



# Desert Upland Baseline Bird Surveys Final Project Report

SEPTEMBER 2018

PREPARED FOR

**Desert Conservation Program  
Clark County Department of Air Quality**

PREPARED BY

**SWCA Environmental Consultants**



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Prepared for

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## EXECUTIVE SUMMARY

In 2018, SWCA Environmental Consultants conducted avian point-count surveys in the Boulder City Conservation Easement (BCCE), which is managed by the Clark County Desert Conservation Program. Point-counts were conducted to establish a baseline data set of avian species presence and distribution at the BCCE and could be compared with future data to quantify the success of management efforts within the BCCE. Surveys consisted of three rounds of breeding bird point-count surveys and were conducted at 40 survey locations across the BCCE between May 15 and June 14, 2018. The surveys did not detect any of the bird species covered by the Clark County Multiple Species Habitat Conservation Plan (MSHCP) but did detect two evaluation species (loggerhead shrike [*Lanius ludovicianus*] and LeConte's thrasher [*Toxostoma lecontei*]). In total, 23 avian species were recorded across the 40 survey locations in the BCCE in 2018.

# 1 INTRODUCTION

The Clark County Desert Conservation Program (DCP) manages compliance with the Endangered Species Act (ESA) through the Clark County Multiple Species Habitat Conservation Plan (MSHCP) (Clark County 2000). The Boulder City Conservation Easement (BCCE) is a unit of the Clark County reserve system and is managed by the DCP. The primary goal in managing the BCCE is to protect and manage for the Mojave desert tortoise (*Gopherus agassizii*) and its habitat (Clark County 2015). However, a secondary goal in managing the BCCE is to protect and manage for other species covered by the MSHCP (Clark County 2015). The MSHCP covers eight bird species, and of these species, two are known to occur away from desert riparian habitats: the phainopepla (*Phainopepla nitens*) can occur in desert washes with mesquite (*Prosopis* spp.) or catclaw acacia (*Senegalia greggii*), and the American peregrine falcon (*Falco peregrinus anatum*) can be found in almost any type of habitat (Clark County 2000). The remainder of the avian species covered by the MSHCP are typically only found within or immediately adjacent to desert riparian habitat. In addition to the eight covered species, several evaluation species could be found in desert upland habitats, such as those found at the BCCE.

## 1.1 Description of the Project

Collection of species abundance and distribution data is critical to monitoring and conservation management efforts for the MSHCP covered species. Prior to making any management decisions or planning potential restoration efforts, the DCP, which administers the MSHCP, solicited proposals to conduct avian point-count surveys within the BCCE. In 2018, SWCA Environmental Consultants (SWCA) was selected to conduct avian point-counts at 40 randomly selected locations across the BCCE (Figure 1). These surveys will establish baseline presence/absence and relative abundance of all bird species at the BCCE, including any MSHCP covered and evaluation species.

## 1.2 Background and Need

On November 2, 2000, the U.S. Fish and Wildlife Service (USFWS) issued an incidental take permit for the Clark County MSHCP (USFWS 2001). Subsequently, on November 19, 2000, the USFWS issued the *Intra-Service Biological and Conference Opinion on Issuance of an Incidental Take Permit to Clark County, Nevada, for a Multiple Species Habitat Conservation Plan* (Biological and Conference Opinion) (USFWS 2000). According to both the Biological and Conference Opinion and Condition P of the associated incidental take permit, the DCP was required to take measures necessary to ensure maintenance of connectivity for desert tortoise and other covered species within the BCCE. While the target species in managing the BCCE is desert tortoise, it was recognized that proper management of desert tortoise habitat could also be beneficial in protecting avian species covered by the MSHCP that use the same habitat.

## 1.3 Management Actions, Goals, and Objectives

The DCP's BCCE Management Plan (Clark County 2015) identifies goals and objectives that help guide management directives within the BCCE. The second goal listed in this plan is to "Protect and manage the BCCE for other MSHCP covered species" (Clark County 2015:33).

The first step in managing any wildlife species is to understand that species' presence and distribution within a given management unit. The long-term goal of this project is to track changes in presence and relative abundance of all bird species that use the BCCE, particularly those listed in the MSHCP, in order to measure the success of management efforts within the BCCE. The short-term objective in achieving that goal is to establish a baseline record of all breeding bird species present within the BCCE.

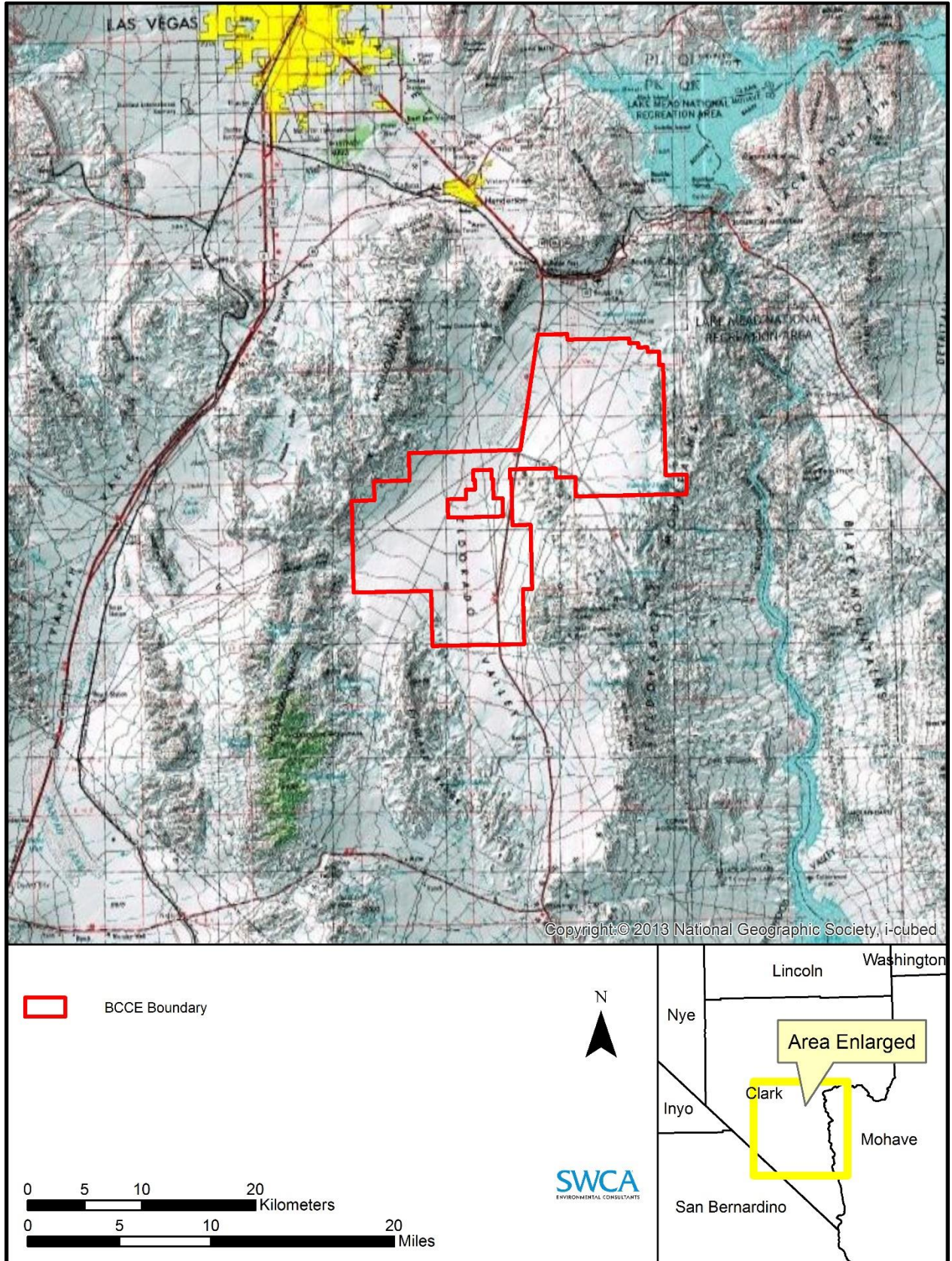


Figure 1. Project location.



## 2 METHODS AND MATERIALS

Surveys conducted for this study followed methods used during the 2017 Point-count Surveys on Riparian Properties project (SWCA 2017), which applied established point-count protocols and drew from methods described by the Great Basin Bird Observatory (GBBO) for its Habitat-based Monitoring Program for Breeding Birds of Nevada (GBBO 2003) and the *Handbook of Field Methods for Monitoring Landbirds* (Ralph et al. 1993).

In 2018, the DCP randomly selected 40 survey locations for point-count surveys in the BCCE (Figure 2). Prior to the commencement of surveys, SWCA avian biologist Mike Swink conducted a site reconnaissance to familiarize himself with the BCCE, identify any potential impediments to access, and flag survey and parking locations. During the reconnaissance, Mr. Swink navigated to each survey point using a handheld GPS unit capable of 5-meter (m) accuracy. Each parking location and survey point was marked with flagging so that it could be easily located on subsequent visits. All flagging was removed at the end of the survey period. The biologist was able to access all 40 survey points provided by the DCP without impediment but suggested moving several survey locations to better sample a wider variety of habitats within the BCCE.

Each biologist followed standard unlimited-radius point-count procedures, with surveys starting at sunrise and concluding by 10:00 a.m. (GBBO 2003; Ralph et al. 1993). Consecutive surveys at a given point were separated by a minimum of 7 days. Each biologist used the most logical order to complete surveys at each study location within the designated survey window. The order and location at which the first point-counts were completed were alternated such that a given point was not visited at the same time of day for all three rounds of survey.

For each survey, the biologist approached each point quietly to avoid overly disturbing any birds present. Prior to the commencement of each point-count, the biologist recorded weather data, including cloud cover, wind speed and direction, temperature, and precipitation, on a standardized form (Appendix A). No surveys were conducted when wind speeds exceeded 25 miles per hour (40 kilometers per hour) or during periods of heavy rain, as both conditions would have precluded the comprehensive inventory of the survey area (GBBO 2003). The 10-minute observation period was broken into four intervals (0–3, 3–5, 5–8, and 8–10 minutes), and the time interval in which the first detection of a given bird was made was recorded. Each biologist recorded species code, interval of detection, sex, age, estimated distance from the observer, bearing to the bird, and behavior of the bird as it pertained to its breeding status (see Appendix A). Any bird that flushed as the surveyor approached the point-count location but that was not detected during the survey was recorded as observed during the 0- to 3-minute interval and in the location from where it flushed. All detections were recorded on hardcopy data sheets, and bird locations were plotted on a standard point-count map (with their associated behavior codes) to help avoid double-counting individuals within a survey location. Any bird that gave an unknown vocalization was tracked following the survey to determine its identity (Ralph et al. 1993).

## 3 RESULTS AND EVIDENCE OF THE RESULTS

### 3.1 Objectives Completed

The sole objective for this project was to establish a baseline record of all bird species present at the BCCE that could be used to compare with future data sets to measure the success of management efforts within the BCCE; those baseline data are presented here.

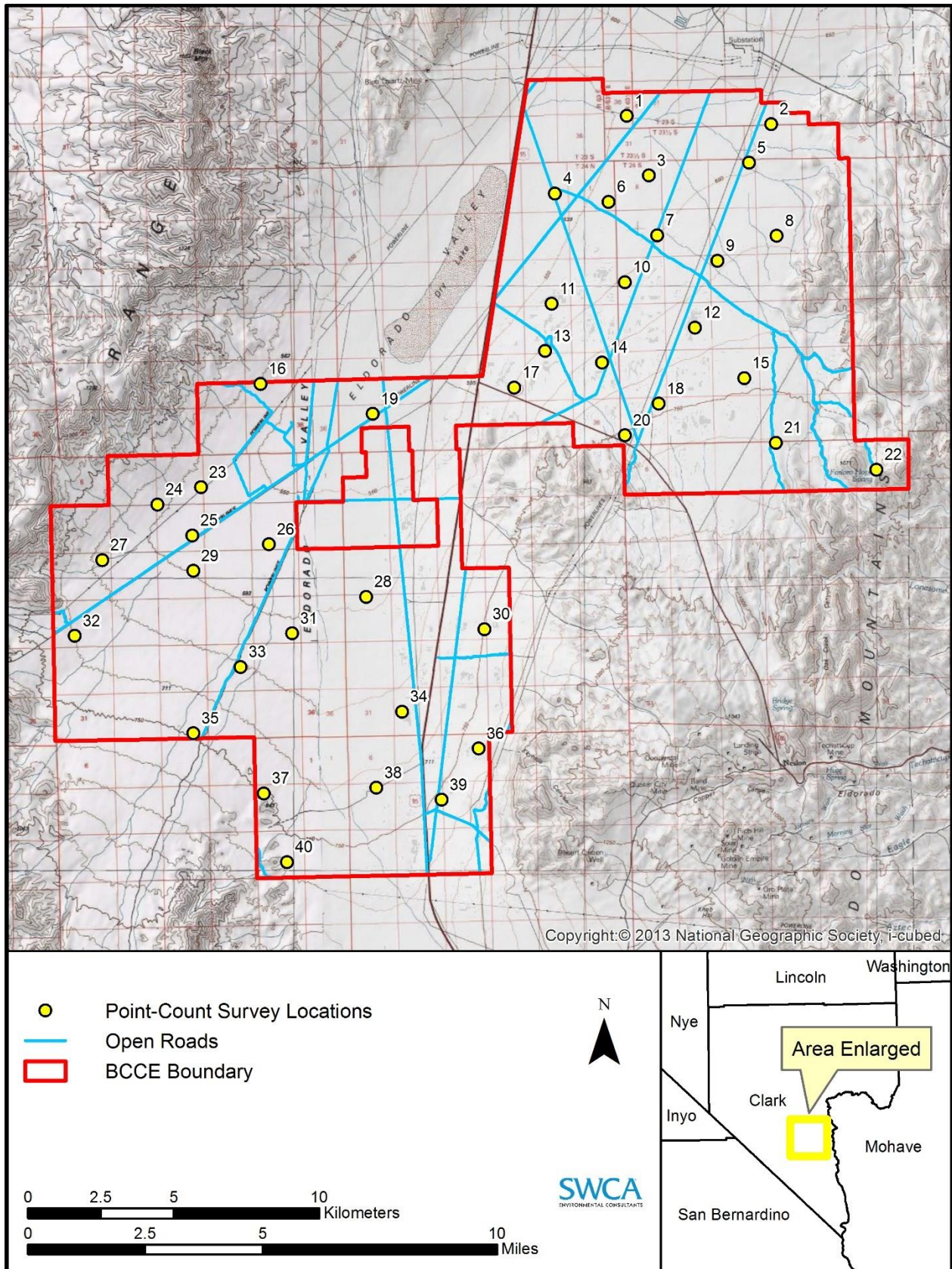


Figure 2. Point-count locations within the BCCE, 2018.

## 3.2 Survey Effort

The three rounds of point-count surveys were completed by SWCA avian ecologists Justin Streit, Mike Swink, and Chad Wilhite between May 15 and June 14, 2018 (Table 1). Each round of point-counts at the BCCE required five survey mornings. Weather conditions were favorable during all three survey rounds, with no precipitation and wind speeds ranging from 0 to 14.3 miles per hour (0–23.0 kilometers per hour).

**Table 1. Survey Dates for Point-Count Surveys**

Survey Round	Dates
First	May 15–19, 2018
Second	May 29–June 2, 2018
Third	June 11–14, 2018

## 3.3 Findings

### 3.3.1 MSHCP-listed Species

Of the eight MSHCP covered bird species, none were recorded during the 2018 point-count surveys; however, biologists recorded two evaluation bird species: loggerhead shrike (*Lanius ludovicianus*) was recorded at five point-count locations (Figure 3), and the LeConte’s thrasher (*Toxostoma lecontei*) was recorded at nine point-count locations (Figure 4). Evaluation species are those species for which future viability is a concern and that may be addressed in subsequent phases or amendments to the MSHCP. Table 2 details the general abundance of the two MSHCP evaluation species recorded during point-count surveys in the BCCE in 2018. These data are presented as total detections and detections within 100 m of the observer in order to compare species with different detection probabilities and reduce bias towards species that are more conspicuous as greater distances (e.g., LeConte’s thrasher) (GBBO 2003; Ralph et al. 1995). Breeding was confirmed for the loggerhead shrike (two adults observed carrying food) and suspected for the LeConte’s thrasher (individuals were heard singing in appropriate habitat during the breeding season).

**Table 2. Number of Detections and Breeding Codes for MSHCP Species Recorded at the BCCE during 2018 Point-Count Surveys**

Common Name	Scientific Name	Total Detections	Detections within 100 m	Breeding Codes*
Loggerhead shrike	<i>Lanius ludovicianus</i>	7	2	CO
LeConte’s thrasher	<i>Toxostoma lecontei</i>	11	1	PO

\* CO = Breeding confirmed – adults carrying food; PO = breeding possible – individual singing in appropriate habitat during the breeding season.

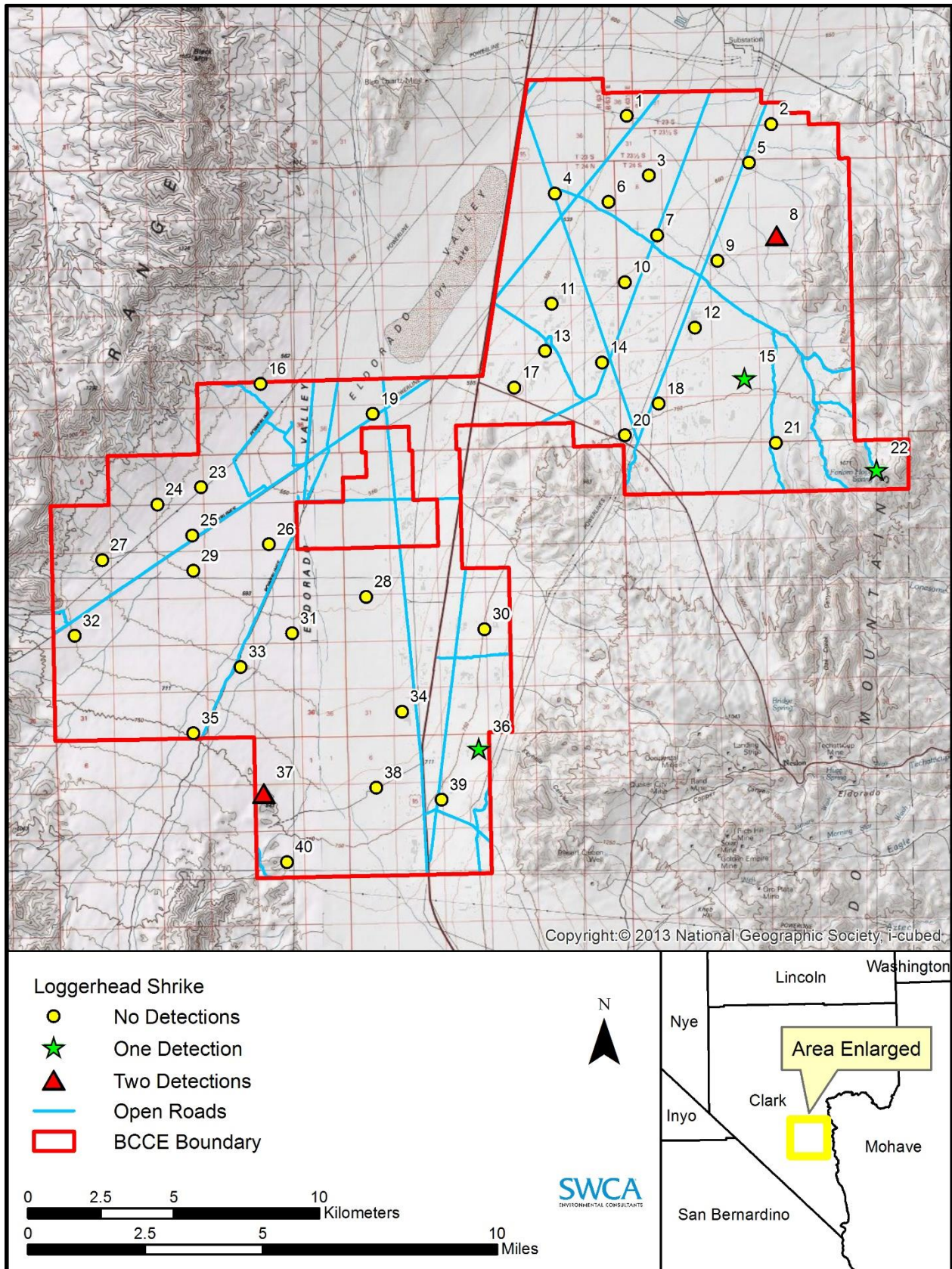


Figure 3. Loggerhead shrike detections at the BCCE, 2018.

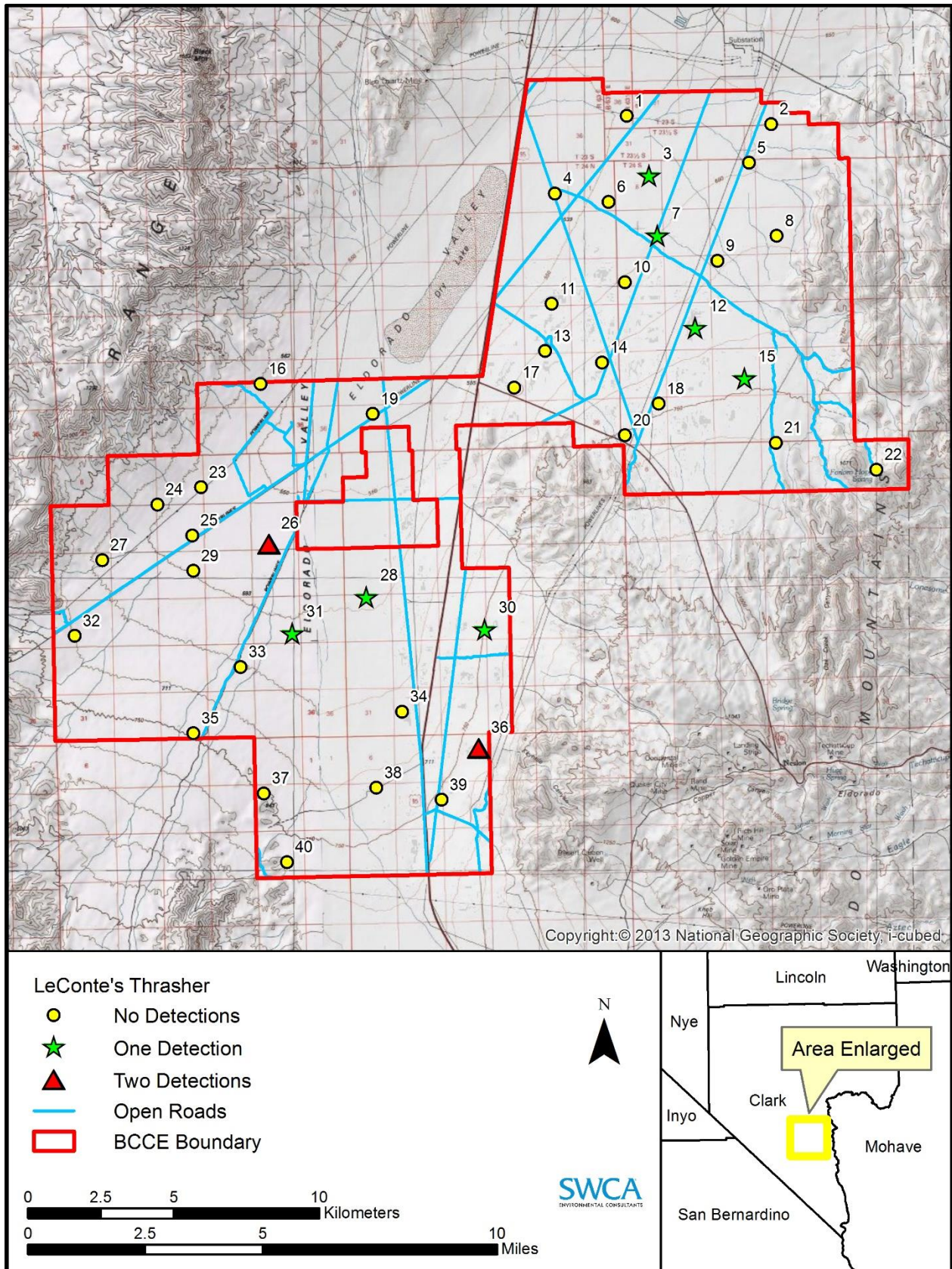


Figure 4. LeConte's thrasher detections at the BCCE, 2018.

### 3.3.2 Non-MSHCP-listed Species

SWCA biologists recorded 21 avian species not listed under the MSHCP across the BCCE point-count locations over all three rounds of 2018 point-count surveys (Table 3). Of these 21 species, 17 were recorded within 100 m of a point-count location. As in Table 2, data presented in Table 3 include all detections, as well as birds detected within 100 m of a point-count location, to standardize the data and account for bias towards birds that can be detected at greater distances than others (e.g., common raven [*Corvus corax*], turkey vulture [*Cathartes aura*]). The three most commonly detected species at the BCCE in terms of total detections, as well as detections within 100 m, were horned lark (*Eremophila alpestris*), black-throated sparrow (*Amphispiza bilineata*), and black-tailed gnatcatcher (*Polioptila melanura*) (see Table 3).

**Table 3. Number of Detections and Breeding Codes for Non-MSHCP-listed Species Recorded at the BCCE during 2018 Point-Count Surveys**

Common Name	Scientific Name	Total Detections	Detections within 100 m	Breeding Codes*
Black-throated sparrow	<i>Amphispiza bilineata</i>	54	30	PO
Black-chinned hummingbird	<i>Archilochus alexandri</i>	1	1	-
Verdin	<i>Auriparus flaviceps</i>	3	3	PO
Great horned owl	<i>Bubo virginianus</i>	1	1	-
Red-tailed hawk	<i>Buteo jamaicensis</i>	10	-	CO
Cactus wren	<i>Campylorhynchus brunneicapillus</i>	4	1	PO
Wilson's warbler	<i>Cardellina pusilla</i>	4	4	-
Turkey vulture	<i>Cathartes aura</i>	2	-	-
Lesser nighthawk	<i>Chordeiles acutipennis</i>	7	6	PO
Common raven	<i>Corvus corax</i>	20	1	CO
Horned lark	<i>Eremophila alpestris</i>	87	55	CO
Greater roadrunner	<i>Geococcyx californianus</i>	1	-	-
House finch	<i>Haemorhous mexicanus</i>	5	5	-
Barn swallow	<i>Hirundo rustica</i>	2	2	-
Scott's oriole	<i>Icterus parisorum</i>	2	2	CO
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>	8	2	PO
Western tanager	<i>Piranga ludoviciana</i>	1	1	-
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>	1	1	PO
Black-tailed gnatcatcher	<i>Polioptila melanura</i>	27	23	CO
Tree swallow	<i>Tachycineta bicolor</i>	1	-	-
Western kingbird	<i>Tyrannus verticalis</i>	2	1	-

\* CO = Breeding confirmed – recently fledged young, adults copulating, or adult(s) observed carrying food; PO = breeding possible – individual(s) singing or performing a territorial display in appropriate habitat during the breeding season.

While several of the species identified in Table 3 were likely migrating through the area on their way to breeding grounds farther north or at higher elevations (e.g., western tanager [*Piranga ludoviciana*] and Wilson's warbler [*Cardellina pusilla*]), most of these species are known to breed in the Mojave Desert and may have bred or attempted to breed within the BCCE boundary in 2018. In particular, black-throated

sparrows were never confirmed to be breeding within the BCCE during the 2018 point-count surveys; however, this species is one of the most common breeders in the Mojave Desert, and it undoubtedly breeds within the BCCE boundary.

Evidence of breeding was recorded for five species not covered under the MSHCP: horned lark (recently fledged young), black-tailed gnatcatcher (recently fledged young), common raven (recently fledged young and adult carrying food), red-tailed hawk (*Buteo jamaicensis*) (recently fledged young), and Scott's oriole (*Icterus parisorum*) (adults copulating). Additionally, six other species were recorded singing or performing territorial displays, which indicates that breeding for that species was possible (though some species may do either during migration). Note that a species without a breeding code does not indicate that the species did not breed within the BCCE, but that no evidence of such was recorded.

## 4 EVALUATION/DISCUSSION OF RESULTS

The methods developed for this project provide a baseline breeding bird data set for the BCCE. Point-count surveys recorded a total of 23 species across the BCCE, including two MSHCP evaluation species. A secondary goal of the BCCE Management Plan (Clark County 2015) is to “Protect and manage the BCCE for other MSHCP covered species” (Clark County 2015:33). While there are no specific objectives identified in the BCCE Management Plan to achieve this goal, the first step in any wildlife management should be to understand the baseline conditions within the management area. This section includes a closer analysis of avian species presence and distribution for the BCCE.

Mojave Desert scrub is the dominant vegetation community across the Mojave Desert, and this community covers over 97% of the BCCE (Clark County 2015). Mojave Desert scrub is co-dominated by creosote bush (*Larrea tridentata*) and burrobush (*Ambrosia dumosa*). The majority of survey points were located within this vegetation community (Figure 5). Salt desert scrub covers 1.5% of the BCCE, and the mesquite/acacia community covers less than 1% of the BCCE (Clark County 2015). The remainder of the BCCE is composed of disturbed habitats; therefore, as a whole, the BCCE is largely undisturbed and comprises native desert vegetation. Several survey points were relocated to sample areas of dense cholla (*Cylindropuntia* spp.) or desert wash habitat (Figure 6).

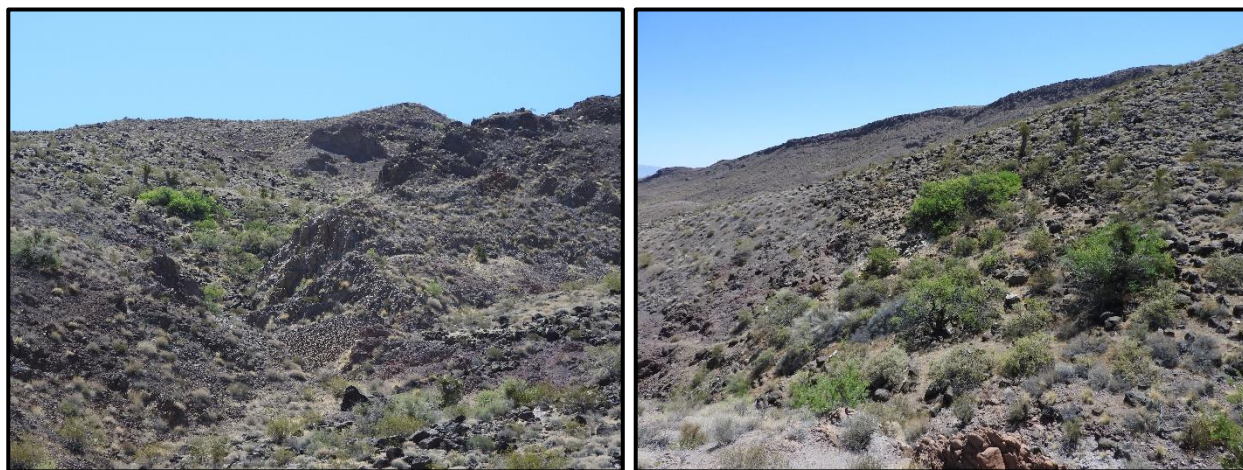


Figure 5. Mojave Desert scrub habitat at survey locations 17 (left) and 39 (right).



**Figure 6. Dense cholla and desert wash habitats at survey locations 32 (left) and 37 (right).**

The BCCE Management Plan identified that no MSHCP covered avian species are known to occur within the BCCE (Clark County 2015). During the 2018 point-count surveys, biologists did not observe any habitat that could be considered suitable for breeding MSHCP covered avian species. Six of the MSHCP covered bird species require desert riparian habitat or habitats that generally occur immediately adjacent to desert riparian habitat (Clark County 2000), and those habitats are completely absent within the BCCE. A small spring, Forlorn Hope Spring, is located near point-count location 22 (see Figure 2), but the habitat at the spring consists mostly of catclaw acacia and lacks species typical of desert riparian habitat, such as willow (*Salix* spp.) and cottonwood (*Populus* spp.) (Figure 7). Point-count surveys did not yield any of the eight MSHCP covered species, including phainopepla and Arizona Bell's vireo (*Vireo bellii arizonae*), which were identified as occurring in areas adjacent to the BCCE (Clark County 2015). Mesquite/acacia habitat is present along ephemeral washes within the BCCE, but that habitat does not appear to provide much, if any, of the mistletoe (*Phoradendron* spp.) that is generally required within phainopepla breeding habitat.



**Figure 7. Catclaw acacia habitat at Forlorn Hope Spring, survey location 22.**



## 4.1 MSHCP-listed Species

Both LeConte's thrasher and loggerhead shrike are known to occur within the BCCE (Clark County 2015), and the point-count surveys in 2018 confirmed their presence. Because these species both generally occur in Mojave Desert scrub (Floyd et al. 2007), their presence is unsurprising. Both species were recorded multiple times and from multiple locations (see Figures 3 and 4).

Loggerhead shrikes were confirmed breeding in the BCCE in 2018, as adults were observed carrying food during point-count surveys. All records of loggerhead shrike within the BCCE came from areas where taller vegetation was present, such as catclaw acacia or Mojave yucca (*Yucca schidigera*) (Figure 8), presumably because these species provide perching opportunities for loggerhead shrike.

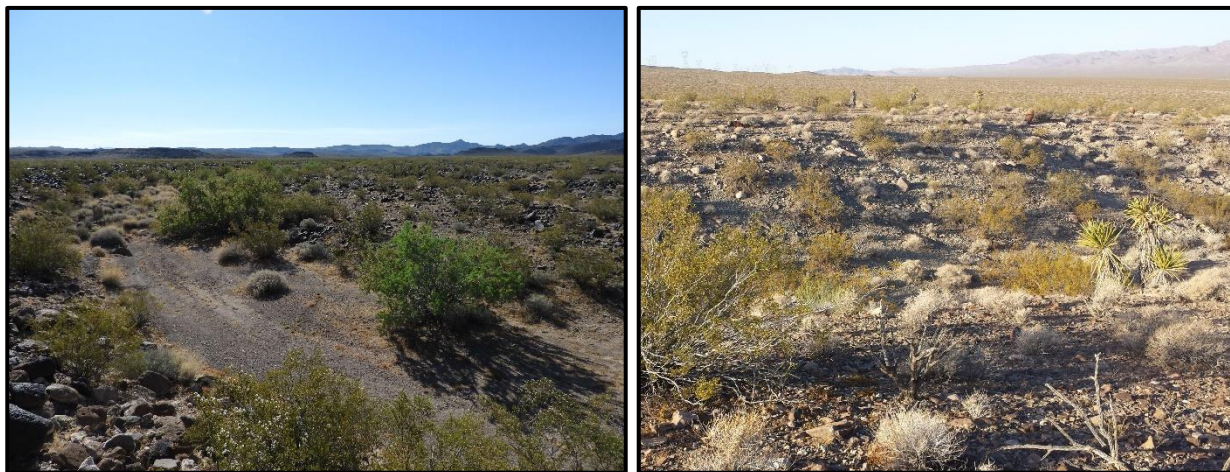


Figure 8. Catclaw acacia and Mojave yucca at survey locations 8 (left) and 36 (right).

While LeConte's thrashers were not confirmed to be breeding in the BCCE in 2018, males were heard singing within suitable breeding habitat during point-count surveys, so it is presumed that the species is likely breeding within the boundary of the BCCE. This species was recorded at survey locations that would all be classified as Mojave Desert scrub, but at least three of the locations at which LeConte's thrashers were detected showed very sandy soils (Figure 9), which is thought to be a key habitat parameter for the species (Floyd et al. 2007).



Figure 9. Sandy soils observed at survey locations 26 (left) and 28 (right).

## 5 CONCLUSIONS

Twenty-three avian species, including two MSHCP evaluation bird species, were recorded during surveys at the BCCE in 2018. Notable conclusions from the 2018 point-count surveys are as follows:

- The most commonly detected species at the BCCE in 2018 were horned lark, black-throated sparrow, and black-tailed gnatcatcher. These species are all common and ubiquitous across the Mojave Desert.
- LeConte's thrashers were recorded from nine different survey locations in 2018, and the species' distribution is sporadic across the BCCE. While breeding was not confirmed for this species, it is presumed that it is likely breeding in the BCCE.
- Loggerhead shrikes were recorded from five different survey locations in 2018, and these detections generally occurred at the higher elevations within the BCCE. Breeding for this species was confirmed at the BCCE in 2018.
- Breeding habitat for the MSHCP covered bird species is currently absent within the BCCE. Habitat for phainopepla could be created or enhanced with the establishment of more mesquite/acacia habitat, as long as that habitat also includes mistletoe, a required food source for phainopepla.

Continued monitoring of avian populations throughout and following the management process is needed to document success of management efforts within the BCCE. Recommendations to achieve these objectives are detailed in the following section.

## 6 RECOMMENDATIONS

Based on observations from the 2018 point-count surveys and factors discussed in this report, there are a few recommendations that would support the DCP's long-term goals for the BCCE:

- Avian point-count surveys should be continued for subsequent years to help build on baseline data and to track changes in avian populations throughout the land management process. These surveys should use the protocols established for this project to ensure data are equal and comparable.
- Areas that currently provide nesting habitat for MSHCP evaluation bird species should not be disturbed during management efforts. These include areas of mesquite or catclaw acacia that provide perching habitat for loggerhead shrike.
- The DCP could plant honey mesquite (*Prosopis glandulosa*) or catclaw acacia in desert washes. This could provide more habitat for loggerhead shrike and phainopepla, if mistletoe infestation occurs as well.

## 7 LITERATURE CITED

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## **APPENDIX A**

### **Point-Count Survey Data Form**

Location: \_\_\_\_\_ Plot #/code \_\_\_\_\_

<b>Database entry:</b>
Name: _____
Date: _____

Date: \_\_\_\_\_ Observer: \_\_\_\_\_ Start Time: \_\_\_\_\_ End Time: \_\_\_\_\_

**Weather Data** (taken at the beginning survey: clock time = time weather taken)

Time	Clock Time	Cloud Cover (%)	Wind Speed (Km/h)	Wind Direction	Temp (C)	Precipitation
Start						

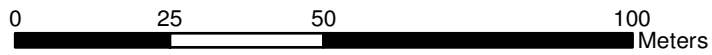
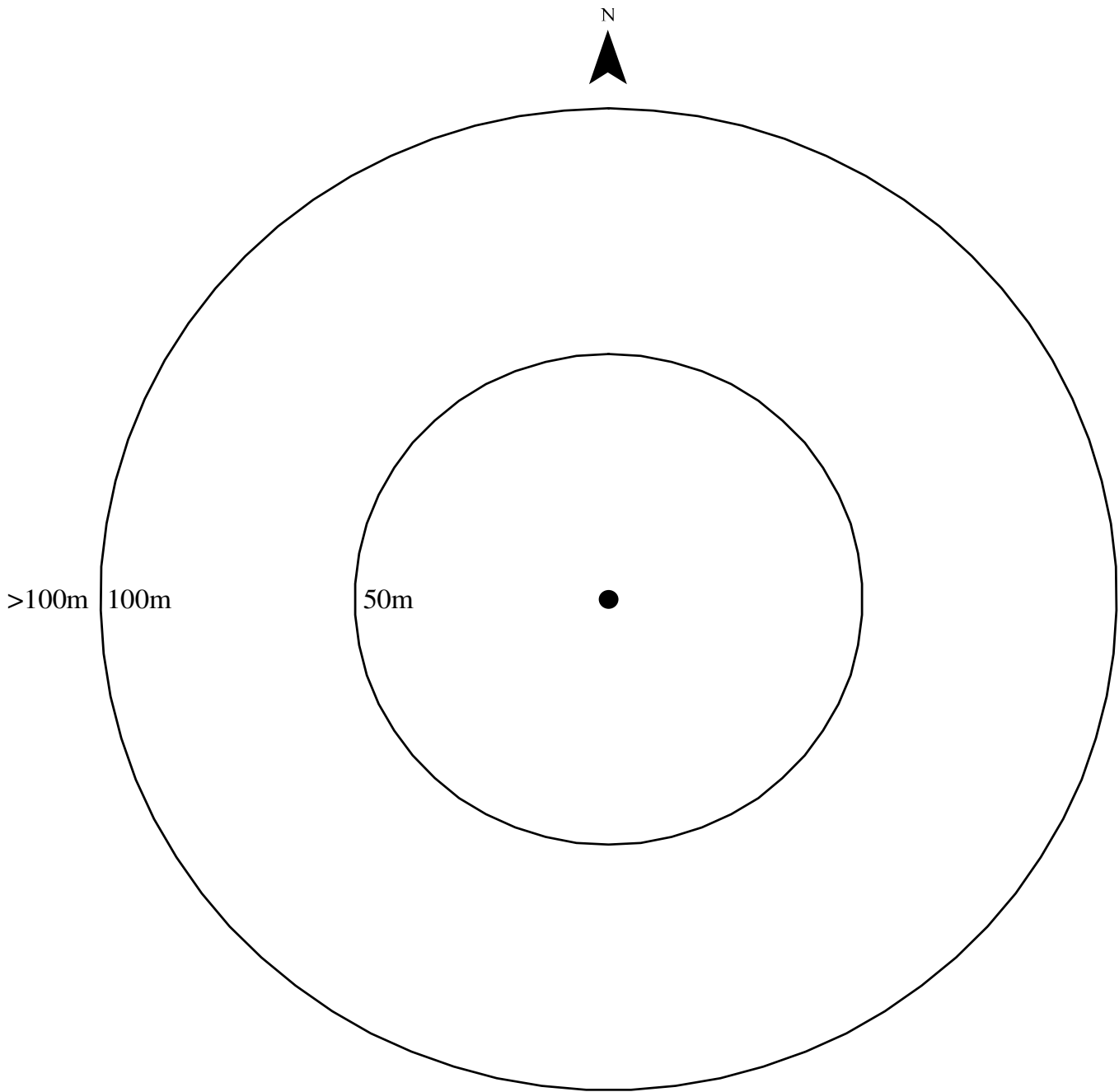
**Wind Direction:** E, ENE, NE etc.

**Precipitation Codes:** 0 = None 1 = Light Drizzle 2 = Rain 3 = Snow 4 = Fog

Time (0-3, 3-5, 5-8, 8-10)	Species Code	Sex	Age	# of birds	Distance† to Bird (m)	Bearing†† to Bird (°)	Breeding Behavior†††

†Distance when bird was first observed using Rangefinder    ††Bearing azimuth (0-360), when bird was first observed  
 †††Breeding Behavior: CA = Calling, CF = Carrying Food, CO = Copulating, FL = Fledgling, FS = Flushed, FY = Flyover,  
 NE = At Nest, NM = Nesting Material, OB = Observed Only, SI = Singing, TD = Territorial Display

**Additional Notes** (e.g., brief weather events, notable behavior, incidental observations, etc.) Rev: 04/27/17jjs



Total number of birds: \_\_\_\_\_

Breeding Behavior: CA = Calling, CF = Carrying Food,  
CO = Copulating, FL = Fledgling, FS = Flushed, FY = Flyover,  
NE = At Nest, NM = Nesting Material, OB = Observed Only,  
SI = Singing, TD = Territorial Display

Use arrows to indicate changes in position.