throated Sparrow had the highest number of birds counted (14% 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 (12%), Turkey Vulture (6%), Pyrrhuloxia (5%), Bell's Vireo (5%), and Ash-throated Flycatcher (5%). No new species were recorded for the park during the 2016 surveys.

3.2.3 Field observations

Note that the field observations described in this section may include general observations of the

field sampling crew while at the park, in addition to observations made during the actual surveys.

Desert residents frequently observed in high numbers in the uplands included Black-throated Sparrow, Cactus Wren, Pyrrhuloxia, Verdin, Black-tailed Gnatcatcher, and Northern Mockingbird. Less numerous but widespread were Curve-billed Thrasher, House Finch, Loggerhead Shrike, and Greater Roadrunner. Early arriving Ash-throated Flycatcher and Scott's Oriole were present in average numbers, and notable detections were Peregrine Falcon, Gray Vireo, Olive-sided Flycatcher and Green-winged Teal (unusual in sparse desert scrub away from the river).

In the riparian habitats of Rio Grande Village and Cottonwood Campground, common species were Vermilion Flycatcher, Summer Tanager, Golden-fronted Woodpecker, Lucy's Warbler, White-winged Dove, and Bell's Vireo. Migrants included Wilson's Warbler, Broad-tailed Hummingbird, Pine Siskin, Lazuli Bunting, and a rare Myrtle Warbler. Active nests were observed for Common Black-Hawk, Gray Hawk, and American Kestrel, and recently fledged juveniles were noted for Great Horned Owl and Red-tailed Hawk.



DAVE MENKE, USFWS

Loggerhead Shrike (*Lanius ludovicianus*) was observed at Big Bend NP and two other CHDN parks during 2016 surveys.

Table 3.2.1. Habitat class, number of points, and sampling dates for each transect or grid at Big Bend NP, 2016

Transect/Grid	Habitat class	# Points	# Visits	Visit date
CH-BB2	Grassland	15	1	4/13/2016
CH-BB3	Grassland	16	1	4/11/2016
CH-BB5	Grassland	12	1	4/18/2016
CH-BB6	Grassland	13	1	4/13/2016
CH-BB7	Grassland	8	1	4/8/2016
CH-BB8	Grassland	16	1	4/14/2016
CH-BB9	Grassland	16	1	4/17/2016
CH-BB10	Grassland	15	1	4/17/2016
CH-BB11	Grassland	16	1	4/9/2016
CH-BB12	Grassland	15	1	4/15/2016
CH-BB13	Grassland	15	1	4/6/2016
CH-BB14	Grassland	14	1	4/17/2016
CH-BB15	Grassland	16	1	4/11/2016
CH-BB16	Grassland	12	1	4/12/2016
CH-BB17	Grassland	16	1	4/19/2016
CH-BB18	Grassland	10	1	4/7/2016
CH-BB19	Grassland	11	1	4/10/2016
CH-BB20	Grassland	11	1	4/14/2016
CH-BIRI2	Riparian	8	1	4/15/2016
CH-BIRI3	Riparian	7	1	4/13/2016
CH-BIRI5	Riparian	9	1	4/14/2016
CH-BIRI8	Riparian	11	1	4/18/2016
CH-BIRI17	Riparian	9	1	4/15/2016

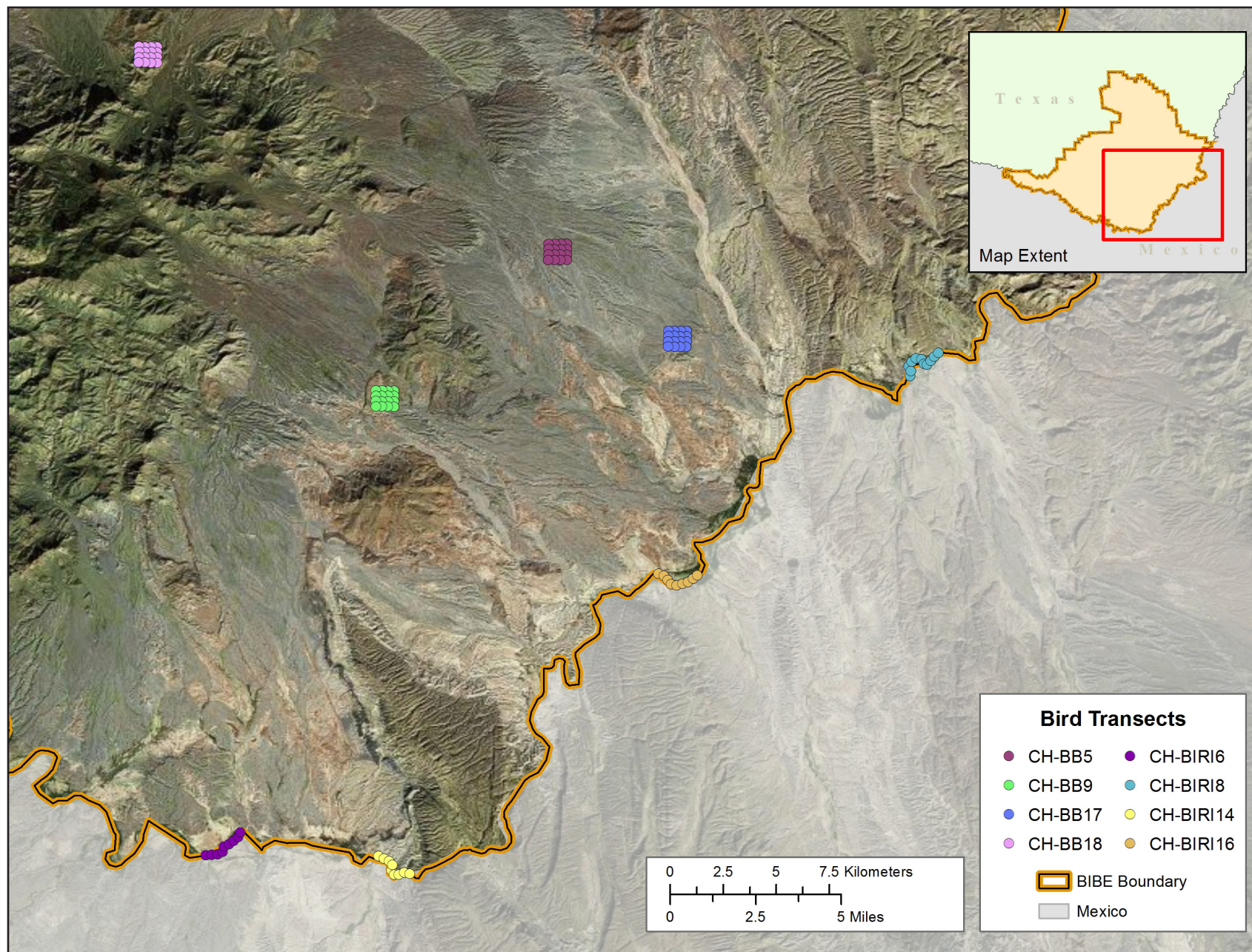


Figure 3.2.1-1. Point locations targeted for annual sampling at Big Bend NP, East.

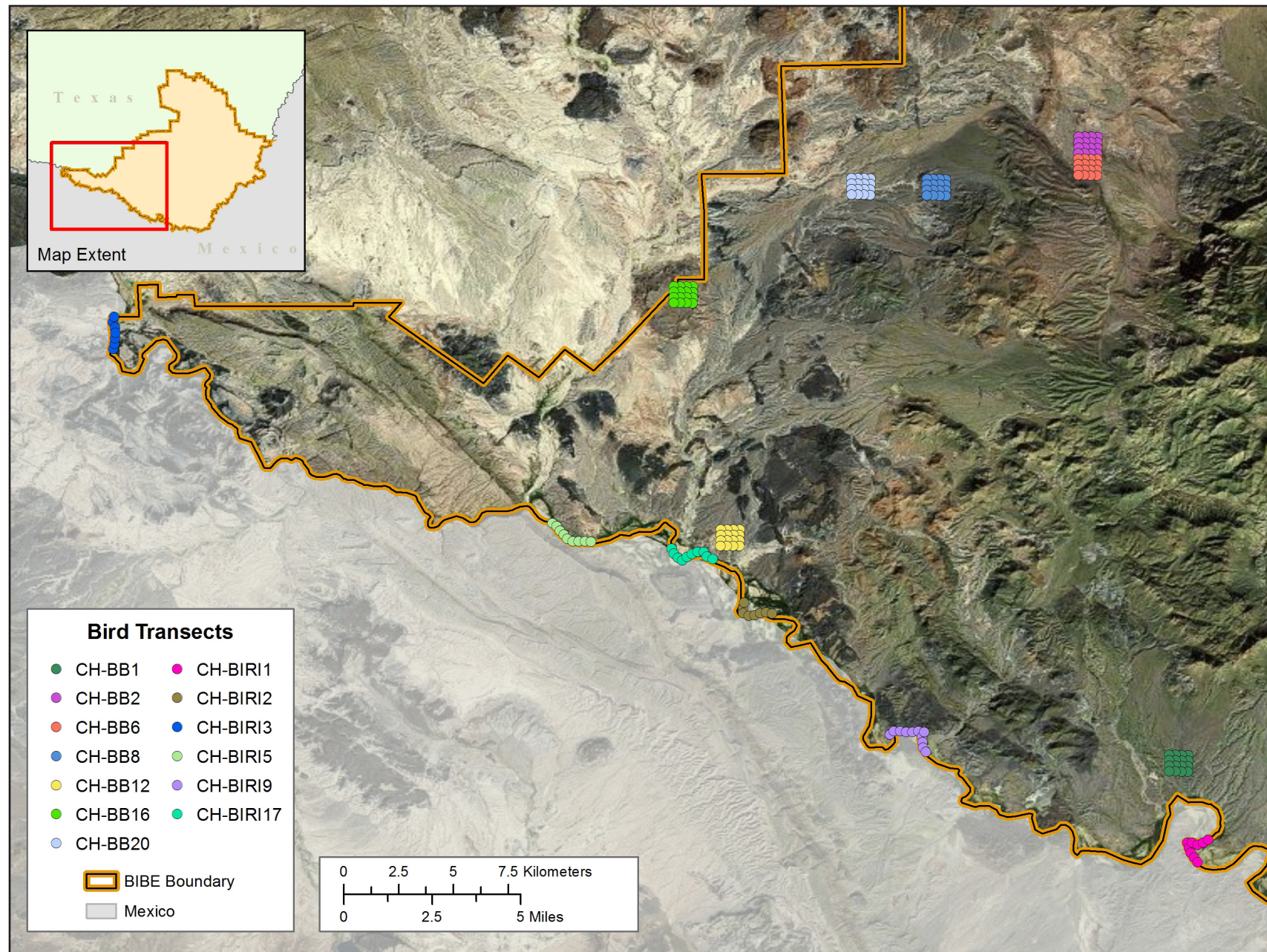


Figure 3.2.1-2. Point locations targeted for annual sampling at Big Bend NP, West.

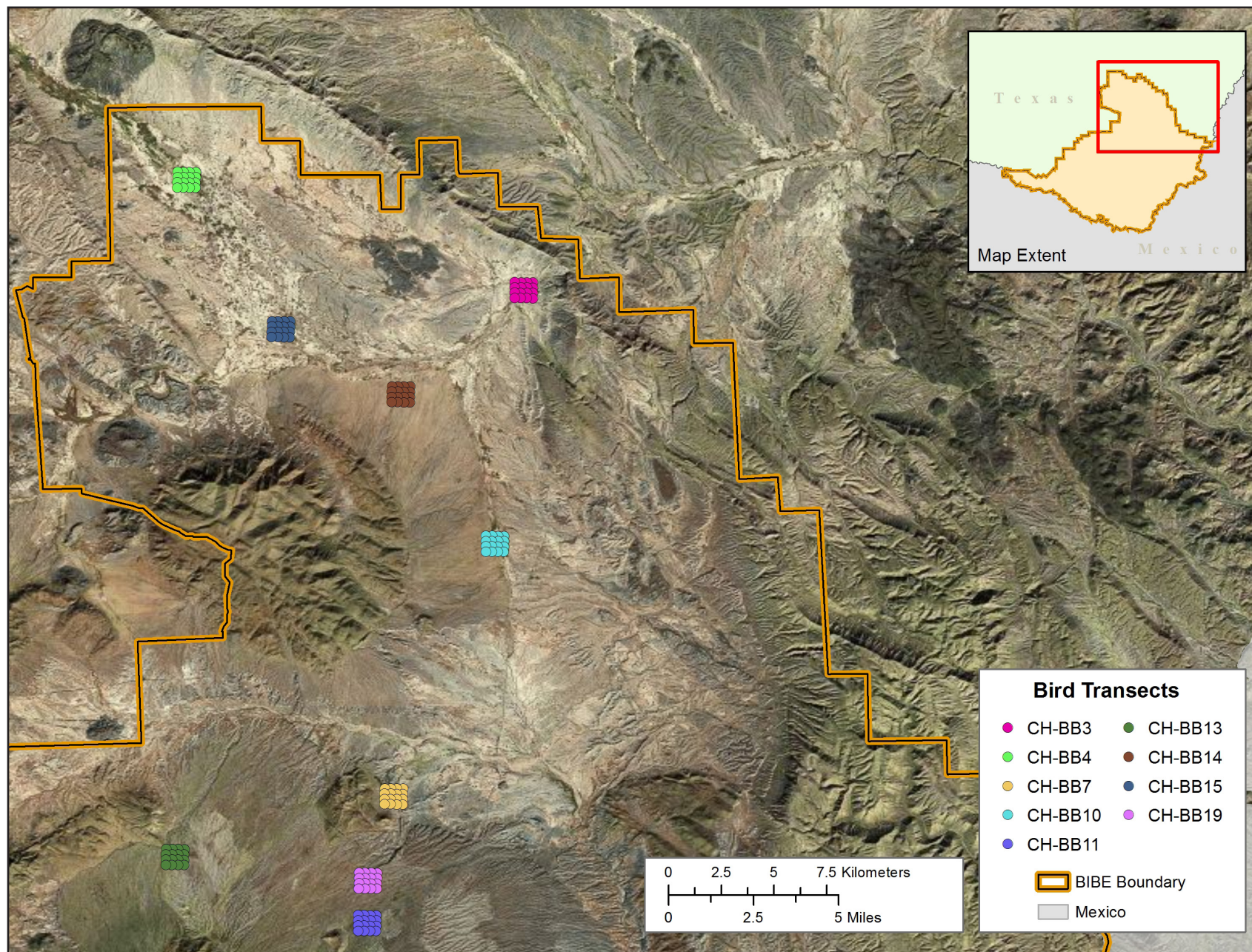


Figure 3.2.1-3. Point locations targeted for annual sampling at Big Bend NP, North.

Table 3.2.2. Number of birds counted of each species in each habitat class, Big Bend NP, 2016

Species	Habitat class		# of Birds counted	
	Grassland	Riparian	Total	% of total
Black-throated Sparrow	372	14	386	14
Cactus Wren	339	1	340	12
Turkey Vulture	154	15	169	6
Pyrrhuloxia	152	3	155	5
Bell's Vireo	45	88	133	5
Ash-throated Flycatcher	103	27	130	5
House Finch	94	17	111	4
Black-tailed Gnatcatcher	104	3	107	4
Verdin	72	18	90	3
White-winged Dove	23	60	83	3
Mourning Dove	50	30	80	3
Northern Mockingbird	74	2	76	3
Scaled Quail	74	–	74	3
Scott's Oriole	73	1	74	3
Brewer's Blackbird	13	54	67	2
Northern Cardinal	–	60	60	2
Chipping Sparrow	19	36	55	2
Rock Wren	44	3	47	2
Rufous-crowned Sparrow	37	1	38	1
Curve-billed Thrasher	32	1	33	1
Greater Roadrunner	18	13	31	1
Brewer's Sparrow	28	–	28	1
Loggerhead Shrike	24	–	24	1
Chihuahuan Raven	19	1	20	1
Yellow-rumped Warbler	4	16	20	1
Common Yellowthroat	–	19	19	1
Yellow-breasted Chat	–	18	18	1
Canyon Wren	2	15	17	1
Cliff Swallow	3	9	12	0
Northern Rough-winged Swallow	–	12	12	0
Lucy's Warbler	–	11	11	0
Audubon's Warbler	2	8	10	0
Say's Phoebe	7	2	9	0
Black Phoebe	–	8	8	0
Canyon Towhee	6	–	6	0
Crissal Thrasher	6	–	6	0
Great Blue Heron	–	6	6	0
Green-tailed Towhee	5	1	6	0

Table 3.2.2. Number of birds counted of each species in each habitat class, Big Bend NP, 2016, cont.

Species	Habitat class		# of Birds counted	
	Grassland	Riparian	Total	% of total
Ladder-backed Woodpecker	2	4	6	0
Summer Tanager	3	3	6	0
Wilson's Warbler	–	6	6	0
Green-winged Teal	5	–	5	0
Red-tailed Hawk	5	–	5	0
White-crowned Sparrow	–	5	5	0
White-throated Swift	4	1	5	0
Blue-gray Gnatcatcher	2	2	4	0
Blue-winged Teal	–	4	4	0
Common Ground-Dove	–	4	4	0
Eurasian Collared-Dove	1	3	4	0
Mallard	–	4	4	0
Northern Shoveler	–	4	4	0
Vesper Sparrow	4	–	4	0
American Pipit	2	1	3	0
Cassin's Sparrow	3	–	3	0
House Sparrow	–	3	3	0
Lark Sparrow	1	2	3	0
Lincoln's Sparrow	1	2	3	0
Spotted Sandpiper	–	3	3	0
Yellow-headed Blackbird	–	3	3	0
American Kestrel	2	–	2	0
Black Vulture	2	–	2	0
Common Raven	2	–	2	0
Killdeer	–	2	2	0
Marsh Wren	–	2	2	0
Swamp Sparrow	–	2	2	0
Western Kingbird	1	1	2	0
Zone-tailed Hawk	–	2	2	0
Belted Kingfisher	–	1	1	0
Black-chinned Hummingbird	–	1	1	0
Brown-headed Cowbird	–	1	1	0
Carolina Wren	–	1	1	0
Cassin's Kingbird	1	–	1	0
Cooper's Hawk	–	1	1	0
Dusky Flycatcher	–	1	1	0
Gambel's Quail	–	1	1	0
Gray Vireo	1	–	1	0

Table 3.2.2. Number of birds counted of each species in each habitat class, Big Bend NP, 2016, cont.

Species	Habitat class		# of Birds counted	
	Grassland	Riparian	Total	% of total
Hermit Thrush	–	1	1	0
House Wren	1	–	1	0
Lark Bunting	1	–	1	0
Lesser Goldfinch	–	1	1	0
Lesser Nighthawk	1	–	1	0
MacGillivray's Warbler	1	–	1	0
Myrtle Warbler	–	1	1	0
Orange-crowned Warbler	–	1	1	0
Osprey	–	1	1	0
Peregrine Falcon	1	–	1	0
Pine Siskin	1	–	1	0
Sharp-shinned Hawk	–	1	1	0
Vermilion Flycatcher	–	1	1	0
Violet-green Swallow	–	1	1	0
<i>Unidentified bird</i>	86	23	109	4
<i>Unidentified raven</i>	9	2	11	0
<i>Unidentified dove</i>	6	–	6	0
<i>Unidentified sparrow</i>	5	1	6	0
<i>Unidentified woodpecker</i>	3	3	6	0
<i>Unidentified warbler</i>	2	–	2	0
<i>Unidentified gnatcatcher</i>	1	–	1	0
<i>Unidentified hummingbird</i>	1	–	1	0
<i>Unidentified myiarchus</i>	1	–	1	0
<i>Unidentified raptor</i>	1	–	1	0
Total	2,161	680	2,841	100

Note: New species that have not previously been verified for the park (if any) 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 2016 sampling

During May of 2016, we sampled nine transects/grids at Carlsbad Caverns NP (Figure 3.3.1). We conducted 112 point counts on eight grids in grassland habitat and 16 point counts on one transect in riparian habitat (Table 3.3.1). The grassland grids were visited once in 2016, but the riparian transect, along the drainage of Rattlesnake Springs, was visited twice. We conducted a total of 128 point counts at the park.

3.3.2 Results

During 2016, 1,967 birds of 74 species were counted at Carlsbad Caverns NP (Table 3.3.2). Black-throated Sparrow had the highest number of birds counted (14% of the total number of birds counted). The next species observed in relatively high numbers were Northern Mockingbird (13%) and Scaled Quail (13%), followed by Cave Swallow (4%), Mourning Dove (4%), Rufous-crowned Sparrow (4%), and Turkey Vulture (4%). No new species were recorded for the park during the surveys.

3.3.3 Field observations

Note that the field observations described in this section may include general observations of the field sampling crew while at the park, in addition to observations made during the actual surveys.

The most common species in the upland habitats were Black-throated Sparrow, Northern Mockingbird, and Scaled Quail, followed by Mourning Dove and Turkey Vulture. Cactus Wren, Ash-throated Flycatcher, and Pyrrhuloxia seemed less numerous than previous seasons, and species typical of rocky hillsides, such as Rufous-crowned Sparrow, Canyon Towhee, Rock Wren, and Canyon Wren, were locally common. Low density species not regularly recorded were Cassin's Sparrow and Eastern Meadowlark, and the few raptors observed were Swainson's Hawk,



MOEZ ALI

Scaled Quail (*Callipepla squamata*) accounted for 13% of the total number of birds counted at Carlsbad Caverns NP in 2016.

Red-tailed Hawk, Cooper's Hawk, and American Kestrel. The Cave Swallow nesting colony was quite active, and wide-ranging foraging flocks were regularly observed throughout the park in diverse habitats.

The lush riparian transect at Rattlesnake Springs featured numerous Cassin's Kingbird, White-winged Dove, House Finch, Bell's Vireo, Blue Grosbeak, Summer Tanager, and Yellow-breasted Chat. The large resident flock of Wild Turkeys was ever-present and vocal, and both Gray Hawk and Yellow-billed Cuckoo were territorial in suitable breeding habitat. Migrant warblers, vireos, flycatchers, orioles, tanagers, and sparrows were numerous, and early nesting was observed for several resident species. Interesting highlights included Least Flycatcher, American Goldfinch, Orchard Oriole, Painted Bunting, Great Egret, and juvenile Great Horned Owls. Despite reports of a Groove-billed Ani and a Red-bellied Woodpecker (both unusual vagrants) during the sampling period, they were undetected on the surveys.

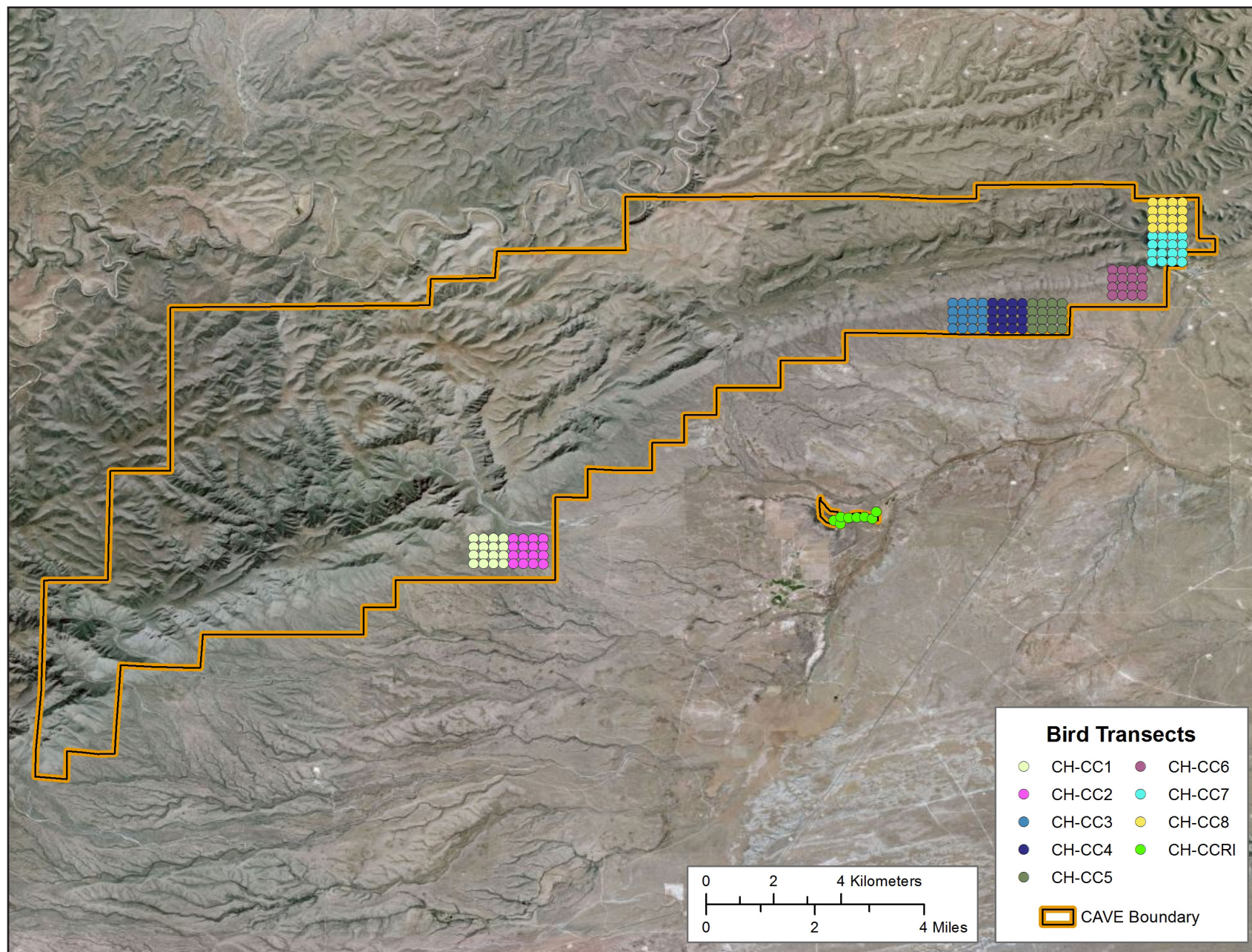


Figure 3.3.1. Point locations targeted for annual sampling at Carlsbad Caverns NP.

Table 3.3.1. Habitat class, number of points, and sampling dates for each transect or grid at Carlsbad Caverns NP, 2016

Transect/Grid	Habitat class	# Points	# Visits	Visit 1	Visit 2
CH-CC1	Grassland	14	1	5/15/2016	–
CH-CC2	Grassland	16	1	5/15/2016	–
CH-CC3	Grassland	14	1	5/18/2016	–
CH-CC4	Grassland	15	1	5/18/2016	–
CH-CC5	Grassland	16	1	5/18/2016	–
CH-CC6	Grassland	16	1	5/19/2016	–
CH-CC7	Grassland	11	1	5/16/2016	–
CH-CC8	Grassland	10	1	5/16/2016	–
CH-CCRI	Riparian	16 ¹	2	5/20/2016	5/21/2016

¹ A total of 16 points were sampled- 8 on Visit 1 and 8 on Visit 2.

Table 3.3.2. Number of birds counted of each species in each habitat class, Carlsbad Caverns NP, 2016

Species	Habitat class		# of Birds counted	
	Grassland	Riparian	Total	% of total
Black-throated Sparrow	281	–	281	14
Northern Mockingbird	251	9	260	13
Scaled Quail	252	5	257	13
Cave Swallow	77	9	86	4
Mourning Dove	59	26	85	4
Rufous-crowned Sparrow	80	–	80	4
Turkey Vulture	70	7	77	4
Ash-throated Flycatcher	42	12	54	3
Blue Grosbeak	40	10	50	3
Western Kingbird	32	15	47	2
Wild Turkey	–	47	47	2
White-winged Dove	1	45	46	2
Pyrrhuloxia	35	–	35	2
Brown-headed Cowbird	17	16	33	2
Cassin's Kingbird	–	31	31	2
Yellow-breasted Chat	1	28	29	1
Great-tailed Grackle	23	3	26	1
Cactus Wren	21	–	21	1
House Finch	5	16	21	1
Verdin	20	–	20	1
Western Wood-Pewee	–	20	20	1

Table 3.3.2. Number of birds counted of each species in each habitat class, Carlsbad Caverns NP, 2016, cont.

Species	Habitat class		# of Birds counted	
	Grassland	Riparian	Total	% of total
Rock Wren	18	–	18	1
Bell's Vireo	–	17	17	1
Vermilion Flycatcher	–	17	17	1
Northern Cardinal	–	16	16	1
Painted Bunting	–	16	16	1
Scott's Oriole	15	–	15	1
Summer Tanager	–	15	15	1
Yellow Warbler	–	14	14	1
Canyon Wren	12	–	12	1
Common Yellowthroat	–	12	12	1
Black-tailed Gnatcatcher	11	–	11	1
Greater Roadrunner	6	5	11	1
Bewick's Wren	1	8	9	0
Curve-billed Thrasher	5	4	9	0
Ladder-backed Woodpecker	3	6	9	0
Brewer's Sparrow	8	–	8	0
Canyon Towhee	8	–	8	0
Lucy's Warbler	–	8	8	0
Wilson's Warbler	–	7	7	0
Black-chinned Hummingbird	–	6	6	0
Barn Swallow	–	5	5	0
Cassin's Sparrow	5	–	5	0
Eastern Meadowlark	5	–	5	0
Orchard Oriole	–	5	5	0
Western Tanager	4	1	5	0
Bullock's Oriole	2	2	4	0
Eurasian Collared-Dove	–	4	4	0
Gray Hawk	–	4	4	0
Lesser Goldfinch	1	3	4	0
MacGillivray's Warbler	1	2	3	0
Red-tailed Hawk	3	–	3	0
Yellow-billed Cuckoo	–	3	3	0
Audubon's Warbler	2	–	2	0
Black Phoebe	–	2	2	0
Chipping Sparrow	2	–	2	0
Green-tailed Towhee	2	–	2	0
Hooded Oriole	–	2	2	0

Table 3.3.2. Number of birds counted of each species in each habitat class, Carlsbad Caverns NP, 2016, cont.

Species	Habitat class		# of Birds counted	
	Grassland	Riparian	Total	% of total
House Wren	–	2	2	0
Lark Sparrow	2	–	2	0
Lazuli Bunting	2	–	2	0
American Goldfinch	–	1	1	0
Chihuahuan Raven	1	–	1	0
Cliff Swallow	1	–	1	0
Common Grackle	–	1	1	0
Common Nighthawk	1	–	1	0
Common Poorwill	1	–	1	0
Dusky Flycatcher	–	1	1	0
Least Flycatcher	–	1	1	0
Lesser Nighthawk	1	–	1	0
Pine Siskin	–	1	1	0
Say's Phoebe	1	–	1	0
Warbling Vireo	–	1	1	0
White-crowned Sparrow	–	1	1	0
<i>Unidentified bird</i>	31	–	31	2
<i>Unidentified sparrow</i>	8	–	8	0
<i>Unidentified swallow</i>	3	–	3	0
<i>Unidentified duck</i>	1	–	1	0
<i>Unidentified raptor</i>	1	–	1	0
Total	1,475	492	1,967	100

Note: New species that have not previously been verified for the park (if any) 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.

3.4 Fort Davis National Historic Site

3.4.1 2016 sampling

During April of 2016, we sampled one grid at Fort Davis NHS (Figure 3.4.1) twice (visits were one day apart). We conducted a total of 36 point counts in the park (Table 3.4.1).

3.4.2 Results

During 2016, 451 birds of 35 species were counted at Fort Davis NHS (Table 3.4.2). Canyon Wren had the highest number of birds counted (10% of the total number of birds counted). The next most counted species were Cactus Wren (8%) and Black-throated Sparrow (7%), followed by Ash-throated Flycatcher (4%), Eurasian Col-lared-Dove (4%), White-winged Dove (4%), Mourning Dove (4%), Northern Cardinal (4%), and Scott's Oriole (4%). No new species were recorded for the park in 2016.

3.4.3 Field observations

Note that the field observations described in this section may include general observations of the field sampling crew while at the park, in addition to observations made during the actual surveys.

In the grassy lowlands, Black-chinned Humming-bird, Cassin's Kingbird, Black-throated Spar-row, Rufous-crowned Sparrow, Scott's Oriole, Rock Wren, White-winged Dove, Eurasian Col-lared-Dove, Canyon Towhee, Barn Swallow, and Brewer's Blackbird, were all commonly detected. When hiking into the cliffs the field crew ob-served Canyon Wren, Bewick's Wren, and Black-crested Titmouse in high numbers. Lark Sparrow and Phainopepla were also commonly seen in the lowlands but appeared little on the survey due to their becoming active closer to noon. Swainson's Hawks share the property's large cottonwoods as a nesting area with Cassin's Kingbirds. Park staff also mentioned a pair of Red-tailed Hawks nest-ing in Hospital Canyon. The uncommon Mont-ezuma Quail was detected only once during the survey period (but not on a survey).



Cactus Wren (*Campylorhynchus brunneicapillus*) was observed at Fort Davis NHS, as well as at all other CHDN parks, in 2016.

Table 3.4.1. Habitat class, number of points, and sampling dates for the grid at Fort Davis NHS, 2016

Transect/Grid	Habitat class	# Points	# Visits	Visit 1	Visit 2
CH-FODA	Grassland	36 ¹	2	4/19/2016	4/20/2016

¹ A total of 36 points were sampled in 2016 (17 on the first visit and 19 on the second visit).

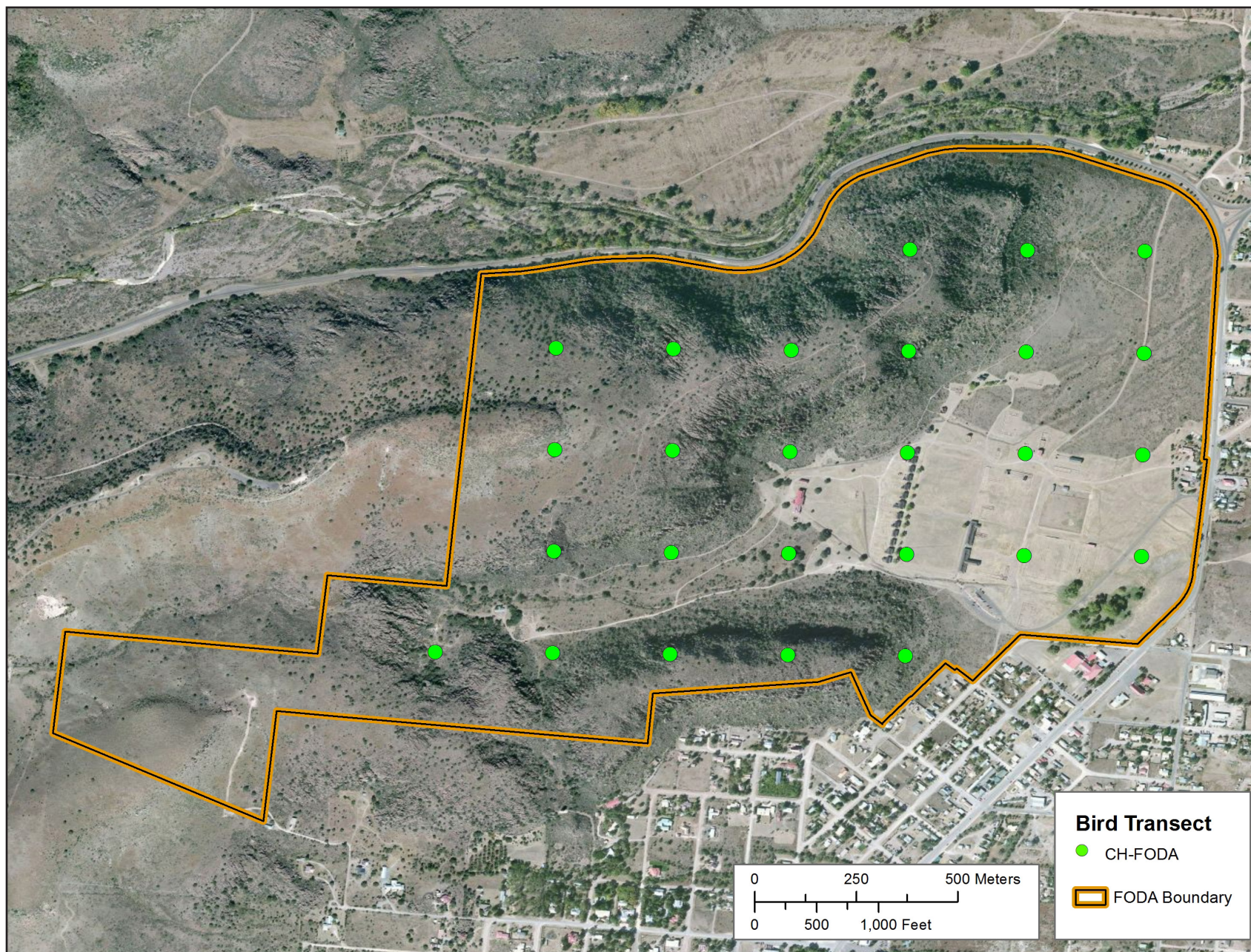


Figure 3.4.1. Point locations targeted for annual sampling at Fort Davis NHS.

Table 3.4.2. Number of birds counted of each species in each habitat class, Fort Davis NHS, 2016

Species	# of Birds counted		Species	# of Birds counted	
	Total (grassland)	% of total		Total (grassland)	% of total
Canyon Wren	44	10	Black-crested Titmouse	3	1
Cactus Wren	34	8	Curve-billed Thrasher	3	1
Black-throated Sparrow	31	7	American Robin	1	0
Ash-throated Flycatcher	18	4	Brewer's Sparrow	1	0
Eurasian Collared-Dove	18	4	Common Raven	1	0
White-winged Dove	18	4	Lesser Goldfinch	1	0
Mourning Dove	17	4	Phainopepla	1	0
Northern Cardinal	16	4	Pyrrhuloxia	1	0
Scott's Oriole	16	4	Summer Tanager	1	0
Barn Swallow	15	3	Swainson's Hawk	1	0
Rufous-crowned Sparrow	15	3	Yellow-rumped Warbler	1	0
Canyon Towhee	11	2	Unidentified bird	63	14
Chipping Sparrow	10	2	Unidentified sparrow	26	6
Rock Wren	10	2	Unidentified hawk	3	1
Turkey Vulture	10	2	Unidentified dove	2	0
Brewer's Blackbird	9	2	Unidentified falcon	2	0
Northern Mockingbird	9	2	Unidentified hummingbird	1	0
House Finch	8	2	Total	451	100
Black-chinned Hummingbird	7	2	<i>Note:</i> New species that have not previously been verified for the park (if any) 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.		
Cassin's Kingbird	6	1			
Bewick's Wren	5	1			
Blue-gray Gnatcatcher	4	1			
Greater Roadrunner	4	1			
House Sparrow	4	1			

3.5 Guadalupe Mountains National Park

3.5.1 2016 sampling

During May of 2016, we sampled a total of 10 transects/grids at Guadalupe Mountains NP one time (Figure 3.5.1). We conducted 116 point counts on 10 grids in grassland habitat, but we did not sample the riparian transect (Table 3.5.1). The riparian transect was not sampled because it was affected by a wildfire that closed off McKittrick Canyon.

3.5.2 Results

We counted 1,029 birds of 39 species at Guadalupe Mountains NP in 2016 (Table 3.5.2). The number of species counted was substantially smaller than in 2014 (the last time sampled, 85 species), presumably because the riparian transect was not sampled. Black-throated Sparrow had the highest number of birds counted (23% of the total number of birds counted). Other species counted in relatively high numbers included Cactus Wren (10%), Scott's Oriole (10%), Northern Mockingbird (10%), and Scaled Quail (7%). No new species were recorded for the park in 2016.

3.5.3 Field observations

Note that the field observations described in this section may include general observations of the field sampling crew while at the park, in addition to observations made during the actual surveys.

The most numerous species in the upland habitats were Black-throated Sparrow, Cactus Wren, Scott's Oriole, Northern Mockingbird, and Scaled Quail. Lark Bunting was notably prominent in mixed sparrow flocks, which contained fewer Brewer's, Chipping, and White-crowned sparrows. Species seemingly less common than in previous seasons were Verdin, Black-tailed Gnatcatcher, Curve-billed Thrasher, Pyrrhuloxia, and Greater Roadrunner. Regularly expected migrants in the sparse desertscrub included Western Tanager, Black-headed Grosbeak, Western Wood-Pewee, Warbling Vireo, and Yellow-rumped Warbler.

Due to a prolonged wildfire closure at McKittrick Canyon, the riparian transect was not surveyed during the sampling period, although a few notable incidental sightings included nesting Gray Vireos, territorial Black-chinned Sparrows, dis-



Verdin (*Auriparus flaviceps*) was among the 15 birds recorded in the highest numbers at Guadalupe Mountains NP in 2016.

playing Broad-tailed Hummingbirds, and courting Red-tailed Hawks. Several montane species characteristic of the higher elevations were undoubtedly affected by the fire and were observed downslope in unusual locations and habitats outside the canyon. These included Grace's Warbler, Hepatic Tanager, Pygmy Nuthatch, Hairy Woodpecker, Hermit Thrush, and Steller's Jay.

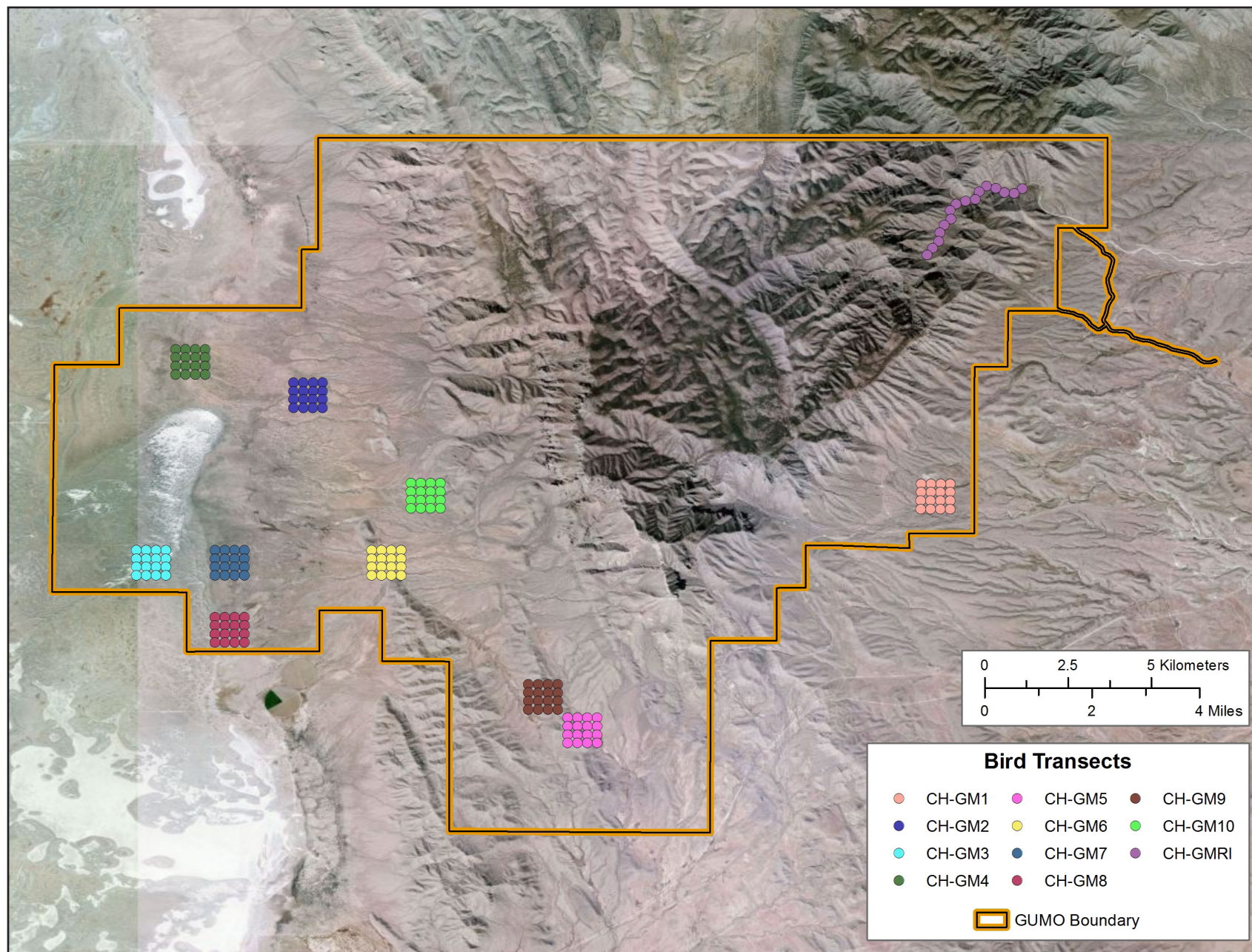


Figure 3.5.1. Point locations targeted for annual sampling at Guadalupe Mountains NP.

Table 3.5.1. Habitat class, number of points, and sampling dates for each transect or grid at Guadalupe Mountains NP, 2016

Transect/Grid	Habitat class	# Points	# Visits	Visit 1	Visit 2
CH-GM1	Grassland	16	1	5/13/2016	–
CH-GM2	Grassland	8	1	5/10/2016	–
CH-GM3	Grassland	14	1	5/13/2016	–
CH-GM4	Grassland	13	1	5/10/2016	–
CH-GM5	Grassland	9	1	5/12/2016	–
CH-GM6	Grassland	10	1	5/11/2016	–
CH-GM7	Grassland	13	1	5/14/2016	–
CH-GM8	Grassland	9	1	5/14/2016	–
CH-GM9	Grassland	12	1	5/12/2016	–
CH-GM10	Grassland	12	1	5/11/2016	–
CH-GMRI	Riparian	– ¹	–	–	–

¹ The riparian transect was not sampled in 2016 due to wildfire.

Table 3.5.2. Number of birds counted of each species in each habitat class, Guadalupe Mountains NP, 2016

Species	Habitat class		# of Birds counted	
	Grassland	Riparian	Total	% of total
Black-throated Sparrow	235	–	235	23
Cactus wren	102	–	102	10
Scott's Oriole	101	–	101	10
Northern Mockingbird	99	–	99	10
Scaled Quail	72	–	72	7
Ash-throated Flycatcher	46	–	46	4
Brewer's Sparrow	36	–	36	3
Mourning Dove	32	–	32	3
Lark Bunting	30	–	30	3
Rufous-crowned Sparrow	30	–	30	3
Pyrrhuloxia	23	–	23	2
Greater Roadrunner	18	–	18	2
Verdin	16	–	16	2
Canyon Towhee	12	–	12	1
Black-tailed Gnatcatcher	9	–	9	1
Cassin's Sparrow	9	–	9	1
Western Kingbird	9	–	9	1
Lesser Nighthawk	7	–	7	1
Turkey Vulture	7	–	7	1

Table 3.5.2. Number of birds counted of each species in each habitat class, Guadalupe Mountains NP, 2016, cont.

Species	Habitat class		# of Birds counted	
	Grassland	Riparian	Total	% of total
Chihuahuan Raven	4	–	4	0
House Finch	4	–	4	0
Loggerhead Shrike	4	–	4	0
Bewick's Wren	3	–	3	0
Lesser Goldfinch	3	–	3	0
Swainson's Hawk	3	–	3	0
Canyon Wren	2	–	2	0
Curve-billed Thrasher	2	–	2	0
Rock Wren	2	–	2	0
Summer Tanager	2	–	2	0
Vesper Sparrow	2	–	2	0
White-winged Dove	2	–	2	0
Blue-gray Gnatcatcher	1	–	1	0
Common Poorwill	1	–	1	0
Crissal Thrasher	1	–	1	0
Green-tailed Towhee	1	–	1	0
Green-winged Teal	1	–	1	0
Spotted Towhee	1	–	1	0
Western Tanager	1	–	1	0
Western Wood-Pewee	1	–	1	0
<i>Unidentified bird</i>	72	–	72	7
<i>Unidentified sparrow</i>	17	–	17	2
<i>Unidentified dove</i>	2	–	2	0
<i>Unidentified raven</i>	2	–	2	0
<i>Unidentified hummingbird</i>	1	–	1	0
<i>Unidentified woodpecker</i>	1	–	1	0
Total	1,029	0	1,029	100

Note: New species that have not previously been verified for the park (if any) 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 2016 sampling

During May of 2016, we sampled 10 grids at White Sands NM (Figure 3.6.1). We conducted 152 point counts on the 10 grids in grassland habitat (Table 3.6.1). Each point was surveyed once.

3.6.2 Results

During 2016 surveys, 596 birds of 42 species were counted at White Sands NM (Table 3.6.2). Black-throated Sparrow had the highest number of birds counted (27% of the total number of birds counted). The next most counted species were Northern Mockingbird (17%), Scott's Oriole (7%), and Western Kingbird (6%), as well as Western Wood-Pewee (4%), Ash-throated Flycatcher (4%), and Cactus Wren (4%). No new species were recorded during surveys in the park in 2016.

3.6.3 Field observations

Note that the field observations described in this section may include general observations of the field sampling crew while at the park, in addition to observations made during the actual surveys.

Overall detections in the flat open uplands were noticeably lower than last season, especially in the sparsely vegetated dunes where the diversity and numbers were quite minimal. Black-throated Sparrow and Northern Mockingbird were observed in expected numbers and seemed common throughout, but species recorded in lower than average totals were Cactus Wren, Mourning Dove, Horned Lark, and Loggerhead Shrike.



One Lazuli Bunting (*Passerina amoena*) was observed at White Sands NM during 2016 surveys.

Loggerhead Shrike was especially absent from suitable areas where it has bred in the past. Very few sparrows were present, mostly represented by Brewer's, Chipping and White-crowned sparrows, and the only migrants were Orange-crowned Warbler and Wilson's Warbler.

The large cottonwood grove at Big Pedestal, south of the Visitor Center, once again proved to be the best birding spot with its big trees, dense bushes, and sheltered "oasis" aspect; it hosted a nice diversity and large numbers of resident and migrant species. Common birds were House Finch, Western Kingbird, Ash-throated Flycatcher, and Western Wood-Pewee. Many migrants staged here, even during the heat of the day, such as Bullock's Oriole, Lazuli Bunting, Pine Siskin, Western Tanager, Black-headed Grosbeak, Dusky Flycatcher, and Summer Tanager. Nesting Barn Swallow and Say's Phoebe were common around the Visitor Center and housing area, and the previously known Great Horned Owl nest was occupied by Chihuahuan Ravens with young.

Table 3.6.1. Habitat class, number of points, and sampling dates for each transect or grid at White Sands NM, 2016

Transect/Grid	Habitat class	# Points	# Visits	Visit date
CH-WH1	Grassland	16	1	5/24/2016
CH-WH2	Grassland	15	1	5/24/2016
CH-WH3	Grassland	16	1	5/25/2016
CH-WH5	Grassland	13	1	5/23/2016
CH-WH6	Grassland	12	1	5/23/2016
CH-WH7	Grassland	16	1	5/25/2016
CH-WH8	Grassland	16	1	5/24/2016
CH-WH9	Grassland	16	1	5/23/2016
CH-WH10	Grassland	16	1	5/22/2016
CH-WH11	Grassland	16	1	5/25/2016

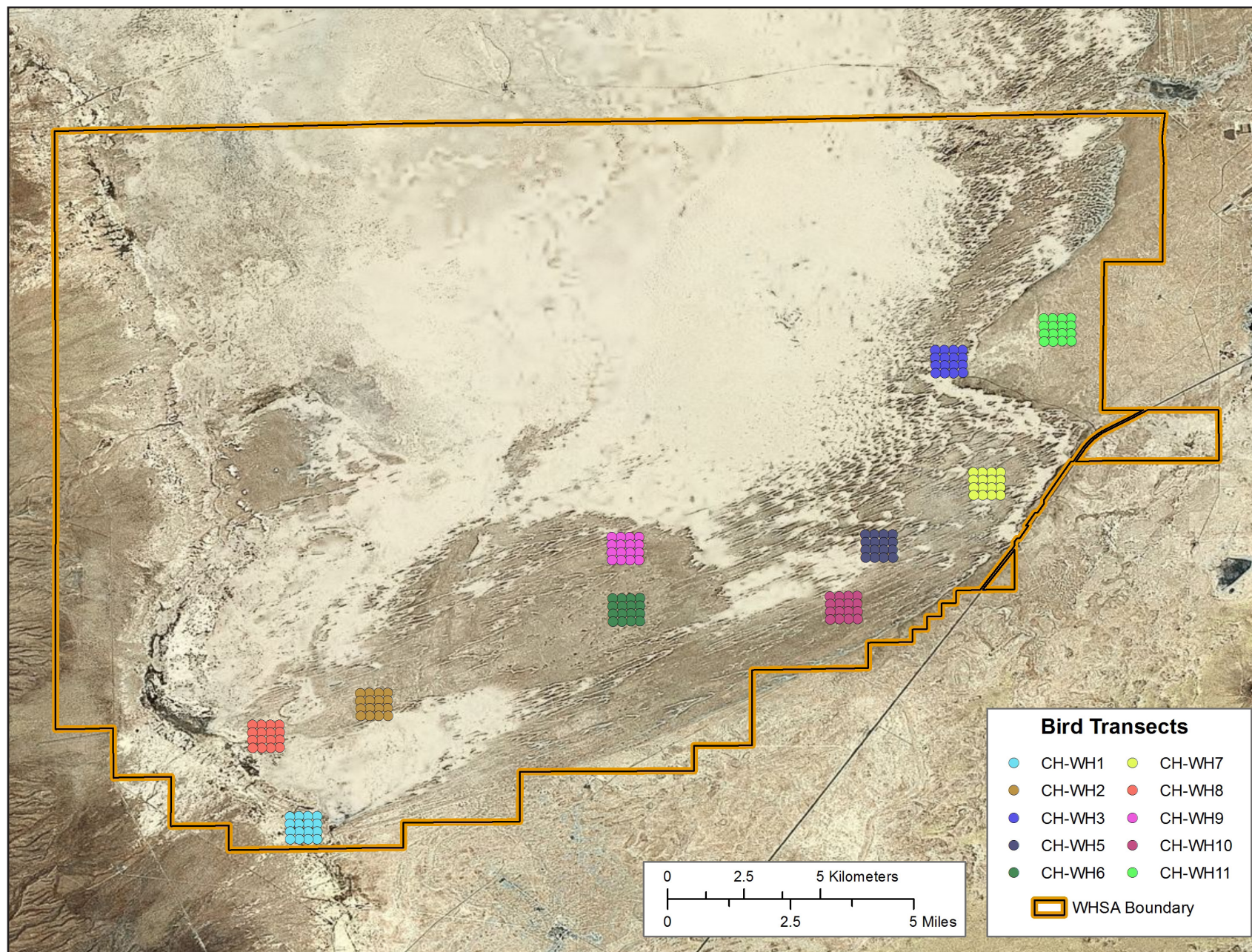


Figure 3.6.1. Point locations targeted for annual sampling at White Sands NM.

Table 3.6.2. Number of birds counted of each species in each habitat class, White Sands NM, 2016

Species	# of Birds counted		Species	# of Birds counted	
	Total (grassland)	% of total		Total (grassland)	% of total
Black-throated Sparrow	162	27	Lesser Goldfinch	2	0
Northern Mockingbird	104	17	Pine Siskin	2	0
Scott's Oriole	43	7	Swainson's Hawk	2	0
Western Kingbird	34	6	White-winged Dove	2	0
Western Wood-Pewee	26	4	Yellow-rumped Warbler	2	0
Ash-throated Flycatcher	25	4	Black-headed Grosbeak	1	0
Cactus Wren	25	4	Blue-gray Gnatcatcher	1	0
Horned Lark	12	2	Cassin's Sparrow	1	0
Loggerhead Shrike	10	2	Cliff Swallow	1	0
Chihuahuan Raven	9	2	Lark Bunting	1	0
Western Tanager	9	2	Lazuli Bunting	1	0
House Finch	7	1	Pyrhuloxia	1	0
White-crowned Sparrow	7	1	Say's Phoebe	1	0
Eastern Meadowlark	6	1	Summer Tanager	1	0
Mourning Dove	6	1	White-throated Swift	1	0
Verdin	6	1	<i>Unidentified bird</i>	38	6
Bullock's Oriole	5	1	<i>Unidentified raven</i>	6	1
Lesser Nighthawk	4	1	<i>Unidentified sparrow</i>	5	1
Scaled Quail	4	1	<i>Unidentified meadowlark</i>	2	0
Blue Grosbeak	3	1	<i>Unidentified swallow</i>	2	0
Greater Roadrunner	3	1	Total	596	100
MacGillivray's Warbler	3	1	<i>Note:</i> New species that have not previously been verified for the park (if any) 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.		
Audubon's Warbler	2	0			
Barn Swallow	2	0			
Black-chinned Hummingbird	2	0			
Crissal Thrasher	2	0			
Dusky Flycatcher	2	0			

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