

**Western Riverside County  
Multiple Species Habitat Conservation Plan  
Biological Monitoring Program**

**2024 Grasshopper Sparrow Survey Report**



Grasshopper Sparrow survey site within the Potrero Unit of the San Jacinto Wildlife Area. Photo by Nicholas Peterson (California Department of Fish and Wildlife).

**June 2025**

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## **NOTE TO READER:**

This report is an account of survey activities conducted by the Biological Monitoring Program (BMP) for the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The MSHCP was permitted in June 2004. Reserve assembly is ongoing and is expected to take 20 or more years to complete. The Conservation Area includes lands acquired under the terms of the MSHCP and other lands that have conservation value (called Public/Quasi-Public Lands in the MSHCP) within the boundary of the MSHCP (Plan Area). In this report, the term “Conservation Area” refers to these lands as understood by the BMP at the time the surveys were conducted.

The BMP monitors the status and distribution of the 146 species covered by the MSHCP within the Conservation Area to provide information to Permittees, land managers, the public, and the Wildlife Agencies [i.e., the California Department of Fish and Wildlife (CDFW, formerly California Department of Fish and Game) and the U.S. Fish and Wildlife Service]. BMP activities are guided by defined conservation objectives for each Covered Species, other information needs identified in MSHCP Section 5.3 or elsewhere in the document (Dudek & Associates 2003), and the information needs of the Permittees. A list of the lands where data collection activities were conducted in 2024 is included in Section 8.0 (Appendix B, Table B-1) of the Western Riverside County Regional Conservation Authority (RCA) Annual Report to the Wildlife Agencies.

The primary author of this report was the 2024 Avian Program Lead, Nicholas Peterson. This report should be cited as: Biological Monitoring Program. 2025. Western Riverside County MSHCP Biological Monitoring Program 2024 Grasshopper Sparrow Survey Report. Prepared for the Western Riverside County Multiple Species Habitat Conservation Plan. Riverside, CA. Available online: <https://www.wrc-rca.org/species-surveys/>.

While we have made every effort to accurately represent our data and results, it should be recognized that data management and analysis are ongoing activities. Any reader wishing to make further use of the information or data provided in this report should contact the BMP to ensure that they have access to the best available or most current data.

Please contact the BMP Administrator with questions about the information provided in this report. Questions about the MSHCP should be directed to the Executive Director of the RCA. Further information on the MSHCP and the RCA can be found at [www.wrc-rca.org](http://www.wrc-rca.org).

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## INTRODUCTION

The Grasshopper Sparrow (*Ammodramus savannarum*) is one of 45 bird species covered by the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP; Dudek & Associates 2003) and is a Species of Special Concern in the State of California (Unitt 2008). The statewide population is considered greatly reduced (>40–80%) since population estimates were reported by Grinnell and Miller (1944), with a current estimate of 10,000–100,000 birds (Unitt 2008). The range size of Grasshopper Sparrows in California is slightly reduced (>10–20%; Unitt 2008) since the publication of Grinnell and Miller (1944). By 2028, habitat loss, habitat degradation, or other human-induced threats are projected to greatly reduce (>15–20%) the species' population in California (Unitt 2008).

The MSHCP identifies two species objectives for Grasshopper Sparrows. Objective 1 requires the conservation of at least 38,690 acres (15,657 hectares [ha]) of suitable non-native, valley, and foothill grassland habitats. Objective 2 is the monitoring objective and requires that the species maintain occupancy in three designated large (i.e.,  $\geq 809$  ha of grassland or grassland-dominated habitat) Core Areas and at least three (75%) of four designated smaller ( $\geq 202$  ha of grassland or grassland-dominated habitat) Core Areas in at least one year out of any five-consecutive-year period. The species account identifies 11 potential Core Areas, including Badlands, Box Springs, Kabian Park, Lake Mathews-Estelle Mountain, Lake Skinner/Diamond Valley Lake/Johnson Ranch, Mystic Lake/San Jacinto Wildlife Area (WA), Potrero, Prado Basin, Santa Rosa Plateau/Tenaja, Steele Peak, and Sycamore Canyon (Figure 1). The Badlands and Potrero are both part of the Plan Area's Core 3, so we combined them into a single Core Area for the purposes of this study. Five Core Areas contained at least 809 ha of grassland habitat in 2024 and were thus considered large, and these include Badlands/Potrero (combined), Lake Mathews-Estelle Mountain, Lake Skinner/Diamond Valley Lake/Johnson Ranch, Mystic Lake/San Jacinto WA, and Santa Rosa Plateau/Tenaja. Four additional Core Areas contained at least 202 ha, but less than 809 ha, of grassland habitat, and these include Box Springs, Kabian Park, Steele Peak, and Sycamore Canyon. Finally, one Core Area, Prado Basin, contained just 142 ha of grassland or grassland-dominated habitat within the Conservation Area, so does not technically qualify as a small Core Area; however, we surveyed habitat in this Core Area for Grasshopper Sparrows in 2024. Finally, Objective 2 also requires that five of seven designated Core Areas support at least 20 Grasshopper Sparrow pairs with evidence of successful reproduction within the first five years after permit issuance (Dudek & Associates 2003). This five-year period has already passed so nest searching and monitoring was not a component of our 2024 surveys.

The winter range of Grasshopper Sparrows in North America extends from portions of the southeastern U.S. south through much of Mexico. The species breeds in

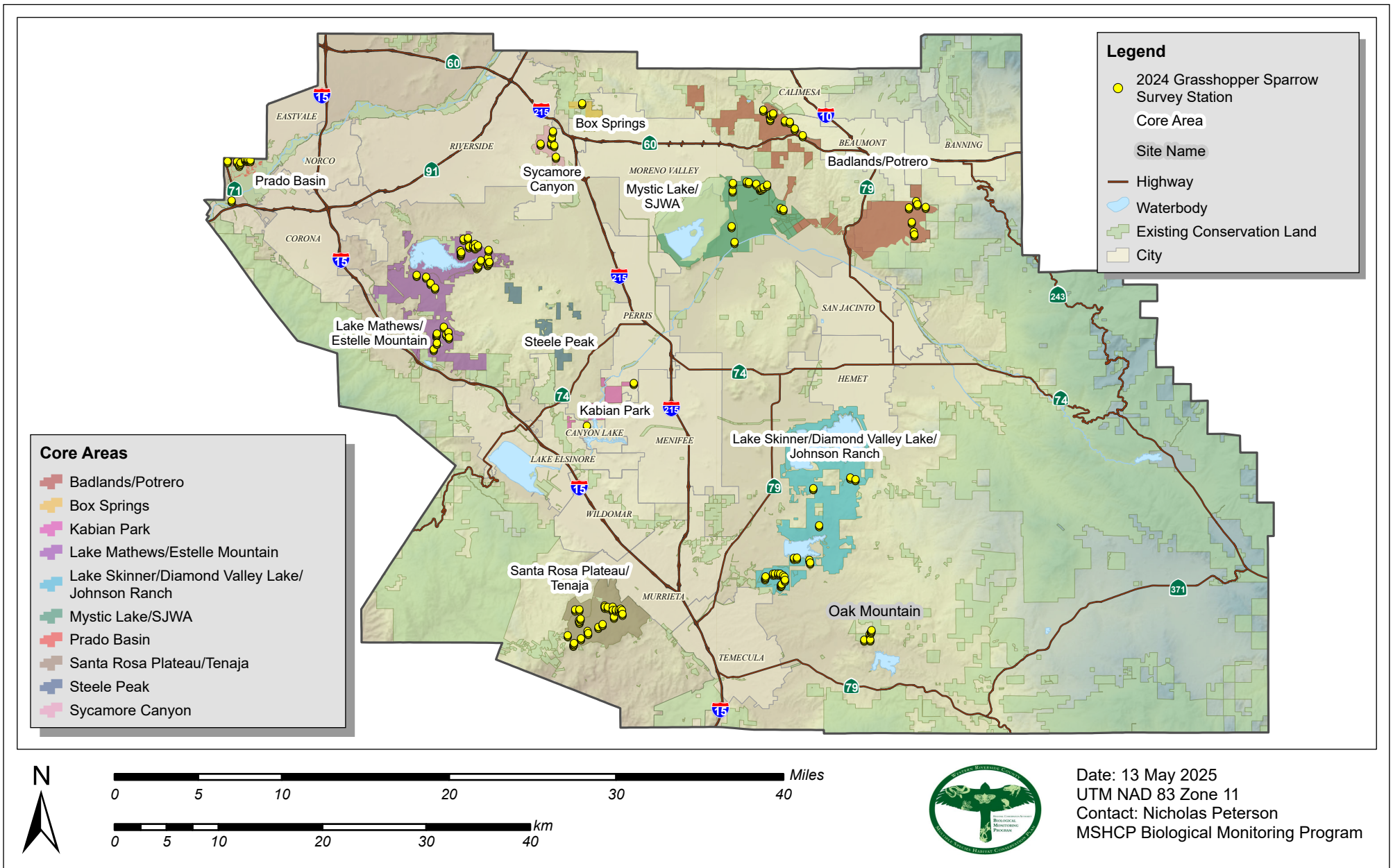


Figure 1. Grasshopper Sparrow Core Areas and 2024 survey sites.

southern New England west to Montana, and south into northern Texas, Arkansas, Tennessee, and North Carolina, with a patchy distribution west of the Rockies (Vickery 2020). Grasshopper Sparrows in California occur west of the Sierra Nevada and are primarily summer residents (McCaskie et al. 1979; Garrett and Dunn 1981), from Mendocino, Tehama, and Trinity counties in the north, to western Riverside and San Diego counties in the south (Grinnell and Miller 1944). Within western Riverside County, the species is found in suitable habitat within the Riverside Lowlands, San Jacinto Foothills, and Santa Ana Mountains Bioregions (Garrett and Dunn 1981), but predominantly within the central and south-central portions of the Plan Area (Dudek & Associates 2003).

Throughout their range, Grasshopper Sparrows occupy sites with moderately open grasslands containing patches of bare ground (Elliott and Johnson 2017; Vickery 2020). Such grasslands in southern California can consist of native or non-native grasses 12–23 centimeters (cm) tall (Jobin and Falardeau 2010; Bogard and Davis 2014) and may contain scattered shrubs that do not form contiguous thickets (Cooper 2000; Unitt 2008). The absence of trees at sites is also an important predictor of use by the species in southern California (Collier 1994). Grasshopper Sparrows prefer territories with at least 24% bare ground (Whitmore 1979) but rarely occupy sites with >35% bare ground (Bock and Webb 1984). Additionally, Grasshopper Sparrows may prefer flat sites with a northerly aspect (Gennet et al. 2017). Finally, Grasshopper Sparrows prefer a shallow layer of litter because it provides concealment of nests (Frey et al. 2008; Stauffer et al. 2011; Elliott and Johnson 2017; Kempema et al. 2023).

## **Survey Goals**

1. Document the distribution of Grasshopper Sparrows in the MSHCP-identified Core Areas.
  - a. Conduct repeat-visit point-transect surveys within accessible Grasshopper Sparrow foraging and nesting habitat in the Plan Area, recording all bird species observed.

## **METHODS**

### **Study Area**

We conducted this study within western Riverside County, California, from 18 March to 26 July 2024. Grasshopper Sparrow habitat that we surveyed within the MSHCP occurs in lowlands that have a Mediterranean climate. We used climate data collected from the Elsinore station during calendar years 2020–2024, and monthly summarized data during this time indicated mean daily maximum and minimum temperatures of 26.8 degrees Celsius (°C) and 10.9 °C, respectively. Mean annual precipitation during the same time period was 24.2 cm (National Weather Service 2025).

## Survey Design

We conducted surveys for Grasshopper Sparrows by making repeat visits to point transects (Herkert 1994; Best et al. 1997; Reynolds and Krausman 1998; Rahmig et al. 2009; George et al. 2013). We developed survey methods using techniques described in Rosenstock et al. (2002). The design we used allows for the calculation of transect-level detection probability ( $p$ ) and can also be used to evaluate correlations between covariates (MacKenzie et al. 2006).

We began study site selection by first selecting Grasshopper Sparrow habitats within our ArcGIS (ESRI 2006) vegetation layer (CDFG et al. 2005) that were identified by the MSHCP (Dudek & Associates 2003) as suitable for the species, namely non-native, valley, and foothill grasslands. We included agricultural land and low-density ( $\leq 25\%$  coverage) coastal sage scrub as well because we frequently detect Grasshopper Sparrows in or near these habitats. After we identified appropriate Grasshopper Sparrow habitat in GIS, we clipped that layer to a separate GIS layer consisting of conserved lands within the Grasshopper Sparrow Core Areas designated by the MSHCP. Next, we generated randomly-located survey points, separated by at least 100 meters (m), within the Core Areas. We ground-truthed each of these points to determine whether the habitat appeared suitable for use by Grasshopper Sparrows. If the habitat was suitable, we generated two more points, each of which was 100 m from the original point, in opposite directions (i.e., creating a point-transect consisting of three points). We chose a spacing of 100 m because it allowed us to place an adequate number of point-transects within smaller Core Areas to allow for data analysis if necessary. Finally, we oriented each point-transect in a north-south direction.

We ultimately generated enough survey points to create 115 point-transects, and we surveyed each point-transect up to four times in 2024. The number of visits to each point-transect was guided by our 2019 Grasshopper Sparrow survey results, which suggested four survey rounds would be optimal for future efforts (Biological Monitoring Program 2020). Further, we incorporated a removal sampling design for our 2024 surveys. This survey design means that we removed point-transects from our 2024 survey effort if we detected Grasshopper Sparrows along the point-transect. Doing this allowed us to use our time more efficiently by focusing on sites where we had not yet detected Grasshopper Sparrows rather than revisiting sites where we previously detected the species (MacKenzie et al. 2006). We selected point-transects from the ground-truthed sites discussed above and we distributed them among the Core Areas in a way that reflected the distribution of Grasshopper Sparrow habitat. We did not conduct any surveys within the Steele Peak Core Area due to a lack of Grasshopper Sparrow habitat within conservation, following our scouting of conditions at the site. Similarly, the Box Springs and Kabian Park Core Areas had just one and two transects, respectively, due to the paucity of Grasshopper Sparrow habitat (Figure 1).

## Field Methods

We conducted surveys during the first four hours following sunrise (Johnson and Sandercock 2010; McLaughlin et al. 2014) and we terminated surveys if the temperature exceeded 35 °C, during heavy precipitation or fog, or when maximum wind speeds exceeded 20 kilometers per hour (Earnst et al. 2009; Jobin and Falardeau 2010; Graves et al. 2010; George et al. 2013; Bogard and Davis 2014; Henderson and Davis 2014; McLaughlin et al. 2014).

Observers started their surveys at one endpoint of a point-transect, and each of the below procedures was repeated at all three points along the point-transect. When surveying a point-transect, observers recorded the start time, temperature, maximum and average wind speeds during a one-minute period, and sky conditions. Observers spent exactly five minutes at each of the three survey points, during which time they recorded information on their data sheet for all bird species detected. For non-covered species, observers recorded information for only the first individual of that species detected, which provided species richness data for the site. For such species, observers recorded the four-letter species code, age class information, and sex. For Covered Species, observers recorded the four-letter species code, age class, and sex for every individual detected while surveying from the point. If observers were unsure whether they had already recorded data on an individual (i.e., they were double-counting), they erred on the side of caution and recorded information on that individual. For each Grasshopper Sparrow detected, observers also recorded on their data sheet the distance to the bird. Observers measured distances using a laser rangefinder and distances were never estimated. If a laser rangefinder was unsuitable for measuring the distance, the observer walked to the location of the bird after the five-minute survey period and marked the location using a handheld GPS. We then calculated the distance in the office and recorded it on the data sheet. The survey protocol used in 2024 is described more completely at the *Western Riverside County MSHCP Biological Monitoring Program Grasshopper Sparrow Survey 2024 Protocol*, available from [https://wrc-rca.org/survey\\_protocols/](https://wrc-rca.org/survey_protocols/). Finally, we considered any Covered avian species detected outside of survey periods as incidental observations, as were all detections of Covered non-avian species, regardless of when those species were detected.

## RESULTS

### Detections of Grasshopper Sparrows

We detected 124 avian species during our 2024 survey, 20 of which are covered by the MSHCP (Appendix A). We detected Grasshopper Sparrows in four large Core Areas in 2024, and all five large Core Areas within the current monitoring period (2020–2024; Figure 2), thereby meeting the first requirement of Objective 2 for the species. We did not detect Grasshopper Sparrows within any of the small Core Areas in 2024, but we

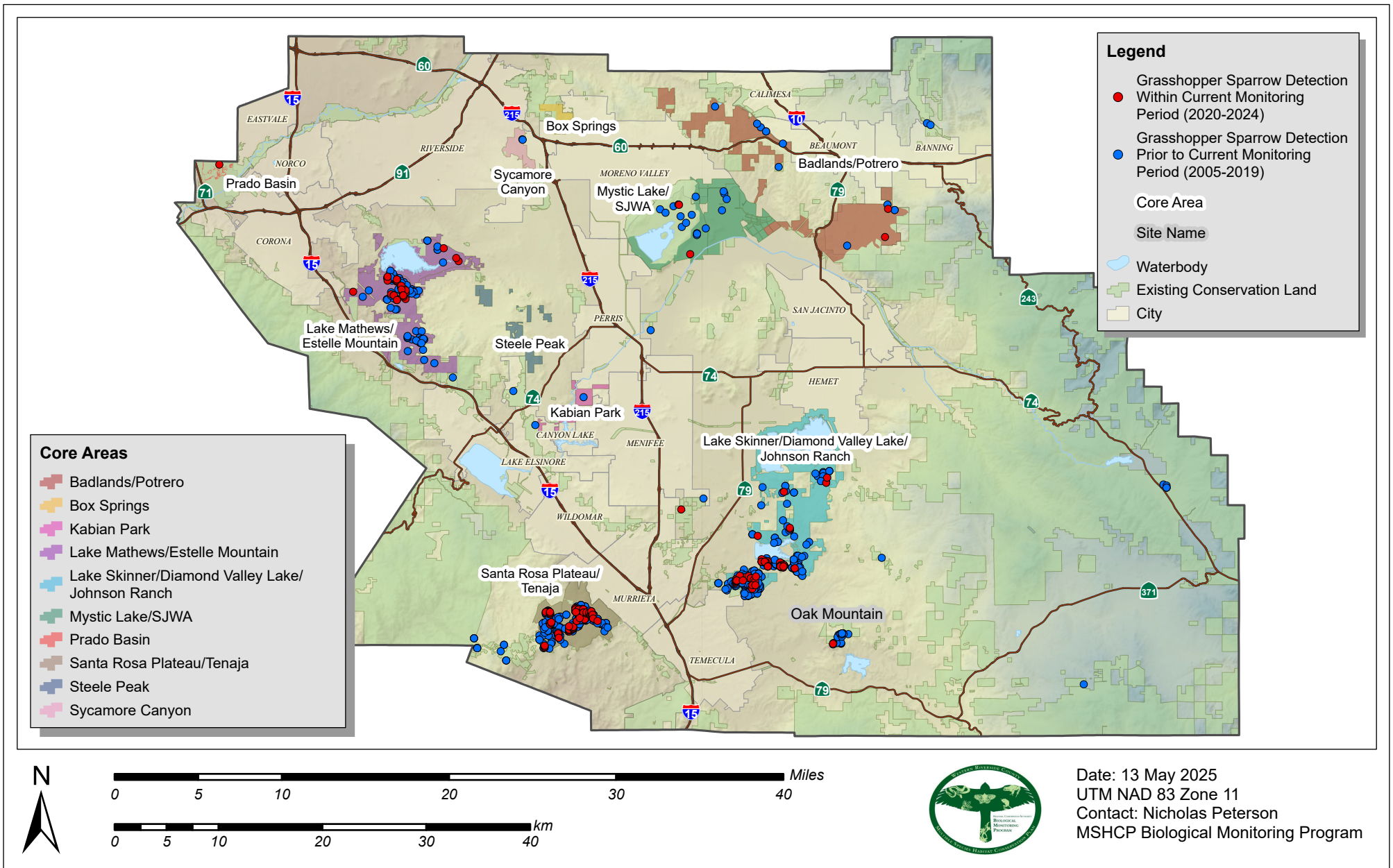


Figure 2. Grasshopper Sparrow Core Areas and detections from 2005-2024.

detected them incidentally within the Prado Basin Core Area in 2023. We did not detect them in any other small Core Areas during the current monitoring period (Figure 2), thereby failing to meet the second requirement of Objective 2 for the species (Table 1).

**Table 1.** The most recent detections of Grasshopper Sparrows on conserved land within each of the MSHCP-designated Core Areas.

Core Area	Year of most recent Grasshopper Sparrow detection
<b><i>Large Core Areas</i></b>	
Badlands/Potrero	2024
Lake Mathews-Estelle Mountain	2024
Lake Skinner/Diamond Valley Lake/Johnson Ranch	2024
Mystic Lake/San Jacinto Wildlife Area	2020
Santa Rosa Plateau/Tenaja	2024
<b><i>Small Core Areas</i></b>	
Box Springs	Never
Kabian Park	(2005)*
Prado Basin	2023
Steele Peak	Never
Sycamore Canyon	(2005)*

\* Parenthetical years precede the current monitoring period (2020–2024) and thus do not count toward meeting Objective 2.

We detected Grasshopper Sparrows along 46 (40%) of the 115 point-transects we surveyed in 2024. Two (4%) of these 46 point-transects were in the Badlands/Potrero Core Area, six (13%) were in the Lake Mathews-Estelle Mountain Core Area, 17 (37%) were in the Lake Skinner/Diamond Valley Lake/Johnson Ranch Core Area, and 21 (46%) were in the Santa Rosa Plateau/Tenaja Core Area. We did not detect Grasshopper Sparrows along transects within the Box Springs, Kabian Park, Prado Basin, or Sycamore Canyon Core Areas in 2024. As previously stated, we did not have any transects within the Steele Peak Core Area due to a lack of Grasshopper Sparrow habitat.

We detected Grasshopper Sparrows on conserved land 187 times within the current monitoring period (2020–2024). Thirty (16%) of these detections were within the Lake Mathews-Estelle Mountain Core Area, 69 (37%) were within the Lake Skinner/Diamond Valley Lake/Johnson Ranch Core Area, and 79 (42%) were within the Santa Rosa Plateau/Tenaja Core Area. Detections within these three Core Areas, then, collectively accounted for 95% of BMP detections of Grasshopper Sparrows from 2020–2024. Finally, the remaining nine (5%) detections were scattered throughout the Plan Area (Figure 2).

We conducted four survey rounds for Grasshopper Sparrows in 2024. The first round occurred from 18 March–22 May, during which time we surveyed 115 point-transects and detected Grasshopper Sparrows along 42 (37%). Round 2 occurred from 22 May–14 June and we surveyed 72 transects, detecting Grasshopper Sparrows along five

(7%). We did not survey the 42 transects in Round 2 along which we detected Grasshopper Sparrows in Round 1, due to our removal sampling design; additionally, we did not survey one transect because a prescribed burn had occurred and removed all Grasshopper Sparrow habitat. Round 3 occurred from 14 June–9 July, during which time we surveyed 67 transects and did not detect Grasshopper Sparrows along any. We did not survey the 47 transects along which we had previously detected Grasshopper Sparrows, and we did not survey the one transect within the prescribed burn footprint. Finally, Round 4 occurred 9–26 July and we surveyed the same 67 transects as in Round 3; similarly, we did not detect any Grasshopper Sparrows while surveying transects in Round 4.

## DISCUSSION

### Detections of Grasshopper Sparrows

The Lake Mathews-Estelle Mountain, Lake Skinner/Diamond Valley Lake/Johnson Ranch, and Santa Rosa Plateau/Tenaja Core Areas collectively accounted for the majority of Grasshopper Sparrow detections by BMP biologists during our 2015, 2019 (Biological Monitoring Program 2016, 2020), and 2024 surveys (Figure 2). Further, most of these detections occurred within the Santa Rosa Plateau/Tenaja Core Area, which has been identified as being the location in western Riverside County in which the species most consistently occurs. Lake Mathews and Lake Skinner are also identified as sites at which Grasshopper Sparrows occur, albeit irregularly, within western Riverside County (Unitt 2008).

We have detected Grasshopper Sparrows twice within the Badlands/Potrero Core Area during the current monitoring period, and both of these were within the Potrero Unit of the San Jacinto WA (Figure 2). Prior to the current monitoring period, we detected Grasshopper Sparrow 11 times within this Core Area, specifically within the Potrero Unit of the San Jacinto WA and in San Timoteo Canyon, south of San Timoteo Canyon Road. These two areas are generally the only sites within the Core Area that seem to have relatively large tracts of suitable Grasshopper Sparrow habitat, with the rest of the Core Area consisting of rugged and hilly terrain that is unsuitable for use by the species.

We have detected Grasshopper Sparrows 10 times within the Mystic Lake/San Jacinto WA Core Area, but only one of these detections occurred within the current monitoring period (Figure 2). Some of the conserved land within the Core Area has the potential to be suitable for the species because there are few trees and the terrain is gently sloping, but much of the area is managed for Stephens' kangaroo rat (*Dipodomys stephensi*), whose habitat preferences include open space and sparse vegetation cover (Price et al. 1994), which is not ideal for Grasshopper Species (Bock and Webb 1984). In addition, portions of the Core Area are managed for upland game species through

agricultural planting, which is not a habitat preferred by Grasshopper Sparrows (Vickery 2020).

Our biologists have detected Grasshopper Sparrows just twice in the Sycamore Canyon Core Area (Figure 2), despite conducting focused surveys here in 2005, 2015, 2019, and 2024 (Biological Monitoring Program 2006, 2016, 2020). Both of these detections occurred prior to the current monitoring period, on the same day in 2005, and were 53 m apart, perhaps representing the same individual bird. The northeastern part of the Core Area, where these detections occurred, periodically has tall and dense grasses, but much of the rest of the Core Area is sometimes heavily grazed by sheep, so the habitat is usually not suitable for Grasshopper Sparrows (Coppedge et al. 2008).

Similarly, we have detected Grasshopper Sparrows within the Kabian Park Core Area just once, in 2005 (Figure 2), despite conducting focused surveys in 2005, 2015, 2019, and 2024 (Biological Monitoring Program 2006, 2016, 2020). This Core Area has just 30 ha of conserved grassland habitat and this is scattered among small patches that average 1.6 ha (range = 0.02–7.6 ha) in size. Patches of this size are generally too small to support Grasshopper Sparrows, which generally require patches that are a minimum of 12–100 ha in size (Herkert 1994; Walk and Warner 1999; Vickery 2020).

We detected a Grasshopper Sparrow in the Prado Basin Core Area for the first time in 2023. The detection occurred in grassland habitat west of Raahauge's Shooting Range (Figure 2), which we identified in 2019 as being a site within the Core Area that has potential habitat for the species (Biological Monitoring Program 2020). The site has a southerly aspect, which is not usually preferred by the species (Gennet et al. 2017) and may explain why we have detected Grasshopper Sparrows just once since 2005.

We have never detected Grasshopper Sparrows within the Box Springs or Steele Peak Core Areas, as defined in 2024 (Figure 2). These Core Areas contain relatively small amounts of conserved grassland habitat (69 ha and 98 ha, respectively). Grassland habitat within these Core Areas is patchily distributed, and as previously discussed, the patches may not be large enough to be suitable for Grasshopper Sparrows (Herkert 1994; Walk and Warner 1999; Vickery 2020).

In addition to the MSHCP-designated Core Areas, we have detected Grasshopper Sparrows incidentally 28 times on conserved land in the Oak Mountain area north of Vail Lake (Figure 2) from 2005–2023. We surveyed the area for Grasshopper Sparrows in 2019 and 2024 but failed to detect the species during either survey effort. Despite our previous detections of Grasshopper Sparrows at the site, it may not be ideal for the species because of its southerly aspect (Gennet et al. 2017).

## Recommendations

### *Conservation and Management*

Prescribed burns, grazing, mowing, or some combination thereof are common management techniques at sites that contain Grasshopper Sparrows. Such methods should ideally occur early in the year to avoid decreasing Grasshopper Sparrow abundance or return rates (Ingold et al. 2010; Johnson and Sandercock 2010). Because Grasshopper Sparrows prefer a shallow litter layer for nest concealment (Frey et al. 2008; Stauffer et al. 2011), any management technique for the species should aim to retain this habitat feature as much as possible, especially during the breeding season. When the litter layer is removed, Grasshopper Sparrows tend to abandon the site. For example, Grasshopper Sparrows avoided burned plots in a southeastern Arizona study site for two years following prescribed burns, largely due to the loss of the litter layer (Bock and Bock 1992). Similarly, Grasshopper Sparrow abundance initially decreased following a wildfire in Washington, but subsequently increased in the third and fourth years following the fire (Earnst et al. 2009). These trends were also reported from a site in Texas, where the relative abundance of Grasshopper Sparrows decreased following a prescribed fire, but eventually increased as vegetation regrowth progressed (Reynolds and Krausman 1998).

Grazing and prescribed burns can be used by managers to create conditions that are preferred by Grasshopper Sparrows, but the suitability of each application may depend upon the site conditions. For example, western Grasshopper Sparrows tend to select sites with native bunchgrass (Earnst and Holmes 2012), which contains patches of bare ground preferred by the species. In these sites, light to moderate grazing may suffice because fire can create too much open space. Conversely, fires may be ideally suited for sites with dense grasses because they will create openings in the habitat for Grasshopper Sparrows (Earnst et al. 2009). Another benefit of light to moderate grazing is that it is comparable to entire sites being burned annually. The conditions created by such treatments are preferred by the species over the more extreme conditions created by patch-burn treatments in which litter and vegetation are allowed to accumulate before being completely removed by fire (Coppedge et al. 2008). Grazing and prescribed fire do not always benefit Grasshopper Sparrows in the same way, however. Grasshopper Sparrow abundance and density may be higher in grazed sites, whereas nest success tends to be highest in burned hayfields (Rahmig et al. 2009; Powell and Busby 2013). More investigation may be needed at the local scale to determine when to apply each treatment to Grasshopper Sparrow management and conservation.

Finally, any management technique for improving Grasshopper Sparrow habitat should seek to create a diverse grassland ecosystem that contains a patchwork of bare ground, litter, shrubs, and dense grasses and forbs. This patchwork may encourage use by adult Grasshopper Sparrows but may also be critically important for juvenile birds.

Dependent juvenile Grasshopper Sparrows tend to benefit from patches containing high levels of vegetative cover, in which they can hide from predators, whereas independent juveniles must feed themselves and thus benefit from areas that contain bare ground in which they can forage (Small et al. 2015).

## ACKNOWLEDGMENTS

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**Appendix A.** Avian species detected during 2024 Grasshopper Sparrow surveys. Species in bold are covered by the MSHCP.

COMMON NAME	SCIENTIFIC NAME
Acorn Woodpecker	<i>Melanerpes formicivorus</i>
Allen's Hummingbird	<i>Selasphorus sasin</i>
American Avocet	<i>Recurvirostra americana</i>
American Barn Owl	<i>Tyto furcata</i>
American Coot	<i>Fulica americana</i>
American Crow	<i>Corvus brachyrhynchos</i>
American Goldfinch	<i>Spinus tristis</i>
American Kestrel	<i>Falco sparverius</i>
American Pipit	<i>Anthus rubescens</i>
American Robin	<i>Turdus migratorius</i>
American White Pelican	<i>Pelecanus erythrorhynchos</i>
American Wigeon	<i>Mareca americana</i>
Anna's Hummingbird	<i>Calypte anna</i>
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>
Audubon's Warbler	<i>Setophaga coronata auduboni</i>
<b>Bald Eagle</b>	<b><i>Haliaeetus leucocephalus</i></b>
Barn Swallow	<i>Hirundo rustica</i>
<b>Bell's Sparrow</b>	<b><i>Artemisiospiza belli</i><sup>1</sup></b>
Bewick's Wren	<i>Thryomanes bewickii</i>
Black Phoebe	<i>Sayornis nigricans</i>
Black-chinned Sparrow	<i>Spizella atrogularis</i>
<b>Black-crowned Night Heron</b>	<b><i>Nycticorax nycticorax</i></b>
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>
Black-necked Stilt	<i>Himantopus himantopus</i>
Blue Grosbeak	<i>Passerina caerulea</i>
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>
Brewer's Sparrow	<i>Spizella breweri</i>
Brown-headed Cowbird	<i>Molothrus ater</i>
Bullock's Oriole	<i>Icterus bullockii</i>
Bushtit	<i>Psaltriparus minimus</i>
<b>California Horned Lark</b>	<b><i>Eremophila alpestris actia</i></b>
California Quail	<i>Callipepla californica</i>
California Scrub-Jay	<i>Aphelocoma californica</i>

<sup>1</sup> The MSHCP Covered Species name is Bell's Sage Sparrow, *Amphispiza belli belli*, as adopted.

**Appendix A. Continued.**

COMMON NAME	SCIENTIFIC NAME
California Thrasher	<i>Toxostoma redivivum</i>
California Towhee	<i>Melospiza crissalis</i>
Canada Goose	<i>Branta canadensis</i>
Canyon Wren	<i>Catherpes mexicanus</i>
Caspian Tern	<i>Hydroprogne caspia</i>
Cassin's Kingbird	<i>Tyrannus vociferans</i>
Cinnamon Teal	<i>Spatula cyanoptera</i>
Clark's Grebe	<i>Aechmophorus clarkii</i>
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>
<b>Coastal California Gnatcatcher</b>	<b><i>Polioptila californica californica</i></b>
Common Raven	<i>Corvus corax</i>
Common Yellowthroat	<i>Geothlypis trichas</i>
<b>Cooper's Hawk</b>	<b><i>Accipiter cooperii</i></b>
Costa's Hummingbird	<i>Calypte costae</i>
<b>Double-crested Cormorant</b>	<b><i>Nannopterum auritum</i><sup>2</sup></b>
Eared Grebe	<i>Podiceps nigricollis</i>
Eurasian Collared-Dove	<i>Streptopelia decaocto</i>
European Starling	<i>Sturnus vulgaris</i>
Gadwall	<i>Mareca strepera</i>
<b>Grasshopper Sparrow</b>	<b><i>Ammodramus savannarum</i></b>
<b>Great Blue Heron</b>	<b><i>Ardea herodias</i></b>
Great Egret	<i>Ardea alba</i>
Great Horned Owl	<i>Bubo virginianus</i>
Greater Roadrunner	<i>Geococcyx californianus</i>
Greater Yellowlegs	<i>Tringa melanoleuca</i>
Great-tailed Grackle	<i>Quiscalus mexicanus</i>
Hooded Oriole	<i>Icterus cucullatus</i>
House Finch	<i>Haemorhous mexicanus</i>
House Sparrow	<i>Passer domesticus</i>
Killdeer	<i>Charadrius vociferus</i>
Lark Sparrow	<i>Chondestes grammacus</i>
Lawrence's Goldfinch	<i>Spinus lawrencei</i>
Lazuli Bunting	<i>Passerina amoena</i>
<b>Least Bell's Vireo</b>	<b><i>Vireo bellii pusillus</i></b>

<sup>2</sup> The MSHCP Covered Species name is Double-crested Cormorant, *Phalacrocorax auritus*, as adopted.

**Appendix A. Continued.**

COMMON NAME	SCIENTIFIC NAME
Lesser Goldfinch	<i>Spinus psaltria</i>
<b>Lincoln's Sparrow</b>	<b><i>Melospiza lincolnii</i></b>
<b>Loggerhead Shrike</b>	<b><i>Lanius ludovicianus</i></b>
Mallard	<i>Anas platyrhynchos</i>
Marsh Wren	<i>Cistothorus palustris</i>
Mountain Chickadee	<i>Poecile gambeli</i>
Mourning Dove	<i>Zenaida macroura</i>
Northern Flicker	<i>Colaptes auratus</i>
<b>Northern Harrier</b>	<b><i>Circus hudsonius</i><sup>3</sup></b>
Northern House Wren	<i>Troglodytes aedon</i>
Northern Mockingbird	<i>Mimus polyglottos</i>
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>
Northern Shoveler	<i>Spatula clypeata</i>
Nuttall's Woodpecker	<i>Dryobates nuttallii</i>
Oak Titmouse	<i>Baeolophus inornatus</i>
Orange-crowned Warbler	<i>Leiothlypis celata</i>
Phainopepla	<i>Phainopepla nitens</i>
Pied-billed Grebe	<i>Podilymbus podiceps</i>
Red-shouldered Hawk	<i>Buteo lineatus</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Ring-necked Pheasant	<i>Phasianus colchicus</i>
Rock Pigeon	<i>Columba livia</i>
Rock Wren	<i>Salpinctes obsoletus</i>
Ruby-crowned Kinglet	<i>Corthylio calendula</i>
Ruddy Duck	<i>Oxyura jamaicensis</i>
Savannah Sparrow	<i>Passerculus sandwichensis</i>
Say's Phoebe	<i>Sayornis saya</i>
Scaly-breasted Munia	<i>Lonchura punctulata</i>
Snowy Egret	<i>Egretta thula</i>
Song Sparrow	<i>Melospiza melodia</i>
Sora	<i>Porzana carolina</i>
<b>Southern California Rufous-crowned Sparrow</b>	<b><i>Aimophila ruficeps canescens</i></b>
Spotted Sandpiper	<i>Actitis macularius</i>

<sup>3</sup> The MSHCP Covered Species name is Northern Harrier, *Circus cyaneus*, as adopted.

**Appendix A. Continued.**

COMMON NAME	SCIENTIFIC NAME
Spotted Towhee	<i>Pipilo maculatus</i>
<b>Tree Swallow</b>	<b><i>Tachycineta bicolor</i></b>
<b>Turkey Vulture</b>	<b><i>Cathartes aura</i></b>
Vesper Sparrow	<i>Pooecetes gramineus</i>
Violet-green Swallow	<i>Tachycineta thalassina</i>
Virginia Rail	<i>Rallus limicola</i>
Western Bluebird	<i>Sialia mexicana</i>
Western Flycatcher	<i>Empidonax difficilis</i>
Western Grebe	<i>Aechmophorus occidentalis</i>
Western Kingbird	<i>Tyrannus verticalis</i>
Western Meadowlark	<i>Sturnella neglecta</i>
Whimbrel	<i>Numenius phaeopus</i>
White-breasted Nuthatch	<i>Sitta carolinensis aculeata</i>
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
<b>White-faced Ibis</b>	<b><i>Plegadis chihi</i></b>
<b>White-tailed Kite</b>	<b><i>Elanus leucurus</i></b>
White-throated Swift	<i>Aeronautes saxatalis</i>
Wood Duck	<i>Aix sponsa</i>
Wrentit	<i>Chamaea fasciata</i>
<b>Yellow Warbler</b>	<b><i>Setophaga petechia</i><sup>4</sup></b>
<b>Yellow-breasted Chat</b>	<b><i>Icteria virens</i></b>
Yellow-rumped Warbler	<i>Setophaga coronata</i>

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<sup>4</sup> The MSHCP Covered Species name is Yellow Warbler, *Dendroica petechia brewsteri*, as adopted.