Final

# TARGETED MONITORING PLAN
# RESOURCE-SPECIFIC MONITORING

## 2019 Annual Report

Prepared for
Department of Parks and Recreation
County of San Diego
5500 Overland Avenue, Suite 410
San Diego, CA 92123
Contact: Ms. Jennifer Price

September 2019

Final

# TARGETED MONITORING PLAN
# RESOURCE-SPECIFIC MONITORING

## 2019 Annual Report

Prepared for
Department of Parks and Recreation
County of San Diego
5500 Overland Avenue, Suite 410
San Diego, CA 92123
Contact: Ms. Jennifer Price

September 2019

550 West C Street
Suite 750
San Diego, CA 92101
619.719.4200
esassoc.com

D170240.10

**OUR COMMITMENT TO SUSTAINABILITY** | ESA helps a variety of public and private sector clients plan and prepare for climate change and emerging regulations that limit GHG emissions. ESA is a registered assessor with the California Climate Action Registry, a Climate Leader, and founding reporter for the Climate Registry. ESA is also a corporate member of the U.S. Green Building Council and the Business Council on Climate Change (BC3). Internally, ESA has adopted a Sustainability Vision and Policy Statement and a plan to reduce waste and energy within our operations. This document was produced using recycled paper.

# TABLE OF CONTENTS

## Targeted Monitoring Plan


Page

Acronyms and Abbreviations ..... iii

**Chapter 1 Introduction ..... 1-1**
1.1 Purpose of the Project ..... 1-1
1.2 Multiple Species Conservation Program Context ..... 1-2

**Chapter 2 Study Area Description ..... 2-1**
2.1 Project Location ..... 2-1

**Chapter 3 Methods ..... 3-1**
3.1 Rare Plant Monitoring ..... 3-1
3.2 Variegated Dudleya Management ..... 3-3
3.3 Arroyo Toad ..... 3-4
3.4 Tricolored Blackbird ..... 3-4
3.5 Burrowing Owl ..... 3-5
3.6 Coastal Cactus Wren ..... 3-7
3.7 Stephens' Kangaroo Rat ..... 3-8
3.8 Vernal Pool/Alkali Playa ..... 3-10

**Chapter 4 Results and Discussion ..... 4-1**
4.1 Rare Plant Monitoring ..... 4-1
4.2 Arroyo Toad ..... 4-18
4.3 Tricolored Blackbird ..... 4-21
4.4 Burrowing Owl ..... 4-24
4.5 Coastal Cactus Wren ..... 4-26
4.6 Stephens' Kangaroo Rat ..... 4-34
4.7 Vernal Pool/Alkali Playa ..... 4-37
4.8 Volunteer Training Summary ..... 4-46

**Chapter 5 References ..... 5-1**

Page

## Appendices

A. Rare Plant Photo Monitoring
B. MSP Rare Plant Occurrence Monitoring Forms
C. Arroyo Toad Monitoring Representative Photos
D. Arroyo Toad Monitoring Data Sheets
E. Avian Habitat & Threats Assessment Forms
F. Burrowing Owl Monitoring Representative Photos
G. Coastal Cactus Wren Point Count Data Sheets
H. Coastal Cactus Wren Photo Monitoring
I. Stephens' Kangaroo Rat Monitoring Data Sheets
J. Stephens' Kangaroo Rat Monitoring Report
K. Aquatic Phase Qualitative Monitoring of Vernal Pools Memo
L. Vernal Pool Monitoring Data Sheets
M. Vernal Pool Invasive Non-Native Plant Management Photos

## List of Figures

1 Project Location ....2-3
2 San Diego Thornmint Monitoring Results ....4-5
3 Encinatas Baccharis Monitoring Results .... 4-10
4 San Miguel Savory Monitoring Results .... 4-12
5 Variegated Dudleya Monitoring Results .... 4-14
6 Willowy Monardella Monitoring Results .... 4-16
7 Arroyo Toad Monitoring Results .... 4-19
8 Tricolored Blackbird Monitoring Results4-23
9 Burrowing Owl Monitoring Results .... 4-25
10 Proposed Revisions to Burrowing Owl Monitoring Areas .... 4-30
11 Cactus Wren Monitoring Results .... 4-31
12 Cactus Wren Photo Monitoring and Restoration Areas .... 4-33
13 Stephens' Kangaroo Rat Monitoring Results .... 4-35
14 Vernal Pool Monitoring Results .... 4-38

## List of Tables

1 MSP Rare Plant Monitoring ....3-2
2 Burrowing Owl Survey Dates and Weather Conditions ....3-6
3 Coastal Cactus Wren Survey Dates and Weather Conditions ....3-8
4 SKR Survey Dates and Weather Conditions ....3-9
5 Vernal Pool/Alkali Playa Qualitative Monitoring Survey Dates and Weather Conditions .... 3-10
6 MSP 2019 Rare Plant Monitoring Summary Table ....4-2
7 Willowy Monardella Additional Monitoring Data .... 4-17
8 Cactus Wren Avian Point Count Survey Results .... 4-27
9 SKR Occupancy Results and Potential for Occupancy .... 4-34
10 SKR Habitat Assessment Summary .... 4-36
11 Qualitative Vernal Pool Monitoring Observations .... 4-40
12 Observed Vernal Pool Indicator and Invasive Non-Native Plant Species .... 4-42
13 Volunteer Training .... 4-46

## Acronyms and Abbreviations

| | |
|---|---|
| ASMD | area specific management objectives |
| Cal-IPC | California Invasive Plant Council |
| CDFG | California Department of Fish and Game (prior to 2013) |
| CDFW | California Department of Fish and Wildlife (2013 and on) |
| CNPS | California Native Plant Society |
| Collector | ArcGIS Collector |
| County | County of San Diego |
| DPR | Department of Parks and Recreation |
| ESA | Environmental Science Associates |
| FESA | federal Endangered Species Act |
| FMP | Framework Management Plan |
| GIS | Geographic Information System |
| GPS | Global Positioning System |
| HCP | Habitat Conservation Plan |
| MCAS | Marine Corps Air Station |
| MSCP | Multiple Species Conservation Plan |
| MSP | Management Strategic Plan |
| NCCP | Natural Community Conservation Plan |
| RMWD | Ramona Municipal Water District |
| SDMMP | San Diego Management and Monitoring Program |
| SKR | Stephens' kangaroo rat |
| SR | State Route |
| TMP | Targeted Monitoring Plan |
| USACE | U.S. Army Corps of Engineers |
| USFWS | U.S. Fish and Wildlife Service |

# CHAPTER 1
# Introduction

## 1.1 Purpose of the Project

As a participant in the Multiple Species Conservation Program (MSCP) and the adopted South County MSCP Subarea Plan, the County of San Diego (County) is obligated to conduct biological monitoring of habitats and species covered by the MSCP to ensure that the MSCP biological conservation goals and conditions for species coverage are being met. The County Department of Parks and Recreation (DPR) has prepared a Targeted Monitoring Plan (TMP) (ESA and ICF 2015) to provide detailed specifications for implementation of adaptive management and monitoring within County-owned and managed conserved lands (open space parks and preserves) overseen by DPR. The TMP is an adaptive implementation plan that includes focused goals and objectives for target resources and detailed monitoring protocols, and is intended to achieve the area specific management directives (ASMDs) for species per the adopted South County MSCP Framework Management Plan (FMP) (County of San Diego 1998). The regional framework that guides monitoring at the preserve level has been refined over time and is still evolving through a collaborative effort among U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW) (collectively known as the Wildlife Agencies), MSCP jurisdictions, and outside scientific experts. It is understood by all stakeholders (e.g., state and federal resource agencies, municipal and county agencies, land managers) that adaptive management is an iterative process in which lessons are learned and used to further refine priorities, goals, objectives, and monitoring methods.

Currently, the TMP addresses monitoring within the following 10 parks and preserves: Boulder Oaks Preserve, Del Dios Highlands Preserve, El Capitan Preserve, El Monte Regional Park, Lakeside Linkage Preserve, Lusardi Creek Preserve, Oakoasis Preserve, Ramona Grasslands Preserve, Stelzer Regional Park, and Sycamore Canyon/Goodan Ranch Preserve. Resource-specific monitoring for 2019 was conducted in six preserves identified in the TMP: Boulder Oaks Preserve, Del Dios Highlands Preserve, Lakeside Linkage Preserve, Lusardi Creek Preserve, Ramona Grasslands Preserve, and Sycamore Canyon/Goodan Ranch Preserve.

Monitoring was conducted for the following 11 MSCP-covered species and habitats in 2019:

- San Diego thornmint (Acanthomintha ilicifolia)
- Encinitas baccharis (*Baccharis vanessae*)
- San Miguel savory (*Clinopodium chandleri*)
- Variegated dudleya (*Dudleya variegata*)
- Willowy monardella (*Monardella viminea*)

- Tricolored blackbird (*Agelaius tricolor*)
- Burrowing owl (*Athene cunicularia*)
- Coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*)
- Arroyo toad (*Anaxyrus californica*)
- Stephens' kangaroo rat (*Dipodomys stephensi*)
- Vernal pool/alkali playa habitat

The goal of resource-specific monitoring is to collect high-quality data to inform trends in occurrences and populations, evaluate the current habitat conditions, assess threats, and provide adaptive management recommendations to ensure that the conservation goals of the MSCP are being met.

## 1.2 Multiple Species Conservation Program Context

The MSCP is a comprehensive habitat conservation planning document and one of several subregional habitat conservation programs in San Diego County that contribute to the preservation of regional biodiversity. Agencies participating in the MSCP include the County of San Diego, other local jurisdictions within San Diego County (e.g., City of San Diego, City of Chula Vista, etc.), USFWS, and CDFW. The County and other local jurisdictions implement the MSCP through subarea plans, which describe specific implementing mechanisms for the MSCP. The MSCP Plan and subarea plans serve as a multiple species Habitat Conservation Plan (HCP) pursuant to Section 10(a)(1)(B) of the federal Endangered Species Act (FESA) and a Natural Community Conservation Plan (NCCP) pursuant to the California NCCP Act of 1991 (amended in 2001), and the state Endangered Species Act.

The South County MSCP Subarea Plan was adopted in October 1997 and covers 23 vegetation communities and 85 species. The County is preparing the North County Subarea Plan (herein referred to as the North County MSCP) for the northwestern unincorporated areas of the County, and the East County Subarea Plan for the eastern unincorporated areas of the County.

Species-specific management and monitoring requirements for the MSCP are summarized in Table 3-5 of the MSCP Plan. In addition, the assurances and obligations to implement the South County MSCP Subarea Plan have been established in the Implementing Agreement (County of San Diego 1998), which was signed by the County, USFWS, and CDFW.

# CHAPTER 2
# Study Area Description

During the 2019 reporting period, Environmental Science Associates (ESA) performed resource-specific monitoring in the following six preserves identified in the TMP: Boulder Oaks Preserve, Del Dios Highlands Preserve, Lakeside Linkage Preserve, Lusardi Creek Preserve, Ramona Grasslands Preserve, and Sycamore Canyon/Goodan Ranch Preserve (**Figure 1**).

All of the parks and preserves, with the exception of Ramona Grasslands Preserve, are located within the South County MSCP and will be monitored and managed in accordance with the Implementing Agreement (County of San Diego 1998). Ramona Grasslands is located within the draft North County MSCP Plan area and is included at this time due to the number of on-site special-status resources and existing conservation easements and deed restrictions that require their conservation and management. Del Dios Highlands Preserve is located within the junction of both the North County MSCP Plan and the South County MSCP Plan regions; however, 2019 monitoring occurred in the South County MSCP Plan region. Several of the preserves (El Capitan, El Monte, Oakoasis, and Stelzer Regional Park) are clustered together; have similar topography, vegetation communities, and covered species; and are referred to collectively as the El Capitan Suite.

Additional preserves will be added to the TMP in 2019 to include all preserves in the MSCP and the draft North County MSCP Plan area that have finalized Resource Management Plans.

## 2.1 Project Location

A description of the location for the six preserves monitored in 2019 is provided below.

### *Boulder Oaks Preserve*

Boulder Oaks Preserve is an approximately 2,016-acre open space preserve comprising two contiguous parcels, Boulder Oaks North Preserve (747.8 acres) and Boulder Oaks South Preserve (1,268 acres). It is located south of the unincorporated township of Ramona, between State Route (SR) 67 and Mussey Grade Road, in central San Diego County. It is located just north of the Santa Vicente Reservoir, extending east from Iron Mountain and north of Fosters Canyon, and is bisected by Foster Truck Trail.

### *Del Dios Highlands Preserve*

Del Dios Highlands Preserve is an approximately 781.8-acre open space preserve located southwest of the city of Escondido, west of Del Dios Highway, and northwest of Lake Hodges, within an unincorporated area of San Diego County. It is located at 9860 Del Dios Highway,

Escondido, adjacent to Lake Hodges, within the coastal foothills of the Peninsular Ranges of Southern California.

### *Lakeside Linkage Preserve*

Lakeside Linkage Preserve is an approximately 134-acre open space preserve composed of three noncontiguous properties: (1) western property, 46 acres located west of Los Coches Road between Calle Lucia Terrace on the south and a private drive south of Rock Crest Lane on the north; (2) central property, 77 acres located east of Los Coches Road between Ha Hana Road on the south and extending slightly north of Casa Vista Road on the north; and (3) eastern property, 11 acres located approximately one block northwest of the junction of Lakeview and East Lakeview Roads. It is located along both sides of Los Coches Road between SR 67 and Interstate 8 within Lakeside, Lakeview, and Winter Gardens, which are unincorporated communities of San Diego County.

### *Lusardi Creek Preserve*

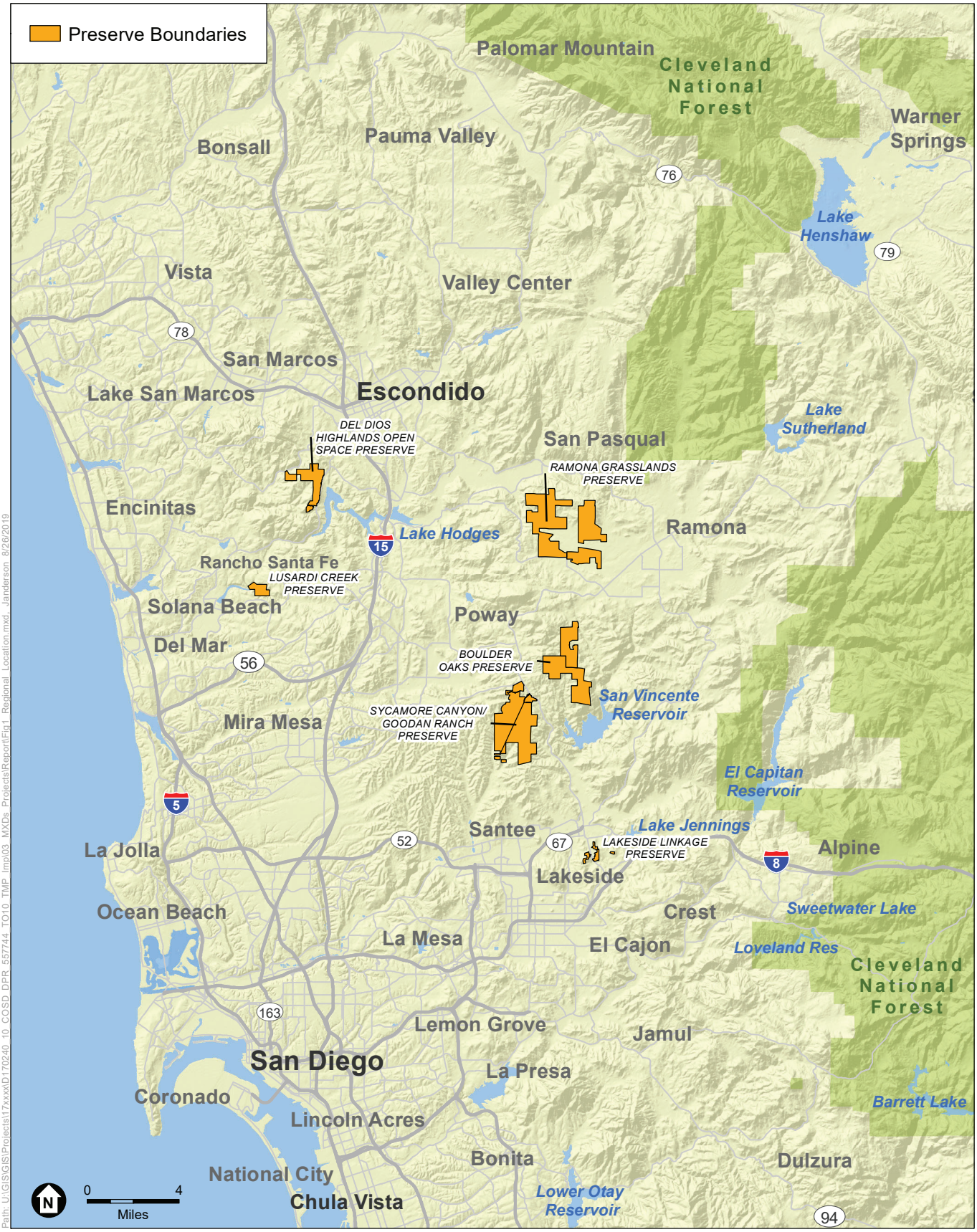
Lusardi Creek Preserve is an approximately 194.5-acre open space preserve located along the northern boundary of the city of San Diego, slightly southeast of Rancho Santa Fe, an unincorporated community of San Diego County. It is located in western San Diego County in the Lusardi Creek Valley, just north of San Dieguito Road, west of Del Sur and South of Artesian Road, within the San Dieguito River Watershed.

### *Ramona Grasslands Preserve*

Ramona Grasslands Preserve is an approximately 3,490-acre open space preserve comprising 56 near contiguous parcels. The preserve is located west of the community of Ramona, an unincorporated community of San Diego County. It is located in west-central San Diego County in the western portion of Santa Maria Valley within the San Dieguito Watershed.

### *Sycamore Canyon/Goodan Ranch Preserve*

Sycamore Canyon/Goodan Ranch Preserve is an approximately 2,693.2-acre open space preserve located just east of Marine Corps Air Station (MCAS) Miramar and approximately 2 miles north of Santee within an unincorporated area of San Diego County. It is located in the coastal foothills of the Peninsular Ranges in south-central San Diego County within the Peñasquitos and San Diego Watersheds.




SOURCE: ESRI, 2019; SanGIS, 2019; ESA, 2019.

COSD DPR 557744_TO 10 TMP Implementation

**Figure 1**
Project Location

ESA

# CHAPTER 3
# Methods

Resource-specific monitoring followed the methods and key considerations as outlined in the TMP (ESA and ICF 2015) for each species and habitat type. Specific monitoring methods are described below. Areas monitored are depicted on figures provided in Chapter 4 Results. All data was collected using the ArcGIS Collector (Collector app) and will be submitted to DPR with the final version of this report; data sheets for all surveys can be found in the appendix.

## 3.1 Rare Plant Monitoring

Six rare plant species—San Diego thornmint, Encinitas baccharis, Lakeside ceanothus, San Miguel savory, variegated dudleya, and willowy monardella—were prioritized for resource-specific monitoring in the TMP. Species were prioritized according to which population-level species-specific monitoring was considered critical for effective management (ESA and ICF 2015).

ESA biologists and volunteers (discussed further in Section 4.8) conducted resource-specific monitoring in 2019 for five of the six rare plant species: San Diego thornmint, Encinitas baccharis, San Miguel savory, variegated dudleya, and willowy monardella. Lakeside ceanothus is monitored once every 5 years and was not scheduled to be monitored in 2019. As stated in the TMP, rare plant monitoring will follow the most current Management Strategic Plan (MSP) Rare Plant Monitoring Protocol prepared by the San Diego Management and Monitoring Program (SDMMP), and additional monitoring protocols stated in the TMP. Monitoring details including species, dates, number of monitoring plots, preserve name, and field personnel are listed in **Table 1** below.

**TABLE 1**
**MSP RARE PLANT MONITORING**

| Species | Plot Establishment Date | 2019 Monitoring Date | # of Permanent Monitoring Plots | Preserve | Name of Biologists (and Volunteers)[1] |
|---|---|---|---|---|---|
| San Diego thornmint | April 22, May 4–5, 2016; and May 4, 2017 | May 3, 14,15, 18, and 24 | 11 | Sycamore Canyon/Goodan Ranch | Adrienne Lee, Douglas Gordon-Blackwood, Alanna Sullivan, Jaclyn Catino-Davenport, Jaclyn Anderson, (Carol Crafts, Phoenix Von Hendy) |
| Encinitas baccharis | July 24 and 30, 2015 | August 22 | 3 | Del Dios Highlands | Alanna Sullivan, Jaclyn Catino-Davenport |
| San Miguel savory | April 6 and 16, 2016 | April 10 and June 14 | 2 | Boulder Oaks | Alanna Sullivan, Cailin Lyons, Lisa Maier |
| Variegated dudleya | April 27, 2016 | May 4 | 1 | Lusardi Creek | Alanna Sullivan, Paige Anderson |
| Willowy monardella | July 7, 2015, and June 22, 2016 | June 28 | 2 | Sycamore Canyon/Goodan Ranch | Alanna Sullivan, Adrienne Lee |

[1] Names in parentheses are of volunteers who participated and were trained during the survey.

Ten permanent monitoring plots were established for San Diego thornmint within Sycamore Canyon/Goodan Ranch Preserve by ICF in 2016 and an eleventh permanent monitoring plot was added by ICF in 2017. Three permanent monitoring plots were established for Encinitas baccharis within Del Dios Highlands Preserve by ICF in 2015. Two permanent monitoring plots were established for San Miguel savory within Boulder Oaks Preserve by ICF in 2016. One permanent monitoring plot was established for variegated dudleya within Lusardi Creek Preserve by ICF in 2016. One permanent monitoring plot was established for willowy monardella within Sycamore Canyon/Goodan Ranch Preserve by ICF in 2015, and a second permanent monitoring plot was established by the Conservation Biology Institute in 2016.

Monitoring of special-status plant occurrence status within the permanent monitoring plots followed the MSP 2019 Rare Plant Monitoring Protocol, which included the following steps:

- The perimeter of the current extent of the occurrence was mapped with sub-meter-accuracy Global Positioning System (GPS) and Collector app, and estimated or counted and recorded the number of plants within the current mapped extent. If the previously mapped current extent was still an accurate representation of the 2019 extent of the occurrence, no remapping occurred.
- Photo monitoring was conducted by taking a picture from the previously established permanent photo point facing toward the center point of the plot. The photo followed the angle and direction of the previous year's photograph, when applicable.
- A habitat assessment was conducted within the permanent monitoring plot using the MSP – 2019 Rare Plant Occurrence Monitoring Form to identify and record number of target plants per plot; phenological stages of plants; evidence of herbivory, disease, and stunted growth; and associated species.

- A threats assessment was conducted within the current maximum extent of the occurrence and an adjacent 10-meter buffer and provided management recommendations for the site using the MSP – 2019 Rare Plant Occurrence Monitoring Form.

Additional data not specified in the SDMMP MSP – 2019 Rare Plant Monitoring Protocol but included in the TMP was also collected for Encinitas baccharis as follows:

- Identify and record the sex and age of each shrub within each plot.
  - Seedling: 4 inches tall or less.
  - Adult: more than 4 inches tall.
- Determine the male to female ratio within each plot.

Additional data not specified in the SDMMP MSP – 2019 Rare Plant Monitoring Protocol but included in the TMP was also collected for willowy monardella as follows:

- The height, width, and length in meters of each willowy monardella cluster within the monitoring plot was recorded. A cluster is defined as plants within 0.5 meters of each other (Rebman and Dossey 2006). The plants were then classified as a seedling, juvenile, mature, or adult based on the following categories:
  - Seedling: lacks multiple stems and is less than 4 inches tall.
  - Juvenile: lacks multiple stems and is more than 4 inches tall.
  - Mature: more than 4 inches tall and has less than 20 stems.
  - Adult: more than 4 inches tall and has more than 20 stems.

## 3.2 Variegated Dudleya Management

Habitat restoration company D&D Wildlife Habitat Restoration Inc. (D&D) is performing routine management of the variegated dudleya occurrence area at Lusardi Creek Preserve within an approximately 0.75-acre management area. Management during this reporting period began in February 2019 and will continue through September 2019, as-needed. Prior to management actions, variegated dudleya were flagged to avoid accidental trampling by restoration crews. The control of invasive non-native plant species is a primary concern for the management of this and other TMP rare plant species. As stated in the TMP, invasive non-native plant species within the approximately 0.75-acre variegated dudleya management area are treated as-needed. As stated in the TMP, invasive, non-native plants within 18 inches of the variegated dudleya are carefully pulled by hand on an as-needed basis. As stated in the TMP, outside of this buffer area, but within the management area, invasive non-native plants are trimmed with a mechanical weed trimmer to 2 inches from the ground and raked, bagged, and properly disposed of off-site at the D&D yard waste disposal dumpsters or the San Diego County landfill. The cut non-native plants are then sprayed with a 2.5 percent glyphosate solution to minimize chances of persistence. Snail damage was noted on March 21, 2019. With DPR staff approval, an organic snail bait was applied around the perimeter of each variegated dudleya plant at a distance of 24 inches or greater from the target plant on April 4, 2019. Snail kill was noted after this date; however, damage of the plants seemed to persist. Rabbit scat was noted in the area; it is likely at least some of the damage to the dudleya was done by rabbits. Management recommendations are noted in Section 4.1.4.

## 3.3 Arroyo Toad

USGS established monitoring reaches for arroyo toad along Santa Maria Creek in Ramona Grasslands Preserve. Using coordinates obtained from USGS, ESA biologists conducted a habitat assessment along the monitoring reaches of Santa Maria Creek on May 14 and 15, 2019, to assess the current condition of arroyo toad habitat within Ramona Grasslands Preserve. The entire length of Santa Maria Creek within Ramona Grasslands Preserve was visually surveyed for the presence of arroyo toad tadpoles, toadlets, and eggs within ponded areas and along adjacent sandbar/gravel habitats. All arroyo toad observations were noted for approximate number of individuals, lifeform, and habitat quality and the locations were recorded with GPS. Ponded areas were also inspected for exotic predators such as bullfrogs (*Rana catesbiana*), fish, and crayfish (*Procambarus* sp.). Invasive non-native plant species located within and adjacent to the creek, such as tamarisk, were also noted. Locations of all exotic predators and invasive non-native plant species encountered were recorded with GPS to inform future management.

Additionally, the survey included a habitat assessment to document the conditions within Santa Maria Creek. The habitat assessment included qualitative observations regarding habitat suitability for arroyo toad, including the soil substrate, hydrology, and vegetation within and adjacent to the channel, at periodic sampling points. Sampling points were sited to document changes in the habitat condition along the channel and include a representation of habitat suitability within the entire channel. Representative photographs were taken at each sampling point, and sampling point locations were recorded with GPS.

## 3.4 Tricolored Blackbird

Areas in the southwestern portion of the Ramona Grasslands Preserve were identified as suitable habitat for breeding tricolored blackbirds, including possible nesting areas and one likely nesting area during 2018 monitoring efforts. The likely nesting area and one of the possible nesting areas were documented not on the Preserve, but directly adjacent to the Preserve, on Ramona Municipal Water District (RMWD) property. Suitable habitat areas within Ramona Grasslands Preserve included Santa Maria Creek, which runs through the Preserve, providing open water for potential breeding tricolored blackbirds; a stock pond located in the southwestern corner of the Preserve; and open water north of Highland Valley Road with potential for breeding tricolored blackbirds.

On April 23, 2019, ESA biologists revisited areas assessed in 2018 to inspect suitable breeding habitat conditions and document breeding tricolored blackbirds. The survey occurred during mid to late April to not only document whether breeding occurred but also to document nest success (USFWS 2006). The biologists recorded observations of tricolored blackbird and any other special-status species (including their GPS locations) on the Collector mobile application. The observations included the number of individuals and nesting behavior (carrying material, male territorial display, etc.). Suitable nesting habitat was mapped in the field using an aerial figure of Ramona Grasslands Preserve. Areas identified as suitable nesting habitat were then incorporated into a geographic information system (GIS) shape file.

ESA biologists also conducted a threats assessment for tricolored blackbird. Since neither SDMMP nor other regional entities have developed a species-specific threats assessment for the tricolored blackbird, the threats assessment form from Section VI of the 2019 Rare Plant Occurrence Monitoring Form and the 2019 Management Needs and Notes Form was completed (SDMMP 2019). The threats assessment survey included an evaluation of the vegetation as it pertains to the needs of the tricolored blackbird (e.g., native or non-native vegetation, running/open water, presence of protective nest substrate/vegetation, etc.).

## 3.5 Burrowing Owl

ESA biologists conducted presence/absence monitoring within the previously determined nine monitoring polygons within Ramona Grasslands Preserve for breeding burrowing owls. ESA biologists also completed a habitat assessment with a focus on the presence of California ground squirrels (*Otospermophilus beecheyi*), California ground squirrel burrows, or rock outcrops that provide natural coverage for small mammals and/or burrowing owls. Survey dates, weather conditions, and field personnel names are provided in **Table 2**. Four presence/absence surveys of all nine polygons were conducted approximately 3 weeks or more apart during the burrowing owl breeding season (February 1–August 31) and during the recommended timeframe outlined in the CDFW *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). The first survey was conducted between February 15 and April 15, when owls may first appear at their breeding burrows. The following two surveys were conducted between April 15 and July 15, as this is the peak breeding period for burrowing owl in California. The final survey was conducted after June 15, as recommended, to confirm nesting success; this is also when owls will most likely remain above ground and can be more detectable (Table 2).

**TABLE 2**
**BURROWING OWL SURVEY DATES AND WEATHER CONDITIONS**

| Survey Date | Survey Number | Survey Times | Start Weather Conditions | End Weather Conditions | Name of Biologists (and Volunteers) [1] |
|---|---|---|---|---|---|
| 3/20/2019 | 1a | 0615-1115 | Temp: 50 °F, 100% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 1 mph, Wind Direction: SE | Temp: 55 °F, 80% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 3 mph, Wind Direction: E | Jaclyn Catino-Davenport, Adrienne Lee, Paige Anderson |
| 3/22/2019 | 1b | 0645-1045 | Temp: 39 °F, 100% cloud cover, Visibility: Fair, Precipitation: None, Avg. Wind Speed: 0 mph, Wind Direction: NA | Temp: 52 °F, 20% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 0 mph, Wind Direction: NA | Jaclyn Catino-Davenport, Adrienne Lee, Paige Anderson |
| 4/24/2019 | 2a | 0545-1145 | Temp: 47 °F, 0% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 1 mph, Wind Direction: W | Temp: 78 °F, 0% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 7 mph, Wind Direction: W | Jaclyn Catino-Davenport, Adrienne Lee, Paige Anderson |
| 4/26/2019 | 2b | 0545-1145 | Temp: 50 °F, 25% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 2 mph, Wind Direction: W | Temp: 73 °F, 5% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 5 mph, Wind Direction: NW | Jaclyn Catino-Davenport, Adrienne Lee, Paige Anderson, (Megan Flaherty) |
| 5/20/2019 | 3a | 0515-1115 | Temp: 51 °F, 100% cloud cover, Visibility: Good, Precipitation: light rain, Avg. Wind Speed: 3 mph, Wind Direction: W | Temp: 56 °F, 80% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 8 mph, Wind Direction: NW | Jaclyn Catino-Davenport, Adrienne Lee, Lisa Maier, (William Watson III), (David Watson) |
| 5/21/2019 | 3b | 0515-1045 | Temp: 49 °F, 85% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 2 mph, Wind Direction: SW | Temp: 54 °F, 90% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 10 mph, Wind Direction: SW | Jaclyn Catino-Davenport, Adrienne Lee, Lisa Maier |
| 6/18/2019 | 4a | 0515-1130 | Temp: 60 °F, 100% cloud cover, Visibility: Fair, Precipitation: misting, Avg. Wind Speed: 1 mph, Wind Direction: NW | Temp: 71 °F, 20% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 4 mph, Wind Direction: W | Jaclyn Catino-Davenport, Natalie Woods, Paige Anderson |
| 6/19/2019 | 4b | 0515-1115 | Temp: 55 °F, 100% cloud cover, Visibility: Fair, Precipitation: None, Avg. Wind Speed: 0 mph, Wind Direction: NA | Temp: 72 °F, 20% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 6 mph, Wind Direction: W | Jaclyn Catino-Davenport, Adrienne Lee, Lisa Maier |

[1] Names in parentheses are of volunteers who participated and were trained during the survey.

Surveys were conducted during the morning hours and under weather conditions conducive for breeding burrowing owl surveys (e.g., no heavy fog, high winds, or precipitation). ESA biologists scanned the monitoring polygons with binoculars before walking transects (no more than 100 feet apart) through the polygon to provide 100 percent coverage. Potential burrows or rock crevices were inspected for burrowing owl sign (tracks, white wash, pellets, etc.). Locations of MSCP or other special-status species were recorded on the Collector app. ESA biologists were mindful not to flush or disturb the bald eagle pair at or near their nest site during polygon #7 monitoring, and the pair did not show signs of disturbance during monitoring surveys.

ESA biologists conducted a burrowing owl habitat and threats assessment monitoring during the last round of burrowing owl breeding surveys. Since neither SDMMP nor other regional entities have developed a species-specific threats assessment for the burrowing owl, the threats assessment form from Section VI of the 2019 Rare Plant Occurrence Monitoring Form and the 2019 Management Needs and Notes Form was completed (SDMMP 2019). The threats assessment survey included an evaluation of the vegetation as it pertains to the needs of the burrowing owl (e.g., native or non-native vegetation, vegetation height).

## 3.6 Coastal Cactus Wren

In 2008, five avian point count stations were established during baseline biological resources inventory surveys on the Lakeside Linkage Preserve (ICF 2008). Two coastal cactus wren habitat restoration sites were installed in the central portion of the Preserve in 2011 (see Section 4.5.1 for figures showing avian point count stations and restoration sites). To specifically capture potential coastal cactus wren activities based on the establishment of the restoration sites, avian point count stations R1 and R2 were established within or near the restoration sites. In 2018, avian point count station #3 was removed to reduce redundancy in avian species/numbers due to its proximity to avian point count stations R1 and #4. The existing avian point count surveys are established within the Preserve to assist with monitoring the status of coastal cactus wren and their use of the habitat restoration sites.

A total of five avian point count surveys were conducted during 2019 at six-point count stations. Survey dates, times, weather conditions, and field personnel names are provided in **Table 3**.

Avian point count surveys followed the methodology detailed in Ralph et al. 1995. Each point count survey was 10 minutes in duration at each point count station. Surveyors recorded each species observed or detected (heard), as well as the total number of individuals of that species. Data such as flyover, breeding behavior, and distance from point count station location was also recorded. Locations of MSCP or other special-status species were recorded on the Collector mobile application. Avian point count data was recorded on paper, but only the species observed were transcribed into a final table (see Section 4.5.1).

Immediately following each avian point count survey, cactus restoration areas and other large cactus on the Lakeside Linkage Preserve were inspected for the presence of cactus wren nests.

An ESA biologist conducted a coastal cactus wren habitat and threats assessment monitoring after the last day of avian point count surveys. Photo monitoring was also conducted at established photo points identified within restoration area in 2011. Photographs were taken from the same vantage points as previous photos taken during the same time of year (July) to document and monitor the progress of the two restoration sites over time.

**TABLE 3**
**COASTAL CACTUS WREN SURVEY DATES AND WEATHER CONDITIONS**

| Survey Date | Survey Number | Survey Times | Start Weather Conditions | End Weather Conditions | Name of Biologists (and Volunteers) [1] |
|---|---|---|---|---|---|
| 3/12/2019 | 1 | 0600-1100 | Temp: 44 °F, 40% Cloud Cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 1 mph, Wind Direction: W | Temp: 62 °F, 20% Cloud Cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 4 mph, Wind Direction: NW | Jaclyn Catino-Davenport |
| 4/12/2019 | 2 | 0600-0930 | Temp: 56 °F, 100% Cloud Cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 1.5 mph, Wind Direction: SE | Temp: 60 °F, 20% Cloud Cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 3.5 mph, Wind Direction: S | Jaclyn Catino-Davenport, (Markus Spiegelberg |
| 5/17/2019 | 3 | 0530-1000 | Temp: 49 °F, 50% Cloud Cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 0 mph, Wind Direction: NA | Temp: 62 °F, 30% Cloud Cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 4 mph, Wind Direction: W | Jaclyn Catino-Davenport |
| 6/12/2019 | 4 | 0515-0915 | Temp: 62 °F, 15% Cloud Cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 0 mph, Wind Direction: NA | Temp: 72 °F, 5% Cloud Cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 0 mph, Wind Direction: NA | Jaclyn Catino-Davenport |
| 7/3/2019 | 5 | 0545-0930 | Temp: 60 °F, 100% Cloud Cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 3 mph, Wind Direction: W | Temp: 67 °F, 20% Cloud Cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 3 mph, Wind Direction: W | Jaclyn Catino-Davenport |

[1] Names in parentheses are of volunteers who participated and were trained during the survey.

Since neither SDMMP nor other regional entities have developed a species-specific threats assessment for the coastal cactus wren, the threats assessment form from Section VI of the 2019 Rare Plant Occurrence Monitoring Form and the 2019 Management Needs and Notes Form was completed (SDMMP 2019). The threats assessment survey included an evaluation of the vegetation as it pertains to the needs of the coastal cactus wren (e.g., native or non-native vegetation, overtopping cactus, low cactus density).

## 3.7 Stephens' Kangaroo Rat

Specific monitoring protocols followed those outlined in the TMP for Stephens' kangaroo rat (SKR) monitoring at Ramona Grasslands Preserve (ESA and ICF 2015). This methodology follows that used by U.S. Geological Survey for SKR monitoring at Camp Pendleton (Brehme et al. 2016).

SKR monitoring areas were originally determined based on potentially suitable SKR habitat. Within the preserve, specific management areas have been developed by DPR staff and are referred to as Grazing Management Units (i.e., 1A, 1B, 1C, 2A, 2B, 3A, 3B, 3C, 3D, 3E, 4A, 4B, 4C, and 5) and SKR Management Areas (i.e., 1, 2, and 3). Grazing Management Units that provide potentially suitable SKR habitat (i.e., that which consists of flat terrain and/or gentle

slopes that support low-growing, open grasslands) were included within the SKR monitoring area; however, only portions of the associated Grazing Management Units are within SKR Management Areas. The current TMP-selected SKR monitoring areas include Grazing Management Units 2A (portions of Management Unit 1), 2B (portions of Management Area 1 and 2), and 3A and SKR Management Area 3 (portion of Grazing Management Unit 3B), as these areas provide suitable SKR habitat. It is important to note that only the portions of Grazing Management Units 2A and 2B that fall within SKR Management Areas 1 and 2 were included in the monitoring effort. Additionally, the entire Grazing Management Unit 3A is not located within an SKR Management Area but was included in the monitoring effort based on previously determined SKR suitability.

Within the selected monitoring areas, a 50- by 50-meter grid pattern was overlaid on a georeferenced aerial map over each of the SKR monitoring areas. A total of 25 of these sample plots were randomly selected for monitoring within this grid overlay. Additionally, 3 sample plots were randomly selected from within SKR Management Area 3. The 28 randomly selected sample plots (were established during the 2016 SKR monitoring effort (ICF 2017) and used during the 2019 monitoring effort for consistency.

On February 22, 2019, and February 25, 2019, Blackhawk Environmental biologists and ESA biologists navigated to all 28 sample plots using the cellular GPS Data Collector application. Survey dates, times, weather conditions, and field personnel names for these surveys are included in **Table 4**. Upon arrival at each sample plot, pin flags were installed at the corners of each plot and representative photographs were taken from the southeast corner of each plot, facing northwest. The biologists then walked systematic transects through each plot searching for kangaroo rat sign (e.g., burrows, scat, tracks, runways, and dust-bathing sites) until 100 percent coverage of the plot was achieved. All kangaroo rat sign was recorded on data sheets and electronic survey forms using the Survey123 application. Presence or absence of SKR within a given plot was determined solely on whether or not kangaroo rat sign was observed within the plot.

**TABLE 4**
**SKR SURVEY DATES AND WEATHER CONDITIONS**

| Survey Date | Survey Times | Start Weather Conditions | End Weather Conditions | Name of Biologists |
|---|---|---|---|---|
| 2/22/19 | 0900-1600 | Temp: 38 °F<br>25% Cloud Cover<br>Wind Speed: 0–2 mph | Temp: 52 °F<br>40% Cloud Cover<br>Wind Speed: 1–4 mph | Kris Alberts, Karla Flores |
| 2/25/19 | 0900-1530 | Temp: 36 °F<br>10% Cloud Cover<br>Wind Speed: 1–4 mph | Temp: 65 °F<br>15% Cloud Cover<br>Wind Speed: 2–8 mph, | Kris Alberts, Paige Anderson |

The 2019 monitoring effort included a habitat assessment of the 28 plots established during the 2016 SKR monitoring effort (ICF 2017) per the TMP. Habitat assessment forms were completed for each plot, specifically noting habitat characteristics critical to SKR habitat suitability, including percent bare ground, living herb density, shrub/tree density, percentage of dead plant

litter, gopher or ground squirrel density, obstruction factor, types of disturbance, and land use. These assessment variables were modeled after field forms used by Brehme et al. 2016 (adapted from a field form in Montgomery et al. 2008). Based on the quality of potentially suitable SKR habitat and the density of apparent kangaroo rat sign, each plot was assigned an SKR-potential rating (e.g., High Potential, Moderate Potential, Low Potential, or No Potential).

# 3.8 Vernal Pool/Alkali Playa

Per the TMP, two qualitative aquatic phase monitoring surveys of vernal pools/alkali playas were conducted within the Ramona Grasslands Preserve, one in the wet season when pools were inundated with water and one in the dry season when pools were completely dry (**Table 5)**. Qualitative monitoring was performed within the subset of 20 vernal pools within the Ramona Airport mitigation pools, Cagney, Oak Country, and Cumming Ranch vernal pools determined in 2016 by ICF.

Qualitative monitoring consisted of a pedestrian survey of the pools and immediate upland areas around the pool perimeters. The survey included inspections of the pools to determine water quality, edge effects, topographic disturbance, trespass, and presence of invasive plant species. The surveys also included documentation of all observed vernal pool indicator plant species listed on the U.S. Army Corps of Engineers (USACE) Regional General Conditions to the Nationwide Permits – Indicator Species for Vernal Pools (USACE 1997).

**TABLE 5**
**VERNAL POOL/ALKALI PLAYA QUALITATIVE MONITORING SURVEY DATES AND WEATHER CONDITIONS**

| Survey Date | Survey Times | Start Weather Conditions | End Weather Conditions | Name of Biologists |
|---|---|---|---|---|
| 2/28/19 | 0815–1727 | Temp: 57 °F<br>100% Cloud Cover<br>Wind Speed: 2–4 mph | Temp: 60 °F<br>50% Cloud Cover<br>Wind Speed: 6–8 mph | Ian Maunsell, Karla Flores |
| 5/9/19 | 0740–1550 | Temp: 54 °F<br>100% Cloud Cover, light rain<br>Wind Speed: 0–1 mph | Temp: 58 °F<br>100% Cloud Cover<br>Wind Speed: 6–9 mph | Ian Maunsell, Adrienne Lee |

## 3.8.1 Vernal Pool Invasive Non-Native Plant Management

Invasive non-native plants and resulting thatch affect both the vigor of native plant populations and the hydrology of vernal pool systems and are a threat to preserved pools. Invasive non-native plant management was performed by sub-consultant D&D on August 5–9 and August 12–14, 2019, after the ground was completely dry and native plants had generally senesced. Invasive non-native plant management was performed at the 15 vernal pools that were identified by Blackhawk and ESA to benefit from such treatment. Generally, this coincided with surveyed vernal pools with invasive non-native plant cover of 20 percent or more. These target vernal pools were mechanically dethatched with line trimmers. Care was taken to avoid any remaining native plant species, and invasive non-native plants were trimmed as close to the ground as possible. The debris was then raked, bagged, and properly disposed of at sub-consultant D&D yard waste disposal dumpsters. Herbicides were not used within vernal pool basins or within 10 feet of basin margins.

# CHAPTER 4
# Results and Discussion

## 4.1 Rare Plant Monitoring

Rare plant monitoring was conducted on 18 permanent monitoring plots at four preserves in 2019. Rare plot monitoring consisted of eleven San Diego thornmint monitoring plots in Sycamore Canyon/Goodan Ranch, two San Miguel savory monitoring plots in Boulder Oaks Preserve, one variegated dudleya monitoring plot in Lusardi Creek Preserve, two willowy monardella monitoring plots in Sycamore Canyon/Goodan Ranch Preserve and three Encinitas baccharis monitoring plots in Del Dios Highlands Preserve.

A summary of the monitoring plots, monitoring results, and management recommendations are provided in **Table 6**. Photographic monitoring and representative photographs of the monitored plots are provided in **Appendix A**. MSP Rare Plant Occurrence Monitoring Forms, which include Rare Plant Habitat and Threats Assessments, are located in **Appendix B**.

**TABLE 6**
**MSP 2019 RARE PLANT MONITORING SUMMARY TABLE**

| Species | Preserve | Plot #; MSP Occurrence ID[1] | Center Point Coordinates | Population | | Native Plant Cover | | Non-Native Plant Cover[2] | | Management Recommendations |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | # individuals | % cover | # species | % cover | # species | % cover | |
| San Diego thornmint *Acanthomintha ilicifolia* | Sycamore Canyon/Goodan Ranch | SYGOACIL01 ACIL_4SYCA027_01 | E 501592 N 3644272 | 1000 | 3.0 | 25 | 54.4 | 13[2] | 8.3[3] | Conduct management of invasive non-native grasses and herbs, particularly purple false brome *(Brachypodium distachyon)* and tocalote *(Centaurea melitensis)*. Avoid trampling. |
| | | SYGOACIL02 ACIL_4SYCA027_02 | E 501522 N 3644277 | 65 | 1.0 | 19 | 51.7 | 14[3] | 8.2[4] | |
| | | SYGOACIL03 ACIL_4SYCA027_03 | E 501546 N 3644380 | 433 | 1.0 | 24 | 20.7 | 11 | 4.3 | |
| | | SYGOACIL04 ACIL_4SYCA027_04 | E 502555 N 3643683 | 15 | 0.2 | 15 | 8.6 | 7 | 21.9 | |
| | | SYGOACIL05 ACIL_4SYCA027_05 | E 502915 N 3643523 | 68 | 0.2 | 16 | 15.1 | 7 | 20.6 | |
| | | SYGOACIL06 ACIL_4SYCA027_06 | E 502252 N 3644084 | 1440 | 3.0 | 12 | 17.5 | 4 | 4.7 | |
| | | SYGOACIL07 ACIL_4SYCA027_07 | E 502375 N 3644068 | 218 | 0.5 | 11 | 13.6 | 5 | 6.6 | |
| | | SYGOACIL08 ACIL_4SYCA027_08 | E 502267 N 3644249 | 1320 | 2.0 | 11[4] | 12.4[5] | 9 | 17.6 | |
| | | SYGOACIL09 ACIL_4SYCA027_09 | E 501735 N 3644404 | 470 | 0.5 | 17 | 14.0 | 10 | 8.6 | |
| | | SYGOACIL10 ACIL_4SYCA027_10 | E 501927 N 3644370 | 4000 | 5.0 | 15 | 25.4 | 4 | 8.4 | |
| | | SYGOACIL11 ACIL_4SYCA027_11 | E 502683 N 3643722 | 130 | 0.2 | 15 | 25.2 | 6 | 11.0 | |
| Encinitas baccharis *Baccharis vanessae* | Del Dios Highlands | DD201501 BAVA3_6DDHP004_1 | E 488075 N 3658452 | 2 | 0.2 | 20[5] | 75.2[6] | 3 | 0.6 | Implement erosion control measures for the large gully running through Monitoring Plot 1 and potentially divert |
| | | DD201502 BAVA3_6DDHP004_2 | E 488142 N 3658472 | 5 | 0.2 | 14 | 54.4 | 0 | 0 | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | DD201503<br>BAVA3_6DDHP004_3 | E 488032<br>N 3658465 | 40 | 3 | 13 | 67 | 0 | 0 | current water pipe. Monitor Mediterranean red bug to determine if harmful to Encinitas baccharis. |
| San Miguel savory<br>*Clinopodium chandleri* | Boulder Oaks | BOCLCH01<br>CLCH5_4BOPR002_1 | E 505067<br>N 3646951 | 26 | 0.2 | 18 | 37.6 | 2 | 0.4 | Continue monitoring and assessing need to actively manage invasive non-native grasses, particularly perennial veldtgrass (*Ehrharta calycina*). Avoid trampling and excessive walking on slope. |
| | | BOCLCH02<br>CLCH5_4BOPR002_2 | E 505422<br>N 3647075 | 39 | 1.0 | 16 | 41.4 | 2 | 2.0 | |
| Variegated dudleya<br>*Dudleya variegata* | Lusardi Creek | LCDUVA01<br>DUVA_6LUCR023_1 | E 484873<br>N 3652555 | 3 | 0.2 | 13 | 15.4 | 6 | 6.8 | Continue management of invasive non-native plants. If variegated dudleya numbers drop in future years, consider installing rabbit fencing to reduce herbivory. Consider installing signage and fencing to preclude off-road vehicles. Snail bait may be necessary if snails and herbivory are noted. |
| Willowy monardella<br>*Monardella viminea* | Sycamore Canyon/Goodan Ranch | SYC201501<br>MOLIV_4SYCA006_1 | E 502411<br>N 3642217 | 80 | 4.0 | 17 | 16.6 | 8 | 5.2 | Conduct targeted management on invasive non-native grasses, herbs, and thatch immediately surrounding willowy monardella per the TMP. |
| | | SYC201602<br>MOLIV_4SYCA002_1 | E 501047<br>N 3642506 | 1 | 0.2 | 8 | 9.4 | 10 | 8.0 | |

[1] Plot # code is used through this report, and was assigned during plot establishment. MSP occurrence ID is the occurrence number assigned by SDMMP.
2 Non-native plant cover calculation includes invasive non-native plant species.
[3] *Lepidium* spp. was detected at 0.2 percent and was categorized as non-native during vegetation cover calculations.
[4] Unknown grass was detected at 0.2 percent and was categorized as non-native during vegetation cover calculations.
[5] *Lupinus* spp. was detected at 0.2 percent and was categorized as native during vegetation cover calculations.
[6] *Stipa* spp. was detected at 1.0 percent and was categorized as native during vegetation cover calculations.

## 4.1.1 San Diego Thornmint

### 4.1.1.1 Sycamore Canyon/Goodan Ranch Preserve

The 11 monitoring plots previously established within the San Diego thornmint population in Sycamore Canyon/Goodan Ranch Preserve were monitored by ESA in 2019. A total of 9,159 San Diego thornmint plants were detected within the monitoring plots. The entire population of San Diego thornmint within Sycamore Canyon Preserve in 2019 is estimated to be approximately 27,200 plants. The location of the monitoring plots, center points, photo points, and maximum extent of the San Diego thornmint is shown in **Figure 2**. Photo monitoring and representative photographs are shown in Appendix A.

Additional special-status plant species, such as small-flowered bindweed (*Convolvulus simulans*), Palmer's grappling hook (*Harpagonella palmeri*), and variegated dudleya, were also observed within seven of the monitoring plots. Across all 11 monitoring plots, San Diego thornmint habitat contained invasive non-native grasses and herbs, particularly purple false brome (*Brachypodium distachyon*) and tocalote (*Centaurea melitensis*).

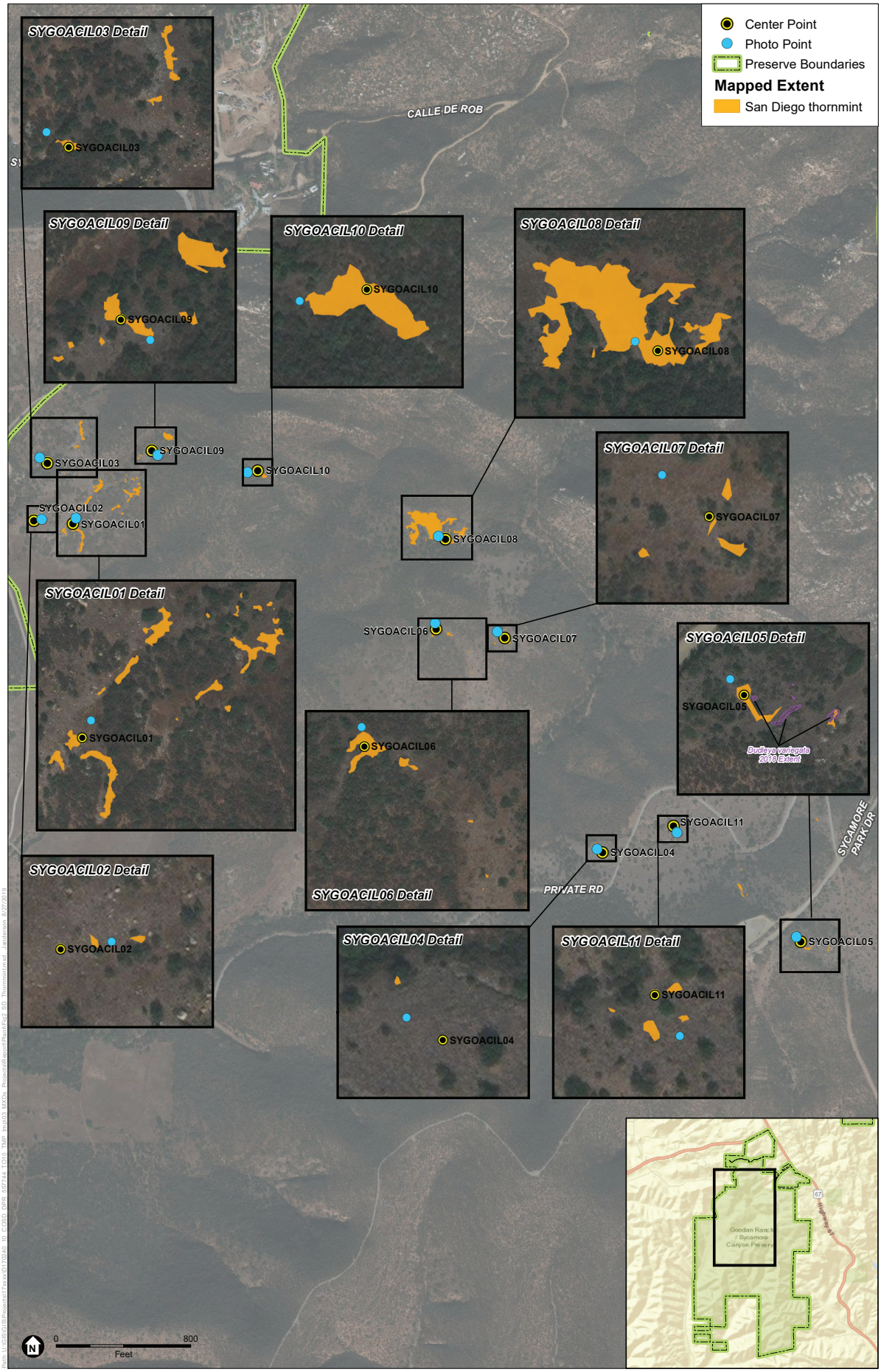
#### *Monitoring Plot Number SYGOACIL01*

Monitoring plot SYGOACIL01 is located in the northwestern portion of the San Diego thornmint population. A total of approximately 1,000 San Diego thornmint plants were estimated to be within the monitoring plot; over 75 percent were in flower, the remaining were fruiting or vegetative. Total vegetative cover within the plot was 63.7 percent, with 55.4 percent native cover and 8.3 percent non-native plant cover[1]. The dominant native plant species within the monitoring plot was clustered tarweed (*Deinandra fasciculata*). Non-native plants included purple false brome, black mustard (*Brassica nigra*), red brome (*Bromus rubens*), tocalote, longbeak stork's bill (*Erodium botrys*), redstem stork's bill (*Erodium circutarium*), annual fescue (*Festuca myuros*), smooth cat's ear (*Hypochaeris glabra*), pepperweed (*Lepidium* spp.), narrowleaf cottonrose (*Logfia gallica*), scarlet pimpernel (*Lysimachia arvensis*), littleseed canarygrass (*Phalaris minor*), and spiny sowthistle (*Sonchus asper*). Additional special-status plant species detected within the plot included small-flower bindweed and Palmer's grappling hook.

#### *Monitoring Plot Number SYGOACIL02*

Monitoring plot SYGOACIL02 is located in the northwestern portion of the San Diego thornmint population. A total of 65 San Diego thornmint plants were detected within the monitoring plot; over 75 percent were in flower, the remaining were vegetative. Total vegetative cover within the plot was 59.9 percent, with 51.7 percent native cover and 8.2 percent non-native plant cover. The dominant native plant species within the monitoring plot was clustered tarweed. Non-native plants included slender oat (*Avena barbata*), purple false brome, soft brome (*Bromus hordeaceus*), foxtail brome (*Bromus madritensis* ssp. *rubens*), tocalote, longbeak stork's bill, redstem stork's bill, annual fescue, smooth cat's ear, narrowleaf cottonrose, scarlet pimpernel (*Lysimachia arvensis*), littleseed canarygrass, and spiny sowthistle. Additional special-status plant species detected within the plot included small-flower bindweed and Palmer's grappling hook.

[1] Note: Non-native plant cover includes invasive plant species.




SOURCE: ESRI; ESA 2019

COSD DPR 557744_TO 10 TMP Implementation

**Figure 2**
San Diego Thornmint Monitoring Results – Sycamore Canyon/Goodan Ranch Preserve

### *Monitoring Plot Number SYGOACIL03*

Monitoring plot SYGOACIL03 is located in the northwestern portion of the San Diego thornmint population. A total of 433 San Diego thornmint plants were detected within the monitoring plot; over 75 percent were in flower, the remaining were vegetative. Total vegetative cover within the plot was 25 percent, with 20.7 percent native cover and 4.3 percent non-native plant cover. The dominant native plant species within the monitoring plot were laurel sumac (*Malosma laurina*) and coastal sagebrush (*Artemisia californica*). Non-native plants included slender oat, soft brome, foxtail brome, tocalote, stork's bill (*Erodium* spp.), petty spurge (*Euphorbia peplus*), annual fescue, smooth cat's ear, narrowleaf cottonrose, scarlet pimpernel, and spiny sowthistle. Additional special-status plant species detected within the plot included small-flower bindweed and Palmer's grappling hook.

### *Monitoring Plot Number SYGOACIL04*

Monitoring plot SYGOACIL04 is located in the southeastern portion of the San Diego thornmint population. A total of 15 San Diego thornmint plants were detected within the monitoring plot; over 75 percent were in flower, the remaining were vegetative. Total vegetative cover within the plot was 30.5 percent, with 8.6 percent native cover and 21.9 percent plant cover. The dominant native plant species within the monitoring plot was clustered tarweed. Non-native plants included purple false brome, tocalote, shortpod mustard (*Hirschfeldia incana*), smooth cat's ear, narrowleaf cottonrose, scarlet pimpernel, and spiny sowthistle. No additional special-status plant species were detected within the plot.

### *Monitoring Plot Number SYGOACIL05*

Monitoring plot SYGOACIL05 is located in the southeastern portion of the San Diego thornmint population. A total of 68 San Diego thornmint plants were detected to be within the monitoring plot, all of which were flowering. Total vegetative cover within the plot was 35.7 percent, with 15.1 percent native cover and 20.6 percent non-native plant cover. The dominant native plant species within the monitoring plot were Mission manzanita (*Xylococcus bicolor*) and clustered tarweed. Non-native plants included purple false brome, foxtail brome, tocalote, annual fescue, smooth cat's ear, narrowleaf cottonrose, and spiny sowthistle. Additional special-status plant species detected within the plot included variegated dudleya.

### *Monitoring Plot Number SYGOACIL06*

Monitoring plot SYGOACIL06 is located in the central-northern portion of the San Diego thornmint population. A total of approximately 1,440 San Diego thornmint plants were estimated to be within the monitoring plot; over 75 percent were in flower, the remaining were vegetative. Total vegetative cover within the plot was 22.2 percent, with 17.5 percent native cover and 4.7 percent non-native cover. The dominant native plant species within the monitoring plot were Mission manzanita, San Diego thornmint, and clustered tarweed. Non-native plants included foxtail brome, tocalote, scarlet pimpernel, and spiny sowthistle. No additional special-status plant species were detected within the plot.

### *Monitoring Plot Number SYGOACIL07*

Monitoring plot SYGOACIL07 is located in the central-northern portion of the San Diego thornmint population. A total of 218 San Diego thornmint plants were detected within the monitoring plot; over 75 percent were in flower, the remaining were vegetative. Total vegetative cover within the plot was 20.2 percent, with 13.6 percent native cover and 6.6 percent non-native cover. The dominant native plant species within the monitoring plot was clustered tarweed. Non-native plants included purple false brome, tocalote, narrowleaf cottonrose, scarlet pimpernel, and spiny sowthistle. No additional special-status plant species were detected within the plot.

### *Monitoring Plot Number SYGOACIL08*

Monitoring plot SYGOACIL08 is located in the central-northern portion of the San Diego thornmint population. A total of approximately 1,320 San Diego thornmint plants were estimated to be within the monitoring plot; over 75 percent were in flower, the remaining were vegetative. Total vegetative cover within the plot was 30 percent, with 12.4 percent native cover and 17.6 percent non-native cover. The dominant native plant species within the monitoring plot were mock parsley (*Apiastrum angustifolium*), and San Diego thornmint. Non-native plants included purple false brome, soft brome, foxtail brome, tocalote, annual fescue, smooth cat's ear, narrowleaf cottonrose, scarlet pimpernel, and spiny sowthistle. Additional special-status plant species detected within the plot included Palmer's grappling hook.

### *Monitoring Plot Number SYGOACIL09*

Monitoring plot SYGOACIL09 is located in the northwestern portion of the San Diego thornmint population. A total of 470 San Diego thornmint plants were detected within the monitoring plot; over 75 percent were in flower, the remaining were vegetative. Total vegetative cover within the plot was 22.6 percent, with 14 percent native cover and 8.6 percent non-native cover. The dominant native plant species within the monitoring plot were clustered tarweed and Nuttall's scrub oak (*Quercus dumosa*). Non-native plants included slender oat, purple false brome, foxtail brome, tocalote, Musky's stork's bill (*Erodium moschatum*), annual fescue, smooth cat's ear, narrowleaf cottonrose, scarlet pimpernel, and spiny sowthistle. Additional special-status plant species detected within the plot included small-flower bindweed, Palmer's grappling hook, and a flyover Cooper's hawk (*Accipiter cooperii*).

### *Monitoring Plot Number SYGOACIL10*

Monitoring plot SYGOACIL10 is located in the northwestern portion of the San Diego thornmint population. A total of approximately 4,000 San Diego thornmint plants were estimated to be within the monitoring plot; over 75 percent were in flower, the remaining were vegetative. Total vegetative cover within the plot was 33.8 percent, with 25.4 percent native cover and 8.4 percent non-native cover. The dominant native plant species within the monitoring plot were black sage (*Salvia mellifera*), San Diego thornmint, and clustered tarweed. Non-native plants included tocalote, smooth cat's ear, scarlet pimpernel, and spiny sowthistle. Additional special-status plant species detected within the plot included small-flower bindweed.

### *Monitoring Plot Number SYGOACIL11*

Monitoring plot SYGOACIL11 is located in the southeastern portion of the San Diego thornmint population. A total of 130 San Diego thornmint plants were detected within the monitoring plot; over 75 percent were in flower, the remaining were vegetative. Total vegetative cover within the plot was 36.2 percent, with 25.2 percent native cover and 11 percent non-native cover. The dominant native plant species within the monitoring plot were clustered tarweed and spiny redberry (*Rhamnus crocea*). Non-native plants included slender oat, purple false brome, tocalote, shortpod mustard, narrowleaf cottonrose, and spiny sowthistle. No additional special-status plant species were detected within the plot.

### *Adaptive Management Recommendations*

To ensure the persistence of San Diego thornmint at Sycamore Canyon/Goodan Ranch Preserve, it is likely that at least three of the plots, plots 4, 5, and 8, would benefit from invasive non-native plant control by a qualified restoration specialist. The TMP recommends overall invasive non-native plant cover be kept to less than 20 percent and cover of purple false brome be kept to less than 10 percent cover (ESA and ICF 2015). Non-native plant cover of plots 4, 5, and 8 were recorded at 21.9, 20.6, and 17.6 percent, respectively. With the exception of plot 11 (at 11 percent non-native plant cover), all of the other plots were under 10 percent total non-native plant cover. In addition, plots 4, 5, and 8 also had lower than average (23.5 percent) native species cover at 15.1, 17.5, and 14.0 percent native cover, respectively. Purple false brome comprised the majority of the non-native plant cover across plots 4, 5, and 8, as well as all other plots (with cover at 15, 15, and 12 percent, respectively). It should be noted that purple false brome at plot 11 totaled 10 percent. The second most prevalent non-native plant species was tocalote. The invasive non-native plant species removal protocol within the TMP, which includes hand-clipping, hand-pulling, and herbicide use, should be followed. Care should be taken when management or monitoring is performed to not trample San Diego thornmint plants.

## 4.1.2 Encinitas Baccharis

### 4.1.2.1 Del Dios Highlands Preserve

The 3 monitoring plots previously established within the Encinitas baccharis population in Del Dios Highlands Preserve were monitored by ESA in 2019. A total of 47 Encinitas baccharis plants were detected within the monitoring plots. The entire population of Encinitas baccharis within Del Dios Highlands Preserve in 2019 is estimated to be approximately 350 plants. The location of the monitoring plots, center points, photo points, and maximum extent of the Encinitas baccharis is shown in **Figure 3**. Photo monitoring and representative photographs are shown in Appendix A.

One additional special-status plant species, wart-stemmed ceanothus (*Ceanothus verrucosus*), was also observed within all three of the monitoring plots. Only monitoring plot DD201501 contained non-native grasses and herbs, including foxtail brome, tocalote, and shortpod mustard.

### *Monitoring Plot Number DD201501*

Monitoring plot DD201501 is located in the south-central portion of the Encinitas baccharis population. A total of approximately 2 Encinitas baccharis plants were estimated to be within the monitoring plot; both were vegetative adults. Total vegetative cover within the plot was 75.8 percent, with 75.2 percent native cover and 0.6 percent non-native plant cover. The dominant native plant species within the monitoring plot were wart-stemmed ceanothus, sugar bush (*Rhus ovata*), black sage, and laurel sumac. Non-native plants included foxtail brome, tocalote, and shortpod mustard. Additional special-status plant species detected within the plot included wart-stemmed ceanothus.

### *Monitoring Plot Number DD201502*

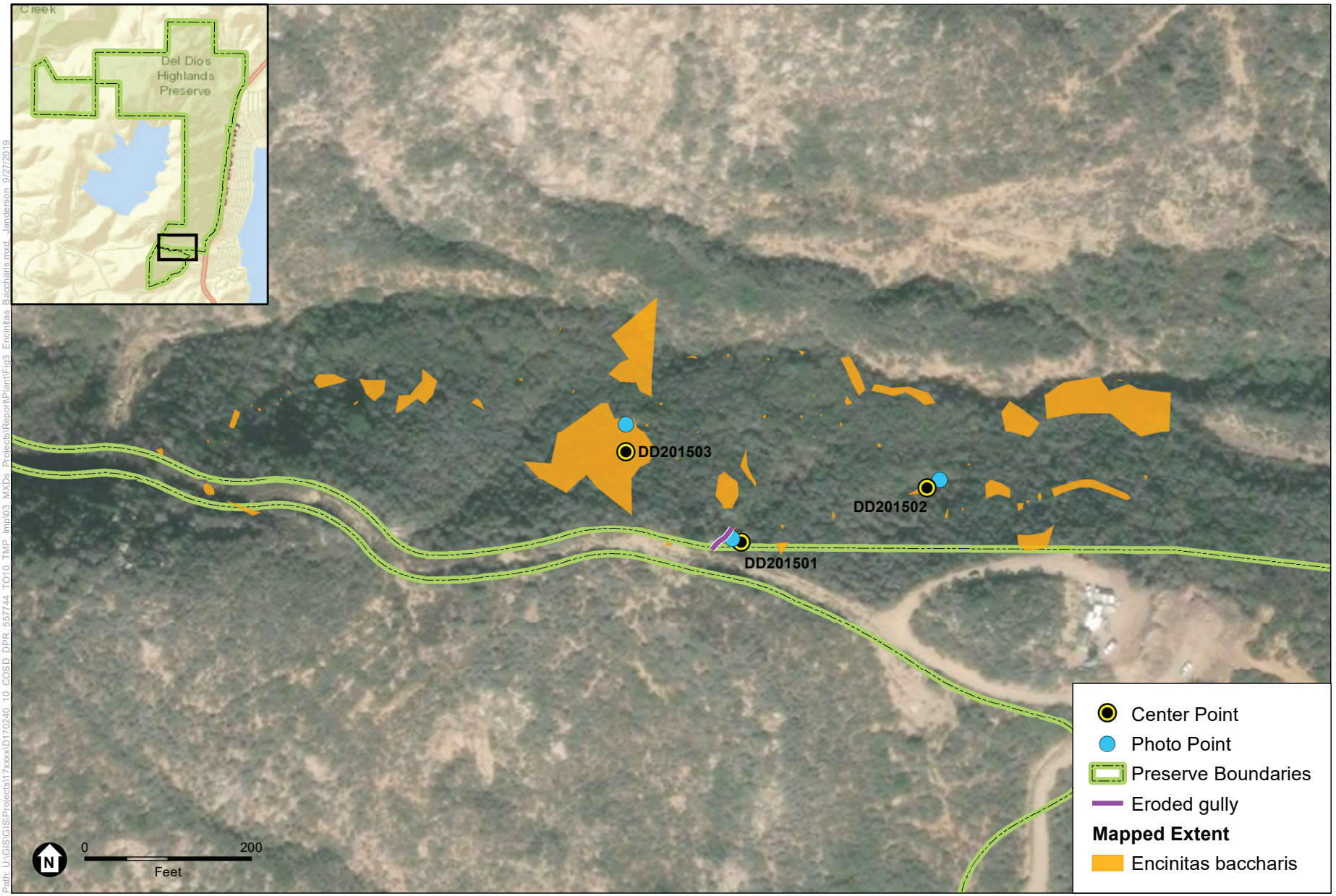
Monitoring plot DD201502 is located in the eastern portion of the Encinitas baccharis population. A total of 5 Encinitas baccharis plants were detected within the monitoring plot; three were vegetative adults, one was an adult female, and one was an adult male, resulting in a 1:1 male-to-female ratio. Total vegetative cover within the plot was 54.4 percent, with all cover being native. The dominant native plant species within the monitoring plot were woolyleaf ceanothus (*Ceanothus tomentosus*) and lemonade berry (*Rhus integrifolia*). No non-native plant species were detected within the monitoring plot. Additional special-status plant species detected within the plot included wart-stemmed ceanothus.

### *Monitoring Plot Number DD201503*

Monitoring plot DD201503 is located in the western portion of the Encinitas baccharis population. A total of 40 Encinitas baccharis plants were detected within the monitoring plot; 28 were vegetative adults, one was a vegetative seedling, nine were adult females, and two were adult males, making the male-to-female ratio 2:9. Total vegetative cover within the plot was 67 percent, with all cover being native. The dominant native plant species within the monitoring plot were wart-stemmed ceanothus and Mission manzanita. No non-native plants were detected within the monitoring plot. Additional special-status plant species detected within the plot included wart-stemmed ceanothus.

### *Adaptive Management Recommendations*

Management objectives for Encinitas baccharis at Del Dios Highlands Preserve include maintaining invasive non-native plant cover to less than 20 percent cover (ESA and ICF 2015). Currently, invasive non-native plants do not pose an immediate threat to this population and no invasive non-native management is needed. Large rills were noted in plot DD201501 (Appendix A). There is a water pipe that runs beneath a dirt access road and expels at the top of this plot. It has created a large gully. The erosion in this area should be addressed to reduce the threat to nearby Encinitas baccharis individuals and diverting the pipe outside of the maximum extent should be considered. It was also noted that Mediterranean red bugs (*Scantius aegyptius*) were mating or present on roughly 10 to 20 percent of all Encinitas baccharis individuals observed (Appendix A). It has not been determined if this non-native species is causing harm to the plants. Damage was not noted, but this should be monitored to determine if management actions need to be taken.




SOURCE: ESRI; ESA

COSD DPR 557744_TO 10 TMP Implementation

**Figure 3**
Encinitas Baccharis Monitoring Results – Del Dios Highlands Preserve

ESA

## 4.1.3 San Miguel Savory

### 4.1.3.1 Boulder Oaks Preserve

The two monitoring plots previously established within the San Miguel savory population in Boulder Oaks Preserve were monitored by ESA in 2019. A total of 65 San Miguel savory plants were detected within the monitoring plots. The entire population of San Miguel savory within Boulder Oaks Preserve is estimated to be 99 plants. The location of the monitoring plots, center points, photo points, and maximum extent of the San Miguel savory is shown in **Figure 4**. Photo monitoring and representative photographs are shown in Appendix A.

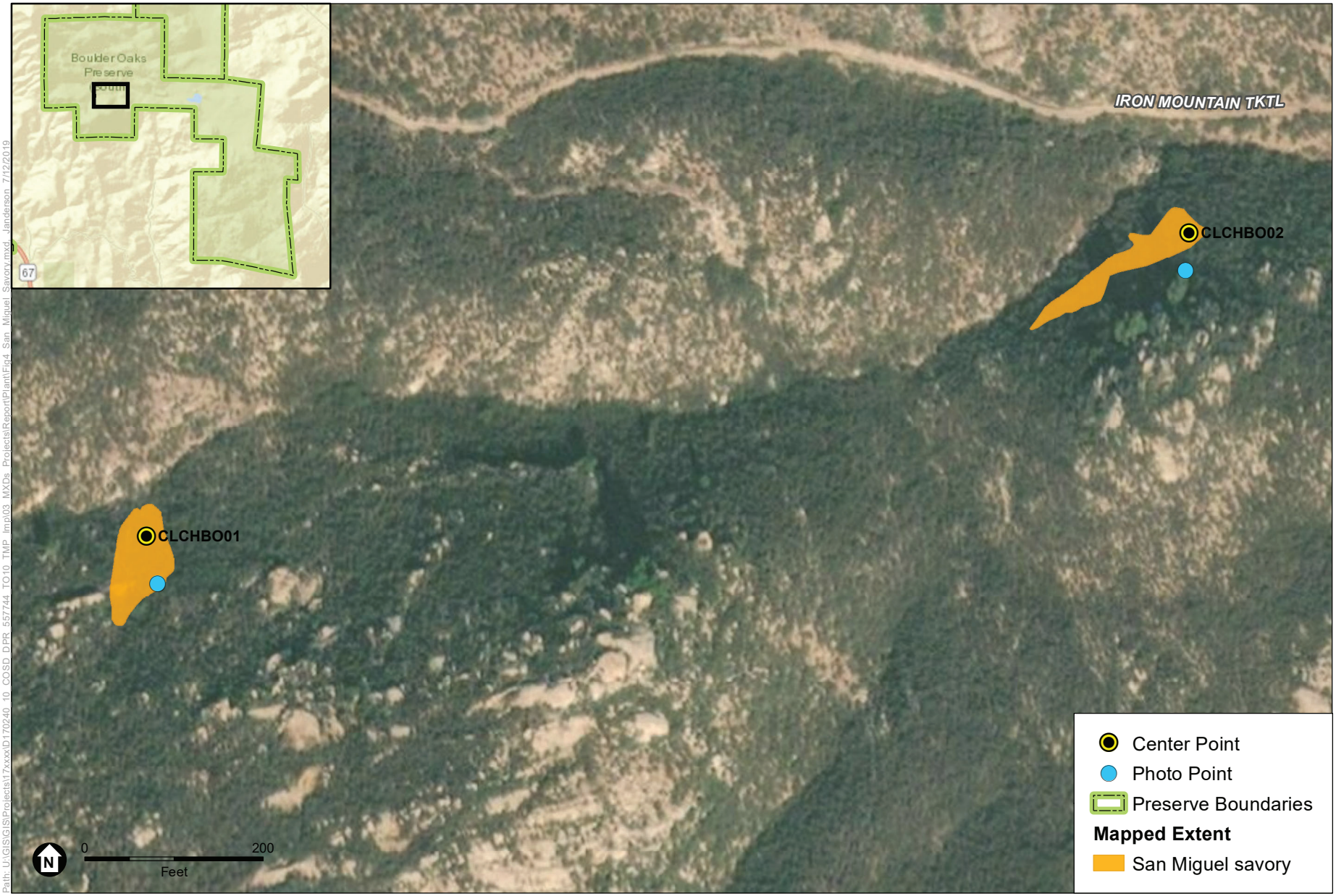
One additional special-status plant, southern mountain misery (*Chamaebatia australis*), was observed. A two-striped garter snake was also observed on a trail within the Preserve after willow monardella monitoring on April 10, 2019. Across both monitoring plots, San Miguel savory habitat contained invasive non-native grasses, particularly perennial veldtgrass (*Ehrharta calycina*).

#### *Monitoring Plot Number BOCLCH01*

Monitoring plot BOCLCH01 is located in the western portion of the San Miguel savory population. A total of 26 San Miguel savory plants were detected to be within the monitoring plot; less than 50 percent were in flower, the remaining were vegetative. Total vegetative cover within the plot was 38 percent, with 37.6 percent native cover and 0.4 percent non-native cover. The dominant native plant species within the monitoring plot were chamise (*Adenostoma fasciculatum*) and Eastwood manzanita (*Arctostaphylos glandulosa*). Non-native plants included foxtail brome and perennial veldtgrass. No additional special-status plant species were detected within the plot.

#### *Monitoring Plot Number BOCLCH02*

Monitoring plot BOCLCH02 is located in the eastern portion of the San Miguel savory population. A total of 39 San Miguel savory plants were estimated to be within the monitoring plot, all of which were vegetative. Total vegetative cover within the plot was 43.4 percent, with 41.4 percent native cover and 2 percent non-native cover. The dominant native plant species within the monitoring plot were chamise, chaparral whitehorn (*Ceanothus leucodermis*), and tree poppy (*Dendromecon rigida*). Non-native plants included foxtail brome and perennial veldtgrass. Additional special-status plant species detected within the plot included southern mountain misery.




Path: U:\GIS\GIS\Projects\17xxxx\D1702401_10_COSD_DPR_557744_TO10_TMP_Imp\03_MXDs_Projects\Report\Plant\Fig4_San_Miguel_Savory.mxd_Janderson_7/12/2019

SOURCE: ESRI; ESA 2019

COSD DPR 557744_TO 10 TMP Implementation

**Figure 4**
San Miguel Savory Monitoring Results – Boulder Oaks Preserve

ESA

### *Adaptive Management Recommendations*

Management objectives for San Miguel savory at Boulder Oaks Preserve include maintaining invasive non-native plant cover to less than 20 percent cover (ESA and ICF 2015). This year's monitoring results demonstrated a healthy San Miguel savory habitat at Boulder Oaks Preserve, with limited non-native plant cover, averaging at approximately 1 percent cover between the two plots and consisting primarily of perennial veldtgrass (*Ehrharta calycina*). Although non-native plant cover is currently very low, the area should continue to be monitored for invasive non-native plants that could threaten this population of San Miguel savory. In addition, because vegetation within the San Miguel savory occurrences is very thick and on steep slopes, care should be taken when performing monitoring to not trample the San Miguel savory plants, and to avoid other native plants to the extent possible.

## 4.1.4 Variegated Dudleya

### 4.1.4.1 Lusardi Creek Preserve

The monitoring plot previously established within the variegated dudleya population in Lusardi Creek Preserve was monitored by ESA in 2019. A total of 3 variegated dudleya plants were detected within the monitoring plot. The entire population of variegated dudleya within Lusardi Creek Preserve was 33 plants. The location of the monitoring plot, center point, photo point, and maximum extent of the variegated dudleya is shown in **Figure 5**. Photo monitoring and representative photographs are shown in Appendix A.

An additional special-status plant species, San Diego barrel cactus (*Ferocactus viridescens*), was also observed within the monitoring plot. Within the monitoring plot, variegated dudleya habitat contained invasive non-native grasses, particularly purple false brome and foxtail brome. Signs of herbivory were observed on March 21, 2019. This was presumed to be damage caused by snails. Rabbit herbivory was also noted during the monitoring visit on April 27, 2019 (Appendix A).

#### *Monitoring Plot Number LCDUVA01*

Monitoring plot LCDUVA01 is located in the eastern portion of the variegated dudleya population. A total of 3 variegated dudleya plants were detected to be within the monitoring plot. Roughly 75 percent were in flower; the remaining were dead or showed signs of herbivory. Total vegetative cover within the plot was 22.2 percent, with 15.4 percent native cover and 6.8 percent non-native cover. The dominant native plant species within the monitoring plot was deerweed (*Acmispon glaber*). Non-native plants included purple false brome, foxtail brome, stork's bill, Italian rye grass (*Festuca perennis*), smooth cat's ear, and Russian thistle (*Salsola tragus*). Additional special-status plant species detected within the plot included San Diego barrel cactus.


Path: U:\GIS\GIS\Projects\17xxxx\D170240_10_COSD_DPR_557744_TO10_TMP_Imp\03_MXDs_Projects\Report\PlantFig5_Variegated_dudleya.mxd Janderson 8/27/2019

SOURCE: ESRI; ESA 2019

COSD DPR 557744_TO 10 TMP Implementation

**Figure 5**
Variegated Dudleya Monitoring Results – Lusardi Creek Preserve

ESA

### *Adaptive Management Recommendations*

With total non-native cover at just under 7 percent, the TMP management objective of maintaining invasive plant cover at less than 20 percent for variegated dudleya is being met (ESA and ICF 2015). To ensure the persistence of variegated dudleya at Lusardi Creek Preserve, the area should continue to be managed and treated for invasive plant species by a qualified restoration specialist on a continual basis, as needed, such as performed by D&D during this reporting period (see Section 3.2). Signs that a vehicle had driven on the top of the ridge directly adjacent to the variegated dudleya occurrence was apparent during the May 2019 monitoring visit (Appendix A). Fencing and signage around the variegated dudleya population is recommended to avoid trampling caused by potential human foot traffic and illegal off-road vehicles. If signs of herbivory continue and are determined to threaten the persistence of this population, fencing to exclude rabbits (such as wildlife-safe small-holed poultry fencing) could be installed to limit such threats. Similarly, if snail damage is noted on subsequent visits, such that it may threaten the persistence of this population, it may be recommended to apply an organic, wildlife-safe snail bait around the perimeters of the variegated dudleya plants, such as was performed this management year (see Section 3.2).

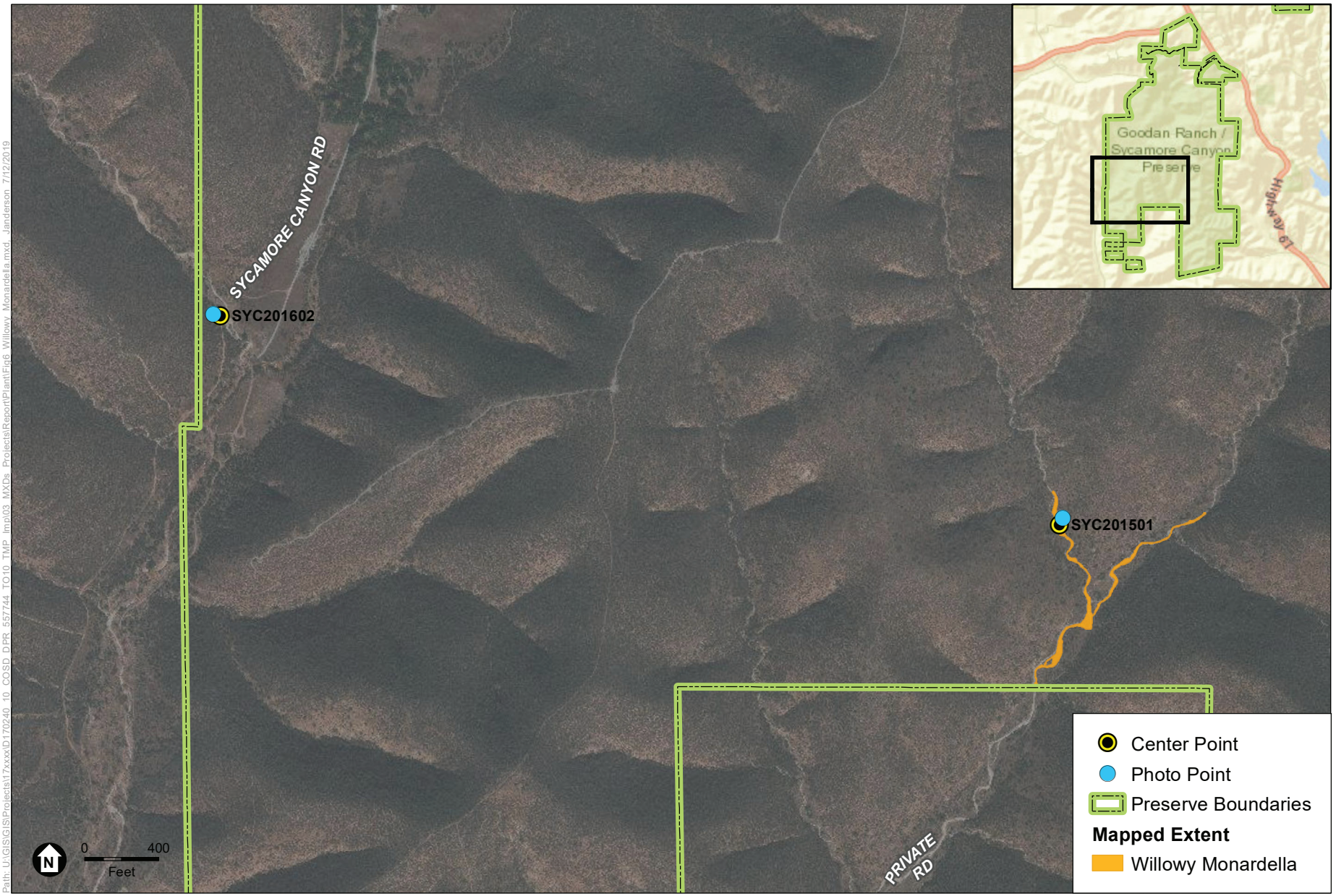
## 4.1.5 Willowy Monardella

### 4.1.5.1 Sycamore Canyon/Goodan Ranch Preserve

The two monitoring plots previously established within the willowy monardella population in Sycamore Canyon/Goodan Ranch Preserve were monitored by ESA in 2019. A total of 83 individual willowy monardella plants were detected within the monitoring plots. The entire population of willowy monardella within Sycamore Canyon/Goodan Ranch Preserve is estimated to be 364 individual plants. The location of the monitoring plots, center points, photo points, and maximum extent of the willowy monardella is shown in **Figure 6**. Photo monitoring and representative photographs are shown in Appendix A.

No additional special-status plant species were observed within the two monitoring plots. Across both monitoring plots, willowy monardella habitat contained by invasive non-native grasses and herbs, particularly brome grasses, shortpod mustard, and yellow star thistle (*Centaurea solstitialis*).

Additional monitoring data, including number of patches, area covered by patches, volume of patches, and growth stages of the plants in each patch, were collected in **Table 7**.




Path: U:\GIS\GIS\Projects\17xxxx\D170240_10_COSD_DPR_557744_TO10_TMP_Imp\03_MXDs_Projects\Report\Plan\Fig6_Willowy_Monardella.mxd_ landerson_7/12/2019

SOURCE: ESRI; ESA 2019

COSD DPR 557744_TO 10 TMP Implementation

**Figure 6**
Willowy Monardella Monitoring Results – Sycamore Canyon/Goodan Ranch Preserve

ESA

**TABLE 7**
**WILLOWY MONARDELLA ADDITIONAL MONITORING DATA**

| Monitoring Plot | Patch Number | Width (m) | Length (m) | Height (m) | Area (Width x Length) | Volume (Width x Length x Height) | # of Individuals within Patch | Growth Stage |
|---|---|---|---|---|---|---|---|---|
| SYC201501 | 1 | 1.70 | 2.90 | 0.60 | 4.93 | 2.96 | 8 | 8 Adult |
| | 2 | 2.10 | 4.60 | 0.60 | 9.66 | 5.80 | 16 | 15 Adult<br>1 Mature |
| | 3 | 1.10 | 2.30 | 0.75 | 2.53 | 1.90 | 10 | 2 Mature<br>8 Adult |
| | 4 | 1.40 | 1.40 | 0.50 | 1.96 | 0.98 | 2 | 2 Adult |
| | 5 | 2.40 | 3.40 | 0.60 | 8.16 | 4.90 | 7 | 7 Adult |
| | 6 | 1.20 | 2.90 | 0.50 | 3.48 | 1.74 | 8 | 8 Adult |
| | 7 | 1.30 | 1.00 | 0.55 | 1.30 | 0.72 | 6 | 6 Adult |
| | 8 | 0.80 | 0.90 | 0.60 | 0.72 | 0.43 | 1 | 1 Adult |
| | 9 | 1.40 | 1.50 | 0.65 | 2.10 | 1.37 | 2 | 2 Adult |
| | 10 | 1.60 | 2.10 | 0.40 | 3.36 | 1.34 | 8 | 8 Adult |
| | 11 | 1.30 | 3.10 | 0.50 | 4.03 | 2.02 | 12 | 12 Adult |
| SYC201602 | 1 | 0.90 | 1.40 | 0.80 | 1.26 | 1.01 | 3 | 3 Adult |

### *Monitoring Plot Number SYC201501*

Monitoring plot SYC201501 is located in the central portion of the willowy monardella population. A total of 80 willowy monardella plants were detected to be within the monitoring plot; over 75 percent were in flower, the remaining were vegetative. Total vegetative cover within the plot was 21.7 percent, with 16.6 percent native cover and 5.2 percent non-native cover. The dominant native plant species within the monitoring plot were California buckwheat (*Eriogonum fasciculatum*), willowy monardella, and spiny redberry. Non-native plants included slender oat, wild oat, ripgut brome, soft brome, foxtail brome, yellow star thistle, pepperweed (*Lepidium* spp.), and common catchfly (*Silene gallica*). No additional special-status plant species were detected within the plot.

### *Monitoring Plot Number SYC201602*

Monitoring plot SYC201602 is located in the western portion of the willowy monardella population. A total of three willowy monardella plants were detected to be within the monitoring plot and all were flowering. Total vegetative cover within the plot was 17.4 percent, with 9.4 percent native cover and 8 percent non-native cover. The dominant native plant species within the monitoring plot was California buckwheat. Non-native plants included ripgut brome, soft brome, foxtail brome, yellow star thistle, longbeak stork's bill, annual fescue, shortpod mustard, Jersey cudweed (*Pseudognaphalium luteoalbum*), wild radish (*Raphanus raphanistrum*), common catchfly. No additional special-status plant species were detected within the plot.

### *Adaptive Management Recommendations*

To ensure the persistence of willowy monardella within Sycamore Canyon/Goodan Ranch Preserve, management recommendations within the TMP include maintaining less than 10 percent cover of non-native species and thatch around willowy monardella individuals and less

than 20 percent cover of invasive plants in the areas between. Although non-native cover averaged less than 7 percent between the two plots, on-site observations demonstrated the non-native cover surrounding certain willowy monardella individuals and clumps to be higher than 10 percent (see Appendix A). Many of the willowy monardella will not need management, but the area should be walked in its entirety and hand-weeding should take place as needed. Annual brome and oat grasses, as well as other non-natives should be targeted.

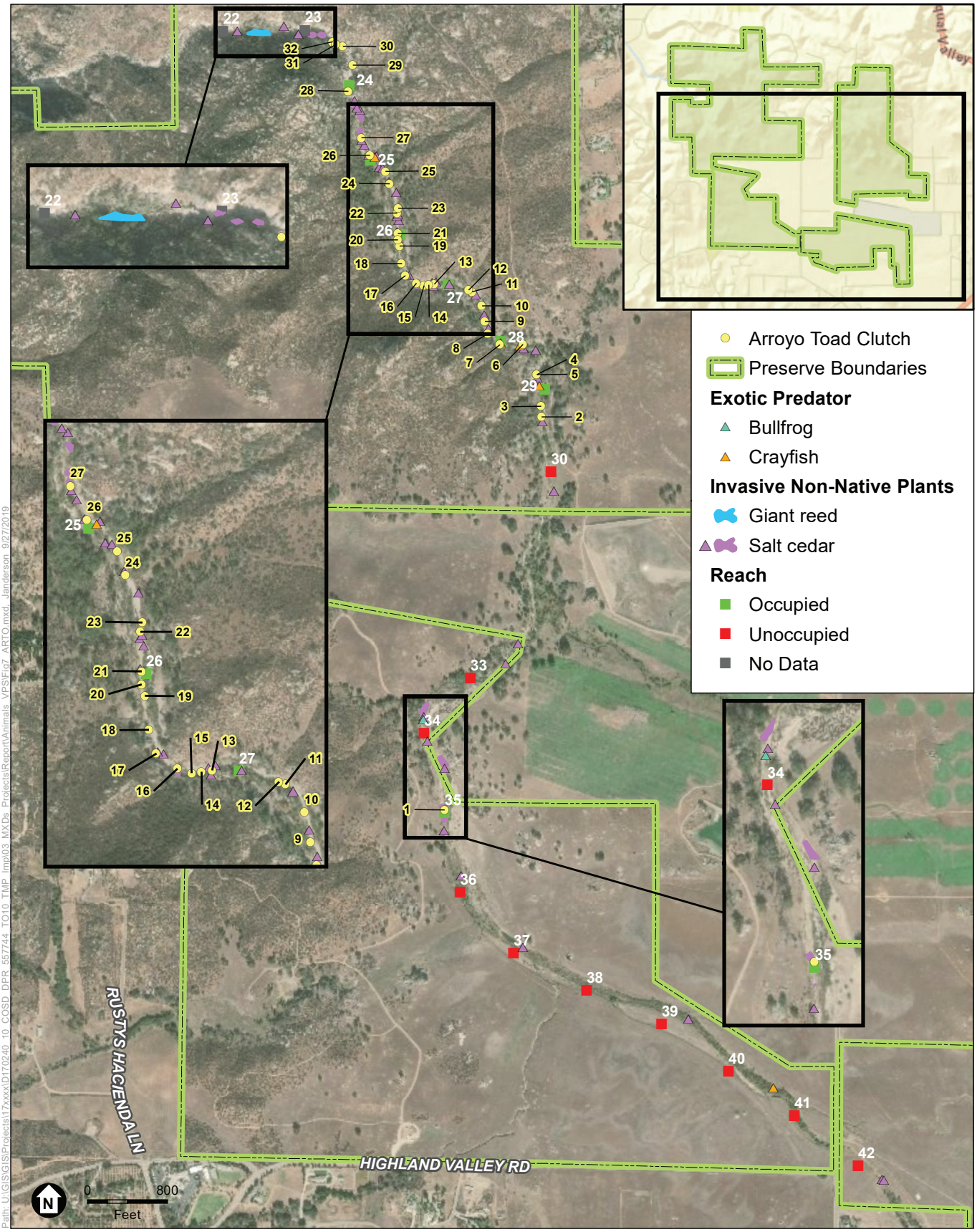
## 4.2 Arroyo Toad

A total 7 monitoring reaches were recorded as occupied during surveys within Santa Maria Creek (**Figure 7**). Arroyo toad observations within these reaches consisted of 28 clutches of tadpoles, with an additional 4 clutches of juvenile toadlets. Tadpole clutch sizes were estimated between 5 and 500 individuals. Toadlets clutches ranged in size from an estimated 5 to 10 individuals. Arroyo toad observations were generally confined to the northern on-site reaches of Santa Maria Creek north of reach 30, with a single occurrence within the southern reaches of Santa Maria Creek. Representative photographs of occupied and unoccupied habitat are included in **Appendix C**. Arroyo toad phenology (e.g. number of individuals & lifeform) and habitat conditions at each sampling point are provided in **Appendix D**.

### *Habitat Assessment*

The southern (upstream) portion of Santa Maria Creek is characterized by moderate- to low-quality habitat for arroyo toad. Arroyo toad was generally absent from this area, with the exception of reach 35 with one clutch of tadpoles. While the channel supports areas with suitable breeding and calling margins, this area is generally characterized by denser vegetation adjacent to and overhanging the channel. The vegetation generally consists of species typical to riparian and wetland habitats, including coast live oak (*Quercus agrifolia*), mule fat (*Baccharis salicifolia*), tule (*Schoenoplectus* sp.), saltgrass (*Distichlis spicata*), and willows (*Salix* spp.). Water levels within the southern portion of the creek varied throughout, and included areas of low flow as well as a large, deep pond. Additionally, a portion of the creek had completely dried south of Highland Valley Road.

The northern (downstream) portion of Santa Maria Creek provides abundant high-quality habitat for all life stages on arroyo toad. Between reach 30 and reach 25, the creek channel varies from a single channel to braided channels with suitable gravelly/sandy substrate and margins for calling and breeding. The channel generally lacks vegetation, with the exception of sparsely scattered tamarisk. North of reach 24, Santa Maria Creek enters a rocky gorge and the channel becomes intersected by large boulders, creating micro-topography comprising varying sized pools underlain by sandy and gravelly substrate. Arroyo toad tadpoles were present in the pools at lower densities (e.g., clutch sizes estimated between 10 and 25 tadpoles). The northernmost reaches of the creek, reach 22 and reach 23, within the Ramona Grasslands Preserve could not be accessed due to topographic constraints; however, it is presumed that the high-quality habitat continues down-stream and likely supports arroyo toad.




SOURCE: ESRI; ESA

COSD DPR 557744_TO 10 TMP Implementation

**Figure 7**
Arroyo Toad Monitoring Results – Ramona Grasslands Preserve

ESA

### *Invasive Non-Native Plants & Exotic Predators*

One invasive non-native plant species, salt-cedar (*Tamarix ramossisima*), occurred at low densities throughout Santa Maria Creek. Salt-cedar has a California Invasive Plant Council (Cal-IPC) rating of "High" due to its severe impacts on physical processes and plant and animal communities (Cal-IPC 2019). Additionally, giant reed (*Arundo donax*), also a Cal-IPC High species, was mapped in 2018 in an inaccessible portion of the creek and is assumed to be present in the northern on-site reaches of Santa Maria Creek. Two exotic predators were also noted during surveys: red-swamp crayfish (*Procambarus clarkii*) and bullfrog. A total of five red-swamp crayfish were observed, primarily in the northern on-site reaches of Santa Maria Creek. One bullfrog was noted in the central portion of Santa Maria Creek within the preserve.

### *Adaptive Management Recommendations*

Santa Maria Creek supports adequate instream habitat for breeding arroyo toad; however, threats such as invasive non-native plant species and exotic predators may diminish the success of the species over time without effective management. Of primary concern is the prevalence of tamarisk throughout the otherwise pristine breeding habitat located in the northern portion of the creek. Though this species is present at relatively low densities throughout the channel, targeted removal of tamarisk is highly recommended consistent with Early Detection Rapid Response practices, which entails targeting localized invasive non-native plant populations before they become widely established. In this case, tamarisk removal is recommended while a majority of the individuals are relatively small and easily controlled, and before the species alters the hydrology or composition of the currently occupied breeding habitat. Hand removal is recommended as the primary control method due to the site's location in active arroyo toad breeding habitat. Care should be taken to remove the underground rhizomes while limiting disturbance to the channel and breeding margins. Removal should occur outside of the arroyo toad breeding season (March – June) to avoid impacts (ESA and ICF 2015). Large tamarisk (e.g., greater than 10 feet high) may be cut and daubed with an herbicide appropriate for aquatic use on a case-by-case basis as necessary.

Additionally, the County should assess the feasibility of removing the giant reed on-site, consistent with Early Detection Rapid Response Practices. Removal of this species should consist of cutting the species with hand tools (e.g., machetes) and spraying new growth using an appropriate herbicide for aquatic use. However, control may not be feasible due to the lack of accessibility of this area and is a lesser priority due to the site's location downstream of the arroyo toad population documented on-site.

Though only one bullfrog individual was noted during surveys, a continuation of bullfrog eradication may also be warranted to ensure success of the current eradication program. Eradication should be accomplished through targeted removal of breeding size adult bullfrogs to avoid and minimize impacts to aquatic species and habitats. Removal of red-swamp crayfish may occur concurrently as desired by DPR staff, though numbers do not appear high enough to warrant a dedicated removal effort at this time.

Lastly, the County should continue ongoing rangeland management practices that keep the cattle outside of Santa Maria Creek outside of the arroyo toad breeding season, as this appears to be an

effective measure for protecting arroyo toad and the quality of the creek. Grazing within Santa Maria Creek during the breeding season has the potential to result in trampling, as well as erosion and sedimentation, which may degrade the habitat over time. Strategic thinning of vegetation adjacent to suitable margins and pools may be an alternative to grazing for enhancing breeding habitat in the southern reaches of Santa Maria Creek on-site.

## 4.3 Tricolored Blackbird

The 2019 survey focused on areas identified as suitable nesting habitat during 2018 monitoring efforts, which consisted of effluent ponds within the RMWD property and along Santa Maria Creek within Ramona Grasslands Preserve (Figure 8). The effluent ponds located outside Ramona Grasslands Preserve, on RMWD lands, were documented during 2017 monitoring efforts as supporting nesting colonies. Low suitable tricolored blackbird nesting habitat occurs along Santa Maria Creek, which includes the segment just west of Rangeland Road as well as the northern segment, where a possible nesting area was documented during 2018 monitoring efforts. The habitat has low suitability because of limited thick, protective substrate/vegetation where tricolored blackbirds could nest. Most of the habitat is covered in mule fat thicket, a type of vegetation cover that can be utilized by tricolored blackbirds for nesting; however, the mule fat is neither thick nor dense enough to protect a nesting colony from predators. Due to the consistent rains throughout the spring of 2019, Santa Maria Creek was also flowing with water and there were no areas that had pooled to create tricolored blackbird habitat. The stock pond located within the Preserve, adjacent to the trail system, had no vegetation immediately surrounding the pond where tricolored blackbirds could nest; therefore, the stock pond on the Preserve is currently not suitable for nesting tricolored blackbirds. This pond was also assessed during 2017 and 2018 monitoring efforts for tricolored blackbird breeding habitat enhancement but was deemed too small (0.7 acres) and likely infeasible due to cattle grazing on the Preserve.

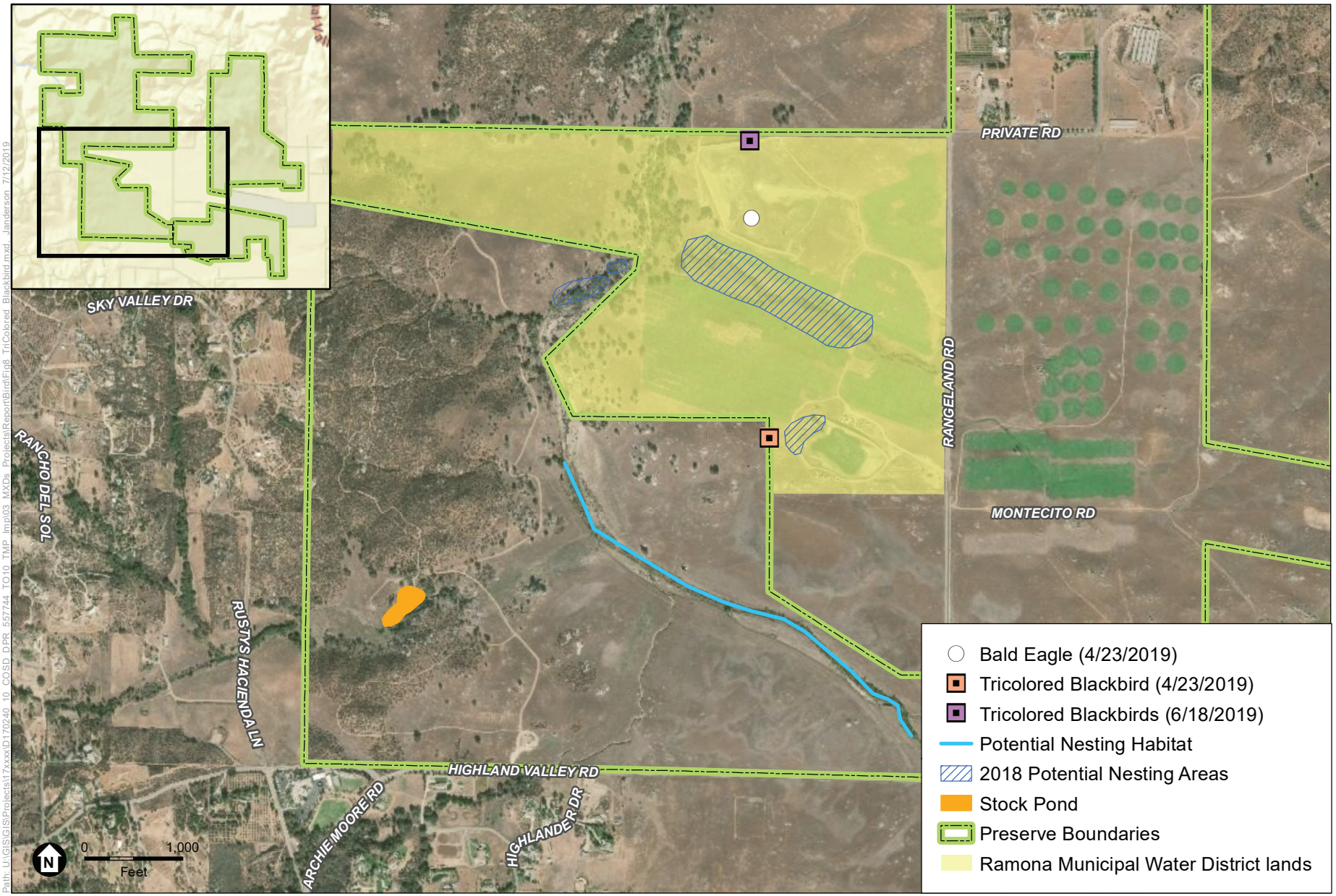
During April 23, 2019 survey, 12 tricolored blackbird individuals were observed within the effluent pond just east of the Ramona Grasslands Preserve boundary and north of Santa Maria Creek on adjacent RMWD property (**Figure 8**). An adult male individual was seen at the off-site effluent pond adjacent to the Preserve. Additionally, at least two individuals were observed foraging with a flock of red-winged blackbirds during burrowing owl surveys on June 18, 2019. The flock was observed foraging along the southern side of the dirt access road and along the north bank of the northern-most effluent pond. They perched on the fence between the Preserve and RMWD property but were mostly foraging on RMWD lands (**Figure 8**).

There is low suitable nesting habitat for tricolored blackbird both on and off the Preserve. The Santa Maria Creek is comprised primarily of mule fat thickets and does not hold riparian vegetation that is either dense or thick enough to support nesting as it would not prevent predators from infiltrating the habitat. The off-site effluent pond on RMWD property where individuals were observed, had bulrush present (which could potentially provide nesting habitat), but the majority of vegetation had recently been cut to allow access to the water. There was a very small patch that was untouched by disturbance within this effluent pond, which held a few nesting red-winged blackbirds (*Agelaius phoeniceus*), but the area was not large enough to support tricolored

blackbirds. However, individuals were observed foraging in the grasslands within the Preserve, therefore, foraging habitat for tricolored blackbirds is present on the Preserve.

### *Adaptive Management Recommendations*

The Targeted Monitoring Plan management goal for tricolored blackbirds is to maintain suitable foraging and nesting habitat on Ramona Grasslands Preserve (ESA and ICF 2015). Based on the habitat and threats assessment, the Preserve has low potential for tricolored blackbird nesting habitat (**Appendix E**). There are no wetland/marsh areas with protective substrate/vegetation on the Preserve within a large enough area that can support a breeding colony of tricolored blackbirds. Ramona Grasslands Preserve still provides suitable foraging habitat but currently lacks moderate- to high-quality nesting habitat. No adaptive management recommendations are suggested at this time for the Preserve due to the lack of moderate- to high-quality tricolored blackbird nesting habitat.




SOURCE: ESRI; ESA 2019

COSD DPR 557744_TO 10 TMP Implementation

**Figure 8**
Tricolored Blackbird Monitoring Results – Ramona Grasslands Preserve

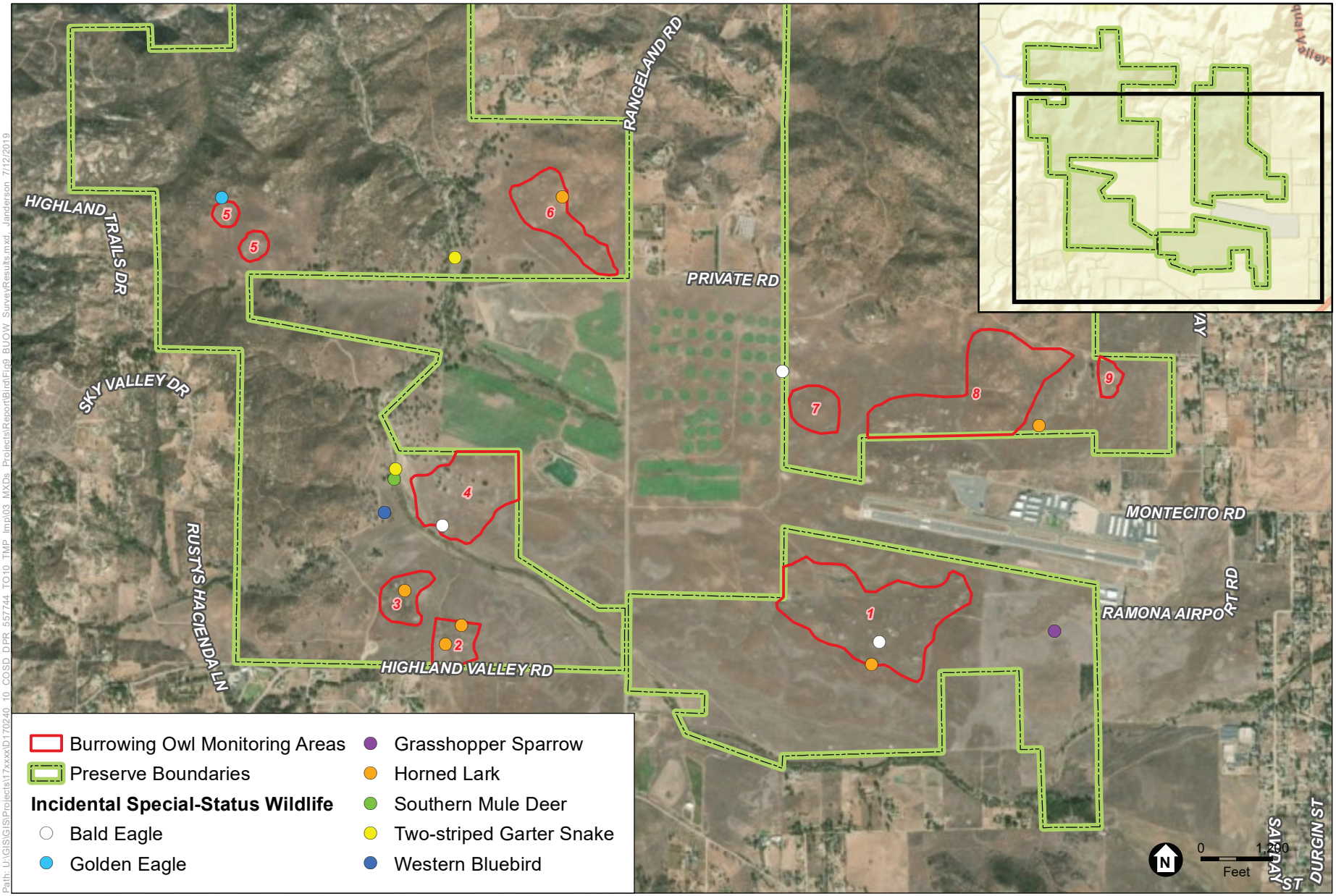
# 4.4 Burrowing Owl

During the 2019 breeding burrowing owl surveys within Ramona Grasslands Preserve, no burrowing owls, sign of burrowing owls, and/or burrows were observed. The habitat and threats assessment survey included an evaluation of the vegetation as it pertains to the needs of the burrowing owl (e.g., native or non-native vegetation, vegetation height) (**Appendix E**). During the first survey in March, the grass height was relatively short (between 4 and 12 inches) providing conditions suitable for high detectability for owls, their burrow, and/or their sign. Due to growth of summer annual plants, the vegetation was taller during the surveys from April through June (between 16 and 36 inches) providing low detectability for owls, their burrows, and/or their sign.

Monitoring polygon #1 had very few ground squirrel observations or burrow complexes; other small mammal burrows (gophers and cottontail) were present but sparse. This polygon had the highest concentration of rocky outcrops. Ground squirrels were only observed in the northern portion of the polygon where the rocky outcrops were minimal and the grasslands habitat started. Polygon #2 and #3 had a high concentration of ground squirrel colonies with minimal rocky outcrops, and suitable grassland habitat for burrowing owl. Polygon #4 consisted of both grassland and oak tree woodland habitat. The ground squirrel colonies were concentrated around the rocky outcrops, usually underneath the canopy of an individual coast live oak. However, the highest concentration was in the northern portion of the monitoring polygon just before the preserve boundary. Polygon #5 and #6 had multiple ground squirrel colonies within their rolling grasslands landscape. These monitoring polygons have ideal suitable habitat for burrowing owl. Polygons #7, #8, and #9 were characterized by relatively flat grasslands and multiple ground squirrel colonies. Polygon #8 had the highest concentration of burrows and the majority of them had active ground squirrel activity, particularly in the northern portion of the polygon. Though no burrowing owls or their sign were observed, multiple great horned owl (*Bubo virginianus*) and/or barn owl (*Tyto alba*) pellets were observed throughout the monitoring polygons, particularly those with rocky outcrops. **Figure 9** shows the location of all monitoring areas. Representative photographs of each survey polygon are presented in **Appendix F**.

### *Adaptive Management Recommendations*

The TMP management goal for burrowing owl is to maintain suitable foraging and nesting habitat for burrowing owl on Ramona Grasslands Preserve (ESA and ICF 2015). Breeding burrowing owl surveys are currently planned to continue in 2020 and 2021 per the recommendations in the TMP, to document and monitor the presence and status of burrowing owl during the breeding season. However, a reduced monitoring frequency is recommended based on the lack of a breeding population at Ramona Grasslands Preserve based on surveys performed in 2016, 2018, and 2019. Due to the lack of a breeding population on-site, adaptive management measures for this species isn't necessary. However, if DPR wishes to improve habitat suitability for breeding burrowing owls, reducing vegetation height, especially during wet years like in 2019, would improve the ability of burrowing owls to locate burrows and provide further visibility to detect potential predators. Cattle grazing could be increased to reduce vegetation height in revised burrowing owl monitoring areas 2, 3, and 5 (**Figure 9**). However, vegetation management in proposed monitoring polygons #1, 4, 7, 8, and 9 (grazing management units 2A, 2B, and 3A) should continue to follow the species-specific recommendations for Stephens' kangaroo rat, given the presence of occupied habitat.




SOURCE: ESRI; ESA 2019

COSD DPR 557744_TO 10 TMP Implementation

**Figure 9**
Burrowing Owl Monitoring Results – Ramona Grasslands Preserve

ESA

Additionally, based on the 2019 breeding burrowing owl surveys, seven of the nine existing survey polygons are recommended to be modified to maximize the potential to detect and locate burrowing owls, their burrows, and/or their sign on the Preserve during future surveys (**Figure 10**). Proposed revisions to monitoring area polygons considered the presence and sign of large raptors as well as trees, which can act as raptor perch sites, thus making these areas unlikely to support burrowing owls. Polygons were adjusted to areas with more open grassland, increased squirrel activity, and less tree cover. Polygon #7 has burrows that are in good condition for burrowing owl usage but were mainly inactive. However, given the proximity of this polygon to the known bald eagle nest and the time of year the breeding burrowing owl surveys need to be completed, it is recommended that this polygon be removed to reduce potential impacts to the bald eagle nest site. No impacts to the bald eagle nest site occurred due to breeding burrowing owl surveys because the nest site had failed early in the season prior to surveys starting in March 2019, as determined by the ESA biologists that performed the burrowing owl surveys.

# 4.5 Coastal Cactus Wren

## 4.5.1 Avian Point Counts

Forty-nine avian species were observed or detected during the cactus wren avian point count surveys on the central property of Lakeside Linkage Preserve in 2019 (**Table 8**). Four special-status species were observed and/or detected including one pair of coastal California gnatcatchers (*Polioptila californica californica*) with fledglings (**Figure 11**). No coastal cactus wrens were detected during avian point count surveys; however, one individual was observed after point count surveys were completed (Figure 11). The following five species were the most common species observed during avian point surveys and typically occur in coastal sage scrub habitat and urban surroundings: California quail, house finch, California towhee, mourning dove, and Anna's hummingbird.

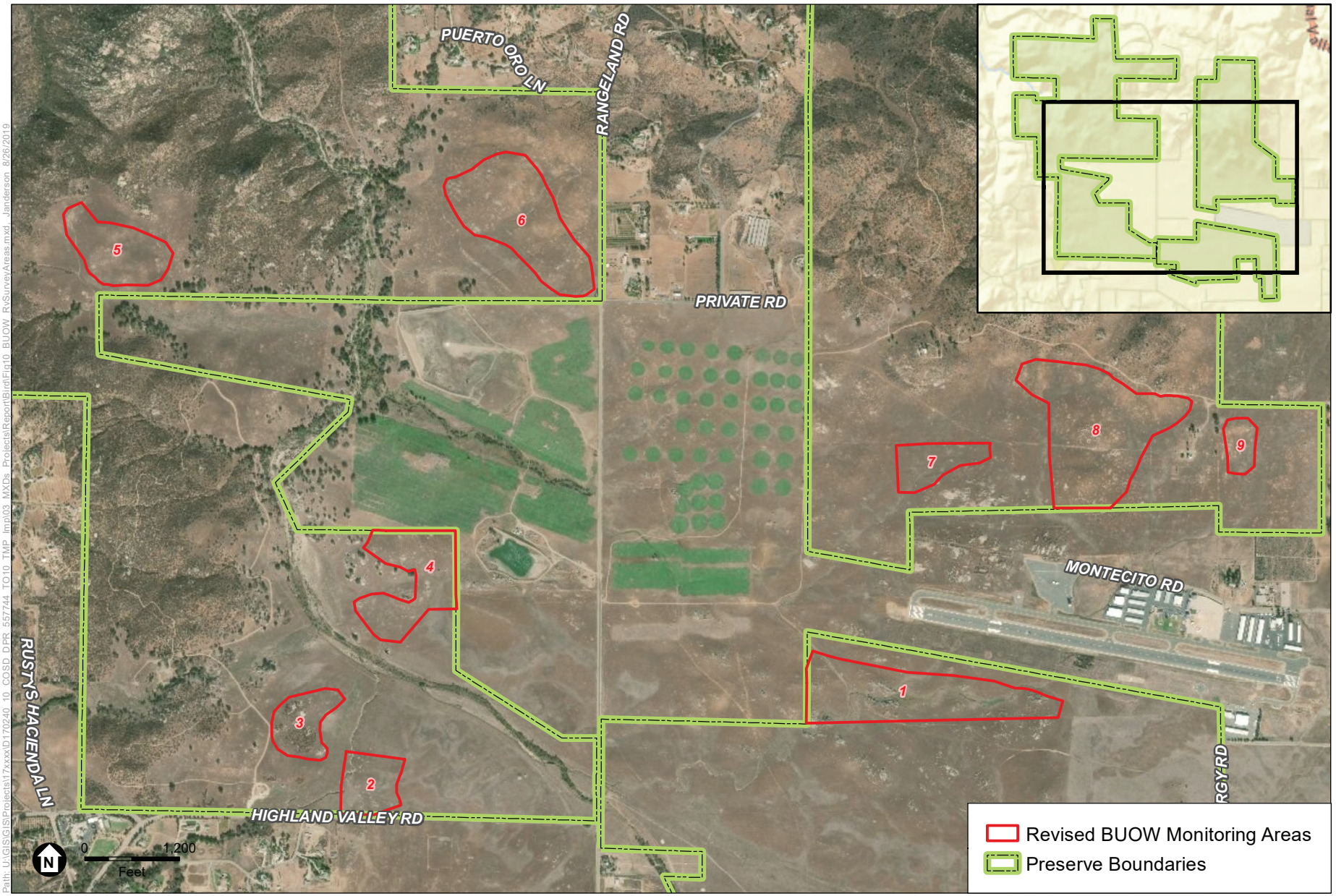
Although no coastal cactus wrens were observed or detected during avian point count surveys, one silent individual was observed in the restoration site 1 (R1) on the first survey. No coastal cactus wrens were heard during the surveys or walking in-between the avian point count stations. At R1, multiple cactus wren nests were observed, and another nest was observed off-site (**Figure 11**). There seemed to be no preference as to what species of cactus (coast prickly pear [*Opuntia littoralis*] or coast cholla [*Cylindropuntia prolifera*]), the individual or pair had used. During the June 2019 survey after the avian point count at R1, a nest with a rim of whitewash at the nest entrance was observed indicating the nest may have been successful at this location. Point count data sheets can be found in **Appendix G**. There was a patch of cactus off-site and west of the Preserve that held a singing coastal cactus wren for years based on previous surveys (ICF 2018), but this individual was not heard or observed during the surveys. However, one nest was seen via binoculars and approximately recorded (**Figure 11**).

**TABLE 8**
**CACTUS WREN AVIAN POINT COUNT SURVEY RESULTS**

| Common Name by Family | Scientific Name | 3/12/2018 | 4/12/2019 | 5/17/2019 | 6/12/2019 | 7/03/2019 | Special-Status Listing |
|---|---|---|---|---|---|---|---|
| ***Anatidae*** | | | | | | | |
| Mallard | *Anas platyrhynchos* | - | X | - | - | - | |
| ***Odontophoridae*** | | | | | | | |
| California Quail | *Callipepla californica* | X | X | X | X | X | |
| ***Phasianidae*** | | | | | | | |
| Indian Peafowl | *Pavo cristatus* | X | X | X | X | X | |
| ***Columbidae*** | | | | | | | |
| Rock Pigeon | *Columba livia* | X | - | X | - | X | |
| Mourning Dove | *Zenaida macroura* | X | X | X | X | X | |
| ***Trochilidae*** | | | | | | | |
| Anna's Hummingbird | *Calypte anna* | X | X | X | X | X | |
| Costa's Hummingbird | *Calypte costae* | - | X | X | X | X | |
| Rufous/Allen's Hummingbird | *Selasphorus rufus/sasin* | - | X | - | - | - | |
| Hummingbird sp. | *Trochilidae sp.* | - | X | - | - | - | |
| ***Cathartidae*** | | | | | | | |
| Turkey Vulture | *Cathartes aura* | - | - | X | - | - | MSCP South County |
| ***Accipitridae*** | | | | | | | |
| Cooper's Hawk | *Accipiter cooperii* | X | - | X | - | - | |
| Red-shouldered Hawk | *Buteo lineatus* | - | X | - | - | X | |
| Red-tailed Hawk | *Buteo jamaicensis* | X | X | - | - | X | |
| ***Picidae*** | | | | | | | |
| Northern Flicker | *Colaptes auratus* | X | - | - | - | - | |
| Acorn Woodpecker | *Melanerpes formicivorus* | - | - | - | - | X | |
| Nuttall's Woodpecker | *Dryobates nuttallii* | X | - | - | X | - | |
| ***Psittacidae*** | | | | | | | |
| Amazona sp. | *Amazona sp.* | - | X | | | | |
| ***Tyrannidae*** | | | | | | | |
| Ash-throated Flycatcher | *Myiarchus cinerascens* | - | - | - | - | X | |
| Black Phoebe | *Sayornis nigricans* | X | X | X | X | X | |
| Cassin's Kingbird | *Tyrannus vociferans* | X | X | X | - | X | |
| Say's Phoebe | *Sayornis saya* | - | - | X | | - | |
| Western Kingbird | *Tyrannus verticalis* | - | - | X | | - | |
| ***Corvidae*** | | | | | | | |
| American Crow | *Corvus brachyrhynchos* | X | X | X | X | X | |
| Common Raven | *Corvus corax* | X | X | X | X | - | |

| Common Name by Family | Scientific Name | 3/12/2018 | 4/12/2019 | 5/17/2019 | 6/12/2019 | 7/03/2019 | Special-Status Listing |
|---|---|---|---|---|---|---|---|
| California Scrub-Jay | *Aphelocoma californica* | X | X | X | - | X | |
| ***Hirundinidae*** | | | | | | | |
| Cliff Swallow | *Petrochelidon pyrrhonota* | - | - | - | - | X | |
| Swallow sp. | Unknown Swallow | - | - | X | - | - | |
| ***Aegithalidae*** | | | | | | | |
| Bushtit | *Psaltriparus minimus* | X | X | X | X | X | |
| ***Troglodytidae*** | | | | | | | |
| Bewick's Wren | *Thryomanes bewickii* | X | X | X | X | X | |
| ***Polioptilidae*** | | | | | | | |
| Coastal California Gnatcatcher | *Polioptila californica californica* | - | X | X | X | X | Federally threatened; MSCP South County |
| ***Paradoxornithidae*** | | | | | | | |
| Wrentit | *Chamaea fasciata* | X | X | X | X | X | |
| ***Turdidae*** | | | | | | | |
| Western Bluebird | *Sialia mexicana* | X | - | - | | X | MSCP South County |
| ***Mimidae*** | | | | | | | |
| California Thrasher | *Toxostoma redivivum* | X | X | X | X | X | |
| Northern Mockingbird | *Mimus polyglottos* | X | X | X | X | X | |
| ***Sturnidae*** | | | | | | | |
| European Starling | *Sturnus vulgaris* | X | X | - | X | - | |
| ***Bombycillidae*** | | | | | | | |
| Cedar Waxwing | *Bombycilla cedrorum* | - | X | X | - | - | |
| ***Passeridae*** | | | | | | | |
| House Sparrow | *Passer domesticus* | - | - | X | | X | |
| ***Fringillidae*** | | | | | | | |
| House Finch | *Haemorhous mexicanus* | X | X | X | X | X | |
| Lesser Goldfinch | *Spinus psaltria* | X | X | X | | X | |
| ***Passerellidae*** | | | | | | | |
| California Towhee | *Melozone crissalis* | X | X | X | X | X | |
| Southern California Rufous-crowned Sparrow | *Aimophila ruficeps canescens* | X | - | | | | CDFW Species of Special Concern; MSCP South County |
| Song Sparrow | *Melospiza melodia* | - | X | | | | |
| Spotted Towhee | *Pipilo maculatus* | X | X | X | X | X | |
| White-crowned Sparrow | *Zonotrichia leucophrys* | X | X | - | - | - | |
| Lincoln's Sparrow | *Melospiza lincolnii* | X | - | | | | |
| ***Icteridae*** | | | | | | | |

| Common Name by Family | Scientific Name | 3/12/2018 | 4/12/2019 | 5/17/2019 | 6/12/2019 | 7/03/2019 | Special-Status Listing |
|---|---|---|---|---|---|---|---|
| Hooded Oriole | *Icterus cucullatus* | - | - | - | X | X | |
| ***Parulidae*** | | | | | | | |
| Orange-crowned Warbler | *Oreothlypis celata* | X | X | - | - | - | |
| Yellow-rumped Warbler | *Setophaga coronata* | X | - | - | - | - | |
| ***Cardinalidae*** | | | | | | | |
| Black-headed Grosbeak | *Pheucticus melanocephalus* | - | X | - | X | X | |
| **Total Number of Species Observed** | **49** | | | | | | |

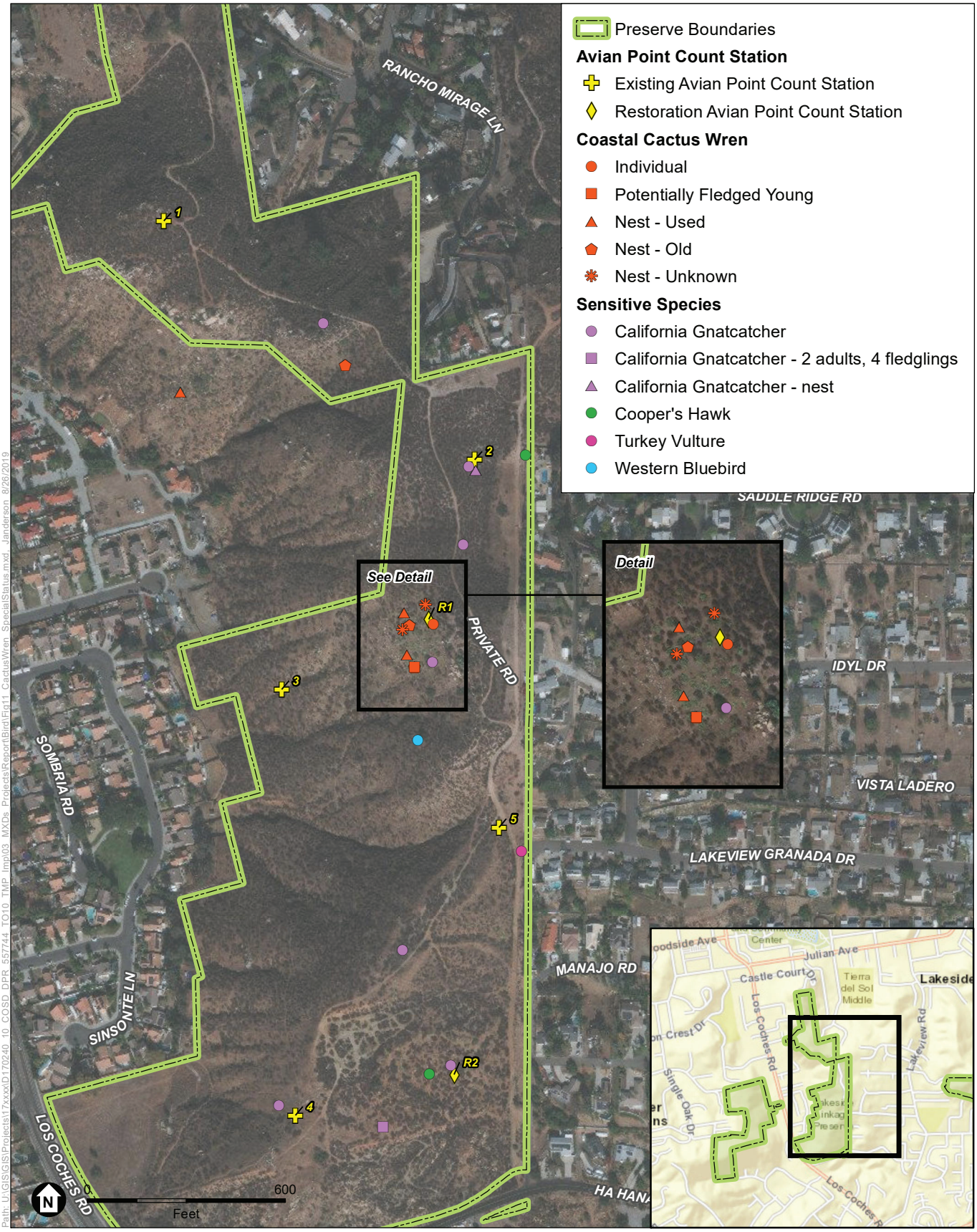



SOURCE: ESRI; ESA 2019

COSD DPR 557744_TO 10 TMP Implementation

**Figure 10**
Proposed Revisions to Burrowing Owl Monitoring Areas– Ramona Grasslands Preserve

ESA




SOURCE: ESRI; ESA 2019

COSD DPR 557744_TO 10 TMP Implementation

**Figure 11**
Cactus Wren Monitoring Results – Lakeside Linkage Preserve

ESA

## 4.5.2 Habitat and Threats Assessment Monitoring

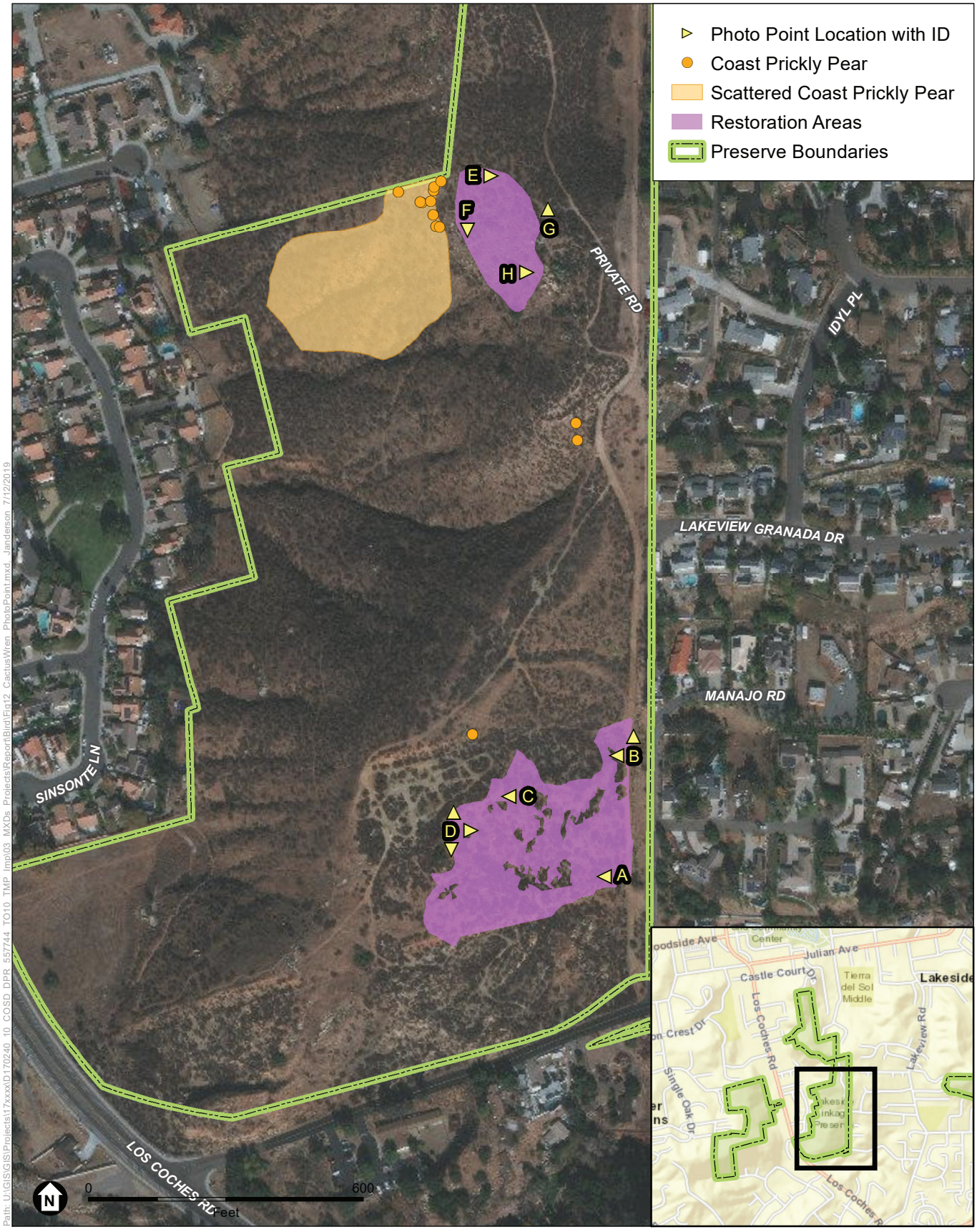
Beginning in 2011, photo points were created, and photo monitoring was conducted for the northern and southern restoration areas on the central property of Lakeside Linkage Preserve. The photo monitoring has been conducted from 2011–2016, 2018, and continued in 2019. Images from 2011–2016, 2018, and 2019 are shown in **Appendix H**. Locations of restoration areas and related photo points are shown in **Figure 12**.

The northern restoration area was in fair condition. There was no unauthorized access, as was seen in past years, and the cactus has grown to a height and density which cactus wrens can now use to build nests (both roost and breeding nests). Compared to previous years when no cactus wren nests were documented within the northern restoration area, 2019 had eight nests observed. One of these nests appeared to have fledged young and some of the other nests were in very good condition. Due to the wet late winter and spring, the invasive non-native plants were greater than 50 percent as observed in the photo monitoring. Multiple species, both native and non-native, were growing among the cactus and were fairly mature. This non-cactus vegetation creates "ladders," which allows more accessibility for predators to enter and exit cactus wren nests. Multiple ladders were in the majority of the cactus plants, with the densest cacti holding cactus wren nests. See **Appendix E** for the habitat and threats assessment field forms.

The southern restoration area was in good condition but with more of the same conditions as the northern restoration area; however, minimal unauthorized walking trails and vegetation clearing appeared to have occurred in this restoration area.

### *Adaptive Management Recommendations*

The TMP management goal for coastal cactus wren is to maintain suitable nesting habitat for coastal cactus wren on the Lakeside Linkage Preserve (ESA and ICF 2015). One adaptive management recommendation is to remove the native and non-native vegetation within established cacti at both restoration sites. Removing ladder plants would reduce predation at cactus wren nest sites. Priority should be to remove ladder plants at the northern restoration site because coastal cactus wren and their nests have been documented in this location. The vegetation is well established and will take time to remove from in-between the cacti. Care should be taken to ensure no damage to established cacti and cactus wren nests occurs during vegetation removal activities. Vegetation removal activities should occur outside of the nesting season (February 15–August 15) (County of San Diego 2010).




SOURCE: ESRI; ESA 2019

COSD DPR 557744_TO 10 TMP Implementation

**Figure 12**
Cactus Wren Photo Monitoring and Restoration Areas – Lakeside Linkage Preserve

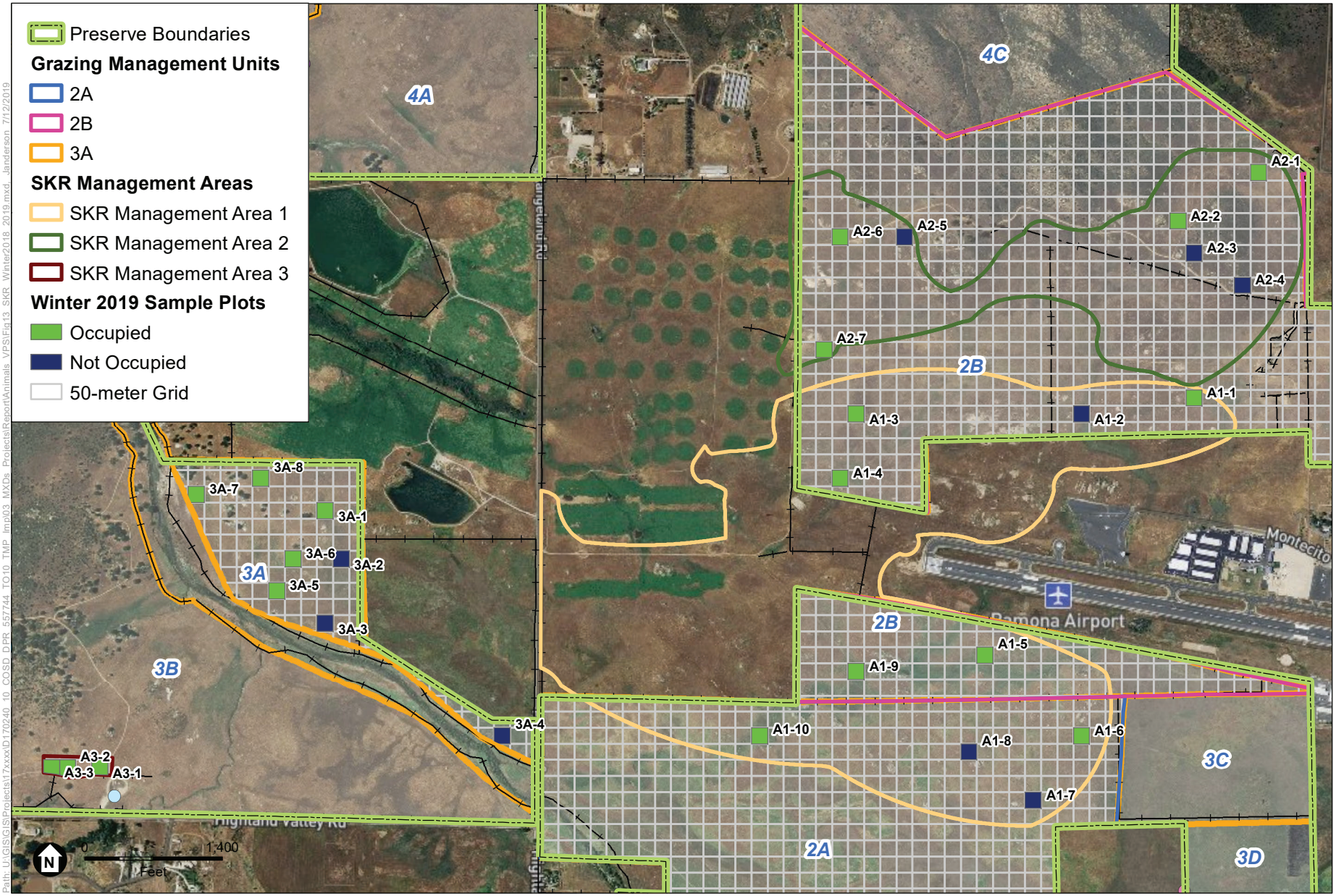
# 4.6 Stephens' Kangaroo Rat

Habitat assessments were conducted at 28 sample plots within Ramona Grasslands Preserve. Of these plots, 19 were determined to be occupied by SKR and nine were determined to be unoccupied (**Figure 13**, **Appendix I**). Each plot was rated for SKR potential, and in total, 21 sample plots were characterized as having a high potential, one was characterized as having a medium potential, and six were characterized as having a low potential (**Table 9**). None of the sample plots were found to have no potential for SKR.

**TABLE 9**
**SKR OCCUPANCY RESULTS AND POTENTIAL FOR OCCUPANCY**

| Occupancy/Potential | | # of Sample Plots |
|---|---|---|
| SKR Occupancy | Occupied | 19 |
| | Unoccupied | 9 |
| SKR Potential | High | 21 |
| | Medium | 1 |
| | Low | 6 |
| | No | 0 |

Overall, habitat suitability is high for SKR within SKR monitoring areas (**Table 10**). These findings may be partly attributed to the previous monitoring period having occurred during an extended drought in the greater San Diego region. Although drought can artificially appear beneficial for SKR suitability because it is likely to decrease vegetation density and height, it ultimately reduces food availability over time and can increase dead plant litter that may increase obstruction factors. Extended droughts, in particular, have the potential to significantly reduce food availability for SKR. The winter of 2019 was marked by above-average rainfall and several significant rain events. In an ecological regime that is free of anthropogenic influences such as cattle grazing, consistently higher rainfall could serve to reduce habitat suitability for SKR by promoting vegetation cover that excludes SKR. However, all of the SKR monitoring areas are actively grazed, thereby reducing significant vegetative growth during years of above-average rainfall. In addition, the majority of the annual vegetation present in most of the SKR monitoring plots consisted of broadleaf filaree a low-growing annual plant that facilitates SKR movement as well as providing a food source. Taller growths of annual vegetation that may preclude or reduce SKR movement were generally not observed. Additional information, including representative photographs, can be found in **Appendix J**, *Stephens' Kangaroo Rat Monitoring Report*.




SOURCE: Digital Globe 2017

COSD DPR 557744_TO 10 TMP Implementation

**Figure 13**

Stephen's Kangaroo Rat Monitoring Results – Ramona Grasslands Preserve

ESA

**TABLE 10**
**SKR HABITAT ASSESSMENT SUMMARY**

| | Winter 2019 | | | | | | | | | 2017–2018 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Plot ID** | **% Bare Ground** | **Living Herb Density** | **Shrub/Tree Density (%)** | **Plant Litter (Dead) (%)** | **Gopher/ Ground Squirrel Density** | **Obstruction Factor** | ***Potential K-Rat Sign** | **SKR Occupancy Determination** | **Rating†** | **Rating†** |
| A1-1 | 5-25 | Low | 0 | 5-25 | Low/High | Low | B, S | Occupied | High** | High** |
| A1-2 | 0-5 | Low | 0 | 5-25 | Low/Low | Low | None | Not Occupied | Medium | Medium |
| A1-3 | 0-5 | Low | 0 | 5-25 | Low/Medium | Low | B, S | Occupied | High** | High** |
| A1-4 | 0-5 | Low | 0 | 5-25 | Low/Low | Low | B | Occupied | High** | High** |
| A1-5 | 0-5 | Low | 0-5 | 0-5 | Low/Low | Low | B, S, T | Occupied | High** | High** |
| A1-6 | 0-5 | Low | 0 | 0-5 | Low/Low | Low | B, S | Occupied | High** | High** |
| A1-7 | 0-5 | Low | 0 | 0-5 | Medium/Low | Medium | B | Not Occupied | High** | None |
| A1-8 | 0-5 | Low | 0 | 5-25 | Low/Low | Low | None | Not Occupied | High** | None |
| A1-9 | 0-5 | Low | 0 | 0-5 | Medium/Low | Medium | B, S | Occupied | High** | Medium** |
| A1-10 | 0-5 | Low | 0-5 | 5-25 | Low/Low | Medium | B, S, TV | Occupied | High** | None |
| A2-1 | 0-5 | Low | 0-5 | 5-25 | Low/High | Low | B, S | Occupied | High** | Medium** |
| A2-2 | 0-5 | Low | 0-5 | 5-25 | Low/High | Low | B, S | Occupied | High** | Medium |
| A2-3 | 0-5 | Medium | 25-50 | 5-25 | Low/Low | Medium | B, S | Not Occupied | Low | Low |
| A2-4 | 0-5 | Medium | 25-50 | 5-25 | Low/Low | Medium | B, S | Not Occupied | Low | Low |
| A2-5 | 0-5 | Medium | 5-25 | 5-25 | Low/Low | Low | None | Not Occupied | Low | Low |
| A2-6 | 0-5 | Low | 0-5 | 5-25 | Low/Low | Low | B, S | Occupied | High** | High** |
| A2-7 | 5-25 | Low | 0 | 5-25 | Low/Medium | Low | B, S | Occupied | High** | High** |
| A3-1 | 0-5 | Low | 0 | 0-5 | Low/Medium | Low | B, S | Occupied | High** | High** |
| A3-2 | 0-5 | Low | 0 | 0-5 | Low/High | Low | B, S | Occupied | High** | Low |
| A3-3 | 0-5 | Low | 0 | 0-5 | Low/High | Low | B, S | Occupied | High** | Low |
| 3A-1 | 0-5 | Low | 0 | 5-25 | High/High | Low | B, S | Occupied | High** | Medium** |
| 3A-2 | 0-5 | Medium | 0 | 5-25 | Low/Low | Medium | None | Not Occupied | Low | None |
| 3A-3 | 0-5 | Medium | 0-5 | 0-5 | Low/Low | Low | None | Not Occupied | Low | Low |
| 3A-4 | 0-5 | Low | 0 | 0-5 | Low/Low | Medium | None | Not Occupied | Low | None |
| 3A-5 | 0-5 | Low | 5-25 | 0-5 | Low/Low | Low | B, S | Occupied | High** | Medium |
| 3A-6 | 0-5 | Low | 0-5 | 0-5 | Low/High | Low | B, S | Occupied | High** | High** |
| 3A-7 | 0-5 | Medium | 0-5 | 5-25 | High/High | Low | B | Occupied | High** | High** |
| 3A-8 | 0-5 | Low | 0 | 0-5 | Low/High | Low | B, S | Occupied | High** | High** |

* = Potential Kangaroo Rat Sign: B=Burrow(s); S=Scat; T=Tracks; TD=Tail Drag; TV=Trails in Vegetation; O=Other
** = Exhibited habitat conditions and observed sign indicates plot is likely occupied by SKR.
† = Estimated potential for SKR occupancy based on habitat community condition and observed kangaroo rat sign.

### *Adaptive Management Recommendations*

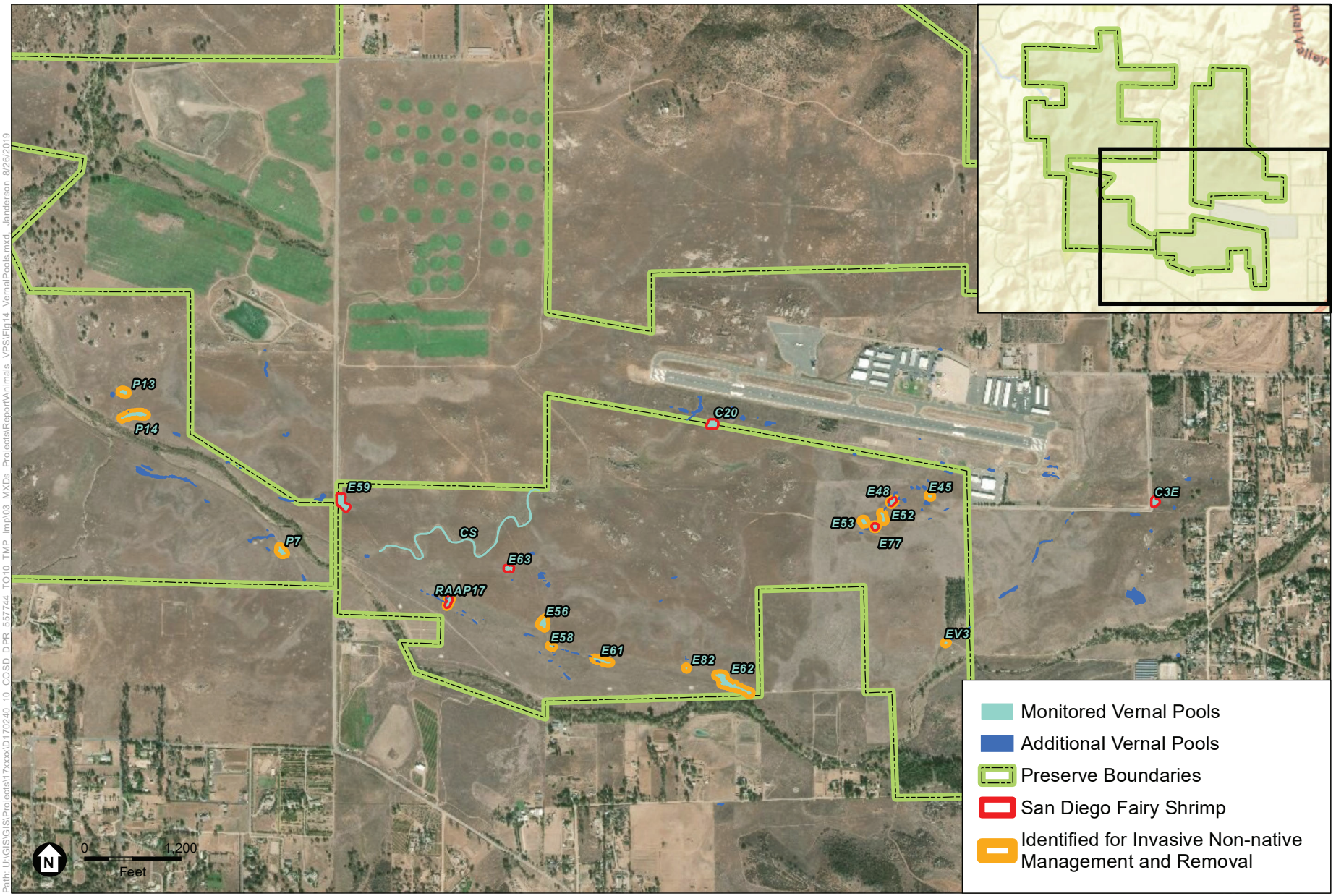
To enable consistent data comparisons on a year-to-year basis, it is recommended that future monitoring efforts are conducted during the fall dry season, and as recommended by the TMP, during the fall months of October through December. Annual weather patterns in the greater San Diego region are known to have significant variability in rainfall quantities, while generally dry conditions prevail for the majority of the year. This rainfall variability can cause significant, albeit temporary, changes in herb density, dead plant litter, bare ground, and obstruction factors that tend to be most dramatic when comparing site conditions during the wet season. Dry season monitoring is likely to yield a more consistent comparison of the assessment areas. It is recommended that cattle grazing within SKR Management Areas continue at the Ramona Grasslands Preserve. Cattle grazing assists in keeping dead plant litter to a minimum, which allows for SKR movement, facilitating foraging and breeding behaviors.

## 4.7 Vernal Pool/Alkali Playa

Rainfall in 2019 was above average, with 20.14 inches of rain reported by Ramona Airport during the hydrologic period of July 1, 2018, to June 30, 2019 (NOAA 2019). The largest storm events occurred between October 2018 and February 2019 and accounted for 12.63 inches of rain.

Overall, the pools surveyed as part of the qualitative monitoring effort appear to be retaining much of their functionality as vernal pools. This is evidenced by the presence of USACE vernal pool floral indicator species at 16 of the 20 pools monitored. San Diego fairy shrimp (*Branchinecta sandiegonensis*), which is included in the USACE faunal indicator species list, was recorded at 7 of the 20 pools (**Figure 14**). It should be noted that despite no observations of floral vernal pool indicator species, pool raap17 was observed to support San Diego fairy shrimp, where this species had not been previously recorded, as well as Coulter's saltbush (*Atriplex coulteri*), a target vernal pool species of the TMP. Therefore, 17 of the 20 pools monitored were observed to support at least one USACE indicator species. Starwort (*Callitriche* sp.) and woolly marbles (*Psillocarphus brevissimus* var. *brevissimus*) were the most abundant indicator species observed, recorded at 11 and 15 pools, respectively. Starwort was observed only during the February 2019 survey period during near maximum inundation for pools, while woolly marbles was observed only during the May 2019 survey period. Special-status indicator species spreading navarretia (*Navarretia fossalis*), Parish's brittlescale (*Atriplex parishii*), and San Diego button celery (*Eryngium aristulatum* var. *parishii*) were not observed in any of the 20 sampled vernal pools.

Grass poly (*Lythrum hyssopifolia*) and Italian rye grass were both abundant invasive non-native species throughout. Grass poly was identified globally within the surveyed pools, while Italian fescue was observed in 18 of 20 pools. Additionally, algal growth was noted to varying degrees in 11 of the 20 sampled pools. The proliferation of algae may be encouraged via the presence of fertilizers, herbicides, and/or pesticides that may be present due to agricultural applications on or near sampled locations, though water quality testing was not undertaken for this survey to determine such presence or absence.




SOURCE: ESRI; ESA 2019

COSD DPR 557744_TO 10 TMP Implementation

**Figure 14**
Vernal Pool Monitoring Results – Ramona Grasslands Preserve

ESA

Pools e56, c58, c82, e62, e45, e77, e53, e52, and e48 were observed to be largely dominated by non-native grasses through both survey periods. Non-native grass cover within these pools ranged from 80 percent to 100 percent total ground cover. The most abundant grass observed within the pool boundaries was seaside barley (*Hordeum marinum*), which could out-compete native vernal pool species; however, it is generally not considered tolerant of inundation. This is evidenced by general absence of the species from expected deeper portions of pools. However, nearly all pools were also observed to support more inundation-tolerant species such as Italian rye grass, annual beard-grass (*Polypogon monspeliensis*), and occasionally black mustard (*Brassica nigra*). Vernal pool indicators within these pools were generally restricted to areas where grasses had been excluded due to water depth/inundation duration, or isolated pockets in the understory of grasses.

Summarized observations of qualitative vernal pool monitoring, including information on water quality, edge effects, and disturbances, are included in **Table 11**. Observed vernal pool indicator plant species and invasive non-native plant species are summarized in **Table 12**. Additional information, including representative photographs, can be found in **Appendix K**, *Aquatic Phase Qualitative Monitoring of Vernal Pools Memo*. Data sheets can be found in **Appendix L**.

### *Adaptive Management Recommendations*

Annual vegetation management, as occurred during this reporting period, is recommended to ensure that competitive exclusion does not result from invasive non-native plants and thatch. Invasive non-native plants and resulting thatch at 15 of the 20 surveyed pools were identified for invasive non-native management and removal. All pools with the exception of Cagney Swale (cs), c3e, c20, e59, and e63 had an invasive non-native cover of approximately 20 percent or greater and were determined to benefit from invasive species management (Figure 14). Invasive non-native plants were removed from these 15 pools in late summer 2019; methods for removal followed those in the TMP (ESA and ICF 2015) and are detailed in Section 3.8.1 of this report. Performing this task in late summer allowed vernal pools to fully dry out and the majority of native plants to seed and senesce. The few native plant species that were observed, such as wooly marbles and iris-leaf rush (*Juncus xiphioides*), were carefully avoided. It is recommended that pools with higher than 20 percent invasive non-native cover continue to be treated annually to allow for native plants and wildlife to inhabit the pools during the following rainy season.

Evidence of vehicular traffic (two-track vehicle access) was observed at the gate south of Ramona Airport accessing pools e45, e77, e53, e52, and e48. Although no direct impacts to pools were observed, these pools generally lacked delineation and, due to heavy grass cover, were not easily distinguished from the surrounding areas. Pool raap17 also showed signs of historic vehicular access originating from a more developed dirt road south of the pool. Due to available vehicular access to the area, installation of fiberglass markers or other delineators along the access route, or delineating the pools themselves, may minimize or prevent the risk of unauthorized vehicular traffic within this pool area/complex.

**TABLE 11**
**QUALITATIVE VERNAL POOL MONITORING OBSERVATIONS**

| Pool # | Avg. Depth (cm)[1] | Approximate Size of Ponding | | Water Quality/Edge Effects[2]: (Turbidity, sediments, herbicides, pesticides, fertilizer, algae[3], etc.) | Trespass/Topographic Disturbances[4]: OHV, trail use, erosion, cattle grazing, etc. |
|---|---|---|---|---|---|
| | | Length (ft) | Width (ft) | | |
| e59 | NC (Pool large and inaccessible due to potential for contamination) | 230 estimated | 170 estimated | Low turbidity, oil sheen present in pool margins, decay/rot of upland vegetation (*Erodium botrys*) evident, likely resulting from prolonged inundation. Large sediment deposit observed in NW corner of pool resulting from road shoulder runoff. Oil sheen also likely the result of road runoff. | Cattle trails and fresh hoof prints observed. Grazing evident in pool margins. Cattle gate located approximately 90 feet north of pool appears to direct cattle traffic in pool proximity. |
| p14 | 10 | 50 | 9 | Low to absent visual turbidity levels. Minor oil sheen observed. | No sign of recent grazing. Cow patties observed. No erosion or sedimentation despite occurrence in vernal swale. |
| p13 | 13 | 77 | 35 | Oil sheen observed in pockets of cattle footprints in pool margins, low turbidity, algae present, no sediments, no erosion. | Cattle hoof prints and cow patties present. |
| p7 | 14 | 167 | 55 | Oil sheen observed, low turbidity, isolated pieces of trash observed, no sedimentation observed. | Cattle hoof prints and cow patties present. |
| cs | NC | NC (swale) | NC (swale) | CS is a long swale complex with a series of deep ponded areas supporting vernal pool hydrology. At time of February 2019 survey, the CS feature was actively flowing. Turbidity was observed in isolated areas due to cattle grazing and traffic. Ponded areas throughout with observed algal growth. During May 2019 visit, isolated areas of ponding were observed to be turbid where cattle traffic was present, while others were clear with low turbidity. | Swale bottom scoured and eroded due to heavy rains. Devoid of vegetation in many areas. Erosion observed on swale bank with undercutting and collapse observed in areas. Sediment deposits observed on swale banks. Areas of functional vernal ponding with vegetation observed largely restricted to extreme south and north reaches of mapped swale. |
| e63 | 11 | 180 | 40 | Algae present, no turbidity or sedimentation observed. | Cow patties observed and cattle prints observed. Cattle traffic heavy in area, bisected by numerous trails. |
| e56 | 8 | 83 | 56 | No turbidity, sediment, algae, etc. observed. Clear water. | Cow patties observed. One cattle trail observed bisecting pool. |
| e58 | 6 | 106 | 27 | No turbidity, sediment, algae, etc. observed. Clear water. | Cow patties observed. One cattle trail observed bisecting pool. |
| e61 | 7 | 48 | 10 | East portion of pool very turbid (unknown source), no sediment or erosion observed. | No cattle sign observed or other disturbances. |
| e82 | NA | 0 | 0 | Soil damp, no ponding. | Cattle hoof prints observed. |

| Pool # | Avg. Depth (cm)[1] | Approximate Size of Ponding | | Water Quality/Edge Effects[2]: (Turbidity, sediments, herbicides, pesticides, fertilizer, algae[3], etc.) | Trespass/Topographic Disturbances[4]: OHV, trail use, erosion, cattle grazing, etc. |
|---|---|---|---|---|---|
| | | Length (ft) | Width (ft) | | |
| e62 | 6 | 57 | 34 | Ponding minimal in many areas. Algal mat observed in low areas of pool margins with less than 1cm of water. No turbidity or sedimentation observed. | Cow patties and cattle prints observed. |
| raap17 | 5 | 27 | 9 | No turbidity, sediment, algae, etc. observed. Clear water. | Relic two-track road running through pool currently in use as well-traveled cattle trail, with cattle tracks present and cow patties observed. |
| c3e | 18 | 91 | 64 | No turbidity, sediment, algae, etc. observed. Clear water. | No sign of cattle activity or trespass. Area secured by wire fencing. |
| e45 | 5 | 23 | 19 | Occasional oil sheen, algae observed. No turbidity or sedimentation. | Cow patties observed. |
| e48 | 9 | 58 | 34 | High turbidity. Bottom of pool not visible due to suspended solids. | Cattle hoof prints and cow patties present. |
| e52 | 12 (N)<br>5 (S) | 44 (N)<br>22 (S) | 28 (N)<br>14 (S) | Low turbidity, algae present, oil sheen occasionally observed. Pool is bisected in north and south, presenting two ponded areas likely connected during periods of extreme inundation. Not hydrologically connected at time of survey. Depths and dimensions collected separately for ponded areas. | Cow patties observed. |
| e53 | NA | NA | NA | No ponding. | Cow patties observed. |
| e77 | 11 | 61 | 30 | Dense algae. | Cow patties and cattle traffic. |
| c20 | 18 | 97 | 161 | No turbidity or sediment observed. Algae forming mat in shallow areas. | Cow patties and cattle traffic. |
| ev3 | 11 | 40 | 17 | Heavy sign of cattle traffic in pool and adjacent areas, algae. Oil sheen observed, possibly resulting from runoff due to location within a larger drainage complex. | Heavy cattle traffic and disturbance with numerous cow patties. Recent two-track road with crushed grasses observed immediately southeast of pool. |

1 Depth and pool dimensions measured on February 28, 2019, expected to reflect at or near maximum ponding area of pools.

2 Described during the February 28, 2019, survey.

3 Algal growth may be encouraged via the presence of fertilizers, herbicides, and/or pesticides that may be present due to agricultural applications on or near the sampled locations.

4 Described during both the February 28, 2019, and the May 9, 2019, surveys.

NC: Indicates areas where data was not collected due to pool configuration or to prevent intrusion or additional impacts to the pool.

NA: Not applicable

**TABLE 12**
**OBSERVED VERNAL POOL INDICATOR AND INVASIVE NON-NATIVE PLANT SPECIES**

| Pool ID # | e59 | p14 | p13 | p7 | cs | e63 | e56 | e58 | e61 | e82 | e62 | raap17 | c3e | e45 | e48 | e52 | e53 | e77 | c20 | ev3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **USACE 1997 Vernal Pool Floral Indicators Observed** | | | | | | | | | | | | | | | | | | | | |
| *Atriplex coulteri* [2,3] Coulter's saltbush | | | | | | | | | | | | X | | | | | | | | |
| *Callitriche* sp.[1] Water starwort | X | X | X | X | X | X | X | X | | | | | X | | X | | | | X | |
| *Crassula aquatica* [1,2] Water pygmy weed | X | | X | | | | | | | | | | X | | | | | | X | |
| *Deschampsia danthonioides*[2] Annual hairgrass | | X | | | X | X | | | | | | | | | | | | | | |
| *Downingia cuspidata* [2] Toothed calicoflower | | | | | | | | | | | | | | | X | | X | | X | |
| *Elatine californica* [2] California waterwort | X | | | | | | | | | | | | | | | | | | | |
| *Marsilea vestita* [1] Hairy waterclover | | | | | | | | | | | | | | | | | | | X | |
| *Plagiobothrys undulatus* [2] Coast allocarya | X | | | | | | | | | | | | | | | | | | | |
| *Psilocarphus brevissimus* var. *brevissimus* [2] Woolly marbles | X | X | X | X | | X | X | X | X | | X | | X | | X | X | X | | X | X |
| *Triglochin [Lilea] scilloides* [2] Flowering-quillwort | X | | | | | | | | | | | | | | | | | | | |

| Pool ID # | e59 | p14 | p13 | p7 | cs | e63 | e56 | e58 | e61 | e82 | e62 | raap17 | c3e | e45 | e48 | e52 | e53 | e77 | c20 | ev3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **USACE 1997 Vernal Pool Faunal Indicators Observed** | | | | | | | | | | | | | | | | | | | | |
| *Branchinecta sandiegonensis* [1] San Diego fairy shrimp | X | | | | | X | | | | | | X | X | | X | | | X | X | |
| *Cladocera* sp. [1] Water flea | X | | | | | | | | | | | | | | | | | | | |
| *Copepoda* sp. [1] Copepod | | | X | | | | | | | | | | | | | | | | | |
| *Ostracoda* sp. [1] Ostracod | X | | X | | X | | | | | | | X | | | | X | | | | X |
| **Invasive Non-Native Plant Species Observed** | | | | | | | | | | | | | | | | | | | | |
| *Avena barbata* [2] Slender oat | | X | | | X | X | X | | X | X | | | X | X | | X | X | X | X | |
| *Brassica nigra** [2] Black mustard | | X | | | X | | X | X | | | X | | | | | | | | | |
| *Bromus hordeaceus* [2] Soft chess brome | | X | | X | X | | | X | X | X | | X | | | | | | | X | |
| *Bromus madritensis* ssp. *rubens* [2] Red brome | X | X | | X | X | | | | | X | X | | X | | | | | | | |

| Pool ID # | e59 | p14 | p13 | p7 | cs | e63 | e56 | e58 | e61 | e82 | e62 | raap17 | c3e | e45 | e48 | e52 | e53 | e77 | c20 | ev3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Cotula coronopifolia** [2]<br>Brass buttons | X | | X | X | | | X | X | X | | | | | | | | | | | |
| *Cynodon dactylon** [2]<br>Bermuda grass | X | | | X | | | | X | X | | X | X | | X | | | | X | | X |
| *Erodium botrys* [2]<br>Longbeak stork's bill | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| *Festuca myuros* [2]<br>Rattail fescue | | X | | X | X | X | | | X | X | | | | | | | | | | |
| *Festuca perennis** [2]<br>Italian rye grass | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | X |
| *Hordeum murinum* [2]<br>Foxtail barley | X | X | | X | X | X | X | X | X | X | X | | X | X | X | X | X | X | | X |
| *Hypochaeris glabra* [2]<br>Smooth cat's ear | | | | | X | | | | | | X | | X | | | | | | | |
| *Lepidium latifolium** [1, 2]<br>Perennial pepperweed | X | X | | | | | | | | | X | | | | X | X | | | | |
| *Lythrum hyssopifolia** [1, 2]<br>Hyssop loosestrife | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| *Malva parviflora* [2]<br>Cheeseweed mallow | | | | | | | X | | | | | | | | | | | | | |

| Pool ID # | e59 | p14 | p13 | p7 | cs | e63 | e56 | e58 | e61 | e82 | e62 | raap17 | c3e | e45 | e48 | e52 | e53 | e77 | c20 | ev3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Medicago polymorpha* [2] Bur clover | | | | | | | | X | X | | X | X | | | | | | | | |
| *Polygonum aviculare* [2] Prostrate knotweed | | | | | | | X | | | | | | | | | | X | | | |
| *Polypogon monspeliensis** [2] Rabbitsfoot grass | | X | X | | X | | X | | | | | | | | | | | | X | |
| *Rumex crispus** [2] Curly dock | X | X | | X | X | | X | X | | | X | X | X | | | | | | X | |
| *Salsola tragus* [2] Russian thistle | | | | | | X | | X | X | | X | | | | | | | | | |
| *Silene gallica* [2] Common catchfly | | | | | X | | X | X | X | | X | | | | | | | | | |
| *Sperguleria bocconi** [2] Boccone's sand spurry | X | | | | | | X | X | | | X | X | | | | | X | | X | |

[1] Observed on February 28, 2019.

[2] Observed on May 9, 2019.

[3] Although not a vernal pool indicator species, Coulter's saltbush is a CRPR 1B.2 species and a target species of the TMP. This species was observed immediately adjacent to and within the upland margins of pool RAAP17.

* Indicates inundation-tolerant species.

Algal blooms may be the result of fertilizer, herbicide, and/or pesticide runoff. Because of the presence of algae in the majority of the pools, it is recommended that water quality testing be performed to inform future management.

A large sediment deposit was observed at pool e59 along the roadside margin of the pool where sediment transport from the road had been deposited. This pool also showed evidence of pollutant transport by surface water runoff from Rangeland Road, as evidenced by oil sheen on large areas of the pool's surface. This pool is of particular value because of the abundance of vernal pool indicators supported, including six floral species, San Diego fairy shrimp, and other aquatic crustaceans. The pool was also observed to support California toad (*Anaxyrus boreas halophilus*) and/or western spadefoot (*Spea hammondii*) eggs. Installation of surface water diversion devices along Rangeland Road, diverting surface water into upland habitats upslope of the pool, may result in increased water quality through reduction of pollutant transport. Installation of sediment and velocity dissipation devices upstream and adjacent to the pool may reduce turbidity due to decreased sediment transport. Pool restoration may also be beneficial to remove accumulated sediments that do not provide suitable soils for vernal pool species.

Oil sheen was also observed at pool ev3. Based on its location at the downstream end of a swale complex, it is likely that upstream pools (not included in this monitoring effort) are also subject to oil/pollutant deposit from Ramona Airport Road, located north and upstream of the pools. Installation of sediment and velocity dissipation devices on the south side of Ramona Airport Road may reduce turbidity due to decreased sediment transport.

## 4.8 Volunteer Training Summary

Per DPR request, volunteers were trained for various monitoring efforts regarding San Diego thornmint, burrowing owl, and cactus wren (**Table 13**). DPR staff lead volunteer coordination efforts, communicating primarily with San Diego Audubon Society, CNPS, and Friends of Sycamore Canyon. ESA biologists informed DPR staff of the appropriate days, meeting times and approximate ends, and meeting places for these surveys. If conditions were expected to be strenuous, such as steep hiking, or walking off-trail through thick shrubs, this was also relayed so DPR staff could inform potential volunteers.

**TABLE 13**
**VOLUNTEER TRAINING**

| Species | Date | Preserve | ESA Biologists | Volunteers |
|---|---|---|---|---|
| Coastal cactus wren | April 12, 2019 | Lakeside Linkage | Jaclyn Catino-Davenport | Markus Spiegelberg |
| Burrowing owl | April 26, 2019 | Ramona Grasslands | Jaclyn Catino-Davenport, Adrienne Lee, Paige Anderson | Megan Flaherty |
| San Diego thornmint | May 3, 2019 | Sycamore Canyon/ Goodan Ranch | Adrienne Lee, Douglas Gordon-Blackwood | Carol Crafts |
| San Diego thornmint | May 14, 2019 | Sycamore Canyon/ Goodan Ranch | Alanna Sullivan, Adrienne Lee | Carol Crafts |
| San Diego thornmint | May 15, 2019 | Sycamore Canyon/ Goodan Ranch | Adrienne Lee, Jaclyn Catino-Davenport | Phoenix Von Hendy |
| Burrowing owl | May 20, 2019 | Ramona Grasslands | Jaclyn Catino-Davenport, Adrienne Lee, Lisa Maier | William Watson III, David Watson |

ESA communicated directly with Friends of Sycamore Canyon volunteers for San Diego thornmint monitoring because multiple rain events resulted in the need to reschedule surveys after the rain events. Efforts were made to reach out to potential volunteers for variegated dudleya, San Miguel savory, and a second coastal cactus wren survey, but volunteers did not sign up for these surveys. Because of a limited response from volunteers for plant species, as well as a steep hike required to access the willowy monardella plots, volunteers were not included in willowy monardella outreach efforts.

Once volunteers were on-site, ESA biologists went over the purpose of the monitoring, safety issues to be aware of, and methods for surveying. Volunteers signed a DPR volunteer participation form, which listed the primary hazards and acknowledged potential risks. These forms were scanned and submitted to DPR staff. Volunteers were also made aware of how to avoid and minimize impacts to the preserves, particularly special-status plants and wildlife; efforts included taking care to not trample special-status plant species and remaining quiet near bald eagle nests and keeping a distance of at least 500 feet.

For San Diego thornmint monitoring, volunteers were first shown how to flag the perimeter of the San Diego thornmint extent. The monitoring plots were then set up and volunteers went through the process of performing MSP rare plant monitoring, including a habitat and threats assessment, with the ESA biologists.

For burrowing owl monitoring, volunteers were shown a digital map of the survey polygons and explained the type of surveying (transects) that would be occurring, what types of signs (whitewash, pellets, feathers, etc.) to look for, burrow conditions, and what to do if a burrowing owl were flushed. The volunteers were always positioned immediately adjacent to the ESA lead biologist during transect surveys to allow easy communication if any questions or concerns occurred. The first survey polygon was typically done with the volunteers and the lead biologist together to clarify the survey process further.

For cactus wren monitoring, volunteers were shown a digital map of where the avian point count stations were located and explained the methodology of using point counts. The importance of holding most questions or comments until after the 10-minute point count survey was completed was also explained prior to the start of the survey. The volunteer was also shown what a cactus wren nest looked like and how to identify if it was an active nest/roost site.

# CHAPTER 5
# References


Brehme, C. S., D. R. Clark, and R. N. Fisher. 2016. *Stephens' Kangaroo Rat Monitoring on MCB Camp Pendleton, Results and Trends Analyses for Fall-Winter 2014*. Prepared for Wildlife Management Branch, AC/S Environmental Security, Marine Corps Base Camp Pendleton.

California Department of Fish and Game (CDFG). 2012. Staff Report on Burrowing Owl Mitigation. State of California Natural Resources Agency Department of Fish and Game. March.

California Invasive Plant Council (Cal-IPC). 2019. https://www.cal-ipc.org/plants/inventory/about-the-inventory/ Accessed June 3, 2019.

California Native Plant Society (CNPS), Rare Plant Program. 2019. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 02 July 2019].

County of San Diego. 1998. Final Multiple Species Conservation Program, MSCP Plan. Available at: https://www.sandiegocounty.gov/content/dam/sdc/pds/mscp/docs/SCMSCP/FinalMSCPProgramPlan.pdf.

County of San Diego. 2010. County of San Diego Guidelines for Determining Significance and Report Format and Content Requirements, Biological Resources. Land Use and Environmental Group. Department of Planning and Land Use. Department of Public Works. Fourth Revision.

Environmental Science Associates (ESA) and ICF International (ICF). 2015. Comprehensive Monitoring Plan (Targeted Monitoring Plan). Prepared for: County of San Diego Department of Parks and Recreation.

ICF International (ICF). 2008. *Baseline Biological Resources Evaluation, Lakeside Linkage Preserve*. Prepared for Department of Parks and Recreation, County of San Diego. December.

ICF. 2013. *Final Ramona Grasslands Preserve Vegetation Management Plan*. Prepared for the County of San Diego Department of Parks and Recreation.

ICF. 2017. *2016 Stephens' Kangaroo Rat Monitoring at the Ramona Grasslands Preserve, Ramona, San Diego County, California*. Prepared for the County of San Diego Department of Parks and Recreation.

ICF. 2018 *Targeted Monitoring Plan Resource-Specific Monitoring 2018 Annual Report*. Prepared for: County of San Diego Department of Parks and Recreation.

NOAA. National Weather Service Forecast Office. 2019. Ramona Stations of *Chronological RTP Listings by Station (May 1998 – Present).* Available at: https://www.wrh.noaa.gov/sgx/obs/rtp/rtpmap.php?wfo=sgx.

Ralph, J.C., S. Droege, and J.R. Sauer. 1995. *Managing and Monitoring Birds Using Point Counts: Standards and Applications*. In USDA Forest Service Gen. Tech Rep. PSW-GTR-149.

Rebman and Dossey. 2006. Baseline survey of willowy monardella on MCAS Miramar.

San Diego Management and Monitoring Program (SDMMP). 2019. *MSP – 2019 Rare Plant Occurrence Monitoring Form*.

USACOE (U.S. Army Corps of Engineers). 1997. Indicator Species for Vernal Pools. In: Special Public Notice, Regional General Conditions to Nationwide Permits, November 25, 1997. Prepared by the Los Angeles District, Regulatory Branch.

U.S. Fish and Wildlife Service (USFWS). 2006. 90-Day Finding on a Petition to List the Tricolored Blackbird as Threatened or Endangered. Federal Register Vol. 71, No. 233, pp 70483-70492.