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Landbird Monitoring in the Southern Plains Network

2013 Annual Report

Natural Resource Technical Report NPS/SOPN/NRTR—2014/842

ON THE COVER

Red-winged Blackbird (***Agelaius phoeniceus***) had the third highest number of individuals counted of all species during point-count surveys in the Southern Plains Inventory & Monitoring Network in 2013. Photo © Robert Shantz.

Landbird Monitoring in the Southern Plains Network

2013 Annual Report

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Contents

Acronyms xi

Executive Summary xiii

1 Introduction 1
- 1.1 Background 1
- 1.2 Program Goals and Objectives 2

2 Methods 3
- 2.1 Methods 3
- 2.2 Bird Surveys 4
- 2.3 Additional Monitoring to Augment Bird Sampling 5
- 2.4 Reporting 6
- 2.5 Accessing the Data 6

3 Results and Discussion 7
- 3.1 Bent's Old Fort National Historic Site 20
- 3.2 Capulin Volcano National Monument 24
- 3.3 Chickasaw National Recreation Area 28
- 3.4 Fort Larned National Historic Site 33
- 3.5 Fort Union National Monument 37
- 3.6 Lake Meredith National Recreation Area 40
- 3.7 Lyndon B. Johnson National Historical Park 48
- 3.8 Pecos National Historical Park 54
- 3.9 Sand Creek Massacre National Historic Site 59
- 3.10 Washita Battlefield National Historic Site 63

4 Literature Cited 67

Figures

Figure 2.1.2. Dates when sampling was conducted in SOPN parks, 2013. 4

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. 5

Figure 3.1.1. Point locations targeted for annual sampling at Bent's Old Fort NHS. 21

Figure 3.2.1. Point locations targeted for annual sampling at Capulin Volcano NM. 25

Figure 3.3.1-1. Bird sampling areas at Chickasaw NRA. 29

Figure 3.3.1-2. Point locations targeted for annual sampling at Chickasaw NRA, North Hunting/West Hunting. 30

Figure 3.3.1-3. Point locations targeted for annual sampling at Chickasaw NRA, Five Lakes. 31

Figure 3.4.1. Point locations targeted for annual sampling at Fort Larned NHS. 34

Figure 3.5.1. Point locations targeted for annual sampling at Fort Union NM. 38

Figure 3.6.1-1. Bird sampling areas at Lake Meredith NRA. 41

Figure 3.6.1-2. Point locations targeted for annual sampling at Lake Meredith NRA, Upland Grass/ Honey Mesquite. 42

Figure 3.6.1-3. Point locations targeted for annual sampling at Lake Meredith NRA, Pernnial Bottomland. 43

Figure 3.6.1-4. Point locations targeted for annual sampling at Lake Meredith NRA, Cottonwood. 44

Figure 3.7.1-1. Bird sampling areas at Lyndon B. Johnson NHP. 49

Figure 3.7.1-2. Point locations targeted for annual sampling at Lyndon B. Johnson NHP, Ranch, ... 50

Figure 3.7.1-3. Point locations targeted for annual sampling at Lyndon B. Johnson NHP, Back 40/ Restoration. 51

Figure 3.8.1. Point locations targeted for annual sampling at Pecos NHP. 55

Figure 3.9.1. Point locations targeted for annual sampling at Sand Creek Massacre NHS. 60

Figure 3.10.1. Point locations targeted for annual sampling at Washita Battlefield NHS. 64

Tables

Table 1.1-1. Parks in the Southern Plains Inventory & Monitoring Network (SOPN) 1

Table 2.1.1-1. Habitat classes and types by park 3

Table 2.1.1-2. Number of transects of each habitat class surveyed in each SOPN park unit, 2013 3

Table 3-1. The number of point visits (# of unique points multiplied by # of visits) and individual birds counted in each habitat class at each SOPN park, 2013 7

Table 3-2. Number of species observed in each habitat class (grassland, pinyon-juniper woodland, and riparian) at each park, 2013 7

Table 3-3. Total number of individual birds observed of each species during surveys in all SOPN parks, 2013 8

Table 3-4. Parks where each species was detected, April through June 2013 11

Table 3.1.1. Habitat type, number of points, and sampling dates for each transect or grid at Bent's Old Fort NHS, 2013 20

Table 3.1.2 Number of birds detected of each species counted in each habitat class, Bent's Old Fort NHS, 2013 22

Table 3.2.1. Habitat type, number of points, and sampling dates for each transect or grid at Capulin Volcano NM, 2013 24

Table 3.2.2. Number of birds detected of each species in each habitat class, Capulin Volcano NM, 2013 26

Table 3.3.1. Habitat type, number of points, and sampling dates for each transect or grid at Chickasaw NRA, 2013 28

Table 3.3.2. Number of birds detected of each species in each habitat class, Chickasaw NRA, 2013 32

Table 3.4.1. Habitat type, number of points, and sampling dates for each transect or grid at Fort Larned NHS, 2013 33

Table 3.4.2. Number of birds detected of each species in each habitat class, Fort Larned NHS, 2013 35

Table 3.5.1. Habitat type, number of points, and sampling dates for each transect or grid at Fort Union NM, 2013 37

Table 3.5.2. Number of birds detected of each species in each habitat class, Fort Union NM, 2013 39

Table 3.6.1. Habitat type, number of points, and sampling dates for each transect or grid at Lake Meredith NRA, 2013 40

Table 3.6.2. Number of birds detected of each species in each habitat class, Lake Meredith NRA, 2013 45

Table 3.7.1. Habitat type, number of points, and sampling dates for each transect or grid at Lyndon B. Johnson NHP, 2013 48

Table 3.7.2. Number of birds detected of each species in each habitat class, Lyndon B. Johnson NHP, 2013 52

Table 3.8.1. Habitat type, number of points, and sampling dates for each transect or grid at Pecos NHP, 2013 54

Table 3.8.2. Number of birds detected of each species in each habitat class, Pecos NHP, 2013 56

Table 3.9.1. Habitat type, number of points, and sampling dates for each transect or grid at Sand Creek Massacre NHS, 2013 59

Table 3.9.2. Number of birds detected of each species in each habitat class, Sand Creek Massacre NHS, 2013 61

Table 3.10.1. Habitat type, number of points, and sampling dates for each transect or grid at Washita Battlefield NHS, 2013 63

Table 3.10.2. Number of birds detected of each species in each habitat class, Washita Battlefield NHS, 2013 65

Photos

Nests of Bank Swallow, Cliff Swallow, and Tree Swallow. All of these species were observed in the SOPN in 2013....10

In 2013, White-faced Ibis (*Plegadis chihi*) was observed during point count surveys at the park for the first time. 20

Red-breasted Nuthatch (*Sitta canadensis*) was recorded for the first time at Capulin Volcano NM in 2013. 24

Dickcissel (*Spiza americana*) accounted for 10% of the birds counted at Chickasaw NRA in 2013...28

American Robin (*Turdus migratorius*) accounted for 5% of the birds counted at the Historic Site in 2013. 33

Greater Roadrunner (*Geococcyx californianus*) was one of five new species at Fort Union NM in 2013....37

Orange-crowned Warbler (*Oreothlypis celata*), a new species for the park in 2013, was observed in riparian habitat. 40

A number of Ladder-backed Woodpeckers (*Picoides scalaris*) were observed at the riparian transect at the park in 2013....48

Riparian habitat at Lyndon B. Johnson NHP....53

Evening Grosbeak (*Coccothraustes vespertinus*), a possible migrant at Pecos NHP, was recorded for the first time at the park in 2013....54

Hairy Woodpecker (*Picoides villosus*) was a new species recorded at Sand Creek Massacre NHS in 2013. 59

Common Nighthawk (*Chordeiles minor*) was recorded in small numbers during surveys at Washita Battlefield NHS in 2013. 63

Acronyms

BEOL	Bent's Old Fort National Historic Site
CAVO	Capulin Volcano National Monument
CHIC	Chickasaw National Recreation Area
FOLS	Fort Larned National Historic Site
FOUN	Fort Union National Monument
LAMR	Lake Meredith National Recreation Area
LYJO	Lyndon B. Johnson National Historical Park
NHP	national historical park
NHS	national historic site
NM	national monument
NP	national park
NPS	National Park Service
PECO	Pecos National Historical Park
RMBO	Rocky Mountain Bird Observatory
SAND	Sand Creek Massacre National Historic Site
SOPN	Southern Plains Inventory & Monitoring Network
WABA	Washita Battlefield National Historic Site

Executive Summary

In 2013, landbirds were surveyed within all of the Southern Plains Inventory & Monitoring Network (SOPN) parks. However, Alibates Flint Quarries National Monument (NM) and Lake Meredith National Recreation Area (NRA) were treated as one park unit, and no sampling was specifically conducted at Alibates Flint Quarries NM. Sample points were located along a transect for linear features (e.g., most riparian habitats) or a grid for areal features. A total of 34 transects or grids were surveyed in 2013. Survey efforts were focused on the breeding season, when increased territorial behavior by songbirds results in higher detection rates and greater sampling efficiency. The window of primary breeding and, therefore, sampling, was from April through June, with adjustments made for individual park visits based on latitude and elevation. We used point-transect surveys to estimate and monitor landbird population parameters. Surveys were conducted three times for each transect or grid to facilitate estimates of occupancy, which rely on an encounter-history matrix derived from repeated visits, rather than a detection function to account for detectability.

There was a total of 1,676 point visits (the number of unique points multiplied by the number of visits) on the 34 transects or grids. Of these, 1,239 were point visits in grassland habitats (including 51 point visits in pinyon-juniper woodland habitat) and 437 were point visits in riparian habitats. We recorded a total of 19,917 individual birds of 181 species on our points, with an additional 113 individual birds detected as flyovers. Pecos National Historical Park (NHP) had the highest number of individual birds counted (n = 3,737). Lyndon B. Johnson NHP had the lowest number of birds counted (n = 633). Species richness and community composition varied widely among the parks surveyed. We observed the greatest number of species at Lake Meredith NRA (n = 92) and the fewest at Lyndon B. Johnson NHP (n = 34). The number of individuals or species detected is influenced not only by the number of points, but also by the size and diversity of available habitats. Western Meadowlark was the species counted in the highest number within the SOPN (n = 1,749), followed by Mourning Dove, Red-winged Blackbird, and Cassin's Sparrow. Four species, Barn Swallow, Brown-headed Cowbird, Mourning Dove, and Northern Mockingbird were detected at every park in the network, and an additional eight species were detected at eight or nine of the ten parks. New species, previously unverified in a given park, were recorded for nine parks. Overall, the number of new species recorded in 2013 was large compared to previous years.

The Rocky Mountain Bird Observatory (RMBO), our primary cooperator for this project, collects and manages the network's bird monitoring data. Other networks using RMBO also use this data management service and have found it to be efficient and effective. This enables SOPN data to be in the same database as those of several other networks and organizations, which in turn allows for a more comprehensive regional assessment. To view interactive maps showing survey and detection locations, as well as species counts and survey effort, visit RMBO's Avian Data Center at http://rmbo.org/v3/avian/Home.aspx.

1 Introduction

1.1 Background

The mission of the National Park Service (NPS) is to manage park resources "unimpaired for future generations." Protecting and managing some of our nation's most significant natural resources requires basic knowledge of the condition of ecosystems and species that occur in national parks. In order to better meet this mission, the Inventory & Monitoring (I&M) Program was established to determine status and trends in ecological resources (NPS 1992). Established in 2002, the Southern Plains Inventory & Monitoring Network (SOPN) includes 11 parks in southeastern Colorado, Kansas, New Mexico, Oklahoma, and Texas (Table 1.1-1). The SOPN consists of mostly mixed- and shortgrass ecosystems. It is bordered on the east by tallgrass prairie, and on the west by the forested systems of the Rocky Mountains (NPS, SOPN 2008).

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 SOPN parks. Landbirds are a conspicuous component of many ecosystems and have high body temperatures, rapid metabolisms, and occupy high trophic levels. As such, changes in landbird populations may be indicators of changes in the biotic or abiotic components of the environment upon which they depend (Canterbury et al. 2000; Bryce et al. 2002). Relative to other vertebrates, landbirds are also highly detectable and can be efficiently surveyed with the use of numerous standardized methods (Bibby et al. 2000; Buckland et al. 2001).

Birds select habitat based on the presence of behavioral cues triggered by the environment (Hutto 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 (Dale and Beyeler 2001) that may assist with elucidating changes in the bird community to other environmental factors. Such a broad-based approach is now being undertaken by the SOPN (NPS, SOPN 2008) and other broad-based monitoring approaches (e.g., Ringold et al. 1996; Stevens and Gold 2003; Barrows et al. 2005).

Perhaps the most compelling reason to monitor landbird communities is that birds themselves are

Table 1.1-1. Parks in the Southern Plains Inventory & Monitoring Network (SOPN)

Park	Park Acronymn	Area (Acres)	Acres (Hectares)
Alibates Flint Quarries National Monument	ALFL	1,371	555
Bent's Old Fort National Historic Site	BEOL	799	323
Capulin Volcano National Monument	CAVO	793	321
Chicasaw National Recreation Area	CHIC	9,889	4,002
Fort Larned National Historic Site	FOLS	718	291
Fort Union National Monument	FOUN	721	292
Lake Meredith National Recreation Area	LAMR	46,349	18,757
Lyndon B. Johnson National Historical Park	LYJO	674	273
Pecos National Historical Park	PECO	6,670	2,699
Sand Creek Massacre National Historic Site	SAND	2,400	971
Washita Battlefield National Historic Site	WABA	326	132

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

The SOPN began monitoring birds in 2009; this effort is now part of a collaboration among the Southern Plains, Sonoran Desert, and Chihuahuan Desert networks.

1.2 Program Goals and Objectives

The overall goal of the SOPN 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. Although we have selected these objectives, 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 most species in most parks. Occupancy is a measure of presence or absence of a species in space that indicates changes in the distribution of a species when evaluated across time. Recent advancements in occupancy theory and modeling have provided sound justification of its application in monitoring programs (MacKenzie et al. 2003; Field et al. 2005; MacKenzie et al. 2006).

1.2.2 Objective 2: Bird species richness and composition

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

1.2.3 Objective 3: Density (when feasible)

We will estimate density of the most common species using the point-transect distance-sampling method at fixed points and the Distance program (Thomas et al. 2005) for subsequent analyses. 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 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 Methods

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.

We sampled primarily in two habitat classes: grassland and riparian, which are the dominant vegetation communities within the SOPN. One pinyon-juniper woodland transect at Capulin Volcano National Monument (NM) was also sampled, however, because the area had been targeted to become grassland; that management strategy may no longer be planned. Within the broad habitat classes, there is considerable variation; SOPN parks can be further stratified into six more specific habitat types (Table 2.1.1-1, -2).

Table 2.1.1-2. Number of transects of each habitat class surveyed in each SOPN park unit, 2013

Park unit	Grassland	PJ Woodland [1]	Riparian
BEOL	4	--	1
CAVO	1	1	--
CHIC	4	--	--
FOLS	2	--	1
FOUN	3	--	--
LAMR	2	--	2
LYJO	1	--	1
PECO	4	--	2
SAND	2	--	1
WABA	2	--	--

[1]Some pinyon-juniper woodlands that were targeted for conversion to grassland prior to 2010 sampling were surveyed.

In 2013, we surveyed landbirds within all of the SOPN park units (Lake Meredith National Recreation Area [NRA] and Alibates Flint Quarries NM were treated as one park unit, and no sampling was specifically done at Alibates Flint Quarries NM). Sample points were located along a transect for linear features (e.g., most riparian habitats) or a grid for area features. Note that in Chapter 3 we may use the terms "transect" and

Table 2.1.1-1. Habitat classes and types by park

Habitat classes	Habitat types	Parks
Grassland	Shortgrass prairie	• BEOL • CAVO • FOUN • PECO • SAND
Grassland	Upland grassland	• CHIC • FOLS • LAMR • LYJO • WABA
Woodland	Pinyon-juniper	• CAVO
Riparian	Bottomland grassland	• LAMR • LYJO • WABA
Riparian	Cottonwood bottom	• BEOL • LAMR • PECO • SAND
Riparian	Riparian woodland	• FOLS

"grid" interchangeably. A total of 34 transects or grids were surveyed in 2013 (Table 2.1.1-2). In most parks, we used sites selected with methodology outlined in 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 certainly an important component of bird communities, their presence can be highly variable and substantially influenced by external factors. Focusing on the breeding population is expected to provide the most reliable information about changes in bird populations related to changes in condition of SOPN 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 June, with adjustments, as described above, for individual park visits based on latitude and elevation (Figure 2.1.2).

2.2 Bird Surveys

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

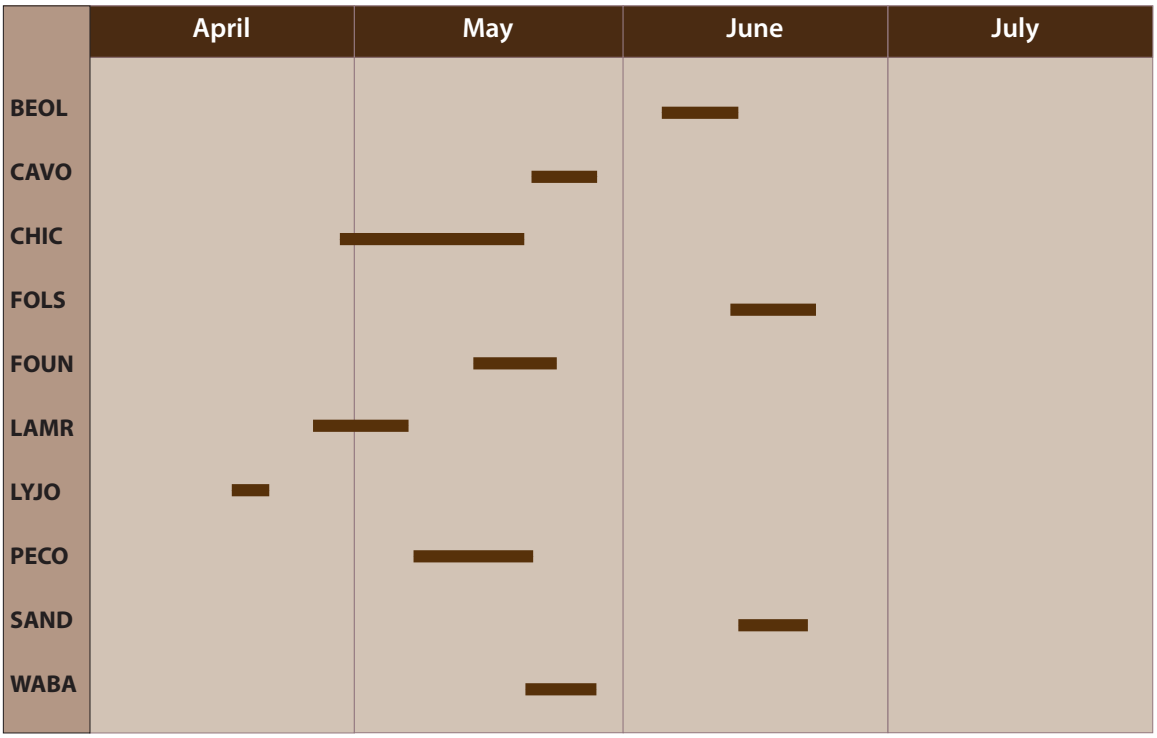

Figure 2.1.2. Dates when sampling was conducted in SOPN parks, 2013.

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

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 species that were either previously unconfirmed or that had not been detected on previous point-transect surveys in a particular park.

Surveys were conducted three times for each transect or grid to facilitate occupancy estimates, which rely on an encounter-history matrix derived from repeated visits, rather than a detection function to account for detectability. Note that in the report we use the terms "points" and "point visits." "Points" are the unique sampling points on transects or grids, while "point visits" are the number of unique points multiplied by the number of visits.

We spent six minutes at each point along the transect or grid and used a rangefinder to estimate the linear distance to each bird or group detected. Six minute counts are consistent with region-wide bird monitoring efforts being conducted by Rocky Mountain Bird Observatory (RMBO) and its partners.

2.3 Additional Monitoring to Augment Bird Sampling

It is well known that landbird populations are particularly influenced by changes in vegetation structure and composition (Holmes and Sherry 2001; Krueper et al. 2003). Considering environmental data, such as vegetation, will allow us to aggregate (i.e., to stratify, post-hoc) survey sites that share similar characteristics. For this purpose, we will use data collected through the network's vegetation monitoring efforts. We will also use other data (e.g., climate) collected by SOPN and other organizations as covariates when assessing population trends for birds. Finally, land-

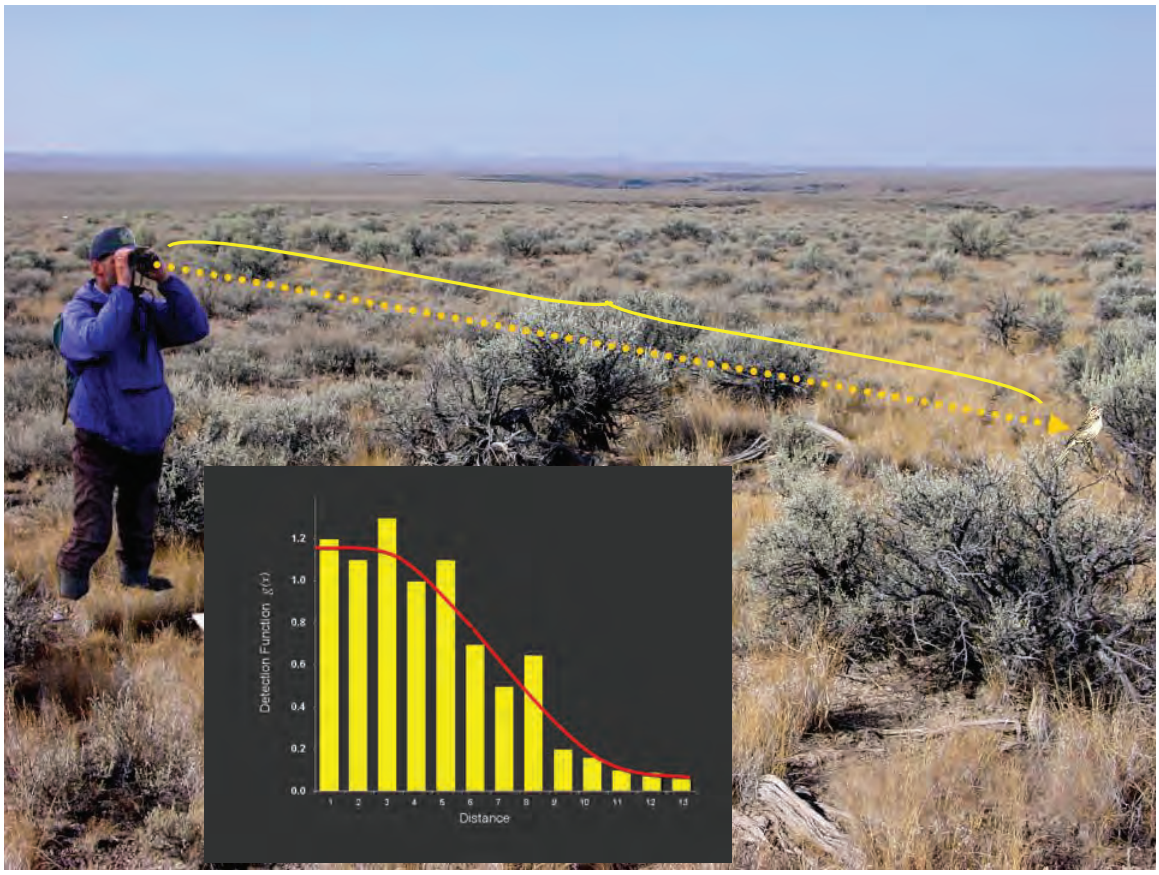

Figure 2.2. Distance sampling works by estimating a detection profile (graph) as a function of distance from which either individual or groups of birds are observed from the transect.

bird population parameters, coupled with detailed environmental information, can be used to build habitat-association models (e.g., Manley et al. 2004) that can inform conservation efforts and scientific inquiry throughout the region.

2.4 Reporting

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

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.

2.5 Accessing the Data

RMBO, our primary cooperator for this project, manages the bird monitoring data associated with it. Other networks using RMBO also use this service and have found it to be efficient and effective. This enables SOPN data to be stored in the same database as that of several other networks and organizations, which in turn allows for a more comprehensive regional assessment. To view interactive maps showing survey and detection locations, as well as species counts and survey effort, visit RMBO's Avian Data Center at http://rmbo.org/v3/avian/Home.aspx.

3 Results and Discussion

We had a total of 1,676 point visits (the number of unique points multiplied by the number of visits) on 34 transects or grids in 2013 (Table 3-1). Of these, 1,239 were point visits in grassland habitats (including 51 in pinyon-juniper woodland habitat), and 437 were point visits in riparian habitats. We recorded a total of 19,917 individual birds (of 181 species) during our point visits, with an additional 113 individual birds detected as flyovers.

Pecos National Historical Park (NHP) had the highest number of individual birds counted (n = 3,737), while Lyndon B. Johnson NHP had the lowest number of birds counted (n = 633). Although species richness and community composition will be estimated in our synthesis reports, observations suggest that these varied widely among the parks surveyed. We observed the greatest number of species at Lake Meredith National Recreation Area (NRA) (n = 92) and the fewest at Lyndon B. Johnson NHP (n = 34) (Table 3-2). The number of individuals or species detected is influenced not only by the number of points and visits, but also by the size and diversity of available habitats.

Western Meadowlark was the species counted in the highest number within the SOPN (n = 1,749), followed by Mourning Dove, Red-winged Blackbird, and Cassin's Sparrow (Table 3-3). Four species, such as Barn Swallow and Brown-headed Cowbird, were detected at all 10 parks surveyed, and an additional eight species were detected at eight or nine of the ten parks (see Table 3-4).

Table 3-2. Number of species observed in each habitat class (grassland, pinyon-juniper woodland, and riparian) at each park, 2013

Park	Species detected			
	Grass.	Wood.	Rip.	Total[1]
Bent's Old Fort NHS	60	--	49	63
Capulin Volcano NM	52	34[2]	--	55
Chickasaw NRA	70	--	--	70
Fort Larned NHS	41	--	45	51
Fort Union NM	42	--	--	42
Lake Meredith NRA	69	--	61	92
Lyndon B. Johnson NHP	20	--	27	34
Pecos NHP	62	--	74	86
Sand Creek Massacre NHS	32	--	35	43
Washita Battlefield NHS	46	--	--	46
Total[1]	**165**	**34**	**131**	**181**

[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.

[2]Some pinyon-juniper woodlands that were targeted for conversion to grassland prior to 2010 sampling were sampled in 2010-2013.

Table 3-1. The number of point visits (# of unique points multiplied by # of visits) and individual birds counted in each habitat class at each SOPN park, 2013

Park	Grassland		Pinyon-Juniper Woodland		Riparian		Total birds detected
	# Point Visits	# Birds	# Point Visits	# Birds	# Point Visits	# Birds	
Bent's Old Fort NHS	114	1,980	---	---	69	1,236	**3,216**
Capulin Volcano NM	84	1,054	51	436	---	---	**1,490**
Chickasaw NRA	204	2,091	---	---	---	---	**2,091**
Fort Larned NHS	75	696	---	---	53	533	**1,229**
Fort Union NM	180	1,011	---	---	---	---	**1,011**
Lake Meredith NRA	114	1,428	---	---	111	1,248	**2,676**
Lyndon B. Johnson NHP	18	150	---	---	51	483	**633**
Pecos NHP	168	2,374	---	---	105	1,363	**3,737**
Sand Creek Massacre NHS	120	1,648	---	---	48	924	**2,572**
Washita Battlefield NHS	111	1,262	---	---	---	---	**1,262**
Total	**1,188**	**13,694**	**51**	**436**	**437**	**5,787**	**19,917**

Note: Bird counts reported here do not include birds observed flying overhead that did not use the habitat (i.e., flyovers).

Table 3-3. Total number of individual birds observed of each species during surveys in all SOPN parks, 2013

Common name	# of birds
Western Meadowlark	1749
Mourning Dove	1747
Red-winged Blackbird	780
Cassin's Sparrow	551
Lark Sparrow	551
Northern Mockingbird	536
Eastern Meadowlark	526
Dickcissel	495
Northern Cardinal	487
Western Kingbird	432
Brown-headed Cowbird	399
Spotted Towhee	398
Yellow Warbler	358
Black-headed Grosbeak	327
Chipping Sparrow	318
Vesper Sparrow	312
Grasshopper Sparrow	308
Common Raven	304
Cassin's Kingbird	296
Western Wood-Pewee	273
House Finch	257
Rock Wren	238
Field Sparrow	226
Horned Lark	216
Barn Swallow	213
Bullock's Oriole	211
Ring-necked Pheasant	211
Pinyon Jay	205
Bewick's Wren	199
Eastern Kingbird	196
Blue Jay	189
Blue Grosbeak	186
House Wren	180
American Robin	174
Yellow-breasted Chat	169
Common Grackle	153
Cliff Swallow	147
Yellow-rumped Warbler	147
Western Scrub-Jay	146
Ash-throated Flycatcher	142
Carolina Wren	136
Rufous-crowned Sparrow	136
Northern Flicker	134
Turkey Vulture	128
Lesser Goldfinch	125
Lark Bunting	122
Plumbeous Vireo	121
Juniper Titmouse	117
Baltimore Oriole	115
Blue-gray Gnatcatcher	98
Common Yellowthroat	98
Warbling Vireo	96
Violet-green Swallow	89
Tufted Titmouse	88
White-crowned Sparrow	88
American Crow	84
Black-crested Titmouse	84
Brewer's Blackbird	82
Northern Rough-winged Swallow	80
Killdeer	79
American Goldfinch	75
Orchard Oriole	75
Tree Swallow	71
Mallard	70
Scissor-tailed Flycatcher	69
Western Tanager	67
European Starling	66
Broad-tailed Hummingbird	64
Great Crested Flycatcher	64
Mountain Bluebird	61
Carolina Chickadee	58
American Coot	57
Eurasian Collared-Dove	56
Red-tailed Hawk	55
Gray Flycatcher	54
Black Vulture	53
Say's Phoebe	52
Common Nighthawk	50
Brown Thrasher	49
Red-headed Woodpecker	48
Red Crossbill	46
Downy Woodpecker	44

Table 3-3. Total number of individual birds observed of each species during surveys in all SOPN parks, 2013, cont.

Common name	# of birds
Song Sparrow	44
Evening Grosbeak	42
Northern Bobwhite	41
Great-tailed Grackle	40
Painted Bunting	40
Pine Siskin	40
Eastern Phoebe	37
Hepatic Tanager	35
Cedar Waxwing	34
Canada Goose	33
Great Horned Owl	33
American Kestrel	31
Red-bellied Woodpecker	30
Gray Catbird	28
Wild Turkey	28
Black-chinned Hummingbird	26
Ladder-backed Woodpecker	26
House Sparrow	24
Black-throated Gray Warbler	23
Great Blue Heron	23
Summer Tanager	23
Indigo Bunting	22
Pygmy Nuthatch	22
Western Bluebird	22
Swainson's Thrush	19
Rock Pigeon	18
Hairy Woodpecker	17
Northern Harrier	17
Eastern Bluebird	15
Long-billed Dowitcher	15
Chihuahuan Raven	14
Orange-crowned Warbler	14
White-winged Dove	13
Bushtit	12
Green-tailed Towhee	12
MacGillivray's Warbler	12
Northern Shoveler	12
White-breasted Nuthatch	12
Black Phoebe	11
Belted Kingfisher	9
Common Poorwill	9

Common name	# of birds
Mountain Chickadee	9
Pileated Woodpecker	9
Bank Swallow	8
Black-capped Chickadee	8
Canyon Wren	8
Red-eyed Vireo	8
Spotted Sandpiper	8
White-eyed Vireo	8
Wood Duck	8
Yellow-billed Cuckoo	8
Black-billed Magpie	7
Wilson's Warbler	7
American Pipit	6
Swainson's Hawk	6
Blue-winged Teal	5
Eastern Wood-Pewee	5
Hermit Thrush	5
Mississippi Kite	5
Virginia's Warbler	5
Yellow-headed Blackbird	5
American Avocet	4
Burrowing Owl	4
Cooper's Hawk	4
Crested Caracara	4
Green Heron	4
Least Flycatcher	4
Louisiana Waterthrush	4
Northern Parula	4
Black-and-white Warbler	3
Canyon Towhee	3
Dark-eyed Junco	3
Great Egret	3
Greater Roadrunner	3
Rose-breasted Grosbeak	3
White-throated Swift	3
Willow Flycatcher	3
Wilson's Phalarope	3
Clay-colored Sparrow	2
Common Merganser	2
Lazuli Bunting	2
Northern Pintail	2

Table 3-3. Total number of individual birds observed of each species during surveys in all SOPN parks, 2013

Common name	# of birds
Peregrine Falcon	2
Ruby-crowned Kinglet	2
American Redstart	1
Baird's Sparrow	1
Barn Owl	1
Barred Owl	1
Black-crowned Night-Heron	1
Brewer's Sparrow	1
Double-crested Cormorant	1
Eared Grebe	1
Ferruginous Hawk	1
Loggerhead Shrike	1
Merlin	1
Pied-billed Grebe	1
Red-breasted Nuthatch	1
Sharp-shinned Hawk	1
White-faced Ibis	1
Unidentified birds	*359*
Total	19,917

Note: Species are listed in rank order from most to least commonly detected. Number of birds is the total number of individuals counted. Due to the potential to confound future comparisons, these values exclude birds flying overhead/not using the habitat. Unidentified birds were included in the total number of birds recorded during surveys, but not in counts of the number of species detected per park.

Nests of Bank Swallow (top left), Cliff Swallow (bottom left), and Tree Swallow (above). All of these species were observed in the SOPN in 2013 (Photographs by J. Peaco, Unknown Photographer, and J. Hemphill, respectively; from Yellowstone NP's Photo Collection).

Table 3-4. Parks where each species was detected, April through June 2013

Common name	Scientific name	BEOL	CAVO	CHIC	FOLS	FOUN	LAMR	LYJO	PECO	SAND	WABA
Acadian Flycatcher	*Empidonax virescens*			o							
American Avocet	*Recurvirostra americana*	o					●				
American Bittern	*Botaurus lentiginosus*	o						o			
American Coot	*Fulica americana*	o		o			●	o			
American Crow	*Corvus brachyrhynchos*	o		●	●	o	o	o	●		●
American Goldfinch	*Spinus tristis*	●		●	●		●	o	●	●	●
American Kestrel	*Falco sparverius*	●	o			●	●	o	o	o	o
American Pipit	*Anthus rubescens*						●	o	●		
American Redstart	*Setophaga ruticilla*	o								●	
American Robin	*Turdus migratorius*	●	●	●	●	●	o	o	●	●	
American Tree Sparrow	*Spizella arborea*						o				o
American Wigeon	*Anas americana*							o			
Ash-throated Flycatcher	*Myiarchus cinerascens*	●	●			●	●	●	●		
Baird's Sparrow	*Ammodramus bairdii*						●				
Bald Eagle	*Haliaeetus leucocephalus*							o			
Baltimore Oriole	*Icterus galbula*			●	●					●	
Bank Swallow	*Riparia riparia*						●		●		
Barn Owl	*Tyto alba*					o	●			o	
Barn Swallow	*Hirundo rustica*	●	●	●	●	●	●	●	●	●	●
Barred Owl	*Strix varia*			●							o
Bell's Vireo	*Vireo bellii*	o			o		o	o			o
Belted Kingfisher	*Megaceryle alcyon*	o		●			●		o		o
Bewick's Wren	*Thryomanes bewickii*		●	●			●	●	●		●
Black Phoebe	*Sayornis nigricans*								●		
Black Rail	*Laterallus jamaicensis*	o									
Black Tern	*Chlidonias niger*	o									
Black Vulture	*Coragyps atratus*			o				●			
Black-and-white Warbler	*Mniotilta varia*			●				o			
Black-billed Cuckoo	*Coccyzus erythropthalmus*				o						
Black-billed Magpie	*Pica hudsonia*		●		o	●			●		
Blackburnian Warbler	*Dendroica fusca*							o			
Black-capped Chickadee	*Poecile atricapillus*		●		o				●		
Black-capped Gnatcatcher	*Polioptila nigriceps*			o							

Table 3-4. Parks where each species was detected, April through June 2013, cont.

Common name	Scientific name	BEOL	CAVO	CHIC	FOLS	FOUN	LAMR	LYJO	PECO	SAND	WABA
Black-chinned Hummingbird	*Archilochus alexandri*	●	●			o		o	●		
Black-crested Titmouse	*Baeolophus atricristatus*							●			
Black-crowned Night-Heron	*Nycticorax nycticorax*	o		o		●	o				
Black-headed Grosbeak	*Pheucticus melanocephalus*	●	●			●	o		●		
Black-necked Stilt	*Himantopus mexicanus*						o				
Black-throated Gray Warbler	*Dendroica nigrescens*								●		
Black-throated Green Warbler	*Dendroica virens*							o			
Black-throated Sparrow	*Amphispiza bilineata*						●				
Blue Grosbeak	*Passerina caerulea*	●	o	●		o	●	o	●	●	●
Blue Jay	*Cyanocitta cristata*	●		●	●		●	●		o	o
Blue-gray Gnatcatcher	*Polioptila caerulea*		●	●		●	●	o	●		●
Blue-headed Vireo	*Vireo solitarius*							o			
Blue-winged Teal	*Anas discors*	o					o	o	●	o	
Blue-winged Warbler	*Vermivora cyanoptera*							o			
Boat-tailed Grackle	*Quiscalus major*			o							
Brewer's Blackbird	*Euphagus cyanocephalus*	●		●		o	●	o	●	o	
Brewer's Sparrow	*Spizella breweri*		o			o			●		
Broad-tailed Hummingbird	*Selasphorus platycercus*		●			o			●		
Broad-winged Hawk	*Buteo platypterus*			o				o			
Bronzed Cowbird	*Molothrus aeneus*							o			
Brown Creeper	*Certhia americana*		o					o			
Brown Thrasher	*Toxostoma rufum*	●		●	●		●	o		o	o
Brown-headed Cowbird	*Molothrus ater*	●	●	●	●	●	●	●	●	●	●
Bullock's Oriole	*Icterus bullockii*	●	●			o	●	o	●	●	o
Burrowing Owl	*Athene cunicularia*	o					o			● [1]	
Bushtit	*Psaltriparus minimus*		●						●		
Cactus Wren	*Campylorhynchus brunneicapillus*						o				
Calliope Hummingbird	*Stellula calliope*		o								
Canada Goose	*Branta canadensis*	o		●		●	o		o		●
Canyon Towhee	*Melozone fusca*		●			o			●		
Canyon Wren	*Catherpes mexicanus*		o			o	●		o		
Carolina Chickadee	*Poecile carolinensis*			●			o	o			●
Carolina Wren	*Thryothorus ludovicianus*			●	●			●			●

Table 3-4. Parks where each species was detected, April through June 2013, cont.

Common name	Scientific name	BEOL	CAVO	CHIC	FOLS	FOUN	LAMR	LYJO	PECO	SAND	WABA
Cassin's Kingbird	*Tyrannus vociferans*	o	●			●			●		
Cassin's Sparrow	*Peucaea cassinii*	●	o			o	●		o	●	●
Cattle Egret	*Bubulcus ibis*			o				o			
Cedar Waxwing	*Bombycilla cedrorum*			o				o	●		o
Chestnut-sided Warbler	*Dendroica pensylvanica*							o		o	
Chihuahuan Raven	*Corvus cryptoleucus*	●	●				●	●			
Chimney Swift	*Chaetura pelagica*	o		o	o			o			o
Chipping Sparrow	*Spizella passerina*	o	●	o		●	●	o	●	o	o
Chuck-will's-widow	*Caprimulgus carolinensis*			o				o			
Cinnamon Teal	*Anas cyanoptera*	o					o	o			
Clark's Nutcracker	*Nucifraga columbiana*								o		
Clay-colored Sparrow	*Spizella pallida*						●	o	● [2]	o	o
Cliff Swallow	*Petrochelidon pyrrhonota*	●	o	●	●	●	●	●	●	o	●
Common Grackle	*Quiscalus quiscula*	●	o	●	●	●	●	●	●	●	o
Common Merganser	*Mergus merganser*								●		
Common Moorhen	*Gallinula chloropus*						o				
Common Nighthawk	*Chordeiles minor*	●	o	●	o	●	o	o	o	●	●
Common Poorwill	*Phalaenoptilus nuttallii*	o	●				●				
Common Raven	*Corvus corax*		●			●			●		
Common Snipe	*Gallinago gallinago*							o			
Common Yellowthroat	*Geothlypis trichas*	●		●	o	o	●	o	●	o	o
Cooper's Hawk	*Accipiter cooperii*		o	o		●	●	o	o		o
Cordilleran Flycatcher	*Empidonax occidentalis*		o						o		
Crested Caracara	*Caracara cheriway*							●			
Curve-billed Thrasher	*Toxostoma curvirostre*					o					
Dark-eyed Junco	*Junco hyemalis*		o				●	o	o		o
Dickcissel	*Spiza americana*	o		●	●		o	o		o	●
Double-crested Cormorant	*Phalacrocorax auritus*						o	●			
Downy Woodpecker	*Picoides pubescens*	o	o	●	●		●	●		●	●
Eared Grebe	*Podiceps nigricollis*						●				
Eastern Bluebird	*Sialia sialis*	●		●	o		o	●		●	●
Eastern Kingbird	*Tyrannus tyrannus*	●		●	●		●	o	o	●	o
Eastern Meadowlark	*Sturnella magna*			●	●		●	o			●

Table 3-4. Parks where each species was detected, April through June 2013, cont.

Common name	Scientific name	BEOL	CAVO	CHIC	FOLS	FOUN	LAMR	LYJO	PECO	SAND	WABA
Eastern Phoebe	*Sayornis phoebe*			●	●	o	●	●			●
Eastern Screech-Owl	*Megascops asio*			o	o		o	o			
Eastern Towhee	*Pipilo erythrophthalmus*							o			
Eastern Wood-Pewee	*Contopus virens*			●	●			o			
Eurasian Collared-Dove	*Streptopelia decaocto*	●	●	o	●	●	●	●	●	o	
European Starling	*Sturnus vulgaris*	●		o	o	o	●	o		●	
Evening Grosbeak	*Coccothraustes vespertinus*								●		
Ferruginous Hawk	*Buteo regalis*	o				o				●	
Field Sparrow	*Spizella pusilla*			●	●		●	●			●
Forster's Tern	*Sterna forsteri*	o						o			
Fox Sparrow	*Passerella iliaca*							o			
Franklin's Gull	*Leucophaeus pipixcan*			o			o	o			
Gadwall	*Anas strepera*						o	o			
Golden Eagle	*Aquila chrysaetos*		o			o					
Golden-crowned Kinglet	*Regulus satrapa*							o			
Golden-fronted Woodpecker	*Melanerpes aurifrons*							o			
Grace's Warbler	*Dendroica graciae*								o		
Grasshopper Sparrow	*Ammodramus savannarum*	o		●	●		●	o		●	●
Gray Catbird	*Dumetella carolinensis*			o	●			o	●		
Gray Flycatcher	*Empidonax wrightii*		●	o			o		●		
Gray Vireo	*Vireo vicinior*								o		
Gray-cheeked Thrush	*Catharus minimus*						o				
Great Blue Heron	*Ardea herodias*	●		●	●	o	●	●	●	o	●
Great Crested Flycatcher	*Myiarchus crinitus*	o		●	●			o			●
Great Egret	*Ardea alba*			●	o		o	o			o
Great Horned Owl	*Bubo virginianus*	●	o	o	o	o	●	o	o	●	o
Greater Roadrunner	*Geococcyx californianus*			o		●	●	o	o		o
Greater Yellowlegs	*Tringa melanoleuca*							o			
Great-tailed Grackle	*Quiscalus mexicanus*	●		o	o	o	●	o	o		o
Green Heron	*Butorides virescens*	●		●			o	o	o		●
Green Kingfisher	*Chloroceryle americana*							o			
Green-tailed Towhee	*Pipilo chlorurus*		●			o			●		
Green-winged Teal	*Anas crecca*						o	o			

Table 3-4. Parks where each species was detected, April through June 2013, cont.

Common name	Scientific name	BEOL	CAVO	CHIC	FOLS	FOUN	LAMR	LYJO	PECO	SAND	WABA
Hairy Woodpecker	*Picoides villosus*	●	●	●	●			o	●	●	●
Harris' Sparrow	*Zonotrichia querula*							o			o
Hepatic Tanager	*Piranga flava*		●						●		
Hermit Thrush	*Catharus guttatus*		o				●	o	●	o	
Hooded Warbler	*Wilsonia citrina*			o				o			
Horned Lark	*Eremophila alpestris*	o	●		●	●	●		●	●	
House Finch	*Carpodacus mexicanus*	●	●	o	●	o	●	o	●	●	
House Sparrow	Passer domesticus	●	o	o	o		●	●	o		o
House Wren	*Troglodytes aedon*	●	●	●	●	o	●	o	●	●	●
Hudsonian Godwit	*Limosa haemastica*							o			
Inca Dove	*Columbina inca*							o			
Indigo Bunting	*Passerina cyanea*	●		●	●		o	o		o	o
Juniper Titmouse	*Baeolophus ridgwayi*		●			●			●		
Killdeer	*Charadrius vociferus*	●		●	●	●	●	o	o	●	●
Ladder-backed Woodpecker	*Picoides scalaris*	●					●	●	o		
Lark Bunting	*Calamospiza melanocorys*	o			o	o	●			●	o
Lark Sparrow	*Chondestes grammacus*	●	●	●	●	●	●	o	●	●	●
Lazuli Bunting	*Passerina amoena*	●									
Le Conte's Sparrow	*Ammodramus leconteii*							o			
Least Flycatcher	*Empidonax minimus*			●							
Least Sandpiper	*Calidris minutilla*			o				o			
Lesser Goldfinch	*Spinus psaltria*	●	●			●		o	●	●	o
Lesser Nighthawk	*Chordeiles acutipennis*							o			
Lesser Scaup	*Aythya affinis*							o			
Lesser Yellowlegs	*Tringa flavipes*							o			
Lewis's Woodpecker	*Melanerpes lewis*	o	o								
Lincoln's Sparrow	*Melospiza lincolnii*			o				o		o	o
Little Blue Heron	*Egretta caerulea*			o				o			
Loggerhead Shrike	*Lanius ludovicianus*	o				o	●	o		o	o
Long-billed Curlew	*Numenius americanus*					● [2]					
Long-billed Dowitcher	*Limnodromus scolopaceus*						●	o			
Louisiana Waterthrush	*Parkesia motacilla*			●				o			

Table 3-4. Parks where each species was detected, April through June 2013, cont.

Common name	Scientific name	BEOL	CAVO	CHIC	FOLS	FOUN	LAMR	LYJO	PECO	SAND	WABA
MacGillivray's Warbler	*Oporornis tolmiei*		o					o	●		
Magnolia Warbler	*Dendroica magnolia*							o			
Mallard	*Anas platyrhynchos*	●		●	●	●	●	o	●	●	o
Merlin	*Falco columbarius*	●									
Mississippi Kite	*Ictinia mississippiensis*	o		●			o	o			●
Mountain Bluebird	*Sialia currucoides*		●			●			●		
Mountain Chickadee	*Poecile gambeli*		●						●		
Mountain Plover	*Charadrius montanus*									o	
Mourning Dove	*Zenaida macroura*	●	●	●	●	●	●	●	●	●	●
Northern Bobwhite	*Colinus virginianus*	●		●	●		●	o	o		●
Northern Cardinal	*Cardinalis cardinalis*		o	●	●		●	●			●
Northern Flicker	*Colaptes auratus*	●	o	●	●	o	●	o	●	●	●
Northern Harrier	*Circus cyaneus*	●			o		●	o		o	o
Northern Mockingbird	*Mimus polyglottos*	●	●	●	●	●	●	●	●	●	●
Northern Parula	*Parula americana*			●							
Northern Pintail	*Anas acuta*						●	o			
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	●	●	o		●	●	o	●		o
Northern Shoveler	*Anas clypeata*	o					●	o	●		
Olive-sided Flycatcher	*Contopus cooperi*			o			o	o			
Orange-crowned Warbler	*Oreothlypis celata*						●	o	●		
Orchard Oriole	*Icterus spurius*	●		●	●		o	●		●	
Osprey	*Pandion haliaetus*							o	o		
Painted Bunting	*Passerina ciris*			●			o	o			●
Peregrine Falcon	*Falco peregrinus*	● [2]	o				●				
Pied-billed Grebe	*Podilymbus podiceps*			o			●	o			
Pileated Woodpecker	*Dryocopus pileatus*			●							o
Pine Siskin	*Spinus pinus*		●				●	o	●		
Pinyon Jay	*Gymnorhinus cyanocephalus*		●			●			●		
Plumbeous Vireo	*Vireo plumbeus*		●			●			●		
Prairie Falcon	*Falco mexicanus*	o	o			o					
Prothonotary Warbler	*Protonotaria citrea*			o							
Purple Finch	*Carpodacus purpureus*							o			
Purple Martin	*Progne subis*			o				o			o

Table 3-4. Parks where each species was detected, April through June 2013, cont.

Common name	Scientific name	BEOL	CAVO	CHIC	FOLS	FOUN	LAMR	LYJO	PECO	SAND	WABA
Pygmy Nuthatch	*Sitta pygmaea*								●		
Red Crossbill	*Loxia curvirostra*								●		
Red-bellied Woodpecker	*Melanerpes carolinus*			●	●		●		o		●
Red-breasted Nuthatch	*Sitta canadensis*		●						o		
Red-eyed Vireo	*Vireo olivaceus*	●		o				●		●	
Redhead	*Aythya americana*							o			
Red-headed Woodpecker	*Melanerpes erythrocephalus*	●		o	●		o	o		●	o
Red-shouldered Hawk	*Buteo lineatus*			o				o			
Red-tailed Hawk	*Buteo jamaicensis*	●	●	●	o	o	●	●	●	o	●
Red-winged Blackbird	*Agelaius phoeniceus*	●		●	●	●	●	●	●	●	●
Ringed Kingfisher	*Megaceryle torquata*							o			
Ring-necked Duck	*Aythya collaris*							o			
Ring-necked Pheasant	Phasianus colchicus	●		o	●		●			●	o
Rock Pigeon	*Columba livia*	o		o	o		●	o	●		
Rock Wren	*Salpinctes obsoletus*	o	●			●	●		o	o	
Rose-breasted Grosbeak	*Pheucticus ludovicianus*				●		o	o			
Rough-legged Hawk	*Buteo lagopus*										o
Ruby-crowned Kinglet	*Regulus calendula*						●	o	o		
Ruby-throated Hummingbird	*Archilochus colubris*			o				o			o
Ruddy Duck	*Oxyura jamaicensis*						o	o			
Rufous Hummingbird	*Selasphorus rufus*		o	o							
Rufous-crowned Sparrow	*Aimophila ruficeps*			●			●	o	o		
Rusty Blackbird	*Euphagus carolinus*							o			
Sandhill Crane	*Grus canadensis*							o			
Savannah Sparrow	*Passerculus sandwichensis*							o			o
Say's Phoebe	*Sayornis saya*	o	●			●	●	o	●	●	
Scaled Quail	*Callipepla squamata*		o				o			o	
Scissor-tailed Flycatcher	*Tyrannus forficatus*			●	●		●	●			●
Screech-Owl [3]	*Megascops* sp.	o									
Sharp-shinned Hawk	*Accipiter striatus*						●	o			
Short-eared Owl	*Asio flammeus*									o	o
Snowy Egret	*Egretta thula*			o				o			
Solitary Sandpiper	*Tringa solitaria*							o			

Table 3-4. Parks where each species was detected, April through June 2013, cont.

Common name	Scientific name	BEOL	CAVO	CHIC	FOLS	FOUN	LAMR	LYJO	PECO	SAND	WABA
Song Sparrow	Melospiza melodia			o			o	o	●		o
Sora	*Porzana carolina*	o									
Spotted Sandpiper	*Actitis macularius*	o		o			o	o	●		
Spotted Towhee	*Pipilo maculatus*	●	●		o	●	●		●	o	o
Steller's Jay	*Cyanocitta stelleri*								o		
Stilt Sandpiper	*Calidris himantopus*							o			
Summer Tanager	*Piranga rubra*			●	o		o	●	o		o
Swainson's Hawk	*Buteo swainsoni*	o		o		o	●	o		●	o
Swainson's Thrush	*Catharus ustulatus*			●						o	
Tennessee Warbler	*Oreothlypis peregrina*							o			
Tree Swallow	*Tachycineta bicolor*			●			● [2]		●		●
Tricolored Heron	*Egretta tricolor*							o			
Tufted Titmouse	*Baeolophus bicolor*			●				o			●
Turkey Vulture	*Cathartes aura*	o	●	●	●	●	●	●	●	o	●
Upland Sandpiper	*Bartramia longicauda*							o			o
Veery	*Catharus fuscescens*							o			
Vermilion Flycatcher	*Pyrocephalus rubinus*							o			
Vesper Sparrow	*Pooecetes gramineus*		●	o		●	●	o	●	o	
Violet-green Swallow	*Tachycineta thalassina*	o	●			●			●		
Virginia Rail	*Rallus limicola*	o					o				
Virginia's Warbler	*Oreothlypis virginiae*		●			o	●		o		
Warbling Vireo	*Vireo gilvus*	●	o	●	●				●	●	
Western Bluebird	*Sialia mexicana*		o						●		
Western Kingbird	*Tyrannus verticalis*	●	●	●	●	●	●	o	o	●	●
Western Meadowlark	*Sturnella neglecta*	●	●		●	●	●	o	●	●	●
Western Sandpiper	*Calidris mauri*							o			
Western Scrub-Jay	*Aphelocoma californica*		●			●	●		●		
Western Tanager	*Piranga ludoviciana*	o	●						●		
Western Wood-Pewee	*Contopus sordidulus*	●	●			o	o		●	●	
White-breasted Nuthatch	*Sitta carolinensis*	o	o	o	●		o		●		
White-crowned Sparrow	*Zonotrichia leucophrys*			o			●	o	●	o	o
White-eyed Vireo	*Vireo griseus*	o		●				o			
White-faced Ibis	*Plegadis chihi*	●					o				

Table 3-4. Parks where each species was detected, April through June 2013, cont.

Common name	Scientific name	BEOL	CAVO	CHIC	FOLS	FOUN	LAMR	LYJO	PECO	SAND	WABA
White-throated Sparrow	*Zonotrichia albicollis*							o			o
White-throated Swift	*Aeronautes saxatalis*		●								
White-winged Dove	*Zenaida asiatica*		o					●	●		
Wild Turkey	*Meleagris gallopavo*	●	●	o	●	o	●	●			●
Willet	*Tringa semipalmata*								o		
Willow Flycatcher	*Empidonax traillii*	●		●			o		o		
Wilson's Phalarope	*Phalaropus tricolor*						●	o			
Wilson's Warbler	*Wilsonia pusilla*			o				o	●		
Winter Wren	*Troglodytes hiemalis*							o			
Wood Duck	*Aix sponsa*	●		o	o			o			
Yellow Warbler	*Dendroica petechia*	●		●	●	o	o	o	●	●	●
Yellow-bellied Flycatcher	*Empidonax flaviventris*							o			
Yellow-bellied Sapsucker	*Sphyrapicus varius*							o			
Yellow-billed Cuckoo	*Coccyzus americanus*	●		●	●		o	o		o	●
Yellow-breasted Chat	*Icteria virens*	●		●		●	o		●		
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	o					●	o			o
Yellow-rumped Warbler	*Dendroica coronata*		●	o			●	●	●		o
Yellow-throated Vireo	*Vireo flavifrons*			o				o			
Yellow-throated Warbler	*Dendroica dominica*			o							

Note: Unverified observations of additional species in a park are not included.

● = Species detected in 2013 survey

● [1] = Species detected adjacent to, but outside of, park boundaries

● [2] = Species detected in 2013 incidental to the survey (and a new species for the park)

o = Species not detected in 2013 survey, but known to occur in the park, including species that migrate through or winter in the park

[3] = unknown whether the Screech-Owl detected at BEOL in 2012 was a Western or Eastern Screech-Owl

3.1 Bent's Old Fort National Historic Site

3.1.1 2013 sampling

During June of 2013, we sampled five transects/grids at Bent's Old Fort National Historic Site (NHS) (Figure 3.1.1). Four grids were in grassland habitat (shortgrass prairie) with 4 to 16 unique points each (Table 3.1.1). One grid was located in a riparian area (cottonwood bottom) with 23 unique points. Points were surveyed three times for a total of 183 point visits (the number of unique points multiplied by the number of visits) at the park in 2013.

3.1.2 Results and discussion

During 2013, 3,216 birds of 63 species were counted at Bent's Old Fort NHS (Table 3.1.2). This was the second highest count among SOPN parks surveyed in 2013. Mourning Dove was the most commonly counted species (15% of the total number of birds counted), followed by Western Meadowlark (14%) and Western Kingbird (6%).

Other common species, in order of highest numbers counted, included Northern Mockingbird, Red-winged Blackbird, Yellow Warbler, and Blue Grosbeak. Increases in detections (compared to 2012) were observed for 10 species, notably Mourning Dove, Northern Mockingbird, Blue Grosbeak, Western Kingbird, Eastern Kingbird, Yellow Warbler, and Cassin's Sparrow.

Several new species were recorded for the park in 2013, including a Spotted Towhee (singing) at the grassland transect, Merlin (probable migrant), Peregrine Falcon (between points; probable migrant), Hairy Woodpecker, Black-chinned Hummingbird (visual detection), Wood Duck (eight individuals, including a possible breeding pair), and House Finch. Northern Bobwhite and Downy Woodpecker, detected in every year at the Historic Site since point count surveys were initiated in 2009, were absent in 2013. Although not a new species for the park, White-faced Ibis was detected for the first time during point count surveys.

Table 3.1.1. Habitat type, number of points, and sampling dates for each transect or grid at Bent's Old Fort NHS, 2013

Transect/Grid	Habitat class	Habitat type	# points	# visits	Visit 1	Visit 2	Visit 3
CWOOD	Riparian	Cottonwood bottom	23	3	6/4 - 6/10	6/5 - 6/11	6/6 - 6/12
GRASS	Grassland	Shortgrass prairie	9	3	6/4 - 6/10	6/5 - 6/11	6/6 - 6/12
PDOG	Grassland	Shortgrass prairie	9	3	6/4 - 6/10	6/5 - 6/11	6/6 - 6/12
REST	Grassland	Shortgrass prairie	4	3	6/4	6/5	6/6
UPLAND	Grassland	Shortgrass prairie	16	3	6/7 - 6/10	6/8 - 6/11	6/9- 6/12

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In 2013, White-faced Ibis (*Plegadis chihi*) was observed during point count surveys at the park for the first time.

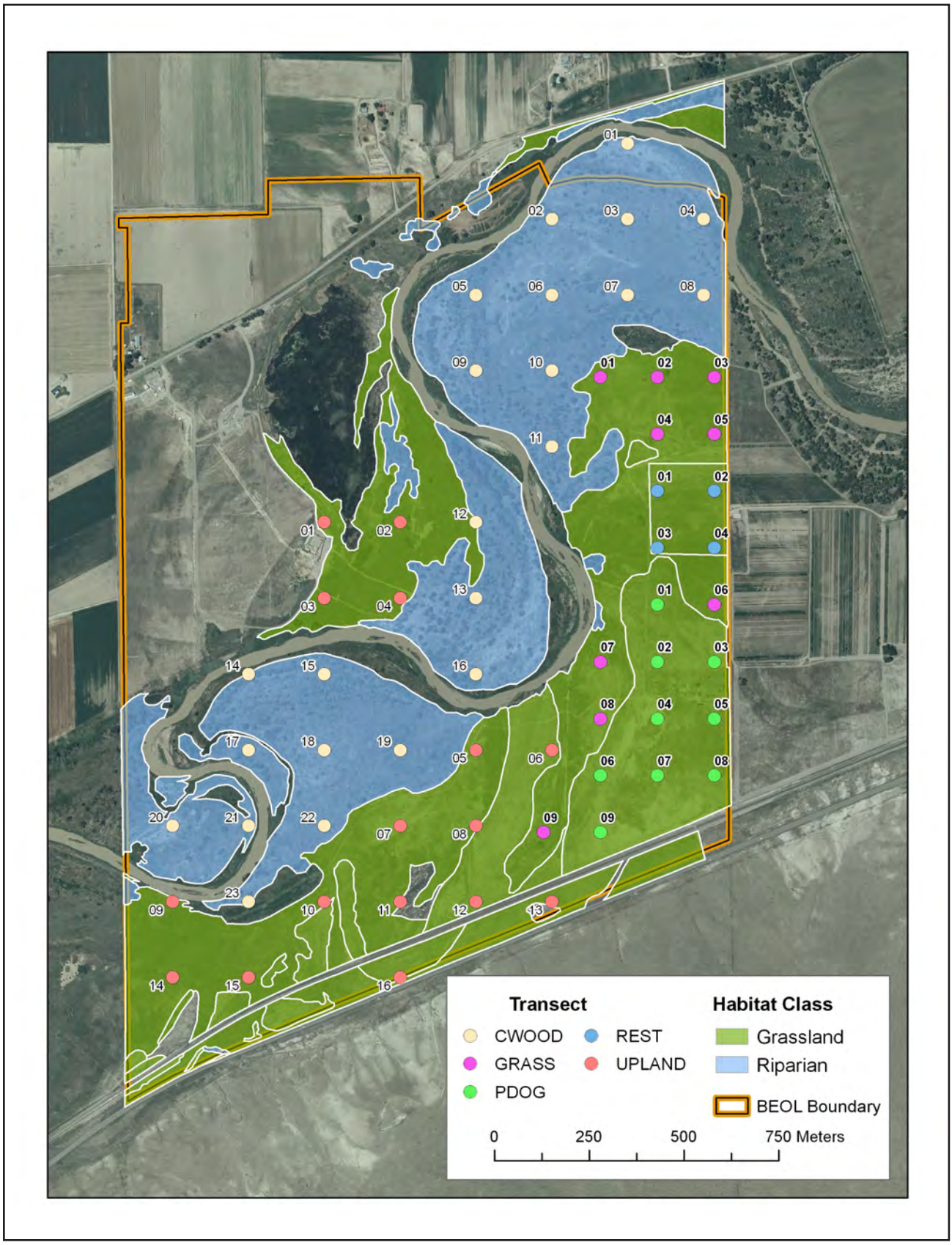

Figure 3.1.1. Point locations targeted for annual sampling at Bent's Old Fort NHS.

Table 3.1.2 Number of birds detected of each species counted in each habitat class, Bent's Old Fort NHS, 2013

Species	Habitat class		# of birds detected	
	Grassland	Riparian	Total	% of total
Mourning Dove	254	214	468	15
Western Meadowlark	316	140	456	14
Western Kingbird	149	53	202	6
Northern Mockingbird	132	69	201	6
Red-winged Blackbird	136	58	194	6
Yellow Warbler	73	111	184	6
Blue Grosbeak	110	44	154	5
Eastern Kingbird	87	53	140	4
Yellow-breasted Chat	53	57	110	3
Ring-necked Pheasant	44	34	78	2
Common Yellowthroat	40	35	75	2
Bullock's Oriole	46	25	71	2
Cassin's Sparrow	59	1	60	2
House Wren	15	45	60	2
European Starling	17	37	54	2
Warbling Vireo	23	30	53	2
Lark Sparrow	49	1	50	2
Brown-headed Cowbird	20	23	43	1
Barn Swallow	40	2	42	1
Common Grackle	26	10	36	1
Brown Thrasher	21	12	33	1
Black-headed Grosbeak	12	15	27	1
Blue Jay	12	13	25	1
Eurasian Collared-Dove	16	9	25	1
Orchard Oriole	6	19	25	1
Great-tailed Grackle	21	3	24	1
Red-tailed Hawk	14	8	22	1
American Goldfinch	11	9	20	1
American Kestrel	10	9	19	1
Killdeer	10	9	19	1
Northern Flicker	9	10	19	1
American Robin	4	14	18	1
Common Nighthawk	17	1	18	1
House Sparrow	18	---	18	1
Red-headed Woodpecker	6	9	15	0
Cliff Swallow	12	2	14	0
Lesser Goldfinch	9	5	14	0
Great Horned Owl	11	2	13	0
Ash-throated Flycatcher	---	12	12	0
Western Wood-Pewee	4	7	11	0
Northern Bobwhite	10	---	10	0

Table 3.1.2. Number of birds detected of each species in each habitat class, Bent's Old Fort NHS, 2013, cont.

Species	Habitat class		# of birds detected	
	Grassland	Riparian	Total	% of total
Mallard	5	4	9	0
Wood Duck	**7**	**1**	**8**	**0**
Chihuahuan Raven	5	1	6	0
Great Blue Heron	6	---	6	0
Wild Turkey	5	1	6	0
Ladder-backed Woodpecker	2	2	4	0
Northern Harrier	1	3	4	0
Northern Rough-winged Swallow	2	2	4	0
Brewer's Blackbird	3	---	3	0
Eastern Bluebird	---	2	2	0
House Finch	**1**	**1**	**2**	**0**
Lazuli Bunting	2	---	2	0
Black-chinned Hummingbird	**1**	**---**	**1**	**0**
Green Heron	1	---	1	0
Hairy Woodpecker	**---**	**1**	**1**	**0**
Indigo Bunting	1	---	1	0
Merlin [1]	**1**	**---**	**1**	**0**
Red-eyed Vireo	1	---	1	0
Spotted Towhee	**1**	**---**	**1**	**0**
White-faced Ibis	1	---	1	0
Willow Flycatcher	1	---	1	0
Yellow-billed Cuckoo	1	---	1	0
Peregrine Falcon [1] (incidental)	**---**	**---**	**---**	**---**
Unidentified Bird	*4*	*3*	*7*	*0*
Unidentified Woodpecker	*3*	*4*	*7*	*0*
Unidentified Duck	*2*	*---*	*2*	*0*
Unidentified Blackbird	*---*	*1*	*1*	*0*
Unidentified Falcon	*1*	*---*	*1*	*0*
Total	**1,980**	**1,236**	**3,216**	**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 of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values exclude observations of species flying overhead/not using the habitat.

[1] Possible migrant.

3.2 Capulin Volcano National Monument

3.2.1 2013 sampling

During May of 2013, we sampled two transects/grids at Capulin Volcano NM (Figure 3.2.1). One transect was in the grassland habitat class (shortgrass prairie) and one was in the woodland habitat class (pinyon-juniper). The woodland habitat in which the transect was located was targeted for conversion to grassland prior to the 2010 sampling year, but it is unclear whether the conversion will take place. The pinyon-juniper transect had 17 unique points and the shortgrass prairie transect had 28 unique points (Table 3.2.1). Points were surveyed three times for a total of 135 point visits (the number of unique points multiplied by the number of visits) in 2013.

3.2.2 Results and discussion

During 2013, 1,490 birds of 55 species were counted at Capulin Volcano NM (Table 3.2.2). Spotted Towhee was the most commonly counted species (14%), followed by Western Wood-Pewee (12%), Northern Mockingbird (7%), Vesper Sparrow (7%), and Rock Wren (6%). Other common species included Black-headed Grosbeak, Chipping Sparrow, Mourning Dove, Brown-headed Cowbird, Cassin's Kingbird, and Bewick's Wren. Other species observed during surveys included Hepatic and Western Tanager, Green-tailed Towhee, and three species of wrens– Bewick's, House and Rock. Notably higher numbers of Rock Wren, Bewick's Wren, and Vesper Sparrow were recorded compared to 2012. Decreases in numbers compared to 2012 were notable for Western Meadowlark and Western Kingbird. Although recorded in every point count survey at the park since 2009, Cassin's Sparrow was absent in 2013. White-throated Swift was detected for the first time in five years of point count surveys. There were three new species observed at the park in 2013- Gray Flycatcher, Bushtit, and Red-breasted Nuthatch.

Table 3.2.1. Habitat type, number of points, and sampling dates for each transect or grid at Capulin Volcano NM, 2013

Transect/Grid	Habitat class	Habitat type	# points	# visits	Visit 1	Visit 2	Visit 3
PJ	Woodland	Pinyon-juniper	17	3	5/24 - 5/27	5/27 - 5/28	5/26 - 5/31
STEPPE	Grassland	Shortgrass prairie	28	3	5/23 - 5/24	5/24 - 5/28	5/26 - 5/31

PHOTO: DAVE MENKE, USFWS

Red-breasted Nuthatch (*Sitta canadensis*) was recorded for the first time at Capulin Volcano NM in 2013.

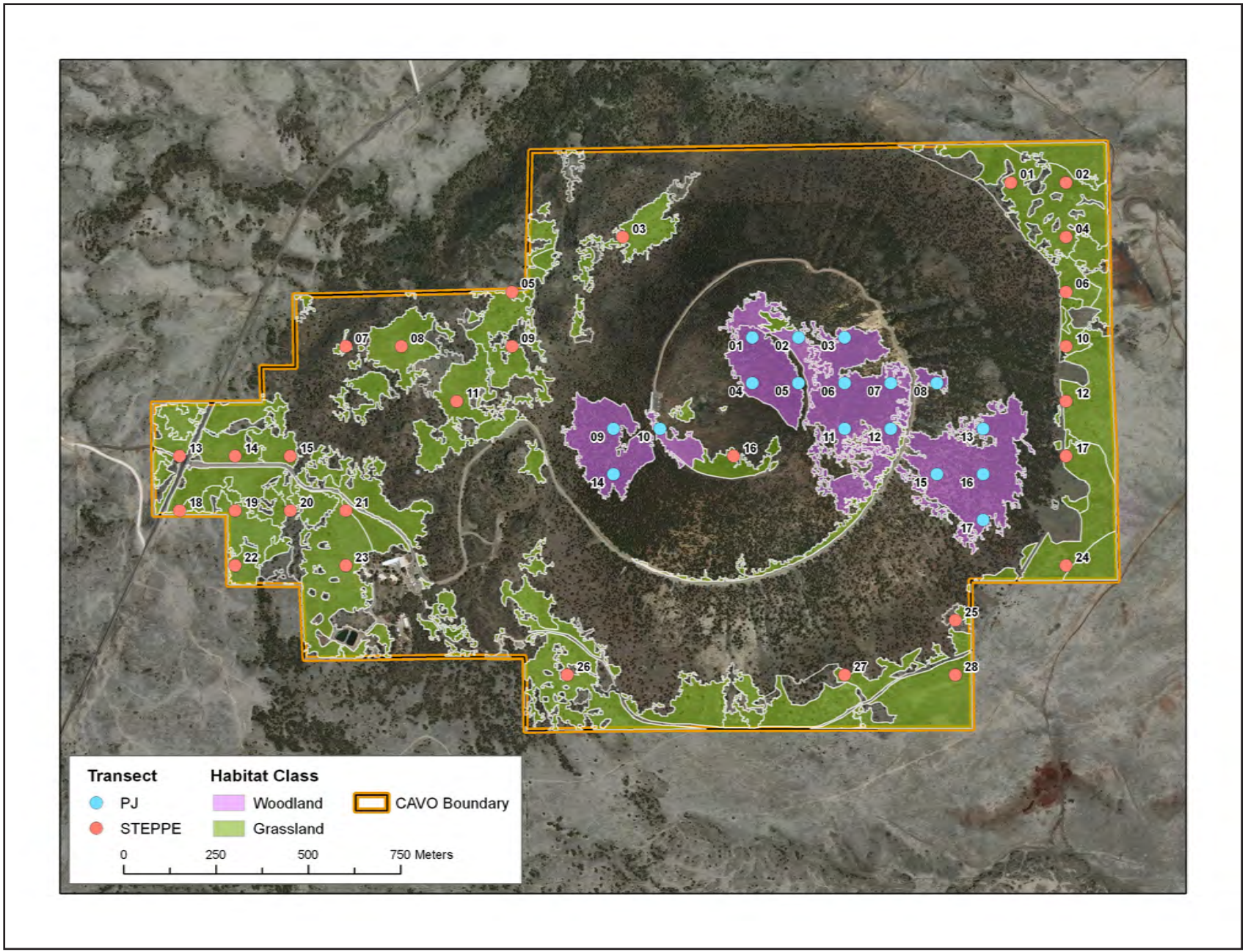

Figure 3.2.1. Point locations targeted for annual sampling at Capulin Volcano NM.

Table 3.2.2. Number of birds detected of each species in each habitat class, Capulin Volcano NM, 2013

Species	Habitat class		# of birds detected	
	Grassland	Woodland	Total	% of total
Spotted Towhee	108	103	211	14
Western Wood-Pewee	90	85	175	12
Northern Mockingbird	89	12	101	7
Vesper Sparrow	100	---	100	7
Rock Wren	54	28	82	6
Lark Sparrow	80	---	80	5
Black-headed Grosbeak	59	14	73	5
Chipping Sparrow	42	24	66	4
Brown-headed Cowbird	25	29	54	4
Mourning Dove	41	13	54	4
Cassin's Kingbird	37	7	44	3
Bewick's Wren	17	26	43	3
Pinyon Jay	30	12	42	3
Western Meadowlark	26	---	26	2
Mountain Bluebird	21	4	25	2
Western Scrub-Jay	19	4	23	2
American Robin	21	---	21	1
Western Tanager	8	10	18	1
Barn Swallow	17	---	17	1
Bullock's Oriole	15	---	15	1
Ash-throated Flycatcher	4	10	14	1
Common Raven	13	1	14	1
Hepatic Tanager	3	9	12	1
Horned Lark	12	---	12	1
Plumbeous Vireo	11	1	12	1
Turkey Vulture	11	1	12	1
Green-tailed Towhee	5	6	11	1
House Finch	10	---	10	1
Gray Flycatcher	**5**	**4**	**9**	**1**
Yellow-rumped Warbler	2	7	9	1
Broad-tailed Hummingbird	6	2	8	1
Mountain Chickadee	4	4	8	1
Pine Siskin	2	3	5	0
Black-capped Chickadee	3	1	4	0
Chihuahuan Raven	3	1	4	0
Eurasian Collared-Dove	4	---	4	0
Juniper Titmouse	3	1	4	0
Virginia's Warbler	2	2	4	0
Common Poorwill	3	---	3	0
Say's Phoebe	3	---	3	0
White-throated Swift	1	2	3	0

Table 3.2.2. Number of birds detected of each species in each habitat class, Capulin Volcano NM, 2013, cont.

Species	Habitat class		# of birds detected	
	Grassland	Woodland	Total	% of total
Wild Turkey	3	---	3	0
Lesser Goldfinch	2	---	2	0
Northern Rough-winged Swallow	2	---	2	0
Red-tailed Hawk	1	1	2	0
Violet-green Swallow	---	2	2	0
Black-billed Magpie	1	---	1	0
Black-chinned Hummingbird	1	---	1	0
Blue-gray Gnatcatcher	1	---	1	0
Bushtit	**1**	**---**	**1**	**0**
Canyon Towhee	1	---	1	0
Hairy Woodpecker	---	1	1	0
House Wren	1	---	1	0
Red-breasted Nuthatch	**---**	**1**	**1**	**0**
Western Kingbird	1	---	1	0
Unidentified Raven	*12*	---	*12*	*1*
Unidentified Bird	*6*	*3*	*9*	*1*
Unidentified Sparrow	*6*	*1*	*7*	*0*
Unidentified Finch	*5*	---	*5*	*0*
Unidentified Flycatcher	---	*1*	*1*	*0*
Unidentified Warbler	*1*	---	*1*	*0*
Total	**1,054**	**436**	**1,490**	**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 of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values exclude observations of species flying overhead/not using the habitat.

3.3 Chickasaw National Recreation Area

3.3.1 2013 sampling

During April and May of 2013, we sampled four transects/grids at Chickasaw NRA (Figures 3.3.1-1, -2, -3). All transects were in the grassland habitat class (upland grassland) with 13 to 19 unique points each (Table 3.3.1). Each point was surveyed three times for a total of 204 point visits (the number of unique points multiplied by the number of visits) at the park.

3.3.2 Results and discussion

During 2013, 2,091 birds of 70 species were counted at Chickasaw NRA. This was the third highest number of species counted in the SOPN in 2013 (Table 3-2). A notable increase in detections compared to 2012 made Dickcissel the most common species in the park (10% of the birds counted; Table 3.3.2).

Other common species, based on the number of birds counted, included Northern Cardinal (10%), Field Sparrow (7%), Eastern Meadowlark (6%), Mourning Dove (6%), Blue Jay (4%), Brown-headed Cowbird (4%), and Tufted Titmouse (4%). Notably higher numbers of Blue Jay, Brown-headed Cowbird, Northern Mockingbird, Bewick's Wren, Eastern Meadowlark, and Mourning Dove were detected compared to 2012. Four species of warblers, five species of woodpeckers, and four species of vireos were recorded during surveys. Notable decreases in detections compared to 2012 were documented for Northern Cardinal, Tufted Titmouse, Painted Bunting, American Crow, Indigo Bunting, and White-eyed Vireo. Notably absent in 2013 were Red-eyed Vireo, recorded in every point count survey at the park since 2009, Yellow-throated Vireo, Yellow-throated Warbler, Purple Martin, and Red-shouldered Hawk. One new species for the park was observed in 2013- Brewer's Blackbird (probably a migrant).

PHOTO: STEVE MASLOWSKI, USFWS

Dickcissel (*Spiza americana*) accounted for 10% of the birds counted at Chickasaw NRA in 2013.

Table 3.3.1. Habitat type, number of points, and sampling dates for each transect or grid at Chickasaw NRA, 2013

Transect/Grid	Habitat class	Habitat type	# points	# visits	Visit 1	Visit 2	Visit 3
5LAKES	Grassland	Upland grassland	19	3	5/8	5/12	5/23
NHUNT	Grassland	Upland grassland	13	3	4/30	5/9	5/13
WHUNT_E	Grassland	Upland grassland	18	3	5/7	5/11	5/22
WHUNT_W	Grassland	Upland grassland	18	3	5/6	5/10	5/14

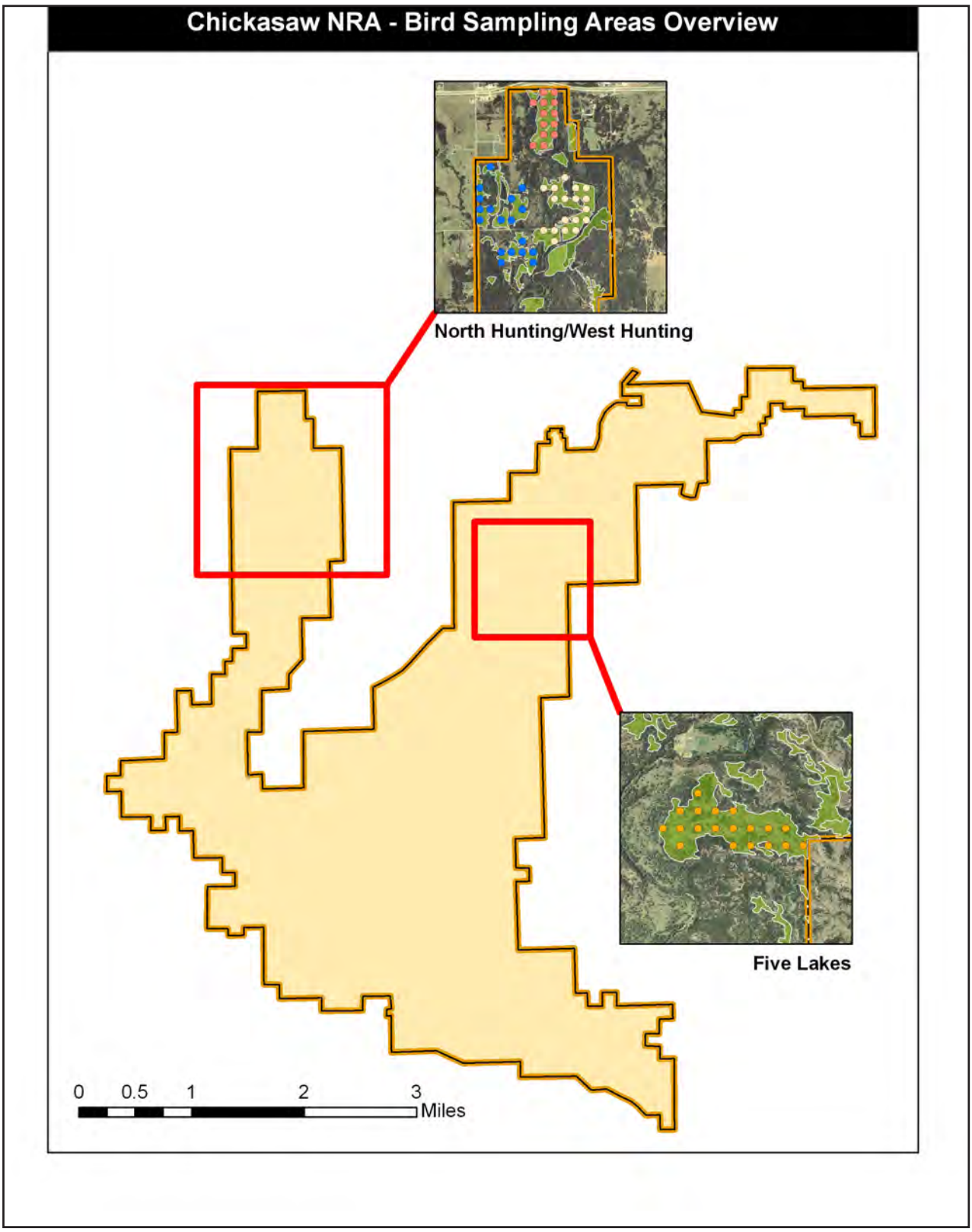

Figure 3.3.1-1. Bird sampling areas at Chickasaw NRA.

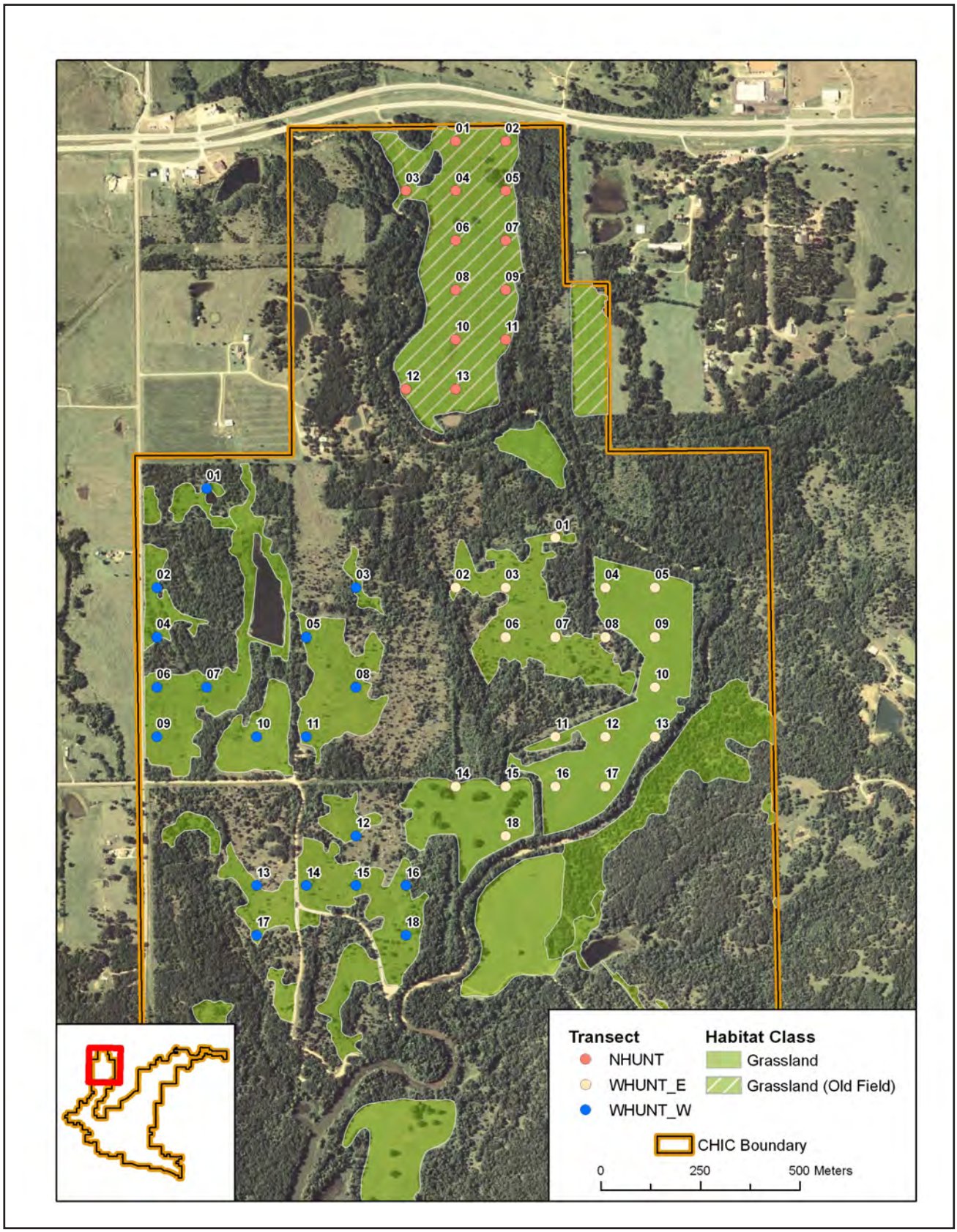

Figure 3.3.1-2. Point locations targeted for annual sampling at Chickasaw NRA, North Hunting/West Hunting.

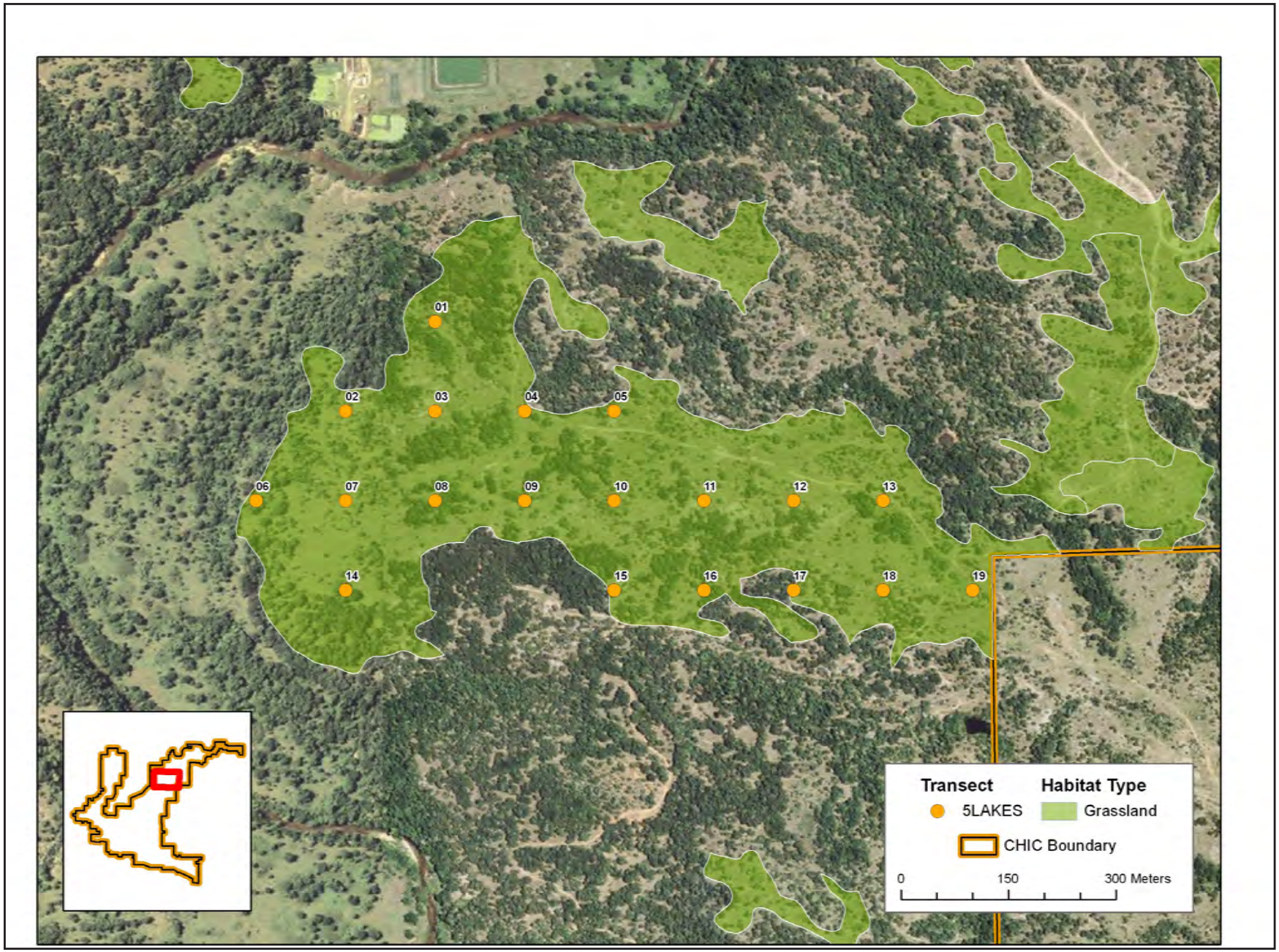

Figure 3.3.1-3. Point locations targeted for annual sampling at Chickasaw NRA, Five Lakes.

Table 3.3.2. Number of birds detected of each species in each habitat class, Chickasaw NRA, 2013

Species	# of birds detected	
	Total (grassland habitat)	% of total
Dickcissel	217	10
Northern Cardinal	199	10
Field Sparrow	147	7
Eastern Meadowlark	132	6
Mourning Dove	116	6
Blue Jay	93	4
Brown-headed Cowbird	92	4
Tufted Titmouse	83	4
Carolina Wren	80	4
Common Grackle	63	3
American Crow	54	3
Bewick's Wren	48	2
Blue-gray Gnatcatcher	46	2
Northern Mockingbird	44	2
Lark Sparrow	43	2
Tree Swallow	40	2
Carolina Chickadee	37	2
Great Crested Flycatcher	36	2
Painted Bunting	36	2
Turkey Vulture	31	1
Yellow Warbler	25	1
Brewer's Blackbird [1]	**24**	**1**
Red-winged Blackbird	23	1
Cliff Swallow	22	1
Northern Flicker	22	1
Downy Woodpecker	20	1
Swainson's Thrush	19	1
Canada Goose	16	1
Yellow-breasted Chat	15	1
American Robin	12	1
Eastern Phoebe	12	1
Eastern Kingbird	11	1
Red-bellied Woodpecker	11	1
Scissor-tailed Flycatcher	11	1
Baltimore Oriole	10	0
Common Yellowthroat	10	0
Barn Swallow	9	0
Killdeer	9	0
Pileated Woodpecker	9	0
Rufous-crowned Sparrow	9	0
Belted Kingfisher	8	0
White-eyed Vireo	8	0
Eastern Bluebird	7	0
Grasshopper Sparrow	7	0
Warbling Vireo	7	0
Brown Thrasher	6	0
Indigo Bunting	6	0
Northern Bobwhite	6	0
Red-tailed Hawk	6	0
Orchard Oriole	5	0
Hairy Woodpecker	4	0
Least Flycatcher	4	0
Louisiana Waterthrush	4	0
Mallard	4	0
Northern Parula	4	0
Summer Tanager	4	0
American Goldfinch	3	0
Black-and-white Warbler	3	0
Common Nighthawk	3	0
Eastern Wood-Pewee	3	0
Great Blue Heron	3	0
Great Egret	3	0
House Wren	3	0
Mississippi Kite	3	0
Western Kingbird	3	0
Blue Grosbeak	2	0
Green Heron	2	0
Willow Flycatcher	2	0
Yellow-billed Cuckoo	2	0
Barred Owl	1	0
Unidentified Blackbird	*14*	*1*
Unidentified Woodpecker	*12*	*1*
Unidentified Sparrow	*3*	*0*
Total	2,091	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 of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values exclude observations of species flying overhead/not using the habitat.

[1] Possible migrant.

3.4 Fort Larned National Historic Site

3.4.1 2013 sampling

During June of 2013, we sampled three transects/grids at Fort Larned NHS (Figure 3.4.1). Two transects were in grassland habitat (upland grassland) with 11 and 14 unique points each. One transect was in the riparian habitat class (riparian woodland) with 18 unique points. Each point was surveyed three times for a total of 128 point visits (the number of unique points multiplied by the number of visits) at the park.

3.4.2 Results and discussion

During 2013, 1,229 birds of 51 species were counted at Fort Larned NHS (Table 3.4.2). Ten of these are national or regional species of concern. The five most common species, in order of numbers of individuals counted, were Mourning Dove (11% of the total number counted), Eastern Meadowlark (9%), Baltimore Oriole (8%), Red-winged Blackbird (8%), and Dickcissel (8%). Other prominent species included Blue Jay, American Robin, House Wren, Northern Cardinal, and Western Meadowlark.

Compared to 2012, numbers counted were notably higher for Mourning Dove, Northern Cardinal, and Grasshopper Sparrow. Notable decreases in numbers counted compared to 2012 occurred for Red-winged Blackbird, House Wren, Orchard Oriole, and Indigo Bunting. Although not a new species for the park, Chimney Swift was observed for the first time in five years of point count surveys (observed between points and therefore not in Table 3.4.2). New species for the park in 2013 were Field Sparrow (at least three detected singing), Northern Mockingbird, and Lark Sparrow (one singing).

Table 3.4.1. Habitat type, number of points, and sampling dates for each transect or grid at Fort Larned NHS, 2013

Transect/Grid	Habitat class	Habitat type	# points	# visits	Visit 1	Visit 2	Visit 3
BU2	Grassland	Upland grassland	11	3	6/13	6/15	6/21
BU8	Grassland	Upland grassland	14	3	6/12	6/14	6/22
RIP	Riparian	Riparian woodland	18 [1]	3	6/12 - 6/13	6/14 - 6/15	6/21 - 6/22

[1] Not all points were sampled on each occasion.

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American Robin (*Turdus migratorius*) accounted for 5% of the birds counted at the Historic Site in 2013.

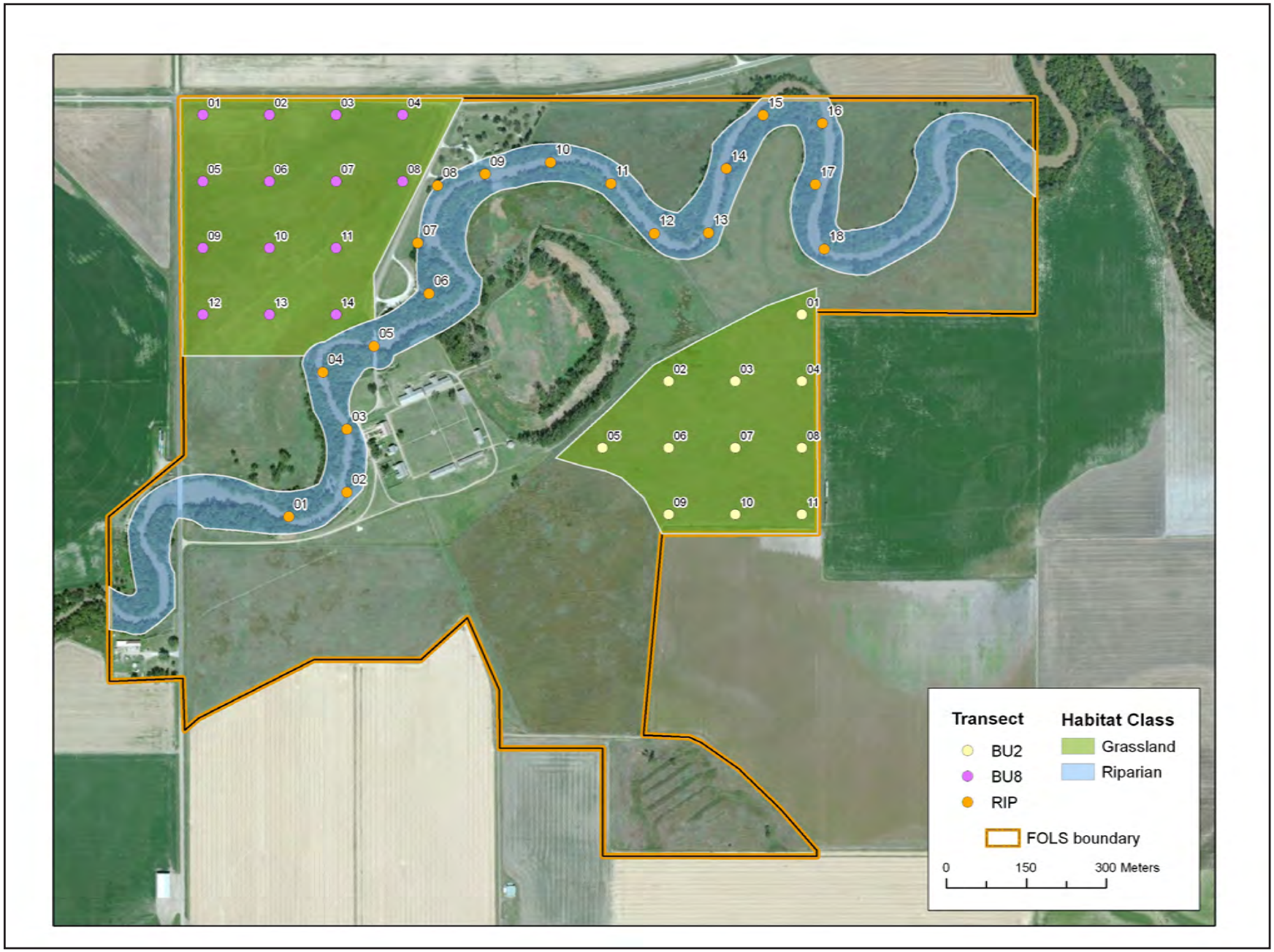

Figure 3.4.1. Point locations targeted for annual sampling at Fort Larned NHS.

Table 3.4.2. Number of birds detected of each species in each habitat class, Fort Larned NHS, 2013

Species	Habitat class		# of birds detected	
	Grassland	Riparian	Total	% of total
Mourning Dove	61	71	132	11
Eastern Meadowlark	107	8	115	9
Baltimore Oriole	31	70	101	8
Red-winged Blackbird	70	25	95	8
Dickcissel	88	5	93	8
Blue Jay	28	40	68	6
American Robin	22	34	56	5
House Wren	8	40	48	4
Northern Cardinal	17	27	44	4
Western Meadowlark	40	3	43	3
Grasshopper Sparrow	37	1	38	3
Brown-headed Cowbird	16	18	34	3
Ring-necked Pheasant	25	4	29	2
Gray Catbird	2	24	26	2
Barn Swallow	10	13	23	2
Carolina Wren	11	11	22	2
Eastern Kingbird	8	13	21	2
Western Kingbird	9	7	16	1
Indigo Bunting	3	12	15	1
Warbling Vireo	7	8	15	1
Great Crested Flycatcher	4	9	13	1
Wild Turkey	9	3	12	1
Killdeer	10	1	11	1
Northern Bobwhite	11	---	11	1
Northern Flicker	5	6	11	1
Downy Woodpecker	---	9	9	1
Eastern Phoebe	---	8	8	1
Eurasian Collared-Dove	5	3	8	1
Brown Thrasher	---	7	7	1
Mallard	---	7	7	1
Cliff Swallow	2	4	6	0
Red-headed Woodpecker	---	6	6	0
Turkey Vulture	6	---	6	0
Common Grackle	4	1	5	0
Field Sparrow	**4**	**1**	**5**	**0**
Red-bellied Woodpecker	2	3	5	0
Yellow Warbler	1	4	5	0
Orchard Oriole	1	3	4	0
Great Blue Heron	2	1	3	0
Horned Lark	3	---	3	0
House Finch	---	3	3	0

Table 3.4.2. Number of birds detected of each species in each habitat class, Fort Larned NHS, 2013, cont.

Species	Habitat class		# of birds detected	
	Grassland	Riparian	Total	% of total
Rose-breasted Grosbeak	2	1	3	0
Scissor-tailed Flycatcher	1	2	3	0
American Crow	2	---	2	0
American Goldfinch	---	2	2	0
Eastern Wood-Pewee	---	2	2	0
Hairy Woodpecker	1	1	2	0
Yellow-billed Cuckoo	---	2	2	0
Lark Sparrow	**1**	**---**	**1**	**0**
Northern Mockingbird	**1**	**---**	**1**	**0**
White-breasted Nuthatch	**---**	1	1	0
Unidentified Swallow	*7*	*6*	*13*	*1*
Unidentified Meadowlark	*12*	*---*	*12*	*1*
Unidentified Woodpecker	*---*	*2*	*2*	*0*
Unidentified Owl	*---*	*1*	*1*	*0*
Total	**696**	**533**	**1,229**	**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 of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values exclude observations of species flying overhead/not using the habitat.

3.5 Fort Union National Monument

3.5.1 2013 sampling

During May of 2013, we sampled three transects or grids at Fort Union NM (Figure 3.5.1). Each transect was in grassland habitat (shortgrass prairie) with 20 unique points each. Each point was surveyed three times for a total of 180 point visits (the number of unique points multiplied by the number of visits) at the park.

3.5.2 Results and discussion

During 2013, 1,011 birds of 42 species were counted at Fort Union NM (Table 3.5.2). Although the number of detections decreased slightly from 2012, the number of species increased by seven. Recorded throughout the park, Western Meadowlark was once again the most abundant species, accounting for 45% of birds counted. Other prominent species included Vesper Sparrow (7%), Horned Lark (7%), Barn and Cliff Swallow in and around the staff residence area (5% and 2%, respectively), Cassin's Kingbird (4%) detected in the pine-juniper immediately adjacent to the first fort boundary, and Red-winged Blackbird (4%).

The number of Horned Lark counted increased from nine in 2012 to 66 in 2013. There were only two detections of Mourning Dove compared to 110 in 2012. Nine species, Ash-throated Flycatcher, Black-headed Grosbeak, Blue-gray Gnatcatcher, Cassin's Kingbird, Juniper Titmouse, Pinyon Jay, Plumbeous Vireo, Spotted Towhee, and Western Scrub Jay, were found on or just outside of the first fort park boundary in pine-juniper habitat. A Prairie Falcon was observed (between points, so excluded from Table 3.5.2) at the shortgrass west transect for the first time in a point count survey at the park. There were five new species for the park observed in 2013: at least one singing Plumbeous Vireo, a singing Greater Roadrunner in pine-juniper habitat on the first fort park boundary, one Black-crowned Night-Heron and a singing Yellow-breasted Chat near Wolf Creek on the south park boundary, and two Long-billed Curlew (between points at the old fort transect).

Table 3.5.1. Habitat type, number of points, and sampling dates for each transect or grid at Fort Union NM, 2013

Transect/Grid	Habitat class	Habitat type	# points	# visits	Visit 1	Visit 2	Visit 3
OLD FORT	Grassland	Shortgrass prairie	20	3	5/20 - 5/21	5/21 - 5/22	5/22 - 5/23
SHORT_E	Grassland	Shortgrass prairie	20	3	5/14	5/15	5/19
SHORT_W	Grassland	Shortgrass prairie	20	3	5/16	5/17 - 5/18	5/18 - 5/20

PHOTO: GARY KRAMER, USFWS

Greater Roadrunner (*Geococcyx californianus*) was one of five new species at Fort Union NM in 2013.

Figure 3.5.1. Point locations targeted for annual sampling at Fort Union NM.

Table 3.5.2. Number of birds detected of each species in each habitat class, Fort Union NM, 2013

Species	# of birds detected	
	Total (grassland habitat)	% of total
Western Meadowlark	460	45
Vesper Sparrow	73	7
Horned Lark	66	7
Barn Swallow	48	5
Cassin's Kingbird	40	4
Red-winged Blackbird	36	4
Common Raven	34	3
Northern Mockingbird	25	2
Say's Phoebe	21	2
Lark Sparrow	19	2
Cliff Swallow	18	2
Black-headed Grosbeak	15	1
Canada Goose	15	1
Pinyon Jay	15	1
Chipping Sparrow	14	1
Spotted Towhee	12	1
Turkey Vulture	11	1
Rock Wren	10	1
Mountain Bluebird	9	1
Northern Rough-winged Swallow	7	1
Western Scrub-Jay	6	1
Western Kingbird	5	0
American Kestrel	4	0
Black-billed Magpie	4	0
Common Grackle	4	0
Eurasian Collared-Dove	3	0
Juniper Titmouse	3	0
Ash-throated Flycatcher	2	0
Brown-headed Cowbird	2	0
Greater Roadrunner	**2**	**0**
Lesser Goldfinch	2	0
Mourning Dove	2	0
Plumbeous Vireo	**2**	**0**
Violet-green Swallow	2	0
American Robin	1	0
Black-crowned Night-Heron	**1**	**0**
Blue-gray Gnatcatcher	1	0
Common Nighthawk	1	0
Cooper's Hawk	1	0
Killdeer	1	0
Mallard	1	0
Yellow-breasted Chat	**1**	**0**
Long-billed Curlew (incidental)	**---**	**---**
Unidentified Bird	*5*	*0*
Unidentified Sparrow	*3*	*0*
Unidentified Kingbird	*2*	*0*
Unidentified Empidonax	*1*	*0*
Unidentified Swallow	*1*	*0*
Total	**1,011**	**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 of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values exclude observations of species flying overhead/not using the habitat.

3.6 Lake Meredith National Recreation Area

3.6.1 2013 sampling

During April and May of 2013, we sampled four transects/grids at Lake Meredith NRA (Figures 3.6.1-1, -2, -3, -4). Two transects were located in grassland habitat (upland grassland) with 19 unique points each, and two were located in riparian habitat (bottomland grassland and cottonwood bottom) with 18 or 19 unique points each (Table 3.6.1). Each point was surveyed three times for a total of 225 point visits (the number of unique points multiplied by the number of visits) at the park.

3.6.2 Results and discussion

During 2013, 2,676 birds were counted at Lake Meredith NRA (Table 3.6.2). Based on sampling, Lake Meredith NRA ranked first in bird diversity among SOPN parks surveyed in 2013, with 92 species recorded. This was compared to 65 species for the park in 2012. The park's diverse habitat, ranging from upland grassland to riparian canyon land and bottomland with a mix of grassland/savannah/wetland, attracts a high diversity of breeding and migrant bird species. The increase in number of species from 2012 to 2013 may be attributed primarily to an ongoing late migration during the survey period. Of 16 new park species detected in 2013 (see Table 3.6.2), 14 were possibly migrants. Also, American Goldfinch (possible migrant), Barn Owl, Belted Kingfisher, Brown Thrasher, Common Poorwill, Dark-eyed Junco (possible migrant), Northern Harrier, and Sharp-shinned Hawk were recorded for the first time on point count surveys.

Mourning Dove (8%) and Grasshopper Sparrow (7%) were counted in the highest numbers. Other common birds included Red-winged Blackbird (6%), Western Meadowlark (6%), Rock Wren (5%), Cassin's Sparrow (5%), and Rufous-crowned Sparrow (5%). The notably higher number of detections for Grasshopper Sparrow, Mourning Dove, Chipping Sparrow, Lark Bunting, Rufous-crowned Sparrow, and Rock Wren in 2013 compared to 2012 was at least in part due to the late migration. Although detected in every point count survey since they were initiated in 2009, Painted Bunting, Red-headed Woodpecker, Mississippi Kite, and Orchard Oriole were notably absent in the 2013 surveys. For the fourth consecutive year, a Cooper's Hawk nest was observed at or near the same site on the cottonwood transect. A pair of Northern Harriers and probable nest were observed at the bottomland transect.

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Orange-crowned Warbler (*Oreothlypis celata*), a new species for the park in 2013, was observed in riparian habitat.

Table 3.6.1. Habitat type, number of points, and sampling dates for each transect or grid at Lake Meredith NRA, 2013

Transect/Grid	Habitat class	Habitat type	# points	# visits	Visit 1	Visit 2	Visit 3
BOTTOM	Riparian	Bottomland grassland	18	3	4/27	4/28	4/29
CWOOD	Riparian	Cottonwood bottom	19	3	4/26	4/27	4/29
HONEY	Grassland	Upland grassland	19	3	4/30	5/4	5/6
UPLAND	Grassland	Upland grassland	19	3	4/28	5/3	5/5

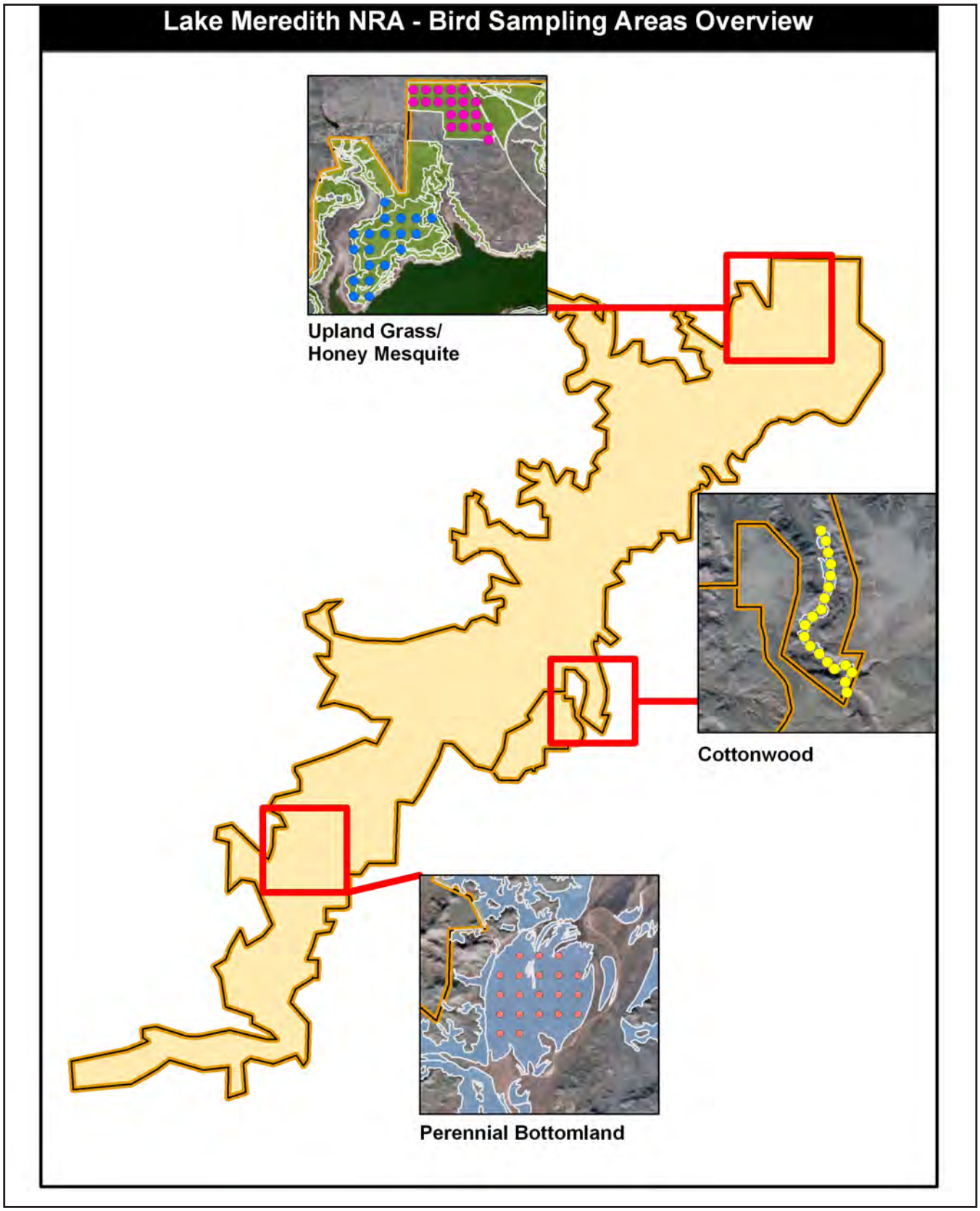

Figure 3.6.1-1. Bird sampling areas at Lake Meredith NRA.

Figure 3.6.1-2. Point locations targeted for annual sampling at Lake Meredith NRA, Upland Grass/Honey Mesquite.

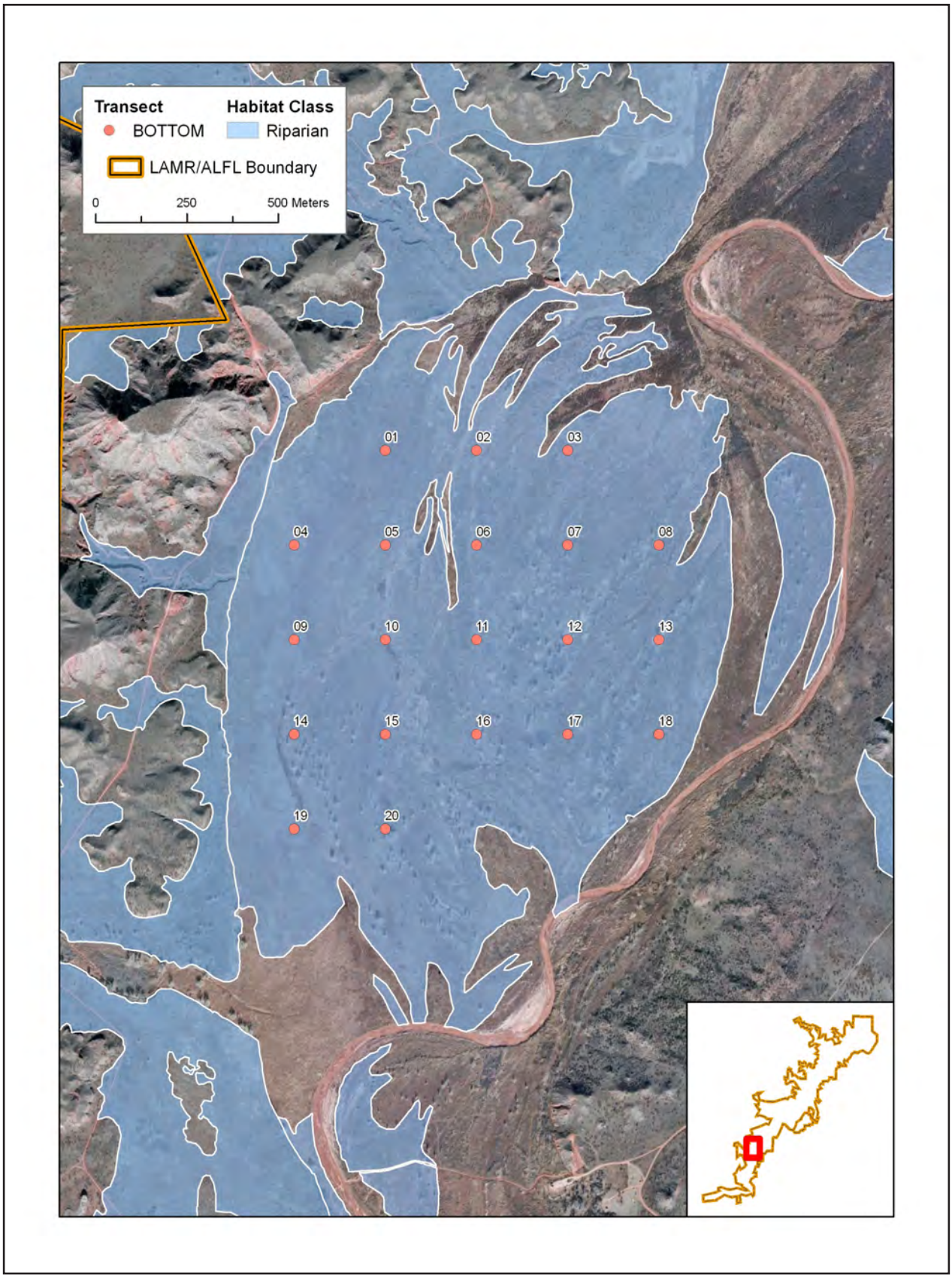

Figure 3.6.1-3. Point locations targeted for annual sampling at Lake Meredith NRA, Pernnial Bottomland.

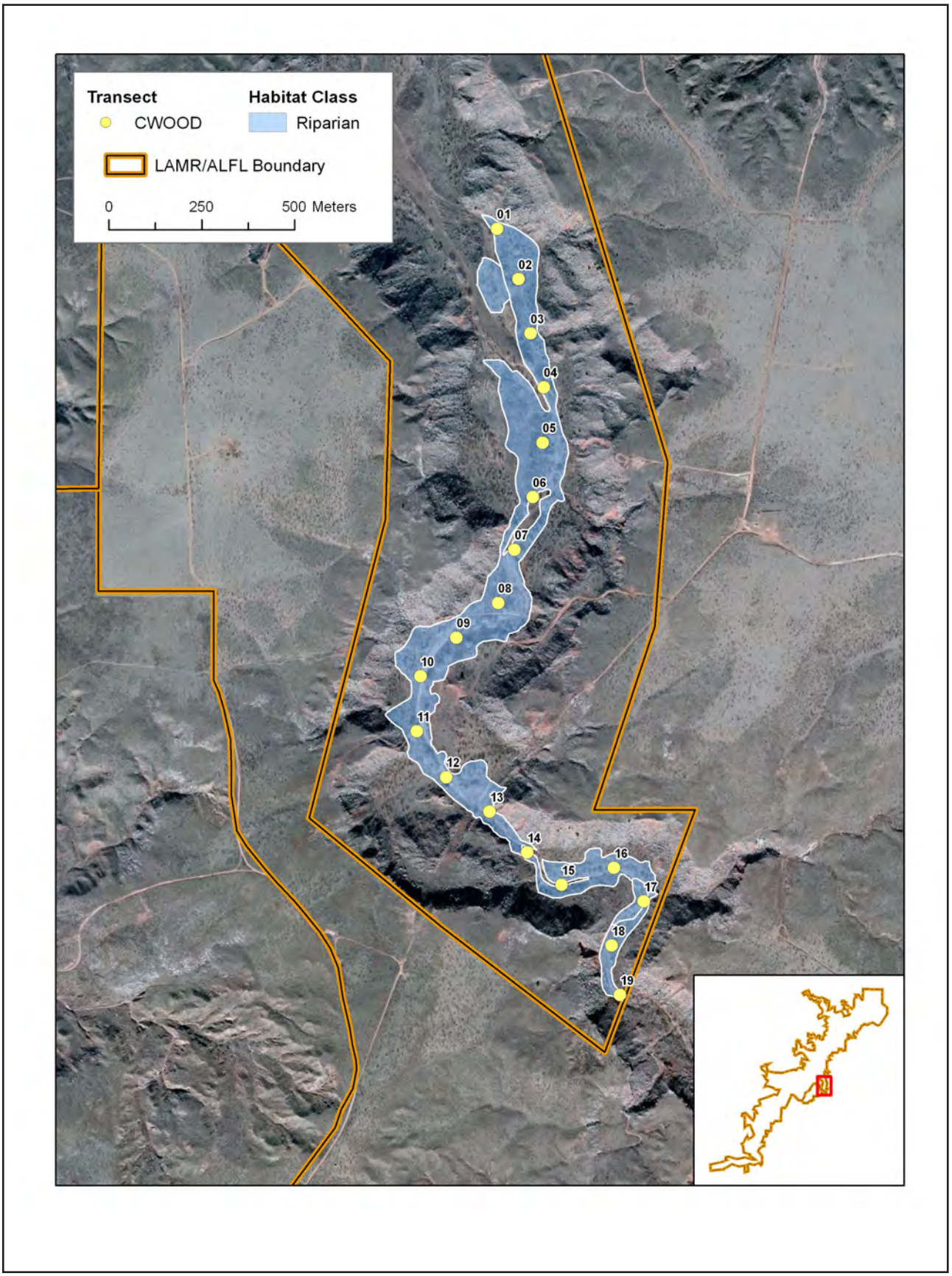

Figure 3.6.1-4. Point locations targeted for annual sampling at Lake Meredith NRA, Cottonwood.

Table 3.6.2. Number of birds detected of each species in each habitat class, Lake Meredith NRA, 2013

Species	Habitat class		# of birds detected	
	Grassland	Riparian	Total	% of total
Mourning Dove	101	111	212	8
Grasshopper Sparrow	149	31	180	7
Red-winged Blackbird	55	95	150	6
Western Meadowlark	147	2	149	6
Rock Wren	40	106	146	5
Cassin's Sparrow	86	53	139	5
Rufous-crowned Sparrow	30	97	127	5
Lark Bunting	119	---	119	4
Chipping Sparrow	82	10	92	3
White-crowned Sparrow	20	65	85	3
Eastern Meadowlark	---	71	71	3
Vesper Sparrow	64	1	65	2
Lark Sparrow	60	4	64	2
American Coot	57	---	57	2
Bewick's Wren	---	55	55	2
Northern Cardinal	7	46	53	2
Yellow-rumped Warbler	11	38	49	2
Ash-throated Flycatcher	---	44	44	2
Brown-headed Cowbird	10	32	42	2
Northern Mockingbird	31	9	40	1
American Goldfinch	---	39	39	1
Field Sparrow	---	34	34	1
Spotted Towhee	5	26	31	1
Blue-gray Gnatcatcher [1]	**---**	**29**	**29**	**1**
Scissor-tailed Flycatcher	4	23	27	1
Turkey Vulture	9	18	27	1
Cliff Swallow	26	---	26	1
Barn Swallow	22	2	24	1
Bullock's Oriole	1	23	24	1
Mallard	24	---	24	1
Western Scrub-Jay [1]	**2**	**22**	**24**	**1**
Common Grackle	12	4	16	1
Great-tailed Grackle	16	---	16	1
Western Kingbird	9	7	16	1
Long-billed Dowitcher [1]	**15**	**---**	**15**	**1**
Rock Pigeon	15	---	15	1
Northern Flicker	1	12	13	0
Northern Harrier	6	7	13	0
Orange-crowned Warbler [1]	**---**	**13**	**13**	**0**
Killdeer	10	2	12	0
Ladder-backed Woodpecker	1	11	12	0

Table 3.6.2. Number of birds detected of each species in each habitat class, Lake Meredith NRA, 2013, cont.

Species	Habitat class		# of birds detected	
	Grassland	Riparian	Total	% of total
Pine Siskin [1]	**4**	**7**	**11**	**0**
Northern Shoveler	10	---	10	0
Red-tailed Hawk	2	8	10	0
House Finch	6	3	9	0
American Kestrel	3	5	8	0
Brewer's Blackbird [1]	**8**	**---**	**8**	**0**
Canyon Wren	---	8	8	0
Common Yellowthroat	1	6	7	0
Red-bellied Woodpecker	---	7	7	0
Say's Phoebe	6	1	7	0
Blue Grosbeak	6	---	6	0
Common Poorwill	3	3	6	0
European Starling	6	---	6	0
Great Horned Owl	4	2	6	0
House Wren	---	6	6	0
Eurasian Collared-Dove	5	---	5	0
Yellow-headed Blackbird [1]	**5**	**---**	**5**	**0**
American Avocet	4	---	4	0
American Pipit [1]	**4**	**---**	**4**	**0**
Brown Thrasher	1	2	3	0
Chihuahuan Raven	---	3	3	0
Cooper's Hawk	---	3	3	0
Dark-eyed Junco	---	3	3	0
Downy Woodpecker	---	3	3	0
Hermit Thrush [1]	**---**	**3**	**3**	**0**
Horned Lark	3	---	3	0
Wilson's Phalarope [1]	**3**	**---**	**3**	**0**
Blue Jay	---	2	2	0
Clay-colored Sparrow	1	1	2	0
Eastern Kingbird	---	2	2	0
Northern Bobwhite	2	---	2	0
Northern Pintail	2	---	2	0
Peregrine Falcon [1]	**2**	**---**	**2**	**0**
Ring-necked Pheasant	---	2	2	0
Ruby-crowned Kinglet	---	2	2	0
Swainson's Hawk	1	1	2	0
Baird's Sparrow [1]	**1**	**---**	**1**	**0**
Bank Swallow	1	---	1	0
Barn Owl	---	1	1	0
Belted Kingfisher	1	---	1	0
Eared Grebe	**1**	**---**	**1**	**0**

Table 3.6.2. Number of birds detected of each species in each habitat class, Lake Meredith NRA, 2013, cont.

Species	Habitat class		# of birds detected	
	Grassland	Riparian	Total	% of total
Eastern Phoebe	---	1	1	0
Great Blue Heron	---	1	1	0
Greater Roadrunner	1	---	1	0
House Sparrow	1	---	1	0
Loggerhead Shrike	1	---	1	0
Northern Rough-winged Swallow	1	---	1	0
Pied-billed Grebe	**1**	**---**	**1**	**0**
Sharp-shinned Hawk	1	---	1	0
Virginia's Warbler [1]	**1**	**---**	**1**	**0**
Wild Turkey	---	1	1	0
Tree Swallow (incidental) [1]	--	--	--	--
Unidentified Sparrow	*32*	*7*	*39*	*1*
Unidentified Blackbird	*28*	*3*	*31*	*1*
Unidentified Bird	*9*	*7*	*16*	*1*
Unidentified Duck	*4*	---	*4*	*0*
Unidentified Swallow	*4*	---	*4*	*0*
Unidentified Kingbird	*1*	---	*1*	*0*
Unidentified Raven	---	*1*	*1*	*0*
Unidentified Woodpecker	---	*1*	*1*	*0*
Total	**1,428**	**1,248**	**2,676**	**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 of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values exclude observations of species flying overhead/not using the habitat.

[1] Possible migrant. There may be little to no breeding habitat at the park for the species.

3.7 Lyndon B. Johnson National Historical Park

3.7.1 2013 sampling

During April of 2013, we sampled two transects or grids at Lyndon B. Johnson NHP (Figure 3.7.1-1, -2, -3). One transect was in riparian habitat (bottomland grassland) with 17 unique points. The other transect was in grassland (upland grassland) habitat with six unique points (Table 3.7.1). Each point was surveyed three times for a total of 69 point visits (the number of unique points multiplied by the number of visits) at the park.

3.7.2 Results and discussion

During 2013, 633 birds of 34 species were counted at Lyndon B. Johnson NHP (Table 3.7.2). Northern Cardinal had the highest number of individuals counted (22% of the total number of birds counted), with Black-crested Titmouse (13%) and Red-winged Blackbird (11%) the next most common. There was one new species recorded at the park in 2013, Red-eyed Vireo (singing in a dense patch of trees and shrubs at the restoration transect).

Other prominent species worth noting included Black Vulture, Turkey Vulture, Summer Tanager, and Ladder-backed Woodpecker at the riparian ranch transect, Northern Mockingbird at the grassland restoration transect, and Carolina Wren and Mourning Dove at both transects. Numbers of Northern Cardinal, Black-crested Titmouse, Northern Mockingbird, Mourning Dove, and Black Vulture were notably higher in 2013 compared to 2012. Field Sparrow was detected at the grassland restoration transect for the third consecutive year. Carolina Chickadee and Great-tailed Grackle, observed in every point count survey at the park since they were initiated in 2009, were absent in 2013.

Table 3.7.1. Habitat type, number of points, and sampling dates for each transect or grid at Lyndon B. Johnson NHP, 2013

Transect/Grid	Habitat class	Habitat type	# points	# visits	Visit 1	Visit 2	Visit 3
RANCH	Riparian	Bottomland grassland	17	3	4/16	4/17	4/19
RESTORATION	Grassland	Upland grassland	6	3	4/16	4/17	4/19

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A number of Ladder-backed Woodpeckers (*Picoides scalaris*) were observed at the riparian transect at the park in 2013.

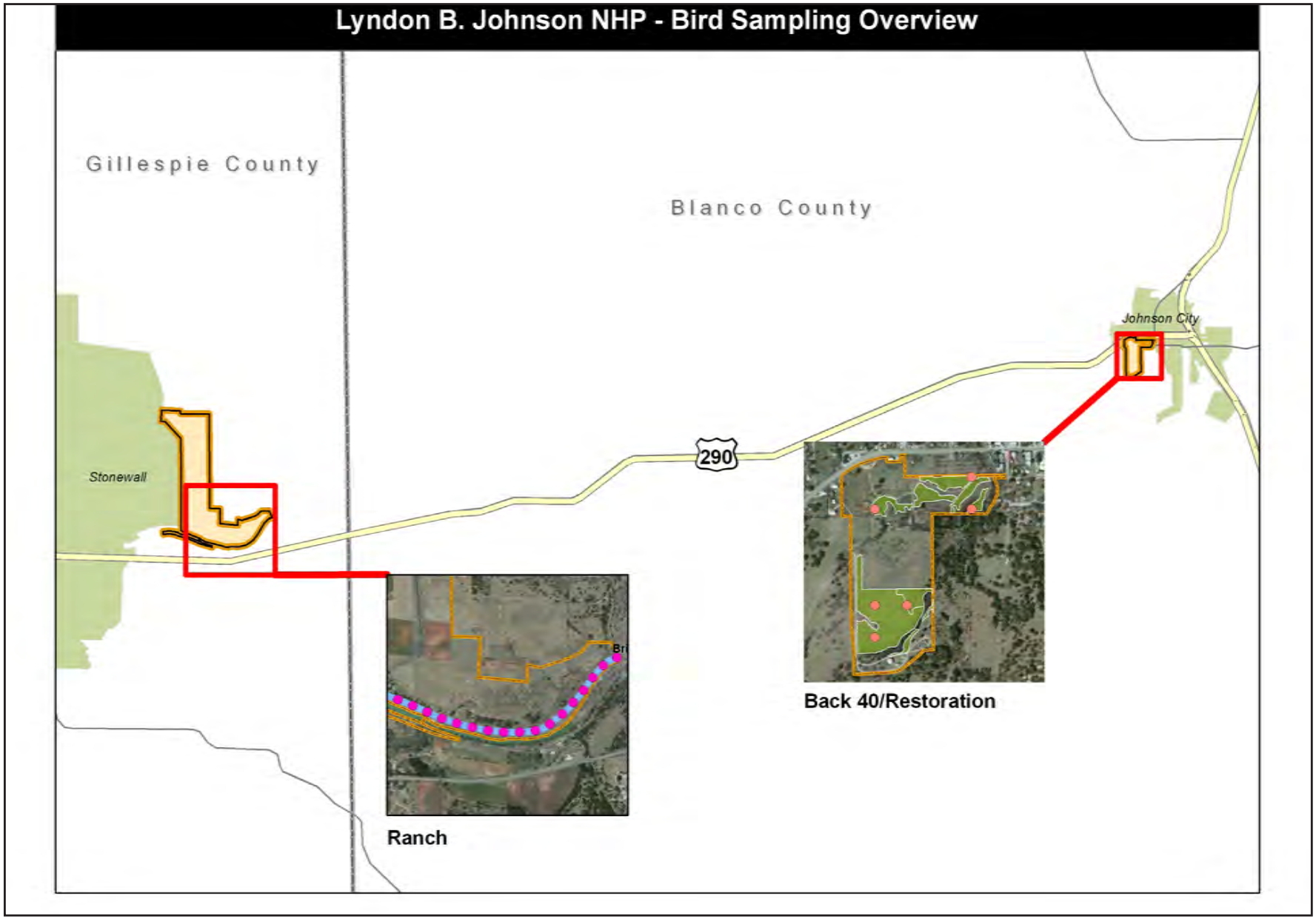

Figure 3.7.1-1. Bird sampling areas at Lyndon B. Johnson NHP.

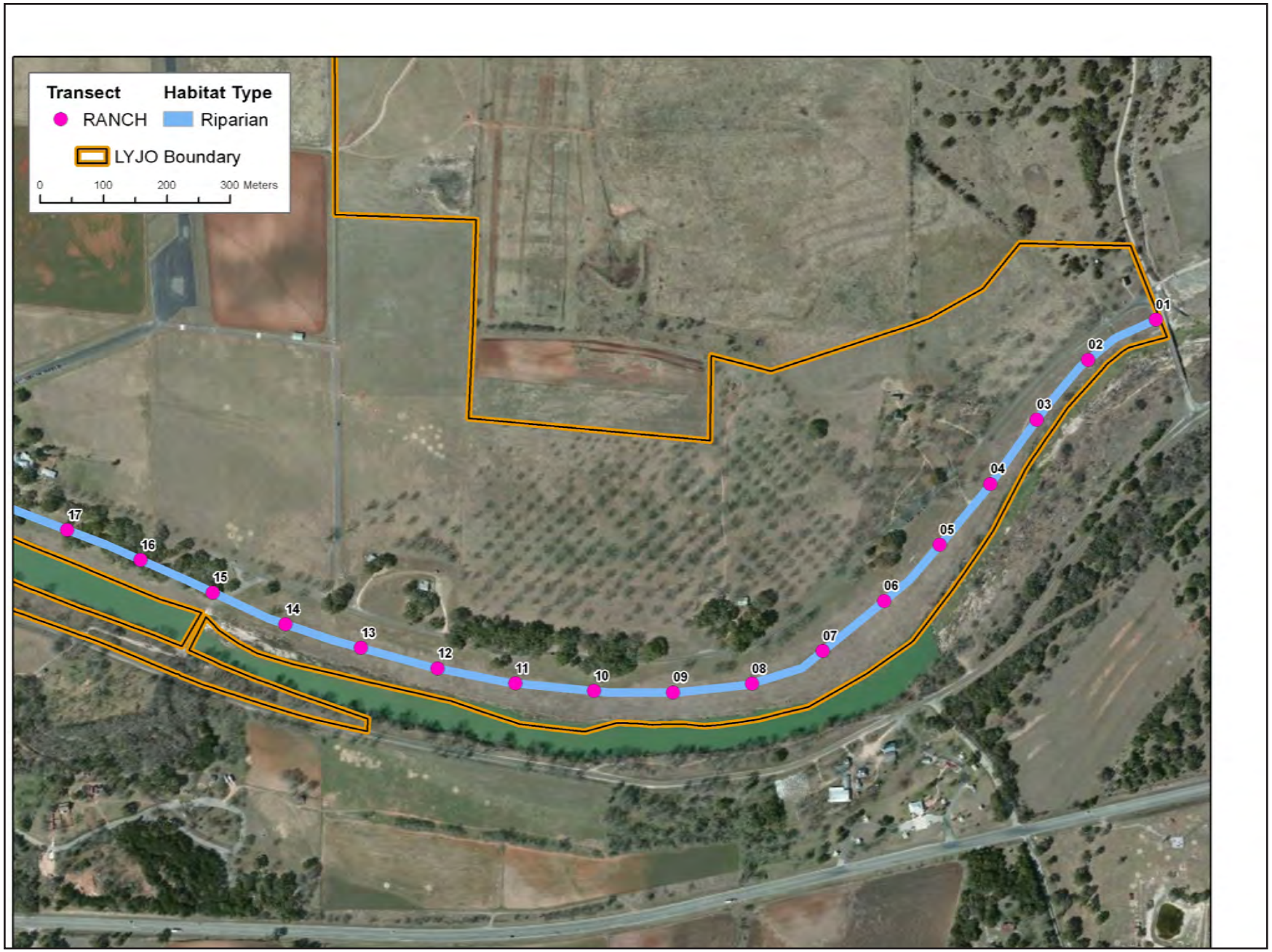

Figure 3.7.1-2. Point locations targeted for annual sampling at Lyndon B. Johnson NHP, Ranch,

Figure 3.7.1-3. Point locations targeted for annual sampling at Lyndon B. Johnson NHP, Back 40/Restoration.

Table 3.7.2. Number of birds detected of each species in each habitat class, Lyndon B. Johnson NHP, 2013

Species	Habitat class		# of birds detected	
	Grassland	Riparian	Total	% of total
Northern Cardinal	44	97	141	22
Black-crested Titmouse	16	68	84	13
Red-winged Blackbird	---	70	70	11
Black Vulture	6	47	53	8
Mourning Dove	26	14	40	6
Turkey Vulture	2	22	24	4
Carolina Wren	6	13	19	3
Summer Tanager	---	19	19	3
Cliff Swallow	4	7	11	2
Common Grackle	1	10	11	2
Scissor-tailed Flycatcher	5	6	11	2
Eastern Phoebe	1	9	10	2
Ladder-backed Woodpecker	---	10	10	2
Northern Mockingbird	10	---	10	2
White-winged Dove	9	1	10	2
Brown-headed Cowbird	2	5	7	1
Bewick's Wren	2	4	6	1
Field Sparrow	5	---	5	1
House Sparrow	---	5	5	1
Orchard Oriole	---	5	5	1
Red-tailed Hawk	---	5	5	1
Crested Caracara	---	4	4	1
Great Blue Heron	---	4	4	1
Yellow-rumped Warbler	---	4	4	1
Barn Swallow	1	2	3	0
Eurasian Collared-Dove	3	---	3	0
Eastern Bluebird	2	---	2	0
Red-eyed Vireo	**2**	**---**	**2**	**0**
Ash-throated Flycatcher	---	1	1	0
Blue Jay	1	---	1	0
Chihuahuan Raven	---	1	1	0
Double-crested Cormorant	---	1	1	0
Downy Woodpecker	---	1	1	0
Wild Turkey	---	1	1	0

Species	Habitat class		# of birds detected	
	Grassland	Riparian	Total	% of total
Unidentified Bird	*1*	*46*	*47*	*7*
Unidentified Hawk	*1*	---	*1*	*0*
Unidentified Sparrow	---	1	*1*	*0*
Total	**150**	**483**	**633**	**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 of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values exclude observations of species flying overhead/not using the habitat.

NPS PHOTO

Riparian habitat at Lyndon B. Johnson NHP.

3.8 Pecos National Historical Park

3.8.1 2013 sampling

During May of 2013, we sampled six transects or grids at Pecos NHP (Figure 3.8.1). Four transects were in the grassland habitat class (shortgrass prairie), with 6 to 18 unique points each. Two transects were in the riparian habitat class (cottonwood bottom), with 17 and 18 unique points each (Table 3.8.1). Most points were surveyed three times for a total of 273 point visits (the number of unique points multiplied by the number of visits) at the park in 2013.

3.8.2 Results and discussion

During 2013, 3,737 birds of 86 species were counted at Pecos NHP (Table 3.8.2). This ranked the park first in the number of birds counted and second in bird diversity among the 10 SOPN parks surveyed. Species counted in the highest numbers were Common Raven (7% of the total number of birds counted), House Finch (6%), Black-headed Grosbeak (6%), Cassin's Kingbird (6%), Lark Sparrow (4%), Pinyon Jay (4%), Chipping Sparrow (4%), and Spotted Towhee (4%). Other prominent species were Juniper Titmouse, Plumbeous Vireo, Lesser Goldfinch, Western Scrub-Jay, Violet-green Swallow, and Mourning Dove.

Compared to 2012, notably higher numbers of Black-headed Grosbeak, House Finch, Common Raven, Chipping Sparrow, Juniper Titmouse, Lesser Goldfinch, Northern Rough-winged Swallow, and Broad-tailed Hummingbird were counted. Decreases in the number of individuals counted compared to 2012 were noted for Western Wood-Pewee, Northern Mockingbird, and Western Kingbird.

PHOTO: DAVE MENKE, USFWS

Evening Grosbeak (*Coccothraustes vespertinus*), a possible migrant at Pecos NHP, was recorded for the first time at the park in 2013.

There were nine new species for the park in 2013 (see Table 3.8.2). Five of the new species (Evening Grosbeak, Clay-colored Sparrow, American Pipit, Common Merganser, and Orange-crowned Warbler) were possibly migrants. Multiple Cedar Waxwings and Wilson Warblers were observed for the first time in a point count since surveys were initiated in 2009. The higher number of migrants and detections for many species compared to 2012 was probably in large part due to an ongoing late migration during the survey period.

Table 3.8.1. Habitat type, number of points, and sampling dates for each transect or grid at Pecos NHP, 2013

Transect/Grid	Habitat class	Habitat type	# points	# visits	Visit 1	Visit 2	Visit 3
GLORIETA	Riparian	Cottonwood bottom	18	3	5/17	5/18	5/19
PECOS	Riparian	Cottonwood bottom	17	3	5/20	5/21	5/22
UNIT 3	Grassland	Shortgrass prairie	18	2	5/10	5/11	5/12
UNIT 6	Grassland	Shortgrass prairie	18	3	5/13	5/14	5/15
UNIT 17	Grassland	Shortgrass prairie	14	3	5/7	5/8	5/9
UNIT 19	Grassland	Shortgrass prairie	6	3	5/7	5/8	5/9

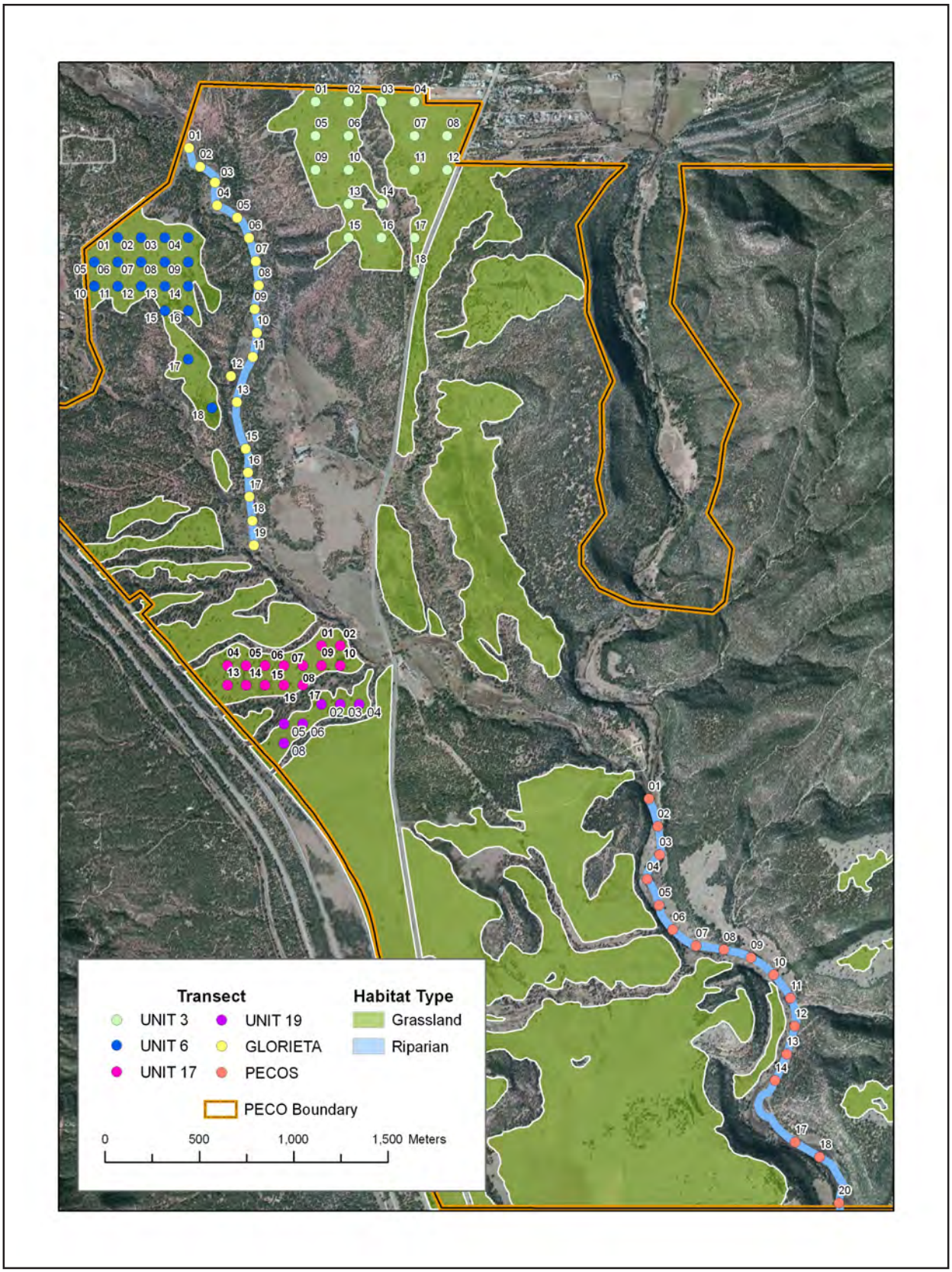

Figure 3.8.1. Point locations targeted for annual sampling at Pecos NHP.

Table 3.8.2. Number of birds detected of each species in each habitat class, Pecos NHP, 2013

Species	Habitat class		# of birds detected	
	Grassland	Riparian	Total	% of total
Common Raven	196	60	256	7
House Finch	194	32	226	6
Black-headed Grosbeak	81	131	212	6
Cassin's Kingbird	178	34	212	6
Lark Sparrow	166	1	167	4
Pinyon Jay	144	4	148	4
Chipping Sparrow	138	8	146	4
Spotted Towhee	52	91	143	4
Juniper Titmouse	94	16	110	3
Plumbeous Vireo	92	15	107	3
Lesser Goldfinch	91	13	104	3
Western Scrub-Jay	58	35	93	2
Mourning Dove	47	39	86	2
Violet-green Swallow	1	84	85	2
Yellow-rumped Warbler	75	10	85	2
Western Wood-Pewee	7	70	77	2
Vesper Sparrow	74	---	74	2
Ash-throated Flycatcher	35	34	69	2
Yellow Warbler	1	67	68	2
Northern Rough-winged Swallow	4	62	66	2
Western Meadowlark	57	7	64	2
American Robin	4	58	62	2
Broad-tailed Hummingbird	46	10	56	1
Western Tanager	10	39	49	1
Brewer's Blackbird	32	15	47	1
Red Crossbill	41	5	46	1
Gray Flycatcher	45	---	45	1
Song Sparrow	---	44	44	1
Bewick's Wren	1	42	43	1
Yellow-breasted Chat	---	43	43	1
Evening Grosbeak [1]	**37**	**5**	**42**	**1**
Brown-headed Cowbird	10	31	41	1
Cliff Swallow	28	12	40	1
Cedar Waxwing	24	10	34	1
Bullock's Oriole	13	17	30	1
Mountain Bluebird	26	1	27	1
Black-chinned Hummingbird	---	24	24	1
Northern Flicker	15	9	24	1
Pine Siskin	23	1	24	1
Black-throated Gray Warbler	19	4	23	1
Hepatic Tanager	23	---	23	1

Table 3.8.2. Number of birds detected of each species in each habitat class, Pecos NHP, 2013, cont.

Species	Habitat class		# of birds detected	
	Grassland	Riparian	Total	% of total
Pygmy Nuthatch	22	---	22	1
Western Bluebird	12	10	22	1
Mallard	---	21	21	1
Say's Phoebe	16	4	20	1
Blue-gray Gnatcatcher	6	8	14	0
Warbling Vireo	7	7	14	0
MacGillivray's Warbler	**4**	**8**	**12**	**0**
Black Phoebe	---	11	11	0
Bushtit	6	5	11	0
White-breasted Nuthatch	6	5	11	0
American Crow	6	4	10	0
Barn Swallow	8	2	10	0
Northern Mockingbird	7	3	10	0
Eurasian Collared-Dove	8	---	8	0
Spotted Sandpiper	---	8	8	0
Bank Swallow	**6**	**1**	**7**	**0**
Wilson's Warbler	---	7	7	0
Common Yellowthroat	---	6	6	0
Red-winged Blackbird	---	6	6	0
Blue-winged Teal	---	5	5	0
Common Grackle	3	2	5	0
Black-capped Chickadee	**---**	**4**	**4**	**0**
Great Blue Heron	---	4	4	0
Hairy Woodpecker	---	4	4	0
House Wren	---	4	4	0
American Goldfinch	2	1	3	0
Horned Lark	3	---	3	0
Red-tailed Hawk	---	3	3	0
Rock Pigeon	3	---	3	0
Tree Swallow	**2**	**1**	**3**	**0**
White-crowned Sparrow	3	---	3	0
White-winged Dove	2	1	3	0
American Pipit [1]	**2**	**---**	**2**	**0**
Black-billed Magpie	2	---	2	0
Canyon Towhee	---	2	2	0
Common Merganser [1]	**---**	**2**	**2**	**0**
Gray Catbird	---	2	2	0
Hermit Thrush	---	2	2	0
Northern Shoveler	---	2	2	0
Blue Grosbeak	---	1	1	0
Brewer's Sparrow	1	---	1	0

Table 3.8.2. Number of birds detected of each species in each habitat class, Pecos NHP, 2013, cont.

Species	Habitat class		# of birds detected	
	Grassland	Riparian	Total	% of total
Green-tailed Towhee	---	1	1	0
Mountain Chickadee	1	---	1	0
Orange-crowned Warbler [1]	**---**	**1**	**1**	**0**
Turkey Vulture	---	1	1	0
Clay-colored Sparrow (incidental) [1]	**--**	**--**	**--**	**--**
Unidentified Bird	*18*	*10*	*28*	*1*
Unidentified Sparrow	*21*	*1*	*22*	*1*
Unidentified Finch	*6*	*1*	*7*	*0*
Unidentified Empidonax	*4*	*1*	*5*	*0*
Unidentified Hummingbird	*---*	*3*	*3*	*0*
Unidentified Swallow	*3*	*---*	*3*	*0*
Unidentified Warbler	*1*	*2*	*3*	*0*
Unidentified Blackbird	*---*	*2*	*2*	*0*
Unidentified Flycatcher	*1*	1	*2*	*0*
Total	**2,374**	**1,363**	**3,737**	**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 of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values exclude observations of species flying overhead/not using the habitat.

[1] Possible migrant. There may be little to no breeding habitat at the park for the species.

3.9 Sand Creek Massacre National Historic Site

3.9.1 2013 sampling

During June of 2013, we sampled three transects or grids at Sand Creek Massacre NHS (Figure 3.9.1). Two transects were in grassland habitat (shortgrass prairie) with 20 unique points each, and one transect was in riparian habitat (cottonwood bottom) with 16 unique points (Table 3.9.1). Each point was surveyed three times for a total of 168 point visits (the number of unique points multiplied by the number of visits) at the park.

3.9.2 Results and discussion

During 2013, 2,572 birds of 43 species were counted at Sand Creek Massacre NHS (Table 3.9.2). Western Meadowlark, the most commonly counted species in the park (21% of the total number of birds counted), was noted throughout the park with the highest numbers in the sand sage and upland grassland. Other common species, in order of number of individuals counted, included Mourning Dove (20%), Cassin's Sparrow (14%), Western Kingbird (7%), Horned Lark (5%), Lark Sparrow (5%), and Ring-necked Pheasant (4%).

Compared to 2012, the number of detections was notably higher for Cassin's Sparrow, Horned Lark, Lark Sparrow, Mourning Dove, Northern Flicker, Ring-necked Pheasant, and Yellow Warbler. Decreases in the number of detections from 2012 were noted for Dickcissel, House Wren, and Baltimore Oriole. Sand Creek NHS is the only park in the SOPN with three species of orioles–Baltimore, Bullock's, and Orchard. Note that the Burrowing Owls observed in 2013 were adjacent to, but just outside of park boundaries.

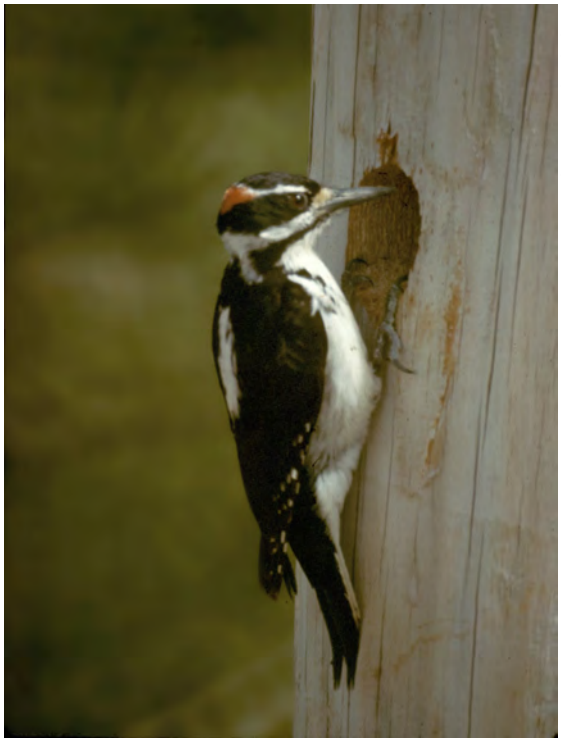

PHOTO: ROB BENNETTS

Hairy Woodpecker (*Picoides villosus*) was a new species recorded at Sand Creek Massacre NHS in 2013.

There were five new species for the park in 2013: Red-eyed Vireo (including at least one singing), Lesser Goldfinch (a possible breeding pair), Hairy Woodpecker, Ferruginous Hawk, and American Redstart (a possible migrant that was detected singing).

Table 3.9.1. Habitat type, number of points, and sampling dates for each transect or grid at Sand Creek Massacre NHS, 2013

Transect/Grid	Habitat class	Habitat type	# points	# visits	Visit 1	Visit 2	Visit 3
COTTONWOOD	Riparian	Cottonwood bottom	16	3	6/14	6/15	6/16
UPLAND GRASS	Grassland	Shortgrass prairie	20	3	6/17	6/18	6/19
UPLAND SAGE	Grassland	Shortgrass prairie	20	3	6/14	6/15	6/16

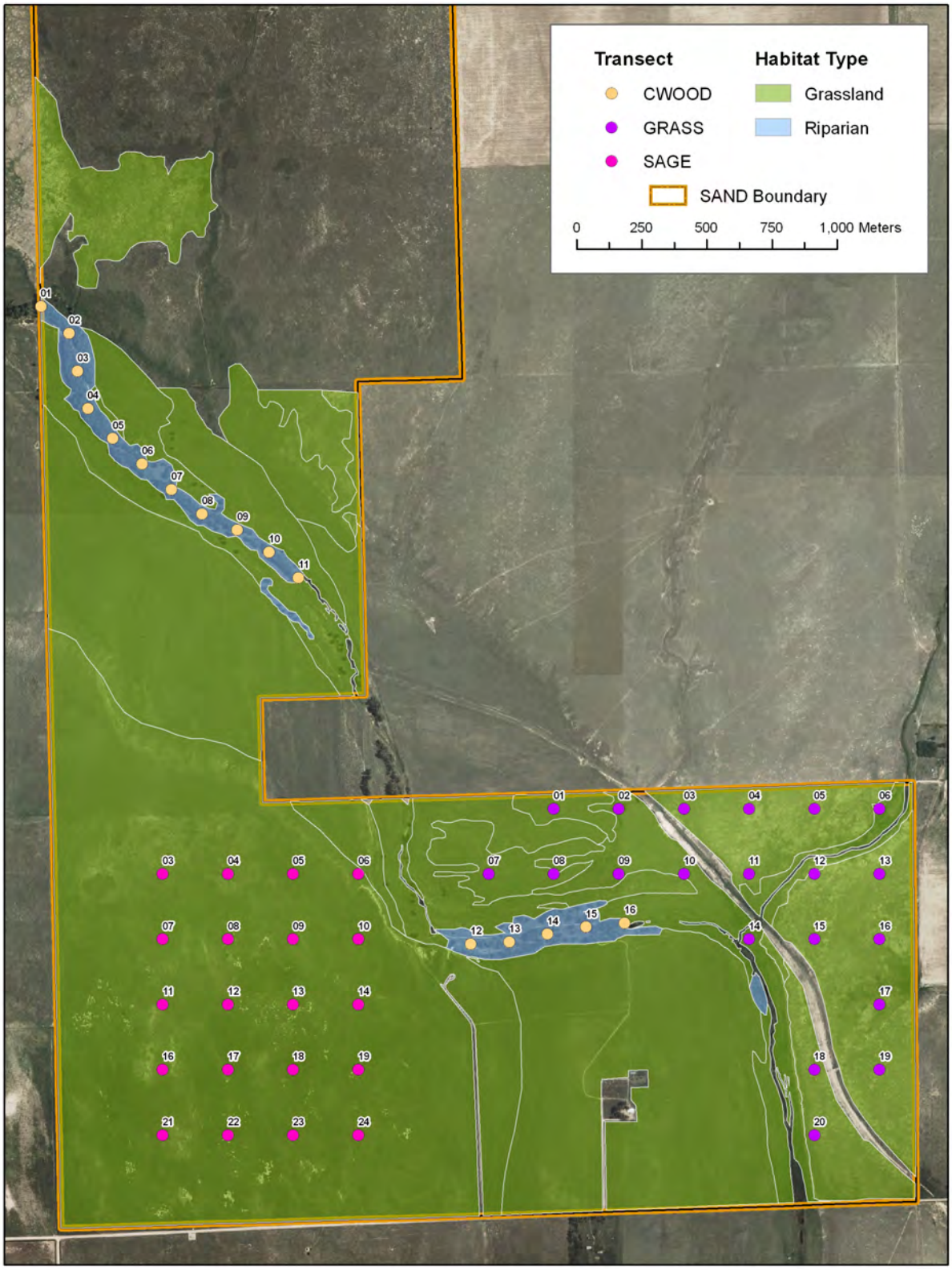

Figure 3.9.1. Point locations targeted for annual sampling at Sand Creek Massacre NHS.

Table 3.9.2. Number of birds detected of each species in each habitat class, Sand Creek Massacre NHS, 2013

Species	Habitat class		# of birds detected	
	Grassland	Riparian	Total	% of total
Western Meadowlark	477	64	541	21
Mourning Dove	182	327	509	20
Cassin's Sparrow	330	20	350	14
Western Kingbird	51	125	176	7
Horned Lark	129	---	129	5
Lark Sparrow	92	29	121	5
Ring-necked Pheasant	83	19	102	4
Yellow Warbler	8	66	74	3
Bullock's Oriole	27	44	71	3
Red-winged Blackbird	60	8	68	3
Grasshopper Sparrow	53	7	60	2
Northern Mockingbird	19	24	43	2
Orchard Oriole	7	29	36	1
Northern Flicker	11	23	34	1
Red-headed Woodpecker	18	9	27	1
Common Nighthawk	19	7	26	1
House Wren	---	24	24	1
Eastern Kingbird	8	14	22	1
Brown-headed Cowbird	7	13	20	1
Blue Grosbeak	15	3	18	1
Great Horned Owl	6	8	14	1
Common Grackle	8	5	13	1
Killdeer	7	3	10	0
Western Wood-Pewee	---	10	10	0
House Finch	5	2	7	0
Warbling Vireo	---	7	7	0
European Starling	3	3	6	0
Red-eyed Vireo	**---**	**5**	**5**	**0**
American Goldfinch	---	4	4	0
American Robin	---	4	4	0
Baltimore Oriole	---	4	4	0
Barn Swallow	4	---	4	0
Burrowing Owl [2]	4	---	4	0
Mallard	4	---	4	0
Swainson's Hawk	4	---	4	0
Downy Woodpecker	---	3	3	0
Lark Bunting	3	---	3	0

Table 3.9.2. Number of birds detected of each species in each habitat class, Sand Creek Massacre NHS, 2013, cont.

Species	Habitat class		# of birds detected	
	Grassland	Riparian	Total	% of total
Lesser Goldfinch	**1**	**2**	**3**	**0**
American Redstart [1]	**---**	**1**	**1**	**0**
Eastern Bluebird	---	1	1	0
Ferruginous Hawk	**1**	**---**	**1**	**0**
Hairy Woodpecker	**---**	**1**	**1**	**0**
Say's Phoebe	1	---	1	0
Unidentified Oriole	---	*3*	*3*	*0*
Unidentified Hawk	---	*2*	*2*	*0*
Unidentified Sparrow	*1*	---	*1*	*0*
Unidentified Vireo	---	*1*	*1*	*0*
Total	**1,648**	**924**	**2,572**	**100%**

Note: Species are listed in rank order of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values exclude observations of species flying overhead/ not using the habitat.

[1] Possible migrant.

[2] Detected during point counts, but on private land adjacent to park boundary.

3.10 Washita Battlefield National Historic Site

3.10.1 2013 sampling

During May of 2013, we sampled two transects/grids at Washita Battlefield NHS (Figure 3.10.1). Both transects were in grassland habitat, bottomland grassland and upland grassland, with 18 and 19 unique points, respectively (Table 3.10.1). Points were surveyed three times for a total of 111 point visits (the number of unique points multiplied by the number of visits) at the Historic Site.

3.10.2 Results and discussion

During 2013, 1,262 birds of 46 species were counted at Washita Battlefield NHS (Table 3.10.2). The occurrence of a nice mix of grassland and savannah/woodland bird species on the Historic Site is a reflection of the diverse habitat. Eastern Meadowlark and Dickcissel were the species counted in the highest numbers (16% and 15%, respectively). Other common species were Red-winged Blackbird (11%), Mourning Dove (10%), Brown-headed Cowbird (5%), and Northern Mockingbird (5%).

Three species of wrens were recorded (Bewick's, Carolina, and House), as were four species of sparrows (Cassin's, Field, Grasshopper, and Lark). Compared to 2012, detections were notably higher for Eastern Meadowlark, Mourning Dove, Brown-headed Cowbird, Red-winged Blackbird, and Grasshopper Sparrow. Notable decreases in detections compared to 2012 were documented for Northern Bobwhite, Northern Cardinal, Painted Bunting, Tufted Titmouse, Red-bellied Woodpecker, and Yellow-billed Cuckoo. No new species were recorded at the park in 2013.

Table 3.10.1. Habitat type, number of points, and sampling dates for each transect or grid at Washita Battlefield NHS, 2013

Transect/Grid	Habitat class	Habitat type	# points	# visits	Visit 1	Visit 2	Visit 3
RESTORATION	Grassland	Bottomland grassland	18	3	5/24	5/26	5/28
UPLAND	Grassland	Upland grassland	19	3	5/25	5/27	5/29

PHOTO: ROB BENNETTS

Common Nighthawk (*Chordeiles minor*) was recorded in small numbers during surveys at Washita Battlefield NHS in 2013.

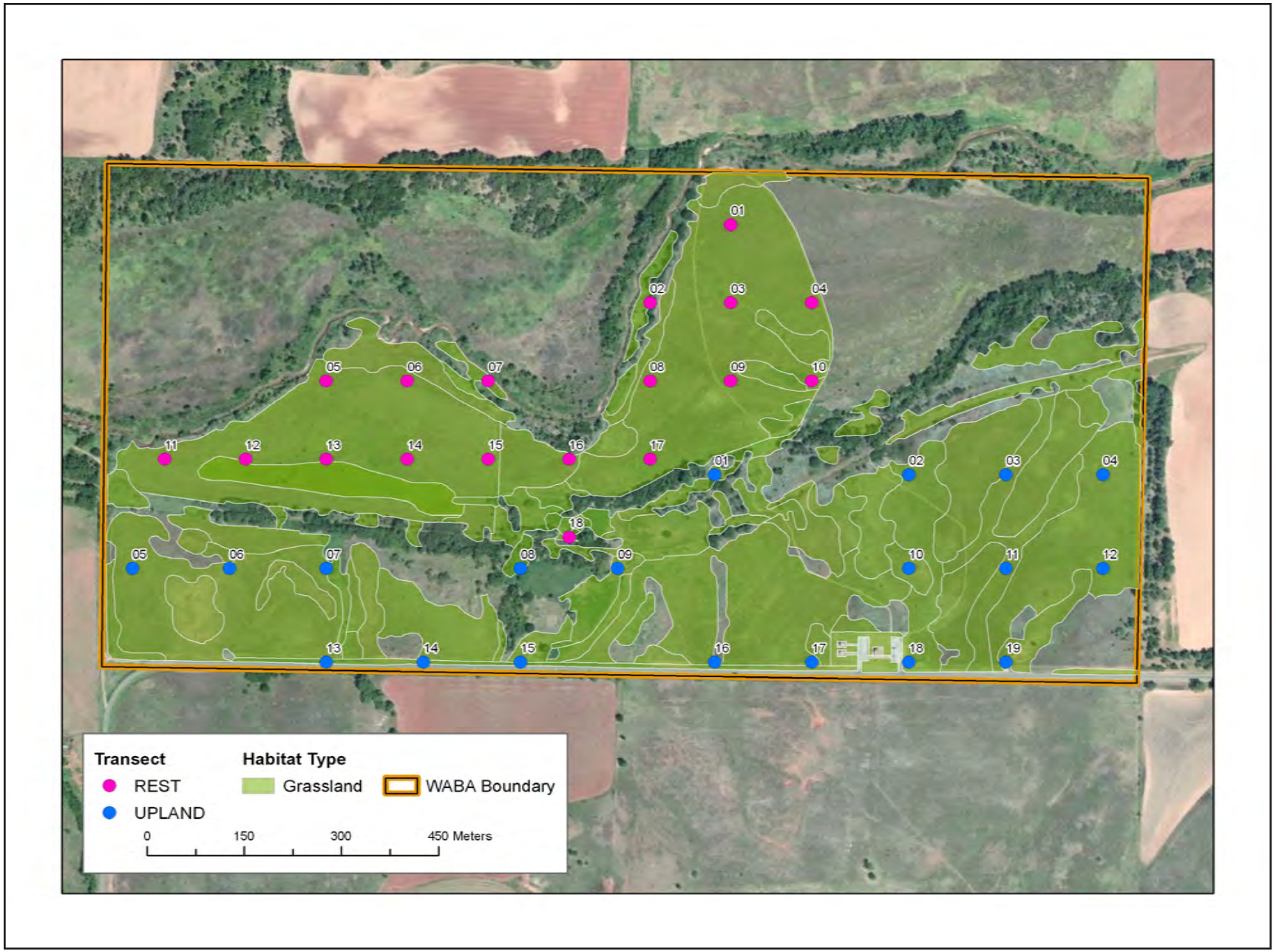

Figure 3.10.1. Point locations targeted for annual sampling at Washita Battlefield NHS.

Table 3.10.2. Number of birds detected of each species in each habitat class, Washita Battlefield NHS, 2013

Species	# of birds detected	
	Total (grassland habitat)	% of total
Eastern Meadowlark	208	16
Dickcissel	185	15
Red-winged Blackbird	138	11
Mourning Dove	128	10
Brown-headed Cowbird	64	5
Northern Mockingbird	61	5
Northern Cardinal	50	4
Field Sparrow	35	3
House Wren	34	3
Barn Swallow	33	3
Tree Swallow	28	2
Grasshopper Sparrow	23	2
Carolina Chickadee	21	2
American Crow	18	1
Killdeer	17	1
Scissor-tailed Flycatcher	17	1
Turkey Vulture	16	1
Carolina Wren	15	1
Great Crested Flycatcher	15	1
Western Kingbird	13	1
Northern Bobwhite	12	1
Northern Flicker	11	1
Cliff Swallow	10	1
Western Meadowlark	10	1
Downy Woodpecker	8	1
Blue-gray Gnatcatcher	7	1
Red-bellied Woodpecker	7	1
Red-tailed Hawk	7	1
Eastern Phoebe	6	0
Lark Sparrow	6	0
Blue Grosbeak	5	0
Tufted Titmouse	5	0
Wild Turkey	5	0
American Goldfinch	4	0
Bewick's Wren	4	0
Hairy Woodpecker	4	0
Painted Bunting	4	0
Eastern Bluebird	3	0
Yellow-billed Cuckoo	3	0
Canada Goose	2	0
Cassin's Sparrow	2	0
Common Nighthawk	2	0
Great Blue Heron	2	0
Mississippi Kite	2	0
Yellow Warbler	2	0
Green Heron	1	0
Unidentified Meadowlark	*9*	*1*
Total	**1,262**	**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 of detection, from the most to least commonly observed. Relative detectability among species has not been taken into account; thus, rank order provides only a general indication of relative abundance. Detectability will be explicitly accounted for in periodic synthesis reports. Because of the potential to confound future comparisons, these values exclude observations of species flying overhead/not using the habitat.

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