

Final

# TARGETED MONITORING PLAN RESOURCE-SPECIFIC MONITORING

## 2021 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

May 2022





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# ACRONYMS AND ABBREVIATIONS

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Blackhawk	Blackhawk Environmental, Inc.
Cal-IPC	California Invasive Plant Council
CBI	Conservation Biology Institute
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
CRPR	California Rare Plant Rank
Collector	ArcGIS Collector
County	County of San Diego
D&D	D&D Wildlife Habitat Restoration, Inc.
DPR	Department of Parks and Recreation
ESA	Environmental Science Associates
FESA	federal Endangered Species Act
FMP	Framework Management Plan
GPS	Global Positioning System
HCP	Habitat Conservation Plan
HDS	Harbison's dun skipper
ICF	ICF International, Inc.
MCAS	Marine Corps Air Station
MSCP	Multiple Species Conservation Program
MSP	Management Strategic Plan
NCCP	Natural Community Conservation Plan
OHV	Off-highway motor vehicle
SDCRPR	San Diego County Regional Priority Ranking
SDMMP	San Diego Management and Monitoring Program
SDNHM	San Diego Natural History Museum
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
USGS	U.S. Geological Survey
Wildlife Agencies	CDFW and USFWS

# EXECUTIVE SUMMARY

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The County of San Diego (County) monitors and adaptively manages habitats and species covered by the Multiple Species Conservation Program (MSCP) to ensure MSCP biological conservation goals and conditions for species coverage are being met, as a requirement of the MSCP and the adopted South County MSCP Subarea Plan. The monitoring and adaptive management program is guided by the Targeted Monitoring Plan (TMP) (Environmental Science Associates [ESA] and ICF International, Inc. [ICF] 2015) and its subsequent draft updates (ESA and ICF 2019a, ESA and ICF 2019b, ESA and ICF 2021).

The TMP was prepared by the County Department of Parks and Recreation (DPR) with review and input by the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife (collectively known as the Wildlife Agencies), along with review and input from the San Diego Management and Monitoring Program (SDMMP) resources experts. The TMP includes focused goals and objectives for target resources and detailed monitoring protocols and is intended to achieve the management directives for species per the adopted South County MSCP Framework Management Plan (County of San Diego 2001). The TMP addresses monitoring and adaptive management within 20 DPR open space parks and preserves for 22 plant and wildlife species and two vegetation communities, located in the South County Subarea Plan and Draft North County MSCP Plan Areas.

On January 30, 2020, COVID-19 was declared as a Public Health Emergency of International Concern by the World Health Organization (WHO) and elevated to a pandemic on March 11, 2020. In response, California Governor Gavin Newsom issued a stay-at-home order (Executive Order N-33-20) on March 19, 2020. In compliance with the stay-at-home order, resource-specific monitoring for 2020 was postponed to 2021 and conducted in combination with 2021 resource-specific monitoring.

TMP implementation in 2021 included habitat and resource-specific monitoring and adaptive management. Vegetation mapping and habitat assessments were conducted on eight preserves in 2021 identified in the TMP: Furby-North Preserve, Hellhole Canyon County Preserve, Lawrence and Barbara Daley County Preserve, Mount Olympus County Preserve, Santa Margarita County Preserve, Simon County Preserve, Stoneridge County Preserve, and Wilderness Gardens County Preserve. These represent all Batch 2 TMP Preserves, with the following exceptions: Barnett Ranch Preserve and Tijuana River Valley Regional Park were mapped and assessed in 2018; therefore, vegetation mapping and habitat assessments were not conducted in 2021 for those sites.

Resource-specific monitoring was conducted in 15 DPR open space parks and preserves: Boulder Oaks County Preserve, Del Dios Highlands County Preserve, El Capitan County Preserve, Furby-

North Property, Hellhole Canyon County Preserve, Louis A. Stelzer County Park, Lusardi Creek County Preserve, Mount Olympus County Preserve, Oakoasis County Preserve, Ramona Grasslands County Preserve, Santa Margarita County Preserve, Simon County Preserve, Sycamore Canyon/Goodan Ranch County Preserve, Tijuana River Valley Regional Park, and Wilderness Gardens County Preserve.

Monitoring was conducted for the following 17 MSCP or draft North County MSCP-covered species and habitats in 2021: golden eagle (*Aquila chrysaetos*) and bald eagle (*Haliaeetus leucocephalus*) and residual dry matter monitoring also occurred in 2021 consistent with the TMP; however, those detailed results are included under separate cover in the *Barnett Ranch Preserve 2020–2021 Raptor Surveys Summary Report* (ESA 2021a), *Ramona Grasslands Preserve 2020–2021 Raptor Surveys Summary Report* (ESA 2021b), and *Residual Dry Matter Monitoring for the Ramona Grasslands County Preserve, October 2021* (ESA 2021c). Golden and bald eagle monitoring results are included in the summary table provided below.

Adaptive management was conducted for the following four MSCP-covered species and habitats in 2021:

- Otay tarplant
- San Miguel savory
- Variegated dudleya
- Vernal pool/alkali playa habitat

# CHAPTER 1

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## 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) prepared a Targeted Monitoring Plan (TMP) (Environmental Science Associates [ESA] and ICF International, Inc. [ICF] 2015), to provide detailed specifications for implementation of adaptive management and monitoring within 10 County-owned and managed conserved lands (open space parks and preserves) (Preserve Group 1) overseen by DPR. The TMP was revised in July 2019 (ESA and ICF 2019a) and again in December 2019 (ESA and ICF 2019b) to incorporate 10 additional open space parks and preserves (Preserve Group 2). These 10 additional open space parks and preserves include 5 in the South County MSCP Subarea Plan Area and 5 in the draft North County MSCP area. The draft North County MSCP Plan Area preserves are included at this time due to the number of sensitive on-site resources that require their conservation and management. In total, the TMP addresses monitoring and adaptive management within the 20 open space parks and preserves.

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 management directives for species per the adopted South County MSCP Framework Management Plan (County of San Diego 2001). 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.

The TMP addresses monitoring within the following 20 open space parks and preserves: Barnett Ranch County Preserve, Boulder Oaks County Preserve, Del Dios Highlands County Preserve, El Capitan County Preserve, El Monte Regional Park, Furby-North Property, Hellhole Canyon County Preserve, Lakeside Linkage County Preserve, Lawrence and Barbara Daley County Preserve, Louis A. Stelzer County Park, Lusardi Creek County Preserve, Mount Olympus County Preserve, Oakoasis County Preserve, Ramona Grasslands County Preserve, Santa Margarita County Preserve, Simon County Preserve, Stoneridge County Preserve, Sycamore Canyon/Goodan Ranch County Preserve, Tijuana River Valley Regional Park, and Wilderness Gardens County Preserve.

On January 30, 2020, COVID-19 was declared as a Public Health Emergency of International Concern by the World Health Organization (WHO) and elevated to a pandemic on March 11, 2020. In response, California Governor Gavin Newsom issued a stay-at-home order (Executive Order N-33-20) on March 19, 2020. In compliance with the stay-at-home order, resource-specific monitoring for 2020 was postponed to 2021 and conducted in combination with 2021 resource-specific monitoring.

Vegetation mapping and habitat assessments were conducted on eight preserves in 2021 identified in the TMP: Furby-North Preserve, Hellhole Canyon County Preserve, Lawrence and Barbara Daley County Preserve, Mount Olympus County Preserve, Santa Margarita County Preserve, Simon County Preserve, Stoneridge County Preserve, and Wilderness Gardens County Preserve. These represent all Batch 2 TMP Preserves, with the following exceptions: Barnett Ranch Preserve and Tijuana River Valley Regional Park were mapped and assessed in 2018; therefore, vegetation mapping and habitat assessments were not conducted in 2021 for those sites.

Resource-specific monitoring was conducted in 15 preserves identified in the TMP in 2021: Boulder Oaks County Preserve, Del Dios Highlands County Preserve, El Capitan County Preserve, Furby-North Property, Hellhole Canyon County Preserve, Louis A. Stelzer County Park, Lusardi Creek County Preserve, Mount Olympus County Preserve, Oakoasis County Preserve, Ramona Grasslands County Preserve, Santa Margarita County Preserve, Simon County Preserve, Sycamore Canyon/Goodan Ranch County Preserve, Tijuana River Valley Regional Park, and Wilderness Gardens County Preserve.

Monitoring was conducted for the following 11 MSCP or draft North County MSCP-covered species and habitats in 2021:

- San Diego thornmint (*Acanthomintha ilicifolia*)
- Orcutt's bird's-beak (*Dicranostegia orcuttiana*)
- Otay tarplant (*Deinandra conjugens*)
- Lakeside ceanothus (*Ceanothus cyaneus*)
- Willow monardella (*Monardella viminea*)
- Encinitas baccharis (*Baccharis vanessae*)
- San Miguel savory (*Clinopodium chandleri*)
- Variegated dudleya (*Dudleya variegata*)
- Arroyo toad (*Anaxyrus californica*)
- Burrowing owl (*Athene cunicularia*)
- Northern harrier (*Circus hudsonius*)
- Least Bell's vireo (*Vireo bellii pusillus*)
- Stephens' kangaroo rat (SKR; *Dipodomys stephensi*)
- Pallid bat (*Antrozous pallidus*)
- Townsend's big-eared bat (*Corynorhinus townsendii*)

- Harbison's dun skipper (HDS; *Euphyes vestris harbisoni*)
- Vernal pool/alkali playa habitat

The goal of vegetation mapping and habitat assessment is to perform regular surveillance monitoring to ensure the integrity of the preserve system and inform adaptive management decisions based on habitat condition assessments and invasive non-native plant species mapping. 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 (County of San Diego 1997). The County is preparing the North County MSCP for the northwestern unincorporated areas of the County, and the East County MSCP 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.

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# CHAPTER 2

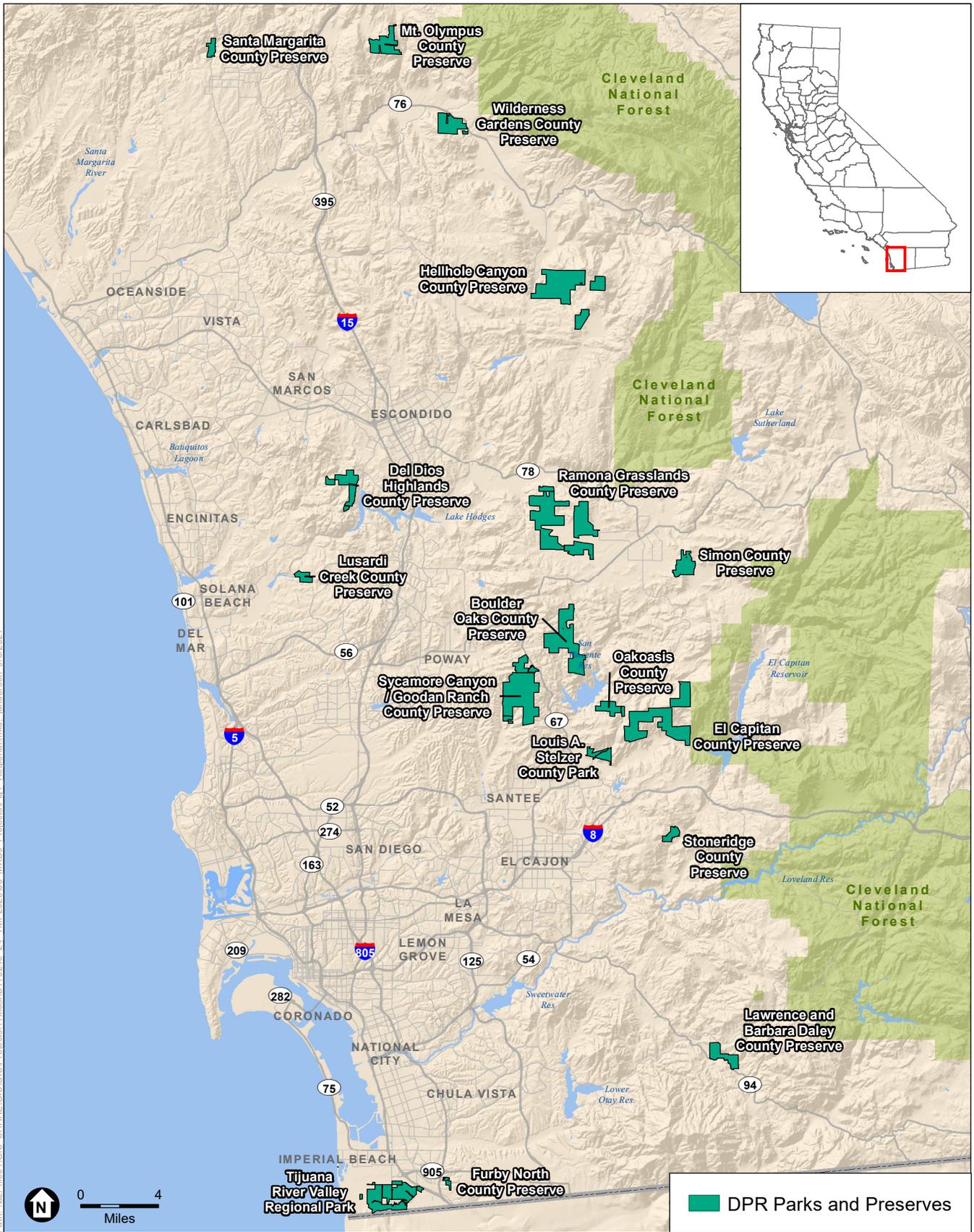
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## Study Area Description

### 2.1 Overview

During the 2021 reporting period, ESA performed habitat monitoring in the following eight preserves identified in the TMP: Furby-North Property, Hellhole Canyon County Preserve, Lawrence and Barbara Daley County Preserve, Mount Olympus County Preserve, Santa Margarita County Preserve, Simon County Preserve, Stoneridge County Preserve, and Wilderness Gardens County Preserve; and resource-specific monitoring in the following fifteen preserves identified in the TMP: Boulder Oaks County Preserve, Del Dios Highlands County Preserve, El Capitan County Preserve, Furby-North Property, Hellhole Canyon County Preserve, Louis A. Stelzer County Park, Lusardi Creek County Preserve, Mount Olympus County Preserve, Oakoasis County Preserve, Ramona Grasslands County Preserve, Santa Margarita County Preserve, Simon County Preserve, Sycamore Canyon/Goodan Ranch County Preserve, Tijuana River Valley Regional Park, and Wilderness Gardens County Preserve (**Figure 1**).

Boulder Oaks County Preserve, Furby-North Property, Lawrence and Barbara Daley County Preserve, Lusardi Creek County Preserve, Oakoasis County Preserve, Stoneridge County Preserve, Sycamore Canyon/Goodan Ranch County Preserve, and Tijuana River Valley Regional Park are located entirely within the South County MSCP and will be monitored and managed in accordance with the Implementing Agreement (County of San Diego 1998). Ramona Grasslands County Preserve has portions located within the draft North County MSCP, which will be monitored and managed in accordance with the draft North County MSCP upon adoption. These preserve areas, in addition to the preserves located completely within the draft North County MSCP (Hellhole Canyon, Mount Olympus, Simon, and Wilderness Gardens County Preserves) are included at this time due to the number of sensitive on-site resources that require their conservation and management.



SOURCE: ESRI; SanGIS, 2021.

COSD DPR 557744\_TO 24 TMP Implementation

**Figure 1**  
Project Location



## 2.2 Project Location

A description of the location for the 17 preserves monitored in 2021 is provided below.

### ***Boulder Oaks County Preserve***

Boulder Oaks County Preserve is an approximately 2,016-acre open space preserve comprising of two contiguous parcels, Boulder Oaks North County Preserve and Boulder Oaks South County Preserve. 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 County Preserve***

Del Dios Highlands County Preserve is an approximately 782-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.

### ***El Capitan County Preserve***

El Capitan County Preserve is an approximately 2,611-acre open space preserve located within the western hills of El Cajon Mountain, northeast of Lakeside, an unincorporated community of San Diego County. It is located at 13775 Blue Sky Ranch Road, Lakeside, north of the San Diego River, west of El Capitan Reservoir, and east of San Vicente Reservoir, within the upper San Diego River Watershed.

### ***Furby-North Preserve***

Furby-North Preserve is an approximately 79-acre open space preserve located in the southern portion of the City of San Diego MSCP Subarea Plan, just south of the Otay River Valley and directly west of Pacific Gateway Park, west of the Brown Field Municipal Airport. It is located near the U.S.–Mexico border in Otay Mesa, directly south of SR 905 and east of Interstate 805.

### ***Hellhole Canyon County Preserve***

Hellhole Canyon County Preserve is an approximately 2,578-acre open space preserve located northeast of Escondido within Valley Center, an unincorporated community of San Diego County. It is located in northeastern San Diego County in the Peninsular Geomorphic Range and consists of two main mountains, Rodriguez Mountain and an unnamed mountain, as well as Hell Creek. A subset of the preserve, 1,857 acres, was subject to TMP surveys in 2021.

### ***Lawrence and Barbara Daley County Preserve***

Lawrence and Barbara Daley County Preserve is an approximately 581-acre open space preserve located in Dulzura, an unincorporated community of south-central San Diego County. It is located just north and east of SR 94 and south of Honey Springs Road, and southeast of the junction of Dulzura Creek and Honey Springs Creek.

### ***Louis A. Stelzer County Park***

Louis A. Stelzer County Park is an approximately 374-acre day-use park located at 11470 Wildcat Canyon Road in Lakeside, an unincorporated community of San Diego County. It is located within the upper San Diego River Watershed, north of the Lake Jennings Reservoir and west of the El Capitan Reservoir.

### ***Lusardi Creek County Preserve***

Lusardi Creek County 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.

### ***Mount Olympus County Preserve***

Mount Olympus County Preserve is an approximately 801-acre open space preserve comprised of two non-contiguous parcels. It is located south of Temecula, just east of Rainbow, an unincorporated community of San Diego County. It is located north of SR 76, south of SR 79, east of Interstate 15, and west of the Cleveland National Forest.

### ***Oakoasis County Preserve***

Oakoasis County Preserve is an approximately 400-acre open space preserve located at 12620 Wildcat Canyon Road, Lakeside, an unincorporated community of San Diego County. It is located southeast of the San Vicente Reservoir, within the upper San Diego River Watershed, and is bisected by Wildcat Canyon Road in the eastern portion of the preserve.

### ***Ramona Grasslands County Preserve***

Ramona Grasslands County Preserve is an approximately 3,490-acre open space preserve comprising of 56 near contiguous parcels. The preserve is located west 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.

### ***Santa Margarita County Preserve***

Santa Margarita County Preserve is an approximately 211-acre open space preserve located in northern San Diego County, west of Interstate 15 and north of SR 76. The preserve is located just east of the northeastern portion of Camp Pendleton Marine Corps Base, and is directly west of Sandia Creek Drive and the southern portion of the preserve is bisected by De Luz Road.

### ***Simon County Preserve***

Simon County Preserve is an approximately 617-acre open space preserve located southeast of the city of San Diego and northeast of the city of Poway, within Ramona, an unincorporated community of San Diego County. It is located within the San Dieguito Watershed and the San Diego River Watershed.

***Stoneridge County Preserve***

Stoneridge County Preserve is an approximately 247-acre open space preserve located within Harbison Canyon, east of the city of El Cajon in central San Diego County, within the Sweetwater Watershed. It is bounded by Mountain View Road to the northwest and Harbison Canyon Road to the southeast.

***Sycamore Canyon/Goodan Ranch County Preserve***

Sycamore Canyon/Goodan Ranch County Preserve is an approximately 2,693-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.

***Tijuana River Valley Regional Park***

Tijuana River Valley Regional Park is an approximately 1,800-acre open space preserve located in the southern portion of the City of San Diego MSCP Subarea Plan, within the southwestern portion of San Diego County. It is bounded by Sunset Avenue to the north, the U.S.–Mexico Border to the south, Border Field State Park and the Tijuana River National Estuarine Research Preserve to the west, and Dairy Mart Road and the San Ysidro community to the east.

***Wilderness Gardens County Preserve***

Wilderness Gardens County Preserve is an approximately 750-acre open space preserve comprised of six contiguous parcels and one separate parcel. It is located at 14209 Highway 76, Pala, an unincorporated community of San Diego County. It is immediately south of SR 76/Pala Road, between Pauma Ridge Road and Pala Mission Road, within northwestern San Diego County in the San Luis Rey River Valley adjacent to Pala Mountain.

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# CHAPTER 3

## Methods

### 3.1 Overview

Vegetation mapping and habitat assessment for invasive non-native plant species and resource-specific monitoring followed the methods and key considerations as outlined in the TMP (ESA and ICF 2015) for overall habitat surveillance and specific MSCP-covered 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 application (Collector) and will be submitted to DPR with the final version of this report; data sheets for all surveys can be found in referenced vegetation mapping and habitat assessment and resource-specific appendices in Chapter 4, *Results*.

### 3.2 Vegetation Mapping and Habitat Assessment

Vegetation mapping and habitat assessments for eight preserves—Furby-North Preserve, Hellhole Canyon County Preserve, Lawrence and Barbara Daley County Preserve, Mount Olympus County Preserve, Santa Margarita County Preserve, Simon County Preserve, Stoneridge County Preserve, and Wilderness Gardens County Preserve—was conducted in 2021. Monitoring details, including preserve name, dates, and field personnel, are listed in **Table 1**.

**TABLE 1**  
**VEGETATION MAPPING AND HABITAT ASSESSMENT SURVEY SUMMARY**

2021 Survey Dates	Name of Biologists
<b>Furby-North Preserve</b>	
March 16–18	Douglas Gordon-Blackwood, Jaclyn Anderson, Rachel Le, Sonya Vargas
<b>Hellhole Canyon County Preserve</b>	
March 23–25, 29–31; April 5–7, 23	Douglas Gordon-Blackwood, Seth Kirby, Brenda McMillan, Rachel Le
<b>Stoneridge County Preserve</b>	
April 12–14, 19–20	Douglas Gordon-Blackwood, Seth Kirby, Rosa Calvario
<b>Santa Margarita County Preserve</b>	
April 27, 28; May 5–7	Douglas Gordon-Blackwood, Seth Kirby, Sonya Vargas
<b>Mount Olympus County Preserve</b>	
May 24–28	Brenda McMillan, Seth Kirby, Rosa Calvario, Luis Ramirez, Anna Millar
<b>Lawrence and Barbara Daley County Preserve</b>	
June 2–4, 7–9, 15	Douglas Gordon-Blackwood, Seth Kirby, Rosa Calvario, Rachel Le, Luis Ramirez

**TABLE 1**  
**VEGETATION MAPPING AND HABITAT ASSESSMENT SURVEY SUMMARY**

2021 Survey Dates	Name of Biologists
<b>Simon County Preserve</b>	
June 16–18, 21–23	Brenda McMillan, Seth Kirby, Rosa Calvario, Mary Cozy, Rachel Le
<b>Wilderness Gardens County Preserve</b>	
June 25, 28–30; July 1–2, 6, 8	Brenda McMillan, Seth Kirby, Rosa Calvario

ESA used object-based segmentation to create vegetation polygons using 4-band NAIP imagery (2020). Each polygon was verified in the field using a sub-meter accuracy Global Positioning System (GPS) unit and its land cover type classified. Vegetation communities and land cover types were classified based on the Vegetation Classification Manual for Western San Diego County (VCM) (Sproul et al. 2011) and Holland (1986) classification system modified by Oberbauer (Oberbauer et al. 2008), in accordance with County DPR habitat identification guidelines (County of San Diego 2010) and the TMP. Acreages of vegetation communities and land cover types present within each of the preserves are provided in a table crosswalk format and depicted in each corresponding figure. All vegetation type descriptions are discussed according to the VCM, with the Holland-Oberbauer crosswalk identified at the end of each description. The Holland-Oberbauer classification system classifies disturbed or developed areas in various categories that do not have a direct crosswalk under the VCM, which only describes native and naturalized vegetation types. In order to provide a higher level of detail using the VCM, these disturbed or developed land cover types were displayed under the alliance level in the crosswalk tables and associated figures.

ESA biologists collected invasive non-native plant species data to assess new invasions or re-invasions within each preserve. Highly invasive perennials described in the RMPs (e.g., tamarisk [*Tamarix* sp.], pampas grass [*Cortaderia selloana*], fennel [*Foeniculum vulgare*]) or specific highly invasive annuals, which might be controlled with appropriate management activities (e.g., yellow star thistle [*Centaurea solstitialis*]) were mapped. All occurrences were mapped using a GPS unit in the field. Surveys focused on areas where invasive non-native plant species were detected in the past, particularly along highly disturbed areas such as trails or recently burned areas, but also included any new occurrences detected during vegetation mapping. Invasive non-native plant species detected within each of the preserves are provided in table format along with the corresponding California Invasive Plant Council (Cal-IPC) ranking and San Diego County Regional Priority Ranking (SDCRPR), general notes, and management recommendations. These occurrences are depicted in corresponding figures by preserve. Tables are provided in Chapter 4 and the corresponding figures are in Appendix A.

ESA biologists mapped incidental special-status plant and wildlife species observations detected during vegetation mapping. These species are listed in tables along with their sensitivity status (State, Federal, San Diego County Special Status List, MSCP status, and the California Native Plant Society (CNPS) California Rare Plant Rank [CRPR; CNPS 2019]), as well as any relevant observations pertaining to the species occurrence. All species locations are depicted in corresponding figures by preserve. Tables are provided in Chapter 4 and the corresponding figures are in Appendix A.

ESA biologists conducted a general habitat condition and threats assessment during habitat mapping. Specific threats assessed included invasive non-native plants, unauthorized habitat disturbance (e.g., trails, dumping), evidence of fire, and plant disease (e.g., *Fusarium* dieback). In Chapter 4, disturbances and stressors within each preserve were noted and described in tables by preserve, along with a brief discussion of the severity and extent within the preserve. The severity rank is based on the threats assessment format used for the San Diego Management and Monitoring Program (SDMMP) Rare Plant Inspect and Manage Monitoring Protocol, where “1” indicates no sign of disturbance occurs within the preserve, and “7” indicates that the disturbance occurs in greater than or equal to 75 percent of the preserve.

The vegetation mapping data was analyzed to detect potential type conversions within each preserve. Holland-Oberbauer vegetation mapping was used to compare the acreage of each habitat type previously mapped with the current acreage by habitat type, the difference of which shows the changes in total habitat type acreage over time. In Chapter 4, this calculation is provided in table format to depict the level of quantitative change within each preserve since the last time it was mapped; however, it should be noted that this analysis has several limitations including: deviations in mapping that occur as a result of methodology advancements in field mapping technology, and as a result of the individual perspective of the biologist; variations in community boundaries and feasibility of walking each vegetation community boundary; and compositional integrity and species composition variations from year to year. The fire history of each preserve (**Table 2**) was referenced in the discussion of potential causes for changes in habitat types.

**TABLE 2**  
**FIRE HISTORY BY PRESERVE**

<b>Fire Name</b>	<b>Fire Year</b>	<b>Area of Preserve Burned (Acres)</b>
<b>Hellhole Canyon County Preserve</b>		
No name	1925	1.05
No name	1926	35.91
No name	1927	0.90
No name	1946	192.29
Guejito	1950	343.40
Rodriguez	1987	12.30
Canal	1999	82.27
Paradise	2003	2,535.83
Poomacha	2007	2,018.69
Rodriguez	1987	12.30
<b>Stoneridge County Preserve</b>		
No name	1947	224.87
Suncrest	1965	34.21
Harbison Canyon	1967	192.81
Laguna	1970	247.49
Cedar	2003	224.87

**TABLE 2**  
**FIRE HISTORY BY PRESERVE**

<b>Fire Name</b>	<b>Fire Year</b>	<b>Area of Preserve Burned (Acres)</b>
<b>Santa Margarita County Preserve</b>		
No name	1911	211.28
No name	1945	53.14
Galivan	2002	211.28
<b>Mount Olympus County Preserve</b>		
No name	1919	7.75
No name	1942	806.69
Pala	2016	24.39
<b>Lawrence and Barbara Daley County Preserve</b>		
No name	1910	43.50
No name	1911	11.51
No name	1912	46.08
No name	1926	199.00
Laguna	1970	384.75
Dulzura	1982	0.04
Mine/Otay	2003	1.14
Harris 2	2007	580.79
Border #25	2007	102.44
<b>Simon County Preserve</b>		
No name	1928	607.94
Vicente	1953	9.30
Outside Origin #42	1956	11.53
Hanson	1979	554.32
Cedar	2003	568.38
Witch	2007	387.98
<b>Wilderness Gardens County Preserve</b>		
No name	1953	715.08

## NOTES:

Furby-North Preserve did not have any fire records.

SOURCE: CALFIRE et. al. 2021

### 3.3 Rare Plant Monitoring

Rare plant monitoring was conducted for eight species. 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 2015 TMP (ESA and ICF 2015) within Preserve Group 1. Species were prioritized according to which population-level species-specific monitoring was considered critical for effective management (ESA and ICF 2015).

Two additional rare plant species—Otay tarplant and Orcutt’s bird’s-beak—were included in the TMP (ESA and ICF 2019b), with the addition of Preserve Group 2.

ESA biologists and DPR staff conducted resource-specific monitoring in 2021 for the eight rare plant species. Rare plant monitoring followed the most current Management Strategic Plan (MSP) Rare Plant Monitoring Protocol prepared by SDMMMP. Additional data was collected for San Diego thornmint at Simon County Preserve, willowy monardella, and Encinitas baccharis, as required by the TMP. Incidental observations of MSCP or other special-status species were recorded. Monitoring details including species, dates, number of monitoring plots, preserve name, and field personnel are listed in **Table 3**.

**TABLE 3**  
**MSP RARE PLANT MONITORING SURVEY SUMMARY**

Species	Plot Establishment Date	2021 Monitoring Date	# of Permanent Monitoring Plots	Preserve	Name of Biologists (and DPR Staff) <sup>a</sup>
San Diego thornmint	April 26, 2016	April 8 <sup>b</sup> and April 20	1	Simon	Brenda McMillan, Adrienne Lee
San Diego thornmint	April 22, May 4–5, 2016; and May 4, 2017	April 29–30 and May 5–7	11	Sycamore Canyon/ Goodan Ranch	Brenda McMillan, Seth Kirby, Adrienne Lee, Jaclyn Anderson, Rosa Calvario, (Patrick Weiner)
Orcutt’s bird’s-beak	June 29, 2016 and June 5, 2017	June 1	2	Tijuana River Valley Regional Park	Brenda McMillan, Seth Kirby
Otay tarplant	June 29, 2016	May 28	1	Furby-North Preserve	Adrienne Lee, Rosa Calvario
Lakeside ceanothus	August 4, 2015	May 10–11	2	Boulder Oaks	Douglas Gordon-Blackwood, Seth Kirby
Lakeside ceanothus	August 6, 2015	May 12 and May 14	2	El Capitan	Douglas Gordon-Blackwood, Seth Kirby, Sonya Vargas
Lakeside ceanothus	August 6, 2015	May 18–19	1	Oakoasis	Brenda McMillan, Rachel Le, Luis Ramirez
Lakeside ceanothus	July 31, 2015	May 21	1	Louis A. Stelzer County Park	Brenda McMillan, Rosa Calvario
Willowy monardella	July 7, 2015, June 22, 2016; June 9, 2021	June 9 and June 22	3	Sycamore Canyon/ Goodan Ranch	Adrienne Lee, Sonya Vargas
Encinitas baccharis	July 24 and 30, 2015	July 28 and August 12	3	Del Dios Highlands	Brenda McMillan, Seth Kirby
San Miguel savory	April 6 and 16, 2016	April 28	2	Boulder Oaks	Brenda McMillan, Sonya Vargas
Variegated dudleya	June 23, 2017 and April 14, 2021	April 9 and April 14	2	Sycamore Canyon/Goodan Ranch	Brenda McMillan, Adrienne Lee, Rosa Calvario
Variegated dudleya	April 27, 2016	April 14	1	Lusardi Creek	Brenda McMillan, Adrienne Lee

NOTES:

<sup>a</sup> Names in parentheses are of DPR Operations staff who participated and were trained during the survey.

<sup>b</sup> This monitoring date was to conduct soil mapping.

Established permanent monitoring plots were monitored for each species. The history of monitoring plot establishment is as follows:

- **San Diego thornmint.** One permanent monitoring plot was established for San Diego thornmint within Simon County Preserve by the Conservation Biology Institute (CBI) in 2016. Ten permanent monitoring plots were established for San Diego thornmint within Sycamore Canyon/Goodan Ranch County Preserve by ICF in 2016 and an eleventh permanent monitoring plot was added by ICF in 2017.
- **Orcutt's bird's-beak.** One permanent monitoring plot was established for Orcutt's bird's-beak within Tijuana River Valley Regional Park by CBI in 2016, and a second permanent monitoring plot was added by CBI in 2017.
- **Otay tarplant.** One permanent monitoring plot was established for Otay tarplant within Furby-North Preserve by CBI in 2016.
- **Lakeside ceanothus.** Two permanent monitoring plots were established for Lakeside ceanothus within Boulder Oaks County Preserve by ICF in 2015. Two permanent monitoring plots were established for Lakeside ceanothus within El Capitan County Preserve by ICF in 2015. One permanent monitoring plot was established for Lakeside ceanothus within Oakoasis County Preserve by ICF in 2015. One permanent monitoring plot was established for Lakeside ceanothus within Louis A. Stelzer County Park by ICF in 2015.
- **Willow monardella.** One permanent monitoring plot was established for willow monardella within Sycamore Canyon/Goodan Ranch County Preserve by ICF in 2015, a second permanent monitoring plot was established by CBI in 2016, and a third permanent monitoring plot was established by ESA in 2021.
- **Encinitas baccharis.** Three permanent monitoring plots were established for Encinitas baccharis within Del Dios Highlands County Preserve by ICF in 2015.
- **San Miguel savory.** Two permanent monitoring plots were established for San Miguel savory within Boulder Oaks County Preserve by ICF in 2016.
- **Variegated dudleya.** One permanent monitoring plot was established for variegated dudleya within Sycamore Canyon/Goodan Ranch County Preserve by ICF in 2017, and a second permanent monitoring plot was established by ESA in 2021. One permanent monitoring plot was established for variegated dudleya within Lusardi Creek County Preserve by ICF in 2016.

Monitoring of special-status plant occurrence status within the permanent monitoring plots followed the MSP 2021 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, and the number of plants was estimated or counted and recorded within the current mapped extent. If the previously mapped current extent was still an accurate representation of the 2021 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 – 2021 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 adjacent 10-meter buffer, and management recommendations were provided for the site using the MSP – 2021 Rare Plant Occurrence Monitoring Form.

Additional data specified in the TMP were collected for three rare plants species: San Diego thornmint, willow monardella, and Encinitas baccharis.

- **San Diego thornmint.** Baseline mapping of clay lenses was conducted in the vicinity of the San Diego thornmint subpopulation within Simon County Preserve using a GPS unit with sub-meter accuracy. The soil test was conducted at three locations – one within, one uphill, and one downhill from the established San Diego thornmint IMG monitoring plot. The field assessment of soil type and texture followed the California Native Plant Society (CNPS) vegetation rapid assessment methodology (CNPS 2007) described in Section D.2, Appendix D of the Adaptive Management Framework for San Diego Thornmint (CBI 2014).
- **Willow monardella.** The height, width, and length in meters of each willow 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.
- **Encinitas baccharis.** The sex and age of each shrub within each plot was identified and recorded to determine the male-to-female ratio within each plot.
  - Seedling: 4 inches tall or less.
  - Adult: more than 4 inches tall.

### 3.4 Otay Tarplant Management

The control of invasive non-native plant species is a primary concern for Otay tarplant management. The TMP recommends overall invasive non-native plant cover be kept to less than 20 percent and thatch to be removed (ESA and ICF 2015). Habitat restoration company, D&D Wildlife Habitat Restoration, Inc. (D&D), performed routine management of the Otay tarplant occurrence area at Furby-North Preserve within an approximately 0.41-acre management area. Management occurred on August 3 and 5, 2021. ESA biologist Adrienne Lee met with the restoration crews on August 5, 2021 to confirm management area boundaries and maintenance work progress. Thatch and invasive non-native grasses within and adjacent to the Otay tarplant population were removed to reduce invasive grass and forb cover to 20 percent absolute cover. D&D removed thatch and invasive non-native grasses with mechanical weed trimmers to 2 inches from the ground. The removed thatch was raked and properly disposed of off-site at the San Diego County landfill on August 6, 2021.

### 3.5 San Miguel Savory Management

The control of invasive non-native plant species is a primary concern for San Miguel savory management. The TMP recommends overall invasive non-native plant cover be kept to less than 20 percent cover (ESA and ICF 2015). D&D performed routine management of the San Miguel savory occurrence areas at Boulder Oaks County Preserve around each monitoring plot, for an approximately combined management area of 3 acres. Management occurred on May 3–5 and May 17, 2021. ESA biologist Sonya Vargas met with the restoration crews on May 3 and May 17, 2021, to point out San Miguel savory plants to avoid and invasive non-native plant species to target. Invasive non-native plants within 12 inches of the San Miguel savory plants were carefully pulled by hand. Invasive non-native plants outside of the buffer area, but within the management area, were treated with a 2.5 percent glyphosate solution to minimize chances of persistence.

### 3.6 Variegated Dudleya Management

The control of invasive non-native plant species is a primary concern for variegated dudleya management. The TMP recommends overall invasive non-native plant cover be kept to less than 20 percent cover (ESA and ICF 2015). D&D performed routine management of the variegated dudleya occurrence area at Lusardi Creek County Preserve within an approximately 0.75-acre management area. Management occurred on April 20–22, April 30, May 6–7, and May 14, 2021. No variegated dudleya were observed during IMG monitoring prior to management actions; therefore, no plants were flagged prior to maintenance. Invasive non-native plant species within the approximately 0.75-acre variegated dudleya management area were treated. Per the TMP, invasive non-native plants within 18 inches of the variegated dudleya should be carefully pulled by hand; however, no variegated dudleya plants were detected in 2021. Invasive non-native plants within the management area, were trimmed with a mechanical weed trimmer to 1–2 inches from the ground. The removed thatch was raked and properly disposed of off-site at the D&D yard waste disposal dumpsters or the San Diego County landfill. The trimmed non-native plants were sprayed with a 2.5 percent glyphosate solution to minimize chances of persistence.

Increased herbivory and unauthorized accessed was noted on April 14, 2021, during monitoring by ESA biologists. Rabbit scat and visible herbivory on plants was detected. D&D installed herbivory fencing in three locations, covering an approximately 0.19-acre area, to limit herbivore access around the variegated dudleya management area. Fence posts were installed to block the unauthorized ATV trail detected on-site.

### 3.7 Arroyo Toad

ESA conducted surveys for arroyo toad along the Santa Margarita River, within the Santa Margarita County Preserve and along the Santa Maria Creek within the Ramona Grasslands County Preserve. The surveys were conducted in accordance with the U.S. Geological Survey (USGS) Aquatic Species and Habitat Assessment Protocol Rivers, Streams and Creeks-Paper (USGS 2020), and timed to fall within the accepted range outlined in the Survey Protocol for the Arroyo Toad (USFWS 1999). Incidental observations of MSCP or other special-status species were recorded. Survey dates and field personnel are listed in **Table 4**.

**TABLE 4**  
**ARROYO TOAD SURVEY SUMMARY**

2021 Survey Dates	Name of Biologists
<b>Santa Margarita County Preserve</b>	
April 26 and June 22	Robert Sweet, Jaclyn Catino-Davenport
<b>Ramona Grasslands County Preserve</b>	
April 27, 28, and 30 and June 23	Robert Sweet, Jaclyn Catino-Davenport, Sonya Vargas

ESA biologists conducted an initial habitat assessment and presence/absence survey along previously established USGS survey reaches within the Santa Margarita River on April 26, 2021, and the Santa Maria Creek on April 27, 28, and 30, 2021. A total of five survey reaches (346–350) have been established along Santa Margarita River; and a total of 21 reaches (22–30, 33–42, 44, and 45) have been established along Santa Maria Creek (survey area). Each survey reach measures a total of 250 meters in length, and is separated into two smaller segments, A and B, each measuring 125 meters in length. The initial habitat assessment and presence/absence survey documented the quality and extent of suitable arroyo toad habitat, and the total number/life stage of arroyo toad clutches observed along each reach. All suitable habitat (i.e., potential breeding pools) was documented in accordance with the USGS protocol, and inspected for the presence and quantity of arroyo toad clutches; as well as the presence and quantity of any potential predator species such as the American bullfrog (*Lithobates catesbeianus*; larvae, sub-adults, and/or adults), red swamp crayfish (*Procambarus clarkii*); and red-eared slider (*Trachemys scripta* ssp. *elegans*). Perennial invasive vegetation observed along each reach (e.g., tamarisk and giant reed [*Arundo donax*]) was also mapped.

For each segment, along each survey reach, survey start information (i.e., date, weather, surveyors, and locational coordinates) was documented and upstream/downstream photographs were taken. Suitable habitat was characterized and included the documentation of substrate along the bed and banks, the presence and extent of aquatic and emergent vegetation/algae along the bed and banks, the vegetation community type (including the presence and extent of an overhead canopy), dominant plant species, etc. An assessment of potential disturbances, natural and man-made (e.g., high flows, livestock), observed within each survey area, was made, as well. Water quality measurements were taken along each segment that included temperature (°C), pH, conductivity, channel width and depth (meter [m]), transparency, channel surface water velocity (m/second [s]), etc.

While conducting the habitat assessment; ESA biologists traversed the survey area sufficiently to achieve full-visual coverage of suitable habitat and to document arroyo toad. For each clutch observed, the number of individuals and age class (i.e., adult, juvenile, metamorphs, larvae, or egg strand) were recorded. Any special-status aquatic species (e.g., two-striped garter snake [*Thamnophis hammondi*], western pond turtle [*Emys marmorata*], arroyo chub [*Gilia orcuttii*]) observed during the survey were noted and recorded.

A late-season survey was completed along the Santa Margarita River on June 22, 2021, and Santa Maria Creek on June 23, 2021, to capture signs of late-season arroyo toad foraging/breeding activity. The survey was separated into day and night components; the purpose of the day survey was to document any distinct clutches, while the night portion was intended to document foraging toads (i.e., juvenile or adult), calling males, pairs engaged in amplexus, or any other signs of arroyo toad activity (e.g., tracks, scat). Additional data regarding the condition of habitat and water quality measurements, were not collected during the late-season survey.

### 3.8 Burrowing Owl

ESA biologists conducted two habitat assessment surveys within the Hellhole Canyon County Preserve in accordance with the CDFW Staff Report on Burrowing Owl Mitigation (CDFG 2012) to identify areas suitable for burrowing owl foraging and breeding, and capable of supporting no less than one node (i.e., five pairs). The two habitat assessment surveys evaluated habitat suitability based on current knowledge of burrowing owl habitat preferences, such as soil type, topography, presence/absence of ground squirrels, presence/absence of refugia, presence/absence of protection from predators, presence/absence of burrows, and vegetation (low/open versus tall/dense). Incidental observations of MSCP or other special-status species were recorded. Survey dates, weather conditions, and field personnel names are provided in **Table 5**.

**TABLE 5**  
**BURROWING OWL SURVEY SUMMARY**

2021 Survey Date	Survey Number	Survey Times	Start Weather Conditions	End Weather Conditions	Name of Biologists
March 2	1a	0605–1215	Temp: 53°F, 15% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 2 mph, Wind Direction: E	Temp: 72°F, 0% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 2 mph, Wind Direction: E	Jaclyn Catino-Davenport, Sonya Vargas
March 24	1b	0700–1030	Temp: 50°F, 0% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 2.5 mph, Wind Direction: S	Temp: 55°F, 0% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 2 mph, Wind Direction: W	Jaclyn Catino-Davenport, Rachel Le

Surveys were conducted during the morning hours and under weather conditions conducive for burrowing owl surveys (e.g., no heavy fog, high winds, or precipitation). ESA biologists scanned the preserve with binoculars before walking transects (no more than 100 feet apart) through suitable burrowing owl habitat areas to provide 100 percent coverage. Potential burrows, rock crevices, rocky outcrops, and/or surrogate burrows were inspected for burrowing owl sign (e.g., tracks, white wash, pellets).

ESA biologists conducted a burrowing owl habitat and threats assessment monitoring during the last survey. 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 2020 Rare Plant Occurrence Monitoring Form and the 2020 Management Needs and Notes Form was completed (SDMMP 2020). 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).

### 3.9 Northern Harrier

ESA biologists conducted four nesting surveys, once a month for four months, within the Tijuana River Valley Regional Park to document northern harrier individuals and breeding behavior. If nest sites were documented, the habitat was characterized and the presence and abundance of prey (i.e., small mammals) were noted. Incidental observations of MSCP or other special-status species were recorded. Survey dates, weather conditions, and field personnel names are provided in **Table 6**.

**TABLE 6**  
**NORTHERN HARRIER SURVEY SUMMARY**

2021 Survey Date	Survey Number	Survey Times	Start Weather Conditions	End Weather Conditions	Name of Biologists
April 7	1	0630–1115	Temp: 54°F, 0% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 2 mph, Wind Direction: N	Temp: 66°F, 0% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 0 mph, Wind Direction: N/A	Jaclyn Catino-Davenport, Rachel Le
May 21	2	0538–1012	Temp: 56°F, 90% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 0.75 mph, Wind Direction: W	Temp: 61°F, 75% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 5 mph, Wind Direction: SW	Jaclyn Catino-Davenport, Rachel Le
June 29	3	0602–1015	Temp: 64°F, 100% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 1 mph, Wind Direction: W	Temp: 65°F, 100% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 7 mph, Wind Direction: W	Jaclyn Catino-Davenport, Rachel Le
July 19	4	0557–1048	Temp: 69°F, 0% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 0 mph, Wind Direction: N/A	Temp: 81°F, 0% cloud cover, Visibility: Good, Precipitation: None, Avg. Wind Speed: 3 mph, Wind Direction: W	Jaclyn Catino-Davenport, Luis Rameriz

Surveys were conducted during the morning hours and under weather conditions conducive for raptor surveys (e.g., no heavy fog, high winds, or precipitation). ESA biologists focused on survey areas with low scrub and/or vegetation and previously documented northern harrier usage areas within the Tijuana River Valley Regional Park. ESA biologists scanned these areas with binoculars before walking along trails or dirt access roads to cover as much of the preserve as feasible. ESA biologists were in communication with other ESA and Blackhawk Environmental, Inc. (Blackhawk) biologists conducting least Bell’s vireo surveys within the Tijuana River Valley Regional Park to ensure all known northern harrier locations were recorded and documented.

ESA biologists conducted the threats assessment monitoring during the last survey. Since neither SDMMMP nor other regional entities have developed a species-specific threats assessment for the northern harrier, the threats assessment form from Section VI of the 2020 Rare Plant Occurrence Monitoring Form and the 2020 Management Needs and Notes Form was completed (SDMMMP

2020). The threats assessment survey included an evaluation of potential threats to northern harrier nest success and/or prey sources.

### 3.10 Least Bell's Vireo

ESA and Blackhawk biologists conducted presence/absence monitoring surveys in April through July to locate vireo territories and determine breeding status of males in the Santa Margarita County Preserve and the Tijuana River Valley Regional Park (**Table 7** and **Table 8**).

Comprehensive surveys were conducted specifically for least Bell's vireo following modified USFWS Least Bell's Vireo Survey Guidelines (USFWS 2001). Surveys were conducted by qualified biologists familiar with the vocalization and plumage of adult and juvenile individuals to maximize detection. (Recovery permits pursuant to section 10(a)(1)(A) of the Endangered Species Act are not required for presence/absence surveys as long as protocol is followed, and vocalization tapes are not used).

**TABLE 7**  
**LEAST BELL'S VIREO SURVEY SUMMARY:**  
**SANTA MARGARITA COUNTY PRESERVE**

2021 Survey Date	Time (start/end)	Wind (mph) (start/end)	Temperature (F) (start-end)	Cloud Cover Percentage (start/end)	Name of Biologists
April 14	0640–0942	0/0–3	55°–60°	50–80	Jaclyn Catino-Davenport, Rachel Le
April 27	0612–1013	0.5/1.5	50°–70°	10–25	Florence Chan, Rachel Le
May 11	0605–1020	0–1/1–2	55°–64°	100–45	Florence Chan, Rachel Le
May 25	0608–1008	0–1/0.5–2.5	55°–82°	20–65	Florence Chan, Rachel Le
June 4	0620–1053	0.5–1.5/3–7	58°–75°	0–0	Florence Chan, Rachel Le
June 16	0610–1100	0/2–6	63°–80°	10–85	Florence Chan, Rachel Le
June 30	0614–1102	0/1	65°–87°	100–0	Florence Chan, Rachel Le
July 15	0611–1055	0/3	68°–80°	100–0	Florence Chan, Luis Ramirez

**TABLE 8**  
**LEAST BELL'S VIREO SURVEY SUMMARY: TIJUANA RIVER VALLEY REGIONAL PARK**

2021 Survey Date	Time (start/end)	Wind (mph) (start/end)	Temperature (F) (start-end)	Cloud Cover Percentage (start/end)	Survey Block-Pass	Surveyors*
April 13	0620–1030	0/0	58°–60°	100–100	1-1	Kris Alberts* Ryan Quilley*
April 12	0615–1100	1–2/3–5	58°–72°	100–0	2-1	Seth Reimers* Tawni Gotbaum*
April 12	0605–1302	0/3–6	57°–71°	100–5	3-1	Ryan Quilley* Hayley Milner*
April 12	0645–1130	1–3/1–3	60°–70°	100–0	4-1	Brenda McMillan

**TABLE 8**  
**LEAST BELL'S VIREO SURVEY SUMMARY: TIJUANA RIVER VALLEY REGIONAL PARK**

2021 Survey Date	Time (start/end)	Wind (mph) (start/end)	Temperature (F) (start-end)	Cloud Cover Percentage (start/end)	Survey Block- Pass	Surveyors*
						Kris Alberts*
April 16	0639–1130	0–1/0–1	55°–65°	100–0	5-1	Brenda McMillan Rosa Calvario
April 15	0700–1100	0/0	50°–52°	65–0	6-1	Brenda McMillan Terah Donovan
April 19	0618–1130	0–1/0–1	52°–55°	0–0	7-1	Brenda McMillan Rachel Le
May 3	0605–1115	0/2–4	59°–71°	100–0	1-2	Kris Alberts* Katie Quint*
May 3	0600–1100	1–2/4–6	62°–68°	100–0	2-2	Seth Reimers* Tawni Gotbaum*
May 3	0620–1214	0/3–7	59°–69°	100–0	3-2	Ryan Quilley* Lorena Bernal*
May 3	0643–1130	1/1–2	57°–63°	100–0	4-2	Brenda McMillan Rosa Calvario
May 7	0606–1135	0/2–3	57°–65°	100–20	5-2	Brenda McMillan Rachel Le
May 5	0649–1130	0/1	56°–59°	100–60	6-2	Brenda McMillan Rosa Calvario
May 6	0638–1130	1/1–3	58°–64°	100–100	7-2	Brenda McMillan Anna Millar
June 8	0600–1045	0/0–2	61°–68°	100–98	1-3	Kris Alberts* Katie Quint*
June 8	0600–1045	0/2–6	63°–64°	95–90	2-3	Seth Reimers* Tawni Gotbaum*
June 8	0600–1243	0/3–7	61°–72°	100–15	3-3	Ryan Quilley* Hayley Milner*
June 9	0630–1130	1–2/8–10	60°–68°	80–30	4-3	Brenda McMillan Rosa Calvario
June 7	0623–1115	0/3–6	56°–62°	100–100	5-3	Brenda McMillan Brennan Mulrooney Luis Ramirez
June 11	0623–1045	0/2–6	56°–63°	60–0	6-3	Brenda McMillan Brennan Mulrooney
June 10	0620–1100	0/5–10	53°–67°	0–0	7-3	Brenda McMillan Brennan Mulrooney
July 12	0600–1030	0–1/0–3	70°–74°	100–80	1-4	Kris Alberts* Katie Quint*
July 12	0600–1000	1–2/3–5	70°–76°	100–10	2-4	Seth Reimers* Tawni Gotbaum*
July 13	0459–1136	0/4–9	70°–78°	100–10	3-4	Ryan Quilley* Hayley Milner*

**TABLE 8**  
**LEAST BELL'S VIREO SURVEY SUMMARY: TIJUANA RIVER VALLEY REGIONAL PARK**

2021 Survey Date	Time (start/end)	Wind (mph) (start/end)	Temperature (F) (start-end)	Cloud Cover Percentage (start/end)	Survey Block-Pass	Surveyors*
July 13	0615–1045	0/4–8	67°–73°	100–30	4-4	Brenda McMillan Brennan Mulrooney
July 15	0603–1103	0/3–6	67°–73°	100–10	5-4	Brennan Mulrooney Seth Kirby
July 12	0633–1055	0–2/3–5	67°–74°	100–0	6-4	Brenda McMillan Brennan Mulrooney
July 14	0620–1100	0–1/3–5	67°–74°	100–20	7-4	Brenda McMillan Brennan Mulrooney

NOTE:

\* Blackhawk Environmental, Inc. staff.

Riparian areas and potential vireo habitat were surveyed eight times (eight survey passes) at Santa Margarita County Preserve and four times (four survey passes) at Tijuana River Valley Regional Park between April 10 and July 31, at least 10 days apart to maximize detection. Santa Margarita County Preserve was surveyed in its entirety over one day for each survey pass. Tijuana River Valley Regional Park was divided into seven survey blocks. All seven survey blocks were surveyed each survey pass and required one survey day each. Individual surveys covered no more than 3 linear kilometers or no more than 50 hectares of habitat.

All vireo detections were recorded and plotted to estimate the location and extent of habitats utilized, and mapped on the appropriate USGS quadrangle map. Data pertaining to vireo status, GPS location, distribution, age and sex of the bird, leg bands were noted and recorded. Passive nest monitoring was conducted through the presence/absence surveys. Biologists did not approach nests directly. Nest success was inferred by nesting behavior during presence/absence surveys. Any threats detected were documented.

In accordance with the USFWS Least Bell's Vireo Survey Guidelines (USFWS 2001), observations of brown-headed cowbirds (*Molothrus ater*) were recorded and GPS locations taken for any individuals detected within vireo territory during each survey, and incidental observations of southwestern willow flycatcher (*Empidonax trallii extimus*) and yellow-billed cuckoo (*Coccyzus americanus*) were recorded. At Tijuana River Valley Regional Park, incidental observations of northern harrier were recorded and communicated to the northern harrier surveyor to augment information collected during the survey.

Monitoring results were evaluated and adaptive management recommended. The results of the survey passes were reviewed and territories assigned for each pair or solitary male. A central point was used to indicate the territory. Recommendations considered included the need for additional nest monitoring, cowbird egg removal, and/or brown-headed cowbird trapping. These recommendations are included in Chapter 4, *Results*, and will be used to inform the brown-headed cowbird management approach in the Targeted Monitoring Plan Update.

### 3.11 Stephens' Kangaroo Rat

SKR monitoring at Hellhole Canyon County Preserve and Ramona Grasslands County Preserve was conducted in October 2021. Specific monitoring protocols followed those outlined in the TMP for SKR monitoring at Ramona Grasslands County Preserve and Hellhole Canyon Preserve (ESA and ICF 2021). This methodology follows that used by USGS for SKR monitoring at Camp Pendleton (Brehme et al. 2016). Incidental observations of MSCP or other special-status species were recorded.

- Ramona Grasslands County Preserve.** SKR monitoring areas were originally determined based on potentially suitable SKR habitat. Within the preserve, specific management areas 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 open, low-growing 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 1A, 1C, 2A (portions of SKR Management Unit 1), 2B (portions of SKR Management Areas 1 and 2), 3A, 3B (SKR Management Area 3), 3C, 3D, 3E, and 4A, as these areas provide suitable SKR habitat. Additional SKR discovery areas are located within Grazing Management Units 3B and 4C. It is important to note that Grazing Management Unit 3A is not located within an SKR Management Area, but is included in the monitoring effort based on previously determined SKR suitability.

Monitoring plots were initially established within SKR core habitat areas on the Preserve in 2016, following an adapted methodology used by USGS for SKR monitoring at Camp Pendleton (Brehme et al. 2016). A 50- x 50-meter grid pattern was overlain onto a georeferenced aerial map over each of the core SKR Monitoring Areas, and 28 plots were established. Of these 28 plots, 16 were determined to be permanent sampling plots that have been monitored since 2016: A1-1 to A1-6, A2-1, A2-6, A2-7, 3A-1, 3A-6, 3A-7, 3A-8, A3-1, A3-2, and A3-3. The 2021 SKR monitoring effort sampled these 16 permanent sampling plots for consistency with previous monitoring efforts, and 12 randomly selected plots—6 within the SKR monitoring area and 6 within the SKR discovery area—for a total of 28 sampling plots (ESA and ICF 2019b).

- Hellhole Canyon County Preserve.** Baseline SKR trapping surveys were conducted in 2020 within the northeastern portion of the Sierra Verde Addition of Hellhole Canyon County Preserve, and confirmed SKR presence in one of the three trapping plots. Due to the size of the suitable SKR habitat at Hellhole Canyon County Preserve, the 2021 SKR monitoring effort consisted of sampling the three previously live-trapped plots (ESA and ICF 2021).

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 were recorded on 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 were observed within the plot.

Habitat assessment forms were completed on the Survey123 application 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). Detailed monitoring methods and results, including plot photographs and habitat assessment forms, are included in **Appendix I, Stephens' Kangaroo Rat Monitoring Memorandums**. Survey dates, times, weather conditions, and field personnel names for these surveys are included in **Table 9**.

**TABLE 9**  
**SKR SURVEY SUMMARY**

Preserve	2021 Survey Date	Survey Times	Start Weather Conditions	End Weather Conditions	Name of Biologists
Ramona Grasslands	October 11	0900–1600	Temp: 48°F 100% Cloud Cover Wind Speed: 0–2 mph	Temp: 64°F 70% Cloud Cover Wind Speed: 2–6 mph	Kris Alberts*, Rachel Le
	October 12	0900–1145	Temp: 46°F 10% Cloud Cover Wind Speed: 0–2 mph	Temp: 58°F 20% Cloud Cover Wind Speed: 1–3 mph,	Kris Alberts*, Sonya Vargas
Hellhole Canyon	October 13	0915–1045	Temp: 61°F 0% Cloud Cover Wind Speed: 0–2 mph	Temp: 64°F 0% Cloud Cover Wind Speed: 1–4 mph	Kris Alberts*, Jaclyn Catino-Davenport

NOTE:

\* Blackhawk Environmental, Inc. staff.

## 3.12 Pallid Bat

### 3.12.1 Roosting Habitat Assessment

ESA and San Diego Natural History Museum (SDNHM) biologists determined potential roosting areas (e.g., tree cavities, rocky cliffs, outcrops, and natural caves) for pallid bats within Hellhole Canyon County Preserve, Mount Olympus County Preserve, and Wilderness Gardens County Preserve, based on review of aerial maps and daytime visual assessments while setting up passive acoustic monitoring equipment. The daytime visual assessment of potential roosting habitat was conducted prior to and coinciding with the setup of passive acoustic equipment. Visual roosting habitat assessment surveys were conducted in May 2021 (Table 10).

### 3.12.2 Passive Acoustic Surveys

ESA and SDNHM biologists conducted passive acoustic surveys for foraging pallid bats at Hellhole Canyon County Preserve, Mount Olympus County Preserve, and Wilderness Gardens County Preserve. Two Titley Electronics passive Anabat Express bat echolocation detectors were

deployed at each preserve for two survey periods: May 17–19, 2021 (spring) and August 31–September 2, 2021 (fall) (**Table 10**). Detector settings were set as follows: division ratio to 8 and sensitivity level to 9. The locations of the detectors were selected based on foraging habitat suitability for pallid bats and accessibility by using existing trails while limiting the potential for vandalism by distancing the detectors from direct trail access. These locations were used for both spring and fall surveys. The detectors were mounted approximately 3 to 5 feet above ground level. Detectors were deployed as follows.

- **Hellhole Canyon County Preserve.** The two detectors were placed along Hell Creek—one within Coast Live Oak Association habitat in the central portion of Hell Creek adjacent to the Escondido Canal on a tree, and one in Western Sycamore–Coast Live Oak Association habitat in the southeast portion of Hell Creek, just north of its southern tributary, on an oak tree branch.
- **Mount Olympus County Preserve.** The two detectors were placed within Coast Live Oak–Western Poison Oak–Grass Association habitat in the northeast corner of the preserve.
- **Wilderness Gardens County Preserve.** The two detectors were placed in the northern portion of the preserve, just south of the San Luis Rey River. One detector was placed within Western Sycamore–Coast Live Oak Association habitat adjacent to the pond. The second detector was placed within Coast Live Oak Association habitat.

**TABLE 10**  
**PALLID BAT SURVEY SUMMARY**

Survey Type	Survey Date	Name of Biologists
Roosting Habitat Assessment	5/17/21	Drew Stokes,* Rachel Le
Passive Acoustic Survey	5/17/21–5/19/21	Drew Stokes,* Rachel Le
Passive Acoustic Survey	8/31/21–9/2/21	Drew Stokes*

NOTE:  
\* San Diego Natural History Museum staff.

The detectors were programmed to turn on 30 minutes before and off 30 minutes after solar sunrise. Bat calls were automatically recorded by the units during the monitoring period. At the end of each passive survey period, the bat detector equipment was removed. The recorded bat calls were processed using ANALOOK Version 4.3I. All recorded bat calls were manually vetted. Manual vetting consisted of reviewing individual calls and comparing them to a reference library of bat calls. Many bat species have overlapping call repertoires; therefore, not all bat calls can be conclusively identified to species. Identifications for inconclusive calls were deferred to the most likely species based on a combination of manual species identification, survey-specific trends noted during manual call review, and species expected to occur based on known seasonal and geographic distribution.

## 3.13 Townsend's Big-Eared Bat

### 3.13.1 Roosting Habitat Assessment

ESA and SDNHM biologists determined potential roosting areas (e.g., tree cavities, rocky cliffs, outcrops, and natural caves) for Townsend's big-eared bats within Hellhole Canyon County Preserve and Wilderness Gardens County Preserve, based on review of aerial maps and daytime visual assessments while setting up passive acoustic monitoring equipment. The daytime visual assessment of potential roosting habitat was conducted prior to and coinciding with the setup of passive acoustic equipment. Visual roosting habitat assessment surveys were conducted in May 2021 (spring) (Table 11).

### 3.13.2 Passive Acoustic Surveys

ESA and SDNHM biologists conducted passive acoustic surveys for foraging pallid bats at Hellhole Canyon County Preserve and Wilderness Gardens County Preserve. Two Titley Electronics passive Anabat Express bat echolocation detectors were deployed at each preserve for two survey periods: May 17–19, 2021 (spring) and August 31–September 2, 2021 (fall) (Table 11). The survey methods and locations in Hellhole Canyon County Preserve and Wilderness Gardens County Preserve are the same as described in Section 3.12.2 for pallid bat.

**TABLE 11**  
**TOWNSEND'S BIG-EARED BAT SURVEY SUMMARY**

Survey Type	Survey Date	Biologists
Roosting Habitat Assessment	5/17/21	Drew Stokes,* Rachel Le
Passive Acoustic Survey	5/17/21–5/19/21	Drew Stokes,* Rachel Le
Passive Acoustic Survey	8/31/21–9/2/21	Drew Stokes*

NOTE:  
\* San Diego Natural History Museum staff.

## 3.14 Harbison's Dun Skipper

### 3.14.1 Host Plant Mapping

A literature search and field surveys were conducted to identify HDS host plant locations. SDNHM's Plant Atlas, Calflora, SDMMP's MOM database, and baseline biological reports pertaining to Hellhole Canyon County Preserve, were reviewed to determine previously documented San Diego sedge (*Carex spissa*) locations within Hellhole Canyon County Preserve. Vegetation maps and aerial imagery were reviewed to assess potentially suitable riparian woodland habitat, particularly southern riparian forest and southern coast live oak riparian forest, which should be targeted for host plant mapping. ESA and Blackhawk biologists mapped locations of San Diego sedge plants and estimated plant counts within suitable habitat of Hell Creek and its southern tributary within Hellhole Canyon County Preserve in 2021 prior to

conducting adult surveys (Table 12). During host plant mapping, biologists opportunistically checked patches of San Diego sedge for larval presence as well.

### 3.14.2 Adult Flight Surveys

ESA and Blackhawk biologists conducted two adult surveys for HDS during the flight season (between May 15 through June 30) (Table 12). Surveys were conducted at two locations, and focused on immediate areas surrounding San Diego sedge plant patches mapped during host plant mapping and worked outwards to nearby potential nectar source. Surveys were conducted in appropriate weather (sunny or partly sunny, 20–35°C, and modest wind speeds of less than 15 mph) (Marschalek and Deutschman 2015). Potential nectar sources and all butterfly species observed during surveys were recorded. A habitat and threats assessment was conducted concurrently with the first adult flight survey, following the *Rare Butterfly Management and Conservation Planning* (Marschalek and Deutschman 2016) to assess tree species, composition of tree canopy, percent of canopy that is thinning, percent of dead trees, and percent of trees with fire damage; general health conditions of San Diego sedge were also documented (if leaves were green, green with brown tips, or mostly brown); presence of flowing and standing water; and threats to habitat such as drought, climate change, human intrusion, pesticide use, altered hydrology, altered fire regime, invasive non-native plant species and competition from native cattail (*Typha* spp.), and tree pests such as gold-spotted oak borer (*Agrilus auroguttatus*) and shothole borer (*Euwallacea* sp.).

**TABLE 12**  
**HARBISON'S DUN SKIPPER SURVEY SUMMARY**

Survey Type	2021 Survey Date	Survey Times	Start Weather Conditions	End Weather Conditions	Name of Biologists
Host plant mapping	April 22–23	NA	NA	NA	Tawni Gotbaum,* Seth Kirby, Rosa Calvario
Adult flight surveys	May 26	0945–1508	Temp: 72°F 40% Cloud Cover Wind Speed: 2 mph	Temp: 77°F 0% Cloud Cover Wind Speed: 4 mph	Kris Alberts,* Brennan Mulrooney
	June 15	0914–1313	Temp: 82°F 40% Cloud Cover Wind Speed: 0 mph	Temp: 98°F 10% Cloud Cover Wind Speed: 1 mph	Kris Alberts,* Adrienne Lee

NOTE:

\* Blackhawk Environmental, Inc. staff.

## 3.15 Vernal Pool/Alkali Playa

ESA and Blackhawk biologists conducted two qualitative aquatic phase monitoring surveys of vernal pools/alkali playas within the Ramona Grasslands County Preserve (Table 13). The first survey was conducted during the wet season when pools were inundated with water. The second survey was conducted during the dry season when pools were completely dry. Qualitative

monitoring was performed within the subset of 20 vernal pools within the Ramona Airport mitigation, 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 non-native plant species. 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) were documented.

On July 20, 2021, SDMMP conducted surveys for Parish’s brittlescale (*Atriplex parishii*) at Ramona Grasslands County Preserve.

**TABLE 13**  
**VERNAL POOL/ALKALI PLAYA QUALITATIVE MONITORING SURVEY SUMMARY**

2021 Survey Date	Survey Times	Start Weather Conditions	End Weather Conditions	Name of Biologists
March 4	0730–1655	Temp: 51°F 5% Cloud Cover Wind Speed: 0–1 mph	Temp: 61.4°F 0% Cloud Cover Wind Speed: 6–4 mph	Lorena Bernal,* Sonya Vargas
May 11	0745–1600	Temp: 54°F 100% Cloud Cover Wind Speed: 0–2 mph	Temp: 80.2°F 0% Cloud Cover Wind Speed: 3–8 mph	Lorena Bernal,* Sonya Vargas

NOTE:

\* Blackhawk Environmental, Inc. staff.

### 3.16 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 vernal pools. Invasive non-native plant management was performed by D&D on July 7–8, July 12–13, and July 19–20, 2021, after the ground was completely dry and native plants had generally senesced. Invasive non-native plant management was performed at the 16 vernal pools recommended for treatment by ESA and Blackhawk based on the qualitative survey results. Generally, this coincided with surveyed vernal pools with invasive non-native plant cover of 20 percent or more. The target vernal pools were mechanically dethatched with line trimmers. Care was taken to avoid remaining native plant species. Invasive non-native plants were trimmed as close to the ground as possible. The debris was then raked, bagged, and properly disposed of at D&D yard waste disposal dumpsters. Herbicides were not used within vernal pool basins or within 10 feet of basin margins.

# CHAPTER 4

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## Results and Discussion

### 4.1 Vegetation Mapping and Habitat Assessment

Vegetation mapping and habitat assessments were conducted on eight preserves in 2021. The mapped preserves are Furby-North Preserve, Hellhole Canyon County Preserve, Lawrence and Barbara Daley County Preserve, Mount Olympus County Preserve, Santa Margarita County Preserve, Simon County Preserve, Stoneridge County Preserve, and Wilderness Gardens County Preserve. These represent all Batch 2 TMP Preserves, with the following exceptions: Barnett Ranch Preserve and Tijuana River Valley Regional Park were mapped and assessed in 2018; therefore, vegetation mapping and habitat assessments were not conducted in 2021 for those sites. The vegetation mapping and habitat assessment results are discussed for each preserve below, including quantitative and qualitative descriptions of the mapped vegetation communities and land cover types, invasive non-native plant species observations and associated recommended treatments, and incidental observations of special-status plant and wildlife species. A habitat condition and threats assessment of the preserve, including type conversion, is also provided. Adaptive management recommendations are presented based on these results.

Appendix A, *Habitat Conditions Assessment Memorandum*, contains a brief summary of the results detailed below, including all tables and figures for each preserve (i.e., VCM and Holland-Oberbauer), invasive non-native plant observations, and incidental special-status plant and wildlife species observation figures, as well as representative photographs. All figures referenced in this section are provided in Appendix A.

#### 4.1.1 Furby-North Preserve

A total of six vegetation communities and one land cover type were identified via Holland-Oberbauer and ten vegetation communities and two land cover types were identified via VCM. These communities are depicted in Appendix A, Figure 1 and Figure 2, and are presented in a crosswalk table format in **Table 14**.

**TABLE 14**  
**VEGETATION COMMUNITIES CROSSWALK: FURBY-NORTH PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
<b>Scrub</b>			
32000 Coastal Scrub	4.6 California Sagebrush Alliance	4.6.1 California Sagebrush Association	0.55
	4.45 Jojoba Alliance	4.45 Jojoba Alliance	9.09
	4.42 Lemonade Berry Alliance	4.42.1 Lemonade Berry Association	0.70
32400 Maritime Succulent Scrub	4.42 Lemonade Berry Alliance	4.42.1 Lemonade Berry Association	0.76
	4.45 Jojoba Alliance	4.45 Jojoba Alliance	9.50
		4.45.1 Jojoba-San Diego County Viguiera Association	23.60
32500 Diegan Coastal Sage Scrub	4.45 Laurel Sumac Alliance	4.35 Laurel Sumac Alliance	0.30
	4.42 Lemonade Berry Alliance	4.42.1 Lemonade Berry Association	1.78
	4.45 Jojoba Alliance	4.45 Jojoba Alliance	9.03
		4.45.1 Jojoba-San Diego County Viguiera Association	0.17
4.6 California Sagebrush Alliance	4.6.1 California Sagebrush Association	5.08	
32510 Diegan Coastal Sage Scrub: Coastal form	4.45 Jojoba Alliance	4.45 Jojoba Alliance	1.17
		4.45.1 Jojoba-San Diego County Viguiera Association	4.06
	4.6 California Sagebrush Alliance	4.6.1 California Sagebrush Association	0.50
	4.7 California Sagebrush-California Buckwheat Alliance	4.7 California Sagebrush-California Buckwheat Association	0.63
		4.7.2 California Sagebrush-California Buckwheat-Coastal Prickly Pear-Fingertips Association	0.23
<b>Riparian</b>			
63300 Southern Riparian Scrub	3.9 Red Willow Alliance	3.9.1 Red Willow Association	0.31
<b>Other<sup>a</sup></b>			
11300 Disturbed Habitat	N/A	Disturbed Habitat	0.37
	N/A	Disturbed Habitat – Trails or Roads	5.17
	5.7	5.7.1 Black Mustard Semi-Natural Stand Type	0.97
	5.16	5.16.1 Crown Daisy Semi-Natural Stands	4.31
12000 Urban/Developed	N/A	Disturbed Habitat	0.22
<b>TOTAL ACREAGE:<sup>b</sup></b>			<b>78.53</b>

## NOTES:

<sup>a</sup> The San Diego Vegetation Classification Manual only classifies vegetated areas. The disturbed land cover types were described and displayed under the association level to provide additional detail in the mapping. This allows for changes in vegetation (i.e., unvegetated to vegetated) to be tracked over time.

<sup>b</sup> Total may not match sum of individual acreages listed due to rounding.

### 4.1.1.1 Vegetation Type Descriptions

The following vegetation community and land cover type descriptions for the Furby-North Preserve follow the VCM classification system. General association and alliance descriptions were taken from the Vegetation Classification Manual for Western San Diego County (Sproul et al. 2011).

#### **Soft-Leaved, Drought-Deciduous Shrublands**

##### **4.45 Jojoba Alliance**

Jojoba Alliance is dominated or codominated by jojoba (*Simmondsia chinensis*). Other species in the shrub canopy may include California sagebrush (*Artemisia californica*), snake cholla (*Cylindropuntia californica*), California buckwheat (*Eriogonum fasciculatum*), matchweed (*Gutierrezia sarothrae*), deerweed (*Acmispon glaber* [*Lotus scoparius*]), sugar bush (*Rhus ovata*), black sage (*Salvia mellifera*), and Mojave yucca (*Yucca schidigera*) as subdominants. Shrubs are typically less than 5 meters tall, and the shrub canopy is open to intermittent and two-tiered, while the herbaceous layer cover is open.

This vegetation community makes up the majority of the Furby-North Preserve (28.8 acres) and occurs predominantly in the northern and southern portions. This community lacks San Diego County viguiera, also known as San Diego viguiera (*Bahiopsis laciniata*), which is diagnostic for the association level community (4.45.1). Therefore, the community was mapped to the alliance level. The main invasive non-native species within the community included crown daisy (*Glebionis coronaria*), tocalote (*Centaurea melitensis*), and redstem filaree (*Erodium cicutarium*). The vegetation community is associated with the Holland-Oberbauer classifications 32000 Coastal Scrub, 32400 Maritime Succulent Scrub, 32500 Diegan Coastal Sage Scrub, and 32510 Diegan Coastal Sage Scrub: Coastal form.

##### **4.45.1 Jojoba San Diego County Viguiera Association**

Jojoba-San Diego County Viguiera Association is codominated by jojoba and San Diego County viguiera, with other shrub species resembling those described in 4.45 Jojoba Alliance, but may also include San Diego barrel cactus (*Ferocactus viridescens*) and cholla (*Cylindropuntia* spp).

This vegetation community makes up the second largest majority of the Furby-North Preserve (27.84 acres). It occurs predominantly in the center portion of the property. The vegetation community is associated with the Holland-Oberbauer classifications 32400 Maritime Succulent Scrub, 32500 Diegan Coastal Sage Scrub, and 32510 Diegan Coastal Sage Scrub: Coastal form.

##### **4.6.1 California Sagebrush Association**

California sagebrush is the dominant or codominant species in an open shrub canopy. Subdominant shrubs include California buckwheat, chamise (*Adenostoma fasciculatum*), Ramona lilac (*Ceanothus tomentosus*), laurel sumac (*Malosma laurina*), bushrue (*Cneoridium dumosum*), deerweed, coyote brush (*Baccharis pilularis*), black sage, white sage (*Salvia apiana*), and San Diego County viguiera. This association may represent an early transitional phase of other shrub associations or occur as a relatively stable association in ecotonal areas. A diverse herb cover occurs mostly in openings, and includes purple needle grass (*Stipa pulchra*), clustered tarweed

(*Deinandra fasciculata*), osmadenia (*Osmadenia tenella*), miniature lupine (*Lupinus bicolor*), showy penstemon (*Penstemon spectabilis*), and many non-native grasses and forbs.

This vegetation community consists of 6.13 acres and occurs as small, scattered patches in the northern portion of the property and one larger patch in the south-central portion. The vegetation community is associated with the Holland-Oberbauer classifications 32000 Coastal Scrub, 32500 Diegan Coastal Sage Scrub, and 32510 Diegan Coastal Sage Scrub: Coastal form.

#### **4.7 California Sagebrush – California Buckwheat Alliance**

Aside from the California sagebrush and California buckwheat codominant species, other shrubs in the canopy may include chamise, orange bush monkeyflower (*Mimulus [Diplacus] aurantiacus*), deerweed, laurel sumac, lemonade berry (*Rhus integrifolia*), sugarbush, and/or white sage. Most shrubs are less than 2 meters tall, with some shrubs up to 5 meters tall. The herbaceous layer may include spring annuals, but may have perennial grasses and geophytes.

This vegetation community occurs in small areas in the northern and central portions of the property (0.63 acres), adjacent to disturbed habitat, including a radio tower that falls outside of the boundaries of the property. This habitat is of moderate quality within the property, and may contain invasive non-native grasses and herbs. The vegetation community is associated with the Holland-Oberbauer classification 32510 Diegan Coastal Sage Scrub: Coastal form.

##### **4.7.2 California Sagebrush – California Buckwheat – Coastal Prickly Pear – Fingertips Association**

Codominant species within this community consist of California sagebrush and California buckwheat, with a relatively open canopy containing coastal prickly pear (*Opuntia littoralis*) and/or fingertips (*Dudleya edulis*) in the understory. Subdominant shrub species include lemonade berry, San Diego County viguiera, California box-thorn (*Lycium californicum*), California sunflower (*Encelia californica*), coast cholla (*Cylindropuntia prolifera*), bush rue (*Cneoridium dumosum*), cliff spurge (*Euphorbia misera*), jojoba, white sage, and black sage. The herbaceous understory is well developed and includes chalk dudleya (*Dudleya pulverulenta*), fingertips, lance-leaved dudleya (*Dudleya lanceolata*), San Diego barrel cactus, granny's hairnet (*Pterostegia drymarioides*), small flowered soaproot (*Chlorogalum parviflorum [Hooveria parviflora]*), ashy spikemoss (*Selaginella cinerascens*), and wishbone bush (*Mirabilis laevis var. crassifolia*).

This vegetation community occurs as one patch along the eastern boundary of the Furby-North Preserve in the central area (0.23 acres). The vegetation community is associated with the Holland-Oberbauer classification 32510 Diegan Coastal Sage Scrub: Coastal form.

### **Upland Herbaceous Vegetation**

#### **5.16.1 Crown Daisy Semi-Natural Stands**

This vegetation community is dominated by crown daisy and encompasses other non-native forb species, including black mustard (*Brassica nigra*), shortpod mustard (*Hirschfeldia incana*), tocalote, and non-native grasses. Native species occur in low cover within this community and

may include jojoba, California sagebrush, and black sage. This vegetation community is usually associated with lands subject to heavy disturbance.

This vegetation community occurs in the northwestern corner and southern portions of the Furby-North Preserve (4.31 acres). The vegetation community is associated with the Holland-Oberbauer classification 11300 Disturbed Habitat.

#### **5.7.1 Black Mustard Semi-Natural Stand Type**

This vegetation community is dominated by black and other mustards, including shortpod mustard, and forms a monoculture in disturbed soils. Native species occur in low cover within this community, and may include jojoba, California sagebrush, and black sage. This vegetation community is usually associated with lands subject to heavy disturbance.

This vegetation community occurs in the southern portions of the Furby-North Preserve (0.97 acres). The vegetation community is associated with the Holland-Oberbauer classification 11300 Disturbed Habitat.

### ***Sclerophyllous, Evergreen Shrublands***

#### **4.35 Laurel Sumac Alliance**

This vegetation community is dominated by laurel sumac. Subdominant shrub species include California sagebrush, deerweed, California buckwheat, and spiny redberry (*Rhamnus crocea*). The herbaceous understory may include wild cucumber (*Marah macrocarpa*), wishbone bush, and island morning glory (*Calystegia macrostegia*).

This vegetation community occurs along a north facing slope on the fire access road in the northern portion of the Furby-North Preserve (0.30 acres). The habitat is high quality with minimal signs of recent disturbance. The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

#### **4.42.1 Lemonade Berry Association**

This vegetation community is dominated by lemonade berry, a large-leaved sclerophyllous shrub that dominates the overstory. Subdominant sclerophyllous or drought-deciduous shrub species that make up the understory include chamise, California sagebrush, California buckwheat, and black sage.

This vegetation community occurs along north to northeast facing slopes along Otay Mesa Road, along an unnamed access road in the eastern portion of the property, as well as along the slopes south of Moody Canyon (3.24 acres). The habitat is of moderate quality with signs of recent disturbance including off-highway motor vehicles (OHV) and fire. The vegetation community is associated with the Holland-Oberbauer classifications 32000 Coastal Scrub, 32400 Maritime Succulent Scrub, and 32500 Diegan Coastal Sage Scrub.

## **Riparian Forests and Woodlands**

### **3.9.1 Red Willow Association**

Within the vegetation community, red willow (*Salix laevigata*) is dominant in an open tree canopy, often with other willows present in lower numbers. Subdominant trees may include native willows such as Goodding's black willow (*Salix gooddingii*), and sandbar willow (*Salix exigua*). Shrub species that make up the understory may include mulefat (*Baccharis salicifolia*), coyote brush, or western poison oak (*Toxicodendron diversilobum*).

This vegetation community occurs within an unnamed ephemeral drainage north-northeast of Otay Mesa Road (0.31 acres). The habitat is of moderate quality with signs of recent disturbance including invasive non-native species like Peruvian pepper (*Schinus molle*) and crown daisy. Upstream portions of this unnamed ephemeral drainage may have been former restoration sites associated with the Remington Hills development north of the property. The vegetation community is associated with the Holland-Oberbauer classification 63300 Southern Riparian Scrub.

### **Other<sup>1</sup>**

#### **Disturbed Habitat**

Disturbed habitat is a land cover type used to define lands that do not match a vegetation community included within the VCM for Western San Diego County, and are subject to regular or frequent disturbance. Disturbed lands often lack native vegetation and have non-native vegetation in low numbers. An unpaved barren parking area is mapped as disturbed in the northwest portion of the property adjacent to the San Ysidro School District Facilities to the north (0.59 acres). The land cover type is associated with the Holland-Oberbauer classification 11300 Disturbed Habitat and 12000 Urban/Developed.

#### **Disturbed Habitat – Trails or Roads**

Disturbed Habitat – Trails or Road is a land cover type used to define unvegetated areas used for vehicular or pedestrian traffic. Within the Furby-North Preserve, areas mapped as disturbed habitat—trails or roads include the numerous fire roads and trails throughout the property, and amount to 5.17 acres of the property. The land cover type is associated with the Holland-Oberbauer classification 11300 Disturbed Habitat.

### **4.1.1.2 Invasive Non-Native Plant Observations**

A total of 15 limited to high-risk invasive non-native plant species, as determined by Cal-IPC, were detected and mapped during field surveys on the Furby-North Preserve (**Table 15** and Appendix A, Figure 3). Of these species, four were identified as having a San Diego County Regional Priority Rank (SDCRPR). The Cal-IPC and SDCRPR were taken into consideration when determining the recommended action and should be referenced for specific treatment methods. The recommended action for the species detected is as follows.

<sup>1</sup> The VCM classification and code is provided in this section's subheadings for all vegetation types; however, there is no VCM classification or code for land cover types without vegetation. For these types, we describe them in detail and provide the Holland-Oberbauer classification and code in the last sentence of the description.

- Remove.** One large Canary Island date palm (*Phoenix canariensis*) was observed growing east of the radio tower. This species tends to grow in clusters that form a dense canopy and exclude light from reaching beneath them, leading to a loss of native plants (Cal-IPC 2021); therefore, this individual is recommended for removal along with follow-up visits to detect any seedlings. Similarly, Peruvian pepper trees have the potential to invade habitat, particularly in riparian corridors. One tree was observed within the unnamed ephemeral drainage north of Otay Mesa Road in the northwestern portion of the site. One tamarisk (*Tamarisk ramosissima*) tree was also observed growing within this drainage and is recommended for removal.
- Treat.** Stinkwort (*Dittrichia graveolens*), fennel, tree tobacco (*Nicotiana glauca*), and Russian thistle (*Salsola tragus*) all occurred as small infestations within the property and are recommended for treatment. Fennel is found at multiple locations throughout Moody Canyon in the center of the property. Tree tobacco was observed in the unnamed ephemeral drainage in the northwest portion of the site. Stinkwort is also known to occur within the property but only a small amount was observed near the western boundary of Moody Canyon. Plants observed were vegetative and not yet flowering, which may have reduced the overall quantity observed. Comprehensive invasive non-native plant species mapping in conjunction with treatment is recommended to determine extent of each species within the property and to monitor the success/effectiveness of treatment. Furby-North Preserve provides habitat for more sensitive plant species than other preserves, and would benefit from detailed invasive non-native plant species mapping (particularly species such as crown daisy and fennel). Currently the most successful methods for control of these species is through manual removal and chemical control with systemic and broad-spectrum herbicides.
- Monitor.** Several species occurred in large numbers throughout the property, including black mustard, tocalote, shortpod mustard, redstem filaree, poison hemlock (*Conium maculatum*), castor bean (*Ricinus communis*), and Bermuda buttercup (*Oxalis pes-caprae*) and should continue to be monitored to detect any negative effects on surrounding native vegetation communities. Crown daisy and black mustard are highly invasive non-native species occurring in large swaths within the property, and represent good target opportunities to treat, after comprehensive mapping to determine focus areas for restoration.

**TABLE 15**  
**INVASIVE NON-NATIVE PLANT SPECIES: FURBY-NORTH PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendations
<i>Brassica nigra</i>	black mustard	Moderate	–	Observed throughout entire property associated with trails and disturbed areas.	Monitor
<i>Bromus rubens</i> <sup>a</sup>	red brome	High	–	Observed throughout the site.	Monitor
<i>Centaurea melitensis</i>	tocalote	Moderate	–	Observed throughout entire property associated with trails and disturbed areas.	Monitor
<i>Conium maculatum</i>	poison hemlock	Moderate	–		Monitor

**TABLE 15**  
**INVASIVE NON-NATIVE PLANT SPECIES: FURBY-NORTH PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendations
<i>Dittrichia graveolens</i>	stinkwort	Moderate (Alert)	High		Treat
<i>Erodium cicutarium</i> <sup>a</sup>	redstem filaree	Limited	–	Observed throughout the site. Most common in disturbed soils.	Monitor
<i>Foeniculum vulgare</i>	fennel	Moderate	Very High	Highest concentration within Moody Canyon.	Treat
<i>Glebionis coronaria</i>	crown daisy	Limited	Medium	Common in large swaths of property. Locations partially captured within the VCM mapping.	Monitor
<i>Hirschfeldia incana</i> <sup>a</sup>	shortpod mustard	Moderate	–	Noted on figure in areas with high concentrations. Common throughout the site.	Monitor
<i>Hordeum murinum</i>	wall barley	Moderate	–	Observed sporadically throughout the site. Possibly more widespread throughout the site.	Monitor
<i>Nicotiana glauca</i>	tree tobacco	Moderate	–	Several large trees observed within unnamed ephemeral channel in northwest portion of site.	Treat
<i>Oxalis pes-caprae</i> <sup>a</sup>	Bermuda buttercup	Moderate	–	Common near western gate.	Monitor
<i>Phoenix canariensis</i>	Canary Island date palm	Limited	–		Remove
<i>Ricinus communis</i>	castor bean	Limited	–		Monitor
<i>Salsola tragus</i>	Russian thistle	Limited	–	Associated with disturbed soils.	Treat
<i>Schinus molle</i>	Peruvian pepper tree	Limited	–		Remove
<i>Silybum marianum</i>	milk thistle	Limited	High		Monitor
<i>Sisymbrium irio</i>	London rocket	Limited	–		Monitor
<i>Stipa miliacea</i> var. <i>miliacea</i>	smilo grass	Limited	–		Monitor
<i>Tamarisk ramosissima</i>	tamarisk	High	–		Remove

**TABLE 15**  
**INVASIVE NON-NATIVE PLANT SPECIES: FURBY-NORTH PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendations
NOTES:					
<sup>a</sup> These species were detected within the property, but not mapped; species were found to be widespread throughout the property.					
<u>Cal-IPC Ranking</u>					
High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.					
Moderate – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.					
Limited – These species are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.					
Alert – An Alert is listed on species with High or Moderate impacts that have limited distribution in California, but may have the potential to spread much further.					
Watch – These species have been assessed as posing a high risk of becoming invasive in the future in California.					
<u>San Diego County Regional Priority Ranking (CBI, DENDRA Inc., and Cal-IPC 2012)</u>					
Very High – Level 1 Surveillance. Low effort required to achieve goal of regional surveillance, early detection, rapid response.					
High – Level 2 Eradication. Moderate effort required to achieve goal of eradication with regionally coordinated control program.					
Medium – Level 3 Containment. Funding typically available for re-treatments or control of small populations. Goal is eradication with coordinated programs by management unit or watershed.					
Medium – Level 4 Directed Management. Area may be managed effectively, with slow re-invasion. Goal is to control within reserve or sub-management unit to benefit NCCP resources.					
Low – Level 5 Directed Suppression. Control is typically of short-term benefit (rapid re-invasion) without active restoration. Goal is suppression, typically to allow recovery disturbed site, improve re-vegetation success, or benefit NCCP resources.					

#### 4.1.1.3 Incidental Special-Status Plant and Wildlife Species Observations

Thirteen special-status plant species and two special-status wildlife species were incidentally detected and mapped during vegetation mapping surveys (Table 16 and Appendix A, Figure 4) on the Furby-North Property.

**TABLE 16**  
**INCIDENTAL SPECIAL-STATUS PLANT AND WILDLIFE SPECIES OBSERVATIONS: FURBY-NORTH PRESERVE**

Scientific Name	Common Name	State/Federal Status	San Diego County Special Status List	MSCP Covered Species	California Rare Plant Rank	Notes
<b>Plants</b>						
<i>Ambrosia chenopodiifolia</i>	San Diego bur ragweed	–/–	List B	–	2B.1	Common throughout western and central portion of site.
<i>Bahiopsis laciniata</i>	San Diego County viguiera	–/–	List D	–	–	San Diego County viguiera is common in the middle to southern portions of the property (see Figure 1 – VCM map 4.45.1 Jojoba-San Diego County Viguiera Association)

**TABLE 16**  
**INCIDENTAL SPECIAL-STATUS PLANT AND WILDLIFE SPECIES OBSERVATIONS: FURBY-NORTH PRESERVE**

Scientific Name	Common Name	State/Federal Status	San Diego County Special Status List	MSCP Covered Species	California Rare Plant Rank	Notes
<i>Calochortus</i> sp.		Unk.	Unk.	Unk.	Unk.	Plant material could not be identified to species. Two or three species could potentially occur within property, with one being a MSCP covered species ( <i>Calochortus dunnii</i> )
<i>Cylindropuntia californica</i> var. <i>californica</i>	snake cholla	–/–	List A	MSCP, NE	–	Many individuals in large maritime succulent scrub within center of site.
<i>Deinandra conjugens</i>	Otay tarplant	CT/FE	List A	MSCP	1B.1	Please refer to the Otay tarplant IMG surveys performed as part of targeted monitoring efforts. Not observed during vegetation mapping efforts.
<i>Dichondra occidentalis</i>	western dichondra	–/–	List D	–	–	Observed in mesic soils in northern portion of site near Otay Mesa Road.
<i>Euphorbia misera</i>	cliff spurge	–/–	List B	–	2B.2	Observed throughout site
<i>Ferocactus viridescens</i>	San Diego barrel cactus	–/–	List B	MSCP	2B.1	Observed in multiple locations throughout the site
<i>Iva hayesiana</i>	San Diego marsh elder	–/–	List B	–	2B.2	Observed in unnamed drainage parallel to Otay Mesa Road, possibly planted in a former restoration site.
<i>Lepidium virginicum</i> ssp. <i>Robinsonii</i>	Robinson's pepperweed	–/–	List A	–	4.3	
<i>Lycium californicum</i>	California box thorn	–/–	List D	–	–	Observed within Moody Canyon.
<i>Quercus engelmannii</i>	Engelmann oak	–/–	List D	–	–	Observed in unnamed drainage parallel to Otay Mesa Road, possibly planted in a former restoration site.
<i>Selaginella cinerascens</i>	ashy spike-moss	–/–	List D	–	4.1	
<b>Animals</b>						
<i>Phrynosoma blainvillii</i> ( <i>Phrynosoma coronatum blainvillei</i> )	Blainville's (coast) horned lizard	–/SSC	–	MSCP	–	
<i>Polioptila californica</i>	California coastal gnatcatcher	FT/SSC	Group 1	MSCP	–	

**TABLE 16  
INCIDENTAL SPECIAL-STATUS PLANT AND WILDLIFE SPECIES OBSERVATIONS: FURBY-NORTH PRESERVE**

Scientific Name	Common Name	State/Federal Status	San Diego County Special Status List	MSCP Covered Species	California Rare Plant Rank	Notes
<u>NOTES:</u>						
<u>State/Federal Status</u>						
FE – Federally Endangered						
FT – Federally Threatened						
CE – California Endangered						
CT – California Threatened						
SSC – CDFW Species Special Concern						
<u>San Diego County Special Status List</u>						
LIST A (Plants rare, threatened or endangered in California and elsewhere)						
LIST B (Plants rare, threatened or endangered in California but more common elsewhere)						
LIST C (Plants that may be quite rare, but need more information to determine their true rarity status)						
LIST D (Plants of limited distribution and are uncommon, but not presently rare or endangered)						
CA rare (rare in California, but not listed)						
NE (MSCP Narrow Endemic)						
<u>California Rare Plant Rank</u>						
1A – Plants presumed extirpated in California and either rare or extinct elsewhere						
1B – Plants rare, threatened, or endangered in California and elsewhere						
2A – Plants presumed extirpated in California but common elsewhere						
2B – Plants rare, threatened, or endangered in California but more common elsewhere						
3 – Review List: Plants about which more information is needed						
4 – Watch List: Plants of limited distribution						
0.1 – Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)						
0.2 – Moderately threatened in California (20%–80% occurrences threatened / moderate degree and immediacy of threat)						
0.3 – Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)						
<u>Other</u>						
Unk – Unknown						

#### 4.1.1.4 Habitat Condition and Threats Assessment

##### *Threats Assessment*

Based on the field surveys, biologists took note of any major issues that could pose a threat to the vegetation communities within the Furby-North Preserve. A list of primary threats identified in the IMG protocol is presented in **Table 17** along with a discussion of the severity of each threat within the property (presented as the extent within the property on a scale of 1 to 7).

**TABLE 17  
THREATS OVERVIEW: FURBY-NORTH PRESERVE**

Disturbances/Stressors	Severity (Extent)	Discussion
Invasive non-native plant species (e.g., annual grasses and herbs)	6	Crown daisy, tocalote, and non-native grasses are scattered throughout the site.
Altered fire regime or risk of catastrophic fire	4	Areas where invasive plant species such as crown daisy and black mustard provide increased fuel during dry periods may present greater risk of fire. No previous fire events are known for the Furby-North Preserve.

**TABLE 17**  
**THREATS OVERVIEW: FURBY-NORTH PRESERVE**

Disturbances/Stressors	Severity (Extent)	Discussion
Unauthorized human use (e.g., off-road vehicles, encampments, unauthorized trails, shooting, poaching, and/or dumping)	4	Sign of human and off-road vehicle use (bike tracks, tire tracks, etc.) near multiple entrances. Entrance near northwest portion of site is a single bar gate and has regular hikers using this entrance. At the southwestern entrance, just west of Byer Blvd along the Furby-North Preserve boundary, there is a county gate that is being circumvented (see photograph attachment).
Shothole borer, gold-spotted oak borer and Fusarium fungal invasion	–	Site was not assessed for invasive insect species or fungi. Limited amounts of host species present for shothole borer, gold-spotted oak borer, or Fusarium dieback.
Erosion	3	Erosion observed surrounding fenced radio tower inholding as a result of runoff from bare areas associated with towers. Deep erosional rills also observed on steep trails throughout site. Erosion limited to areas with regular disturbance.
Small, isolated occurrences vulnerable to loss of genetic diversity and to extirpation due to environmental stochasticity or catastrophic disturbance.	–	Otay tarplant is known to occur within the Furby-North Preserve but was not observed during vegetation mapping activities. One individual was observed during IMG focused surveys. Population could be vulnerable to catastrophic disturbance such as fire, or displacement by invasive species.
Altered hydrology (e.g., urban runoff, flood control facilities)	3	Moody Canyon bisects the property and conveys flows from Otay Mesa in the east and towards San Ysidro to the west. While Moody Canyon remains relatively undisturbed within the Property, upstream and downstream portions appear altered due to surrounding development and roads. A second unnamed drainage that conveys flows parallel to Otay Mesa Road (in the northwest portion of the site) likely has increased runoff, invasive species, and possible restoration plantings as a result of the Remington Hills Development.
Herbivory (e.g., seed, vegetation)	1	Not observed (during Otay tarplant IMG surveys).
Detrimental edge effects from adjacent urban development	–	Adjacent urban development may contribute to illegal site usage, illegal dumping, and introduction of invasive species, as well as potential for wildfire. Adjacent urban development may also reduce the use of site as wildlife corridor. Night lighting from adjacent schools and development may also affect nocturnal species.

## NOTES:

Disturbance Categories within Preserve

- 1 – No sign of disturbance within preserve
- 2 – Disturbance does not occur within preserve, but is detected adjacent to preserve boundaries
- 3 – Disturbance occurs in >0% to <10% of preserve
- 4 – Disturbance occurs in 10% to <25% of preserve
- 5 – Disturbance occurs in 25% to <50% of preserve
- 6 – Disturbance occurs in 50% to <75% of preserve
- 7 – Disturbance occurs in ≥ 75% of preserve

### ***Type Conversion***

To detect potential type conversions within the property, Holland-Oberbauer vegetation mapping was used to compare the acreage of each habitat type that was previously mapped with the current acreage by habitat type (**Table 18**).

Based on the differences in acreage by habitat type, developed, disturbed, riparian, and unvegetated floodplain/channels types have decreased as a result of the expansion of scrub habitats within the property. Scrub has increased a total of 15.16 acres. Previous efforts by the County to restore portions of the property appear to be controlling invasive non-native species like crown daisy and black mustard, but have likely increased the overall scrub cover of the site. Highest quality habitat is provided by maritime succulent scrub throughout the site.

**TABLE 18**  
**TYPE CONVERSION ASSESSMENT BASED ON HOLLAND-OBERBAUER MAPPING:**  
**FURBY-NORTH PRESERVE**

Habitat Type	Acres in 2011	Acres in 2021	Difference in Acreage
Developed	1.54	0.22	-1.32
Disturbed	24.61	10.83	-13.78
Herbaceous	0	0	0
Scrub	52.01	67.17	15.16
Riparian	1.62	0.31	-1.31
Unvegetated Floodplain/Channel	0.36	0	-0.36

#### 4.1.1.5 Adaptive Management Recommendations

Adaptive management recommendations were developed for the Furby-North Preserve based on the general habitat condition and threats assessment conducted during habitat mapping. Recommendations are provided for invasive non-native plant species management, habitat enhancement/restoration opportunities, encroachment, and monitoring. Recommendations are detailed in the following subsections.

##### ***Invasive Non-Native Plant Species Management***

As discussed in the invasive non-native plant observations section, several invasive non-native plant species were detected within the property. A recommended action was identified for each species consisting of either removal, treatment, or monitoring. Final implementation of management activities and treatment methods shall be determined by the County based on priority.

##### ***Habitat Enhancement/Restoration Opportunities***

- Erosion.** The Furby-North Preserve contains valuable lands for conservation and restoration opportunities. This was evident based on the many sensitive plants and animals that were detected during surveys. One of the most significant threats to the property is erosion, which may be caused in part due to access roads and areas with low cover of vegetation (or high cover of non-native annual weeds). During surveys, the property appeared to be affected by erosion particularly in disturbed areas such as trails, adjacent to developed areas, and generally in areas where vegetation cover was low. The property could benefit from a focused assessment of erosion issues to better inform next steps, which may include regrading or recontouring in problem areas and/or revegetation of highly disturbed areas (i.e., conversion of unused roads to native habitat), particularly in areas that have sensitive plant species.

- **Rare plants.** The property contained several sensitive plant species which would benefit from comprehensive mapping to determine management/restoration opportunities. Focused rare plant surveys are recommended to capture areas ideally suited for habitat enhancement and restoration, and those areas that may be extirpated by invasive non-native plant species. This could be accomplished through collaboration with SDMMMP.

### **Encroachment**

- **Access control.** There is unauthorized recreational access throughout the property. The property would benefit from a formal public access plan to direct access away from sensitive resources. Installation of signage, fences, natural deterrents, and increased patrols are potential remedies to access control issues. During surveys of the Furby-North Preserve, multiple hikers were observed bypassing the western gate to access the site.
- **Private inholdings.** There is evidence that the radio tower's owner is staging vehicles and equipment outside of their inholding boundaries. Disturbance and invasive non-native plant species surrounding the tower also suggests land surrounding the inholding is possibly related to fuel modification. Recommend investigation of encroachment issues. Additionally, site runoff within the fenced inholding is causing erosion to occur on the land immediately outside of the fenced area belonging to the inholding.

### **Monitoring**

- **Invasive non-native plants.** Invasive non-native plant species mapping should be conducted annually, if feasible, to inform treatment areas, assess new invasions or re-invasions, and determine effectiveness of treatments.
- **Public use.** Increased patrols and access controls should be considered to restrict human and OHV use within the site.
- **Catastrophic events.** Additional vegetation mapping efforts may be conducted as needed following catastrophic events such as wildfires.

## 4.1.2 Hellhole Canyon County Preserve

A total of 20 vegetation communities and two land cover types were identified via Holland-Oberbauer and 32 vegetation communities and two land cover types were identified via VCM. These communities are depicted in Appendix A, Figure 5 and Figure 6, and provided in a crosswalk table format in **Table 19**.

**TABLE 19**  
**VEGETATION COMMUNITIES CROSSWALK: HELLHOLE CANYON COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
<b>Scrub</b>			
32500 Diegan Coastal Sage Scrub	4.23 California Buckwheat Alliance	4.23.1 California Buckwheat Association	0.57
	4.7 California Sagebrush – California Buckwheat Alliance	4.7 California Sagebrush-California Buckwheat Alliance	4.4
32800 Flat-topped Buckwheat	4.23 California Buckwheat Alliance	4.23.1 California Buckwheat Association	11.35

**TABLE 19**  
**VEGETATION COMMUNITIES CROSSWALK: HELLHOLE CANYON COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
<b>Chaparral</b>			
37120 Southern Mixed Chaparral	4.1 Chamise Alliance	4.1 Chamise Alliance	154.25
		4.1.2 Chamise-(California Buckwheat, California Sagebrush, Black Sage) Association	49.28
		4.1.3 Chamise – Hoaryleaf Ceanothus Association	130.63
		4.1.4 Chamise – Ramona Lilac Association	37.85
	4.18 Ramona Lilac Alliance	4.18.1 Ramona Lilac Association	16.28
	4.2 Chamise – Mission Manzanita Alliance	4.2.1 Chamise-Mission Manzanita Association	27.42
		4.2.2 Chamise – Mission Manzanita – Hoaryleaf Ceanothus Association	334.67
		4.2.3 Chamise – Mission Manzanita – Ramona lilac Association	74.62
		4.2.6 Chamise – Mission Manzanita – Scrub Oak Association	5.91
	4.35 Laurel Sumac Alliance	4.35 Laurel Sumac Alliance	7.80
		4.35.1 Laurel Sumac – Deerweed Association	1.05
	4.38 Scrub Oak – Chamise Alliance	4.38.1 Scrub Oak – Chamise Association	1.58
	4.5 Big Berry Manzanita Alliance	4.5 Big Berry Manzanita Alliance	5.32
		4.5.1 Big Berry Manzanita – Chamise Association	5.54
	37121 Granitic Southern Mixed Chaparral	4.1 Chamise Alliance	4.1 Chamise Alliance
4.1.2 Chamise – (California Buckwheat, California Sagebrush, Black Sage) Association			10.90
4.1.3 Chamise – Hoaryleaf Ceanothus Association			9.19
4.1.5 Chamise – Deerweed Association			18.45
4.14 Hoaryleaf Ceanothus Alliance		4.14.1 Hoaryleaf Ceanothus Association	21.80
4.18 Ramona Lilac Alliance		4.18.1 Ramona Lilac Association	174.93
4.2 Chamise – Mission Manzanita Alliance		4.2.2 Chamise – Mission Manzanita – Hoaryleaf Ceanothus Association	1.88
4.20 Smooth Mountain Mahogany Alliance		4.20.1 Smooth Mountain Mahogany Provisional Association	0.53
4.37 Scrub Oak Alliance		4.37.1 Scrub Oak Association	2.15
4.38 Scrub Oak– Chamise Alliance		4.38.1 Scrub Oak – Chamise Association	1.92

**TABLE 19**  
**VEGETATION COMMUNITIES CROSSWALK: HELLHOLE CANYON COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
37122 Mafic Southern Mixed Chaparral	4.1 Chamise Alliance	4.1.3 Chamise – Hoaryleaf Ceanothus Association	114.57
	4.5 Big Berry Manzanita Alliance	4.5.1 Big Berry Manzanita – Chamise Association	36.78
37200 Chamise Chaparral	4.1 Chamise Alliance	4.1 Chamise Alliance	245.88
		4.1.2 Chamise – (California Buckwheat, California Sagebrush, Black Sage) Association	3.67
		4.1.3 Chamise – Hoaryleaf Ceanothus Association	8.25
		4.1.4 Chamise – Ramona Lilac Association	1.41
	4.14 Hoaryleaf Ceanothus Alliance	4.14.1 Hoaryleaf Ceanothus Association	1.31
	4.2 Chamise – Mission Manzanita Alliance	4.2.1 Chamise – Mission Manzanita Association	47.35
	4.35 Laurel Sumac Alliance	4.35 Laurel Sumac Alliance	0.58
37210 Granitic Chamise Chaparral	4.1 Chamise Alliance	4.1 Chamise Alliance	38.02
		4.1.2 Chamise – (California Buckwheat, California Sagebrush, Black Sage) Association	5.29
		4.1.3 Chamise – Hoaryleaf Ceanothus Association	2.10
	4.2 Chamise – Mission Manzanita Alliance	4.2.1 Chamise – Mission Manzanita Association	4.28
37830 Hoaryleaf Ceanothus Chaparral	4.1 Chamise Alliance	4.1.3 Chamise – Hoaryleaf Ceanothus Association	2.13
	4.14 Hoaryleaf Ceanothus Alliance	4.14.1 Hoaryleaf Ceanothus Association	5.41
37900 Scrub Oak Chaparral	4.37 Scrub Oak Alliance	4.37.1 Scrub Oak Association	1.36
		4.37.2 Scrub Oak – Mountain Mahogany Association	0.31
	4.38 Scrub Oak – Chamise Alliance	4.38.1 Scrub Oak – Chamise Association	10.77
37G00 Coastal Sage-Chaparral Transition	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	1.52
	4.1 Chamise Alliance	4.1.2 Chamise – (California Buckwheat, California Sagebrush, Black Sage) Association	33.38
	4.23 California Buckwheat Alliance	4.23.1 California Buckwheat Association	2.13
	4.7 California Sagebrush – California Buckwheat Alliance	4.7.1 California Sagebrush – California Buckwheat – Laurel Sumac Association	9.28

**TABLE 19**  
**VEGETATION COMMUNITIES CROSSWALK: HELLHOLE CANYON COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
<b>Herbaceous</b>			
42210 Valley Needlegrass Grassland	5.23 Foothill Needle Grass Provisional Alliance	5.23.1 Foothill Needle Grass Provisional Association	1.10
42200 Non-Native Grassland	5.13 Clustered Tarweed Alliance	5.13.1 Clustered Tarweed Association	17.47
	5.8 Brome – Purple False Brome Semi-Natural Alliance	5.8 Brome – Purple False Brome Semi-Natural Stands	0.48
		5.8.2 Rippgut Grass Semi-Natural Stand Type	4.22
42400 Foothill/Mountain Perennial Grassland	4.1 Chamise Alliance	4.1 Chamise Alliance	0.28
	4.35 Laurel Sumac Alliance	4.35 Laurel Sumac Alliance	1.60
<b>Riparian</b>			
61300 Southern Riparian Forest	3.4 Western Sycamore Alliance	3.4.2 Western Sycamore – Fremont Cottonwood/Arroyo Willow Association	1.21
		3.4.3 Western Sycamore-Coast Live Oak Association	8.63
	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	2.70
61310 Southern Coast Live Oak Riparian Forest	3.4 Western Sycamore Alliance	3.4.3 Western Sycamore – Coast Live Oak Association	14.72
	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	6.63
<b>Woodland</b>			
71160 Coast Live Oak Woodland	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	9.28
71161 Open Coast Live Oak Woodland	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	17.16
77000 Mixed Oak Woodland	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	4.20
79100 Eucalyptus Woodland	3.2 Eucalyptus Semi-Natural Stands	3.2 Eucalyptus Semi-Natural Stands	1.55
81310 Coast Live Oak Forest	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	2.01
		3.6.4 Coast Live Oak – Western Poison Oak – Grass Association	0.88
<b>Other<sup>a</sup></b>			
11300 Disturbed Habitat	N/A	Disturbed Habitat – Trails or Roads	32.97
12000 Urban/Developed	N/A	Urban/Developed	10.03
		<b>TOTAL ACREAGE:<sup>b</sup></b>	<b>1,857.04</b>

## NOTES:

<sup>a</sup> The San Diego Vegetation Classification Manual only classifies vegetated areas; however, the land cover types were described and displayed under the association level to provide additional detail.

<sup>b</sup> Total may not match sum of individual acreages listed due to rounding.

### 4.1.2.1 Vegetation Type Descriptions

The following vegetation community and land cover type descriptions for the Hellhole Canyon County Preserve (Proper) follow the VCM classification system. General association and alliance descriptions were taken from the VCM for Western San Diego County (Sproul et al. 2011).

#### ***Upland Forests and Woodlands***

##### **3.2 Eucalyptus Semi-Natural Stands**

Over 50 species of eucalyptus have been introduced to California from Australia. However, only a few are known to form self-perpetuating stands and have the qualities of semi-natural stands. River red gum (*Eucalyptus camaldulensis*) is one of the most common species found in naturalized stands in San Diego County, but there are at least 6 other species that are listed in the most recent San Diego County Plant checklist. River red gum is one of the few that appears to invade riparian channels.

This vegetation community occurs in two areas in the center of the preserve associated with old home sites (1.55 acres). The vegetation community is associated with the Holland-Oberbauer classification 79100 Eucalyptus woodland.

##### **3.4.2 Western Sycamore – Fremont Cottonwood/Arroyo Willow Association**

Western sycamore (*Platanus racemosa*) occurs in an open to intermittent tree canopy with Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), arroyo willow (*Salix lasiolepis*), and/or other willow species. Associated subdominant riparian shrubs include western poison oak, mulefat, desert wild grape (*Vitis girdiana*), and California rose (*Rosa californica*). The herbaceous diversity is moderate and cover is open, and consists of mugwort (*Artemisia douglasiana*), western ragweed (*Ambrosia psilostachya*), San Diego sedge, nutsedges (*Cyperus* spp.), yerba mansa (*Anemopsis californica*), rushes (*Juncus* spp.), cattails, and many ruderal species.

This vegetation community occurs in the eastern, upstream boundary of Hell Creek where it enters the preserve (1.21 acres). The vegetation community is associated with the Holland-Oberbauer classification 61300 Southern Riparian Forest.

##### **3.4.3 Western Sycamore – Coast Live Oak Association**

In this vegetation community, western sycamore and coast live oak (*Quercus agrifolia*) are codominant in a continuous to open tree canopy; subdominants may include Fremont cottonwood and willows. Associated subdominant riparian shrubs include blue elderberry (*Sambucus nigra* ssp. *caerulea*), western poison oak, desert wild grape, California rose, and California blackberry (*Rubus ursinus*). Many associated upland shrubs may also be present including lemonade berry, sugar bush, redberry (*Rhamnus* spp.), toyon (*Heteromeles arbutifolia*), and mulefat. The herbaceous diversity is high and cover is continuous to open, and consists of mugwort, Western ragweed, San Diego sedge, nutsedges, yerba mansa, rushes, cattails, and many ruderal species.

This vegetation community occurs in multiple areas associated with Hell Creek within the preserve (23.24 acres). The vegetation community is associated with the Holland-Oberbauer classifications 61300 Southern Riparian Forest and 61310 Southern Coast Live Oak Riparian Woodland.

### 3.6 Coast Live Oak Alliance

General alliance characteristics of this association include coast live oak as the dominant or codominant species in the tree canopy. Associated tree species may include western sycamore, Fremont cottonwood, Engelmann oak (*Quercus engelmannii*), arroyo willow, and California laurel (*Umbellularia californica*). Trees are generally less than 30 meters tall and the canopy is open to continuous. The shrub and herbaceous canopies are variable.

This vegetation community occurs in many areas associated with Hell Creek, as well as north facing slopes west of the visitor's center/parking lot for the preserve (43.50 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37900 Scrub Oak Chaparral, 61300 Southern Riparian Forest, 61310 Southern Coast Live Oak Riparian Forest, 71160 Coast Live Oak Woodland, 71161 Open Coast Live Oak Woodland, and 77000 Mixed Oak Woodland, 81310 Coast Live Oak Forest.

#### 3.6.4 Coast Live Oak – Western Poison Oak – Grass Association

Coast live oak is dominant in the tree canopy and western poison oak is subdominant in the shrub canopy, with an understory of native herbaceous and ruderal species. Subdominant shrubs include blue elderberry, laurel sumac, and coyote brush. The herbaceous diversity is high and cover is generally intermittent to continuous, and consists of many ruderal species. This association is ecologically similar to the other coast live oak associations but occurs higher on the hydrologic profile where many upland shrubs and ruderal plants are prevalent above the fluvial regime.

This vegetation community occurs as an area just north of Addition 2, in the center of the Hellhole Canyon County Preserve (0.88 acres). The vegetation community is associated with the Holland-Oberbauer classification 81310 Coast Live Oak Forest.

## ***Sclerophyllous, Evergreen Shrublands***

### 4.1 Chamise Alliance

Throughout its range, chamise is dominant in the shrub canopy and, depending on the location, may have Eastwood manzanita (*Arctostaphylos glandulosa*), big berry manzanita (*Arctostaphylos glauca*), *Ceanothus* spp., sticky monkeyflower, California yerba santa, California buckwheat, chaparral yucca (*Hesperoyucca whipplei*), toyon, scrub oak, white sage, purple sage (*Salvia leucophylla*), black sage, and western poison oak as associates to codominants or subdominants. Emergent trees may be present at low cover. Shrubs are typically less than 4 meters, the canopy is intermittent to continuous, and the herbaceous layer is sparse to intermittent.

This vegetation community occurs primarily on south facing slopes, and is the most widespread community within the preserve (472.28 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral, 37121 Granitic Southern Mixed Chaparral, 37200 Chamise Chaparral, 37210 Granitic Chamise Chaparral, and 42400 Foothill/Mountain Perennial Grassland.

#### 4.1.2 Chamise – California Buckwheat – California Sagebrush Association

Chamise is dominant with other shrubs occurring as subdominants; together, these species form either a continuous or more often open canopy cover. Subdominant shrubs most commonly

include California sagebrush, California buckwheat, saw-toothed goldenbush (*Hazardia squarossa* ssp. *squarossa*), black sage, scrub oak and Torrey's hybrid oak (*Quercus berberidifolia*, ×*acutidens*), Ramona lilac, and Eastwood manzanita. Dominant herbs often include native and non-native grasses, such as giant wild-rye (*Elymus condensatus*) and red brome (*Bromus rubens*), with a rich diversity of herb species. This association is a mix of chaparral and coastal sage scrub. It occurs both as a mature, stable shrub community or an early transitional stage of other shrublands in response to fire or other disturbance.

This vegetation community occurs in the eastern and western portions of the preserve (102.52 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37G00 Coastal Sage-Chaparral Transition, 37120 Southern Mixed Chaparral, 37121 Granitic Southern Mixed Chaparral, 37200 Chamise Chaparral, and 37210 Granitic Chamise Chaparral.

#### **4.1.3 Chamise – Hoaryleaf Ceanothus Association**

Chamise and hoaryleaf ceanothus (*Ceanothus crassifolius*) form mostly continuous cover and are the dominant shrubs of this vegetation type. Other shrubs species occurring as subdominants include scrub oak, manzanitas (*Arctostaphylos* spp.), black sage, chaparral whitethorn (*Ceanothus leucodermis*), Ramona lilac, chaparral yucca, hollyleaf redberry (*Rhamnus ilicifolia*), sticky monkeyflower, and toyon. Herb diversity and cover is generally low except after fires. In the absence of fire, hoaryleaf ceanothus may become senescent, causing the stand to open up and become chamise-dominated; however, hoaryleaf ceanothus can recolonize from a soil seed bank following fire.

This vegetation community occurs primarily on south facing slopes in the northern portion of the preserve (266.87 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral, 37121 Granitic Southern Mixed Chaparral, 37122 Mafic Southern Mixed Chaparral, 37200 Chamise Chaparral, 37210 Granitic Chamise Chaparral, and 37830 Hoaryleaf Ceanothus Chaparral.

#### **4.1.4 Chamise – Ramona Lilac Association**

Ramona lilac and chamise form mostly continuous cover and are the dominant shrubs in this vegetation association. Other shrubs species occurring as codominants include laurel sumac, scrub oak, manzanitas, Ramona lilac, hairy ceanothus, chaparral whitethorn, and sugar bush. The normally low herb cover and diversity is enhanced following fire. Slopes of cismontane foothills appear as a continuous cover of blue when the *Ceanothus* spp. of this association are in bloom, although these same slopes appear white with flowering chamise in late spring.

This vegetation community occurs in the northwest, southeast portions of the preserve (39.27 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral and 37200 Chamise Chaparral.

#### **4.1.5 Chamise – Deerweed Association**

Chamise and deerweed form mostly open cover and are the dominant shrubs in this vegetation category. Other shrub species may occur at low densities as seedlings or stump sprouts. Many

other shrub, subshrub, and herbaceous species occur, including laurel sumac, California buckwheat, peak rush-rose (*Helianthemum* [*Crocanthemum*] *scoparium*), matchweed, pincushion (*Chaenactis* spp.), island morning glory, and *Phacelia* spp. This association is a transitional stage to other chaparrals, usually as a result of fire or other disturbance.

This vegetation community occurs in the northwest portion of the preserve (18.45 acres). The vegetation community is associated with the Holland-Oberbauer classification 37121 Granitic Southern Mixed Chaparral.

#### 4.14.1 Hoaryleaf Ceanothus Association

Hoaryleaf ceanothus is dominant in the shrub canopy in dense to open stands with low cover of other subdominant shrubs including chamise, laurel sumac, California buckwheat, scrub oak, mission manzanita (*Xylococcus bicolor*), and chaparral beard tongue (*Keckiella antirrhinoides*). A diverse herb flora occurs mostly in openings and after fire, and includes wild cucumber, *Phacelia* spp., island morning glory, Fremont's star lily (*Toxicoscordion* [*Zigadenus*] *fremontii*), *Cryptantha* (*Cryptantha* spp.), and purple Chinese houses (*Collinsia heterophylla*). This vegetation type occupies xeric sites in the interior of San Diego County, where other *Ceanothus* spp. are largely absent.

This vegetation community occurs in the southeast portion of the preserve (28.52 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37121 Granitic Southern Mixed Chaparral, 37200 Chamise Chaparral, and 37830 Hoaryleaf Ceanothus Chaparral.

#### 4.18.1 Ramona Lilac Association

Ramona lilac is dominant in the shrub canopy in continuous stands with relatively low cover of other subdominant shrubs, including scrub oak, scrub oak, smooth mountain mahogany (*Cercocarpus minutiflorus*), chaparral whitethorn, hoaryleaf ceanothus, western poison oak, toyon, bush poppy (*Dendromecon rigida*), and climbing penstemon. Sparse cover from a diverse herb flora occurs in the understory, which becomes more diverse following fire. Coastal foothills that support this association appear as a continuous cover of dark blue when Ramona lilac is flowering.

This vegetation community occurs on north facing slopes within large portions of the center of the preserve (191.21 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral and 37121 Granitic Southern Mixed Chaparral.

#### 4.2.1 Chamise – Mission Manzanita Association

Chamise and mission manzanita often form continuous cover and are the dominant shrubs in this association. Subdominant shrubs include laurel sumac, black sage, lemonade berry, sugar bush, Ramona lilac, hoaryleaf ceanothus, chaparral yucca, Mojave yucca, scrub oak, and spiny redberry. Many other subshrubs and herbs occur, primarily in openings, such as wild cucumber, saw-toothed goldenbush, island morning glory, small flowered soaproot, and little California melica (*Melica imperfecta*). The normally low herbaceous species cover and diversity is enhanced following fire. This association occurs in the cismontane foothills south of the Transverse Range and is mostly confined to San Diego County and Baja California Norte, Mexico.

This vegetation community has a broad distribution throughout the southern half of the preserve (79.06 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral, 37200 Chamise Chaparral, and 37210 Granitic Chamise Chaparral.

#### **4.2.2 Chamise – Mission Manzanita – Hoaryleaf Ceanothus Association**

Chamise, mission manzanita, and hoaryleaf ceanothus form an open or continuous canopy and occur as codominant shrubs in this vegetation community. Many other shrub species commonly occur, including scrub oaks, chaparral whitethorn, Ramona lilac, manzanitas, sugar bush, redberry, laurel sumac, and matchweed. California buckwheat and California sagebrush may be present in ecotonal areas or as early transitional components. Diverse herb cover often occurs in openings and following fire.

This vegetation community has a broad distribution throughout the southern half of the preserve. It is the second most common community by acreage (336.55 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral and 37121 Granitic Southern Mixed Chaparral.

#### **4.2.3 Chamise – Mission Manzanita – Ramona Lilac Association**

Chamise, mission manzanita, and Ramona lilac form an open or continuous canopy and occur as codominant shrubs in this association. Many other codominant shrubs may also be present, including laurel sumac, chaparral whitethorn, sumacs (*Rhus* spp.), redberry, toyon, chaparral yucca, and black sage. California buckwheat and California sagebrush may be present in ecotonal areas or as early transitional components. Diverse herb cover often occurs in openings and following fire.

This vegetation community is evenly distributed throughout the preserve (74.62 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

#### **4.2.6 Chamise – Mission Manzanita – Scrub Oak Association**

Chamise, mission manzanita, and scrub oak occur as codominants, often with an open canopy. Other subdominant shrubs include Ramona lilac, chaparral whitethorn, California buckwheat, smooth mountain mahogany, laurel sumac, redberry, toyon, Mojave yucca, and chaparral yucca. The herbaceous understory is often sparse except after fires.

This vegetation community occurs in two areas in the center of the preserve (5.91 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

#### **4.20.1 Smooth Mountain Mahogany Provisional Association**

Smooth mountain mahogany is the dominant shrub species in this association, forming an open canopy. Subdominant shrubs include chamise, mission manzanita, toyon, laurel sumac, sticky monkeyflower, chaparral yucca, hollyleaf cherry (*Prunus ilicifolia*), California sagebrush, and black sage. A relatively open herb cover occurs mostly in openings, but increases following fire.

The vegetation community is widespread on mesic exposures throughout cismontane San Diego, Orange, and Riverside Counties, but decreases farther north.

This vegetation community occurs in a small patch on a north facing slope above Escondido Canal in the northwest portion of the preserve (0.53 acres). The vegetation community is associated with the Holland-Oberbauer classification 37121 Granitic Southern Mixed Chaparral.

#### **4.35 Laurel Sumac Alliance**

This community is dominated by laurel sumac. Subdominant shrub species include California sagebrush, deerweed, California buckwheat, and spiny redberry. The herbaceous understory may include wild cucumber, wishbone bush, and island morning glory.

This vegetation community occurs in the northwest portion of the preserve (9.99 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral, 37200 Chamise Chaparral, and 42400 Foothill/Mountain Perennial Grassland.

##### **4.35.1 Laurel Sumac – Deerweed Association**

Laurel sumac and deerweed are codominant in this association in open stands with subdominant shrub species, such as California sagebrush, Ramona lilac, chaparral whitethorn, sages (*Salvia* spp.), California buckwheat, spiny redberry, and chaparral yucca. Herbaceous cover and diversity is high, occurring in openings and stimulated by fire. Herbs include island morning glory, white pincushion (*Chaenactis artemisiifolia*), wild cucumber, wishbone bush, granny's hairnet, blow-wives (*Achyraea mollis*), American wild carrot (*Daucus pusillus*), daggerleaf cottonrose (*Logfia gallica*), and lupines (*Lupinus* spp.). This association is often the result of post-fire regeneration, occurring as a transitional vegetation type while longer lived shrub species regain dominance. This association differs from Section 4.35 Laurel Sumac Alliance with the presence of deerweed as a codominant.

This vegetation community occurs in small patches in the eastern and westernmost portions of the preserve (1.05 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

##### **4.37.1 Scrub Oak Association**

Scrub oak and Torrey's hybrid oak are two of the most widespread scrub oaks within the study area. Due to taxonomic uncertainty, these two scrub oak species are included within the same association. These scrub oaks are dominant in this association, usually with continuous cover and often as small inclusions within other shrublands. Subdominant shrub species include smooth mountain mahogany, chamise, Eastwood manzanita, mission manzanita, lemonade berry, western poison oak, chaparral whitethorn, Ramona lilac, and hoaryleaf ceanothus. Herbaceous diversity and cover are relatively low, mostly occurring in openings and increasing in response to fire.

This vegetation community occurs as a small area in the center of the preserve (3.50 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37121 Granitic Southern Mixed Chaparral and 37900 Scrub Oak Chaparral.

#### **4.37.2 Scrub Oak – Smooth Mountain Mahogany Association**

Scrub oak, Torrey’s hybrid oak, and smooth mountain mahogany are codominants, forming a continuous shrub canopy. Subdominant shrubs include western poison oak, chamise, mission manzanita, chaparral whitethorn, Ramona lilac, wart-stemmed ceanothus (*Ceanothus verrucosus*), lemonade berry, and sticky monkeyflower. Herbaceous diversity and cover is relatively low, mostly occurring in openings and increasing in response to fire.

This vegetation community occurs in a small patch on a north facing slope above Escondido Canal in the northwest portion of the preserve (0.31 acres). The vegetation community is associated with the Holland-Oberbauer classification 37900 Scrub Oak Chaparral.

#### **4.38.1 Scrub Oak – Chamise Association**

Scrub oak, Torrey’s hybrid oak, and chamise are codominants, usually forming a continuous shrub canopy. Associated shrubs include smooth mountain mahogany, Ramona lilac, chaparral whitethorn, wart-stemmed ceanothus, hoaryleaf ceanothus, chaparral yucca, white sage, black sage, and mission manzanita. Herbaceous diversity and cover is relatively low, mostly occurring in openings and increasing in response to fire.

This vegetation community occurs in the eastern portion of the preserve (14.27 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral, 37121 Granitic Southern Mixed Chaparral, and 37900 Scrub Oak Chaparral.

#### **4.5 Big Berry Manzanita Alliance**

Big berry manzanita is dominant or codominant in the shrub canopy with chamise. Other subdominant shrubs may include Eastwood manzanita, California sagebrush, hoaryleaf ceanothus, chaparral whitethorn, mountain mahogany, southern silk tassel (*Garrya veatchii*), chaparral yucca, toyon, scrub oak, hollyleaf redberry, and black sage. Emergent trees such as coast live oak or interior live oak may be present with sparse cover. Shrubs are usually less than 3 meters tall; the canopy is open to continuous, and the herbaceous layer is usually sparse.

This vegetation community occurs as a single area in the eastern portion of the preserve (5.32 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

#### **4.5.1 Big Berry Manzanita – Chamise Association**

Big berry manzanita and chamise occur as codominant shrubs that typically form a continuous canopy. Other subdominant shrubs include mission manzanita, scrub oak, laurel sumac, chaparral yucca, white sage, and Ramona lilac. The herb understory is often sparse except after fires. This association occurs primarily in inland foothill and montane areas.

This vegetation community occurs in the eastern portion of the preserve (42.32 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral, and 37122 Mafic Southern Mixed Chaparral.

## **Soft-Leaved, Drought-Deciduous Shrublands**

### **4.23.1 California Buckwheat Association**

California buckwheat is the dominant or codominant species in an open shrub canopy. Subdominant shrubs include California sagebrush, chamise, Ramona lilac, laurel sumac, deerweed, coyote brush, black sage, white sage, and San Diego County viguiera. This association may represent an early transitional phase of other shrub associations or occur as a relatively stable association in ecotonal areas. A diverse herb cover occurs mostly in openings, and includes purple needle grass, clustered tarweed, osmadenia, miniature lupine, showy penstemon, and many non-native grasses and forbs.

This vegetation community occurs on south-southwest facing slopes above Hell Creek in the center and western portions of the preserve (14.04 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32500 Diegan Coastal Sage Scrub, 32800 Flat-Topped Buckwheat, and 37G00 Coastal Sage-Chaparral Transition.

### **4.7 California Sagebrush – California Buckwheat Alliance**

Aside from the California sagebrush and California buckwheat codominant species, other shrubs in the canopy of this alliance may include chamise, sticky monkeyflower, desert tea (*Ephedra californica*), chaparral yucca, deerweed, laurel sumac, lemonade berry, sugarbush, and/or white sage. Most shrubs are less than 2 meters tall, with some shrubs up to 5 meters tall. The herbaceous layer may include spring annuals, but may have perennial grasses and geophytes.

This vegetation community occurs on two small areas on south-southwest facing slopes above Hell Creek in the center and western portions of the preserve (4.40 acres). The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

#### **4.7.1 California Sagebrush – California Buckwheat – Laurel Sumac Association**

California sagebrush, California buckwheat, and laurel sumac are codominant in this association with a relatively open shrub canopy. Many other subdominant shrub species include lemonade berry, California encelia, white sage, San Diego County viguiera, Saw-toothed goldenbush, Chaparral yucca, chaparral pricklypear (*Opuntia oricola*), California brickellbush (*Brickellia californica*), sticky monkeyflower, chaparral beard tongue, and spiny redberry. Herb cover is usually open and with high species diversity. This association can occur both as a mature stable shrub community or as an early transitional stage of other shrublands in response to fire or other disturbance. This association differs from 4.7 California Sagebrush-California Buckwheat Alliance due to the presence of laurel sumac as a codominant.

This vegetation community occurs in two small areas on south-southwest facing slopes above Hell Creek in the center and western portions of the preserve (9.28 acres). The vegetation community is associated with the Holland-Oberbauer classification 37G00 Coastal Sage-Chaparral Transition.

## **Upland Herbaceous Vegetation**

### **5.13.1 Clustered Tarweed Association**

Clustered tarweed occurs most often with sparse to trace cover in herb-dominated openings within in many shrub-dominated vegetation types. As an association it can occur as a codominant or conspicuous species in the herbaceous layer in a complex mosaic of shrublands with grassland and vernal pool associations. Dominant stands of clustered tarweed are readily replaced in disturbed situations by non-native grasses and broadleaf plants. Shrubs and herbs that are associated are therefore highly diverse, representing these differing vegetation types rather than edaphically similar associated species. Some of these co-occurring plants that are more typical of the intact Clustered Tarweed Association include needle grasses (*Stipa* [*Nasella*] spp.), paintbrushes (*Castilleja* spp.), common goldfields (*Lasthenia gracilis*), common sandaster (*Corethrogyne filaginifolia*), bobtail barley (*Hordeum intercedens*), tidy-tips (*Layia platyglossa*), soap plants (*Chlorogalum* spp.), onions (*Allium* spp.), goldenstars (*Bloomeria* spp.), brodiaea (*Brodiaea* spp.), and blue dicks (*Dipterostemon*[*Dichelostemma*] *capitatus*). Oats grasses (*Avena* spp.) are usually present though usually not codominant except on disturbed often clayey sites.

This vegetation community occurs just east of the center of the preserve, associated with a large clay lens (17.47 acres). Within this community, many Yucaipa onion (*Allium marvinii*) and Palmer’s grapplinghook (*Harpagonella palmeri*) plants were observed. A large component of this community was non-native grasses, which identified it as a non-native grassland. Its next nearest Holland-Oberbauer community would be 42300 Wildflower Field; however, constituent species for 42300 did not match those listed within its characteristic species. The vegetation community is associated with the Holland-Oberbauer classification 42200 Non-Native Grassland.

### **5.23.1 Foothill Needle Grass Provisional Association**

Foothill needle grass (*Stipa* [*Nasella*] *lepida*) is codominant in an open herbaceous canopy. Associated herbaceous flora includes goldenstars, blue dicks, onions, brodiaea, mariposa lilies (*Calochortus* spp.), goldfields (*Lasthenia* spp.), plantains (*Plantago* spp.), little California melic, odora (*Porophyllum gracile*), Padre’s shooting star (*Primula* [*Dodecatheon*] *clevelandii*), pygmy-weed (*Crassula connata*), Bigelow’s spike-moss (*Selaginella bigelovii*), and western blue-eyed-grass (*Sisyrinchium bellum*). This vegetation type is most often mixed with other herbaceous native flora in openings of shrublands.

This vegetation community occurs in the northwest portion of the preserve (1.10 acres). The vegetation community is associated with the Holland-Oberbauer classification 42110 Valley Needlegrass Grassland.

## **5.8 Brome – Purple False Brome Semi-Natural Stands**

Throughout cismontane California non-native bromes and related “false” bromes (*Brachypodium* spp.) have become abundant and tend to dominate strongly in areas where the natural ecology of vegetation has been altered by high fire frequency, deposition, deep tilling of soils, and or intensive grazing. Depending on the setting, many stands with ripgut grass (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), or purple false brome (*Brachypodium distachyon*) are dominant or codominant with non-natives in the herbaceous layer. Sometimes emergent trees and shrubs

may be present at low cover. The herb layer is typically less than 75 centimeters and cover is intermittent to continuous.

This vegetation community is not widespread and occurs in the northwest portion of the preserve (0.48 acres). The vegetation community is associated with the Holland-Oberbauer classification 42200 Non-native grassland.

### **5.8.2 Ripgut Grass Semi-Natural Stand Type**

Ripgut grass dominates the herbaceous canopy of many vegetation types especially as a result of disturbance. This brome is most prominent at dominating native grasslands, the understory of oak woodlands, and other vegetation types. It invades low areas with deeper soils creating dense cover and biomass that create dense perpetual thatch. Soft chess is more often subdominant with many other weedy plant species, often not in continuous stands.

This vegetation community occurs in areas beneath oak woodland, and open spaces associated with suspected grazing near the old home site east of the access road/Arizona crossing through Hell Creek within the preserve (4.22 acres). The vegetation community is associated with the Holland-Oberbauer classifications 42200 Non-native grassland and 32800 Flat-topped buckwheat.

### ***Other<sup>2</sup>***

#### **Disturbed Habitat – Trails or Roads**

Disturbed Habitat – Trails or Road is a land cover type used to define unvegetated areas utilized for vehicular or pedestrian traffic. Disturbed habitat – trails or roads are found throughout the preserve and consist of 32.97 acres. The land cover type is associated with the Holland-Oberbauer classification 11300 Disturbed Habitat.

#### **Urban/Developed**

Urban/Developed is a land cover type used to define areas where man made materials or surfaces occupy the landscape and vegetation is restricted or is completely absent. Urban/developed is used within the preserve to depict a large pipeline as well as a concrete lined aqueduct (Escondido Canal) that is present in the southwest portion of the site. The land cover type occurs in 10.03 acres of the preserve. The land cover type is associated with the Holland-Oberbauer classification 12000 Urban/Developed.

## **4.1.2.2 Invasive Non-Native Plant Observations**

A total of 19 limited to high-risk invasive non-native plant species, as determined by Cal-IPC, were detected and mapped during field surveys on Hellhole Canyon County Preserve (Proper) (**Table 20** and Appendix A, Figure 7). Two additional non-listed species were also recorded. Of these species, one was identified as having a SDCRPR. The Cal-IPC and SDCRPR were taken

<sup>2</sup> The VCM classification and code is provided in this section's subheadings for all vegetation types; however, there is no VCM classification or code for land cover types without vegetation. For these types, we describe them in detail and provide the Holland-Oberbauer classification and code in the last sentence of the description.

into consideration when determining the recommended action, and should be referenced for specific treatment methods. The recommended action for the species detected is as follows.

**Remove.** Artichoke thistle (*Cynara cardunculus*), tree tobacco, and Mexican fan palm (*Washingtonia robusta*) are growing in limited quantities within the preserve and would be best controlled through immediate removal prior to further spread within the preserve. Crimson fountain grass (*Pennisetum setaceum*) was found in large amounts sporadically throughout the preserve. In desert regions, crimson fountain grass is contributing to the type conversion of shrubland to grassland by facilitating the occurrence of periodic fire. Its seeds are windblown and spread in the fur, feathers, and feet of animals (DiTomaso et al. 2013). Removal is recommended to prevent further spread and potential type conversions within the preserve.

**Treat.** Himalayan blackberry, Russian thistle, and periwinkle all occurred as small infestations within the preserve and therefore would be good opportunities for treatment.

**Monitor.** Several species occurred prolifically throughout the preserve, including slender wild oat (*Avena barbata*), red brome, ripgut grass, tocalote, redstem filaree, rattail fescue (*Festuca myuros*), shortpod mustard, and smilo grass (*Stipa miliacea* var. *miliacea*) and should continue to be monitored to detect any negative effects on surrounding native vegetation communities. Several plant species not listed as Cal-IPC or SDCRPR species were also prevalent throughout the preserve, including Namaqualand daisy (*Dimorphotheca sinuata*) and natal grass (*Melinis repens* ssp. *repens*). These species are not considered invasive in San Diego, but should be monitored for continued native plant displacement within the preserve.

**TABLE 20**  
**INVASIVE NON-NATIVE PLANT SPECIES: HELLHOLE CANYON COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
<i>Avena barbata</i> <sup>a</sup>	slender wild oat	Moderate	–		Monitor
<i>Bromus diandrus</i>	ripgut grass	Moderate	–	Present in large swaths associated with old home site and other disturbed areas throughout the preserve.	Monitor
<i>Bromus rubens</i> <sup>a</sup>	red brome	High	–	Distributed uniformly throughout the Hellhole Canyon County Preserve in disturbed areas	Monitor
<i>Centaurea melitensis</i> <sup>a</sup>	tocalote	Moderate	–	Distributed uniformly throughout the Hellhole Canyon County Preserve in disturbed areas.	Monitor
<i>Cynara cardunculus</i>	artichoke thistle	Moderate	Very High	CDFA Noxious Species. In limited numbers within Hellhole Canyon County Preserve near Santee Lane and west of parking lot.	Remove
<i>Dimorphotheca sinuata</i>	Namaqualand daisy	–	–	Occurs sporadically throughout the preserve, mostly associated with disturbed areas adjacent to trails and roads. Not included within CAL-IPC or SDCRPR lists but noted as an emerging	Monitor

**TABLE 20**  
**INVASIVE NON-NATIVE PLANT SPECIES: HELLHOLE CANYON COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
				invasive within California and elsewhere and should be considered weedy within Hellhole Canyon County Preserve. A common ornamental plant in the neighborhoods surrounding the preserve.	
<i>Erodium cicutarium</i> <sup>a</sup>	redstem filaree	Limited	–	Distributed uniformly throughout the Hellhole Canyon County Preserve.	Monitor
<i>Eucalyptus camaldulensis</i>	red gum	Limited	–	Large polygons of eucalyptus woodland west of the parking lot and associated with old home.	Monitor
<i>Festuca myuros</i> <sup>a</sup>	rattail sixweeks grass	Moderate	–	Only 1 observation but likely more common throughout the site	Monitor
<i>Gazania linearis</i>	gazania	Moderate	–	Occurs sporadically throughout the preserve, mostly associated with disturbed areas adjacent to trails and roads. A common ornamental plant in the neighborhoods surrounding the Hellhole Canyon County Preserve. Manual removal effective.	Monitor
<i>Hirschfeldia incana</i>	shortpod mustard	Moderate	–		Monitor
<i>Nicotiana glauca</i>	tree tobacco	Moderate	–		Remove
<i>Melinis repens</i> ssp. <i>repens</i> <sup>a</sup>	Natal grass	–	–		
<i>Oxalis pes-caprae</i>	Bermuda buttercup	Moderate	–		Monitor
<i>Pennisetum setaceum</i>	crimson fountain grass	Moderate	–	CDFA Rating C. Mapped wherever seen, but likely more common throughout preserve.	Remove
<i>Rubus armeniacus</i>	Himalayan blackberry	High	–		Treat
<i>Salsola tragus</i>	Russian thistle	Limited	–		Treat
<i>Silybum marianum</i>	milk thistle	Limited	–		Monitor
<i>Stipa miliacea</i> var. <i>miliacea</i>	smilo grass	Limited	–		Monitor
<i>Vinca major</i>	periwinkle	Moderate	–	Located in several locations, some associated with old houses.	Treat
<i>Washingtonia robusta</i>	Mexican fan palm	Moderate	–		Remove

## NOTES:

<sup>a</sup> These species were detected within the preserve, but not mapped; species were found to be widespread throughout the preserve.

Cal-IPC Ranking

High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

**TABLE 20**  
**INVASIVE NON-NATIVE PLANT SPECIES: HELLHOLE CANYON COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
<p>Moderate – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.</p> <p>Limited – These species are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.</p> <p>Alert – An Alert is listed on species with High or Moderate impacts that have limited distribution in California, but may have the potential to spread much further.</p> <p>Watch – These species have been assessed as posing a high risk of becoming invasive in the future in California.</p> <p><u>San Diego County Regional Priority Ranking (Cal-IPC, Dendra, CBI 2012)</u></p> <p>Very High – Level 1 Surveillance. Low effort required to achieve goal of regional surveillance, early detection, rapid response.</p> <p>High – Level 2 Eradication. Moderate effort required to achieve goal of eradication with regionally coordinated control program.</p> <p>Medium – Level 3 Containment. Funding typically available for re-treatments or control of small populations. Goal is eradication with coordinated programs by management unit or watershed.</p> <p>Medium – Level 4 Directed Management. Area may be managed effectively, with slow re-invasion. Goal is to control within reserve or sub-management unit to benefit NCCP resources.</p> <p>Low – Level 5 Directed Suppression. Control is typically of short-term benefit (rapid re-invasion) without active restoration. Goal is suppression, typically to allow recovery disturbed site, improve re-vegetation success, or benefit NCCP resources.</p>					

### 4.1.2.3 Incidental Special-Status Plant and Wildlife Species Observations

Nine special-status plant species and two special-status wildlife species were detected and mapped during field surveys on Hellhole Canyon County Preserve (Proper) (**Table 21** and **Appendix A, Figure 8**).

**TABLE 21**  
**INCIDENTAL SPECIAL-STATUS PLANT AND WILDLIFE SPECIES OBSERVATIONS: HELLHOLE CANYON COUNTY PRESERVE**

Scientific Name	Common Name	State/Federal Status	San Diego County Special Status List	Draft North County MSCP Covered Species	California Rare Plant Rank	Notes
<b>Plants</b>						
<i>Allium marvinii</i>	Yucaipa onion	–/–	–	–	1B.2	Observed in multiple locations throughout the preserve, and in large numbers within lands identified as 5.13.1 Clustered Tarweed Association.
<i>Chorizanthe leptotheca</i>	peninsular spineflower	–/–	–	–	4.2	Observed in multiple locations but likely more widespread throughout the preserve.
<i>Harpagonella palmeri</i>	Palmer's grapplinghook	–/–	–	–	4.2	Found in several locations in the center of the site (associated with lands identified as 5.13.1 Clustered Tarweed Association) and near the eastern boundary of the Hellhole Canyon County Preserve. Common on clay lens near Addition 3.
<i>Horkelia truncata</i>	Ramona horkelia	–/–	–	–	1B.3	

**TABLE 21**  
**INCIDENTAL SPECIAL-STATUS PLANT AND WILDLIFE SPECIES OBSERVATIONS: HELLHOLE CANYON COUNTY PRESERVE**

Scientific Name	Common Name	State/Federal Status	San Diego County Special Status List	Draft North County MSCP Covered Species	California Rare Plant Rank	Notes
<i>Lepidium virginicum robinsonii</i>	Robinson's pepper grass	—/—	—	—	4.3	Observed in multiple locations but likely more widespread throughout the Hellhole Canyon County Preserve.
<i>Monardella hypoleuca</i> ssp. <i>Lanata</i>	felt-leaved monardella	—/—	—	—	1B.2	
<i>Polygala cornuta</i> var. <i>fishiae</i>	Fish's milkwort	—/—	—	—	4.3	Fairly common in eastern and northern portion of site. Points in figure represent many individuals. More plants likely present.
<i>Quercus engelmannii</i>	Engelmann oak	—/—	List D	NC MSCP	4.2	Observed in Mixed Oak Woodland in center of site. Trees observed in area associated with old home site.
<i>Piperia cooperi</i>	chaparral rein-orchid	—/—	List D	—	4.2	One individual found, likely more common throughout the Hellhole Canyon County Preserve.
<b>Animals</b>						
<i>Vireo bellii pusillus</i>	least Bell's vireo	CE, FE	Group 1	NC MSCP	—	
<i>Phrynosoma blainvillii</i>	Blainville's horned lizard	SSC	—	—	—	

**NOTES:**State/Federal Status

FE – Federally Endangered

FT – Federally Threatened

CE – California Endangered

CT – California Threatened

SSC – CDFW Species Special Concern

San Diego County Special Status List

LIST A (Plants rare, threatened or endangered in California and elsewhere)

LIST B (Plants rare, threatened or endangered in California but more common elsewhere)

LIST C (Plants that may be quite rare, but need more information to determine their true rarity status)

LIST D (Plants of limited distribution and are uncommon, but not presently rare or endangered)

CA rare (rare in California, but not listed)

NE (MSCP Narrow Endemic)

California Rare Plant Rank

1A – Plants presumed extirpated in California and either rare or extinct elsewhere

1B – Plants rare, threatened, or endangered in California and elsewhere

2A – Plants presumed extirpated in California but common elsewhere

2B – Plants rare, threatened, or endangered in California but more common elsewhere

3 – Review List: Plants about which more information is needed

4 – Watch List: Plants of limited distribution

0.1 – Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

0.2 – Moderately threatened in California (20%–80% occurrences threatened / moderate degree and immediacy of threat)

0.3 – Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

Other

Unk – Unknown due to timing of survey and life stage of individual

## 4.1.2.4 Habitat Condition and Threats Assessment

### Threats Assessment

Based on the field surveys, biologists took note of any major issues that could pose a threat to the vegetation communities within Hellhole Canyon County Preserve (Proper). A list of primary threats identified in the IMG protocol is presented in **Table 22**, along with a discussion of the severity of each threat within the preserve (presented as the extent within the preserve on a scale of 1 to 7).

**TABLE 22**  
**THREATS OVERVIEW: HELLHOLE CANYON COUNTY PRESERVE**

Disturbances/Stressors	Severity (Extent)	Discussion
Invasive non-native plant species (e.g., annual grasses and herbs)	3	Crimson fountain grass, tocalote, redstem filaree, and non-native grasses are scattered throughout Hellhole Canyon County Preserve in disturbed areas. Additionally, large plantings of red gum in the western and central portions of the site may displace native tree species through allelopathic inhibitors in soil and fallen leaf litter. Consider removal of red gum trees throughout the preserve.
Altered fire regime or risk of catastrophic fire	3	Areas where invasive plant species such as tocalote and dried non-native grasses provide increased fuel during dry periods may present greater risk of fire. Previous evidence of fire observed throughout the preserve.
Unauthorized human use (e.g., off-road vehicles, encampments, unauthorized trails, shooting, poaching, and/or dumping)	3	Gate associated with northern boundary and pipeline/canal access near northern portion of site has trail bypassing locked gate and off-road vehicle use is likely in this area.  Multiple species of dudleya ( <i>Dudleya</i> spp.) were also observed at higher elevations on the preserve but were very limited in areas with increased recreational access and may be subject to poaching.
Shothole borer, gold-spotted oak borer, and Fusarium fungal invasion	–	Site was not assessed for invasive insect species or fungi. There is a large amount of suitable host species present for shothole borer, gold-spotted oak borer, or fusarium dieback.
Erosion	3	Erosion observed primarily associated with roads and trails in center of site. Two large, eroded portions of Horsethief Canyon Trail and Canyon View Trail were observed associated with an unnamed drainage that conveys water flows from northeast to southwest towards Hell Creek. The erosion appears to have been repaired in the past but may present additional issues in the future. The unnamed drainage is also deeply incised.  Erosion was also observed on the bare ground associated with the Escondido Canal where the canal pipeline crosses Hell Creek.  Small amounts of erosion were also observed along Rodriguez Peak Trail in the eastern portion of the site associated with portions of trail.
Small, isolated occurrences vulnerable to loss of genetic diversity and to extirpation due to environmental stochasticity or catastrophic disturbance.	3	Large patch of Palmer's grapplinghook and Yucaipa onion in center of site (within vegetation communities identified as 5.13.1 Clustered Tarweed Association) surrounded by chaparral is isolated from the rest of the site and likely occurs on an isolated clay lens that may support other rare plant species and wildlife. Consider removal of invasive grasses such as slender wild oats may displace some native species.
Altered hydrology (e.g., urban runoff, flood control facilities)	3	Hell Creek bisects the site from east to west, and is intercepted upstream by Hell Creek Road, and converges downstream with Paradise Creek. Access roads that serve the northern portions of the site cross Hell Creek at an Arizona crossing.  Escondido Canal also meanders through the western and southern portion of the site and collects small amounts of runoff from ephemeral drainages and erosional features upslope from canal. These drainages and erosional features likely fed Hell Creek prior to installation of the Canal, and may now reduce some of the hydrology of Hell Creek during storm events.

**TABLE 22**  
**THREATS OVERVIEW: HELLHOLE CANYON COUNTY PRESERVE**

<b>Disturbances/Stressors</b>	<b>Severity (Extent)</b>	<b>Discussion</b>
Herbivory (e.g., seed, vegetation)	1	Not observed.
Detrimental edge effects from adjacent urban development	2	Gazania, Namaqualand daisy, and crimson fountain grass are considered escaped ornamental plants observed as landscape plants in neighboring properties through Valley Center and are likely source of invasive plants within Hellhole Canyon County Preserve. Coordination with the city of Valley Center may be considered to restrict invasive species spread. Restrict area nurseries from growing invasive species.
Grazing	3	Areas associated with the old residential properties appeared to have supported grazing/ranching activities at one time. These areas now support oak woodland with high percentages of invasive grass species such as riggut grass and slender wild oat. It is unclear whether grazing activities extended outside of a restricted area near Hell Creek or throughout the entire preserve. Extensive grazing was unlikely due to high percentage of dense chaparral present on-site.

## NOTES:

Disturbance Categories within Preserve

- 1 – No sign of disturbance within preserve
- 2 – Disturbance does not occur within preserve, but is detected adjacent to preserve boundaries
- 3 – Disturbance occurs in >0% to <10% of preserve
- 4 – Disturbance occurs in 10 to <25% of preserve
- 5 – Disturbance occurs in 25 to <50% of preserve
- 6 – Disturbance occurs in 50 to <75% of preserve
- 7 – Disturbance occurs in ≥ 75% of preserve

### ***Type Conversion***

To detect potential type conversions within the preserve, Holland-Oberbauer vegetation mapping was used to compare the acreage of each habitat type that was previously mapped with the current acreage by habitat type (**Table 23**).

**TABLE 23**  
**TYPE CONVERSION ASSESSMENT BASED ON HOLLAND-OBERBAUER MAPPING:**  
**HELLHOLE CANYON COUNTY PRESERVE**

<b>Habitat Type</b>	<b>Acres in 2011</b>	<b>Acres in 2021</b>	<b>Difference in Acreage</b>
Developed	12.16	10.03	-2.13
Disturbed	26.45	37.67	11.22
Herbaceous	0	20.46	20.46
Scrub	4.96	16.32	11.36
Chaparral	1718.08	1703.59	-14.49
Woodland	44.15	32.20	-11.95
Forest	50.66	36.78	-13.88
Riparian	0	0	0
Unvegetated (water)	0	0	0

A type conversion of disturbed habitat has increased from 26.45 acres to 37.67 acres. This 11.22-acre increase may be due to increased mapping accuracy, off-road vehicle use on-site, and the establishment of non-native grasslands within the center and western portions of the site.

An increase of herbaceous communities from 0 acres in 2011 to 20.46 acres in 2021, including 5.13.1 Clustered Tarweed, 42110 Valley Needlegrass Grassland, and 42400 Foothill/Mountain Perennial Grasslands communities may be contributed to post-fire successional establishment of herbaceous communities in areas of unique soil types and exposures within the center and eastern portions of the site. Higher accuracy mapping and methodology may also contribute to a more refined approach to mapping these communities.

A 14.49-acre decrease of chaparral within the site may have been a statistically insignificant decrease (less than 1% change), and most likely reflects greater accuracy in mapping and the stability of chaparral communities within the site. A 11.95-acre decrease of woodland and a 13.88-acre decrease in forests could be contributed to loss of a diverse tree cover within riparian areas associated with Hell Creek and north facing slopes west of the Hellhole Canyon County Preserve parking lot.

#### **4.1.2.5 Adaptive Management Recommendations**

Adaptive management recommendations were developed based on the general habitat condition and threats assessment conducted during habitat mapping for Hellhole Canyon County Preserve (Proper). Recommendations are provided for invasive non-native plant species management, habitat enhancement/restoration opportunities, encroachment, and monitoring. Recommendations are detailed in the following subsections.

##### ***Invasive Non-Native Plant Species Management***

As discussed in the invasive non-native plant observations section, several invasive non-native plant species were detected within the preserve. A recommended action was identified for each species consisting of either removal, treatment, or monitoring. Immediate removal of artichoke thistle, tree tobacco, Mexican fan palm, and crimson fountain grass is recommended. Final implementation of management activities and treatment methods shall be determined by the County based on priority.

##### ***Habitat Enhancement/Restoration Opportunities***

- **Erosion.** The preserve appeared to be affected by erosion particularly in disturbed areas such as trails, adjacent to developed areas, and generally in areas where vegetation cover was low. The property would benefit from a focused assessment of erosion issues to better inform next steps, which may include regrading or re-contouring in problem areas and/or revegetation of highly disturbed areas (i.e., conversion of unused roads to habitat).
- **Rare plants.** The preserve contained several sensitive plant species that would benefit from comprehensive mapping to determine management/restoration opportunities. Focused rare plant surveys are recommended to capture areas ideally suited for habitat enhancement and restoration, and those areas that may be extirpated by invasive species. This could be accomplished through collaboration with SDMMP.

### Encroachment

- **OHV usage.** Off-road vehicle use is present within lands surrounding portions of the preserve. It is unclear whether this was occurring prior to acquisition of Addition 1 or has occurred since then. County gate associated with northern boundary and pipeline/canal access near northern portion of site has a trail bypassing the locked gate. Consider reinforcing access restrictions from north and southwest portions of the site.
- **Access control.** Consider improved site access restriction in southwest and northwest portions of site to restrict illegal off-road site usage. The northern entrance is associated with the canal/pipeline access road would benefit from increased restrictive fencing.

### Monitoring

- **Invasive non-native plants** Invasive non-native plant species mapping should be conducted annually, if feasible, to inform treatment areas, assess new invasions or re-invasions, and determine effectiveness of treatments.
- **Public use.** Rodriguez Peak Trail has small amounts of erosion associated with trail along entire length along eastern portion of preserve. Previous repair to the trail was visible during surveys, but may need continued maintenance or repair.
- **Catastrophic events.** Additional vegetation mapping efforts may be conducted as needed following catastrophic events such as wildfires.

## 4.1.3 Stoneridge County Preserve

A total of 10 vegetation communities and one land cover type were identified via Holland-Oberbauer and 21 vegetation communities and two land cover types were identified via VCM for Stoneridge County Preserve. These communities are depicted in Appendix A, Figure 9 and Figure 10, and provided in crosswalk format in **Table 24**.

**TABLE 24**  
**VEGETATION COMMUNITIES CROSSWALK: STONERIDGE COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
<b>Scrub</b>			
32500 Diegan Coastal Sage Scrub	4.13 San Diego County Viguiera Alliance	4.13 San Diego County Viguiera Alliance	0.43
		4.13.1 San Diego County Viguiera-California Sagebrush-California Buckwheat Association	43.83
	4.44 Black Sage Alliance	4.44.2 Black Sage – Laurel Sumac Association	0.42
	4.6 California Sagebrush Alliance	4.6.1 California Sagebrush Association	0.89
	4.7 California Sagebrush – California Buckwheat Alliance	4.7 California Sagebrush – California Buckwheat Alliance	6.59
4.7.1 California Sagebrush – California Buckwheat – Laurel Sumac Association		37.85	

**TABLE 24**  
**VEGETATION COMMUNITIES CROSSWALK: STONERIDGE COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
32520 Diegan Coastal Sage Scrub: Inland Form	4.44 Black Sage Alliance	4.44.1 Black Sage – California Buckwheat Association	0.15
<b>Chaparral</b>			
32800 Flat-topped Buckwheat	4.23 California Buckwheat Alliance	4.23.1 California Buckwheat Association	0.16
37120 Southern Mixed Chaparral	4.1 Chamise Alliance	4.1 Chamise Alliance	0.53
		4.1.2 Chamise – (California Buckwheat, California Sagebrush, Black Sage) Association	4.81
		4.1.4 Chamise – Ramona Lilac Association	3.82
	4.18 Ramona Lilac Alliance	4.18.1 Ramona Lilac Association	0.40
	4.2 Chamise – Mission Manzanita Alliance	4.2.1 Chamise – Mission Manzanita Association	39.97
		4.2.3 Chamise – Mission Manzanita – Ramona Lilac Association	86.98
	4.20 Smooth Mountain Mahogany Alliance	4.20.1 Smooth Mountain Mahogany Provisional Association	0.19
4.35 Laurel Sumac Alliance	4.35 Laurel Sumac Alliance	3.61	
37200 Chamise Chaparral	4.1 Chamise Alliance	4.1 Chamise Alliance	0.80
37G00 Coastal Sage – Chaparral Transition	4.1 Chamise Alliance	4.1.2 Chamise – (California Buckwheat, California Sagebrush, Black Sage) Association	2.22
	4.6 California Sagebrush Alliance	4.6.1 California Sagebrush Association	0.38
<b>Herbaceous</b>			
42200 Non-Native Grassland	5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands	5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands	1.51
<b>Woodland</b>			
71161 Open Coast Live Oak Woodland	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	0.14
<b>Forest</b>			
61300 Southern Riparian Forest	3.4 Western Sycamore Alliance	3.4.3 Western Sycamore – Coast Live Oak Association	4.23

**TABLE 24**  
**VEGETATION COMMUNITIES CROSSWALK: STONERIDGE COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
61310 Southern Coast Live Oak Riparian Forest	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	3.11
		3.6.4 Coast Live Oak – Western Poison Oak – Grass Association	0.64
	3.7 Engelmann Oak Alliance	3.7.2 Engelmann Oak – Coast Live Oak – Western Poison Oak-Grass Association	0.64
<b>Other<sup>a</sup></b>			
11300 Disturbed Habitat	5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands	5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi- Natural Stands	0.33
		N/A	Disturbed Habitat
	N/A	Disturbed Habitat – Trails or Roads	1.17
		<b>TOTAL ACREAGE:<sup>b</sup></b>	<b>247.49</b>

## NOTES:

<sup>a</sup> The San Diego Vegetation Classification Manual only classifies vegetated areas. The disturbed land cover types were described and displayed under the association level to provide additional detail in the mapping. This allows for changes in vegetation (e.g., unvegetated to vegetated) to be tracked over time.

<sup>b</sup> Total may not match sum of individual acreages listed due to rounding.

### 4.1.3.1 Vegetation Type Descriptions

The following vegetation community and land cover type descriptions for the Stoneridge County Preserve follow the VCM classification system. General association and alliance descriptions were taken from the VCM for Western San Diego County (Sproul et al. 2011).

#### ***Soft-Leaved, Drought-Deciduous Shrublands***

##### **4.23.1 California Buckwheat Association**

California buckwheat is the dominant or codominant species in an open shrub canopy. Subdominant shrubs include California sagebrush, chamise, Ramona lilac, laurel sumac, bushrue, deerweed, coyote brush, black sage, white sage, and San Diego County viguiera. This association may represent an early transitional phase of other shrub associations or occur as a relatively stable association in ecotonal areas. A diverse herb cover occurs mostly in openings, and includes purple needle grass, clustered tarweed, osmadenia, miniature lupine, showy penstemon, and many non-native grasses and forbs.

This vegetation community occurs in a small patch at the center of the preserve (0.16 acres). The vegetation community is associated with the Holland-Oberbauer classification 32800 Flat-topped Buckwheat.

#### **4.44.1 Black Sage – California Buckwheat Association**

Black sage and California buckwheat occur as codominants in an open shrub canopy. Associated shrubs include coyote brush, California buckwheat, California sagebrush, laurel sumac, coast prickly pear, and lemonade berry. Herbaceous cover is high and distributed mostly in openings.

This vegetation community occurs as a small patch south of Mountain View Road, at the northeast border of the preserve (0.15 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32520 Diegan Coastal Sage Scrub: Inland Form.

#### **4.44.2 Black Sage – Laurel Sumac Association**

Black sage and laurel sumac occur as codominants in an open shrub canopy. Subdominant shrubs include California sagebrush, California buckwheat, sticky monkeyflower, lemonade berry, Ramona lilac, toyon, spiny redberry, chaparral yucca, and saw-toothed goldenbush. Herbaceous cover is high and distributed mostly in openings.

This vegetation community occurs in a small patch south of Mountain View Road, at the northern border of the preserve (0.42 acres). The community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

#### **4.6.1 California Sagebrush Association**

California sagebrush dominates this association, often with a relatively open cover and high diversity of subdominant shrubs, including lemonade berry, California encelia, laurel sumac, California buckwheat, coyote bush, broom baccharis (*Baccharis sarothroides*), coastal goldenbush (*Isocoma menzeiseii*), black sage, white sage, and chaparral mallow (*Malcothamnus fasciculata*). Higher herb cover and diversity occurs in openings. This association can occur both as a mature stable shrub community or as an early transitional stage of other shrublands in response to fire or other disturbance.

This vegetation community occurs in a small area in the eastern portion of the preserve (1.27 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32500 Diegan Coastal Sage Scrub and 37G00 Coastal Sage-Chaparral Transition.

#### **4.7.1 California Sagebrush – California Buckwheat – Laurel Sumac Association**

California sagebrush, California buckwheat, and laurel sumac are codominant in this association with a relatively open shrub canopy. Many other subdominant shrub species include lemonade berry, California encelia, white sage, San Diego County viguiera, saw-toothed goldenbush, chaparral yucca, bushrue, chaparral pricklypear, California brickellbush, sticky monkeyflower, chaparral beardtongue, and spiny redberry. Herb cover is usually open and with high species diversity. This association can occur both as a mature stable shrub community or as an early transitional stage of other shrublands in response to fire or other disturbance.

This vegetation community occurs on north facing slopes in the northern portion of the preserve and north to east facing slopes in the southern portions of the preserve (44.44 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32500 Diegan Coastal Sage Scrub.

### 4.13 San Diego County Viguiera Alliance

San Diego County viguiera is a distinctive drought-deciduous shrub endemic to San Diego County and adjacent Baja California. San Diego County viguiera stands occur commonly in the southwestern portion of the county. They occupy hot, southerly facing slopes generally a few miles inland from the ocean, where summer fog persists throughout the day. Stands are most closely related ecologically to drier stands of the California Buckwheat Alliance. The characteristics of the alliance and the single association defined to date are described below.

This vegetation community occurs in a small patch in the center of the preserve (0.43 acres). The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

#### 4.13.1 San Diego County Viguiera-California Sagebrush – California Buckwheat Association

San Diego County viguiera, California sagebrush, and California buckwheat are dominant to subdominant in closed to open shrub canopy. Subdominant associates include laurel sumac, California sagebrush, California buckwheat, chamise, and mission manzanita. Herbaceous cover is diverse largely in openings and can include *Dudleya* spp., *Cylindropuntia* spp., and chaparral yucca.

This vegetation community occurs in one area in the center of the preserve (43.83 acres). The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

## ***Sclerophyllus, Evergreen Shrublands***

### 4.1 Chamise Alliance

Throughout its range, chamise is dominant in the shrub canopy and, depending on the location, may have red shank (*Adenostoma sparsifolium*), Eastwood manzanita, common manzanita (*Arctostaphylos manzanita*), sticky whiteleaf manzanita (*Arctostaphylos viscida*), *Ceanothus* spp., sticky monkeyflower, California yerba santa (*Eriodictyon trichocalyx*), California buckwheat, chaparral yucca, toyon, scrub oak, interior live oak (*Quercus wislizeni*), white sage, purple sage, black sage, and western poison oak as associates to codominants or subdominants. Emergent trees may be present at low cover. Shrubs are typically less than 4 meters tall; the canopy is intermittent to continuous, and the herbaceous layer is sparse to intermittent.

This vegetation community occurs in the eastern portion of the preserve (1.34 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral and 37200 Chamise Chaparral.

#### 4.1.2 Chamise – (California Buckwheat, California Sagebrush, Black Sage) Association

Chamise is dominant with other shrubs occurring as subdominants; together, these species form either a continuous or more often open canopy cover. Subdominant shrubs most commonly include California sagebrush, California buckwheat, bushrue, saw-toothed goldenbush, black sage, scrub oak, and Ramona lilac. Dominant herbs often include native and non-native grasses, such as giant wild-rye and red brome, with a rich diversity of herb species. This association is a

mix of chaparral and coastal sage scrub. It occurs both as a mature, stable shrub community or an early transitional stage of other shrublands in response to fire or other disturbance.

This vegetation community occurs in the eastern portion of the preserve (7.04 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral and 37G00 Coastal Sage – Chaparral Transition.

#### **4.1.4 Chamise – Ramona Lilac Association**

Ramona lilac and chamise form mostly continuous cover and are the dominant shrubs in this vegetation association. Other shrubs species occurring as codominants include laurel sumac, scrub oak species, manzanita, hairy ceanothus, chaparral whitethorn, Lakeside ceanothus, and sugar bush. The normally low herb cover and diversity is enhanced following fire. Slopes of cismontane foothills appear as a continuous cover of blue when the *Ceanothus* spp. of this association are in bloom, although these same slopes appear white with flowering chamise in late spring.

This vegetation community occurs in the central and northern portions of the preserve (3.82 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

##### **4.18.1 Ramona Lilac Association**

Ramona lilac is dominant in the shrub canopy in continuous stands with relatively low cover of other subdominant shrubs, including scrub oak, smooth mountain mahogany, hoaryleaf ceanothus, western poison oak, toyon, bush poppy, and climbing penstemon (*Keckiella cordifolia*). Sparse cover from a diverse herb flora occurs in the understory, which becomes more diverse following fire. Coastal foothills that support this association appear as a continuous cover of dark blue when Ramona lilac is flowering.

This vegetation community occurs in one patch in the eastern portion of the preserve (0.40 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

##### **4.2.1 Chamise – Mission Manzanita – Scrub Oak Association**

Chamise and mission manzanita often form continuous cover and are the dominant shrubs in this association. Subdominant shrubs include laurel sumac, black sage, bushrue, lemonade berry, sugar bush, Ramona lilac, wart-stemmed ceanothus, hoaryleaf ceanothus, chaparral yucca, Mojave yucca, scrub oak, and spiny redberry. Many other subshrubs and herbs occur, primarily in openings, such as wild cucumber, saw-toothed goldenbush, island morning glory, small flowered soaproot, and little California melica. The normally low herbaceous species cover and diversity is enhanced following fire. This association occurs in the cismontane foothills south of the Transverse Range and is mostly confined to San Diego County and Baja California Norte, Mexico.

This vegetation community occurs primarily in the southern portion of the preserve (39.97 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

### **4.2.3 Chamise – Mission Manzanita – Ramona Lilac Association**

Chamise, mission manzanita, and Ramona lilac form an open or continuous canopy and occur as codominant shrubs in this association. Many other codominant shrubs may also be present, including laurel sumac, chaparral whitethorn, sumacs, redberry, toyon, chaparral yucca, and black sage. California buckwheat and California sagebrush may be present in ecotonal areas or as early transitional components. Diverse herb cover often occurs in openings and following fire.

This vegetation community occurs in the northern portion of the preserve (86.98 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

#### **4.20.1 Smooth Mountain Mahogany Provisional Association**

Smooth mountain mahogany is the dominant shrub species in this association, forming an open canopy. Subdominant shrubs include chamise, mission manzanita, toyon, laurel sumac, sticky monkeyflower, chaparral yucca, hollyleaf cherry, California sagebrush, and black sage. A relatively open herb cover occurs mostly in openings, but increases following fire. This vegetation type is widespread on mesic exposures throughout cismontane San Diego, Orange, and Riverside Counties, but decreases farther north.

This vegetation community occurs in the eastern portion of the preserve (0.19 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

#### **4.35 Laurel Sumac Alliance**

This community is dominated by laurel sumac. Subdominant shrub species include California sagebrush, deerweed, California buckwheat, and spiny redberry. The herbaceous understory may include wild cucumber, wishbone bush, and island morning glory.

This vegetation community is distributed as small patches throughout the preserve (3.61 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

## ***Riparian Forests and Woodlands***

### **3.4.3 Western Sycamore – Coast Live Oak Association**

In this vegetation community, western sycamore and coast live oak are codominant in a continuous to open tree canopy; subdominants may include Fremont cottonwood and willows. Associated subdominant riparian shrubs include blue elderberry, western poison oak, desert wild grape, California rose, and California blackberry. Many associated upland shrubs may also be present including lemonade berry, sugar bush, redberry, toyon, and mulefat. The herbaceous diversity is high and cover is continuous to open, including mugwort, San Diego sagewort (*Artemisia palmeri*), western ragweed, San Diego sedge, sedges, yerba mansa, rushes, cattails, and many ruderal species.

This vegetation community is found within drainages in the center and northeast portion of the preserve (4.23 acres). The vegetation community is associated with the Holland-Oberbauer classification 61300 Southern Riparian Forest.

## **Upland Forests and Woodlands**

### **3.6 Coast Live Oak Alliance**

General alliance characteristics of this association include coast live oak as the dominant or codominant species in the tree canopy. Associated tree species may include big-leaf maple (*Acer macrophyllum*), box elder (*Acer negundo*), pacific madrone (*Arbutus menziesii*), southern California black walnut (*Juglans californica*), western sycamore, Fremont cottonwood, blue oak (*Quercus douglasii*), valley oak (*Quercus lobata*), Engelmann oak, California black oak, arroyo willow, and/or California laurel. Trees are generally less than 30 meters tall and the canopy is open to continuous. The shrub and herbaceous canopies are variable.

This vegetation community occurs within the drainage along Mountain View Road in the northern portion of the preserve (3.25 acres). The vegetation community is associated with the Holland-Oberbauer classifications 61310 Southern Coast Live Oak Riparian Forest and 71161 Open Coast Live Oak Woodland.

#### **3.6.4 Coast Live Oak – Western Poison Oak – Grass Association**

Coast live oak is dominant in the tree canopy and western poison oak is subdominant in the shrub canopy, with an understory of native herbaceous and ruderal species. Subdominant shrubs include blue elderberry, coyote brush, and San Diego sagewort. The herbaceous diversity is high and cover is generally intermittent to continuous, including fewer wetland affiliates than the previous association and many ruderal species. This association is ecologically similar to the coast live oak/arroyo willow association but occurs higher on the hydrologic profile where many upland shrubs and ruderal plants are prevalent above the fluvial regime.

This vegetation community is found within drainages in the center and northeast portion of the preserve (0.64 acres). The vegetation community is associated with the Holland-Oberbauer classification 61310 Southern Coast Live Oak Riparian Forest.

#### **3.7.2 Engelmann Oak – Coast Live Oak-Western Poison Oak – Grass Association**

Engelmann oak and coast live oak are codominants in the tree canopy. Western poison oak is diagnostically present in the shrub canopy. Grasses and other herbs are dominant in the herbaceous understory. Subdominant shrubs include many coastal sage scrub species including black sage, white sage, California sagebrush, laurel sumac, sticky monkeyflower, and climbing keckiella; however, their combined cover is less than western poison oak. The herbaceous understory is often dominated by non-native ruderal plants.

This vegetation community occurs within the drainage along Mountain View Road in northern portion of the preserve (0.64 acres). The vegetation community is associated with the Holland-Oberbauer classifications 61310 Southern coast live oak Riparian Forest.

## Upland Herbaceous Vegetation

### 5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands

This description is based on the group level, which is the hierarchical level above the alliance. The group level is a useful classification where distinction cannot be made to the alliance or association level. This group level classification may be applied in cases where non-native grasses and forbs are dominant over native species, and where none of the following non-native species are clearly dominant or codominant: wild oats, brome grasses, purple false brome, fescues [*Festuca (perenne, multiflorum, temulentum)*], fountain grass, black mustard, poison hemlock, crown daisy. Any of the species above may be present without dominance in a mixed association that may include many other naturalized ruderal species, including bent grass [*Agrostis (avenacea, desertorum, stolonifera, viridis)*], tall fescue (*Festuca arundinacea*), crab grass (*Digitaria* spp.), Russian thistle (*Salsola* spp.), filaree (*Erodium* spp.), Johnson grass (*Sorghum* spp.), *Centaurea* spp., Bermuda grass (*Cynodon* spp.), *Schismus* spp., and blessed milkthistle (*Silybum marianum*). This vegetation type is widespread and highly variable, representing generalized situations where ruderal floras have replaced native types through a history of repeated soil disturbance and the introduction of non-native plant species.

This vegetation community occurs in multiple small areas in disturbed areas along the southern and southeastern boundary of the preserve (1.84 acres). The vegetation community is associated with the Holland-Oberbauer classifications 42200 Non-native grassland and 11300 Disturbed Habitat.

### Other<sup>3</sup>

#### Disturbed Habitat

Disturbed habitat is a land cover type used to define lands that do not match a vegetation community included within the vegetation classification Manual for Western San Diego County and are subject to regular or frequent disturbance. Disturbed lands often lack native vegetation and have non-native vegetation in low numbers. Disturbed lands were observed associated with neighboring properties fuel modification areas associated with houses along Kelly Drive, Normandy Way, and Rosalie Way along the southern boundary of the site (1.65 acres).

#### Disturbed Habitat – Trails or Roads

Disturbed Habitat – Trails or Road is a land cover type used to define unvegetated areas used for vehicular or pedestrian traffic. Several trails access the interior of the preserve from the north, west, and southern boundaries (1.17 acres).

### 4.1.3.2 Invasive Non-Native Plant Observations

A total of 20 limited to high-risk invasive non-native plant species, as determined by Cal-IPC, were detected and mapped during field surveys on Stoneridge County Preserve (**Table 25** and Appendix A, Figure 11). Of these species, three were identified as having a SDCRPR. The Cal-IPC and SDCRPR

<sup>3</sup> The VCM classification and code is provided in this section's subheadings for all vegetation types; however, there is no VCM classification or code for land cover types without vegetation. For these types, we describe them in detail and provide the Holland-Oberbauer classification and code in the last sentence of the description.

were taken into consideration when determining the recommended action, and should be referenced for specific treatment methods. The recommended action for the species detected is as follows.

- **Remove.** Canary Island date palm tends to grow in clusters that form a dense canopy and exclude light from reaching beneath them, leading to a loss of native plants (Cal-IPC 2021); therefore, this individual is recommended for removal along with follow-up visits to detect any seedlings. Similarly, Peruvian pepper trees and Mexican fan palms have the potential to invade habitat, particularly in riparian corridors. Tree tobacco, olive (*Olea europaea*), and Cootamundra wattle (*Acacia baileyana*) were all observed in limited numbers and are recommended for removal to prevent further spread.
- **Treat.** Long-flowered veldt grass (*Ehrharta longiflora*), fennel (*Foeniculum vulgare*), Bermuda buttercup (*Oxalis pes-caprae*), crimson fountain grass, Russian thistle (*Salsola tragus*), and milk thistle all occur as small infestations within the preserve and are recommended for treatment.
- **Monitor.** Several species occurred prolifically throughout the preserve, including slender wild oat, ripgut grass, red brome, Italian thistle (*Carduus pycnocephalus* ssp. *pycnocephalus*), and tocalote. These species should continue to be monitored to detect any negative effects on surrounding native vegetation communities.

**TABLE 25**  
**INVASIVE NON-NATIVE PLANT SPECIES: STONERIDGE COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
<i>Acacia baileyana</i>	Cootamundra wattle	Watch	–	Only a single tree observed growing along Mountain View Road (with others observed outside preserve).	Remove
<i>Avena barbata</i> <sup>1</sup>	slender wild oat	Moderate	–		Monitor
<i>Bromus diandrus</i> <sup>a</sup>	ripgut grass	Moderate	–		Monitor
<i>Bromus rubens</i> <sup>a</sup>	red brome	High	–		Monitor
<i>Carduus pycnocephalus</i> ssp. <i>pycnocephalus</i>	Italian thistle	Moderate	–	Growing within drainages	Monitor
<i>Centaurea melitensis</i> <sup>a</sup>	tocalote	Moderate	–	Observe throughout the site.	Monitor
<i>Cortaderia selloana</i>	pampas grass	High	–		Remove
<i>Ehrharta longiflora</i>	long-flowered veldt grass	Moderate	Medium	Observed in large amounts in northern portion of preserve, and additional	Treat
<i>Foeniculum vulgare</i>	fennel	Moderate	Very High		Treat
<i>Glebionis coronaria</i>	crown daisy	Limited	Medium		Monitor
<i>Hirschfeldia incana</i>	shortpod mustard	Moderate	–		Monitor

**TABLE 25**  
**INVASIVE NON-NATIVE PLANT SPECIES: STONERIDGE COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
<i>Nicotiana glauca</i>	tree tobacco	Moderate	–		Remove
<i>Olea europaea</i>	olive	Limited	–		Remove
<i>Oxalis pes-caprae</i>	Bermuda buttercup	Moderate	–		Treat
<i>Pennisetum setaceum</i>	crimson fountain grass	Moderate	–		Treat
<i>Phoenix canariensis</i>	Canary island date palm	Limited	–		Remove
<i>Salsola tragus</i>	Russian thistle	Limited	–		Treat
<i>Schinus molle</i>	Peruvian peppertree	Limited	–	Many individuals growing along northern boundary of preserve adjacent to Mountain View Road.	Remove
<i>Silybum marianum</i>	milk thistle	Limited	–		Treat
<i>Stipa miliacea</i> var. <i>miliacea</i>	Smilo grass	Limited	–	Observed in large amounts within Drainage along Mountain View Road.	Monitor
<i>Washingtonia robusta</i>	Mexican fan palm	Moderate	–	Observed multiple individuals associated with both drainages within preserve	Remove

## NOTES:

<sup>a</sup> These species were detected within the preserve, but not mapped; species were found to be widespread throughout the preserve.

Cal-IPC Ranking

High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited – These species are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Alert – An Alert is listed on species with High or Moderate impacts that have limited distribution in California but may have the potential to spread much further.

Watch – These species have been assessed as posing a high risk of becoming invasive in the future in California.

San Diego County Regional Priority Ranking (Cal-IPC, Dendra, CBI 2012)

Very High – Level 1 Surveillance. Low effort required to achieve goal of regional surveillance, early detection, rapid response.

High – Level 2 Eradication. Moderate effort required to achieve goal of eradication with regionally coordinated control program.

Medium – Level 3 Containment. Funding typically available for re-treatments or control of small populations. Goal is eradication with coordinated programs by management unit or watershed.

Medium – Level 4 Directed Management. Area may be managed effectively, with slow re-invasion. Goal is to control within reserve or sub-management unit to benefit NCCP resources.

Low – Level 5 Directed Suppression. Control is typically of short-term benefit (rapid re-invasion) without active restoration. Goal is suppression, typically to allow recovery disturbed site, improve re-vegetation success, or benefit NCCP resources.

### 4.1.3.3 Incidental Special-Status Plant and Wildlife Species Observations

Five special-status plant species and no special-status wildlife species were detected and mapped during field surveys on Stoneridge County Preserve (**Table 26** and Appendix A, Figure 12).

**TABLE 26**  
**INCIDENTAL SPECIAL-STATUS PLANT AND WILDLIFE SPECIES OBSERVATIONS: STONERIDGE COUNTY PRESERVE**

Scientific Name	Common Name	State/Federal Status	San Diego County Special Status List	MSCP Covered Species	California Rare Plant Rank	Notes
<b>Plants</b>						
<i>Artemisia palmeri</i>	San Diego Sagewort	–/–	List D	–	4.2	Observed in Drainage along Mountain View Road.
<i>Carex spissa</i>	San Diego Sedge	–/–	–	–	–	Not rare but mapped as host plant for Harbison's dun skipper, a sensitive butterfly species. Several nectar sources also observed nearby.
<i>Chorizanthe leptotheca</i>	Peninsular spineflower	–/–	List D	–	–	On exposed soils near center of site
<i>Iva hayesiana</i>	San Diego Marsh-Elder	–/–	List B	–	2B.2	Observed in drainage within center of site.
<i>Quercus engelmannii</i>	Engelmann oak	–/–	List D	–	4.2	Many large trees observed within drainage adjacent to Mountain View Road.

**NOTES:**

State/Federal Status

FE – Federally Endangered  
 FT – Federally Threatened  
 CE – California Endangered  
 CT – California Threatened  
 SSC – CDFW Species Special Concern

San Diego County Special Status List

LIST A (Plants rare, threatened or endangered in California and elsewhere)  
 LIST B (Plants rare, threatened or endangered in California but more common elsewhere)  
 LIST C (Plants that may be quite rare, but need more information to determine their true rarity status)  
 LIST D (Plants of limited distribution and are uncommon, but not presently rare or endangered)  
 CA rare (rare in California, but not listed)  
 NE (MSCP Narrow Endemic)

California Rare Plant Rank

1A – Plants presumed extirpated in California and either rare or extinct elsewhere  
 1B – Plants rare, threatened, or endangered in California and elsewhere  
 2A – Plants presumed extirpated in California but common elsewhere  
 2B – Plants rare, threatened, or endangered in California but more common elsewhere  
 3 – Review List: Plants about which more information is needed  
 4 – Watch List: Plants of limited distribution  
 0.1 – Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)  
 0.2 – Moderately threatened in California (20%–80% occurrences threatened / moderate degree and immediacy of threat)  
 0.3 – Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

Other

Unk – Unknown due to timing of survey and life stage of individual

### 4.1.3.4 Habitat Condition and Threats Assessment

#### *Threat Assessment*

Based on the field surveys, biologists took note of any major issues that could pose a threat to the vegetation communities within the Stoneridge County Preserve. A list of primary threats identified in the IMG protocol is presented in **Table 27**, along with a discussion of the severity of each threat within the preserve (presented as the extent within the preserve on a scale of 1 to 7).

**TABLE 27**  
**THREATS OVERVIEW: STONERIDGE COUNTY PRESERVE**

<b>Disturbances/Stressors</b>	<b>Severity (Extent)</b>	<b>Discussion</b>
Invasive non-native plant species (e.g., annual grasses and herbs)	4	Various invasive non-native plant species are scattered throughout the preserve, and highly concentrated in areas associated with the two drainages on-site.
Altered fire regime or risk of catastrophic fire	4	Multiple fires have been recorded within the Stoneridge preserve, the most recent of which was the Cedar fire in 2003. Evidence of the fire was still visible on the trunks of live oaks and sycamores throughout the riparian areas of the site.
Unauthorized human use (e.g., off-road vehicles, encampments, unauthorized trails, shooting, poaching, and/or dumping)	4	A trail entering the site from the west (access from private driveways off Old Mountain View Road) is being utilized for off-road use and other possible activities, such as shooting, poaching, or dumping. Consider access restriction from this side. Tire tracks (motorcycle and 4-wheel) were visible along western trail within site, and only possible access is from the west.
Shothole borer, gold-spotted oak borer, and Fusarium fungal invasion	-	Site was not assessed for invasive insect species or fungi. Limited amounts of host species present for shothole borer, gold-spotted oak borer, or Fusarium dieback. Several dead oak trees were observed within the preserve, but cause of death was not determined.
Erosion	3	Erosion was observed in multiple locations on the preserve. An access road from the northern portion of the preserve has completely washed out and large concrete culverts are now visible. The majority of the access road is overgrown and washed out. Deep erosional rills were observed on north facing slopes of the access road. An additional access road from the west also has large erosional rills present along top of slopes and is visible in aerial imagery.
Small, isolated occurrences vulnerable to loss of genetic diversity and to extirpation due to environmental stochasticity or catastrophic disturbance.	-	N/A
Altered hydrology (e.g., urban runoff, flood control facilities)	3	A small concrete dam structure (32.824365, -116.833404) and multiple temporary sandbag structures were observed within Harbison Canyon altering downstream flows. It is unclear if the sandbag structures were installed as a result of the 2003 Cedar Fire, or during site restoration activities.
Herbivory (e.g., seed, vegetation)	1	N/A
Detrimental edge effects from adjacent urban development	3	Eastern entrance to the preserve (32.823626, -116.832628) was observed to have 'Private Property' signage, various dumped materials and property boundary encroachment by neighbors (~218 Frances Drive) near the easternmost boundary of the preserve. Neighboring properties to the northwest and southeast of the preserve also have vague property boundaries between private properties and the preserve. Fuel modification of lands associated with the preserve was mapped as disturbed during vegetation mapping activities. Preserve would benefit from fencing between private properties and the preserve.

**TABLE 27**  
**THREATS OVERVIEW: STONERIDGE COUNTY PRESERVE**

Disturbances/Stressors	Severity (Extent)	Discussion
NOTES:		
<u>Disturbance Categories within Preserve</u>		
1 – No sign of disturbance within preserve		
2 – Disturbance does not occur within preserve, but is detected adjacent to preserve boundaries		
3 – Disturbance occurs in >0% to <10% of preserve		
4 – Disturbance occurs in 10 to <25% of preserve		
5 – Disturbance occurs in 25 to <50% of preserve		
6 – Disturbance occurs in 50 to <75% of preserve		
7 – Disturbance occurs in ≥ 75% of preserve		

### ***Type Conversion***

In order to detect potential type conversions within the preserve, Holland-Oberbauer vegetation mapping was used to compare the acreage of each habitat type that was previously mapped with the current acreage by habitat type (**Table 28**).

An increase of disturbed land cover type of 1.49 acres, and a decrease of developed land uses of 0.34 acres can be contributed to differences in mapping methodologies and an increase in mapping accuracy.

Increases in woodlands and decreases in forests are likely due increased accuracy in mapping, and successional changes since the Cedar Fire in 2003. A 50.25-acre decrease in scrub and a 56.52-acre increase in chaparral could also be attributed to successional development of the preserve post-fire.

**TABLE 28**  
**TYPE CONVERSION ASSESSMENT BASED ON HOLLAND-OBERBAUER MAPPING:**  
**STONERIDGE COUNTY PRESERVE**

Habitat Type	Acres in 2012	Acres in 2021	Difference in Acreage
Developed	0.34	0	-0.34
Disturbed	3.17	4.66	1.49
Herbaceous	0	0	0
Scrub	140.58	90.33	-50.25
Chaparral	87.21	143.73	56.52
Woodland	16.05	0.14	-15.91
Forest	0	8.62	8.62
Riparian	0.14	0	-0.14
Unvegetated (water)	0	0	0

### 4.1.3.5 Adaptive Management Recommendations

Adaptive management recommendations for Stoneridge County Preserve were developed based on the general habitat condition and threats assessment conducted during habitat mapping. Recommendations are provided for invasive non-native plant species management, habitat enhancement/restoration opportunities, encroachment, and monitoring. Recommendations are detailed in the following subsections.

#### ***Invasive Non-Native Plant Species Management***

As discussed in the invasive non-native plant observations section, several invasive non-native plants were detected within the preserve. A recommended action was identified for each species consisting of either removal, treatment, or monitoring. Final implementation of management activities and treatment methods shall be determined by the County based on priority.

#### ***Habitat Enhancement/Restoration Opportunities***

- **Erosion.** The preserve is affected by erosion particularly in disturbed areas such as trails, adjacent to developed areas, and generally in areas where vegetation cover was low. The preserve would benefit from a focused assessment of erosion issues to better inform habitat enhancement/restoration opportunities. Project types may include regrading or re-contouring in problem areas and/or revegetation of highly disturbed areas (i.e., conversion of unused roads to habitat).
- **Hydrological management.** Concrete and sandbag impoundments, in addition to invasive non-native plant species, have contributed to altered hydrology within Harbison Canyon and may have contributed to poor downstream conditions. A structured wetland assessment (such as the Hydrogeomorphic approach [HGM] or the California Rapid Assessment Method [CRAM]) can be used to assess the ambient functional condition of the drainages within Stoneridge County Preserve. These baseline surveys can then be compared if restoration of either drainage occurs.

#### ***Encroachment***

- **Access control.** There is unauthorized recreational access throughout the preserve. The preserve would benefit from a formal public access plan to direct access away from sensitive resources. Installation of signage, fences, natural deterrents, and increased patrols are potential remedies to access control issues. Currently, it is unclear whether public access is allowed within the preserve. Signage near the southern boundary indicates that access may be allowed but the preserve provides no clear trail heads or parking areas.
- **OHV use.** A trail entering the preserve from the west side is being utilized by off-road vehicles within the preserve. Tire tracks and shell casings were visible within the preserve along this western trail. A gate installed between the trail and private driveways off Old Mountain View Road appears to restrict access to this trail, but whoever has access to this gate may be using the preserve for these purposes.
- **Fire management.** Vegetation removal within the preserve as possible fuel modification is occurring along the southern boundary of the preserve. Areas mapped as disturbed identify those areas where this vegetation removal is likely encroaching onto the preserve. Enhanced fencing or preserve boundary delineation is recommended. Restoration of native habitat within these areas is recommended. Monitor treated areas to detect effectiveness of actions.

### Monitoring

- **Invasive non-native plants.** Invasive non-native plant species mapping should be conducted annually, if feasible, to inform treatment areas, assess new invasions or re-invasions, and determine effectiveness of treatments.
- **Hydrological management.** Survey the drainages within preserve to assess the baseline functionality and inform habitat enhancement/restoration opportunities.
- **Catastrophic events.** Additional vegetation mapping efforts may be conducted as needed following catastrophic events such as wildfires.

#### 4.1.4 Santa Margarita County Preserve

A total of 19 vegetation communities and one land cover type was identified via Holland-Oberbauer and 35 vegetation communities and three land cover types were identified via VCM for Santa Margarita County Preserve. These communities are depicted in Appendix A, Figure 13 and Figure 14, and provided in crosswalk format in **Table 29**.

**TABLE 29**  
**VEGETATION COMMUNITIES CROSSWALK: SANTA MARGARITA COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage	
	Alliance Level	Association Level		
<b>Scrub</b>				
32500 Diegan Coastal Sage Scrub	4.1 Chamise Alliance	4.1.2 Chamise-California Buckwheat- California Sagebrush Association	0.39	
	4.6 California Sagebrush Alliance	4.6.1 California Sagebrush Association	1.79	
	4.7 California Sagebrush – California Buckwheat Alliance	4.7 California Sagebrush – California Buckwheat Alliance		7.07
		4.7.1 California Sagebrush-California Buckwheat – Laurel Sumac Association		24.78
		4.7.2 California Sagebrush-California Buckwheat – Chaparral Pricklypear/Fingertips Association		0.24
	4.32 Deerweed Alliance	4.32.1 Deerweed Association	0.11	
	4.43 White Sage Alliance	4.43.2 White Sage – California Sagebrush Association	0.39	
	4.23 California Buckwheat Alliance	4.23.3 California Buckwheat – Sweetbush Association	0.23	
32520 Diegan Coastal Sage Scrub: Inland form	4.7 California Sagebrush – California Buckwheat Alliance	4.7 California Sagebrush – California Buckwheat Alliance	0.19	
		4.7.1 California Sagebrush – California Buckwheat – Laurel Sumac Association	0.12	
	4.23 California Buckwheat Alliance	4.23.3 California Buckwheat – Sweetbush Association	6.85	
	4.43 White Sage Alliance	4.43.2 White Sage – California Sagebrush Association	5.43	

**TABLE 29**  
**VEGETATION COMMUNITIES CROSSWALK: SANTA MARGARITA COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
<b>Chaparral</b>			
37120 Southern Mixed Chaparral	4.1 Chamise Alliance	4.1 Chamise Alliance	0.53
		4.1.2 Chamise – California Buckwheat – California Sagebrush Association	2.65
		4.1.3 Chamise – Hoaryleaf Ceanothus Association	1.07
		4.1.5 Chamise – Deerweed Association	0.27
	4.2 Chamise – Mission Manzanita Alliance	4.2.1 Chamise-Mission Manzanita-Scrub Oak Association	12.46
		4.2.2 Chamise – Mission Manzanita – Hoaryleaf Ceanothus Association	0.82
	4.20 Smooth Mountain Mahogany Alliance	4.20.1 Smooth Mountain Mahogany Provisional Association	3.09
	4.35 Laurel Sumac Alliance	4.35 Laurel Sumac Alliance	0.45
		4.35.1 Laurel Sumac – Deerweed Association	2.26
	4.38 Scrub Oak – Chamise Alliance	4.38.1 Scrub Oak – Chamise Association	64.03
37200 Chamise Chaparral	4.1 Chamise Alliance	4.1 Chamise Alliance	7.21
		4.1.3 Chamise – Hoaryleaf Ceanothus Alliance	0.11
		4.1.5 Chamise – Deerweed Association	0.67
37900 Scrub Oak Chaparral	4.37 Scrub Oak Alliance	4.37.1 Scrub Oak Association	0.40
		4.37.2 Scrub Oak – Smooth Mountain Mahogany Association	0.27
37G00 Coastal Sage- Chaparral Transition	4.1 Chamise Alliance	4.1.2 Chamise – (California Buckwheat, California Sagebrush, Black Sage) Association	8.31
<b>Herbaceous</b>			
42200 Non-Native Grassland	5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands	5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi- Natural Stands	0.13
42300 Wildflower Field	5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands	5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi- Natural Stands	0.46
<b>Riparian</b>			
61300 Southern Riparian Forest	3.4 Western Sycamore Alliance	3.4 Western Sycamore Alliance	7.66
		3.4.1 Western Sycamore/Mulefat Association	0.39
		3.4.2 Western Sycamore-Cottonwood- Arroyo Willow Association	0.71
		3.4.3 Western Sycamore-Coast Live Oak Association	4.43
	3.6 Coast Live Oak Alliance	3.6.4 Coast Live Oak-Western Poison Oak-Grass Association	0.22

**TABLE 29**  
**VEGETATION COMMUNITIES CROSSWALK: SANTA MARGARITA COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
61310 Southern Coast Live Oak Riparian Forest	3.4 Western Sycamore Alliance	3.4.3 Western Sycamore-Coast Live Oak Association	0.17
	3.6 Coast Live Oak Alliance	3.6.3 Coast Live Oak – Arroyo Willow Association	0.26
61330 Southern Cottonwood-Willow Riparian Forest	3.4 Western Sycamore Alliance	3.4.2 Western Sycamore – Cottonwood – Arroyo Willow Association	1.27
	3.5 Fremont Cottonwood Alliance	3.5 Fremont Cottonwood Alliance	0.36
		3.5.1 Fremont Cottonwood/Mulefat Association	0.55
		3.5.2 Fremont Cottonwood – Goodding's Black Willow/Mulefat Association	0.53
62400 Southern Sycamore-Alder Riparian Woodland	3.4 Western Sycamore Alliance	3.4 Western Sycamore Alliance	0.47
62500 Southern Riparian Woodland	3.4 Western Sycamore Alliance	3.4 Western Sycamore Alliance	0.89
		3.4.1 Western Sycamore/Mulefat Association	1.41
		3.4.2 Western Sycamore – Cottonwood – Arroyo Willow Association	3.45
	3.6 Coast Live Oak Alliance	3.6.3 Coast Live Oak – Arroyo Willow Association	4.34
	3.9 Red Willow Alliance	3.9.1 Red Willow Association	9.75
	3.10 Arroyo Willow Alliance	3.10.1 Arroyo Willow Association	0.57
63300 Southern Riparian Scrub	3.4 Western Sycamore Alliance	3.4.1 Western Sycamore/Mulefat Association	0.35
	Hinds' Willow Alliance	Hind's Willow Alliance	0.32
63320 Southern Willow Scrub	3.9 Red Willow Alliance	3.9.1 Red Willow Association	3.62
	3.10 Arroyo Willow Alliance	3.10.1 Arroyo Willow Association	0.65
	Hind's Willow Alliance	Hind's Willow Alliance	0.67
<b>Woodland</b>			
71160 Coast Live Oak Woodland	3.4 Western Sycamore Alliance	3.4.3 Western Sycamore – Coast Live Oak Association	0.11
	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	1.98
		3.6.2 Coast Live Oak – Scrub Oak Association	1.09
		3.6.4 Coast Live Oak – Western Poison Oak-Grass Association	1.20
71161 Open Coast Live Oak Woodland	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	1.24
		3.6.4 Coast Live Oak – Western Poison Oak-Grass Association	2.63
<b>Forest</b>			
81310 Coast Live Oak Forest	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	0.14

**TABLE 29**  
**VEGETATION COMMUNITIES CROSSWALK: SANTA MARGARITA COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
<b>Other<sup>a</sup></b>			
11300 Disturbed Habitat	N/A	Disturbed Habitat	1.18
12000 Urban/Developed	N/A	Disturbed Habitat – Trails or Roads	5.39
64100 Open Water	Open Water	Open Water	0.46
<b>TOTAL ACREAGE:<sup>b</sup></b>			<b>211.28</b>

## NOTES:

<sup>a</sup> The San Diego Vegetation Classification Manual only classifies vegetated areas. The disturbed land cover types were described and displayed under the association level to provide additional detail in the mapping. This allows for changes in vegetation (e.g., unvegetated to vegetated) to be tracked over time.

<sup>b</sup> Total may not match sum of individual acreages listed due to rounding.

#### 4.1.4.1 Vegetation Type Descriptions

The following vegetation community and land cover type descriptions for the Santa Margarita County Preserve follow the VCM classification system. General association and alliance descriptions were taken from the VCM for Western San Diego County (Sproul et al. 2011).

##### ***Soft-Leaved, Drought-Deciduous Shrublands***

##### **4.23.3 California Buckwheat – Sweetbush Association**

California buckwheat and sweetbush (*Bebbia juncea*) are codominant in this association, forming an open canopy. Subdominant shrubs include laurel sumac, chaparral yucca, deerweed, California sagebrush, sages, and California brickellbush. A diverse herbaceous understory occurs, and may include granny's hair net, Dudleya (*Dudleya* spp.), Bigelow's spike moss, stinging lupine (*Lupinus hirsutissimus*), and bird's-foot fern (*Pellaea mucronata*). This association occurs on dry sites, both on slopes and alluvial terraces.

This vegetation community occurs in the center portion of the preserve, north of De Luz Road (7.08 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32500 Diegan Coastal Sage Scrub and 32520 Diegan Coastal Sage Scrub: Inland Form.

##### **4.32.1 Deerweed Association**

Deerweed is dominant in this association with an open shrub canopy, and often occurs with subdominant shrubs from various other shrublands. Subdominant shrubs include California buckwheat, California sagebrush, saw toothed goldenbush, chaparral mallow, chamise, *Ceanothus* (*Ceanothus* spp.), sages, and scrub oaks. Herb cover and diversity is also diverse and variable, and includes species such as island morning glory, everlasting neststraw (*Stylocline gnaphaloides*), cudweeds (*Pseudognaphalium* spp.), and common eucrypta (*Eucrypta*

*chrysanthemifolia*). This association is considered early transitional, resulting from natural regeneration following fire.

This vegetation community occurs in the central portion of the preserve, south of De Luz Road (0.11 acres). The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

#### **4.35 Laurel Sumac Alliance**

This community is dominated by laurel sumac. Subdominant shrub species include California sagebrush, deerweed, California buckwheat, and spiny redberry. The herbaceous understory may include wild cucumber, wishbone bush, and island morning glory.

This vegetation community occurs in the northern and southern portions of the preserve (0.45 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

##### **4.35.1 Laurel Sumac – Deerweed Association**

Laurel sumac and deerweed are codominant in this association and form open stands with subdominant shrub species, such as California sagebrush, Ramona lilac, chaparral whitethorn, sages, California buckwheat, spiny redberry, and chaparral yucca. Herbaceous cover and diversity is high, occurring in openings and stimulated by fire. Herbs include island morning glory, white pincushion, wild cucumber, wishbone bush, fairy mist, American wild carrot, daggerleaf cottonrose, and lupines. This association is often the result of post-fire regeneration, occurring as a transitional vegetation type while longer lived shrub species regain dominance.

This vegetation community occurs in the northeast and southern portions of the preserve (2.26 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral.

##### **4.37.1 Scrub Oak Association**

Scrub oak and Torrey's hybrid oak are two of the most widespread scrub oaks within western San Diego County. Due to taxonomic uncertainty, these two scrub oak species are included within the same association. These scrub oaks are dominant in this association, usually with continuous cover and often as small inclusions within other shrublands. Subdominant shrub species include smooth mountain mahogany, chamise, manzanitas, mission manzanita, lemonade berry, western poison oak, chaparral whitethorn, Ramona lilac, and hoaryleaf ceanothus. Herbaceous diversity and cover is relatively low, mostly occurring in openings and increasing in response to fire.

This vegetation community occurs as two small patches along the east facing slope above Santa Margarita River in the center of the preserve (0.40 acres). The vegetation community is associated with the Holland-Oberbauer classification 37900 Scrub Oak Chaparral.

##### **4.37.2 Scrub Oak – Smooth Mountain Mahogany Association**

Scrub oaks and smooth mountain mahogany are codominant, forming a continuous shrub canopy. Subdominant shrubs include western poison oak, chamise, mission manzanita, chaparral

whitethorn, Ramona lilac, lemonade berry, and sticky monkeyflower. Herbaceous diversity and cover is relatively low, mostly occurring in openings and increasing in response to fire.

This vegetation community occurs in a small patch in the northcentral portion of the preserve, adjacent to the neighboring avocado orchards to the west (0.27 acres). The vegetation community is associated with the Holland-Oberbauer classification 37900 Scrub Oak Chaparral.

#### **4.38.1 Scrub Oak – Chamise Association**

Scrub oak and chamise are codominant, usually as a continuous shrub canopy. Associated shrubs include smooth mountain mahogany, Ramona lilac, chaparral whitethorn, wart-stemmed ceanothus, hoaryleaf ceanothus, chaparral yucca, white sage, black sage, and mission manzanita. Herbaceous diversity and cover is relatively low, mostly occurring in openings and increasing in response to fire.

This vegetation community makes up large portions of the northern, western, and southern portions of the preserve (64.03 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

#### **4.43.2 White Sage – California Sagebrush Association**

White sage and California sagebrush occur as codominants in an open shrub canopy in this association. Associated subdominant shrubs include saw-toothed goldenbush, chaparral yucca, spiny redberry, laurel sumac, and California buckwheat. Herb cover is well developed and diverse, and generally occurs in openings. This association can occur as a mix of chaparral and coastal sage scrub in mature stable shrub communities or as an early transitional stage of other shrublands in response to fire or other disturbance.

This vegetation community is evenly distributed throughout the preserve (5.82 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32500 Diegan Coastal Sage Scrub and 32520 Diegan Coastal Sage Scrub: Inland Form.

#### **4.6.1 California Sagebrush Association**

California sagebrush clearly dominates this association, often with a relatively open cover and high diversity of subdominant shrubs, including lemonade berry, coastal goldenbush, laurel sumac, California buckwheat, coyote bush, coastal goldenbush, black sage, white sage, and chaparral mallow. Higher herb cover and diversity occurs in openings. This association can occur both as a mature stable shrub community or as an early transitional stage of other shrublands in response to fire or other disturbance.

This vegetation community occurs in the northern and central portions of the preserve (1.79 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32500 Diegan Coastal Sage Scrub.

#### **4.7 California Sagebrush – California Buckwheat Alliance**

Aside from the California sagebrush and California buckwheat codominant species, other shrubs in the canopy of this alliance may include chamise, sticky monkeyflower, chaparral yucca, deerweed, laurel sumac, lemonade berry, and white sage. Most shrubs are less

than 2 meters tall, with some shrubs up to 5 meters tall. The herbaceous layer may include spring annuals, but may have perennial grasses and geophytes.

This vegetation community occurs in the northern and central portions of preserve (7.26 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32500 Diegan Coastal Sage Scrub and 32520 Diegan Coastal Sage Scrub: Inland Form.

#### **4.7.1 California Sagebrush – California Buckwheat – Laurel Sumac Association**

California sagebrush, California buckwheat, and laurel sumac are codominant in this association with a relatively open shrub canopy. Many other subdominant shrub species include lemonade berry, California encelia, white sage, San Diego County viguiera, saw-toothed goldenbush, chaparral yucca, chaparral pricklypear, California brickellbush, sticky monkeyflower, chaparral beardtongue, and spiny redberry. Herb cover is usually open and with high species diversity. This association can occur both as a mature stable shrub community or as an early transitional stage of other shrublands in response to fire or other disturbance.

This vegetation community occurs in the northern and southern portions of the preserve (24.91 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32500 Diegan Coastal Sage Scrub and 32520 Diegan Coastal Sage Scrub: Inland Form.

#### **4.7.2 California Sagebrush – California Buckwheat – Chaparral Pricklypear/Fingertips Association**

California sagebrush and California buckwheat are codominant, having a relatively open canopy with chaparral pricklypear, and/or fingertips present in the understory. Subdominant shrub species include lemonade berry, San Diego County viguiera, California box-thorn, California encelia, white sage, and black sage. The herbaceous understory is well-developed and includes chalk dudleya, fingertips, lance-leaved dudleya, giant needle grass (*Achnatherum [Stipa] coronatum*), San Diego barrel cactus, granny's hairnet, and wishbone bush.

This vegetation community occurs in the northern portion of the preserve (0.24 acres). The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

### ***Sclerophyllus, Evergreen Shrublands***

#### **4.1 Chamise Alliance**

Throughout its range, chamise is dominant in the shrub canopy and, depending on the location, may have Rainbow manzanita (*Arctostaphylos rainbowensis*), Ramona lilac, sticky monkeyflower, California buckwheat, chaparral yucca, toyon, scrub oak, white sage, black sage, and western poison oak as associates to codominants or subdominants. Emergent trees may be present at low cover. Shrubs are typically less than 4 meters; the canopy is intermittent to continuous, and the herbaceous layer is sparse to intermittent.

This vegetation community occurs in the central, western, and northern portions of the preserve (7.74 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral and 37120 Chamise Chaparral.

#### **4.1.2 Chamise – (California Buckwheat, California Sagebrush, Black Sage) Association**

Chamise is dominant with other shrubs occurring as subdominants; together, these species form either a continuous or more often open canopy cover. Subdominant shrubs most commonly include California sagebrush, California buckwheat, saw-toothed goldenbush, black sage, scrub oak, and Ramona lilac. Dominant herbs often include native and non-native grasses, such as giant wild-rye and red brome, with a rich diversity of herb species. This association is a mix of chaparral and coastal sage scrub. It occurs both as a mature, stable shrub community or an early transitional stage of other shrublands in response to fire or other disturbance.

This vegetation community is evenly distributed throughout the preserve (11.35 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32500 Diegan Coastal Sage Scrub, 37120 Southern Mixed Chaparral, and 37G00 Coastal Sage-Chaparral Transition.

#### **4.1.3 Chamise – Hoaryleaf Ceanothus Association**

Chamise and hoaryleaf ceanothus form mostly continuous cover and are the dominant shrubs of this vegetation type. Other shrubs species occurring as subdominants include scrub oak species, manzanitas, black sage, chaparral whitethorn, Ramona lilac, chaparral yucca, sticky monkeyflower, and toyon. Herb diversity and cover is generally low except after fires. This association typically occupies xeric interior sites in the cismontane portion of the study area. In the absence of fire, hoaryleaf ceanothus may become senescent, causing the stand to open up and become chamise dominated; however, hoaryleaf ceanothus can recolonize from a soil seed bank following fire.

This vegetation community occurs as two small areas in the west-central portion of the preserve (1.17 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral and 37200 Chamise Chaparral.

#### **4.1.5 Chamise – Deerweed Association**

Chamise and deerweed form mostly open cover and are the dominant shrubs in this vegetation category. Other shrub species may occur at low densities as seedlings or stump sprouts. Many other shrub, subshrub, and herbaceous species occur, including laurel sumac, California buckwheat, rush-rose, matchweed, pincushion, island morning glory, and phacelias. This association is a transitional stage to other chaparrals, usually as a result of fire or other disturbance.

This vegetation community occurs as several patches within the center of the preserve (0.95 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral and 37200 Chamise Chaparral.

#### **4.2.1 Chamise – Mission Manzanita Association**

Chamise and mission manzanita often form continuous cover and are the dominant shrubs in this association. Subdominant shrubs include laurel sumac, black sage, bushrue, lemonade berry, sugar bush, Ramona lilac, hoaryleaf ceanothus, chaparral yucca, scrub oak, and spiny redberry. Many other subshrubs and herbs occur, primarily in openings, such as wild cucumber, saw-

toothed goldenbush, island morning glory, small flowered soaproot, and little California melica. The normally low herbaceous species cover and diversity is enhanced following fire. This association occurs in the cismontane foothills south of the Transverse Range and is mostly confined to San Diego County and Baja California Norte, Mexico.

This vegetation community occurs in a large area in the east-central portion of the preserve (12.46 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

#### **4.2.2 Chamise – Mission Manzanita – Hoaryleaf Ceanothus Association**

Chamise, mission manzanita, and hoaryleaf ceanothus form an open or continuous canopy and occur as codominant shrubs in this vegetation community. Many other shrub species commonly occur, including scrub oaks, chaparral whitethorn, Ramona lilac, manzanitas, sugar bush, redberry, laurel sumac, and matchweed. California buckwheat and California sagebrush may be present in ecotonal areas or as early transitional components. Diverse herb cover often occurs in openings and following fire.

This vegetation community occurs in the northern and southern portions of the preserve (0.82 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

#### **4.20.1 Smooth Mountain Mahogany Provisional Association**

Smooth mountain mahogany is the dominant shrub species in this association, forming an open canopy. Subdominant shrubs include chamise, mission manzanita, toyon, laurel sumac, sticky monkeyflower, chaparral yucca, hollyleaf cherry, California sagebrush, and black sage. A relatively open herb cover occurs mostly in openings, but increases following fire. This vegetation type is widespread on mesic exposures throughout cismontane San Diego, Orange, and Riverside Counties, but decreases farther north.

This vegetation community occurs in a large area in the center of the preserve (3.09 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral.

### ***Riparian Shrublands***

#### **3.9.1 Red Willow Association**

Within this community, red willow is dominant in an open tree canopy, often with other willows present in lower numbers. Subdominant trees may include native willows such as Goodding's black willow, and Hind's willow (*Salix exigua* var. *hindsiana*). Shrub species that make up the understory may include mulefat, coyote brush, or western poison oak.

This vegetation community occurs along the Santa Margarita River within the preserve (13.37 acres). The vegetation community is associated with the Holland-Oberbauer classifications 62500 Southern Riparian Woodland and 63320 Southern Willow Scrub.

### **Hind's Willow Alliance**

Within this community, Hind's willow is dominant in the shrub canopy, often with other willows present in lower numbers.<sup>4</sup> Subdominant trees may include native willows such as Goodding's black willow, and arroyo willow. Shrub species that make up the understory may include mulefat, coyote brush, or western poison oak.

This vegetation community occurs east of the Santa Margarita River in the center of the preserve (0.99 acres). The vegetation community is associated with the Holland-Oberbauer classifications 63300 Southern Riparian Scrub and 63320 Southern Willow Scrub.

### **Riparian Forests and Woodlands**

#### **3.10.1 Arroyo Willow Association**

Arroyo willow is the dominant species in the shrub canopy of this vegetation community, often with subdominants including Hind's willow, mulefat, or coyote brush, and may include occasional Goodding's black willow and/or red willow as emergent trees with trace cover. The herbaceous canopy (stratum) includes a number of wetland species as subdominants, such as Western ragweed and mugwort.

This vegetation community occurs along the Santa Margarita River within the preserve (1.23 acres). The vegetation community is associated with the Holland-Oberbauer classifications 62500 Southern Riparian Woodland and 63320 Southern Willow Scrub.

#### **3.4 Western Sycamore Alliance**

Western sycamore alliance stands may include coast live oak and other trees but are characterized by the presence of regularly spaced western sycamore. In general, western sycamore is dominant or codominant in the tree canopy; additional tree species may include southern California black walnut, Fremont cottonwood, coast live oak, narrow-leaved willow, Goodding's black willow, red willow, arroyo willow, and California laurel. Trees are generally less than 35 meters with open canopy. The shrub and herb canopies are open with sparse cover.

This vegetation community occurs along the Santa Margarita River within the preserve (9.02 acres). The vegetation community is associated with the Holland-Oberbauer classifications 61300 Southern Riparian Forest, 62400 Southern Sycamore-Alder Riparian Woodland, and 62500 Southern Riparian Woodland.

##### **3.4.1 Western Sycamore – Mulefat Association**

Within this vegetation community, western sycamore is dominant or codominant in an open tree canopy with mulefat dominant in an open shrub canopy. Associated subdominant riparian shrubs include western poison oak, blue elderberry, desert wild grape, and California rose. Many upland shrubs may also occur in this association. The herbaceous diversity is low and cover is sparse; characteristic species include mugwort, western ragweed, and San Diego sedge.

<sup>4</sup> There is no number associated with this alliance in the VCM. The manual only makes the distinction and calls out the "Salix exigua Alliance" in the Group 3 key at the beginning and in the crosswalk table at the end.

This vegetation community occurs along the downstream portion of the Santa Margarita River near De Luz Road within the preserve (2.15 acres). The vegetation community is associated with the Holland-Oberbauer classifications 61300 Southern Riparian Forest, 62500 Southern Riparian Woodland, and 63300 Southern Riparian Scrub.

### **3.4.2 Western Sycamore – Fremont Cottonwood – Arroyo Willow Association**

Western sycamore occurs in an open to intermittent tree canopy with Fremont cottonwood, arroyo willow, and/or other willow species. Associated subdominant riparian shrubs include western poison oak, broom baccharis, mulefat, desert wild grape, and California rose. The herbaceous diversity is moderate and cover is open, including mugwort, western ragweed, San Diego sedge, nutsedges, yerba mansa, rushes, and many ruderal species.

This vegetation community occurs in the central portions of the preserve (5.43 acres). The vegetation community is associated with the Holland-Oberbauer classifications 61300 Southern Riparian Forest, 61330 Southern Cottonwood-Willow Riparian Forest, and 62500 Southern Riparian Woodland.

### **3.4.3 Western Sycamore – Coast Live Oak Association**

In this vegetation community, western sycamore and coast live oak are codominant in a continuous to open tree canopy; subdominants may include Fremont cottonwood and willows. Associated subdominant riparian shrubs include blue elderberry, western poison oak, desert wild grape, California rose, and California blackberry. Many associated upland shrubs may also be present including lemonade berry, redberry, toyon, and mulefat. The herbaceous diversity is high and cover is continuous to open, including mugwort, Western ragweed, San Diego sedge, nutsedges, yerba mansa, rushes, cattails, and many ruderal species.

This vegetation community occurs in the southeast portions of preserve (4.72 acres). The vegetation community is associated with the Holland-Oberbauer classifications 61300 Southern Riparian Forest, 61310 Southern Coast Live Oak Riparian Forest, and 71160 Coast Live Oak Woodland.

## **3.5 Fremont Cottonwood Alliance**

This alliance is generally characterized as having Fremont cottonwood as the dominant or codominant in the tree canopy with western sycamore, coast live oak, narrow-leaved willow, Goodding's black willow, red willow, arroyo willow, and shining willow (*Salix lasiandra* ssp. *lasiandra*). Trees average less than 25 meters; canopy is open. The shrub and herbaceous canopies are typically open.

This vegetation community occurs at the upstream limit of the Santa Margarita River where it intersects the preserve boundary (0.36 acres). The vegetation community is associated with the Holland-Oberbauer classifications 61330 Southern Cottonwood-Willow Riparian Forest.

### **3.5.1 Fremont Cottonwood – Mulefat Association**

Fremont cottonwood and mulefat occur together as codominants. Associated subdominant riparian shrubs include blue elderberry, coastal goldenbush, and willows. The herbaceous

diversity is low and cover is mostly continuous in openings, including western ragweed, yerba mansa, and many ruderal species.

This vegetation community occurs in small, scattered areas along the Santa Margarita River within the preserve (0.55 acres). The vegetation community is associated with the Holland-Oberbauer classification 61330 Southern Cottonwood-Willow Riparian Forest.

### **3.5.2 Fremont Cottonwood – Goodding's Black Willow/Mulefat Association**

Fremont cottonwood and Goodding's black willow occur as codominants in an open tree canopy with mulefat subdominant in the shrub canopy. Subdominant tree species include red willow, arroyo willow, narrow-leaved willow, blue elderberry, coast live oak, and western sycamore. Associated shrubs include western poison oak, coyote bush, and California rose. Herbaceous vegetation occurs in openings, often in flood scour or depositional areas including a diverse assemblage of native and non-native wetland plants such as mugwort, seaside heliotrope (*Heliotropium curassavicum*), bulrush (*Schoenoplectus* spp.), cattails, cocklebur (*Xanthium strumarium*), and smilo grass.

This vegetation community occurs between De Luz Road and the preserve parking lot, south of the Santa Margarita River (0.53 acres). The vegetation community is associated with the Holland-Oberbauer classification 61330 Southern Cottonwood-Willow Riparian Forest.

## ***Upland Forests and Woodlands***

### **3.6 Coast Live Oak Alliance**

Coast live oak is the dominant or codominant species in the tree canopy and can be associated with other tree species such as southern California black walnut, western sycamore, Fremont cottonwood, Engelmann oak, arroyo willow, and/or California laurel. Trees are generally less than 30 meters tall and the canopy is open to continuous. The shrub and herbaceous canopies are variable.

This vegetation community occurs along the south side of De Luz Road near the preserve parking lot, and along an unnamed drainage in the northern portion of the preserve (3.36 acres). The vegetation community is associated with the Holland-Oberbauer classifications 71160 Coast Live Oak Woodland, 71161 Open Coast Live Oak Woodland, and 81310 Coast Live Oak Forest.

#### **3.6.2 Coast Live Oak – Scrub Oak Association**

Coast live oak is dominant in an open tree canopy with scrub oak diagnostically present in the shrub canopy. Subdominant shrubs include Ramona lilac, toyon, smooth mountain mahogany, sticky monkeyflower, fragrant sumac, California sagebrush, laurel sumac, California yerba santa, climbing penstemon, saw-toothed goldenbush, and many other chaparral species. Herbaceous cover occurs in openings including wild cucumber, phacelias, and a high diversity of chaparral-associated plants. This association is typical of mesic slopes where coast live oak is not associated with riparian vegetation types.

This vegetation community occurs in the northern and southern portions of the preserve (1.09 acres). The vegetation community is associated with the Holland-Oberbauer classifications 71160 Coast Live Oak Woodland.

### **3.6.3 Coast Live Oak – Arroyo Willow Association**

Coast live oak is dominant in an open to closed tree canopy with arroyo willow typically dominating the shrub canopy. Subdominant trees may include western sycamore, Fremont cottonwood, and willows; if present, these tree species must have a less than trace percent cover for this association to apply. Subdominant shrubs include desert wild grape, blue elderberry, and *Baccharis* spp. (*salicifolia*, *sarothroides*, *pilularis*). The herbaceous diversity is low and cover is generally open, including wetland affiliates such as San Diego sagewort, western ragweed, yerba mansa, and fringed willowherb.

This vegetation community occurs south of the Santa Margarita River, and adjacent to the preserve parking lot (4.60 acres). The vegetation community is associated with the Holland-Oberbauer classifications 61310 Southern Coast Live Oak Riparian Forest and 62500 Southern Riparian Woodland.

### **3.6.4 Coast Live Oak – Western Poison Oak – Grass Association**

Coast live oak is dominant in the tree canopy and western poison oak is subdominant in the shrub canopy, with an understory of native herbaceous and ruderal species. Subdominant shrubs may include blue elderberry and coyote brush. The herbaceous diversity is high and cover is generally intermittent to continuous, including fewer wetland affiliates than the previous association and many ruderal species. This association is ecologically similar to the coast live oak/arroyo willow Association but occurs higher on the hydrologic profile where many upland shrubs and ruderal plants are prevalent above the fluvial regime.

This vegetation community occurs along the western side of the Santa Margarita River within the center of the preserve (4.05 acres). The vegetation community is associated with the Holland-Oberbauer classifications 61300 Southern Riparian Forest, 71160 Coast Live Oak Woodland, and 71161 Open Coast Live Oak Woodland.

## ***Upland Herbaceous Vegetation***

### **5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands**

This description is based on the group level, which is the hierarchical level above the alliance. The group level is a useful classification where a distinction cannot be made to the alliance or association level. This group level classification may be applied in cases where non-native grasses and forbs are dominant over native species, and where none of the following non-native species are clearly dominant or codominant: wild oats, bromes, purple false brome, fescues, fountain grass, black mustard, poison hemlock, and crown daisy. Any of the species above may be present without dominance in a mixed association that may include many other naturalized ruderal species, including bent grass, tall fescue, crab grass, Russian thistle, filaree, Sorghum, *Centaurea* spp., Bermuda grass, *Schismus* spp., and blessed milkthistle. This vegetation community is highly variable, representing generalized situations where ruderal florae have

replaced native types through a history of repeated soil disturbance and the introduction of non-native plant species.

This vegetation community is limited in the preserve (0.59 acres). The vegetation community is associated with the Holland-Oberbauer classifications 42200 Non-Native Grassland and 42300 Wildflower Field.

A small patch (0.46 acres) associated with an elevated sandbar where non-native grass species outnumber native flower species is mapped as 42300 Wildflower field in Holland-Oberbauer maps. This is due to the presence of sensitive flowering plant species (see **Table 31** and Appendix A, Figure 16) within the sandbar. A more suitable VCM alliance or association could not be found to describe this vegetation community.

### **Other<sup>5</sup>**

#### **Open Water**

Open water is a land cover type used to define areas where flowing or standing water occurs. These areas are not included within the vegetation classification manual for Western San Diego County. Freshwater vegetation, if present, usually consists of riparian plants along the shoreline or floating plants such as duckweed (*Lemna* spp.) or mosquito fern (*Azolla* spp.).

This land cover type occurs along the Santa Margarita River in the western portion of the preserve (0.46 acres). The land cover type is associated with the Holland-Oberbauer classification 64100 Open Water.

#### **Disturbed Habitat**

Disturbed habitat is a land cover type used to define lands that do not match a vegetation community included within the VCM for Western San Diego County and are subject to regular or frequent disturbance. Disturbed lands often lack native vegetation and have non-native vegetation in low numbers.

This land cover type is associated with open areas associated with the preserve parking lot (1.18 acres). The land cover type is associated with the Holland-Oberbauer classification 11300 Disturbed Habitat.

#### **Disturbed Habitat – Trails or Roads**

Disturbed Habitat – Trails or Road is a land cover type used to define unvegetated areas utilized for vehicular or pedestrian traffic.

This land cover type occurs in the northern and southern portions of the preserve (5.39 acres). The land cover type is associated with the Holland-Oberbauer classification 12000 Urban/Developed.

<sup>5</sup> The VCM classification and code is provided in this section's subheadings for all vegetation types; however, there is no VCM classification or code for land cover types without vegetation. For these types, we describe them in detail and provide the Holland-Oberbauer classification and code in the last sentence of the description.

#### 4.1.4.2 Invasive Non-Native Plant Observations

A total of 25 limited to high-risk invasive non-native plant species, as determined by Cal-IPC, and two considered to be problematic within Santa Margarita County Preserve, were detected and mapped during field surveys (Table 30 and Appendix A, Figure 15). Of these species, five were identified as having a SDCRPR. The Cal-IPC and SDCRPR were taken into consideration when determining the recommended action, and should be referenced for specific treatment methods. The recommended action for the species detected is as follows.

- Remove.** Canary Island date palm tends to grow in clusters that form a dense canopy and exclude light from reaching beneath them, leading to a loss of native plants (Cal-IPC 2021); therefore, this species is recommended for removal along with follow up visits to detect any seedlings. Mexican fan palm, tamarisk, tree tobacco, olive, and floating water primrose (*Ludwigia peploides/hexapetala*) were observed in isolated clustered and control of these species could occur with immediate manual removal.

Perennial pepperweed (*Lepidium latifolium*) was observed in a single location and could be eliminated through manual removal; however, seeds and root fragments are spread easily (Cal-IPC 2021). Immediate treatment and careful removal of plant material is recommended as plants are considered a very high priority for removal by the County and is a state-listed noxious species. Perennial pepperweed pose a great threat to the riparian areas associated with the Santa Margarita River. Upstream and downstream reaches may already be infested with this species.

- Treat.** Fennel, crimson fountain grass, and castor bean (*Ricinus communis*) all occurred as small infestations within the Preserve and are recommended for treatment. Poison hemlock occurs throughout all riparian areas and may require many years of chemical treatment until the seedbank has diminished. Poison hemlock are poisonous to native fauna and humans, and may represent a risk to recreational visitors and horses using the area.
- Monitor.** Several species occurred throughout the preserve including ripgut grass, red brome, Italian thistle, tocalote, poison hemlock, redstem filaree, shortpod mustard, common pokeweed (*Phytolacca americana*), castor bean, smilo, and periwinkle (*Vinca major*) and should continue to be monitored to detect any negative effects on surrounding native vegetation communities. Crown daisy is also a highly invasive non-native plant species occurring as large swaths within the preserve. Comprehensive mapping for these species to determine focus areas for restoration is recommended prior to implementing treatment.

Two species were observed that are not noted as invasive non-native plant species but may represent potentially invasive non-native plant species within the preserve. Spanish flea-bane (*Pulicaria paludosa*) and false hair-grass (*Pentameris airoides* ssp. *airoides*) are present within the preserve and should be monitored to note continued spread within the area. False hair-grass has been collected within a very limited range from Camp Pendleton north to the Santa Margarita County Preserve, east into Fallbrook, and west to Deluz.

**TABLE 30**  
**INVASIVE NON-NATIVE PLANT SPECIES: SANTA MARGARITA COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
<i>Arundo donax</i>	giant reed	High	Very High		Treat
<i>Bromus diandrus</i>	ripgut grass	Moderate	–		Monitor
<i>Bromus rubens</i>	red brome	High	–	Nearly ubiquitous throughout the preserve.	Monitor
<i>Carduus pycnocephalus</i> var. <i>pycnocephalus</i>	Italian thistle	Moderate	–		Monitor
<i>Conium maculatum</i>	poison hemlock	Moderate	–	Common throughout riparian areas of the site	Treat
<i>Cynodon dactylon</i>	Bermuda grass	Moderate	–		Monitor
<i>Ehrharta longiflora</i>	long-flowered veldt grass	Moderate	Medium	Infrequent annual in isolated patches within riparian areas.	
<i>Erodium cicutarium</i> <sup>a</sup>	redstem filaree	Limited	–		Monitor
<i>Eucalyptus camaldulensis</i>	red gum	Limited	–		Monitor
<i>Foeniculum vulgare</i>	fennel	Moderate	Very High	Common throughout riparian areas of the site	Treat
<i>Glebionis coronaria</i>	crown daisy	Limited	Medium	Common throughout riparian areas of the site	Monitor
<i>Hirschfeldia incana</i>	Shortpod mustard	Moderate	–		Monitor
<i>Lepidium latifolium</i>	Perennial pepperweed	High	Very High	Only small amount observed and may be easily removed through manual removal. CDFG B Rated noxious plant species.	Treat/Remove
<i>Ludwigia peploides/hexapetala</i>	Floating water primrose	High	–	Found along edge of Santa Margarita River	Remove
<i>Medicago polymorpha</i>	California burclover	Limited	–		Monitor
<i>Nicotiana glauca</i>	tree tobacco	Moderate	–		Remove
<i>Olea europaea</i>	olive	Limited	–	Planted trees observed in areas	Remove

**TABLE 30**  
**INVASIVE NON-NATIVE PLANT SPECIES: SANTA MARGARITA COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
				associated with old house.	
<i>Pennisetum setaceum</i>	crimson fountain grass	Moderate	–		Treat
<i>Pentameris airoides</i> ssp. <i>airoides</i>	false hair-grass	–	–	Found only in the preserve and surrounding area and is not recognized by the County or CAL-IPC. Not enough data to be included in invasive lists, but may represent a good opportunity to stop a future invasive threat.	Monitor
<i>Phoenix canariensis</i>	Canary Island date palm	Limited	–		Remove
<i>Phytolacca americana</i>	common pokeweed	Limited	–		Monitor
<i>Pulicaria paludosa</i>	Spanish false fleabane	–	–	Not recognized as invasive by CAL-IPC or County, but may be considered invasive along watercourses, moist soils, disturbed ground throughout the southwest.	Monitor
<i>Ricinus communis</i>	castor bean	Limited	–		Treat
<i>Stipa miliacea</i> var. <i>miliacea</i>	smilo grass	Limited	–	Common in riparian areas.	Monitor
<i>Tamarix ramosissima</i>	tamarisk	High	–		Remove
<i>Vinca major</i>	periwinkle	Moderate	–	Found growing near old house.	Monitor
<i>Washingtonia robusta</i>	Mexican fan palm	Moderate	–		Remove

## NOTES:

<sup>a</sup> These species were detected within the preserve, but not mapped; species were found to be widespread throughout the preserve.

Cal-IPC Ranking

High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high

**TABLE 30**  
**INVASIVE NON-NATIVE PLANT SPECIES: SANTA MARGARITA COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.					
Limited – These species are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.					
Alert – An Alert is listed on species with High or Moderate impacts that have limited distribution in California, but may have the potential to spread much further.					
Watch – These species have been assessed as posing a high risk of becoming invasive in the future in California.					
<u>San Diego County Regional Priority Ranking (Cal-IPC, Dendra, CBI 2012)</u>					
Very High – Level 1 Surveillance. Low effort required to achieve goal of regional surveillance, early detection, rapid response.					
High – Level 2 Eradication. Moderate effort required to achieve goal of eradication with regionally coordinated control program.					
Medium – Level 3 Containment. Funding typically available for re-treatments or control of small populations. Goal is eradication with coordinated programs by management unit or watershed.					
Medium – Level 4 Directed Management. Area may be managed effectively, with slow re-invasion. Goal is to control within reserve or sub-management unit to benefit NCCP resources.					
Low – Level 5 Directed Suppression. Control is typically of short-term benefit (rapid re-invasion) without active restoration. Goal is suppression, typically to allow recovery disturbed site, improve re-vegetation success, or benefit NCCP resources.					

#### 4.1.4.3 Incidental Special-Status Plant and Wildlife Species Observations

Six special-status plant species and two special-status wildlife species were detected and mapped during field surveys on Santa Margarita County Preserve (**Table 31** and Appendix A, Figure 16).

**TABLE 31**  
**INCIDENTAL SPECIAL-STATUS PLANT AND WILDLIFE SPECIES OBSERVATIONS: SANTA MARGARITA COUNTY PRESERVE**

Scientific Name	Common Name	State/Federal Status	San Diego County Special Status List	Draft North County MSCP Covered Species	California Rare Plant Rank	Notes
<b>Plants</b>						
<i>Abronia villosa</i> var. <i>aurita</i>	Yellow hairy sand verbena	–/–	–	–	1B.1	Growing in stabilized sandbar in same vicinity as white rabbit-tobacco.
<i>Arctostaphylos rainbowensis</i>	Rainbow manzanita	–/–	List A	–	1B.1	Growing widely throughout higher elevation portions of the site.
<i>Juglans californica</i>	Southern California black walnut	–/–	List D	–	4.2	
<i>Pseudognaphalium leucocephalum</i>	White rabbit-tobacco	–/–	–	–	2B.2	growing in sandy stabilized bank of river bed along channel. Many individuals observed.
<i>Quercus engelmannii</i>	Engelmann oak	–/–	List D	NC MSCP	4.2	
<i>Piperia cooperi</i>	Chaparral rein-orchid	–/–	List D	–	4.2	Only 1 plant observed but likely more widespread in chaparral

**TABLE 31**  
**INCIDENTAL SPECIAL-STATUS PLANT AND WILDLIFE SPECIES OBSERVATIONS: SANTA MARGARITA COUNTY PRESERVE**

Scientific Name	Common Name	State/Federal Status	San Diego County Special Status List	Draft North County MSCP Covered Species	California Rare Plant Rank	Notes
<b>Animals</b>						
<i>Vireo bellii pusillus</i>	Least Bell's vireo	CE/FE	Group 1	NC MSCP	–	
<i>Aspidoscelis hyperythra</i>	Orange-throated whiptail	–/–	Group 2	–	–	

## NOTES:

State/Federal Status

FE – Federally Endangered

FT – Federally Threatened

CE – California Endangered

CT – California Threatened

SSC – CDFW Species Special Concern

San Diego County Special Status List

LIST A (Plants rare, threatened or endangered in California and elsewhere)

LIST B (Plants rare, threatened or endangered in California but more common elsewhere)

LIST C (Plants that may be quite rare, but need more information to determine their true rarity status)

LIST D (Plants of limited distribution and are uncommon, but not presently rare or endangered)

CA rare (rare in California, but not listed)

NE (MSCP Narrow Endemic)

California Rare Plant Rank

1A – Plants presumed extirpated in California and either rare or extinct elsewhere

1B – Plants rare, threatened, or endangered in California and elsewhere

2A – Plants presumed extirpated in California but common elsewhere

2B – Plants rare, threatened, or endangered in California but more common elsewhere

3 – Review List: Plants about which more information is needed

4 – Watch List: Plants of limited distribution

0.1 – Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

0.2 – Moderately threatened in California (20%–80% occurrences threatened / moderate degree and immediacy of threat)

0.3 – Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

Other

Unk – Unknown due to timing of survey and life stage of individual

#### 4.1.4.4 Habitat Condition and Threats Assessment

##### *Threat Assessment*

Based on the field surveys, biologists took note of any major issues that could pose a threat to the vegetation communities within Santa Margarita County Preserve. A list of primary threats identified in the IMG protocol is presented in **Table 32**, along with a discussion of the severity of each threat within the preserve (presented as the extent within the preserve on a scale of 1 to 7).

**TABLE 32**  
**THREATS OVERVIEW: SANTA MARGARITA COUNTY PRESERVE**

Disturbances/Stressors	Severity (Extent)	Discussion
Invasive non-native plant species (e.g., annual grasses and herbs)	5	Displacement of native plants by Invasive plant species represent the greatest threat to the preserve.
Altered fire regime or risk of catastrophic fire	3	Areas where invasive plant species such as non-native grasses provide increased fuel during dry periods may present greater risk of fire.

**TABLE 32**  
**THREATS OVERVIEW: SANTA MARGARITA COUNTY PRESERVE**

<b>Disturbances/Stressors</b>	<b>Severity (Extent)</b>	<b>Discussion</b>
Unauthorized human use (e.g., off-road vehicles, encampments, unauthorized trails, shooting, poaching, and/or dumping)	4	An unidentified hunter on neighboring properties was observed on multiple days by several biologists during site visits. The hunter was playing animal calls and hunting with a bow on properties east of Sandia Creek Drive. There is high likelihood this hunter and others utilize the preserve lands to hunt illegally within the preserve. Camera trapping and increased patrol are recommended to reduce potential for poaching. Multiple species of dudleya ( <i>Dudleya</i> spp.) were also observed at higher elevations on the preserve but were very limited in areas with increased recreational access and may be subject to poaching.
Shothole borer, gold-spotted oak borer, and Fusarium fungal invasion	–	Site was not assessed for invasive insect species or fungi. Suitable species are present within the preserve and may further be introduced due to copious amounts of adjacent avocado orchards nearby.
Erosion	3	Erosion was limited to disturbed areas and roads associated with the higher elevation portions of the site. Deep erosional rills have caused the power line access road within the center of the preserve to become unpassable to vehicles.
Small, isolated occurrences vulnerable to loss of genetic diversity and to extirpation due to environmental stochasticity or catastrophic disturbance.	3	Rainbow manzanita (CNPS Rare Plant Rank 1B.1, County List B) is rare species of manzanita endemic to San Diego and Riverside Counties, and is restricted to granitic outcroppings within the peninsular range.
Altered hydrology (e.g., urban runoff, flood control facilities)	3	The Santa Margarita River is subject control by multiple agencies with downstream water rights (Camp Pendleton, Fallbrook Public Utility District) and flows appear to be consistent year-round. Prior to human intervention, the Santa Margarita River may have had a more seasonal flow with highs in the winter and lows in the summer.
Herbivory (e.g., seed, vegetation)	3	Willows within the preserve displayed teeth marks characteristic of California golden beaver ( <i>Castor canadensis subauratus</i> ) present within the area. It is unclear if this is a natural occurrence or a species reintroduced to the area. The species can represent issues such as damming by beaver impoundments, streambed alterations, and enhanced erosion through removal of willow trees along the banks of the river. Some sensitive species benefit from impoundment of rivers by beavers such as southwestern pond turtle, red legged frog and southwestern willow flycatcher. Beavers are also protected by various state and federal fur-bearing mammal trapping laws.
Detrimental edge effects from adjacent urban development	3	Poorly managed avocado orchards adjacent to the western boundary of the preserve show evidence of substantial dieback or abandonment within the orchards. Agricultural ditches feed into an unnamed drainage that feeds directly into the Santa Margarita River. A high likelihood of increased runoff may be reaching Santa Margarita River and may be introducing unwanted chemicals and sediment to the river during rain events. Additionally, many fungal species common in avocado trees also affect <i>Quercus</i> species negatively (such as Armillaria root rot).

## NOTES:

Disturbance Categories within Preserve

- 1 – No sign of disturbance within preserve
- 2 – Disturbance does not occur within preserve, but is detected adjacent to preserve boundaries
- 3 – Disturbance occurs in >0% to <10% of preserve
- 4 – Disturbance occurs in 10 to <25% of preserve
- 5 – Disturbance occurs in 25 to <50% of preserve
- 6 – Disturbance occurs in 50 to <75% of preserve
- 7 – Disturbance occurs in ≥ 75% of preserve

### **Type Conversion**

In order to detect potential type conversions within the preserve, Holland-Oberbauer vegetation mapping was used to compare the acreage of each habitat type that was previously mapped with the current acreage by habitat type (**Table 33**).

A decrease of disturbed habitat from 3.22 acres to 0 acres, and an increase in developed habitat from 2.05 acres to 6.70 acres can likely be contributed to differences in mapping methodologies. Increases in herbaceous and woodlands are also likely due to accuracy of mapping methods and technology. The 25.90-acre increase in chaparral may be due to increased mapping accuracy and type conversion of shrub communities to chaparral. A 12.91-acre increase of woodland and a 5.70-acre decrease in forests may be contributed to changes in compositional integrity within the riparian woodlands and forests associated with Santa Margarita Creek.

**TABLE 33**  
**TYPE CONVERSION ASSESSMENT BASED ON HOLLAND-OBERBAUER MAPPING:**  
**SANTA MARGARITA COUNTY PRESERVE**

<b>Habitat Type</b>	<b>Acres in 2012</b>	<b>Acres in 2021</b>	<b>Difference in Acreage</b>
Developed	2.05	6.70	4.65
Disturbed	3.22	0	-3.22
Herbaceous	0	0.46	0.46
Scrub	65.73	47.60	-18.13
Chaparral	78.71	104.61	25.90
Woodland	16.23	29.14	12.91
Forest	5.84	0.14	-5.70
Riparian	36.21	22.17	-14.04
Unvegetated (water)	2.38	0.46	-1.92

#### **4.1.4.5 Adaptive Management Recommendations**

Adaptive management recommendations for Santa Margarita County Preserve were developed based on the general habitat condition and threats assessment conducted during habitat mapping. Recommendations are provided for invasive non-native plant species management, habitat enhancement/restoration opportunities, encroachment, and monitoring. Recommendations are detailed in the following subsections.

##### ***Invasive Non-Native Plant Species Management***

As discussed in the invasive non-native plant observations section, several invasive non-native plant species were detected within the preserve. A recommended action was identified for each species consisting of either removal, treatment, or monitoring. Final implementation of management activities and treatment methods shall be determined by the County based on priority.

### **Habitat Enhancement/Restoration Opportunities**

- **Erosion.** Deep erosional rills were observed along trails in the center of the site. A comprehensive analysis of erosion within the site is recommended.
- **Riparian corridor.** Control of invasive non-native plant species within riparian corridor along the Santa Margarita River is recommended. This would require focused surveys to determine invasive non-native plant species extent, treatment plan, and effectiveness monitoring. This would benefit TMP species arroyo toad and least Bell's vireo.
- **Rare plants.** The preserve contains several sensitive plant species that would benefit from comprehensive mapping to determine management/restoration opportunities. Focused rare plant surveys are recommended to capture areas ideally suited for habitat enhancement and restoration, and those areas that may be extirpated by invasive non-native plant species. This could be accomplished through collaboration with SDMMP.

### **Encroachment**

- **Access control.** There is a need for increased access control to direct access the public away from sensitive resources. Installation of signage, fences, natural deterrents, and increased patrols are potential remedies to access control issues.

### **Monitoring**

- **Invasive non-native plants.** Invasive non-native plant species mapping should be conducted annually, if feasible, to inform treatment areas, assess new invasions or re-invasions, and determine effectiveness of treatments.
- **Public use.** Site patrols should be increased to reduce potential poaching of plants (e.g., dudleya) and wildlife within the preserve. On- and off-preserve hunting was observed during surveys.
- **Catastrophic events.** Additional vegetation mapping efforts may be conducted as needed following catastrophic events such as wildfires.

## **4.1.5 Mount Olympus County Preserve**

A total of 14 vegetation communities and one land cover type was identified via Holland-Oberbauer and 23 vegetation communities and three land cover types were identified via VCM for Mount Olympus County Preserve. These communities are depicted in Appendix A, Figure 17 and Figure 18 and provided in crosswalk format in **Table 34**.

**TABLE 34**  
**VEGETATION COMMUNITIES CROSSWALK: MOUNT OLYMPUS COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
<b>Herbaceous</b>			
42200 Non-Native Grassland	5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands	5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands	0.37
	5.8.2 Ripgut Grass Semi-Natural Stands	5.8.2 Ripgut Grass Semi-Natural Stand Type	0.26
	5.9 Red Brome Semi-Arabian achismus and Old Han schismus Semi-Natural Stands	5.9.1 Red Brome Semi-Natural Stand Type	0.47

**TABLE 34**  
**VEGETATION COMMUNITIES CROSSWALK: MOUNT OLYMPUS COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
<b>Scrub</b>			
32520 Diegan Coastal Sage Scrub: Inland form	4.24 California Buckwheat – White Sage Alliance	4.24 California Buckwheat – White Sage Alliance	0.30
32700 Riversidian Sage Scrub	4.44 Black Sage Alliance	4.44.2 Black Sage – Laurel Sumac Association	0.67
<b>Chaparral</b>			
37120 Southern Mixed Chaparral	4.14 Hoaryleaf Ceanothus Alliance	4.14.1 Hoaryleaf Ceanothus Association	2.92
	4.2 Chamise – Mission Manzanita Alliance	4.2.6 Chamise – Mission Manzanita – Scrub Oak Association	0.49
	4.35 Laurel Sumac Alliance	4.35 Laurel Sumac Alliance	0.30
		4.35.1 Laurel Sumac – Deerweed Association	0.28
4.37 Scrub Oak Alliance	4.37.2 Scrub Oak – Mountain Mahogany Association	0.72	
37121 Granitic Southern Mixed Chaparral	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	0.56
		3.6.2 Coast Live Oak – Scrub Oak Association	12.72
	4.1 Chamise Alliance	4.1 Chamise Alliance	3.62
		4.1.2 Chamise – California Buckwheat – California Sagebrush – Black Sage Association	0.11
		4.1.3 Chamise – Hoaryleaf Ceanothus Association	1.99
	4.14 Hoaryleaf Ceanothus Alliance	4.14.1 Hoaryleaf Ceanothus Association	0.32
	4.2 Chamise – Mission Manzanita Alliance	4.2 Chamise – Mission Manzanita Alliance	1.38
		4.2.6 Chamise – Mission Manzanita – Scrub Oak Association	0.61
	4.35 Laurel Sumac Alliance	4.35 Laurel Sumac Alliance	0.41
	4.37 Scrub Oak Alliance	4.37.1 Scrub Oak Association	13.79
4.37.2 Scrub Oak – Chamise Association		129.19	
4.38 Scrub Oak – Chamise Alliance	4.38.1 Scrub Oak – Chamise Association	3.25	
4.5 Big Berry Manzanita Alliance	4.5.1 Big Berry Manzanita – Chamise Association	0.74	
37210 Granitic Chamise Chaparral	4.1 Chamise Alliance	4.1 Chamise Alliance	0.29
37830 Hoaryleaf Chaparral	4.14 Hoaryleaf Ceanothus Alliance	4.14.1 Hoaryleaf Ceanothus Association	10.41

**TABLE 34**  
**VEGETATION COMMUNITIES CROSSWALK: MOUNT OLYMPUS COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
37900 Scrub Oak Chaparral	3.6 Coast Live Oak Alliance	3.6.2 Coast Live Oak – Scrub Oak Association	9.47
	4.2 Chamise – Mission Manzanita Alliance	4.2.6 Chamise – Mission Manzanita – Scrub Oak Association	2.21
	4.37 Scrub Oak Alliance	4.37.1 Scrub Oak Association	130.86
4.37.2 Scrub Oak – Mountain Mahogany Association		426.64	
37G00 Coastal Sage- Chaparral Transition	4.1 Chamise Alliance	4.1.2 Chamise –California Buckwheat –California Sagebrush – Black Sage Association	0.34
	4.35 Laurel Sumac Association	4.35 Laurel Sumac Association	0.09
<b>Woodland</b>			
71160 Coast Live Oak Woodland	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	1.01
		3.6.2 Coast Live Oak – Scrub Oak Association	4.36
		3.6.3 Coast Live Oak – Arroyo Willow Association	0.29
71161 Open Coast Live Oak Woodland	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	5.62
		3.6.2 Coast Live Oak – Scrub Oak Association	7.46
		3.6.4 Coast Live Oak – Western Poison Oak – Grass Association	7.38
	4.1 Chamise Alliance	4.1 Chamise Alliance	2.27
71181 Open Engelmann Oak Woodland	3.7 Engelmann Oak Alliance	3.7 Engelmann Oak Alliance	0.70
		3.7.2 Engelmann Oak – Coast Live Oak – Western Poison Oak – Grass Association	0.70
79100 Eucalyptus Woodland	3.2 Eucalyptus Semi-Natural Stands	3.2 Eucalyptus Semi – Natural Stands	0.73
<b>Other<sup>a</sup></b>			
11300 Disturbed Habitat	N/A	Disturbed Habitat	0.53
		Disturbed Habitat – Trails or Roads	10.46
Rocky Outcropping <sup>b</sup>	N/A	Rocky Outcropping	3.71
<b>TOTAL ACREAGE:<sup>c</sup></b>			<b>800.99</b>

## NOTES:

- <sup>a</sup> The San Diego Vegetation Classification Manual only classifies vegetated areas. The disturbed land cover types were described and displayed under the association level to provide additional detail in the mapping. This allows for changes in vegetation (e.g., unvegetated to vegetated) to be tracked over time.
- <sup>b</sup> Rocky outcropping does not have a classification in the San Diego Vegetation Classification Manual or Holland-Oberbauer; however, this land cover type defines areas that support large, bare granite boulders.
- <sup>c</sup> Total may not match sum of individual acreages listed due to rounding.

### 4.1.5.1 Vegetation Type Descriptions

The following vegetation community and land cover type descriptions for the Mount Olympus County Preserve follow the VCM classification system. General association and alliance descriptions were taken from the VCM for Western San Diego County (Sproul et al. 2011).

#### ***Soft-Leaved, Drought-Deciduous Shrublands***

##### **4.14.1 Hoaryleaf Ceanothus Association**

Hoaryleaf ceanothus is dominant in the shrub canopy in dense to open stands with low cover of other subdominant shrubs including chamise, laurel sumac, California buckwheat, scrub oak, mission manzanita, and chaparral beard tongue. A diverse herb flora occurs mostly in openings and after fire, and includes wild cucumber, *Phacelia* spp., island morning glory, Fremont's star lily, cryptantha, and purple Chinese houses. This vegetation community occupies xeric sites in the interior of San Diego County, where other *Ceanothus* spp. are largely absent.

This vegetation community occurs in the northeastern section of the preserve (13.65 acres). It is located on the lower slopes of the ridge and is south-facing. For all the vegetation communities on this drier slope, invasive non-native plant species such as shortpod mustard, tocalote, and red brome are abundant. The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral, 37121 Granitic Southern Mixed, and 37830 Hoaryleaf.

##### **4.24 California Buckwheat – White Sage Alliance**

California buckwheat and white sage are codominant in the shrub canopy, with California sagebrush, chamise, desert ceanothus (*Ceanothus pauciflorus*), chaparral whitethorn, matchweed, chaparral yucca, toyon, chaparral beard tongue deerweed, laurel sumac, and/or scrub oak sometimes present as subdominants. Emergent coast live oak trees may be present. Shrub canopy is usually less than 2.5 meters tall and is intermittent. The herbaceous layer is variable and may be dominated by non-native grasses.

This vegetation community is located in one small patch in the northern part of the preserve (0.30 acres). It is located on the lower slopes of the ridge and is south-facing. As stated previously, invasive non-native plant species such as shortpod mustard, tocalote, and red brome are abundant on this drier slope. The vegetation community is associated with the Holland-Oberbauer classification 32520 Diegan Coastal Sage Scrub: Inland.

##### **4.35 Laurel Sumac Alliance**

Laurel sumac is the dominate shrub species. Subdominant shrub species include California sagebrush, deerweed, California buckwheat, and spiny redberry. The herbaceous understory may include wild cucumber, wishbone bush, and island morning glory.

This vegetation community is located in two small patches in the northeast corner of the preserve (0.80 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral, 37121 Granitic Southern Mixed Chaparral, and 37G00 Coastal Sage-Chaparral Transition.

#### 4.35.1 Laurel Sumac – Deerweed Association

Laurel sumac and deerweed are codominant in this association in open stands with subdominant shrub species, such as California sagebrush, Ramona lilac, chaparral whitethorn, sages, California buckwheat, spiny redberry, and chaparral yucca. Herbaceous cover and diversity is high, occurring in openings and stimulated by fire. Herbs include island morning glory, white pincushion, wild cucumber, whishbone bush, granny's hairnet, blow-wives, American wild carrot, daggerleaf cottonrose, and lupines. This association is often the result of post-fire regeneration, occurring as a transitional vegetation type while longer lived shrub species regain dominance.

This vegetation community occurs in one patch in the northeastern portion of the preserve (0.28 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

#### 4.44.2 Black Sage – Laurel Sumac Association

Black sage and laurel sumac occur as codominants in an open shrub canopy. Subdominant shrubs include California sagebrush, California buckwheat, sticky monkeyflower, lemonade berry, Ramona lilac, wart-stemmed ceanothus, Lakeside ceanothus, toyon, spiny redberry, chaparral yucca, California adolphia (*Adolphia californica*), and saw-toothed goldenbush. Herbaceous cover is high and distributed mostly in openings.

This vegetation community occurs in one small patch in the northeast portion of the preserve (0.67 acres). The vegetation community is associated with the Holland-Oberbauer classification 32700 Riversidian Sage Scrub.

### ***Sclerophyllus, Evergreen Shrublands***

#### 4.1 Chamise Alliance

Throughout its range, chamise is dominant in the shrub canopy and, depending on the location, may have red shank, Eastwood manzanita, common manzanita, sticky whiteleaf manzanita (*Arctostaphylos viscida*), *Ceanothus* spp., sticky monkeyflower, California yerba santa, California buckwheat, chaparral yucca, toyon, scrub oak, interior live oak, white sage, purple sage, black sage, and western poison oak as associates to codominants or subdominants. Emergent trees may be present at low cover. Shrubs are typically less than 4 meters tall; the canopy is intermittent to continuous, and the herbaceous layer is sparse to intermittent.

This vegetation community occurs in two areas in the northeast portion of preserve (6.17 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37121 Granitic Southern Mixed, 37210 Granitic Chamise Chaparral, and 71161 Open Coast Live Oak Woodland.

#### 4.1.2 Chamise – California Buckwheat – California Sagebrush Association

Chamise is dominant with other shrubs occurring as subdominants; together, these species form either a continuous or more often open canopy cover. Subdominant shrubs most commonly include California sagebrush, California buckwheat, bushrue, saw-toothed goldenbush, black sage, scrub oak, Torrey's hybrid oak, Nuttall's scrub oak (*Quercus dumosa*), Ramona lilac, wart-stemmed ceanothus, and Eastwood manzanita. Dominant herbs often include native and non-native grasses, such as giant wild-rye and red brome, with a rich diversity of herb species. This association is a mix

of chaparral and coastal sage scrub. It occurs both as a mature, stable shrub community or an early transitional stage of other shrublands in response to fire or other disturbance.

This vegetation community occurs in two patches in the northeast portion of the preserve (0.45 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37121 Granitic Southern Mixed and 37G00 Coastal Sage-Chaparral.

#### **4.1.3 Chamise – Hoaryleaf Ceanothus Association**

Chamise and hoaryleaf ceanothus form mostly continuous cover and are the dominant shrubs of this vegetation type. Other shrubs species occurring as subdominants include scrub oak species, manzanitas, black sage, chaparral whitethorn, Ramona lilac, chaparral yucca, hollyleaf redberry, sticky monkeyflower, and toyon. Herb diversity and cover is generally low except after fires. This association typically occupies xeric interior sites in the cismontane portion of the study area. In the absence of fire, hoaryleaf ceanothus may become senescent, causing the stand to open up and become chamise dominated; however, hoaryleaf ceanothus can recolonize from a soil seed bank following fire.

This vegetation community occurs in small areas in the western and south-central portions of the preserve (1.99 acres). The vegetation community is associated with the Holland-Oberbauer classification 37121 Granitic Southern Mixed.

#### **4.2 Chamise – Mission Manzanita Alliance**

In this association, chamise and mission manzanita are codominants in the shrub canopy; subdominant shrubs may include hoaryleaf ceanothus, Ramona lilac, wart-stemmed ceanothus, bushrue, chaparral yucca, toyon, laurel sumac, scrub oak, hollyleaf redberry, sugar bush, white sage, and black sage. Shrubs are usually less than 3 meters tall and the canopy is intermittent to continuous. The herbaceous layer is sparse to intermittent.

This vegetation community occurs in the northeastern portion of the preserve (1.38 acres). The vegetation community is associated with the Holland-Oberbauer classification 37121 Granitic Southern Mixed.

#### **4.2.6 Chamise – Mission Manzanita – Scrub Oak Association**

Chamise, mission manzanita, scrub oak, and Torrey's hybrid oak occur as codominants, often with an open canopy. Other subdominant shrubs include Ramona lilac, chaparral whitethorn, California buckwheat, smooth mountain mahogany, laurel sumac, redberry, toyon, Mojave yucca, and chaparral yucca. The herbaceous understory is often sparse except after fires.

This vegetation community occurs in several patches in the northwestern portion of preserve (3.32 acres). The vegetation community is associated with Holland-Oberbauer vegetation communities 37120 Southern Mixed Chaparral, 37121 Granitic Southern Mixed, and 37900 Scrub Oak Chaparral.

#### **4.37.1 Scrub Oak Association**

Scrub oak and Torrey's hybrid oak are two of the most widespread scrub oaks within the study area. Due to taxonomic uncertainty, these two scrub oak species are included within the same

association. These scrub oaks are dominant in this association, usually with continuous cover and often as small inclusions within other shrublands. Subdominant shrub species include smooth mountain mahogany, chamise, Eastwood manzanita, mission manzanita, lemonade berry, western poison oak, chaparral whitethorn, Ramona lilac, and hoaryleaf ceanothus. Herbaceous diversity and cover is relatively low, mostly occurring in openings and increasing in response to fire.

This vegetation community is present throughout and makes up the second largest area of preserve (144.65 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37121 Granitic Southern Mixed and 37900 Scrub Oak Chaparral.

#### **4.37.2 Scrub Oak – Smooth Mountain Mahogany Association**

Scrub oak, Torrey’s hybrid oak, and smooth mountain mahogany are codominant, forming a continuous shrub canopy. Due to the taxonomic uncertainty of these scrub oaks, they are treated within the same association. Subdominant shrubs include western poison oak, chamise, mission manzanita, chaparral whitethorn, Ramona lilac, wart-stemmed ceanothus, lemonade berry, and sticky monkeyflower. Herbaceous diversity and cover is relatively low, mostly occurring in openings and increasing in response to fire.

This is the dominant vegetation community within the preserve (556.55 acres). It generally occurs on the ridges and the portions of the preserve that are of higher elevation. The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral, 37121 Granitic Southern Mixed, and 37900 Scrub Oak Chaparral.

#### **4.38.1 Scrub Oak – Chamise Association**

Scrub oak, Torrey’s hybrid oak, and chamise are codominant, usually as a continuous shrub canopy. Due to the taxonomic uncertainty of these scrub oaks, they are treated within the same association. Associated shrubs include smooth mountain mahogany, Ramona lilac, chaparral whitethorn, wart-stemmed ceanothus, hoaryleaf ceanothus, chaparral yucca, white sage, black sage, and mission manzanita. Herbaceous diversity and cover is relatively low, mostly occurring in openings and increasing in response to fire.

This vegetation community occurs in two small patches in the western portion of the preserve (3.25 acres). The vegetation community is associated with the Holland-Oberbauer classification 37121 Granitic Southern Mixed Chaparral.

#### **4.5.1 Big Berry Manzanita – Chamise Association**

Big berry manzanita and chamise occur as codominant shrubs that typically form a continuous canopy. Other subdominant shrubs include mission manzanita, scrub oak, laurel sumac, chaparral yucca, white sage, Ramona lilac, desert ceanothus, and hairy ceanothus. The herb understory is often sparse except after fires. This association occurs primarily in inland foothill and montane areas.

This vegetation community occurs in one small patch in the western portion of the preserve (0.74 acres). The vegetation community is associated with the Holland-Oberbauer classification 37121 Granitic Southern Mixed Chaparral.

## **Riparian Forests and Woodlands**

### **3.6.3 Coast Live Oak – Arroyo Willow Association**

Coast live oak is dominant in an open to closed tree canopy with arroyo willow typically dominating the shrub canopy. Subdominant trees may include western sycamore, Fremont cottonwood, and willows. Subdominant shrubs include desert wild grape, blue elderberry, and *Baccharis* spp. The herbaceous diversity is low and cover is generally open, including wetland affiliates such as San Diego sagewort, western ragweed, yerba mansa, salt grass (*Distichlis spicata*), and fringed willowherb.

This vegetation community occurs in a small patch in the western portion of the preserve (0.29 acres). The vegetation community is associated with the Holland-Oberbauer classification 71160 Coast Live Oak Woodland.

## **Upland Forests and Woodlands**

### **3.2 Eucalyptus Semi-Natural Stands**

Over 50 species of eucalyptus have been introduced to California from Australia. However, only a few are known to form self-perpetuating stands and have the qualities of semi-natural stands. The two most common species that form semi-natural stands are listed in parentheses in the name of this type. River red gum is one of the most common species found in naturalized stands in San Diego County, but there are at least six other species that are listed in the most recent San Diego County Plant checklist. River red gum is one of the few that appears to invade riparian channels.

This vegetation community occurs in one small patch in the northeastern portion of the preserve (0.73 acres). The vegetation community is associated with the Holland-Oberbauer classification 79100 Eucalyptus Woodland.

### **3.6 Coast Live Oak Alliance**

General alliance characteristics of this alliance include coast live oak as the dominant or codominant species in the tree canopy. Associated tree species may include southern California black walnut, western sycamore, Fremont cottonwood, Engelmann oak, arroyo willow, and/or California laurel. Trees are generally less than 30 meters tall and the canopy is open to continuous. The shrub and herbaceous canopies are variable.

This vegetation community occurs in several small areas within the preserve (7.19 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37121 Granitic Southern Mixed Chaparral, 71160 Coast Live Oak Woodland, and 71161 Open Coast Live Oak Woodland.

### **3.6.2 Coast Live Oak – Scrub Oak (*berberidifolia*, *xacutidens*) Association**

Coast live oak is dominant in an open tree canopy with scrub oak diagnostically present in the shrub canopy. Subdominant shrubs include Ramona lilac, toyon, smooth mountain mahogany, sticky monkeyflower, fragrant sumac, California sagebrush, laurel sumac, California yerba santa, climbing penstemon, saw-toothed goldenbush, and many other chaparral species. Herbaceous cover occurs in openings including wild cucumber, phacelias, and a high diversity of chaparral-associated plants. This association is typical of mesic slopes where coast live oak is not associated with riparian vegetation types.

This vegetation community primarily occurs in the northwest corner of the preserve, but also occurs scattered through the rest of the preserve (34 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37121 Granitic Southern Mixed Chaparral, 37900 Scrub Oak Chaparral, 71160 Coast Live Oak Woodland, and 71161 Open Coast Live Oak Woodland.

### **3.6.4 Coast Live Oak – Western Poison Oak – Grass Association**

Coast live oak is dominant in the tree canopy and western poison oak is subdominant in the shrub canopy, with an understory of native herbaceous and ruderal species. Subdominant shrubs include blue elderberry, coyote brush, and San Diego sagewort. The herbaceous diversity is high and cover is generally intermittent to continuous, including fewer wetland affiliates than the previous association and many ruderal species. This association is ecologically similar to the coast live oak/arroyo willow Association but occurs higher on the hydrologic profile where many upland shrubs and ruderal plants are prevalent above the fluvial regime.

This vegetation community occurs in several areas mainly in the northeast portion of the preserve (7.38 acres). The vegetation community is associated with the Holland-Oberbauer classification 71161 Open Coast Live Oak Woodland.

### **3.7 Engelmann Oak Alliance**

Engelmann oak is dominant or codominant in the tree canopy with southern California black walnut, coast live oak, and California black oak sometimes present as associates. Trees are usually less than 18 meters tall, and the canopy may be open to closed. The shrub layer is sparse to open and the herbaceous layer is sparse and often dominated by grass species.

This vegetation community occurs in one patch in the northeastern part of the preserve (0.70 acres). The vegetation community is associated with the Holland-Oberbauer classification 71181 Open Engelmann Oak Woodland.

### **3.7.2 Engelmann Oak – Coast Live Oak – Western Poison Oak – Grass Association**

Engelmann oak and coast live oak are codominants in the tree canopy, western poison oak is diagnostically present in the shrub canopy, and grasses and other herbs are dominant in the herbaceous understory. Subdominant shrubs include many coastal sage scrub species including black sage, white sage, California sagebrush, laurel sumac, sticky monkeyflower, and climbing keckiella; however, their combined cover is less than western poison oak. The herbaceous understory is often dominated by non-native ruderal plants.

This vegetation community occurs in one patch in the northeastern part of the preserve (0.70 acres). The vegetation community is associated with the Holland-Oberbauer classification 71181 Open Engelmann Oak Woodland.

## ***Upland Herbaceous Vegetation***

### **5.8.2 Ripgut Grass Semi-Natural Stand Type**

Ripgut grass dominates the herbaceous canopy of many vegetation types especially as a result of disturbance. This brome is most prominent at dominating native grasslands, the understory of oak woodlands, and other vegetation types. It invades low areas with deeper soils creating dense

cover and biomass that create dense perpetual thatch. Soft chess is more often subdominant with many other weedy plant species, and often not in continuous stands.

This vegetation community occurs in one small patch in the northeast area of the preserve (0.26 acres). The vegetation community is associated with the Holland-Oberbauer classification 42200 Non-Native Grassland.

### 5.9.1 Red Brome Semi-Natural Stand Type

Red brome dominates a continuous to open herbaceous canopy in this vegetation type. Non-native herbs including filarees, bromes, tocalote, shortpod mustard, small-flower catchfly (*Silene gallica*), and smooth cat's-ear (*Hypochaeris glabra*) are often subdominant to codominant and native herb species may be subdominant. Emergent native shrubs can occur at trace levels. This vegetation type occupies areas with drier site conditions and poorer soils than areas supporting ripgut grass, purple false brome, and black mustard.

This vegetation community occurs in one small patch in the northeast portion of the preserve (0.47 acres). The vegetation community is associated with the Holland-Oberbauer classification 42200 Non-Native Grassland.

### 5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands

This description is based on the group level, which is the hierarchical level above the alliance. The group level is a useful classification where distinction cannot be made to the alliance or association level. This group level classification may be applied in cases where non-native grasses and forbs are dominant over native species, and where none of the following non-native species are clearly dominant or codominant: wild oats, bromes, purple false brome, fescues, fountain grass, black mustard, poison hemlock, crown daisy. Any of the species above may be present without dominance in a mixed association that may include many other naturalized ruderal species, including bent grass, tall fescue, crab grass, Russian thistle, filaree, sorghum, *Centaurea* spp., Bermuda grass, *Schismus* spp., and blessed milk thistle. This vegetation type is widespread and highly variable, representing generalized situations where ruderal floras have replaced native types through a history of repeated soil disturbance and the introduction of non-native plant species.

This vegetation community occurs in one small patch in the northeast portion of the preserve (0.37 acres). The vegetation community is associated with the Holland-Oberbauer classification 42200 Non-Native Grassland.

### Other<sup>6</sup>

#### Rocky Outcropping

Rocky outcropping is a land type used here to define areas that support large, bare granite boulders that are surrounded by dense native vegetation. Occasionally an outcropping may support a few shrubs such as scrub oak, manzanita, or mountain mahogany and herbaceous

<sup>6</sup> The VCM classification and code is provided in this section's subheadings for all vegetation types; however, there is no VCM classification or code for land cover types without vegetation. For these types, we describe them in detail and provide the Holland-Oberbauer classification and code in the last sentence of the description.

species in cracks. Rock outcrops do not have a classification in VCM or Holland-Oberbauer. These features were associated with the VCM classification Scrub Oak-Mountain Mahogany Association. The vegetation community occurs in three discrete areas in the center and eastern portions of the preserve (3.71 acres).

### **Disturbed Habitat**

Disturbed habitat is a land cover type used to define lands that do not match a vegetation community included within the VCM for Western San Diego County and are subject to regular or frequent disturbance. Disturbed lands often lack native vegetation and have non-native vegetation in low numbers.

This land cover type occurs in the northernmost portion of the preserve (0.53 acres). This area was once a homestead. The land cover type is associated with the Holland-Oberbauer classification 11300 Disturbed Habitat.

### **Disturbed Habitat – Trails or Roads**

Disturbed Habitat – Trails or Road is a land cover type used to define unvegetated areas utilized for vehicular or pedestrian traffic.

This land cover type occurs where there are trails and roads throughout the preserve (10.46 acres). The majority are roads associated with utility easements. The land cover type is associated with the Holland-Oberbauer classification 11300 Disturbed Habitat.

## **4.1.5.2 Invasive Non-Native Plant Observations**

A total of 17 limited to high-risk invasive non-native plant species (as determined by Cal-IPC) were detected and mapped during field surveys for Mount Olympus County Preserve (**Table 35** and Appendix A, Figure 19). Of these species, three were identified as having a SDCRPR. The Cal-IPC and SDCRPR were taken into consideration when determining the management recommendation. The recommended action for the species detected is as follows.

- **Remove.** Pampas grass, eucalyptus, tree tobacco, and African daisy (*Gazania linearis*) were species identified for removal due to their invasive nature and small concentrations that could be targeted before they become more widespread.
- **Treat.** Due to its limited spread, long-flowered veldt grass could be a good option for treatment to control prior to further spread.
- **Monitor.** Twelve species were detected throughout the preserve. Since they are mostly widespread within the preserve, they would be best managed in conjunction with future restoration projects that would prevent re-infestation. Continued monitoring is recommended to detect any negative effects on surrounding native vegetation communities.

**TABLE 35**  
**INVASIVE NON-NATIVE PLANT SPECIES: MOUNT OLYMPUS COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
<i>Avena barbata</i> <sup>a</sup>	slender wild oat	Moderate	–	Observed throughout the site.	Monitor
<i>Brachypodium distachyon</i> <sup>a</sup>	purple false brome	Moderate	Very High	Observed throughout the site.	Monitor
<i>Bromus diandrus</i> <sup>a</sup>	ripgut grass	Moderate	–	Observed throughout the site.	Monitor
<i>Bromus hordaceus</i> <sup>a</sup>	soft chess	Limited	–	Observed throughout the site.	Monitor
<i>Bromus rubens</i> <sup>a</sup>	red brome	High	–	Observed throughout the site.	Monitor
<i>Carduus pycnocephalus</i>	Italian thistle	Moderate	–	Observed in northeastern section of preserve near old homestead.	Monitor
<i>Centaurea melitensis</i> <sup>a</sup>	toçalote	Moderate	–	Observed throughout entire preserve associated with trails and disturbed areas.	Monitor
<i>Cortaderia selloana</i>	pampas grass	High	High	Observed along the main trail in the western section of the Preserve	Remove
<i>Ehrharta longiflora</i>	long-flowered veldt grass	Limited	Medium		Treat
<i>Erodium cicutarium</i> <sup>a</sup>	redstem filaree	Limited	–	Observed throughout the site. Most common in disturbed soils.	Monitor
<i>Eucalyptus</i> sp.	eucalyptus	Limited	–	Observed in the northern portion of the Preserve along the trail off Rancho Height Road.	Remove
<i>Festuca myuros</i> <sup>a</sup>	rattail sixweeks grass	Moderate	–	Observed throughout the site.	Monitor
<i>Festuca perrenis</i> <sup>a</sup>	Italian ryegrass	Moderate	–	Observed in small, scattered patches throughout the site.	Monitor
<i>Gazania linearis</i>	African daisy	Moderate	–	Observed along the main trail in the western section of the Preserve.	Remove
<i>Hirschfeldia incana</i> <sup>a</sup>	shortpod mustard	Moderate	–	Noted on figure in areas with high concentrations. Common throughout the site, particularly in the northeastern area.	Monitor
<i>Nicotiana glauca</i>	tree tobacco	Moderate	–	Observed in northeast corner.	Remove
<i>Raphanus sativus</i> <sup>a</sup>	wild radish	Limited	–	Observed in disturbed areas with shortpod mustard and filaree.	Monitor

**TABLE 35**  
**INVASIVE NON-NATIVE PLANT SPECIES: MOUNT OLYMPUS COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
NOTES:					
<p><sup>a</sup> These species were detected within the preserve, but not mapped; species were found to be widespread throughout the preserve.</p> <p><u>Cal-IPC Ranking</u>            High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.            Moderate – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.            Limited – These species are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.            Alert – An Alert is listed on species with High or Moderate impacts that have limited distribution in California, but may have the potential to spread much further.            Watch – These species have been assessed as posing a high risk of becoming invasive in the future in California.</p> <p><u>San Diego County Regional Priority Ranking (Cal-IPC, Dendra, CBI 2012)</u>            Very High – Level 1 Surveillance. Low effort required to achieve goal of regional surveillance, early detection, rapid response.            High – Level 2 Eradication. Moderate effort required to achieve goal of eradication with regionally coordinated control program.            Medium – Level 3 Containment. Funding typically available for re-treatments or control of small populations. Goal is eradication with coordinated programs by management unit or watershed.            Medium – Level 4 Directed Management. Area may be managed effectively, with slow re-invasion. Goal is to control within reserve or sub-management unit to benefit NCCP resources.            Low – Level 5 Directed Suppression. Control is typically of short-term benefit (rapid re-invasion) without active restoration. Goal is suppression, typically to allow recovery disturbed site, improve re-vegetation success, or benefit NCCP resources.</p>					

### 4.1.5.3 Incidental Special-Status Plant and Wildlife Species Observations

One special-status plant species and three special-status wildlife species were detected and mapped during field surveys for Mount Olympus County Preserve (Table 36 and Appendix A, Figure 20).

**TABLE 36**  
**INCIDENTAL SPECIAL-STATUS PLANT AND WILDLIFE SPECIES OBSERVATIONS: MOUNT OLYMPUS COUNTY PRESERVE**

Scientific Name	Common Name	State/Federal Status	San Diego County Special Status List	Draft North County MSCP Covered Species	California Rare Plant Rank	Notes
<b>Plants</b>						
<i>Quercus engelmannii</i>	Engelmann oak	–/–	List D	NC MSCP	4.2	Observed in the northern section of the Preserve along the perimeter trail
<b>Animals</b>						
<i>Buteo linearis</i> <sup>a</sup>	Red-Shouldered Hawk	–/–	Group 1	–	–	Observed in flying and heard vocalizing near Coast live oak woodland on the eastern side of the Preserve

**TABLE 36**  
**INCIDENTAL SPECIAL-STATUS PLANT AND WILDLIFE SPECIES OBSERVATIONS: MOUNT OLYMPUS COUNTY PRESERVE**

Scientific Name	Common Name	State/Federal Status	San Diego County Special Status List	Draft North County MSCP Covered Species	California Rare Plant Rank	Notes
<i>Cathartes aura</i> <sup>a</sup>	Turkey Vulture	–/–	Group 1	–	–	Observed flying overhead during site visits throughout the Preserve
<i>Aspidoscelis tigris stejnegeri</i> <sup>a</sup>	Coastal western whiptail	SSC	Group 2	–	–	

## NOTES:

<sup>a</sup> Detected but not mapped.

State/Federal Status

FE – Federally Endangered

FT – Federally Threatened

CE – California Endangered

CT – California Threatened

SSC – CDFW Species Special Concern

San Diego County Special Status List

LIST A (Plants rare, threatened or endangered in California and elsewhere)

LIST B (Plants rare, threatened or endangered in California but more common elsewhere)

LIST C (Plants that may be quite rare, but need more information to determine their true rarity status)

LIST D (Plants of limited distribution and are uncommon, but not presently rare or endangered)

CA rare (rare in California, but not listed)

NE (MSCP Narrow Endemic)

California Rare Plant Rank

1A – Plants presumed extirpated in California and either rare or extinct elsewhere

1B – Plants rare, threatened, or endangered in California and elsewhere

2A – Plants presumed extirpated in California but common elsewhere

2B – Plants rare, threatened, or endangered in California but more common elsewhere

3 – Review List: Plants about which more information is needed

4 – Watch List: Plants of limited distribution

0.1 – Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

0.2 – Moderately threatened in California (20%–80% occurrences threatened / moderate degree and immediacy of threat)

0.3 – Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

Other

Unk – Unknown due to timing of survey and life stage of individual

#### 4.1.5.4 Habitat Condition and Threats Assessment

##### *Threat Assessment*

Based on the field surveys, biologists took note of any major issues that could pose a threat to the vegetation communities within Mount Olympus County Preserve. A list of primary threats identified in the IMG protocol is presented in **Table 37** along with a discussion of the severity of each threat within the preserve (presented as the extent within the preserve on a scale of 1 to 7).

**TABLE 37**  
**THREATS OVERVIEW: MOUNT OLYMPUS COUNTY PRESERVE**

Disturbances/Stressors	Severity (Extent)	Discussion
Invasive non-native plant species (e.g., annual grasses and herbs)	3	The preserve is dominated by the scrub oak chaparral vegetation community, which is dense and prevents non-native invasive species from growing. However, the northeast corner of the preserve, which is mostly chaparral and woodland, contains scattered tocalote, red brome, and shortpod mustard throughout. An area appearing on the map as disturbed was once a homestead is densely covered with invasive species such as those mentioned above. Non-native invasive species were also detected in the northwest corner; pampas grass along the road was recommended for removal.
Altered fire regime or risk of catastrophic fire	5	Due to the age of existing vegetation (last substantial fire was in 1942), the potential risk for fire may be elevated since there is a large amount of woody vegetation. Non-native invasive annuals may further increase the risk of fire due to dry biomass, which is particularly flammable. The northeastern area (east facing slope) consisting primarily of southern mixed chaparral is particularly vulnerable to fires due to dry native plant material and high cover of dry annuals.
Unauthorized human use (e.g., off-road vehicles, encampments, unauthorized trails, shooting, poaching, and/or dumping)	3	While there are many trails and roads within the preserve, the majority are utility easements (no sign of recent new off-road trails). In addition, the location is remote and access is not apparent from the main roads. Gates appear to be preventing unauthorized access. The northeast corner of the preserve and the homestead area did have signs of disturbance from trash and invasive non-native plant growth. There were no significant trash observations throughout the rest of the preserve.
Shothole borer, gold-spotted oak borer, and Fusarium fungal invasion	–	Site was not assessed for invasive insect species or fungi. Limited amounts of host species present for shothole borer, gold-spotted oak borer, or Fusarium dieback.
Erosion	3	Minor erosion signs were detected and primarily associated with the regularly maintained roads. Major erosion issues were associated with old roads located at the northeast area (east facing slope).
Small, isolated occurrences vulnerable to loss of genetic diversity and to extirpation due to environmental stochasticity or catastrophic disturbance.	–	Engelmann OAK occurs sporadically in the northeastern area of the preserve, which may be vulnerable.
Altered hydrology (e.g., urban runoff, flood control facilities)	3	Due to the presence of abandoned roads within the northeast area of the preserve, the site experiences runoff, which contributes to erosion issues that may affect adjacent vegetation communities.
Herbivory (e.g., seed, vegetation)	1	Not observed.
Detrimental edge effects from adjacent urban development	3	Most of the preserve boundary is surrounded by undisturbed open space, which presents little to no risk of detrimental edge effects. The eastern boundary is directly adjacent to Pala Temecula Road in some sections, and there are several networks of unpaved utility access roads outside the boundaries of the preserve that may influence edge effects from non-native invasive species, litter, and increased risk of unauthorized access.

**TABLE 37**  
**THREATS OVERVIEW: MOUNT OLYMPUS COUNTY PRESERVE**

Disturbances/Stressors	Severity (Extent)	Discussion
NOTES:		
<u>Disturbance Categories within Preserve</u>		
1 – No sign of disturbance within preserve		
2 – Disturbance does not occur within preserve, but is detected adjacent to preserve boundaries		
3 – Disturbance occurs in >0% to <10% of preserve		
4 – Disturbance occurs in 10 to <25% of preserve		
5 – Disturbance occurs in 25 to <50% of preserve		
6 – Disturbance occurs in 50 to <75% of preserve		
7 – Disturbance occurs in ≥ 75% of preserve		

### ***Type Conversion***

In order to detect potential type conversions within the preserve, Holland-Oberbauer vegetation mapping was used to compare the acreage of each habitat type that was previously mapped with the current acreage by habitat type (**Table 38**). Since vegetation mapping was last completed, an 86-acre parcel was added to the Mount Olympus County Preserve (on the northwest corner of the site). This added acreage resulted in an overall increase in most habitat types listed below.

The fire history influences on the current vegetation composition. The Pala 3 Fire burned only 24.39 acres in 2016, while the largest fire event, burning 806 acres of the preserve occurred in 1942. The topography and infrequent fire return interval has resulted in very stable old growth vegetation communities. Due to little sign of public use, the site appears to face few disturbances overall.

The increase in chaparral habitat type (92.23 acres) is primarily due to the acquisition of the new parcel. The increase in the unvegetated habitat type most likely reflects greater accuracy in mapping of 3.71 acres of rocky outcroppings. The decrease in herbaceous habitat type reflects a change in mapping methodology. Non-native grasslands increased and were mapped in new locations totaling 1.09 acres (primarily in the northeast area of the preserve); however, this was classified as a disturbed habitat type. The 24.22-acre increase in disturbed habitat includes this acreage and was as the acreage from the acquired parcel, which contains roads.

**TABLE 38**  
**TYPE CONVERSION ASSESSMENT BASED ON HOLLAND-OBERBAUER MAPPING:**  
**MOUNT OLYMPUS COUNTY PRESERVE**

Habitat Type	Acres in 2009	Acres in 2021	Difference in Acreage
Developed	0	0	0
Disturbed	9.48	33.71	24.22
Herbaceous	0.16	0.00	-0.16
Scrub	0	0.97	0.97
Chaparral	661.49	753.72	92.23
Woodland	36.49	30.52	-5.97
Forest	0	0	0
Riparian	0	0	0
Unvegetated (Rocky Outcropping)	0	3.71	3.71

#### 4.1.5.5 Adaptive Management Recommendations

Adaptive management recommendations were developed for Mount Olympus County Preserve based on the general habitat condition and threats assessment conducted during habitat mapping. Recommendations are provided for invasive non-native plant species management, habitat enhancement/restoration opportunities, encroachment, and monitoring. Recommendations are detailed in the following subsections.

##### ***Invasive Non-Native Plant Species Management***

As discussed in the invasive non-native plant observations section, several invasive non-native plant species were detected within the preserve. A recommended action was identified for each species consisting of either removal, treatment, or monitoring. Final implementation of management activities and treatment methods shall be determined by the County based on priority.

##### ***Habitat Enhancement/Restoration Opportunities***

- **Homestead and cabin.** In the northeastern corner of the preserve, past the second County access gate, exists an old, broken down homestead. Burned trash is scattered throughout. The remains of the structure and its contents remain standing or scattered around the homestead. A thorough removal of at least small- to medium-size trash (as well as the remaining structure, if possible) would enhance the habitat value of the site. The Mount Olympus County Preserve RMP considers these structures to be not significant. The homestead and the old cabin structures have the highest concentration of invasive non-native plant species within the preserve. Habitat enhancement/restoration could be achieved through removal of ornamental bushes and other invasive non-native plant species like tree tobacco and grass species. Revegetation or restoration activities can include planting additional Engelmann oaks to enhance the existing on-site population.

##### ***Encroachment***

- **Access control.** There are currently two locked gates at the northeast corner, one locked gate at the northwest corner and one locked gate at the south-central boundary (not accessible due to private road with several locked gates), which prevent public access. All gates are in good condition and the preserve is not easily located or accessed from public roads. Little to no evidence of regular unauthorized use of the preserve was observed during vegetation mapping. The existing roads are primarily accessed for utility easement purposes. It is recommended that these gates are routinely monitored to ensure the preserve stays protected from unauthorized use.
- **Homestead and cabin.** A deteriorating cabin exists in the northeastern area of the preserve and is located on the same property as the old homestead. A possible recent visit to the cabin was noted by the fresh ATV tracks that stopped where a tree had fallen near the structure. Additionally, the old homestead contained black, charred material that is likely the result of a previous burn site. Regular monitoring of this area for illegal activities, including unauthorized access, trash/dumping, and fires, is advised.

### Monitoring

- **Invasive non-native plants.** Invasive non-native plant species mapping should be conducted annually, if feasible, to inform treatment areas, assess new invasions or re-invasions, and determine effectiveness of treatments.
- **Public use.** Homestead, cabin, and access points should be monitored for unauthorized access.
- **Catastrophic events.** Additional vegetation mapping efforts may be conducted as needed following catastrophic events such as wildfires.

### 4.1.6 Lawrence and Barbara Daley County Preserve

A total of 16 vegetation communities and one land cover type was identified via Holland-Oberbauer and 33 vegetation communities and one land cover type was identified via VCM for Lawrence and Barbara Daley County Preserve. These communities are depicted in Appendix A, Figure 21 and Figure 22, and provided in crosswalk format in **Table 39**.

**TABLE 39**  
**VEGETATION COMMUNITIES CROSSWALK: LAWRENCE AND BARBARA DALEY COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
<b>Scrub</b>			
32500 Diegan Coastal Sage Scrub	4.13 San Diego County Viguiera Alliance	4.13 San Diego County Viguiera Alliance	85.63
		4.13.1 San Diego County Viguiera – California Sagebrush – California Buckwheat Association	143.57
	4.2 Chamise – Mission Manzanita Alliance	4.2 Chamise – Mission Manzanita Alliance	0.36
	4.23 California Buckwheat Alliance	4.23 California Buckwheat Alliance	0.27
	4.31 Chaparral Beard Tongue Alliance	4.31.1 Chaparral Beard Tongue – California Sagebrush Association	1.10
	4.35 Laurel Sumac Alliance	4.35 Laurel Sumac Alliance	1.43
	4.45 Jojoba Alliance	4.45 Jojoba Alliance	82.18
		4.45.1 Jojoba – San Diego County Viguiera Association	4.11
	4.6 California Sagebrush Alliance	4.6.1 California Sagebrush Association	2.66
	4.7 California Sagebrush – California Buckwheat Alliance	4.7 California Sagebrush – California Buckwheat Alliance	43.02
4.7.1 California Sagebrush – California Buckwheat Association		104.84	

**TABLE 39**  
**VEGETATION COMMUNITIES CROSSWALK: LAWRENCE AND BARBARA DALEY COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
<b>Chaparral</b>			
37120 Southern Mixed Chaparral	4.1 Chamise Alliance	4.1.2 Chamise-(California Buckwheat, California Sagebrush, Black Sage) Association	2.23
		4.2 Chamise – Mission Manzanita Alliance	10.01
		4.2.1 Chamise – Mission Manzanita Association	0.35
	4.7 California Sagebrush – California Buckwheat Alliance	4.7 California Sagebrush – California Buckwheat Alliance	0.18
4.7.1 California Sagebrush – California Buckwheat Association		1.44	
37200 Chamise Chaparral	4.1 Chamise Alliance	4.1 Chamise Alliance	0.19
37900 Scrub Oak Chaparral	4.2 Chamise – Mission Manzanita Alliance	4.2.6 Chamise – Mission Manzanita – Scrub Oak Association	0.26
37C30 Southern Maritime Chaparral	4.2 Chamise – Mission Manzanita Alliance	4.2.6 Chamise – Mission Manzanita – Scrub Oak Association	0.18
37G00 Coastal Sage- Chaparral Transition	4.1 Chamise Alliance	4.1.2 Chamise-(California Buckwheat, California Sagebrush, Black Sage) Association	0.86
	4.13 San Diego County Viguiera Alliance	4.13.1 San Diego County Viguiera – California Sagebrush – California Buckwheat Association	2.03
<b>Woodland</b>			
71160 Coast Live Oak Woodland	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	0.15
71161 Open Coast Live Oak Woodland	3.6 Coast Live Oak Association	3.6 Coast Live Oak Association	0.44
		3.6.1 Coast Live Oak – California Sagebrush Association	0.88
		3.6.4 Coast Live Oak – Western Poison Oak-Grass Association	3.55
71181 Open Engelmann Oak Woodland	3.7 Engelmann Oak Alliance	3.7 Engelmann Oak Alliance	0.25
79100 Eucalyptus Woodland	3.2 Eucalyptus Semi-Natural Stands	3.2 Eucalyptus Semi-Natural Stands	3.73
<b>Riparian</b>			
61300 Southern Riparian Forest	3.4 Western Sycamore Alliance	3.4.3 Western Sycamore – Coast Live Oak Association	13.70
		3.4.3 Western Sycamore – Coast Live Oak Association	2.47
61310 Southern Coast Live Oak Riparian Forest	3.6 Coast Live Oak Alliance	3.6.3 Coast Live Oak – Arroyo Willow Association	1.20

**TABLE 39**  
**VEGETATION COMMUNITIES CROSSWALK: LAWRENCE AND BARBARA DALEY COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
61330 Southern Cottonwood-Willow Riparian Forest	3.4 Western Sycamore Alliance	3.4.1 Western Sycamore/Mulefat Association	5.49
		3.4.3 Western Sycamore – Coast Live Oak Association	0.17
	3.5 Fremont Cottonwood Alliance	3.5.1 Fremont Cottonwood Association	1.65
62500 Southern Riparian Woodland	3.4 Western Sycamore Alliance	3.4 Western Sycamore Alliance	0.93
		3.4.1 Western Sycamore/Mulefat Association	1.33
		3.4.2 Western Sycamore – Cottonwood – Arroyo Willow Association	0.91
		3.4.3 Western Sycamore – Coast Live Oak Association	3.23
	3.6 Coast Live Oak Alliance	3.6.3 Coast Live Oak – Arroyo Willow Association	0.22
		3.6.4 Coast Live Oak – Western Poison Oak-Grass Association	1.37
	3.7 Engelmann Oak Alliance	3.7.2 Engelmann Oak – Coast Live Oak-Western Poison Oak – Grass Association	0.27
65100 Arundo- Dominated Riparian	5.4 Giant Reed Semi-Natural Stands	5.4 Giant Reed Semi-Natural Stands	0.16
42200 Non-Native Grassland	5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi- Natural Stands	5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands	0.70
	5.5 Wild Oat Semi-Natural Stands	5.5 Wild Oat Semi-Natural Stands	0.33
	5.7 Black Mustard and Other Mustards Semi-Natural Stands	5.7 Black Mustard and Other Mustards Semi-Natural Stands	43.24
	5.8 Ripgut Grass and Soft Chess-Purple False Brome Semi-Natural Stands	5.8.2 Ripgut Grass Semi-Natural Stand Type	1.39
	5.9 Red Brome – Arabian Schismus and Old Han Schismus Semi-Natural Stands	5.9.1 Red Brome Semi-Natural Stand Type	1.06
<b>Other<sup>a</sup></b>			
11300 Disturbed Habitat	N/A	Disturbed Habitat – Trails or Roads	5.07
<b>TOTAL ACREAGE:<sup>b</sup></b>			<b>580.79</b>

## NOTES:

<sup>a</sup> The San Diego Vegetation Classification Manual only classifies vegetated areas. The disturbed land cover types were described and displayed under the association level to provide additional detail in the mapping. This allows for changes in vegetation (e.g., unvegetated to vegetated) to be tracked over time.

<sup>b</sup> Total may not match sum of individual acreages listed due to rounding.

### 4.1.6.1 Vegetation Type Descriptions

The following vegetation community and land cover type descriptions for the Lawrence and Barbara Daley County Preserve follow the VCM classification system. General association and alliance descriptions were taken from the VCM for Western San Diego County (Sproul et al. 2011).

#### ***Soft-Leaved, Drought-Deciduous Shrublands***

##### **4.13 San Diego County Viguiera Alliance**

San Diego County viguiera is a distinctive drought-deciduous shrub endemic to San Diego County and adjacent Baja California. San Diego County viguiera stands occur commonly in the southwestern portion of the county. They occupy hot, southerly facing slopes generally a few miles inland from the ocean, where summer fog persists throughout the day. Stands are most closely related ecologically to drier stands of the California buckwheat Alliance. The characteristics of the alliance and the single association defined to date are described below.

This vegetation community occurs in one large and four smaller areas in the southern side of the preserve's east-west trending ridge (85.63 acres). The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

##### **4.13.1 San Diego County Viguiera – California Sagebrush – California Buckwheat Association**

San Diego County viguiera, California sagebrush, and California buckwheat are dominant to subdominant in closed to open shrub canopy. Subdominant associates include laurel sumac, California sagebrush, California buckwheat, chamise, and mission manzanita. Herbaceous cover is diverse largely in openings and can include *Dudleya* spp., cholla, and chaparral yucca.

This vegetation community occurs in the southern and eastern portions of the preserve (145.60 acres), with two very large occurrences dominating the eastern portion of the preserve. The vegetation community is associated with the Holland-Oberbauer classifications 32500 Diegan Coastal Sage Scrub and 37G00 Coastal Sage-Chaparral Transition.

##### **4.23 California Buckwheat Alliance**

Stands of this alliance are generally characterized by California buckwheat as dominant or codominant in the shrub canopy. In cismontane areas, subdominant species include California sagebrush, big sagebrush (*Artemisia tridentata*), coyote brush, sticky monkeyflower, California encelia, brittlebush (*Encelia farinosa*), coastal goldenbush, deerweed, chaparral mallow, white sage, and black sage. In transmontane areas, subdominants include white bur-sage (*Ambrosia dumosa*), common burrobrush (*Ambrosia salsola*), black brush (*Coleogyne ramosissima*), Nevada ephedra (*Ephedra nevadensis*), green-leaf rabbitbrush (*Ericameria teretifolia*), desert creosote bush (*Larrea tridentata*), bladdersage (*Salazaria mexicana*), jojoba, and Parish's goldeneye (*Bahiopsis parishii*). Emergent trees such as California juniper (*Juniperus californica*), Utah juniper (*Juniperus osteosperma*), or Joshua tree may be present at trace cover. Shrubs are typically less than 2 meters tall and the canopy is continuous or intermittent. The herbaceous layer is variable and may be dominated by grasses.

This vegetation community occurs in one small patch in the eastern portion of the preserve (0.27 acres). The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

#### **4.31.1 Chaparral Beard Tongue – California Sagebrush Association**

Chaparral beard tongue and California sagebrush occur as codominants in a closed to open canopy. Subdominant shrubs include California buckwheat, sages, laurel sumac, sticky monkeyflower, redberry, chamise, Ramona lilac, hoaryleaf ceanothus, and mission manzanita. A diverse herbaceous cover occurs in openings and includes wishbone bush, spotted eucrypta, sacapellote (*Acourtia microcephala*), wild cucumber, California figwort (*Scrophularia californica*), and caterpillar phacelia (*Phacelia cicutaria* ssp. *Hispida*).

This vegetation community occurs in two small patches and is located just above the riparian area and below the highway in the southwestern part of the preserve (1.10 acres). The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

#### **4.35 Laurel Sumac Alliance**

This community is dominated by laurel sumac. Subdominant shrub species include California sagebrush, deerweed, California buckwheat, and spiny redberry. The herbaceous understory may include wild cucumber, wishbone bush, and island morning glory.

This vegetation community occurs in four small areas scattered throughout the preserve (4.35 acres). The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

#### **4.45 Jojoba Alliance**

This alliance is dominated or codominated by jojoba. Other species in the shrub canopy may include California sagebrush, snake cholla, California buckwheat, matchweed, deerweed, sugar bush, black sage, and Mojave yucca as subdominants. Shrubs are typically less than 5 meters tall and the shrub canopy is open to intermittent and two-tiered, while the herbaceous layer cover is open.

This vegetation community occurs in one small and one large occurrence on the southern side of the preserve's east-west trending ridge in the southwestern portion of the preserve (82.18 acres). The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

#### **4.45.1 Jojoba – San Diego County Viguiera Association**

This association is codominated by jojoba and San Diego County viguiera, with other shrub species resembling those described in 4.45, Jojoba Alliance, but may also include San Diego barrel cactus and cholla.

This vegetation community occurs in eight small areas on the southern side of the preserve's east-west trending ridge in the southwestern portion of the preserve (4.11 acres). The vegetation

community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

#### **4.6.1 California Sagebrush Association**

California sagebrush clearly dominates this association, often with a relatively open cover and high diversity of subdominant shrubs, including four-wing saltbush (*Atriplex canescens*), lemonade berry, California encelia, laurel sumac, California buckwheat, coyote brush, broom baccharis, coastal goldenbush, black sage, white sage, and chaparral mallow. Higher herb cover and diversity occurs in openings. This association can occur both as a mature stable shrub community or as an early transitional stage of other shrublands in response to fire or other disturbance.

This vegetation community occurs in two areas in the southwestern part of the preserve directly above the riparian area (2.66 acres). The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

#### **4.7 California Sagebrush – California Buckwheat Alliance**

Aside from the California sagebrush and California buckwheat codominant species, other shrubs in the canopy of this alliance may include chamise, sticky monkeyflower, desert tea, chaparral yucca, deerweed, laurel sumac, lemonade berry, sugar bush and/or white sage. Most shrubs are less than 2 meters tall, with some shrubs up to 5 meters tall. The herbaceous layer may include spring annuals, but may have perennial grasses and geophytes.

This vegetation community occurs throughout the preserve in small patches and medium-size areas (43.20 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32500 Diegan Coastal Sage Scrub and 37120 Southern Mixed Chaparral.

##### **4.7.1 California Sagebrush – California Buckwheat – Laurel Sumac Association**

California sagebrush, California buckwheat, and laurel sumac are codominant in this association with a relatively open shrub canopy. Many other subdominant shrub species include lemonade berry, California encelia, white sage, San Diego County viguiera, saw-toothed goldenbush, broom baccharis, chaparral yucca, bushrue, coast prickly pear, California brickellbush, sticky monkeyflower, chaparral beard tongue, and spiny redberry. Herb cover is usually open and with high species diversity. This association can occur both as a mature stable shrub community or as an early transitional stage of other shrublands in response to fire or other disturbance.

This vegetation community occurs throughout the preserve (106.28 acres). It is a dominant vegetation community on the north-facing slope of the preserve's east-west trending ridge in the northwestern part of the preserve and is found scattered throughout the remainder of the preserve. The vegetation community is associated with the Holland-Oberbauer classifications 32500 Diegan Coastal Sage Scrub and 37120 Southern Mixed Chaparral.

## ***Sclerophyllus, Evergreen Shrublands***

### **4.1 Chamise Alliance**

Throughout its range, chamise is dominant in the shrub canopy and, depending on the location, may have red shank, Eastwood manzanita, common manzanita, sticky whiteleaf manzanita, *Ceanothus* spp., sticky monkeyflower, California yerba santa, California buckwheat, chaparral yucca, toyon, scrub oak, interior live oak, white sage, purple sage, black sage, and western poison oak as associates to codominants or subdominants. Emergent trees may be present at low cover. Shrubs are typically less than 4 meters tall; the canopy is intermittent to continuous, and the herbaceous layer is sparse to intermittent.

This vegetation community occurs in a small patch in the northwestern portion of the preserve on top of the east-west trending ridge (0.19 acres). The vegetation community is associated with the Holland-Oberbauer classification 37200 Chamise Chaparral.

#### **4.1.2 Chamise – California Buckwheat – California Sagebrush Association**

Chamise is dominant with other shrubs occurring as subdominants; together, these species form either a continuous or more often open canopy cover. Subdominant shrubs most commonly include California sagebrush, California buckwheat, bushrue, saw-toothed goldenbush, black sage, scrub oak, Torrey's hybrid oak, Nuttall's scrub oak, Ramona lilac, wart-stemmed ceanothus, and Eastwood manzanita. Dominant herbs often include native and non-native grasses, such as giant wild-rye and red brome, with a rich diversity of herb species. This association is a mix of chaparral and coastal sage scrub. It occurs both as a mature, stable shrub community or an early transitional stage of other shrublands in response to fire or other disturbance.

This vegetation community occurs in three small areas in various parts of the preserve (3.08 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral and 37G00 Coastal Sage-Chaparral Transition.

### **4.2 Chamise – Mission Manzanita Alliance**

In this alliance, chamise and mission manzanita are codominants in the shrub canopy; subdominant shrubs may include hoaryleaf ceanothus, Ramona lilac, wart-stemmed ceanothus, bushrue, chaparral yucca, toyon, laurel sumac, scrub oak, hollyleaf redberry, sugar bush, white sage, and black sage. Shrubs are usually less than 3 meters tall and the canopy is intermittent to continuous. The herbaceous layer is sparse to intermittent.

This vegetation community occurs in six small areas scattered about the preserve (10.38 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32500 Diegan Coastal Sage Scrub and 37120 Southern Mixed Chaparral.

#### **4.2.1 Chamise – Mission Manzanita – Scrub Oak Association**

Chamise and mission manzanita often form continuous cover and are the dominant shrubs in this association. Subdominant shrubs include laurel sumac, black sage, bushrue, lemonade berry, sugar bush, Ramona lilac, wart-stemmed ceanothus, hoaryleaf ceanothus, chaparral yucca, Mojave yucca, scrub oak (*Quercus* spp.), and spiny redberry. Many other subshrubs and herbs occur, primarily in openings, such as wild cucumber, saw-toothed goldenbush, island morning

glory, small flowered soaproot, and little California melica. The normally low herbaceous species cover and diversity is enhanced following fire. This association occurs in the cismontane foothills south of the Transverse Range and is mostly confined to San Diego County and Baja California Norte, Mexico.

This vegetation community occurs in one small patch in the northwestern portion of the preserve (0.35 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

#### **4.2.6 Chamise – Mission Manzanita – Scrub Oak (*berberidifolia*, x *acutidens*) Association**

Chamise, mission manzanita, scrub oak (*berberidifolia*, x *acutidens*) occur as codominants, often with an open canopy. Other subdominant shrubs include Ramona lilac, chaparral whitethorn, California buckwheat, smooth mountain mahogany, laurel sumac, redberry, toyon, Mojave yucca, and chaparral yucca. The herbaceous understory is often sparse except after fires.

This vegetation community occurs in two small patches in the northern and southern portions of the preserve (0.44 acres). The vegetation community is associated with the Holland-Oberbauer classification 37900 Scrub Oak Chaparral and 37C30 Southern Maritime Chaparral overlap with this vegetation type.

### ***Riparian Forests and Woodlands***

#### **3.4 Western Sycamore Alliance**

The western sycamore alliance may include coast live oak and other trees but are characterized by the presence of regularly spaced western sycamore. In general, western sycamore is dominant or codominant in the tree canopy; additional tree species may include white alder (*Alnus rhombifolia*), southern California black walnut, Fremont cottonwood, coast live oak, valley oak, narrow-leaved willow, Goodding's black willow, red willow, arroyo willow, yellow willow (*Salix lutea*), and California laurel. Trees are generally less than 35 meters tall with open canopy. The shrub and herb canopies are open with sparse cover.

This vegetation community occurs in three small patches in the southern portion of the preserve along the riparian corridor (0.93 acres). The vegetation community is associated with the Holland-Oberbauer classification 62500 Southern Riparian Woodland.

##### **3.4.1 Western Sycamore – Mulefat Association**

Within this vegetation community, western sycamore is dominant or codominant in an open tree canopy with mulefat dominant in an open shrub canopy. Associated subdominant riparian shrubs include western poison oak, blue elderberry, broom baccharis, desert wild grape, and California rose. Many upland shrubs may also occur in this association. The herbaceous diversity is low and cover is sparse; characteristic species include mugwort, Western ragweed, and San Diego sedge.

This vegetation community occurs in two areas in the southwestern portion of the preserve along the riparian corridor (6.82 acres). The larger area is a restoration site and includes a mix of several planted species commonly found in riparian habitats. The vegetation community is

associated with the Holland-Oberbauer classification 61330 Southern Cottonwood-Willow and 62500 Southern Riparian Woodland.

### **3.4.2 Western Sycamore – Fremont Cottonwood – Arroyo Willow Association**

Western sycamore occurs in an open to intermittent tree canopy with Fremont cottonwood, arroyo willow, and/or other willow species. Associated subdominant riparian shrubs include western poison oak, mulefat, desert wild grape, and California rose. The herbaceous diversity is moderate and cover is open, including mugwort, western ragweed, San Diego sedge, nutsedges, yerba mansa, rushes, cattails, and many ruderal species.

This vegetation community occurs in three small patches in the southwestern part of the preserve along the riparian area (0.91 acres). The vegetation community is associated with the Holland-Oberbauer classification 62500 Southern Riparian Woodland.

### **3.4.3 Western Sycamore – Coast Live Oak Association**

In this vegetation community, western sycamore and coast live oak are codominant in a continuous to open tree canopy; subdominants may include Fremont cottonwood and willows. Associated subdominant riparian shrubs include blue elderberry, western poison oak, desert wild grape, California rose, and California blackberry. Many associated upland shrubs may also be present, including lemonade berry, sugar bush, redberry, toyon, and mulefat. The herbaceous diversity is high and cover is continuous to open, including mugwort, San Diego sagewort, western ragweed, San Diego sedge, nutsedges, yerba mansa, rushes, cattails, and many ruderal species.

This vegetation community occurs throughout the riparian corridor, in the northern and southern portions of the preserve, and in the ephemeral drainages throughout the preserve (19.56 acres). The vegetation community is associated with the Holland-Oberbauer classifications 61300 Southern Riparian Forest, 61310 Southern Coast Live Oak, 61330 Southern Cottonwood-Willow, and 62500 Southern Riparian Woodland.

### **3.5.1 Fremont Cottonwood – Mulefat Association**

Fremont cottonwood and mulefat together occur as codominants. Associated subdominant riparian shrubs include blue elderberry, coastal goldenbush, and willows. The herbaceous diversity is low and cover is mostly continuous in openings, including salt grass, western ragweed, yerba mansa, and many ruderal species.

This vegetation community occurs in two small patches in the southwestern portion of the preserve along the riparian corridor (1.56 acres). The vegetation community is associated with the Holland-Oberbauer classifications 61330 Southern Cottonwood-Willow.

### **3.6.3 Coast Live Oak – Arroyo Willow Association**

Coast live oak is dominant in an open to closed tree canopy with arroyo willow typically dominating the shrub canopy. Subdominant trees may include western sycamore, Fremont cottonwood, and willows. Subdominant shrubs include desert wild grape, blue elderberry, and *Baccharis* spp. (*salicifolia*, *sarothroides*, *pilularis*). The herbaceous diversity is low and cover is

generally open, including wetland affiliates such as San Diego sagewort, western ragweed, yerba mansa, salt grass, and fringed willowherb.

This vegetation community occurs in two small patches in southern portion of the preserve along the riparian corridor (1.43 acres). The vegetation community is associated with the Holland-Oberbauer classifications 61310 Southern Coast Live Oak and 62500 Southern Riparian Woodland.

## ***Upland Forests and Woodlands***

### **3.2 Eucalyptus Semi-Natural Stands**

Over 50 species of eucalyptus have been introduced to California from Australia. However, only a few are known to form self-perpetuating stands and have the qualities of semi-natural stands. The two most common species that form semi-natural stands are listed in parentheses in the name of this type. River red gum is one of the most common species found in naturalized stands in San Diego County, but there are at least six other species that are listed in the most recent San Diego County Plant checklist. River red gum is one of the few that appears to invade riparian channels.

This vegetation community occurs in one area in the northwestern portion of the preserve along the riparian corridor (3.73 acres). The vegetation community is associated with the Holland-Oberbauer classification 79100 Eucalyptus Woodland.

### **3.6 Coast Live Oak Alliance**

General alliance characteristics of this association include coast live oak as the dominant or codominant species in the tree canopy. Associated tree species may include big-leaf maple, box elder, pacific madrone, southern California black walnut, western sycamore, Fremont cottonwood, blue oak, valley oak, Engelmann oak, California black oak, arroyo willow, and/or California laurel. Trees are generally less than 30 meters tall and the canopy is open to continuous. The shrub and herbaceous canopies are variable.

This vegetation community occurs in two small patches in the northern and southern portions of the preserve along the riparian corridor (0.59 acres). The vegetation community is associated with the Holland-Oberbauer classification 71160 Coast Live Oak Woodland and 71161 Open Coast Live Oak Woodland.

#### **3.6.1 Coast Live Oak – California Sagebrush Association**

Coast live oak is the dominant species in an open tree canopy, while California sagebrush is dominant in an open shrub canopy. Subdominant shrubs include a variety of chaparral and coastal sage species, such as Ramona lilac, chamise, sticky monkeyflower, laurel sumac, blue elderberry, hollyleaf redberry, California sagebrush, California buckwheat, and toyon. Herbaceous cover occurs in openings and includes wild cucumber, purple needle grass, *Phacelia* spp., checkerbloom (*Sidalcea malviflora*), gumweed (*Grindelia hirsutula*), and many shrubs, and often includes a high cover of ruderal species.

This vegetation community occurs in two small patches in the southern portion of the preserve along the riparian corridor (0.88 acres). The vegetation community is associated with the Holland-Oberbauer classification 71161 Open Coast Live Oak Woodland.

### **3.6.4 Coast Live Oak – Western Poison Oak – Grass Association**

Coast live oak is dominant in the tree canopy and western poison oak is subdominant in the shrub canopy, with an understory of native herbaceous and ruderal species. Subdominant shrubs include blue elderberry, coyote brush, and San Diego sagewort. The herbaceous diversity is high and cover is generally intermittent to continuous, including fewer wetland affiliates than the previous association and many ruderal species. This association is ecologically similar to the Coast Live Oak/Arroyo Willow Association but occurs higher on the hydrologic profile where many upland shrubs and ruderal plants are prevalent above the fluvial regime.

This vegetation community occurs in patches in the southern portion of the preserve along the riparian corridor (4.92 acres). The vegetation community is associated with the Holland-Oberbauer classification 62500 Southern Riparian Woodland and 71161 Open Coast Live Oak Woodland.

### **3.7 Engelmann Oak Alliance**

Engelmann oak is dominant or codominant in the tree canopy with southern California black walnut, coast live oak, and California black oak sometimes present as associates. Trees are usually less than 18 tall, and the canopy may be open to closed. The shrub layer is sparse to open and the herbaceous layer is sparse and often dominated by grass species.

This vegetation community occurs in one patch in the southern portion of the preserve (0.25 acres). The vegetation community is associated with the Holland-Oberbauer classification 71181 Open Engelmann Oak.

### **3.7.2 Engelmann Oak – Coast Live Oak – Western Poison Oak – Grass Association**

Engelmann oak and coast live oak are codominants in the tree canopy, western poison oak is diagnostically present in the shrub canopy, and grasses and other herbs are dominant in the herbaceous understory. Subdominant shrubs include many coastal sage scrub species including black sage, white sage, California sagebrush, laurel sumac, sticky monkeyflower, and climbing keckiella; however, their combined cover is less than western poison oak. The herbaceous understory is often dominated by non-native ruderal plants.

This vegetation community occurs in one patch the southern portion of the preserve in the riparian corridor (0.27 acres). The vegetation community is associated with the Holland-Oberbauer classification 62500 Southern Riparian Woodland.

## ***Upland Herbaceous Vegetation***

### **5.5 Wild Oat Semi-Natural Stands**

Stands strongly dominated by non-native *Avena* spp. Are common in waste places, rangelands, openings in woodlands, and type-converted chaparral or coastal scrub throughout Cismontane California. Slender wild oat or wild oat (*Avena fatua*) is dominant or codominant in the

herbaceous layer. Emergent trees and shrubs may be present at low cover. Herbs are less than 1.2 meters tall and the cover is open to continuous.

Stands in San Diego County often contain ripgut brome, soft chess, and other non-native grasses and herbs. Natives in the genera *Clarkia* spp., blue dicks, bedstraw (*Galium* spp.), lupines, popcorn flowers (*Plagiobothrys* spp.), and clover (*Trifolium* spp). If they exist in the stands are of substantially lower cover than the non-natives. Many *Avena* spp. Stands occur on moderate to steep slopes formerly occupied by scrub alliances, apparently the result of type-conversion from high frequency fires. It is unknown whether these will be ultimately replaced by shrub alliance stands.

This vegetation community occurs in one patch in the southeastern portion of the preserve (0.33 acres). The vegetation community is associated with the Holland-Oberbauer classification 42200 Non-Native Grassland.

### **5.7 Black Mustard and Other Mustards Semi-Natural Stands**

Stands of non-native annual mustards occupy fallow fields, grasslands, roadsides, levee slopes, disturbed scrublands, riparian areas, and waste places throughout California. These mustards are treated as a singular type of semi-natural vegetation based on their ecological similarities. They form dense colonies that overtop most other plants whether they are native or non-native. All respond positively to regular frequent disturbance, whether it be fire, disking, intermittent flooding, or heavy grazing. Emergent shrubs and trees may be present at low cover. Herbs are generally less than 3 meters tall with the canopy ranging from open to continuous.

This vegetation community occurs in one area in the southern portion of the preserve (43.24 acres). The vegetation community dominates a south-facing slope on the edge of the preserve. It is possible this hillside was previously used for grazing. It contains very few native species and appears highly degraded. The vegetation community is associated with the Holland-Oberbauer classification 42200 Non-Native Grassland.

#### **5.8.2 Ripgut Grass Semi-Natural Stand Type**

Ripgut grass dominates the herbaceous canopy of many vegetation types especially as a result of disturbance. This brome is most prominent at dominating native grasslands, the understory of oak woodlands, and other vegetation types. It invades low areas with deeper soils creating dense cover and biomass that create dense perpetual thatch. Soft chess is more often subdominant with many other weedy plant species, often not in continuous stands.

This vegetation community occurs in four small patches near or along the preserve boundaries (1.39 acres). The vegetation community is associated with the Holland-Oberbauer classification 42200 Non-Native Grassland.

#### **5.9.1 Red Brome Semi-Natural Stand Type**

Red brome dominates a continuous to open herbaceous canopy in this vegetation type. Non-native herbs, including filarees, bromes (*Bromus* spp.), tocalote, shortpod mustard, small-flower catchfly, and smooth cat's-ear are often subdominant to codominant, and native herbs may be subdominant. Emergent native shrubs are trace. The type occupies areas with drier site

conditions and poorer soils than areas supporting ripgut grass, purple false brome, and black mustard.

This vegetation community occurs in one area in the northeastern portion of the preserve (1.06 acres). The vegetation community is associated with the Holland-Oberbauer classification 42200 Non-Native Grassland.

#### **5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands**

This description is based on the group level, which is the hierarchical level above the alliance. The group level is a useful classification where distinction cannot be made to the alliance or association level. This group level classification may be applied in cases where non-native grasses and forbs are dominant over native species, and where none of the following non-native species are clearly dominant or codominant: wild oats, bromes, purple false brome, fescues, fountain grass, black mustard, poison hemlock, crown daisy. Any of the species above may be present without dominance in a mixed association that may include many other naturalized ruderal species, including bent grass, tall fescue, crab grass, Russian thistle, filaree, sorghum, *Centaurea* spp., Bermuda grass, *Schismus* spp., and blessed milk thistle. This vegetation type is widespread and highly variable, representing generalized situations where ruderal floras have replaced native types through a history of repeated soil disturbance and the introduction of non-native plant species.

This vegetation community occurs in one patch in the southern portion of the preserve (0.70 acres). The vegetation community is associated with the Holland-Oberbauer classification 42200 Non-Native Grassland.

#### **5.4 Giant Reed Semi-Natural Stands**

Giant reed (*Arundo donax*) is an aggressive, large, introduced perennial grass. The roots are extensive and densely matted. Plants can form dense, floating mats in riparian areas, along low-gradient streams, ditches, and coastal marshes. The rhizomes and culms that detach from clumps are the major method of propagation. Stands are simple due to the rapid dominance by the species. Typically, giant reed is strongly dominant in the herbaceous layer. Emergent trees may occur at low cover. Stands may be up to 8 meters, and the mature stand canopy is continuous. Giant reed dominates all canopies of a variety of riparian associations to the exclusion of many native trees, including willows. Giant reed is less prominent in the drier riparian systems usually dominated by mulefat, coyote brush, broom baccharis, arrow-weed (*Pluchea sericea*), and often arroyo willow where it frequently occurs more as an isolated infestation possibly where vegetation reproduction is less promoted by flood scour.

This vegetation community occurs in one small patch in the southern portion of the preserve in an ephemeral drainage (0.16 acres). The vegetation community is associated with the Holland-Oberbauer classification 65100 Arundo-Dominated Riparian.

## Other<sup>7</sup>

### Disturbed Habitat – Trails or Roads

Disturbed Habitat – Trails or Road is a land cover type used to define unvegetated areas used for vehicular or pedestrian traffic. Disturbed habitat within the preserve consists of 5.07 acres. There is a regularly maintained fuel modification zone along the eastern boundary of the northernmost section of the preserve associated with the rural residential community that occurs directly adjacent to the preserve boundary. Several foot paths exist along the northwest and southwest boundary of the preserve. The land cover type is associated with the Holland-Oberbauer classification 11300 Disturbed Habitat.

### 4.1.6.2 Invasive Non-Native Plant Observations

A total of 26 limited to high-risk and one watch invasive non-native plant species (as determined by Cal-IPC) were detected and mapped during field surveys for Lawrence and Barbara Daley County Preserve (**Table 40** and **Appendix A, Figure 23**). Of these species, two were identified as having a SDCRPR. The Cal-IPC and SDCRPR were taken into consideration when determining the recommended action, and should be referenced for specific treatment methods. The recommended action for the species detected is as follows.

- **Remove.** Cootamundra wattle, pampas grass, eucalyptus, tree tobacco, olive, Peruvian peppertree, and Mexican fan palm were species identified for removal due to their invasive nature and small concentrations that could be targeted before they become more widespread.
- **Treat.** Fennel and crimson fountain grass both occurred as small infestations within the preserve and are recommended for treatment.
- **Monitor.** Sixteen species were detected within the preserve. These species are mostly widespread within the preserve and therefore, would be best managed in conjunction with future restoration projects that would prevent re-infestation. Continued monitoring is recommended to detect any negative effects on surrounding native vegetation communities.

**TABLE 40**  
**INVASIVE NON-NATIVE PLANT SPECIES: LAWRENCE AND BARBARA DALEY COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
<i>Acacia baileyana</i>	Cootamundra wattle	Watch	–	Observed in few locations	Remove
<i>Avena barbata</i> <sup>a</sup>	slender wild oat	Moderate	–	Observed throughout the site	Monitor
<i>Avena sativa</i> <sup>a</sup>	cultivated oats	None	–	Observed throughout the site	Monitor
<i>Bromus diandrus</i>	ripgut grass	Moderate	–	Observed throughout the site	Monitor

<sup>7</sup> The VCM classification and code is provided in this section's subheadings for all vegetation types; however, there is no VCM classification or code for land cover types without vegetation. For these types, we describe them in detail and provide the Holland-Oberbauer classification and code in the last sentence of the description.

**TABLE 40**  
**INVASIVE NON-NATIVE PLANT SPECIES: LAWRENCE AND BARBARA DALEY COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
<i>Bromus rubens</i>	red brome	High	–	Observed throughout the site	Monitor
<i>Carduus pycnocephalus</i>	Italian thistle	Moderate	–	Observed throughout the site	Monitor
<i>Centaurea melitensis</i>	tocalote	Moderate	–	Observed throughout the site	Monitor
<i>Cortaderia selloana</i> <sup>b</sup>	pampas grass	High	–	Observed in seasonal drainages	Remove
<i>Cynodon dactylon</i>	Bermuda grass	Moderate	–	Observed in a few locations	Monitor
<i>Erharta longiflora</i> <sup>a</sup>	long-flowered veldt grass	Moderate	–	Observed throughout the site	Monitor
<i>Eucalyptus</i> sp.	Eucalyptus	Limited	–	Observed in the northern riparian area as a planted row and in the southern riparian area as scattered individuals	Remove
<i>Festuca myuros</i> <sup>a</sup>	rat-tail fescue	Moderate	–	Observed throughout the site	Monitor
<i>Foeniculum vulgare</i>	fennel	Moderate	Very High	Observed in seasonal drainages	Treat
<i>Glebionis coronaria</i>	crown daisy	Limited	Medium	Observed in a few occurrences	Monitor
<i>Hirschfeldia incana</i>	shortpod mustard	Moderate	–	Observed throughout the site	Monitor
<i>Lythrum hyssopifolia</i> <sup>b</sup>	Hyssop loosestrife	Limited	–	Observed in a few locations in seasonal drainage	Monitor
<i>Nicotiana glauca</i>	tree tobacco	Moderate	–	Observed in a few locations	Remove
<i>Olea europaea</i> <sup>b</sup>	olive	Limited	–	Observed in a few locations	Remove
<i>Oxalis pes-caprae</i> <sup>b</sup>	Bermuda buttercup	Moderate	–	Observed in a few locations	Monitor
<i>Pennisetum setaceum</i> <sup>a</sup>	crimson fountain grass	Moderate	–	Observed throughout the site	Treat
<i>Phoenix canariensis</i> <sup>b</sup>	Canary island date palm	Limited	–	Observed in seasonal drainages	Remove
<i>Salsola tragus</i>	Russian thistle	Limited	–	Observed throughout the site	Monitor
<i>Schinus molle</i> <sup>b</sup>	Peruvian peppertree	Limited	–	Observed in a few locations	Remove
<i>Silybum marianum</i>	milk thistle	Limited	–	Observed in a few occurrences	Monitor

**TABLE 40**  
**INVASIVE NON-NATIVE PLANT SPECIES: LAWRENCE AND BARBARA DALEY COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
<i>Stipa miliacea</i> var. <i>miliacea</i>	Smilo grass	Limited	–	Observed in seasonal drainages	Monitor
<i>Washingtonia robusta</i>	Mexican fan palm	Moderate	–	Observed in seasonal drainages	Remove

## NOTES:

<sup>a</sup> These species were detected within the preserve, but not mapped; species were found to be widespread throughout the preserve.

<sup>b</sup> These species detected within preserve, but not mapped.

Cal-IPC Ranking

High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited – These species are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Alert – An Alert is listed on species with High or Moderate impacts that have limited distribution in California, but may have the potential to spread much further.

Watch – These species have been assessed as posing a high risk of becoming invasive in the future in California.

San Diego County Regional Priority Ranking (Cal-IPC, Dendra, CBI 2012)

Very High – Level 1 Surveillance. Low effort required to achieve goal of regional surveillance, early detection, rapid response.

High – Level 2 Eradication. Moderate effort required to achieve goal of eradication with regionally coordinated control program.

Medium – Level 3 Containment. Funding typically available for re-treatments or control of small populations. Goal is eradication with coordinated programs by management unit or watershed.

Medium – Level 4 Directed Management. Area may be managed effectively, with slow re-invasion. Goal is to control within reserve or sub-management unit to benefit NCCP resources.

Low – Level 5 Directed Suppression. Control is typically of short-term benefit (rapid re-invasion) without active restoration. Goal is suppression, typically to allow recovery disturbed site, improve re-vegetation success, or benefit NCCP resources.

### 4.1.6.3 Incidental Special-Status Plant and Wildlife Species Observations

Seven special-status plant species, and two with the possibility of being special-status were detected and mapped during field surveys for Lawrence and Barbara Daley County Preserve (Table 41 and Appendix A, Figure 24).

**TABLE 41**  
**INCIDENTAL SPECIAL-STATUS PLANT AND WILDLIFE SPECIES OBSERVATIONS: LAWRENCE AND BARBARA DALEY COUNTY PRESERVE**

Scientific Name	Common Name	State/Federal Status	San Diego County Special Status List	MSCP Covered Species	California Rare Plant Rank	Notes
<b>Plants</b>						
<i>Ambrosia monogyra</i>	Singlewhorl burrobrush	S2/–	–	–	2B.2	
<i>Artemisia palmeri</i>	San Diego sagewort	–/–	List D	–	4.2	

**TABLE 41**  
**INCIDENTAL SPECIAL-STATUS PLANT AND WILDLIFE SPECIES OBSERVATIONS: LAWRENCE AND BARBARA DALEY COUNTY PRESERVE**

Scientific Name	Common Name	State/Federal Status	San Diego County Special Status List	MSCP Covered Species	California Rare Plant Rank	Notes
<b>Plants</b>						
<i>Calochortus</i> spp.	Mariposa lily					Plant material could not be identified to species. Two or three species could potentially occur within preserve, with one being a MSCP covered species ( <i>Calochortus dunnii</i> )
<i>Carex spissa</i>	San Diego sedge	–/–	–	–	–	Not special-status but host species for Harbison's dun skipper
<i>Chorizanthe</i> spp.	Spineflower					Plant material could not be identified to species. Two or three species could potentially occur within the preserve, with one being a California rare plant ranking 4.2 ( <i>Chorizanthe leptotheca</i> )
<i>Iva hayesiana</i>	San Diego marsh elder	S2/–	List B	–	2B.2	
<i>Juncus acutus</i> ssp. <i>Leopoldii</i>	Southwestern spiny rush	–/–	List D	–	4.2	
<i>Romneya coulterii</i>	Coulter's matilija poppy	–/–	List D	–	4.2	
<i>Quercus engelmannii</i>	Engelmann oak	–/–	List D	–	4.2	

## NOTES:

State/Federal Status

FE – Federally Endangered

FT – Federally Threatened

CE – California Endangered

CT – California Threatened

SSC – CDFW Species Special Concern

San Diego County Special Status List

LIST A (Plants rare, threatened or endangered in California and elsewhere)

LIST B (Plants rare, threatened or endangered in California but more common elsewhere)

LIST C (Plants that may be quite rare, but need more information to determine their true rarity status)

LIST D (Plants of limited distribution and are uncommon, but not presently rare or endangered)

CA rare (rare in California, but not listed)

NE (MSCP Narrow Endemic)

California Rare Plant Rank

1A – Plants presumed extirpated in California and either rare or extinct elsewhere

1B – Plants rare, threatened, or endangered in California and elsewhere

2A – Plants presumed extirpated in California but common elsewhere

2B – Plants rare, threatened, or endangered in California but more common elsewhere

3 – Review List: Plants about which more information is needed

4 – Watch List: Plants of limited distribution

0.1 – Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

0.2 – Moderately threatened in California (20%–80% occurrences threatened / moderate degree and immediacy of threat)

0.3 – Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

Other

Unk – Unknown due to timing of survey and life stage of individual

#### 4.1.6.4 Habitat Condition and Threats Assessment

##### *Threat Assessment*

Based on the field surveys, biologists took note of any major issues that could pose a threat to the vegetation communities within Lawrence and Barbara Daley County Preserve. A list of primary threats identified in the IMG protocol is presented in **Table 42** along with a discussion of the severity of each threat within the preserve (presented as the extent within the preserve on a scale of 1 to 7).

**TABLE 42**  
**THREATS OVERVIEW: LAWRENCE AND BARBARA DALEY COUNTY PRESERVE**

<b>Disturbances/Stressors</b>	<b>Severity (Extent)</b>	<b>Discussion</b>
Invasive non-native plant species (e.g., annual grasses and herbs)	6	Shortpod mustard, tocalote, and non-native grasses are common throughout the preserve. Near the southern border of the preserve a riparian area runs the length of the border. The riparian habitat contains many invasive species such as smilo grass, pampas grass, canary island date palm, Mexican fan palm, and Peruvian pepper tree. The challenge in restoring the riparian area is that seeds of invasive species are easily spread by vehicles traveling on highway 94 (Campo Rd.), which abuts the preserve and riparian area.
Altered fire regime or risk of catastrophic fire	6	The preserve has large areas of slopes facing a southern direction with a steep aspect and rocky substrate. These slopes are characterized by having a more open shrub canopy with deciduous shrub species such as San Diego County viguiera and contain a dense cover of shortpod mustard, tocalote, and non-native grasses in-between shrubs. In the latter half of the dry season these deciduous shrubs and annual invasive plants become very dry and thus would be highly susceptible to a catastrophic fire. Because of the dry, rocky, steep slopes the possibility exists of a complete type conversion to a vegetation community containing mainly invasive species.
Unauthorized human use (e.g., off-road vehicles, encampments, unauthorized trails, shooting, poaching, and/or dumping)	6	Because of the preserve's close proximity to the border, it receives heavy use as a migrant crossing path to vehicle pick up sites on the Honey Springs Road, which adjoins the preserve's northern boundary. Signs of migrants passing through the preserve were observed in scattered but numerous trash sites containing either a few pieces of clothing, water bottles, or food packaging. Numerous trails have also been created throughout the preserve. Some remain faint and obscure while other trails receiving heavier use have grown larger and the associated vegetation and soil more impacted. Use by the general public seems unlikely as there are few trails to enter the preserve and the heavy presence of border patrol would deter most people from entering.
Shothole borer, gold-spotted oak borer, and Fusarium fungal invasion	–	Site was not assessed for invasive insect species or fungi. Limited amounts of host species present for shothole borer, gold-spotted oak borer, or Fusarium dieback.
Erosion	3	No signs of more than minor erosion were observed in the preserve.
Small, isolated occurrences vulnerable to loss of genetic diversity and to extirpation due to environmental stochasticity or catastrophic disturbance.	–	Not observed.

**TABLE 42**  
**THREATS OVERVIEW: LAWRENCE AND BARBARA DALEY COUNTY PRESERVE**

Disturbances/Stressors	Severity (Extent)	Discussion
Altered hydrology (e.g., urban runoff, flood control facilities)	3	In the northern section of the preserve, an intermittent drainage has been highly altered. Part of the drainage has been filled and planted with a row of eucalyptus trees. Several large ranches are found upstream of this area and it is suspected that any seasonal flow this drainage would receive is now captured by properties upstream. Removal of the row of Eucalyptus and restoration of the riparian habitat would be desirable, though it is highly likely that the altered hydrology would not support the original riparian vegetation communities.
Herbivory (e.g., seed, vegetation)	1	Not observed.
Detrimental edge effects from adjacent urban development	4	This preserve does not share its borders with urban development. However, a 2-lane highway (94 or Campo Rd.) receives heavy use with most of its users commuting from the border and transporting goods from Mexico. Due to the highway running adjacent to the southern border of the preserve it serves as a source for the spread of invasive species' seeds.

## NOTES:

Disturbance Categories within Preserve

- 1 – No sign of disturbance within preserve
- 2 – Disturbance does not occur within preserve, but is detected adjacent to preserve boundaries
- 3 – Disturbance occurs in >0% to <10% of preserve
- 4 – Disturbance occurs in 10 to <25% of preserve
- 5 – Disturbance occurs in 25 to <50% of preserve
- 6 – Disturbance occurs in 50 to <75% of preserve
- 7 – Disturbance occurs in ≥ 75% of preserve

### ***Type Conversion***

In order to detect potential type conversions within the preserve, Holland-Oberbauer vegetation mapping was used to compare the acreage of each habitat type that was previously mapped with the current acreage by habitat type (**Table 43**).

There was a 58.61-acre increase in scrub habitat types and 36.80-acre decrease in chaparral habitat types. This change occurred throughout the preserve, but primarily in the northwestern portion of the preserve. The type conversion may be caused by frequent disturbance from foot-traffic and/or the spread of invasive non-native grasses as well as differences in mapping methodology.

The 3.98 loss in disturbed habitat is primarily due to different vegetation community classifications. The previous mapping effort classified habitat openings as disturbed. The current effort mapped these as Diegan coastal sage scrub when looking at the entirety of the preserve; however, as previously mentioned, the native shrubs in this community were surrounded by non-native annuals (see representative photos in Appendix A, Attachment 1).

The 29.21-acre decrease in woodland habitat types is associated with the 24.68-acre increase in forest habitat types. This change primarily occurred in the northeastern corner of the

northernmost portion of the preserve. Eucalyptus woodland was mapped farther east along the drainage than was mapped previously. This may be due to the spread of eucalyptus trees over the past 11 years and/or the changes in mapping methodologies. As a result, the previously mapped southern riparian woodland has shrunk, though the trees have matured and are now considered southern riparian forest. Management recommendations to address this vegetation type conversion are presented in the Management and Monitoring Recommendations section.

**TABLE 43**  
**TYPE CONVERSION ASSESSMENT BASED ON HOLLAND-OBERBAUER MAPPING:**  
**LAWRENCE AND BARBARA DALEY COUNTY PRESERVE**

Habitat Type	Acres in 2010	Acres in 2021	Difference in Acreage
Developed	2.30	0	-2.30
Disturbed	55.77	51.79	-3.98
Herbaceous	2.90	0	-2.90
Scrub	410.58	469.19	58.61
Chaparral	54.52	17.72	-36.80
Woodland	54.72	25.51	-29.21
Forest	0.00	24.68	24.68
Riparian	0	0.16	0.16
Unvegetated (water)	0	0	0

#### 4.1.6.5 Adaptive Management Recommendations

Adaptive management recommendations for Lawrence and Barbara Daley County Preserve were developed based on the general habitat condition and threats assessment conducted during habitat mapping. Recommendations are provided for invasive non-native plant species management, habitat enhancement/restoration opportunities, encroachment, and monitoring. Recommendations are detailed in the following subsections.

##### ***Invasive Non-Native Plant Species Management***

As discussed in the invasive non-native plant observations section, several invasive non-native plant species were detected within the preserve. A recommended action was identified for each species consisting of either removal, treatment, or monitoring. Final implementation of management activities and treatment methods shall be determined by the County based on priority.

##### ***Habitat Enhancement/Restoration Opportunities***

- Riparian corridor.** The greatest opportunity for restoration on this preserve lies in the riparian habitat on the southern border of the preserve. The riparian habitat contains many invasive non-native species such as smilo grass, pampas grass, Canary Island date palm, Mexican fan palm, and Peruvian pepper tree. The challenge in removal and restoration of this area is that a heavily trafficked road abuts the preserve and thus serves as a source for the spread of invasive non-native species' seeds. While the eastern three-quarters of the riparian habitat is mainly unaltered, the western quarter of the riparian habitat was converted for

agricultural use and has recently undergone a restoration effort with plantings in rows of several native species. A large-scale restoration effort of the entirety of this riparian habitat would likely result in a significant increase in habitat quality.

- **Hydrological management.** In the northern section of the preserve an intermittent drainage has been highly altered. Part of the drainage has been filled and planted with a row of invasive non-native eucalyptus trees. Several large ranches are found upstream of this area and it is suspected that any seasonal flow this drainage would receive is now captured by properties upstream. Removal of the row of eucalyptus trees and restoration of the habitat would be desirable; however, the altered hydrology may not support the original riparian vegetation communities. Other options include planting coast live oak or sycamore in their place.

### **Encroachment**

- **Access control.** The preserve receives heavy foot traffic because of its close proximity to the border. Increased signage and patrols are recommended to prevent further impacts to habitat from trampling and reduce the risk of type conversion. The preserve would benefit from regular patrols and trash removal.

### **Monitoring**

- **Invasive non-native plants.** Invasive non-native plant species mapping should be conducted annually, if feasible, to inform treatment areas, assess new invasions or re-invasions, and determine effectiveness of treatments.
- **Fire management.** Continued monitoring of the vegetation communities to detect potential type conversions, including monitoring potential creeping of non-native plants from the fuel modification zone that runs along the eastern boundary on the northernmost area of the preserve.
- **Public use.** Increased patrols to control unauthorized access.
- **Catastrophic events.** Additional vegetation mapping efforts may be conducted as needed following catastrophic events such as wildfires.

## 4.1.7 Simon County Preserve

A total of 17 vegetation communities and three land cover types were identified via Holland-Oberbauer and 27 vegetation communities and four land cover types were identified via VCM for Simon County Preserve. These communities are depicted in Appendix A, Figures 25 and Figure 26, and provided in crosswalk format in **Table 44**.

**TABLE 44**  
**VEGETATION COMMUNITIES CROSSWALK: SIMON COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
<b>Scrub</b>			
32000 Coastal Scrub	4.46 Western Poison Oak Alliance	4.46 Western Poison Oak Alliance	0.53

**TABLE 44**  
**VEGETATION COMMUNITIES CROSSWALK: SIMON COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
32500 Diegan Coastal Sage Scrub	4.1 Chamise Alliance	4.1.2 Chamise-California Buckwheat – California Sagebrush – Black Sage – Association	1.92
	4.23 California Buckwheat Alliance	4.23.1 California Buckwheat Association	29.33
	4.24 California Buckwheat – White Sage Alliance	4.24 California Buckwheat – White Sage Association	0.29
	4.28 Matchweed Provisional Alliance	4.28 Matchweed Provisional Alliance	1.36
	4.35 Malosma laurina Alliance	4.35 Laurel Sumac Alliance	2.40
	4.43 White Sage Alliance	4.43.2 White Sage – California Sagebrush Association	5.28
	4.6 California Sagebrush Alliance	4.6.1 California Sagebrush Association	1.52
	4.7 California Sagebrush – California Buckwheat Alliance	4.7 California Sagebrush – California Buckwheat Alliance	105.54
		4.7.1 California Sagebrush – California Buckwheat – Laurel Sumac Association	123.17
4.8 California Sagebrush – Black Sage Alliance	4.8 California Sagebrush – Black Sage Alliance	0.14	
<b>Chaparral</b>			
37120 Southern Mixed Chaparral	4.1 Chamise Alliance	4.1 Chamise Alliance	18.59
		4.1.2 Chamise – California Buckwheat – California Sagebrush – Black Sage Association	7.91
	4.2 Chamise – Mission Manzanita Alliance	4.2 Chamise-Mission Manzanita Alliance	11.69
	4.35 Laurel Sumac Alliance	4.35 Laurel Sumac Alliance	0.34
	4.7 California Sagebrush – California Buckwheat Alliance	4.7.1 California Sagebrush – California Buckwheat – Laurel Sumac Association	1.51
37121 Granitic Southern Mixed Chaparral	4.1 Chamise Alliance	4.1 Chamise Alliance	19.57
	4.2 Chamise – Mission Manzanita Alliance	4.2.6 Chamise – Mission Manzanita – Scrub Oak Association	2.15
	4.35 Laurel Sumac Alliance	4.35 Laurel Sumac Alliance	1.30
	4.38 Scrub Oak – Chamise Alliance	4.38.1 Scrub Oak – Chamise Association	1.87
37200 Chamise Chaparral	4.1 Chamise Alliance	4.1 Chamise Alliance	29.36
37210 Granitic Chamise Chaparral	4.1 Chamise Alliance	4.1 Chamise Alliance	0.25
37900 Scrub Oak Chaparral	4.37 Scrub Oak Alliance	4.37.1 Scrub Oak Association	1.12

**TABLE 44**  
**VEGETATION COMMUNITIES CROSSWALK: SIMON COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
37G00 Coastal Sage-Chaparral Transition	4.1 Chamise Alliance	4.1.2 Chamise – California Buckwheat – California Sagebrush – Black Sage Association	5.71
<b>Woodland</b>			
71160 Coast Live Oak Woodland	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	0.90
71161 Open Coast Live Oak Woodland	3.4 Western Sycamore Alliance	3.4.3 Western Sycamore – Coast Live Oak Association	1.48
	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	0.85
		3.6.2 Coast Live Oak – Scrub Oak Association	1.58
		3.6.3 Coast Live Oak – Arroyo Willow Association	1.84
		3.6.4 Coast Live Oak – Western Poison Oak – Grass Association	0.19
71180 Engelmann Oak Woodland	3.7 Engelmann Oak Alliance	3.7.2 Engelmann Oak – Coast Live Oak – Western Poison Oak – Grass Association	1.28
79100 Eucalyptus Woodland	3.2 Eucalyptus (globulus, camaldulensis) Semi-Natural Stands	3.2 Eucalyptus (globulus, camaldulensis) Semi-Natural Stands	1.66
<b>Forest</b>			
61300 Southern Riparian Forest	3.6 Coast Live Oak Alliance	3.6.3 Coast Live Oak/Arroyo Willow Association	0.54
<b>Herbaceous</b>			
11000 Non-Native Vegetation	N/A	Disturbed Habitat	1.17
42200 Non-Native Grassland	5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands	5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands	86.84
	5.5 Wild Oat Semi-Natural Stands	5.5 Wild Oat Semi-Natural Stands	125.67
	5.9 Red Brome Semi-Arabian Schismus and Old Han Schismus Semi-Natural Stands	5.9.1 Red Brome Semi-Natural Stand Type	0.66
42300 Wildflower Field	5.23 Foothill Needle Grass Provisional Alliance	5.23.1 Foothill Needle Grass Provisional Association	0.96
<b>Other<sup>a</sup></b>			
11300 Disturbed Habitat	N/A	Disturbed Habitat	1.64
	N/A	Disturbed Habitat – Trails or Roads	11.98
12000 Urban/Developed	N/A	Urban/Developed	2.11

**TABLE 44**  
**VEGETATION COMMUNITIES CROSSWALK: SIMON COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
18100 Orchards/Vineyards	N/A	Urban/Developed	3.07
Rocky Outcropping <sup>b</sup>	N/A	Rocky Outcropping	0.14
<b>TOTAL ACREAGE:<sup>c</sup></b>			<b>616.92</b>

## NOTES:

- <sup>a</sup> The San Diego Vegetation Classification Manual only classifies vegetated areas. The disturbed land cover types were described and displayed under the association level to provide additional detail in the mapping. This allows for changes in vegetation (e.g., unvegetated to vegetated) to be tracked over time.
- <sup>b</sup> Rocky outcropping does not have a classification in the San Diego Vegetation Classification Manual or Holland-Oberbauer; however, this land cover type defines areas that support large, bare granite boulders.
- <sup>c</sup> Total may not match sum of individual acreages listed due to rounding.

### 4.1.7.1 Vegetation Type Descriptions

The following vegetation community and land cover type descriptions for the Simon County Preserve follow the VCM classification system. General association and alliance descriptions were taken from the VCM for Western San Diego County (Sproul et al. 2011).

#### ***Soft-Leaved, Drought-Deciduous Shrublands***

##### **4.23.1 California Buckwheat Association**

California buckwheat is the dominant or codominant species in an open shrub canopy. Subdominant shrubs include California sagebrush, chamise, laurel sumac, bush-rue, deerweed, coyote brush, broom baccharis, black sage, white sage, and San Diego County viguiera. This association may represent an early transitional phase of other shrub associations or occur as a relatively stable association in ecotonal areas. The composition of this association supports a diverse herb cover occurs mostly in openings, and includes purple needle grass, clustered tarweed, osmadenia, miniature lupine, showy penstemon, as well as many non-native grasses and forbs.

This vegetation community occurs in scattered patches throughout the preserve (29.33 acres). The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

##### **4.24 California Buckwheat – White Sage Alliance**

This alliance is limited to Southern California and adjacent Baja California, Mexico. It differs from the previous California buckwheat alliance in having white sage as a codominant species with an intermittent shrub canopy, usually less than 2.5 meters in height. In general, stands of this alliance are characterized by California buckwheat, white sage, California sagebrush, chamise, cup-leaf ceanothus (*Ceanothus perplexans*), chaparral whitethorn, matchweed, chaparral yucca, toyon, chaparral beard tongue, deerweed, laurel sumac, and/or scrub oak sometimes present as subdominants. Emergent coast live oak trees may be present and the herbaceous layer is variable and may be dominated by non-native grasses.

This vegetation community occurs in a single patch in the southern portion of the preserve (0.29 acres). The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

#### **4.28 Matchweed Provisional Alliance**

Matchweed (*Gutierrezia californica*, *sarothrae*) occur in open stands of the shrub canopy, mostly in openings of chaparral and is associated with a wide variety of chaparral species and subshrub associations, especially chamise associations. Some frequent associates are deerweed, *Bromus* spp., and stump sprouts or seedlings of shrubs such as *Ceanothus* spp., scrub oaks, and birch leaf mountain mahogany (*Cercocarpus betuloides*). This alliance often occurs in areas recovering from disturbance such as roadsides, fuel breaks, and cleared areas.

This vegetation community occurs in one area in the northeastern portion of the preserve (1.36 acres). The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

#### **4.35 Laurel Sumac Alliance**

This community is dominated by laurel sumac, a large evergreen sclerophyllous shrub that is frost sensitive and is capable of resprouting from a deep crown-root multiple times in response to frequent fires. Subdominant shrub species include California sagebrush, deerweed, California buckwheat, California encelia and sticky monkey flower. In this alliance shrubs are usually less than 5 meters in height and form a continuous canopy. The sparse herbaceous understory may include Canchalagua (*Zeltnera venustum*), wishbone bush, and morning glory.

This vegetation community occurs in scattered patches throughout the preserve (4.04 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32500 Diegan Coastal Sage Scrub, 37120 Southern Mixed Chaparral, and 37121 Granitic Southern Mixed Chaparral.

#### **4.43.2 White Sage – California Sagebrush Association**

White sage and California sagebrush occur as codominants in an open shrub canopy and can occur as a mix of chaparral and coastal sage scrub in mature stable shrub communities or as an early transitional stage of other shrublands in response to fire or other disturbance. This association includes subdominant shrubs such as, saw-toothed goldenbush, chaparral yucca, spiny redberry, laurel sumac, and California buckwheat. Herb cover is well developed and diverse, and generally occurs in openings within the shrub canopy. Characteristic herb species can include but is not limited to silverpuffs (*Uropapus lindleyi*), filaree, canchalagua, goldfields and invasive non-native grasses (e.g., bromes, fescues).

This vegetation community occurs in scattered patches throughout the preserve (5.28 acres). The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

#### **4.46 Western Poison Oak Alliance**

This alliance is generally characterized by western poison oak dominance in the intermittent to continuous shrub canopy with a variable herbaceous layer. The associated shrubs are generally

less than 4 meters tall and together with western poison oak may create a two-tiered canopy with California sagebrush, coyote brush, sticky monkeyflower, toyon, climbing keckiella, laurel sumac, hollyleaf redberry, thimbleberry (*Rubus parviflorus*), black sage, and/or blue elderberry occurring as subdominants with ripgut grass often present as a monoculture. Emergent trees such as southern California black walnut and coast live oak may be present.

This vegetation community occurs in two small patches in the preserve (0.54 acres). The vegetation community is associated with the Holland-Oberbauer classification 32000 Coastal Scrub.

#### **4.6.1 California Sagebrush Association**

California sagebrush is dominant or codominant in the is intermittent to continuous shrub canopy. Associated subdominant shrubs, depending on location, may include chamise, coyote brush, sticky monkeyflower, California encelia, California brittlebush (*Encelia farinosa*), California buckwheat, chaparral yucca, coastal goldenbush, deerweed, coast prickly pear, white sage, purple sage, black sage, and western poison oak. The main shrub layer is less than 2 meters tall, and, in some cases, there is a second tier of emergent taller shrubs (less than 5 meters tall) such as laurel sumac, lemonade berry, or blue elderberry. The herbaceous layer is variable both seasonally and annually and can be diverse in the absence of significant disturbance.

This vegetation community occurs in scattered patches throughout the preserve (1.52 acres). The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

#### **4.7 California Sagebrush – California Buckwheat Alliance**

This California sagebrush – California buckwheat alliance is characterized by the codominance of California sagebrush and California buckwheat species in the shrub canopy. Additional species in this alliance may include chamise, sticky monkeyflower, desert tea, chaparral yucca, deerweed, laurel sumac, lemonade berry, sugarbush, and/or white sage. Most shrubs are typically less than 2 meters tall, with some reaching up to 5 meters tall. The herbaceous layer may include spring annuals, but may also support native perennial grasses (*Stipa* spp., *Muhlenbergia* spp.) and geophytes (e.g., *Allium* spp., *Bloomeria* spp., *Dichelostemma capitata*).

This vegetation community occurs throughout the preserve (105.54 acres). The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

##### **4.7.1 California Sagebrush – California Buckwheat – Laurel Sumac Association**

California sagebrush, California buckwheat, and laurel sumac are codominant in this association with a relatively open shrub canopy. Many other subdominant shrub species include lemonade berry, California encelia, white sage, San Diego County viguiera, saw-toothed goldenbush, chaparral yucca, chaparral pricklypear, California brickelbush, sticky monkeyflower, chaparral beard tongue, and spiny redberry. Herb cover is usually open and with high species diversity. This association can occur both as a mature stable shrub community or as an early transitional stage of other shrublands in response to fire or other disturbance. This association differs from 4.7

California Sagebrush-California Buckwheat Alliance due to the presence of laurel sumac as a codominant.

This vegetation community occurs in large areas throughout the preserve (124.68 acres). It is the second most common vegetation community within the preserve. The vegetation community is associated with the Holland-Oberbauer classifications 32500 Diegan Coastal Sage Scrub and 37120 Southern Mixed Chaparral.

#### **4.8 California Sagebrush – Black Sage Alliance**

California sagebrush and black sage are codominant within this alliance. Several other shrub species may be found at low cover and can include, chamise, sticky monkeyflower, California encelia, California buckwheat, chaparral yucca, deerweed, and white sage and help create an intermittent to continuous canopy. The herbaceous layer can be variable but often includes grasses as well as native and non-native annual species.

This vegetation community occurs in one small patch in the center of the preserve (0.14 acres). The vegetation community is associated with the Holland-Oberbauer classification 32500 Diegan Coastal Sage Scrub.

### ***Sclerophyllus, Evergreen Shrublands***

#### **4.1 Chamise Alliance**

Throughout its range, chamise is dominant in the shrub canopy and, depending on the location, may have red shank, Eastwood manzanita, common manzanita, sticky whiteleaf manzanita, *Ceanothus* spp., sticky monkeyflower, California yerba santa, California buckwheat, chaparral yucca, toyon, scrub oak, interior live oak, white sage, purple sage, black sage, and western poison oak as associates to codominants or subdominants. Emergent trees may be present at low cover. Shrubs are typically less than 4 meters tall the canopy is intermittent to continuous, and the herbaceous layer is sparse to intermittent.

This vegetation community occurs in northeastern facing slopes along the ridgeline road and in two areas on the northeastern portion of the preserve (67.77 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral, 37121 Granitic Southern Mixed Chaparral, 37200 Chamise Chaparral, and 37210 Granitic Chamise Chaparral.

#### **4.1.2 Chamise – California Buckwheat – California Sagebrush – Black Sage-Association**

In this association chamise is dominant with other shrubs occurring as subdominants; together, these species form either a continuous or more often an open canopy cover. Subdominant shrubs include California sagebrush, California buckwheat, saw-toothed goldenbush, black sage, scrub oak, Torrey's hybrid oak, Ramona lilac, and Eastwood manzanita. In the understory, dominant species often include native and non-native perennial and annual grasses, in addition to a rich diversity of herb species. This association is a mix of chaparral and coastal sage scrub. It occurs both as a mature, stable shrub community or an early transitional stage of other shrublands in response to fire or other disturbance.

This vegetation community occurs in scattered patches throughout the preserve, mostly in the northeastern portion (15.54 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32500 Diegan Coastal Sage Scrub, 37120 Southern Mixed Chaparral, and 37G00 Coastal Sage-Chaparral Transition.

#### **4.2 Chamise – Mission Manzanita Alliance**

Chamise and mission manzanita are codominants, creating an intermittent to continuous shrub canopy and sparse to intermittent herbaceous layer. Shrubs are generally less than 3 meters tall and subdominant shrubs may include hoaryleaf ceanothus, Ramona lilac, wart-stemmed ceanothus, bushrue, chaparral yucca, toyon, laurel sumac, scrub oak, hollyleaf redberry, sugar bush, white sage, and black sage.

This vegetation community occurs in large and small areas on the north facing slopes along the eastern boundary (11.69 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral.

##### **4.2.6 Chamise – Mission Manzanita – Scrub Oak (*berberidifolia*, *xacutidens*) Association**

Chamise, mission manzanita, and scrub oak occur as codominants in this association often with an open canopy and sparse herbaceous understory. Other subdominant shrubs in this association include Ramona lilac, chaparral whitethorn, California buckwheat, smooth mountain mahogany, laurel sumac, toyon, Mojave yucca, and chaparral yucca. After fires, the herbaceous layer may become a diverse array of showy annuals; however, if fires become too frequent this association is susceptible to type conversion typically to non-native grasslands.

This vegetation community occurs in one area on a north facing slope below the ridgeline road in the northeastern portion of the preserve (2.15 acres). The vegetation community is associated with the Holland-Oberbauer classification 37121 Granitic Southern Mixed Chaparral.

##### **4.37.1 Scrub Oak Association**

Scrub oak and Torrey’s hybrid oak are two of the most widespread scrub oaks in San Diego. Due to taxonomic uncertainty, these two scrub oak species are included within the same association. These scrub oaks are dominant in this association, with continuous cover and often as small inclusions within other shrublands. Subdominant shrub species include smooth mountain mahogany, chamise, Eastwood manzanita, mission manzanita, lemonade berry, western poison oak, chaparral whitethorn, Ramona lilac, and hoaryleaf ceanothus. Herbaceous diversity and cover are relatively low, mostly occurring in openings and increasing in response to fire.

This vegetation community occurs in one area on a west facing slopes below the ridgeline road in the western portion of the preserve (1.12 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral, 37121 Granitic Southern Mixed Chaparral, and 37900 Scrub Oak Chaparral.

##### **4.38.1 Scrub Oak (*berberidifolia*, *xacutidens*) – Chamise Association**

This association is related to the scrub oak (*berberidifolia*) alliance, but tends to occupy mid- to upper-slope positions and is transitional between xeric and mesic conditions. It covers extensive

areas of the lower montane and foothill belt of the Transverse and Peninsular Ranges in Southern California. Statewide, this association is generally characterized by scrub oak (*berberidifolia*) and chamise as codominants in the shrub canopy, with manzanitas, hoaryleaf ceanothus, cup-leaf ceanothus, chaparral whitethorn, smooth mountain mahogany, toyon, hollyleaf redberry, and/or mission manzanita occurring as subdominants. Emergent coast live oak or Engelmann oak trees may be present. Shrubs are relatively tall in mature stands, but typically less than 6 meters tall with a moderately open canopy and sparse herbaceous layer in mature stands.

This vegetation community occurs in one area on the northern section of the preserve (1.87 acres). The vegetation community is associated with the Holland-Oberbauer classification 37121 Granitic Southern Mixed Chaparral.

### ***Upland Forests and Woodlands***

#### **3.2 Eucalyptus Semi-Natural Stands**

Over 50 species of eucalyptus have been introduced to California from Australia. However, only a few are known to form self-perpetuating stands and have the qualities of semi-natural stands. The two most common species that form semi-natural stands are listed in parentheses in the name of this type. River red gum is one of the most common species found in naturalized stands in San Diego County, but there are at least six other species that are listed in the most recent San Diego County Plant checklist. River red gum is one of the few that appears to invade riparian channels.

This vegetation community occurs in the southeast corner near the preserve entrance (1.66 acres). One species associated with this vegetation community, sugar gum (*Eucalyptus cladocalyx*), is associated with the historical Mill and day-use picnic area. The vegetation community is associated with the Holland-Oberbauer classification 79100 Eucalyptus Woodland.

#### **3.6 Coast Live Oak Alliance**

General alliance characteristics of this association include coast live oak as the dominant or codominant species in the tree canopy. Associated tree species may include southern California black walnut, western sycamore, Fremont cottonwood, Engelmann oak, California black oak, arroyo willow, and/or California laurel. Trees are generally less than 30 meters tall and the canopy is open to continuous. The shrub and herbaceous canopies are variable.

This vegetation community occurs along an unnamed stream that runs along the eastern boundary of the preserve (1.26 acres). Where oak trees abut private properties, the understory was bare. The vegetation community is associated with the Holland-Oberbauer classification 71160 Coast Live Oak Woodland and 71161 Open Coast Live Oak Woodland.

##### **3.6.2 Coast Live Oak – Scrub Oak Association**

Coast live oak is dominant in an open tree canopy with scrub oak diagnostically present in the shrub canopy. Subdominant shrubs include Ramona lilac, toyon, smooth mountain mahogany, sticky monkeyflower, fragrant sumac, California sagebrush, laurel sumac, hairy yerba santa, climbing penstemon, saw-toothed goldenbush, and many other chaparral species. Herbaceous cover occurs in openings including wild cucumber, *Phacelia* spp. And a high diversity of

chaparral-associated plants. This association is typical of mesic slopes where coast live oak is not associated with riparian vegetation types.

This vegetation community occurs in one area on a west facing slope below the ridgeline road in the western portion of the preserve (1.58 acres). No herbaceous layer was observed; thick leaf litter accumulation prevents an understory from establishing. The vegetation community is associated with the Holland-Oberbauer classification 71161 Open Coast Live Oak Woodland.

### **3.6.3 Coast Live Oak – Arroyo Willow Association**

Coast live oak is dominant in an open to closed tree canopy with arroyo willow typically dominating the shrub canopy. Subdominant trees may also include in trace amounts, Western sycamore, Fremont cottonwood, and willows (red willow, Goodings black willow). In the shrub layer, subdominant shrubs may include desert wild grape, blue elderberry, and *Baccharis* spp. (*salicifolia*, *sarothroides*, *pilularis*). The herbaceous diversity is low and cover is generally open, including wetland affiliates such as San Diego sagewort, western ragweed, yerba mansa, salt grass, and fringed willow herb.

This vegetation community occurs in two areas along an unnamed stream that runs along the eastern boundary of the preserve (2.38 acres). Where oak trees abut private properties, the understory was bare. The vegetation community is associated with the Holland-Oberbauer classifications 61300 Southern Riparian Forest and 71161 Open Coast Live Oak Woodland.

### **3.6.4 Coast Live Oak – Western Poison Oak – Grass Association**

Coast live oak is dominant in the tree canopy and western poison oak is subdominant in the shrub canopy, with an understory of native herbaceous and ruderal species. Subdominant shrubs include blue elderberry, coyote brush, and San Diego sagewort. The herbaceous diversity is high and cover is generally intermittent to continuous, including fewer wetland affiliates than the previous association and many ruderal species. This association is ecologically similar to the coast live oak/arroyo willow association but occurs higher on the hydrologic profile where many upland shrubs and ruderal plants are prevalent above the fluvial regime.

This vegetation community occurs in one small patch in the western portion of the preserve (0.19 acres). The vegetation community is associated with the Holland-Oberbauer classification 71161 Open Coast Live Oak Woodland.

### **3.7.2 Engelmann Oak/Coast Live Oak – Western Poison Oak – Grass Association**

Engelmann oak and coast live oak are codominants in the tree canopy with western poison oak diagnostically present in the shrub canopy, and grasses and other herbs are dominant in the herbaceous understory. Subdominant shrubs include many coastal sage scrub species including black sage, white sage, California sagebrush, laurel sumac, orange bush monkeyflower, and heartleaf penstemon; however, their combined cover is less than western poison oak. The herbaceous understory is often dominated by non-native ruderal plants.

This vegetation community occurs in one area along the unnamed stream that runs along the eastern boundary of the preserve (1.28 acres). Engelmann oak trees were also found scattered in the adjacent grassland. Several planted saplings were observed along the main trail/access road in

the southeast. The vegetation community is associated with the Holland-Oberbauer classification 71180 Engelmann Oak Woodland.

### ***Riparian Forests and Woodlands***

#### **3.4.3 Western Sycamore – Coast Live Oak Association**

In this vegetation community, western sycamore and coast live oak together are codominant in a continuous to open tree canopy; subdominants may include Fremont cottonwood and willow trees. Associated subdominant riparian shrubs include blue elderberry, western poison oak, wild grape, California rose, and California blackberry. Many associated upland shrubs may also be present including lemonade berry, sugar bush, redberry, toyon, and mulefat. The herbaceous diversity is high and cover is continuous to open, including mugwort, San Diego sagewort, western ragweed, San Diego sedge, nutsedges, yerba mansa, rushes, cattails, and many ruderal species.

This vegetation community occurs in one area along the unnamed stream on the eastern boundary of the preserve (1.48 acres). The vegetation community is associated with the Holland-Oberbauer classification 71161 Open Coast Live Oak Woodland.

#### **3.6.3 Coast Live Oak – Arroyo Willow Association**

Coast live oak is dominant in an open to closed tree canopy with arroyo willow typically dominating the shrub canopy. Subdominant trees may include western sycamore, Fremont cottonwood, and willows. Subdominant shrubs include desert wild grape, blue elderberry, and *Baccharis* spp. (*salicifolia*, *sarothroides*, *pilularis*). The herbaceous diversity is low and cover is generally open.

This vegetation community occurs in two areas along the unnamed stream that runs along the eastern boundary of the preserve (2.38 acres). The vegetation community is associated with the Holland-Oberbauer classification 71161 Open Coast Live Oak Woodland.

### ***Upland Herbaceous Vegetation***

#### **5.5 Wild Oat Semi-Natural Stands**

Wild oat semi-natural stands are strongly dominated by non-native wild oat (*Avena* spp.), which is commonly found in waste places, rangelands, openings in woodlands, and type-converted chaparral or coastal scrub throughout cismontane California. Slender wild oat or wild oat is dominant or codominant in the herbaceous layer. Emergent trees and shrubs may be present at low cover and typically herbs less than 1.2 meters tall can be found in open areas.

Stands in San Diego County often contain ripgut grass, soft chess, and other non-native grasses and herbs. Occasionally, natives in the genera *Clarkia* spp., blue dicks, bedstraw, lupine, popcorn flower, and clover can be found in stands but are of substantially lower cover than the non-natives. Many wild oat stands occur on moderate to steep slopes formerly occupied by scrub alliances, apparently the result of type-conversion from high frequency fires. It is unknown whether these will be ultimately replaced by shrub alliance stands.

This vegetation community occurs in large areas in the northwest, center, and southeast portions of the preserve, as well as in scattered patches in the northeast portion. It is the dominant vegetation community in the preserve. The vegetation community is associated with the Holland-Oberbauer classification 42200 Non-Native Grassland.

### 5.9.1 Red Brome Semi-Natural Stand Type

Red brome dominates a continuous to open herbaceous canopy in this vegetation type. Non-native herbs including filaree, *Bromus* spp., tocalote, shortpod mustard, small-flower catchfly, and smooth cat's-ear are often subdominant to codominant, and native herbs may also be subdominant with trace amounts of emergent native shrubs. The type occupies areas with drier site conditions and poorer soils than areas supporting ripgut grass, purple false brome and black mustard.

This vegetation community occurs in one small patch in the northwestern portion of the preserve (0.66 acres). It is associated with an area of disturbance within native vegetation. The vegetation community is associated with the Holland-Oberbauer classification 42200 Non-Native Grassland.

### 5.23.1 Foothill Needle Grass Provisional Association

Foothill needle grass is codominant in an open herbaceous canopy vegetation community. Associated herbaceous flora includes goldenstar (*Bloomeria crocea.*), blue dicks, wild onion, chocolate lily (*Fritillaria biflora*), brodiaea, mariposa lily, goldfields, plantain (*Plantago* spp.), California melica, slender Padre's shooting star, pygmy-weed, spike-moss (*Selaginella* spp.), and western blue-eyed-grass. This vegetation type is most often mixed with other herbaceous native flora in mesic openings of shrublands.

This vegetation community occurs in one small patch in the southeastern corner of the preserve (0.96 acres). This area was found on clay soils on a gentle slope above an unnamed drainage that drains towards to unnamed stream in the southeastern section and along the eastern border. This is unique in that it supports very few noxious weeds compared to the surrounding wild oat dominated non-native grassland and successional Diegan Sage Scrub. Diegan Sage Scrub in this area of the preserve is expanding into the non-native grasslands increasing the structure and composition of the surrounding landscape. The soils were less disturbed than the surrounding area, which likely contributed to the wildflower diversity. The vegetation community is associated with the Holland-Oberbauer classification 42300 Wildflower Field. While this community supports native grass species it has a diversity of wildflowers that is higher than what is typically found in a native grassland.

### 5.21 Mediterranean California Naturalized Annual and Perennial

This description is based on the group level, which is the hierarchical level above the alliance. The group level is a useful classification where distinction cannot be made to the alliance or association level. This group level classification may be applied in cases where non-native grasses and forbs are dominant over native species, and where none of the following non-native species are clearly dominant or codominant: wild oats, bromes, purple false brome, fescues, fountain grass, black mustard, poison hemlock, crown daisy. Any of the species above may be present without dominance in a mixed association that may include many other naturalized

ruderal species, including bent grass, tall fescue, crab grass, Russian thistle, filaree, sorghum, *Centaurea* spp., Bermuda grass, *Schismus* spp., and blessed milk thistle. This vegetation type is widespread and highly variable, representing generalized situations where ruderal floras have replaced native types through a history of repeated soil disturbance and the introduction of non-native plant species.

This vegetation community occurs in one large swath in the southwestern corner and a small patch in the northeastern portion of the preserve (86.84 acres). It is the second dominant non-native vegetation community. The vegetation community is associated with the Holland-Oberbauer classification 42200 Non-Native Grassland.

### **Other<sup>8</sup>**

#### **Rocky Outcropping**

Rocky outcropping is a land cover type used here to define areas that support large, bare granite boulders within the unnamed stream found along the eastern border of the preserve. These features were associated with the coast live oak-willow association on the banks. This land cover type occurs on 0.14 acres.

#### **Disturbed Habitat**

Disturbed habitat is a land cover type used to define lands that do not match a vegetation community included within the VCM for Western San Diego County and are subject to regular or frequent disturbance. Disturbed lands often lack native vegetation and have non-native vegetation in low numbers.

This land cover type occurs on 2.81 acres of the preserve. It occurs in areas at the southeast entrance where soils are bare or sparsely covered with shortpod mustard, red brome, and filaree and includes a dense stand of tocolote in the northeast. This land cover type is associated with the Holland-Oberbauer classifications 42200 Non-Native Vegetation and 11300 Disturbed Habitat.

#### **Disturbed Habitat – Trails or Roads**

Disturbed Habitat – Trails or Road is a land cover type used to define unvegetated areas utilized for vehicular or pedestrian traffic. The land cover type occurs on 11.98 acres. It includes authorized and unauthorized trails, access roads for DPR, utilities and fire. This land cover type is associated with the Holland-Oberbauer classification Disturbed Habitat.

#### **Urban/Developed**

Urban/Developed is a land cover type used to define areas where man made materials or surfaces occupy the landscape and vegetation is restricted or is completely absent. Urban/developed is used within Simon preserve to depict abandoned olive orchards located in the western section. The understory was a sparse cover of red brome. This land cover type occurs in 5.17 acres of the preserve.

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<sup>8</sup> The VCM classification and code is provided in this section's subheadings for all vegetation types; however, there is no VCM classification or code for land cover types without vegetation. For these types, we describe them in detail and provide the Holland-Oberbauer classification and code in the last sentence of the description.

### 4.1.7.2 Invasive Non-Native Plant Observations

A total of 14 limited to high-risk invasive non-native plant species, including one watch species (as determined by Cal-IPC) were detected and mapped during field surveys for Simon County Preserve (Table 45 and Appendix A, Figure 27). Of these species, none were identified as having a SDCRPR. The Cal-IPC and SDCRPR were taken into consideration when determining the recommended action, and should be referenced for specific treatment methods. The recommended action for the species detected is as follows.

- Remove.** Five species are known to invade native vegetation communities and become problematic for native habitat. These species are recommended for removal along with follow up visits to detect any seedlings. Cootamundra wattle favors scrub and chaparral habitat. It has long-lived seeds that accumulate in the soil and germinate after fires, hot weather or other disturbances. Eucalyptus trees are found throughout California and are known to increase risk of catastrophic wildland fires and compete with native trees in canyons and drainages. Olive trees produce hundreds of seeds that are spread by birds and mammals and has invaded areas in southern California and the Central Valley. Canary Island date palm tends to grow in clusters that form a dense canopy and exclude light from reaching beneath them, leading to a loss of native plants. Tamarisk is associated with dramatic changes in geomorphology, groundwater availability, soil chemistry, fire frequency, plant community composition, and native wildlife diversity and have the potential to invade habitat, particularly in riparian corridors (Cal-IPC 2021).
- Treat.** Due to limited spread of these species, all occurring as small infestations within the preserve, treatment is recommended for tocolote, tree tobacco, and Smilo grass.
- Monitor.** Several species occurred throughout the preserve, including wild oat, ripgut grass, red brome, redstem filaree shortpod mustard, and Mediterranean schismus (*Schismus barbatus*). These species would be best managed in conjunction with future restoration projects that would prevent re-infestation. Continued monitoring is recommended to detect any negative effects on surrounding native vegetation communities.

**TABLE 45**  
**INVASIVE NON-NATIVE PLANT SPECIES: SIMON COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
<i>Acacia baileyana</i>	Cootamundra wattle	Watch	–	Several individuals were observed in the southern portion of the preserve	Remove
<i>Avena barbata</i> <sup>a</sup>	slender wild oat	Moderate	–	Observed in large fields in several areas of the preserve. It is the most common non-native grass	Monitor
<i>Bromus diandrus</i> <sup>a</sup>	ripgut grass	Moderate	–	Observed in a large patch in the western section and was associated with trails and road edges	Monitor

**TABLE 45**  
**INVASIVE NON-NATIVE PLANT SPECIES: SIMON COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
<i>Bromus rubens</i> <sup>a</sup>	red brome	High	–	Observed throughout the site associated with native and disturbed communities	Monitor
<i>Centaurea melitensis</i>	tocalote	Moderate	–	Observed in two large patches with scattered individuals found throughout preserve.	Treat
<i>Erodium cicutarium</i> <sup>a</sup>	redstem filaree	Limited	–	Observed throughout the site. Most common in disturbed soils.	Monitor
<i>Eucalyptus</i> sp.	Eucalyptus	Watch	–	Found in the southeastern corner of the Preserve	Remove
<i>Hirschfeldia incana</i> <sup>a</sup>	shortpod mustard	Moderate	–	Found scattered throughout the preserve and concentrated in patches along the dirt access/hiking roads	Monitor
<i>Nicotiana glauca</i>	tree tobacco	Moderate	–	Found on western side of the Preserve and was not widespread or common	Treat
<i>Olea europaea</i>	olive	Limited	–	Found in groves at two locations and individuals were found in Diegan Coastal Sage Scrub.	Remove
<i>Phoenix canariensis</i>	Canary island date palm	Limited	–	Mature individuals found in a stream along eastern edge of the Preserve associated with Coast Live Oak Woodlands	Remove
<i>Schismus barbatus</i> <sup>a</sup>	Mediterranean schismus	Limited	–	Observed throughout the site.	Monitor
<i>Stipa miliacea</i> var. <i>miliacea</i>	smilo grass	Limited	–	Found along the edge of the unnamed gravelly bottom stream on the eastern side of the Preserve	Treat
<i>Tamarisk ramosissima</i>	tamarisk	High	–	Found in association with an unnamed gravelly bottom stream on the eastern side of the Preserve	Remove

**TABLE 45**  
**INVASIVE NON-NATIVE PLANT SPECIES: SIMON COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
NOTES:					
<sup>a</sup> These species were detected within the preserve, but not mapped; species were found to be widespread throughout the preserve.					
<u>Cal-IPC Ranking</u>					
High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.					
Moderate – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.					
Limited – These species are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.					
Alert – An Alert is listed on species with High or Moderate impacts that have limited distribution in California, but may have the potential to spread much further.					
Watch – These species have been assessed as posing a high risk of becoming invasive in the future in California.					
<u>San Diego County Regional Priority Ranking (Cal-IPC, Dendra, CBI 2012)</u>					
Very High – Level 1 Surveillance. Low effort required to achieve goal of regional surveillance, early detection, rapid response.					
High – Level 2 Eradication. Moderate effort required to achieve goal of eradication with regionally coordinated control program.					
Medium – Level 3 Containment. Funding typically available for re-treatments or control of small populations. Goal is eradication with coordinated programs by management unit or watershed.					
Medium – Level 4 Directed Management. Area may be managed effectively, with slow re-invasion. Goal is to control within reserve or sub-management unit to benefit NCCP resources.					
Low – Level 5 Directed Suppression. Control is typically of short-term benefit (rapid re-invasion) without active restoration. Goal is suppression, typically to allow recovery disturbed site, improve re-vegetation success, or benefit NCCP resources.					

#### 4.1.7.3 Incidental Special-Status Plant and Wildlife Species Observations

Seven special-status plant species and four special-status wildlife species were detected and mapped during field surveys for Simon County Preserve (Table 46 and Appendix A, Figure 28).

**TABLE 46**  
**INCIDENTAL SPECIAL-STATUS PLANT AND WILDLIFE SPECIES OBSERVATIONS: SIMON COUNTY PRESERVE**

Scientific Name	Common Name	State/Federal Status	San Diego County Special Status List	Draft North County MSCP Covered Species	California Rare Plant Rank	Notes
<b>Plants</b>						
<i>Acanthomintha ilicifolia</i>	San Diego thornmint	CE/FT	List A	NC MSCP	1B.1	Several individuals were observed in the IMG plot in Chamise chaparral and one loose clay soils.
<i>Allium marvinii</i>	Yucaipa Onion	–/–	–	–	1B	Observed in a wildflower field adjacent to the large non-native grassland in the southern area of the Preserve
<i>Harpagonella palmeri</i>	Palmer's grapplinghook	–/–	List D	–	4.2	Found associated with the IMG thornmint population and downslope in Diegan Coastal Sage Scrub on loose clay soils.

**TABLE 46**  
**INCIDENTAL SPECIAL-STATUS PLANT AND WILDLIFE SPECIES OBSERVATIONS: SIMON COUNTY PRESERVE**

Scientific Name	Common Name	State/Federal Status	San Diego County Special Status List	Draft North County MSCP Covered Species	California Rare Plant Rank	Notes
<i>Microseris douglasii</i> ssp. <i>Playcarpha</i>	small flowered microseris	–/–	List D	–	4.2	Observed growing scattered in open chaparral associated with San Diego thornmint habitat.
<i>Selaginella cinerascens</i>	ashy spike-moss	–/–	List D	–	4.1	Found in small patches along the edge San Diego thornmint habitat.
<i>Quercus engelmannii</i>	Engelmann oak	–/–	List D	NC MSCP	4.2	Found scattered throughout the preserve
<i>Xanthisma juncea</i>	rush-like bristleweed	–/–	List D	–	4.3	Observed within openings in chaparral
<b>Animal</b>						
<i>Accipiter cooperii</i>	Cooper's hawk	–/–	Group 1	–	–	Observed in flying near Coast live oak woodland on the eastern side of the Preserve
<i>Aspidoscelis hyperythrus beldingi</i>	Belding's orange-throated whiptail	–/–	Group 2	–	–	Observed in open areas in mature Diegan Sage Scrub along the ridgeline and in the Wood Hills Lane gate.
<i>Buteo linearis</i>	red-shouldered hawk	–/–	Group 1	–	–	Observed in flying and heard vocalizing near Coast live oak woodland on the eastern side of the Preserve
<i>Cathartes aura</i>	turkey vulture	–/–	Group 1	–	–	Observed flying overhead during site visits throughout the Preserve

## NOTES:

State/Federal Status

FE – Federally Endangered

FT – Federally Threatened

CE – California Endangered

CT – California Threatened

SSC – CDFW Species Special Concern

San Diego County Special Status List

LIST A (Plants rare, threatened or endangered in California and elsewhere)

LIST B (Plants rare, threatened or endangered in California but more common elsewhere)

LIST C (Plants that may be quite rare, but need more information to determine their true rarity status)

LIST D (Plants of limited distribution and are uncommon, but not presently rare or endangered)

CA rare (rare in California, but not listed)

NE (MSCP Narrow Endemic)

California Rare Plant Rank

1A – Plants presumed extirpated in California and either rare or extinct elsewhere

1B – Plants rare, threatened, or endangered in California and elsewhere

2A – Plants presumed extirpated in California but common elsewhere

2B – Plants rare, threatened, or endangered in California but more common elsewhere

3 – Review List: Plants about which more information is needed

4 – Watch List: Plants of limited distribution

0.1 – Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

0.2 – Moderately threatened in California (20%–80% occurrences threatened / moderate degree and immediacy of threat)

0.3 – Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

Other

Unk – Unknown due to timing of survey and life stage of individual

#### 4.1.7.4 Habitat Condition and Threats Assessment

##### ***Threat Assessment***

Based on the field surveys, biologists took note of any major issues that could pose a threat to the vegetation communities within Simon County Preserve. A list of primary threats identified in the IMG protocol is presented in **Table 47** along with a discussion of the severity of each threat within the preserve (presented as the extent within the preserve on a scale of 1 to 7).

**TABLE 47**  
**THREATS OVERVIEW: SIMON COUNTY PRESERVE**

<b>Disturbances/Stressors</b>	<b>Severity (Extent)</b>	<b>Discussion</b>
Invasive non-native plant species (e.g., annual grasses and herbs)	6	Wild oats, ripgut grass, red brome and tocalote, are scattered throughout the site. Wild oats are the dominant grass on the preserve and are found covering large areas in the northwest and southeast. Tocalote was also found in a few isolated dense patches within chamise chaparral and is a threat to San Diego thornmint and Palmer's grappling hook as well as native geophytes found in the preserve.
Altered fire regime or risk of catastrophic fire	6	Invasive plant species such as wild oats and shortpod mustard provide increased fuel loads during dry periods and may present greater risk of fire. Frequent fires have resulted in type conversion from Diegan sage scrub to wild oat dominated non-native grasslands.
Unauthorized human use (e.g., off-road vehicles, encampments, unauthorized trails, shooting, poaching, and/or dumping)	3	A few unauthorized trails were observed along the ridge access road but did not appear to be heavily used.
Shothole borer, gold-spotted oak borer, and Fusarium fungal invasion	–	Site was not assessed for invasive insect species or fungi. Limited amounts of host species present for shothole borer, gold-spotted oak borer, or Fusarium dieback.
Erosion	3	Erosion was observed along the steep utility dirt access road and the associated spur roads.
Small, isolated occurrences vulnerable to loss of genetic diversity and to extirpation due to environmental stochasticity or catastrophic disturbance.	3	San Diego thornmint occurs in one small patch in the north section of the preserve and is vulnerable to weed invasion and soil disturbance. The occurrence is downslope from non-native grasslands and the fragile soil is susceptible to trampling and compaction.
Altered hydrology (e.g., urban runoff, flood control facilities)	1	Not observed.
Herbivory (e.g., seed, vegetation)	1	Not observed (during IMG surveys).
Detrimental edge effects from adjacent urban development	–	Adjacent urban development may contribute to the introduction of invasive species, and potential for wildfire. Adjacent urban development may reduce the use of site as a wildlife corridor. Night lighting from adjacent development may also affect nocturnal species.

**NOTES:**

Disturbance Categories within Preserve

- 1 – No sign of disturbance within preserve
- 2 – Disturbance does not occur within preserve, but is detected adjacent to preserve boundaries
- 3 – Disturbance occurs in >0% to <10% of preserve
- 4 – Disturbance occurs in 10 to <25% of preserve
- 5 – Disturbance occurs in 25 to <50% of preserve
- 6 – Disturbance occurs in 50 to <75% of preserve
- 7 – Disturbance occurs in ≥ 75% of preserve

### **Type Conversion**

In order to detect potential type conversions within the preserve, Holland-Oberbauer vegetation mapping was used to compare the acreage of each habitat type that was previously mapped with the current acreage by habitat type (**Table 48**).

The non-native grasslands are categorized under the disturbed habitat type. There was a 24.12-acre decrease in disturbed habitat type overall; this may mostly be due to the successional changes in some areas of the preserve from non-native grassland to Diegan coastal sage scrub (35.34-acre increase) in the northwestern portion of the preserve. Related to this, there was also a 7.49-acre decrease in chaparral habitat type, which suggests a conversion from evergreen shrubs to soft shrubs; however, this may also be due to the different mapping methods used for the recent surveys. The increase in herbaceous habitat type was due to the mapping of a 0.96-acre wildflower field in the southeastern portion of the preserve. The 2.8-acre increase in developed habitat type is primarily due to the designation of a portion of land with an access road and a residential property adjacent to the central northwestern corner of the preserve boundary as developed as well as a portion of land next to the water tank. The developed area around the water tank was bare soils with scattered non-native species such as filaree and Mediterranean schismus likely due to regular disturbance as a result of maintenance visits.

The preserve is situated in a fire prone area of San Diego and experienced catastrophic fires in 2003 and 2008. The evidence of those fires is still visible in the form of charred stems and non-native grasslands. Wildfire continues to be a threat to the preserve and flammable fuels like non-native annual grasses increase the potential. As areas recover from wildfire, they are susceptible to invasion by invasive non-native annual grasses that create dense thatch layers and prolific non-native seed banks, which inhibit native seedling germination. Additionally, altered fire regimes of more frequent fires can also prevent sufficient post-fire shrub recovery and result in type conversion as well. This cycle will ultimately lead to a vegetation community type conversion from native scrublands to invasive non-native grasslands. Other aggressive invasive non-native species, such as mustards and thistles, can take advantage of this type conversion and become established, further reducing the native diversity in an area.

**TABLE 48**  
**TYPE CONVERSION ASSESSMENT BASED ON HOLLAND-OBERBAUER MAPPING:**  
**SIMON COUNTY PRESERVE**

<b>Habitat Type<sup>a</sup></b>	<b>Acres in 2009</b>	<b>Acres in 2021</b>	<b>Difference in Acreage</b>
Developed	2.80	5.17	2.38
Disturbed	252.09	227.96	-24.12
Herbaceous	0	0.96	0.96
Scrub	236.15	271.49	35.34
Chaparral	108.85	101.36	-7.49
Woodland	12.20	9.29	-2.90
Forest	4.39	0.54	-3.85
Riparian	0.44	0	-0.44
Unvegetated (water)	0	0.14	0.14

**TABLE 48**  
**TYPE CONVERSION ASSESSMENT BASED ON HOLLAND-OBERBAUER MAPPING:**  
**SIMON COUNTY PRESERVE**

Habitat Type <sup>a</sup>	Acres in 2009	Acres in 2021	Difference in Acreage
NOTE:			
<sup>a</sup> The 2009 Vegetation Maps for Simon County Preserve use communities not recognized in Holland-Oberbauer such as "Diegan Coastal Sage Scrub-Southern Mixed Chaparral" and "Oak Riparian Forest". For these communities, a suitable Holland-Oberbauer was compared for detecting type conversions but may not accurately represent natural communities observed in 2009.			

### 4.1.7.5 Adaptive Management Recommendations

Adaptive management recommendations were developed for Simon County Preserve based on the general habitat condition and threats assessment conducted during habitat mapping. Recommendations are provided for invasive non-native plant species management, habitat enhancement/restoration opportunities, encroachment, and monitoring. Recommendations are detailed in the following subsections.

#### ***Invasive Non-Native Plant Species Management***

As discussed in the invasive non-native plant observations section, several invasive non-native plant species were detected within the preserve. A recommended action was identified for each species consisting of either removal, treatment, or monitoring. Final implementation of management activities and treatment methods shall be determined by the County based on priority.

#### ***Habitat Enhancement/Restoration Opportunities***

- **Rare plants.** The preserve contained several sensitive plant species that would benefit from comprehensive mapping to determine management/restoration opportunities. Focused rare plant surveys are recommended to capture areas ideally suited for habitat enhancement and restoration, and those areas that may be extirpated by invasive species. This could be accomplished through collaboration with SDMMP.
- **Native grassland and wildflower field enhancement.** Yucaipa onion was found associated with a native grassland and wildflower field along the access road in the center of the preserve. This area provides opportunities for habitat enhancement. While the native grassland supported several native annuals and perennials it is surrounded by non-native grassland and a heavily used dirt access road.
- **Targeted seeding.** Expand the native grassland through seeding efforts, using appropriate local seeds, during the appropriate time of year and before a forecasted rain event (e.g., fall). This should be accompanied by educational information for preserve users highlighting the benefits of native grasslands in Ramona.

#### ***Encroachment***

- **Access control.** There are currently three locked gates at the southeast corner, one locked gate at the north corner and one locked gate at the west boundary (not accessible due to private road), which prevent unauthorized vehicle access. The gates at the southeast corner and in the north and a pedestrian trail access in the northeast allow for authorized public

access. All gates were in good condition, and the preserve is not easily located or accessed from public roads. Little to no evidence of regular unauthorized use of the preserve was observed. The existing roads are primarily accessed for utility easement and park maintenance purposes. It is recommended that these gates are regularly monitored to ensure the preserve stays protected from unauthorized use.

### Monitoring

- **Invasive non-native plants.** Conduct invasive non-native plant species mapping annually, if feasible, to inform treatment areas, assess new invasions or re-invasions, and determine effectiveness of treatments.
- **Catastrophic events** Additional vegetation mapping efforts may be conducted as needed following catastrophic events such as wildfires.

## 4.1.8 Wilderness Gardens County Preserve

A total of 23 vegetation communities and two land cover types were identified via Holland-Oberbauer and 35 vegetation communities and three land cover types were identified via VCM for Wilderness Gardens County Preserve. These communities are depicted in Appendix A, Figure 29 and Figure 30, and provided in crosswalk format in **Table 49**.

**TABLE 49**  
**VEGETATION COMMUNITIES CROSSWALK: WILDERNESS GARDENS COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
<b>Scrub</b>			
32500 Diegan Coastal Sage Scrub	4.23 California Buckwheat Alliance	4.23.1 California Buckwheat Association	15.96
	4.7 California Sagebrush – California Buckwheat Alliance	4.7 California Sagebrush – California Buckwheat Alliance	3.86
32520 Diegan Coastal Sage Scrub: Inland form	4.1 Chamise Alliance	4.1.2 Chamise-(California Buckwheat, California Sagebrush, Black Sage) Association	0.29
		4.1.3 Chamise – Hoaryleaf Ceanothus Association	2.97
	4.23 California Buckwheat Alliance	4.23.1 California Buckwheat Association	7.40
		4.23.3 California Buckwheat – Sweetbush Association	1.93
	4.31 Chaparral Beard Tongue Alliance	4.31.1 Chaparral Beard Tongue – California Sagebrush Association	51.85
	4.35 Laurel Sumac Alliance	4.35 Laurel Sumac Alliance	10.33
	4.38 Scrub Oak – Chamise Alliance	4.38.1 Scrub Oak – Chamise Association	7.09
	4.7 California Sagebrush – California Buckwheat Alliance	4.7 California Sagebrush – California Buckwheat Alliance	12.98
4.7.1 California Sagebrush – California Buckwheat – Laurel Sumac Association		46.94	

**TABLE 49**  
**VEGETATION COMMUNITIES CROSSWALK: WILDERNESS GARDENS COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
32710 Riversidian Upland Sage Scrub	4.23 California Buckwheat Alliance	4.23.3 California Buckwheat – Sweetbush Association	11.64
<b>Chaparral</b>			
37120 Southern Mixed Chaparral	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Alliance	0.78
		3.6.4 Coast Live Oak – Western Poison Oak – Grass Association	0.77
	4.1 Chamise Alliance	4.1 Chamise Alliance	209.88
		4.1.2 Chamise – (California Buckwheat, California Sagebrush, Black Sage) Association	2.56
		4.1.3 Chamise – Hoaryleaf Ceanothus Association	24.60
	4.14 Hoaryleaf Ceanothus Alliance	4.14 Hoaryleaf Ceanothus Alliance	16.26
	4.2 Chamise – Mission Manzanita Alliance	4.2.1 Chamise – Mission Manzanita Association	37.91
		4.2.2 Chamise – Mission Manzanita – Hoaryleaf Ceanothus Association	0.46
		4.2.6 Chamise – Mission Manzanita – Scrub Oak Association	5.04
	4.20 Smooth Mountain Mahogany Alliance	4.20 Smooth Mountain Mahogany Alliance	12.98
	4.31 Chaparral Beard Tongue Alliance	4.31 Chaparral Beard Tongue Alliance	0.77
		4.31.1 Chaparral Beard Tongue – California Sagebrush Association	1.17
	4.35 Laurel Sumac Alliance	4.35 Laurel Sumac Alliance	3.79
	4.37 Scrub Oak Alliance	4.37.1 Scrub Oak Association	3.75
	4.38 Scrub Oak – Chamise Alliance	4.38.1 Scrub Oak – Chamise Association	2.84
4.7 California Sagebrush – California Buckwheat Alliance	4.7.1 California Sagebrush – California Buckwheat – Laurel Sumac Association	0.55	
37121 Granitic Southern Mixed Chaparral	4.1 Chamise Alliance	4.1 Chamise Alliance	0.62
37900 Scrub Oak Chaparral	3.6 Coast Live Oak Alliance	3.6.2 Coast Live Oak – Scrub Oak Association	0.44
<b>Riparian</b>			
52410 Coastal and Valley Freshwater Marsh	5.35 Cattail Alliance	5.35.2 Broad – Leaved Cattail Association	3.37

**TABLE 49**  
**VEGETATION COMMUNITIES CROSSWALK: WILDERNESS GARDENS COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
61300 Southern Riparian Forest	3.4 Western Sycamore Alliance	3.4.3 Western Sycamore – Coast Live Oak Association	0.97
61310 Southern Coast Live Oak Riparian Forest		3.4.3 Western Sycamore – Coast Live Oak Association	0.45
	3.6 Coast Live Oak Alliance	3.6.3 Coast Live Oak – Arroyo Willow Association	1.45
62500 Southern Riparian Woodland	3.4 Western Sycamore	3.4.1 Western Sycamore – Mulefat Association	6.22
		3.4.3 Western Sycamore – Coast Live Oak Association	3.71
63310 Mule Fat Scrub	4.11 Mulefat Alliance	4.11.1 Mulefat Association	11.75
<b>Woodland</b>			
71100 Oak Woodland	3.6 Coast Live Oak Alliance	3.6.2 Coast Live Oak – Scrub Oak Association	1.59
71160 Coast Live Oak Woodland	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Association	20.86
		3.6.1 Coast Live Oak – California Sagebrush Association	0.25
		3.6.2 Coast Live Oak – Scrub Oak Association	20.60
		3.6.4 Coast Live Oak – Western Poison Oak – Grass Association	0.56
71161 Open Coast Live Oak Woodland	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Association	64.69
		3.6.1 Coast Live Oak – California Sagebrush Association	0.38
		3.6.2 Coast Live Oak – Scrub Oak Association	2.14
		3.6.3 Coast Live Oak – Arroyo Willow Association	0.34
71180 Engelmann Oak Woodland	3.7 Engelmann Oak Alliance	3.6.4 Coast Live Oak – Western Poison Oak- Grass Association	78.55
		3.7 Engelmann Oak Alliance	1.25
		3.7.2 Engelmann Oak – Coast Live Oak – Western Poison Oak – Grass Association	0.22
79100 Eucalyptus Woodland	3.2 Eucalyptus Semi-Natural Stands	3.2 Eucalyptus Semi-Natural Stands	1.05
<b>Forest</b>			
81310 Coast Live Oak Forest	3.6 Coast Live Oak Alliance	3.6 Coast Live Oak Association	1.86
<b>Herbaceous</b>			
42100 Native Grassland	5.23 Foothill Needle Grass Alliance	5.23.1 Foothill Needle Grass Provisional Association	2.49

**TABLE 49**  
**VEGETATION COMMUNITIES CROSSWALK: WILDERNESS GARDENS COUNTY PRESERVE**

Oberbauer-Modified Holland Code	San Diego Vegetation Classification Manual		Acreage
	Alliance Level	Association Level	
42110 Valley Needlegrass Grassland	5.24 Purple Needle Grass Alliance	5.24.1 Purple Needle Grass Association	0.80
42200 Non-Native Grassland	5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi- Natural Stands	5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi- Natural Stands	0.35
	5.5 Wild Oat Semi-Natural Stands	5.5 Wild Oat Semi-Natural Stands	5.93
	5.8 Bromes – False Bromes Semi-Natural Stands	5.8.2 Ripgut Grass Semi-Natural Stand Type	3.77
42210 Non-Native Grassland: Broadleaf- Dominated	5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi- Natural Stands	5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi- Natural Stands	1.83
	5.8 Brome – Purple False Brome Semi-Natural Stands	5.8.2 Ripgut Grass Semi-Natural Stand Type	0.33
42300 Wildflower Field	5.13 Clustered Tarweed Alliance	5.13 Clustered Tarweed Alliance	0.24
11000 Non-Native Vegetation	N/A	Disturbed Habitat	1.58
<b>Other<sup>a</sup></b>			
11300 Disturbed Habitat	N/A	Disturbed Habitat	2.61
	N/A	Disturbed Habitat – Trails or Roads	6.38
12000 Urban/Developed	N/A	Disturbed Habitat – Trails or Roads	0.95
	N/A	Urban/Developed	1.91
<b>TOTAL ACREAGE:<sup>b</sup></b>			<b>749.79</b>

## NOTES:

<sup>a</sup> The San Diego Vegetation Classification Manual only classifies vegetated areas. The disturbed land cover types were described and displayed under the association level to provide additional detail in the mapping. This allows for changes in vegetation (e.g., unvegetated to vegetated) to be tracked over time.

<sup>b</sup> Total may not match sum of individual acreages listed due to rounding.

### 4.1.8.1 Vegetation Type Descriptions

The following vegetation community and land cover type descriptions for the Wilderness Gardens County Preserve follow the VCM classification system. General association and alliance descriptions were taken from the VCM for Western San Diego County (Sproul et al. 2011).

#### *Soft-Leaved, Drought-Deciduous Shrublands*

##### 4.23.1 California Buckwheat Association

California buckwheat is the dominant or codominant species in an open shrub canopy. Subdominant shrubs include California sagebrush, chamise, laurel sumac, bush-rue, deerweed,

coyote brush, broom baccharis, black sage, white sage, and San Diego County viguiera. This association may represent an early transitional phase of other shrub associations or occur as a relatively stable association in ecotonal areas. The composition of this association supports a diverse herb cover occurs mostly in openings, and includes purple needle grass, clustered tarweed, osmadenia, miniature lupine, showy penstemon, as well as many non-native grasses and forbs.

This vegetation community occurs in scattered patches of varying sizes throughout the preserve (23.35 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32500 Diegan Coastal Sage Scrub and 32520 Diegan Coastal Sage Scrub: Inland form.

#### **4.23.3 California Buckwheat – Sweetbush Association**

California buckwheat and rough sweetbush (*Bebbia juncea*) are codominant in this association, forming an open canopy. Subdominant shrubs include laurel sumac, chaparral yucca, California broomsage (*Lepidospartum squamatum*), deerweed, big sagebrush, broom baccharis, California sagebrush, sages, and California brickellbush. A diverse herbaceous understory occurs, and may include purple three awn (*Aristida purpurea*), San Diego needle grass (*Stipa diegoense*), granny's hair net, *Dudleya* spp., Bigelow's spike moss (*Selaginella bigelovii*), stinging lupine, and bird's-foot fern (*Pellaea mucronata*). This association occurs on dry sites, both on slopes and alluvial terraces.

This vegetation community occurs along the San Luis Rey River terraces and on perched hummocks in the riverbed of the preserve (13.57 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32520 Diegan Coastal Sage Scrub: Inland form and 32710 Riversidian Upland Sage Scrub.

#### **4.31 Chaparral Beard Tongue Alliance**

Chaparral beard tongue is dominant or codominant in the shrub canopy with chamise, California sagebrush, bushrue, thick-leaved yerba santa (*Eriodictyon crassifolium*), California buckwheat, chaparral yucca, laurel sumac, scrub oak, sugar bush, white sage, black sage, cotton thorn (*Tetradymia comosa*), and mission manzanita. Shrubs are generally less than 2 meters tall with an open to continuous canopy that may be two-tiered. Emergent Engelmann oak trees may be present at trace cover and the herbaceous layer can range from an open to patchy cover.

This vegetation community occurs in one patch in the northern portion of the preserve (0.77 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

##### **4.31.1 Chaparral Beard Tongue – California Sagebrush Association**

Chaparral beard tongue and California sagebrush occur as codominants in a closed to open canopy. Subdominant shrubs include California buckwheat, sages, laurel sumac, sticky monkeyflower, redberry, chamise, Ramona lilac, hoaryleaf ceanothus, and mission manzanita. A diverse herbaceous cover occurs in openings and includes wishbone bush, spotted eucrypta, sacapellote, wild cucumber, California figwort, and caterpillar phacelia.

This vegetation community occurs in scattered patches of varying sizes throughout the preserve (53.02 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32520 Diegan Coastal Sage Scrub: Inland form and 37120 Southern Mixed Chaparral.

#### **4.35 Laurel Sumac Alliance**

This community is dominated by laurel sumac, a large evergreen sclerophyllous shrub that is frost sensitive and is capable of resprouting from a deep crown-root multiple times in response to frequent fires. Subdominant shrub species include California sagebrush, deerweed, California buckwheat, California encelia and sticky monkey flower. In this alliance shrubs are usually less than 5 meters in height and form a continuous canopy. The sparse herbaceous understory may include canchalagua, wishbone bush, and island morning glory.

This vegetation community occurs in several patches of varying sizes primarily in the northwest area of the preserve (14.12 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32520 Diegan Coastal Sage Scrub: Inland form and 37120 Southern Mixed Chaparral.

#### **4.7 California Sagebrush – California Buckwheat Alliance**

This alliance is characterized by the codominance of California sagebrush and California buckwheat species in the shrub canopy. Additional species in this alliance may include chamise, sticky monkeyflower, desert tea, chaparral yucca, deerweed, laurel sumac, lemonade berry, sugarbush, and/or white sage. Most shrubs are typically less than 2 meters tall, with some reaching up to 5 meters tall. The herbaceous layer may include spring annuals, but may also support native perennial grasses (*Stipa* spp., *Muhlenbergia* spp.) and geophytes (e.g., *Allium* spp., *Bloomeria* spp., *Dichelostemma capitata*).

This vegetation community occurs in scattered patches of varying sizes throughout the preserve (16.84 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32500 Diegan Coastal Sage Scrub and 32520 Diegan Coastal Sage Scrub: Inland form.

##### **4.7.1 California Sagebrush – California Buckwheat – Laurel Sumac Association**

California sagebrush, California buckwheat, and laurel sumac are codominant in this association with a relatively open shrub canopy. Many other subdominant shrub species include lemonade berry, California encelia, white sage, San Diego County viguiera, saw-toothed goldenbush, broom baccharis, Chaparral yucca, bushrue, coastal prickly pear, California brickelbush, sticky monkeyflower, chaparral beard tongue, and spiny redberry. Herb cover is usually open and with high species diversity. This association can occur both as a mature stable shrub community or as an early transitional stage of other shrublands in response to fire or other disturbance.

This vegetation community occurs in scattered patches throughout the preserve, with a big area covering the southwest corner (47.49 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32520 Diegan Coastal Sage Scrub: Inland form and 37120 Southern Mixed Chaparral.

## ***Sclerophyllus, Evergreen Shrublands***

### **4.1 Chamise Alliance**

Throughout its range, chamise is dominant in the shrub canopy and, depending on the location, may have red shank, Eastwood manzanita, common manzanita, sticky whiteleaf manzanita, *Ceanothus* spp., sticky monkeyflower, California yerba santa, California buckwheat, chaparral yucca, toyon, scrub oak, interior live oak, white sage, purple sage, black sage, and western poison oak as associates to codominants or subdominants. Emergent trees may be present at low cover. Shrubs are typically less than 4 meters tall; the canopy is intermittent to continuous, and the herbaceous layer is sparse to intermittent.

This vegetation community encompasses the largest area, primarily growing as dense habitat on the steep mountains in the southern half of the preserve (210.49 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral, and 37121 Granitic Southern Mixed Chaparral.

#### **4.1.2 Chamise – California Buckwheat – California Sagebrush Association**

In this association, chamise is dominant with other shrubs occurring as subdominants; together, these species form either a continuous or more often an open canopy cover. Subdominant shrubs include California sagebrush, California buckwheat, saw-toothed goldenbush, black sage, scrub oak, Torrey's hybrid oak, Ramona lilac, and Eastwood manzanita. In the understory, dominant species often include native and non-native perennial and annual grasses, in addition to a rich diversity of herb species. This association is a mix of chaparral and coastal sage scrub. It occurs both as a mature, stable shrub community or an early transitional stage of other shrublands in response to fire or other disturbance.

This vegetation community occurs in two small areas in the eastern portion of the preserve (2.85 acres). The Holland-Oberbauer vegetation communities corresponding to this vegetation type are 32520 Diegan Coastal Sage Scrub: Inland form and 37120 Southern Mixed Chaparral.

#### **4.1.3 Chamise – Hoaryleaf Ceanothus Association**

Chamise and hoaryleaf ceanothus form mostly continuous cover and are the dominant shrubs of this vegetation type. Other shrubs species occurring as subdominants include scrub oak species, manzanitas, black sage, chaparral whitethorn, Ramona lilac, chaparral yucca, hollyleaf redberry, sticky monkeyflower, and toyon. Herb diversity and cover is generally low except after fires. This association typically occupies xeric interior sites in the cismontane portion of the study area. In the absence of fire, hoaryleaf ceanothus may become senescent, causing the stand to open up and become chamise dominated; however, hoaryleaf ceanothus can recolonize from a soil seed bank following fire.

This vegetation community occurs in scattered patches of varying sizes throughout the preserve (27.56 acres). The vegetation community is associated with the Holland-Oberbauer classifications 32520 Diegan Coastal Sage Scrub: Inland form and 37120 Southern Mixed Chaparral.

#### 4.11.1 Mulefat Association

Mulefat is dominant or codominant in the shrub canopy, with few to relatively numerous associated shrubs depending on location. These can include California sagebrush, willow baccharis (*Baccharis emoryi* [*salicina*]), coyote brush, tree tobacco, laurel sumac, arrow-weed, *Rubus* spp., narrow-leaved willow, arroyo willow, blue elderberry, and tamarisk. Emergent trees such as foothill pine (*Pinus sabiniana*), western sycamore, Fremont cottonwood, oaks, and willows may be present in some stands. Shrubs are generally less than 5 meters tall, with the shrub canopy open to continuous and the herbaceous layer usually sparse.

This vegetation community occurs in one area in the north-central portion of the preserve (11.75 acres). The vegetation community is associated with the Holland-Oberbauer classification 63310 Mule Fat Scrub.

#### 4.14 Hoaryleaf Ceanothus Alliance

This alliance is characterized by hoaryleaf ceanothus as the dominant or codominant species in the shrub canopy, with chamise, big berry manzanita, chaparral whitethorn, smooth mountain mahogany, sticky monkeyflower, California buckwheat, chaparral yucca, toyon, chaparral beard tongue, laurel sumac, scrub oak, sugar bush, and/or black sage occurring as subdominants. Emergent coast live oak and other trees may be present at low cover. Shrubs are usually less than 3.5 meters tall with the canopy intermittent to continuous. In mature stands, the herbaceous layer is open.

This vegetation community occurs in three areas in the eastern portion of the preserve (16.26 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

#### 4.2.1 Chamise – Mission Manzanita Association

Chamise and mission manzanita often form continuous cover and are the dominant shrubs in this association. Subdominant shrubs include laurel sumac, black sage, bushrue, lemonade berry, sugar bush, Ramona lilac, wart-stemmed ceanothus, hoaryleaf ceanothus, chaparral yucca, Mojave yucca, scrub oak, and spiny redberry. Many other subshrubs and herbs occur, primarily in openings, such as wild cucumber, saw-toothed goldenbush, island morning glory, small flowered soaproot, and little California melica. The normally low herbaceous species cover and diversity is enhanced following fire. This association occurs in the cismontane foothills south of the Transverse Range and is mostly confined to San Diego County and Baja California Norte, Mexico.

This vegetation community occurs in scattered patches of varying sizes throughout the preserve, with a large area located in the northwest corner (37.91 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

#### 4.2.2 Chamise – Mission Manzanita – Hoaryleaf Ceanothus Association

Chamise, mission manzanita, and hoaryleaf ceanothus form an open or continuous canopy and occur as codominant shrubs in this vegetation community. Many other shrub species commonly occur, including scrub oaks, chaparral whitethorn, Ramona lilac, manzanitas, sugar bush,

redberry, laurel sumac, and matchweed. California buckwheat and California sagebrush may be present in ecotonal areas or as early transitional components. Diverse herb cover often occurs in openings and following fire.

This vegetation community occurs in one small patch in the northwest portion of the preserve along the interior boundary line. The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

#### **4.2.6 Chamise – Mission Manzanita – Scrub Oak Association**

Chamise, mission manzanita, and scrub oak occur as codominants in this association often with an open canopy and sparse herbaceous understory. Other subdominant shrubs in this association include Ramona lilac, chaparral whitethorn, California buckwheat, smooth mountain mahogany, laurel sumac, redberry, toyon, Mojave yucca, and chaparral yucca. After fires, the herbaceous layer may become a diverse array of showy annuals however if fires become too frequent this association is susceptible to type conversion typically to non-native grasslands.

This vegetation community occurs in two areas in the northwest portion of the preserve (5.04 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

#### **4.20 Smooth Mountain Mahogany Alliance**

Smooth Mountain Mahogany is generally dominant or codominant in the shrub canopy of this alliance. Subdominant shrubs include chamise, red shank, Eastwoods manzanita, big berry manzanita, California sagebrush, hoaryleaf ceanothus, buck brush (*Ceanothus cuneatus*), big pod ceanothus (*C. megacarpus*), green-bark lilac (*C. spinosus*), California buckwheat, Wright's buckwheat (*E. wrightii*), California fremontia (*Fremontodendron californicum*), ashy silk tassel (*Garrya flavescens*), chaparral yucca, toyon, laurel sumac, holly-leaved cherry, scrub oak, Tucker's oak (*Quercus john-tuckeri*), hollyleaf redberry, white sage, and black sage. Emergent trees may be present with trace cover. Shrubs are usually less than 5 meters tall and the shrub canopy is single or two-tiered and open to continuous. The herbaceous layer is sparse or grassy depending on canopy cover and location.

This vegetation community occurs in scattered patches of varying sizes in the southeastern portion of the preserve (12.98 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

#### **4.37.1 Scrub Oak Association**

Scrub oak (*Quercus berberidifolia*) and Torrey's hybrid oak are two of the most widespread scrub oaks in San Diego. Due to taxonomic uncertainty, these two scrub oak species are included within the same association. These scrub oaks are dominant in this association, usually with continuous cover and often as small inclusions within other shrublands. Subdominant shrub species include smooth mountain mahogany, chamise, Eastwood manzanita, mission manzanita, lemonade berry, western poison oak, chaparral whitethorn, Ramona lilac, and hoaryleaf ceanothus. Herbaceous diversity and cover is relatively low, mostly occurring in openings and increasing in response to fire.

This vegetation community occurs in one area in the eastern portion of the preserve (3.75 acres). The vegetation community is associated with the Holland-Oberbauer classification 37120 Southern Mixed Chaparral.

#### **4.38.1 Scrub Oak – Chamise Association**

Scrub oak, Torrey’s hybrid oak, and chamise are codominant, usually as a continuous shrub canopy. Due to the taxonomic uncertainty of these scrub oaks, they are treated within the same association. Associated shrubs include smooth mountain mahogany, Ramona lilac, chaparral whitethorn, hoaryleaf ceanothus, chaparral yucca, white sage, black sage, and mission manzanita. Herbaceous diversity and cover is relatively low, mostly occurring in openings and increasing in response to fire.

The vegetation community occurs in several patches of varying sizes throughout the preserve and one large area in the western portion of the preserve (9.93 acres). The vegetation community is associated with the Holland-Oberbauer classification 32520 Diegan Coastal Sage Scrub: Inland form and 37120 Southern Mixed Chaparral.

### ***Riparian Forests and Woodlands***

#### **3.4.1 Western Sycamore – Mulefat Association**

Within this vegetation community, western sycamore is dominant or codominant in an open tree canopy with mulefat dominant in an open shrub canopy. Associated subdominant riparian shrubs include western poison oak, blue elderberry, broom baccharis, desert wild grape, and California rose. Many upland shrubs may also occur in this association. The herbaceous diversity is low and cover is sparse; characteristic species include mugwort, western ragweed, and San Diego sedge.

This vegetation community occurs in three areas in the riparian corridor along the San Luis Rey River in the preserve (6.22 acres). The vegetation community is associated with the Holland-Oberbauer classification 62500 Southern Riparian Woodland.

#### **3.4.3 Western Sycamore – Coast Live Oak Association**

In this vegetation community, western sycamore and coast live oak together are codominant in a continuous to open tree canopy; subdominants may include Fremont cottonwood and willow trees. Associated subdominant riparian shrubs include blue elderberry, western poison oak, wild grape, California rose, and California blackberry. Many associated upland shrubs may also be present including lemonade berry, sugar bush, redberry, toyon, and mulefat. The herbaceous diversity is high and cover is continuous to open, including mugwort, San Diego sagewort, western ragweed, San Diego sedge, nutsedges, yerba mansa, rushes, cattails, and many ruderal species.

This vegetation community occurs several areas in the riparian corridor along the San Luis Rey River and one drainage in the preserve (5.13 acres). The vegetation community is associated with the Holland-Oberbauer classifications 61300 Southern Riparian Forest, 61310 Southern Coast Live Oak Riparian Forest, and 62500 Southern Riparian Woodland.

### 3.6.3 Coast Live Oak – Arroyo Willow Association

Coast live oak is dominant in an open to closed tree canopy with arroyo willow typically dominating the shrub canopy. Subdominant trees may include Western sycamore, Fremont cottonwood, and willows (red willow, Gooding's black willow); if present, these tree species must have a less than trace percent cover for this association to apply. Subdominant shrubs include desert wild grape, blue elderberry, and *Baccharis* spp. (*salicifolia*, *sarothroides*, *pilularis*). The herbaceous diversity is low and cover is generally open, including wetland affiliates such as San Diego sagewort, Western ragweed, yerba mansa, salt grass, and fringed willowherb.

This vegetation community occurs in two small areas in the eastern portion of the preserve (1.78 acres). The vegetation community is associated with the Holland-Oberbauer classifications 61310 Southern Coast Live Oak Riparian Forest and 71161 Open Coast Live Oak Woodland.

## Upland Forests and Woodlands

### 3.2 Eucalyptus Semi-Natural Stands

Over 50 species of eucalyptus have been introduced to California from Australia. However, only a few are known to form self-perpetuating stands and have the qualities of semi-natural stands. The two most common species that form semi-natural stands are listed in parentheses in the name of this type. River red gum is one of the most common species found in naturalized stands in San Diego County, but there are at least six other species that are listed in the most recent San Diego County Plant checklist. River red gum is one of the few that appears to invade riparian channels.

This vegetation community occurs adjacent to the Ranger station and preserve staging area (1.05 acres). The vegetation community is associated with the Holland-Oberbauer classifications 79100 Eucalyptus Woodland.

### 3.6 Coast Live Oak Alliance

General alliance characteristics of this association include coast live oak as the dominant or codominant species in the tree canopy. Associated tree species may include southern California black walnut, western sycamore, Fremont cottonwood, Engelmann oak, California black oak, arroyo willow, and/or California laurel. Trees are generally less than 30 meters tall and the canopy is open to continuous. The shrub and herbaceous canopies are variable.

This vegetation community occurs in several patches of varying sizes throughout the preserve (88.20 acres). It is the second most widespread vegetation community. The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral, 71160 Coast Live Oak Woodland, 71161 Open Coast Live Oak Woodland, and 81310 Coast Live Oak Forest.

### 3.6.1 Coast Live Oak – California Sagebrush Association

Coast live oak is the dominant species in an open tree canopy, while California sagebrush is dominant in an open shrub canopy. Subdominant shrubs include a variety of chaparral and coastal sage species, such as Ramona lilac, chamise, sticky monkeyflower, laurel sumac, blue elderberry, hollyleaf redberry, California sagebrush, California buckwheat, and toyon. Herbaceous cover

occurs in openings and includes wild cucumber, purple needle grass, *Phacelia* spp., checkerbloom, gumweed, and many shrubs, and often includes a high cover of ruderal species.

This vegetation community occurs in two small patches in the eastern portion of the preserve (0.62 acres). The vegetation community is associated with the Holland-Oberbauer classifications 71160 Coast Live Oak Woodland and 71161 Open Coast Live Oak Woodland.

### **3.6.2 Coast Live Oak – Scrub Oak Association**

Coast live oak is dominant in an open tree canopy with scrub oak diagnostically present in the shrub canopy. Subdominant shrubs include Ramona lilac, toyon, smooth mountain mahogany, sticky monkeyflower, fragrant sumac, California sagebrush, laurel sumac, hairy yerba santa, climbing penstemon, saw-toothed goldenbush, and many other chaparral species. Herbaceous cover occurs in openings including wild cucumber, *Phacelia* spp. and a high diversity of chaparral-associated plants. This association is typical of mesic slopes where coast live oak is not associated with riparian vegetation types.

This vegetation community occurs in several areas of the preserve, primarily in the densely vegetated areas on the steep mountainside (24.77 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37900 Scrub Oak Chaparral, 71100 Oak Woodland, 71160 Coast Live Oak Woodland, and 71161 Open Coast Live Oak Woodland.

### **3.6.4 Coast Live Oak – Western Poison Oak – Grass Association**

Coast live oak is dominant in the tree canopy and western poison oak is subdominant in the shrub canopy, with an understory of native herbaceous and ruderal species. Subdominant shrubs include blue elderberry, coyote brush, and San Diego sagewort. The herbaceous diversity is high and cover is generally intermittent to continuous, including fewer wetland affiliates than the previous association and many ruderal species. This association is ecologically similar to the Coast Live Oak/Arroyo Willow Association but occurs higher on the hydrologic profile where many upland shrubs and ruderal plants are prevalent above the fluvial regime.

This vegetation community occurs primarily in large swaths on either side of the San Luis Rey River (79.88 acres). The vegetation community is associated with the Holland-Oberbauer classifications 37120 Southern Mixed Chaparral, 71160 Coast Live Oak Woodland, and 71161 Open Coast Live Oak Woodland.

## **3.7 Engelmann Oak Alliance**

Engelmann oak is dominant or codominant in the tree canopy with southern California black walnut, coast live oak, and California black oak sometimes present as associates. Trees are usually less than 18 meters tall, and the canopy may be open to closed. The shrub layer is sparse to open and the herbaceous layer is sparse and often dominated by grass species.

This vegetation community occurs in one area on the eastern portion of the preserve (1.25 acres). The vegetation community is associated with the Holland-Oberbauer classifications 71180 Engelmann Oak Woodland.

### 3.7.2 Engelmann Oak – Coast Live Oak – Western Poison Oak – Grass Association

Engelmann oak and coast live oak are codominants in the tree canopy, western poison oak is diagnostically present in the shrub canopy, and grasses and other herbs are dominant in the herbaceous understory. Subdominant shrubs include many coastal sage scrub species including black sage, white sage, California sagebrush, laurel sumac, sticky monkeyflower, and climbing keckiella; however, their combined cover is less than western poison oak. The herbaceous understory is often dominated by non-native ruderal plants.

This vegetation community occurs in one small patch in the eastern portion of the preserve associated with coast live oak woodland. The vegetation community is associated with the Holland-Oberbauer classifications 71180 Engelmann Oak Woodland.

### ***Upland Herbaceous Vegetation***

#### 5.13 Clustered Tarweed Alliance

Characteristics of the alliance generally include clustered tarweed as a codominant or conspicuous species in the herbaceous layer with common fiddleneck (*Amsinckia menziesii*), silverscale (*Atriplex argentea*), tocolote, yellow-starthistle (*Centaurea solstitialis*), alkali weed (*Cressa truxillensis*), annual hair grass (*Deschampsia danthonioides*), redstem filaree, shortpod mustard, alkali barley (*Hordeum depressum*), hare barley (*Hordeum murinum*), vernal barley (*Hordeum intercedens*), goldfields, valley lessingia (*Lessingia filaginifolia*), horehound (*Marrubium vulgare*), slender-leaved iceplant (*Mesembryanthemum nodiflorum*), popcorn flowers (*Cryptantha* spp., *Plagiobothrys* spp.), and clovers. Emergent shrubs, such as California sagebrush, California buckwheat, alkali heath (*Frankenia salina*), matchweed, saw-toothed goldenbush, and bush seepweed (*Suaeda moquinii*), may be present at low cover. Herbs are less than 1-meter-tall and the cover is open to continuous.

Clustered tarweed occurs most often with sparse to trace cover in herb-dominated openings within in many shrub-dominated vegetation types. As an association it can occur as a codominant or conspicuous species in the herbaceous layer in a complex mosaic of shrublands with grassland and vernal pool associations. Dominant stands of clustered tarweed are readily replaced in disturbed situations by non-native grasses and broadleaf plants. Shrubs and herbs that are associated are therefore highly diverse, representing these differing vegetation types rather than edaphically similar associated species. Some of these co-occurring plants that are more typical of the intact clustered tarweed Association include *Nassella* spp., *Castilleja* spp., osmadenia, graceful tarplant (*Holocarpha virgata* ssp. *elongata*), goldfields, common sandaster, bobtail barley, tidy-tips, soap plant, wild onion, goldenstars, brodiaea, and blue dicks. Wild oats are usually present though usually not codominant except on disturbed often clayey sites.

This vegetation community occurs in a small patch in the center of the preserve. The vegetation community is associated with the Holland-Oberbauer classifications 42300 Wildflower Field.

#### 5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands

This description is based on the group level, which is the hierarchical level above the alliance. The group level is a useful classification where distinction cannot be made to the alliance or

association level. This group level classification may be applied in cases where non-native grasses and forbs are dominant over native species, and where none of the following non-native species are clearly dominant or codominant: wild oats, bromes, purple false brome, fescues, fountain grass, black mustard, poison hemlock, crown daisy. Any of the species above may be present without dominance in a mixed association that may include many other naturalized ruderal species, including bent grass, tall fescue, crab grass, Russian thistle, filaree, sorghum, *Centaurea* spp., Bermuda grass, *Schismus* spp., and blessed milk thistle. This vegetation type is widespread and highly variable, representing generalized situations where ruderal floras have replaced native types through a history of repeated soil disturbance and the introduction of non-native plant species.

This vegetation community occurs in three areas in the eastern portion of the preserve (2.18 acres). The largest patch is located just west of the pond. The vegetation community is associated with the Holland-Oberbauer classifications 42200 Non-Native Grassland and 42210 Non-Native Grassland: Broadleaf-Dominated.

### 5.23.1 Foothill Needle Grass Provisional Association

Foothill needle grass is codominant in an open herbaceous canopy vegetation community. Associated herbaceous flora includes Goldenstar, blue dicks, wild onion, chocolate lily, brodiaea, mariposa lily, goldfields, plantain (*Plantago* spp.), California melica, slender Padre's shooting star, pygmy-weed, spike-moss (*Selaginella* spp.), and western blue-eyed-grass. This vegetation type is most often mixed with other herbaceous native flora in mesic openings of shrublands. This vegetation type is most often mixed with other herbaceous native flora in openings of shrublands. It is less extensive than purple needle grass, which is more prominent in native grassland vegetation types of more loamy soils.

This vegetation community occurs in one area in the western portion of the preserve, adjacent to the interior boundary (2.49 acres). The vegetation community is associated with the Holland-Oberbauer classification 42100 Native Grassland.

### 5.24.1 Purple Needle Grass Association

Purple needle grass is codominant to sparse in the herbaceous canopy of grasslands, grassland-shrubland complexes, or Engelmann oak woodland. This type is often proximally associated with vernal pools. Associated herbs include tarweed (*Deinandra* spp.), soap plant, gumweed, osmadenia, brodiaea, purple clarkia (*Clarkia purpurea*), blue dicks, common sandaster, nodding needle grass (*Nassella cernua*), and western blue-eyed grass. Non-native annual grasses and broadleaf plant species including *Bromus* spp., and tocolote often subdominant. This association shows resilience to fire and may be enhanced with infrequent fire by the suppression for invasive annuals.

This vegetation community occurs in one small patch adjacent to the southeast boundary of the preserve (0.80 acres). The vegetation community is associated with the Holland-Oberbauer classification 42110 Valley Needlegrass Grassland.

### 5.35.2 Broad-Leaved Cattail Association

Broad-leaved cattail (*Typha latifolia*) is dominant with a closed herbaceous canopy. Two other *Typha* species also occur in San Diego County-Southern cattail (*Typha domingensis*) and narrow-leaved cattail (*Typha angustifolia*). *Typha* species are rhizomatous and grow in dense colonies forming uniform stands that are not proximally associated with other plants except generally as wetland affiliates. Many other wetland plant species may be present in the riparian vegetation type but are not associated as fully aquatic emergent wetland plant species. Associated riparian species include western ragweed, mulefat, salt grass, willow, Fremont cottonwood, western sycamore and, coastal goldenbush. Other emergent wetland plants may occur, including other bulrush (*Schoenoplectus* spp.), alkali bulrush (*Bolboschoenus maritimus*), cattails, mosquito-fern (*Azolla filiculoides*), duck weed, water hyacinth (*Eichhornia crassipes*), and primrose-willow (*Ludwigia* spp.).

This vegetation community occurs in one area of the preserve, east of the pond (3.37 acres). The vegetation community is associated with the Holland-Oberbauer classification 52410 Coastal and Valley Freshwater Marsh.

### 5.5 Wild Oat Semi-Natural Stands

Stands strongly dominated by non-native wild oats are common in waste places, rangelands, openings in woodlands, and type-converted chaparral or coastal scrub throughout Cismontane California. Slender wild oat or wild oat is dominant or codominant in the herbaceous layer. Emergent trees and shrubs may be present at low cover. Herbs are less than 1.2 meters tall and the cover is open to continuous.

Stands in San Diego County often contain ripgut brome, soft chess, and other non-native grasses and herbs. Natives in the genera *Clarkia* spp., blue dicks, bedstraw, lupine, popcorn flowers, and clover if they exist in the stands are of substantially lower cover than the non-natives. Many wild oat stands occur on moderate to steep slopes formerly occupied by scrub alliances, apparently the result of type-conversion from high frequency fires. It is unknown whether these will be ultimately replaced by shrub alliance stands.

This vegetation community occurs in one area in the eastern portion of the preserve (5.93 acres). The vegetation community is associated with the Holland-Oberbauer classification 42200 Non-Native Grassland.

### 5.8.2 Ripgut Grass Semi-Natural Stand Type

Ripgut grass dominates the herbaceous canopy of many vegetation types especially as a result of disturbance. Ripgut grass is most prominent at dominating native grasslands, the understory of oak woodlands, and other vegetation types. It invades low areas with deeper soils creating dense cover and biomass that create dense perpetual thatch. Soft chess is more often subdominant with many other weedy plant species, often not in continuous stands.

This vegetation community occurs in several areas, primarily adjacent to the trails and roads in the preserve (4.10 acres). The vegetation community is associated with the Holland-Oberbauer

classification 42200 Non-Native Grassland and 42210 Non-Native Grassland: Broadleaf-Dominated.

### **Other<sup>9</sup>**

#### **Disturbed Habitat**

Disturbed habitat is a land cover type used to define lands that do not match a vegetation community included within the VCM for Western San Diego County and are subject to regular or frequent disturbance. Disturbed lands often lack native vegetation and have non-native vegetation in low numbers.

This land cover type occurs primarily in the preserve staging area and around the historical buildings and historical use areas (2.61 acres). The land cover type is associated with the Holland-Oberbauer classifications 11000 Non-Native Vegetation and 11300 Disturbed Habitat.

#### **Disturbed Habitat – Trails or Roads**

Disturbed Habitat – Trails or Road is a land cover type used to define unvegetated areas utilized for vehicular or pedestrian traffic.

This land cover type occurs primarily in the northern half of the preserve, where recreational trails bisect the vegetation communities, and in association with the Ranger Station and staging area (7.33 acres). The land cover type is associated with the Holland-Oberbauer classifications 11300 Disturbed Habitat and 12000 Urban/Developed.

#### **Urban/Developed**

Urban/Developed is a land cover type used to define areas where man made materials or surfaces occupy the landscape and vegetation is restricted or is completely absent.

This land cover type is primarily associated with the Ranger station and preserve parking area (1.91 acres). The land cover type is associated with the Holland-Oberbauer classification 12000 Urban/Developed.

### **4.1.8.2 Invasive Non-Native Plant Observations**

A total of 26 limited to high-risk invasive non-native plant species (as determined by Cal-IPC) were detected and mapped during field surveys for Wilderness Gardens County Preserve (**Table 50** and Appendix A, Figure 31). Of these species, one was identified as having a SDCRPR. The Cal-IPC and SDCRPR were taken into consideration when determining the recommended action, and should be referenced for specific treatment methods. The recommended action for the species detected is as follows.

- **Remove.** Plume acacia (*Albizia lophantha*), California burclover (*Medicago officinalis*), alfalfa (*Medicago sativa*), tree tobacco, olive, castor bean, Peruvian pepper tree, Brazilian pepper tree (*Schinus terebinthifolia*), tamarisk, and were species identified for removal due to

<sup>9</sup> The VCM classification and code is provided in this section's subheadings for all vegetation types; however, there is no VCM classification or code for land cover types without vegetation. For these types, we describe them in detail and provide the Holland-Oberbauer classification and code in the last sentence of the description.

their invasive nature and small concentrations that could be targeted before they become more widespread.

- **Treat.** Due to its limited spread, veldt grass, shortpod mustard, prickly lettuce, Hyssop loosestrife (*Lythrum hyssopifolia*), curly dock (*Rumex crispus*), Russian thistle, smilo grass, and puncture vine (*Tribulus terrestris*) could be a good option for treatment to control prior to further spread.
- **Monitor.** Monitoring is recommended for 14 species that were detected within the preserve. These species are mostly widespread within the preserve and therefore, would be best managed in conjunction with future restoration projects that would prevent re-infestation. Oleander is included here to help preserve the historical nature of the preserve, but should be monitored for seedling establishment and treated before it spreads into the native vegetation communities. Continued monitoring is recommended to detect any negative effects on surrounding native vegetation communities.

**TABLE 50**  
**INVASIVE NON-NATIVE PLANT SPECIES: WILDERNESS GARDENS COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
<i>Albizia lophantha</i>	plume acacia	–	–	Observed around Disturbed habitat adjacent to Ranger Station and Historic Mill site.	Remove
<i>Avena barbata</i> <sup>a</sup>	slender wild oat	Moderate	–	Observed in large fields in several areas of the preserve. It is the most commonly found associated with Ripgut Grass dominated non-native grasslands in the Preserve	Monitor
<i>Bromus diandrus</i> <sup>a</sup>	ripgut grass	Moderate	–	Observed throughout the alluvial terraces and is the dominant non-native grass species associated with Coast Live Oak Woodland-Western Poison Oak Grassland vegetation community. Common throughout the site.	Monitor
<i>Bromus rubens</i> <sup>a</sup>	red brome	High	–	Observed scattered throughout the site and was associated with all vegetation communities.	Monitor
<i>Carduus pycnocephalus</i> <sup>a</sup>	Italian thistle	Moderate	–	Observed throughout entire preserve associated with non-native grasslands and disturbed areas on alluvial terraces and in drainages. Common throughout the site.	Monitor
<i>Centaurea melitensis</i> <sup>a</sup>	toocalote	Moderate	–	Observed scattered throughout entire preserve associated with trails and disturbed areas.	Monitor
<i>Cynodon dactylon</i> <sup>b</sup>	Bermuda grass	Moderate	–	A few scattered locations.	Monitor

**TABLE 50**  
**INVASIVE NON-NATIVE PLANT SPECIES: WILDERNESS GARDENS COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
<i>Ehrharta</i> sp. <sup>b</sup>	veldt grass	Moderate	Medium ( <i>E. calycina</i> , and <i>longiflora</i> )	Observed in disturbed sandy soils with Puncture vine and Veldt Grass.	Treat
<i>Erodium botrys</i> <sup>a</sup>	filaree	Limited	–	Observed throughout the site. Most common in disturbed soils.	Monitor
<i>Eucalyptus</i> sp.	eucalyptus	Limited	–	Observed around Historic use areas and day use areas.	Monitor
<i>Festuca myuros</i> <sup>a</sup>	rattail sixweeks grass	Moderate	–	Common throughout floodplain.	Monitor
<i>Hirschfeldia incana</i> <sup>a</sup>	shortpod mustard	Moderate	–	Common throughout the site. Most common in disturbed soils along roads and trails.	Treat
<i>Hypochaeris glabra</i> <sup>a</sup>	smooth cat's-ear	Limited	–	Observed throughout the site. Most common in disturbed soils.	Monitor
<i>Hypochaeris radicata</i> <sup>a</sup>	rough cat's-ear	Moderate	–	Observed along the floodplain in open areas in Disturbed habitat and non-native grasslands throughout the site.	Monitor
<i>Lactuca seriola</i> <sup>b</sup>	prickly lettuce	–	–	Observed scattered around parking and day use areas and trailheads.	Treat
<i>Lythrum hyssopifolia</i> <sup>b</sup>	Hyssop loosestrife	Limited	–	A few individuals observed in riparian area	Treat
<i>Medicago polymorpha</i> <sup>b</sup>	California burclover	Limited	–	Observed along the edges of the Freshwater Marsh.	Remove
<i>Medicago sativa</i> <sup>b</sup>	alfalfa	–	–	Observed along the edges of the Freshwater Marsh.	Remove
<i>Nerium oleander</i>	oleander	–	–	Observed along road and within Non-native grasslands and historic use areas within the Preserve.	Monitor
<i>Nicotiana glauca</i>	tree tobacco	Moderate	–	Observed in canyons and within Coast Live Oak Woodlands along the edges of the San Luis Rey River.	Remove
<i>Olea europea</i>	olive	Limited	–	Observed adjacent to Freshwater marsh and is associated with Historic use areas within the Preserve.	Remove
<i>Pinus pinea</i> <sup>b</sup>	stone pine	–	–	In Disturbed areas with Rippgut grass dominated grassland	Monitor
<i>Raphanus sativus</i> <sup>b</sup>	radish	Limited	–	A few scattered locations in floodplain.	Monitor

**TABLE 50**  
**INVASIVE NON-NATIVE PLANT SPECIES: WILDERNESS GARDENS COUNTY PRESERVE**

Scientific Name	Common Name	Cal-IPC Ranking	San Diego County Regional Priority Ranking	Notes	Management Recommendation
<i>Ricinus communis</i> <sup>b</sup>	castor bean	Limited	–	Observed in disturbed drainage and man-made basins in the floodplain of the San Luis Rey River	Remove
<i>Rumex crispus</i> <sup>b</sup>	curly dock	Limited	–	A few scattered plants on shores of pond	Treat
<i>Salsola</i> sp. <sup>b</sup>	Russian thistle	Limited	–	Associated with Disturbed soils.	Treat
<i>Schinus molle</i>	Peruvian pepper tree	Limited	–	Observed along the edges of the Freshwater Marsh.	Remove
<i>Schinus terebinthifolia</i> <sup>b</sup>	Brazilian pepper tree	Moderate	–	Observed along the edges of the Freshwater Marsh.	Remove
<i>Stipa miliacea</i> var. <i>miliacea</i> <sup>b</sup>	smilo grass	Limited	–	Along San Luis Rey on edges of Riversidian Sage Scrub and rivered.	Treat
<i>Tamarisk ramosissima</i>	tamarisk	High	–	Along San Luis Rey on edges of Riversidian Sage Scrub and rivered.	Remove
<i>Tribulus terrestris</i> <sup>b</sup>	puncture vine	Limited	–	Observed in the Disturbed area adjacent to the Ranger Station	Treat

## NOTES:

<sup>a</sup> These species were detected within the preserve, but not mapped; species were found to be widespread throughout the preserve.

<sup>b</sup> These species were detected within the preserve, but not mapped.

Cal-IPC Ranking

High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited – These species are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Alert – An Alert is listed on species with High or Moderate impacts that have limited distribution in California, but may have the potential to spread much further.

Watch – These species have been assessed as posing a high risk of becoming invasive in the future in California.

San Diego County Regional Priority Ranking (Cal-IPC, Dendra, CBI 2012)

Very High – Level 1 Surveillance. Low effort required to achieve goal of regional surveillance, early detection, rapid response.

High – Level 2 Eradication. Moderate effort required to achieve goal of eradication with regionally coordinated control program.

Medium – Level 3 Containment. Funding typically available for re-treatments or control of small populations. Goal is eradication with coordinated programs by management unit or watershed.

Medium – Level 4 Directed Management. Area may be managed effectively, with slow re-invasion. Goal is to control within reserve or sub-management unit to benefit NCCP resources.

Low – Level 5 Directed Suppression. Control is typically of short-term benefit (rapid re-invasion) without active restoration. Goal is suppression, typically to allow recovery disturbed site, improve re-vegetation success, or benefit NCCP resources.

### 4.1.8.3 Incidental Special-Status Plant and Wildlife Species Observations

Three special-status plant species and five special-status wildlife species were incidentally detected and mapped during field surveys for Wilderness Gardens County Preserve (Table 51 and Appendix A, Figure 32).

**TABLE 51  
INCIDENTAL PLANT AND ANIMAL OBSERVATIONS: WILDERNESS GARDENS COUNTY PRESERVE**

Scientific Name	Common Name	State/Federal Status	San Diego County Special Status List	Draft North County MSCP Covered Species	California Rare Plant Rank	Notes
<b>Plants</b>						
<i>Juglans californica</i> ssp. <i>californica</i>	southern California black walnut	—/—	List D	—	4.2	Observed in a small group just off a trail adjacent to the Historic mill site.
<i>Quercus engelmannii</i>	Engelmann oak	—/—	List D	NC MSCP	—	Observed along the edge of the Upper Meadow associated with Coast Live Oak and grasslands in the western portion of the Preserve.
<i>Selaginella cinerascens</i>	ashy spike-moss	—/—	List D	—	4.1	Observed within the San Luis Rey floodplain in open areas in Riversidan Sage Scrub found on the northern edge of the Preserve.
<b>Animal</b>						
<i>Accipiter cooperii</i>	Cooper's hawk	—/—	Group 1	—	—	Observed perched on a snag in Southern Riparian Woodland in the western portion of the Preserve.
<i>Buteo linearis</i>	red-shouldered hawk	—/—	Group 1	—	—	Observed (visual and auditory) in Southern Riparian Woodland along San Luis Rey River tributary along the base of the cliffs towards the western portion of the Preserve.
<i>Cathartes aura</i>	turkey vulture	—/—	Group 1	—	—	Observed flying overhead throughout the Preserve.
<i>Mustela frenata</i>	California long-tailed weasel	—/—	—	—	—	Observed moving through live oak woodland understory along a well-worn trail.

**TABLE 51**  
**INCIDENTAL PLANT AND ANIMAL OBSERVATIONS: WILDERNESS GARDENS COUNTY PRESERVE**

Scientific Name	Common Name	State/Federal Status	San Diego County Special Status List	Draft North County MSCP Covered Species	California Rare Plant Rank	Notes
<i>Odocoileus hemionus fuliginata</i>	southern mule deer	—/—	Group 2	—	—	Observed (family group and individual) foraging in Open Coast Live Oak Woodlands along the San Luis Rey River in the northeastern portion of the Preserve. Scat and other evidence was also observed in the Oak Woodlands.

## NOTES:

State/Federal Status

FE – Federally Endangered

FT – Federally Threatened

CE – California Endangered

CT – California Threatened

SSC – CDFW Species Special Concern

San Diego County Special Status List

LIST A (Plants rare, threatened or endangered in California and elsewhere)

LIST B (Plants rare, threatened or endangered in California but more common elsewhere)

LIST C (Plants that may be quite rare, but need more information to determine their true rarity status)

LIST D (Plants of limited distribution and are uncommon, but not presently rare or endangered)

CA rare (rare in California, but not listed)

NE (MSCP Narrow Endemic)

California Rare Plant Rank

1A – Plants presumed extirpated in California and either rare or extinct elsewhere

1B – Plants rare, threatened, or endangered in California and elsewhere

2A – Plants presumed extirpated in California but common elsewhere

2B – Plants rare, threatened, or endangered in California but more common elsewhere

3 – Review List: Plants about which more information is needed

4 – Watch List: Plants of limited distribution

0.1 – Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

0.2 – Moderately threatened in California (20%–80% occurrences threatened / moderate degree and immediacy of threat)

0.3 – Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

Other

Unk – Unknown due to timing of survey and life stage of individual

#### 4.1.8.4 Habitat Condition and Threats Assessment

##### *Threat Assessment*

Based on the field surveys, biologists took note of any major issues that could pose a threat to the vegetation communities within Wilderness Gardens County Preserve. A list of primary threats identified in the IMG protocol is presented in **Table 52** along with a discussion of the severity of each threat within the preserve (presented as the extent within the preserve on a scale of 1 to 7).

**TABLE 52**  
**THREATS OVERVIEW: WILDERNESS GARDENS COUNTY PRESERVE**

Disturbances/Stressors	Severity (Extent)	Discussion
Invasive non-native plant species (e.g., annual grasses and herbs)	5	The floodplain terrace section of the preserve once was the site of a mill operation and contains large areas where the natural vegetation was converted to cleared land or planted with ornamental trees and shrubs. This area hosts the densest occurrences of invasive species. Other areas in the floodplain terrace that are not covered in chaparral contain the second highest densities of invasive plants. Lastly the mountainous section of the preserve (approx. 70% of total area) is generally covered in thick chaparral or woodlands and contains the least quantity of invasive non-native plant species due to the dense canopy of the native shrubs or trees and lacks the light needed for annual invasive species to exist. However, the drier slopes (approx. 10% of the mountainous section) have a less contiguous shrub cover and invasive species do occupy the open ground between shrubs.
Altered fire regime or risk of catastrophic fire	7	The preserve can be divided into two sectors, a mountainous area (70%) and a floodplain terrace (30%). As mentioned above, the mountainous area has a dense cover of chaparral and woodlands and therefore contains high quantities of fuel that would most likely result in a catastrophic fire. The floodplain terrace area does not accommodate as dense of fuels as the mountainous area, but its high density of annual invasive species, which become very dry in late summer, would certainly create the conditions for a catastrophic fire. The area surrounding the San Luis Rey River contains open gravelly soils with low vegetation cover and therefore does not exhibit the conditions for catastrophic fire due to lack of fuels.
Unauthorized human use (e.g., off-road vehicles, encampments, unauthorized trails, shooting, poaching, and/or dumping)	3	No signs of unauthorized use were observed. The preserve has a timed gate (opening at 7 a.m. and closing at 4 p.m.) and the trail system is patrolled daily by several rangers. The only boundary providing public access is the northeastern border, which is paralleled by state route 76. Accessing the park from here would not be possible due to cliffs that rise above the San Luis Rey River to heights of over 100 feet. The rest of the perimeter of the preserve is surrounded by unaltered natural properties.
Shothole borer, gold-spotted oak borer, and Fusarium fungal invasion	–	Site was not assessed for invasive insect species or fungi. Limited amounts of host species present for shothole borer, gold-spotted oak borer, or Fusarium dieback.
Erosion	3	Erosion was observed on the steep cliffs directly below SR 76 on the north side of the Preserve. This area is sparsely vegetated and shows signs of significant erosion with debris falling several feet into the San Luis Rey floodplain. Erosion was also observed along the river bank west of the parking area. This area is susceptible to bank collapse during heavy flow or large storm events.
Small, isolated occurrences vulnerable to loss of genetic diversity and to extirpation due to environmental stochasticity or catastrophic disturbance.	–	Not observed.
Altered hydrology (e.g., urban runoff, flood control facilities)	3	The San Luis Rey River runs east to west through the preserve. A concrete Arizona crossing was installed where the access road intersects the riverbed, which can increase the flow velocity during flood events. Portions of the floodplain and terraces are developed or are adjacent to disturbed and developed areas, which can alter how water enters the system during storm events.
Herbivory (e.g., seed, vegetation)	1	Not observed.
Detrimental edge effects from adjacent urban development	1	The preserve does not share its borders with urban development therefore no detrimental edge effects could occur.

**TABLE 52**  
**THREATS OVERVIEW: WILDERNESS GARDENS COUNTY PRESERVE**

Disturbances/Stressors	Severity (Extent)	Discussion
NOTES:		
<u>Disturbance Categories within Preserve</u>		
1 – No sign of disturbance within preserve		
2 – Disturbance does not occur within preserve, but is detected adjacent to preserve boundaries		
3 – Disturbance occurs in >0% to <10% of preserve		
4 – Disturbance occurs in 10 to <25% of preserve		
5 – Disturbance occurs in 25 to <50% of preserve		
6 – Disturbance occurs in 50 to <75% of preserve		
7 – Disturbance occurs in ≥ 75% of preserve		

### ***Type Conversion***

In order to detect potential type conversions within the preserve, Holland-Oberbauer vegetation mapping was used to compare the acreage of each habitat type that was previously mapped with the current acreage by habitat type (**Table 53**). It should be noted that the preserve acquired a new rectangular parcel since the last time the preserve was mapped, which will appear as an overall increase in several habitat types and acreage.

The last fire that burned 715 acres of the preserve occurred in 1953, indicating that the vegetation consists of old growth, as is particularly evident in the dense chaparral and scrub oak habitats located within the mountainside on the southern half of the preserve. However, there was a 190.79-acre decrease in chaparral habitat type cover since 2009. This is likely due to the advanced aerial imagery mapping that was used to map this mountainous habitat, which was not easily accessed by foot. Several large portions of this habitat were re-classified from chaparral to shrub, woodlands, or forest. This is evident by the 99.28-acre increase in woodland habitat type, as well as the 134.19-acre increase in scrub habitat type (which is also due to the additional scrub habitat within the parcel that was acquired). The 24.30-acre decrease in disturbed habitat type is likely due to different mapping methodologies and increased cover of coast live oak to classify as woodland rather than non-native grassland.

**TABLE 53**  
**TYPE CONVERSION ASSESSMENT BASED ON HOLLAND-OBERBAUER MAPPING:**  
**WILDERNESS GARDENS COUNTY PRESERVE**

Habitat Type	Acres in 2009	Acres in 2021	Difference in Acreage
Developed	19.97	2.87	-17.10
Disturbed	48.03	23.73	-24.30
Herbaceous	1.83	3.97	2.14
Scrub	38.08	172.27	134.19
Chaparral	515.51	324.72	-190.79
Woodland	103.11	202.39	99.28
Forest	2.12	4.73	2.61
Riparian	2.70	15.12	12.42
Unvegetated (water)	1.05	0	-1.05

### 4.1.8.5 Adaptive Management Recommendations

Adaptive management recommendations were developed for Wilderness Gardens County Preserve based on the general habitat condition and threats assessment conducted during habitat mapping. Recommendations are provided for invasive non-native plant species management, habitat enhancement/restoration opportunities, encroachment, and monitoring. Recommendations are detailed in the following subsections.

#### ***Invasive Non-Native Plant Species Management***

As discussed in the invasive non-native plant observations section, several invasive non-native plant species were detected within the preserve. A recommended action was identified for each species consisting of either removal, treatment, or monitoring. Final implementation of management activities and treatment methods shall be determined by the County based on priority.

#### ***Habitat Enhancement/Restoration Opportunities***

- **California walnut trees.** California walnut fruit should be collected and trees grown for enhancement of the existing population. Thatch removal under the California walnut trees is recommended to help promote seedling germination.
- **Rare plants.** The preserve contained several sensitive plant species, which would benefit from comprehensive mapping to determine management/restoration opportunities. Focused rare plant surveys are recommended to capture areas ideally suited for habitat enhancement and restoration, and those areas that may be extirpated by invasive species. This could be accomplished through collaboration with SDMMP.

#### ***Encroachment***

- **Access control.** No signs of unauthorized use were observed. The Wilderness Gardens County Preserve has a timed gate (opening at 7 a.m. and closing at 4 p.m.) and is the only public access entrance. A private inholding is located along the entrance road (Bodie Boulevard with the preserve secured by a chain barrier across the driveway and provides no public access. SR 76 runs along the northeast border inhibiting public access from the north. The existing roads are primarily accessed for utility easement and park maintenance purposes. It is recommended that these gates are regularly monitored to ensure the preserve stays protected from unauthorized use.

#### ***Monitoring***

- **Invasive non-native plants.** Invasive non-native plant species mapping should be conducted annually, if feasible, to inform treatment areas, assess new invasions or re-invasions, and determine effectiveness of treatments.
- **Tree pests.** Oak trees, western sycamore, and walnuts should be monitored for pests and treated as soon as feasible to help prevent further spread in the Wilderness Gardens County Preserve and to protect the existing stands.
- **Catastrophic events.** Additional vegetation mapping efforts may be conducted as needed following catastrophic events such as wildfires.

## 4.2 Rare Plant Monitoring

Rare plant monitoring was conducted on 32 permanent monitoring plots at 10 preserves in 2021. Rare plant monitoring consisted of one San Diego thornmint monitoring plot at Simon County

Preserve; eleven San Diego thornmint monitoring plots in Sycamore Canyon/Goodan Ranch County Preserve; two Orcutt's bird's-beak monitoring plots at Tijuana River Valley Regional Park; one Otay tarplant monitoring plot at Furby-North Preserve; two Lakeside ceanothus monitoring plots at Boulder Oaks Preserve; two Lakeside ceanothus monitoring plots at El Capitan County Preserve; one Lakeside ceanothus monitoring plot at Oakoasis County Preserve; one Lakeside ceanothus monitoring plot at Louis A. Stelzer County Park; three willowy monardella monitoring plots at Sycamore Canyon/Goodan Ranch County Preserve; three Encinitas baccharis monitoring plots at Del Dios Highlands County Preserve; two San Miguel savory monitoring plots in Boulder Oaks County Preserve; two variegated dudleya monitoring plots at Sycamore Canyon/Goodan Ranch County Preserve; and one variegated dudleya monitoring plot at Lusardi Creek County Preserve.

A summary of the monitoring plots, monitoring results, and management recommendations are provided in **Table 54**. Photographic monitoring and representative photographs of the monitored plots are provided in **Appendix B**. MSP Rare Plant Occurrence Monitoring Forms, which include Rare Plant Habitat and Threats Assessments, are located in **Appendix C**.

## 4.2.1 San Diego Thornmint

### 4.2.1.1 Simon County Preserve

Soil Data Collection Forms for the three soil test locations at Simon County Preserve are provided in **Appendix D**. The three soil test locations are also depicted on **Figure 2**.

The one monitoring plot previously established within the San Diego thornmint population in Simon County Preserve was monitored by ESA in 2021. A total of 1,105 San Diego thornmint plants were detected within the monitoring plot. The entire population of San Diego thornmint within Simon County Preserve in 2021 is estimated to be approximately 1,158 plants. The location of the monitoring plot, center point, photo point, and maximum extent of the San Diego thornmint population is shown in **Figure 2**. Photo monitoring and representative photographs are shown in Appendix B. Additional special-status species, such as Palmer's grappling hook and turkey vulture (*Cathartes aura*), were observed within the monitoring plot. The San Diego thornmint habitat contained invasive non-native grasses and herbs, particularly foxtail brome (*Bromus madritensis* ssp. *Rubens*) and tocalote.

#### **Monitoring Plot Number ACIL\_4SIPR026\_1**

Monitoring plot ACIL\_4SIPR026\_1 is located in the central portion of the San Diego thornmint population. A total of approximately 1,105 San Diego thornmint plants were estimated to be within the monitoring plot; over 75 percent were vegetative, the remaining were flowering. Total vegetative cover within the plot was 25.8 percent, with 21.8 percent native cover and 4 percent non-native plant cover.<sup>10</sup> The dominant native plant species within the monitoring plot was mission manzanita. Invasive non-native plant species included slender wild oat, soft brome, foxtail brome, tocalote, longbeak stork's bill (*Erodium botrys*), foothill filaree (*Erodium brachycarpum*), rattail sixweeks grass, shortpod mustard, smooth cat's ear, narrowleaf cottonrose, common groundsel (*Senecio vulgaris*), and spiny sowthistle (*Sonchus asper*). Additional special-status plant species detected within the plot were Palmer's grappling hook and turkey vulture.

<sup>10</sup> Non-native plant cover includes invasive plant species.

**TABLE 54**  
**MSP 2021 RARE PLANT MONITORING SUMMARY**

Species	Preserve	Plot #; MSP Occurrence ID <sup>a</sup>	Center Point Coordinates	Population		Native Plant Cover		Non-Native Plant Cover <sup>b</sup>		Management Recommendations
				# individuals	% cover	# species	% cover	# species	% cover	
San Diego thormint <i>Acanthomintha ilicifolia</i>	Simon	– ACIL_4SIPR026_1	E 516451 N 3654129	1,105	1.0	12	21.8	12	4.0	Continue IMG monitoring of population. Conduct management of invasive non-native grasses and forbs. Avoid trampling.
San Diego thormint <i>Acanthomintha ilicifolia</i>	Sycamore Canyon/Goodan Ranch	SYGOACIL01 ACIL_4SYCA027_1	E 501592 N 3644272	529	1.0	17	12.0	8	11.0	Continue IMG monitoring of population. Conduct management of invasive non-native grasses and forbs, particularly purple false brome and tocalote. Conduct thatch removal. Monitor for gopher activity and implement management control as needed. Avoid trampling.
		SYGOACIL02 ACIL_4SYCA027_2	E 501522 N 3644277	191	0.2	11	8.4	9	15.2	
		SYGOACIL03 ACIL_4SYCA027_3	E 501546 N 3644380	170	0.2	15	21.6	9	4.4	
		SYGOACIL04 ACIL_4SYCA027_4	E 502555 N 3643683	60	0.2	13	12.4	5	56.4	
		SYGOACIL05 ACIL_4SYCA027_5	E 502915 N 3643523	159	1.0	21	35.2 <sup>c</sup>	5	32.6	
		SYGOACIL06 ACIL_4SYCA027_6	E 502252 N 3644084	1,073	1.0	18	44.6 <sup>d</sup>	6	4.4	
		SYGOACIL07 ACIL_4SYCA027_7	E 502375 N 3644068	524	1.0	11	21.8	5	55.8	
		SYGOACIL08 ACIL_4SYCA027_8	E 502267 N 3644249	700	1.0	13	10.2	4	11.4	
		SYGOACIL09 ACIL_4SYCA027_9	E 501735 N 3644404	281	1.0	15	19.2	8	12.2 <sup>e</sup>	
		SYGOACIL10 ACIL_4SYCA027_10	E 501927 N 3644370	250	2.0	15	21.6	4	1.6	

**TABLE 54**  
**MSP 2021 RARE PLANT MONITORING SUMMARY**

Species	Preserve	Plot #; MSP Occurrence ID <sup>a</sup>	Center Point Coordinates	Population		Native Plant Cover		Non-Native Plant Cover <sup>b</sup>		Management Recommendations
				# individuals	% cover	# species	% cover	# species	% cover	
		SYGOACIL11 ACIL_4SYCA027_11	E 502683 N 3643722	0	0.0	16	20	7	64.8	
Orcutt's bird's-beak <i>Dicranostegia orcuttiana</i>	Tijuana River Valley Regional Park	– COOR7_1SMGU006_1	E 491709 N 3600493	5	0.2	20	61.6 <sup>f</sup>	5	7.4	Continue IMG monitoring of population. Conduct management of invasive non-native grasses and forbs, particularly foxtail brome ( <i>Bromus madritensis</i> ssp. <i>Rubens</i> ) and mustards ( <i>Brassica tournefortii</i> , <i>Hirschfeldia incana</i> ). Apply vertical mulch to redirect foot traffic away from Orcutt's bird's-beak locations.
		– COOR7_1TIRI009_1	E 490646 N 3600256	38	0.2	27	54.2	11	8.6 <sup>g</sup>	
Otay tarplant <i>Deinandra conjugens</i>	Furby-North	– DECO13_3OMEA026_1	E 496809 N 3602882	1	0.2	12	21.4 <sup>h</sup>	9	25.0	Continue IMG monitoring of population. Continue management of thatch and invasive non-native grasses and forbs, particularly Italian rye grass and crown daisy. If Otay tarplant numbers continue to be low, seed collection and seeding efforts should be implemented to enhance the Furby-North Preserve population.
Lakeside ceanothus <i>Ceanothus cyaneus</i>	Boulder Oaks	BO201501 CECY_4BOPR004_1	E 506845 N 3645998	24	12.0	27	58.6	9	2.6	Continue IMG monitoring of population. Conduct invasive non-native plant treatment to remove crimson fountaingrass ( <i>Pennisetum setaceum</i> ) occurrences within BO201501. Consider seed collection or prescribed fire to augment the population and diversify the age structure at Boulder Oaks County Preserve.
		BO201502 CECY_4BOPR004_2	E 506960 N 3645905	17	8.0	19	60.8	3	0.6	

**TABLE 54**  
**MSP 2021 RARE PLANT MONITORING SUMMARY**

Species	Preserve	Plot #; MSP Occurrence ID <sup>a</sup>	Center Point Coordinates	Population		Native Plant Cover		Non-Native Plant Cover <sup>b</sup>		Management Recommendations
				# individuals	% cover	# species	% cover	# species	% cover	
Lakeside ceanothus <i>Ceanothus cyaneus</i>	El Capitan	EC201502 CECY_4ELCA002_1	E 511938	11	4.0	30	81.8 <sup>i</sup>	4	0.8	Continue IMG monitoring of population. Conduct invasive non-native plant treatment to remove crimson fountaingrass. Implement erosion control measures for EC201502. Consider seed collection or prescribed fire to augment the population and diversify the age structure at El Capitan County Preserve.
			N 3641389							
		EC201501 CECY_4ELCA003_1	E 514279	12	7.0	25	74.4 <sup>j</sup>	2	5.4	
			N 3641648							
Lakeside ceanothus <i>Ceanothus cyaneus</i>	Oakoasis	OO201501 CECY_4OAKO001_1	E 509721 N 3641854	3	3.0	23	65.2 <sup>k</sup>	4	5.6 <sup>k</sup>	Continue IMG monitoring of population. Conduct invasive non-native plant treatment to remove natal grass and crimson fountaingrass. Consider seed collection or prescribed fire to augment the population and diversify the age structure at Oakoasis County Preserve.
Lakeside ceanothus <i>Ceanothus cyaneus</i>	Louis A. Stelzer	STZ201501 CECY_4STEL005_1	E 508350 N 3638428	4	5.0	21	57.0 <sup>l</sup>	11	12.6 <sup>l</sup>	Continue IMG monitoring of population. Conduct invasive non-native plant treatment for grasses and herbs, particularly soft brome ( <i>Bromus hordeaceus</i> ), stork's bill ( <i>Erodium</i> spp.), and rattail sixweeks grass ( <i>Festuca myuros</i> ). Consider seed collection or prescribed fire to augment the population and diversify the age structure at Louis A. Stelzer County Park.

**TABLE 54**  
**MSP 2021 RARE PLANT MONITORING SUMMARY**

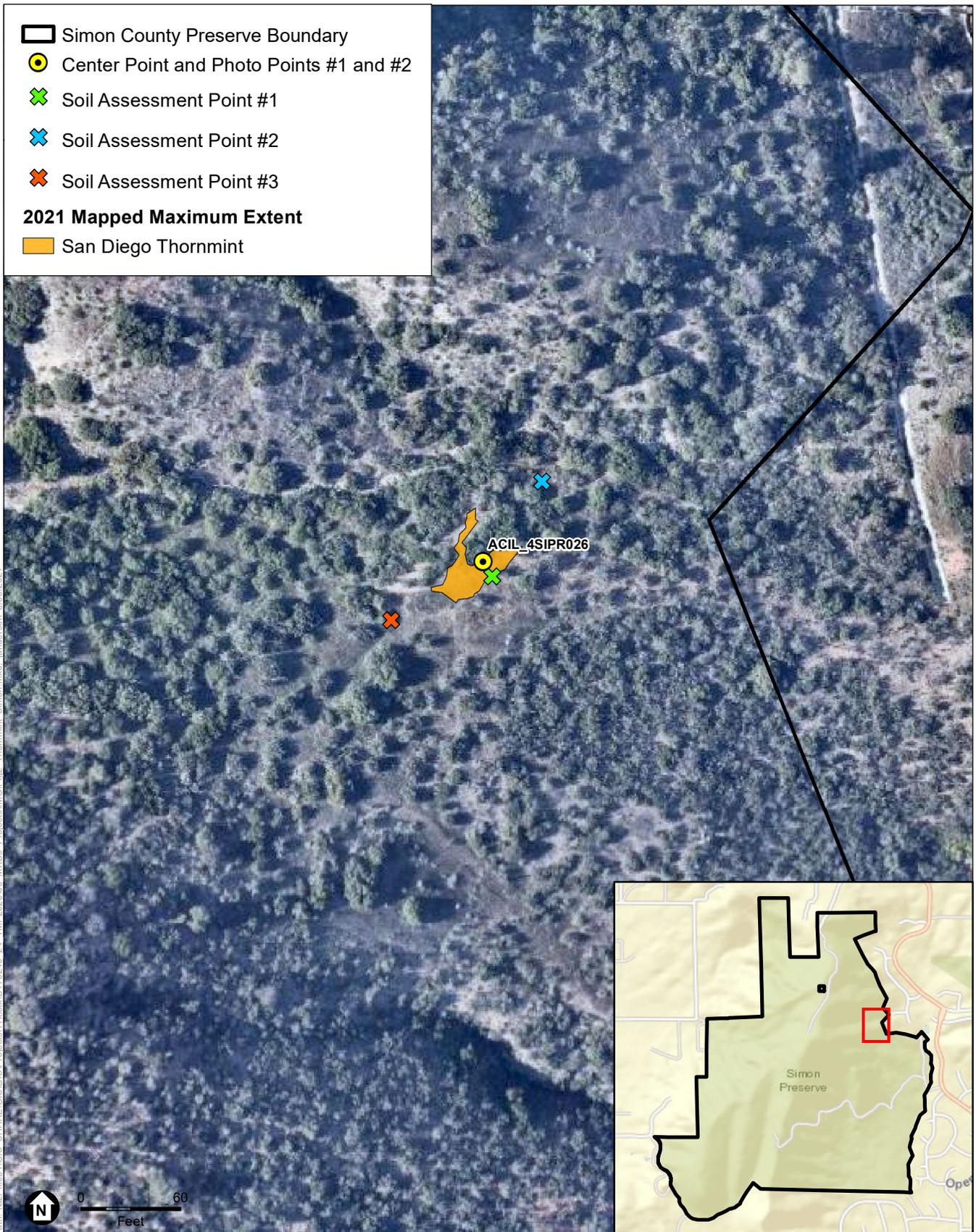
Species	Preserve	Plot #; MSP Occurrence ID <sup>a</sup>	Center Point Coordinates	Population		Native Plant Cover		Non-Native Plant Cover <sup>b</sup>		Management Recommendations
				# individuals	% cover	# species	% cover	# species	% cover	
Willow monardella <i>Monardella</i> <i>viminea</i>	Sycamore Canyon/Goodan Ranch	SYC201501 MOLIV_4SYCA006_1	E 502412	50	3.0	17	19.2 <sup>m</sup>	8	9.4 <sup>m</sup>	Continue IMG monitoring of population. Conduct invasive non-native plant treatment for grasses and herbs, particularly oat ( <i>Avena</i> spp.), purple false brome, brome ( <i>Bromus</i> spp.), and annual fescue immediately surrounding willow monardella per the TMP. Trimming of California buckwheat within SYC201602 can be considered to reduce potential native competition to willow monardella plants.
			N 3642218							
		SYC201602 MOLIV_4SYCA002_1	E 501045	3	0.2	8	11.8	10	7.2 <sup>n</sup>	
N 3642551										
SYC202103 MOLIV_4SPCA006_2	E 501657 N 3640638	4	0.2	14	19.0 <sup>o</sup>	11	8.6 <sup>o</sup>			
Encinitas baccharis <i>Baccharis</i> <i>vanessae</i>	Del Dios Highlands	DD201501 BAVA3_6DDHP004_1	E 488075	4	0.2	21	66.8	1	0.2	
			N 3658452							
		DD201502 BAVA3_6DDHP004_2	E 488143	4	2.0	14	74.0	0	0.0	
			N 3658472							
		DD201503 BAVA3_6DDHP004_3	E 488033	38	3.0	15	68.0	0	0.0	
			N 3658465							
San Miguel savory <i>Clinopodium</i> <i>chandleri</i>	Boulder Oaks	BOCLCH01 CLCH5_4BOPR002_1	E 505067	30	2.0	24	66.0 <sup>p</sup>	3	0.6	Continue IMG monitoring of population and conducting invasive non-native plant treatment for grasses and herbs, particularly perennial veldtgrass ( <i>Ehrharta calycina</i> ) and annual fescue. Avoid trampling and excessive walking on slope.
			N 3646951							
		BOCLCH02 CLCH5_4BOPR002_2	E 505422	45	1.0	25	71.2 <sup>q</sup>	5	1.8	
			N 3647075							
Variegated dudleya <i>Dudleya</i> <i>variegata</i>	Sycamore Canyon/Goodan Ranch	SYGODUVA01 DUVA_4SYCA019_1	E 52936	205	1.0	20	35.0 <sup>r</sup>	4	30.6	Continue IMG monitoring of population. Conduct invasive non-native plant treatment for grasses and herbs, particularly purple false brome. Monitor for changes in herbivory and gopher presence.
			N 3643516							
		SYGODUVA02 DUVA_4SYCA019_2	E 502891	568	1.0	23	27.6	5	40.4	
			N 3643611							

**TABLE 54**  
**MSP 2021 RARE PLANT MONITORING SUMMARY**

Species	Preserve	Plot #; MSP Occurrence ID <sup>a</sup>	Center Point Coordinates	Population		Native Plant Cover		Non-Native Plant Cover <sup>b</sup>		Management Recommendations
				# individuals	% cover	# species	% cover	# species	% cover	
Variegated dudleya <i>Dudleya variegata</i>	Lusardi Creek	LCDUVA01 DUVA_6LUCR023_1	E 484873 N 3652555	0	0.0	11	31.0	5	12.8	Continue IMG monitoring of population. Continue conducting thatch removal and invasive non-native plant treatment for grasses and herbs, particularly purple false brome. Inspect herbivory fencing and document any changes in herbivory presence.

## NOTES:

- <sup>a</sup> Plot # code was assigned during plot establishment by the establishing plot biologist and is used throughout this report when available. However, some monitoring plots do not have a plot # code associated with them as the establishing plot biologist used only the MSP occurrence ID (assigned by SDMMMP) to establish and document the plot. In these instances, the MSP occurrence ID is used throughout this report.
- <sup>b</sup> Non-native plant cover calculation includes invasive non-native plant species.
- <sup>c</sup> *Calochortus* spp., *Galium* spp., and *Stipa* spp. Were detected at 0.2 percent each and were categorized as native during vegetation cover calculations.
- <sup>d</sup> *Cryptantha* spp. Was detected at 0.2 percent and was categorized as native during vegetation cover calculations.
- <sup>e</sup> *Erodium* spp. Was detected at 0.2 percent and was categorized as non-native during vegetation cover calculations.
- <sup>f</sup> *Acmispon* spp. And *Cryptantha* spp. Were detected at 0.2 percent each and were categorized as native during vegetation cover calculations.
- <sup>g</sup> *Avena* spp. Was detected at 0.2 percent and was categorized as non-native during vegetation cover calculations.
- <sup>h</sup> *Allium* sp. Was detected at 0.2 percent and was categorized as native during vegetation cover calculations.
- <sup>i</sup> *Cuscuta* spp. And *Delphinium* sp. Was detected at 0.2 percent each and was categorized as native during vegetation cover calculations.
- <sup>j</sup> *Calochortus* spp. Was detected at 0.2 percent and was categorized as native during vegetation cover calculations.
- <sup>k</sup> *Avena* spp. Was detected at 0.2 percent and was categorized as non-native during vegetation cover calculations; *Stipa* spp. Was detected at 0.2 percent and was categorized as native during vegetation cover calculations.
- <sup>l</sup> *Avena* spp. Was detected at 0.2 percent and *Erodium* spp. Was detected at 2.0 percent and was categorized as non-native during vegetation cover calculations; *Clarkia* spp. And *Clematis* sp. Were both detected at 0.2 percent and were categorized as native during vegetation cover calculations.
- <sup>m</sup> *Erodium* spp. Was detected at 2.0 percent and was categorized as non-native during vegetation cover calculations; *Galium* spp. And *Cirsium* sp. Were both detected at 0.2 percent and were categorized as native during vegetation cover calculations.
- <sup>n</sup> *Erodium* spp. Was detected at 0.2 percent and was categorized as non-native during vegetation cover calculations.
- <sup>o</sup> *Erodium* spp. Was detected at 2.0 percent and was categorized as non-native during vegetation cover calculations; *Cuscuta* spp. Was detected at 0.2 percent and was categorized as native during vegetation cover calculations.
- <sup>p</sup> *Calochortus* spp. And *Gilia* sp. Were both detected at 0.2 percent and were categorized as native during vegetation cover calculations.
- <sup>q</sup> *Calochortus* spp. Was detected at 0.2 percent and was categorized as native during vegetation cover calculations.
- <sup>r</sup> *Lepidium* spp. Was detected at 0.2 percent and was categorized as native during vegetation cover calculations.



SOURCE: Nearmap, 4/18/2021.

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**Figure 2**  
 San Diego Thornmint Soil Test Locations and Monitoring Results  
 Simon County Preserve



### **Adaptive Management Recommendations**

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). Although non-native cover was 4 percent within the monitoring plot, on-site observations demonstrated the non-native cover adjacent to the monitoring plot to be higher, with increased percentages of invasive non-native brome grasses and tocalote. To ensure the persistence of San Diego thornmint at Simon County Preserve, invasive non-native plant control, particularly for purple false brome (currently not observed within the monitoring plot but observed within the maximum extent), brome grasses and tocalote, should be implemented by a qualified restoration specialist. The area should be walked in its entirety and hand-weeding should take place as needed. Care should be taken when management or monitoring is performed to not trample San Diego thornmint plants. Seed collection (e.g., collecting less than 10 percent of the total available seed in any given year, cleaning, and drying for short-term storage) should be considered to augment the on-site population. Seeding efforts can be implemented after invasive non-native plant management activities to support recolonization of these areas.

#### **4.2.1.2 Sycamore Canyon/Goodan Ranch County Preserve**

The 11 monitoring plots previously established within the San Diego thornmint population in Sycamore Canyon/Goodan Ranch County Preserve were monitored by ESA in 2021. A total of 3,937 San Diego thornmint plants were detected within the monitoring plots. The entire population of San Diego thornmint within Sycamore Canyon County Preserve in 2021 is estimated to be approximately 12,990 plants. The location of the monitoring plots, center points, photo points, and maximum extent of the San Diego thornmint is shown in **Figure 3**. Photo monitoring and representative photographs are shown in Appendix B. Incidentally observed special-status plant species include small-flowered bindweed (*Convolvulus simulans*) at 8 monitoring plots, and Palmer's grappling hook at 9 of the 11 monitoring plots. Incidental special-status wildlife species observed within or between monitoring plots included southern mule deer (*Odocoileus hemionus fuliginatus*) scat. Across all 11 monitoring plots, San Diego thornmint habitat contained invasive non-native grasses and herbs, particularly purple false brome and tocalote.

##### **Monitoring Plot Number SYGOACIL01**

Monitoring plot SYGOACIL01 is located in the northwestern portion of the San Diego thornmint population. A total of 529 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 23.0 percent, with 12.0 percent native cover and 11.0 percent non-native plant cover. The dominant native plant species within the monitoring plot was clustered tarweed. Invasive non-native plant species included purple false brome, foxtail brome, longbeak stork's bill, redstem stork's bill, annual fescue, narrowleaf cottonrose, scarlet pimpernel (*Lysimachia arvensis*), and spiny sowthistle. Additional special-status plant species detected within the plot were 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 25 San Diego thornmint plants were detected within the monitoring plot;

over 75 percent were in flower, the remaining were fruiting. Total vegetative cover within the plot was 23.6 percent, with 8.4 percent native cover and 15.2 percent non-native plant cover. The dominant native plant species within the monitoring plot were silver puffs and clustered tarweed. Invasive non-native plant species included slender oat, purple false brome, soft brome, foxtail brome, tocalote, longbeak stork's bill, redstem stork's bill, annual fescue, and spiny sowthistle. Additional special-status plant species detected within the plot included Palmer's grappling hook.

### **Monitoring Plot Number SYGOACIL03**

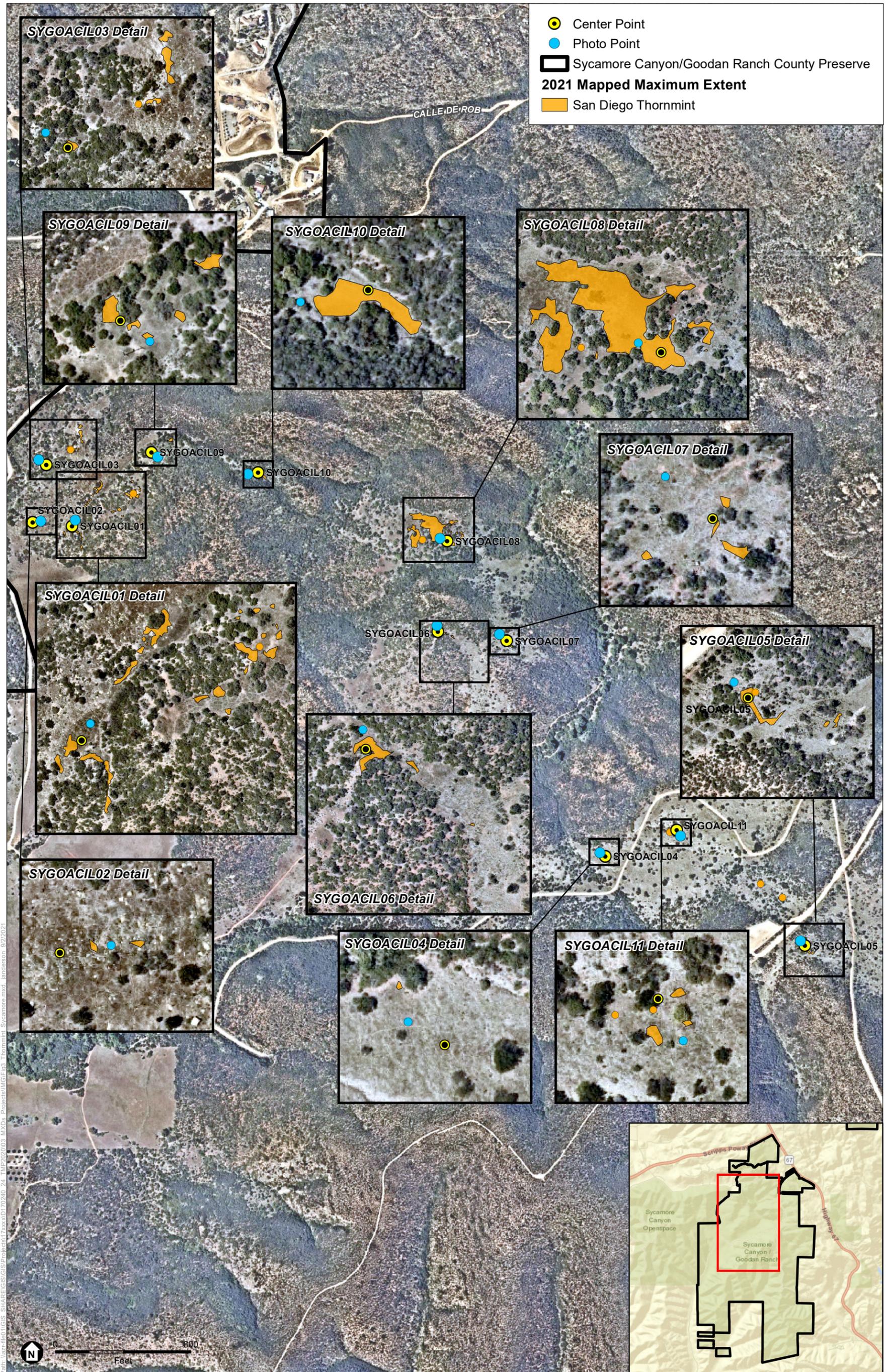
Monitoring plot SYGOACIL03 is located in the northwestern portion of the San Diego thornmint population. A total of 170 San Diego thornmint plants were detected within the monitoring plot; over 75 percent were in flower, the remaining were vegetative. Total vegetative cover within the plot was 26.0 percent, with 21.6 percent native cover and 4.4 percent non-native plant cover. The dominant native plant species within the monitoring plot were laurel sumac and black sage. Invasive non-native plant species included slender oat, purple false brome, soft brome, foxtail brome, tocalote, annual fescue, narrowleaf cottonrose, scarlet pimpernel, and spiny sowthistle. Palmer's grappling hook was the only additional special-status plant species detected within the plot.

### **Monitoring Plot Number SYGOACIL04**

Monitoring plot SYGOACIL04 is located in the southeastern portion of the San Diego thornmint population. A total of 60 San Diego thornmint plants were detected within the monitoring plot; 25 to 50 percent were in flower; the remaining were vegetative. Total vegetative cover within the plot was 68.8 percent, with 12.4 percent native cover and 56.4 percent plant cover. The dominant native plant species within the monitoring plot was spiny redberry. Invasive non-native plants included purple false brome, shortpod mustard, smooth cat's ear, Dyer's mignonette (*Reseda luteola*), and common sowthistle (*Sonchus oleraceus*). Additional special-status plant species detected within the plot were small-flower bindweed and Palmer's grappling hook.

### **Monitoring Plot Number SYGOACIL05**

Monitoring plot SYGOACIL05 is located in the southeastern portion of the San Diego thornmint population. A total of 159 San Diego thornmint plants were detected to be within the monitoring plot; 25 to 50 percent were in flower, 25 to 50 percent were vegetative, and the remaining were fruiting. Total vegetative cover within the plot was 67.8 percent, with 35.2 percent native cover and 32.6 percent non-native plant cover. The dominant native plant species within the monitoring plot was Mission manzanita. Invasive non-native plant species included purple false brome, soft brome, tocalote, redstem stork's bill, and scarlet pimpernel. Additional special-status plant species detected within the plot were small-flower bindweed and Palmer's grappling hook.



SOURCE: Nearmap, 4/18/2021.

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**Figure 3**  
San Diego Thornmint Monitoring Results  
Sycamore Canyon/Goodan Ranch County Preserve

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**Monitoring Plot Number SYGOACIL06**

Monitoring plot SYGOACIL06 is located in the central-northern portion of the San Diego thornmint population. A total of approximately 1,073 San Diego thornmint plants were estimated to be within the monitoring plot; 50 to 75 percent were vegetative, 10 to 25 percent were flowering, and 0 to 10 percent were fruiting. Total vegetative cover within the plot was 49.0 percent, with 44.6 percent native cover and 4.4 percent non-native cover. The dominant native plant species within the monitoring plot were black sage and laurel sumac. Invasive non-native plants included purple false brome, soft brome, tocalote, scarlet pimpernel, spiny sowthistle, and common sowthistle. Additional special-status plant species detected within the plot were small-flower bindweed and Palmer's grappling hook.

**Monitoring Plot Number SYGOACIL07**

Monitoring plot SYGOACIL07 is located in the central-northern portion of the San Diego thornmint population. A total of 524 San Diego thornmint plants were detected within the monitoring plot; 50 to 75 percent were vegetative, 25 to 50 percent were flowering, and 0 to 10 percent were fruiting. Total vegetative cover within the plot was 77.6 percent, with 21.8 percent native cover and 55.8 percent non-native cover. The dominant native plant species within the monitoring plot was laurel sumac and spiny redberry. Invasive non-native plant species included purple false brome, foxtail brome, narrowleaf cottonrose, scarlet pimpernel, and spiny sowthistle. Additional special-status plant species detected within the plot were small-flower bindweed and Palmer's grappling hook.

**Monitoring Plot Number SYGOACIL08**

Monitoring plot SYGOACIL08 is located in the central-northern portion of the San Diego thornmint population. A total of approximately 700 San Diego thornmint plants were estimated to be within the monitoring plot; over 75 percent were in flower, the remaining were vegetative – but 25 to 50 percent of all plants showed potential sign of stunted growth. Total vegetative cover within the plot was 21.6 percent, with 10.2 percent native cover and 11.4 percent non-native cover. The dominant native plant species within the monitoring plot was lemonade berry. Invasive non-native plant species included purple false brome, soft brome, tocalote, and scarlet pimpernel. Additional special-status plant species detected within the plot were small-flower bindweed and Palmer's grappling hook. Southern mule deer scat was detected.

**Monitoring Plot Number SYGOACIL09**

Monitoring plot SYGOACIL09 is located in the northwestern portion of the San Diego thornmint population. A total of 281 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 31.4 percent, with 19.2 percent native cover and 12.2 percent non-native cover. The dominant native plant species within the monitoring plot was Torrey's hybrid oak. Invasive non-native plant species included slender oat, purple false brome, soft brome, foxtail brome, tocalote, filaree, scarlet pimpernel, and spiny sowthistle. No additional special-status plant species were detected within the plot.

### ***Monitoring Plot Number SYGOACIL10***

Monitoring plot SYGOACIL10 is located in the northwestern portion of the San Diego thornmint population. A total of approximately 250 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 23.2 percent, with 21.6 percent native cover and 1.6 percent non-native cover. The dominant native plant species within the monitoring plot was black sage. Invasive non-native plant species included foxtail brome, tocalote, scarlet pimpernel, and spiny sowthistle. Additional special-status plant species detected within the plot were small-flower bindweed and Palmer's grappling hook.

### ***Monitoring Plot Number SYGOACIL11***

Monitoring plot SYGOACIL11 is located in the southeastern portion of the San Diego thornmint population. No San Diego thornmint plants were detected within the monitoring plot in 2021. Total vegetative cover within the plot was 84.8 percent, with 20.0 percent native cover and 64.8 percent non-native cover. The dominant native plant species within the monitoring plot were lemonade berry and sugar bush. Invasive non-native plant species included purple false brome, tocalote, cretanweed, shortpod mustard, scarlet pimpernel, spiny sowthistle, and common sowthistle. Small-flower bindweed was the only additional special-status plant species detected within the plot.

### ***Adaptive Management Recommendations***

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). To ensure the persistence of San Diego thornmint at Sycamore Canyon/Goodan Ranch County Preserve, it is recommended that invasive non-native plant control be implemented by a qualified restoration specialist within at least 8 of the monitoring plots: plots 1, 2, 4, 5, 7, 8, 9, and 11. Total non-native plant cover and purple false brome percent cover for all monitoring plots are provided in **Table 55** with recommended management priority levels. 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. Seed collection (e.g., collecting less than 10 percent of the total available seed in any given year, cleaning, and drying for short-term storage) should be considered to augment the on-site population, particularly at SYGOACIL11. Seeding efforts can be implemented after invasive non-native plant management activities to support recolonization of these areas.

Gopher activity was also detected within a handful of maximum extent polygons between monitoring plot 1 and monitoring plot 9. Future San Diego thornmint monitoring should continue to note gopher activity within the San Diego thornmint population. If gopher activity increases and is impacting the San Diego thornmint population, management control is recommended.

**TABLE 55**  
**SAN DIEGO THORN MINT INVASIVE NON-NATIVE PLANT CONTROL MANAGEMENT PRIORITIES: SYCAMORE CANYON/GOODAN RANCH COUNTY PRESERVE**

Monitoring Plot	Total Non-Native Plant Cover (%)	Purple False Brome Cover (%) <sup>a</sup>	Priority for Invasive Non-Native Plant Management <sup>b</sup>
1	11.0	8.0	Moderate
2	15.2	8.0	Moderate
3	4.4	2.0	Low
4	56.4	55.6	High
5	32.6	31.0	High
6	4.4	1.0	Low
7	55.8	55.0	High
8	11.4	10.0	High
9	12.2	10.0	High
10	1.6	0.0	Low
11	64.8	62.8	High

## NOTES:

<sup>a</sup> Invasive non-native purple false brome percent cover is included in the total non-native plant cover percentage.

<sup>b</sup> Management priority was determined based on total non-native plant cover and purple false brome cover.

High – If total non-native plant cover was greater than 20 percent, and/or purple false brome cover was 10 percent or greater.

Moderate – If total non-native plant cover was 10 to 20 percent, and/or purple false brome cover was 5 to 10 percent.

Low – If total non-native plant cover was under 10 percent, and/or purple false brome cover was under 5 percent.

## 4.2.2 Orcutt’s Bird’s-Beak

### 4.2.2.1 Tijuana River Valley Regional Park

The two monitoring plots previously established within the Orcutt’s bird’s-beak population in Tijuana River Valley Regional Park were monitored by ESA in 2021. A total of 43 Orcutt’s bird’s-beak plants were detected within the monitoring plots. The entire population of Orcutt’s bird’s-beak plants within Tijuana River Valley Regional Park in 2021 is estimated to be approximately 123 plants. The location of the monitoring plot, center point, photo point, and maximum extent of the Orcutt’s bird’s-beak population is shown in **Figure 4**. Photo monitoring and representative photographs are shown in Appendix B. Additional special-status species, such as western ponyfoot (*Dichondra occidentalis*), San Diego barrel cactus, ashy spikemoss and least Bell’s vireo, were observed within the monitoring plot. The Orcutt’s bird’s-beak habitat contained invasive non-native grasses and herbs, particularly foxtail brome, Saharan mustard (*Brassica tournefortii*), and shortpod mustard.



### **Monitoring Plot Number COOR7\_1TIRI009\_1**

Monitoring plot COOR7\_1TIRI009\_1 is located in the southern portion of the Orcutt's bird's-beak population. A total of 38 Orcutt's bird's-beak plants were detected within the monitoring plot; over 75 percent were vegetative, the remaining were flowering or fruiting. Zero to 10 percent of all plants showed potential sign of stunted growth. Total vegetative cover within the plot was 62.8 percent, with 54.2 percent native cover and 8.6 percent non-native plant cover. The dominant native plant species within the monitoring plot was California sagebrush. Invasive non-native plant species included Australian saltbush (*Atriplex semibaccata*), Asian mustard, foxtail brome, tocalote, redstem filaree, annual fescue, crown daisy, smooth cat's ear, pepperweed, narrowleaf cottonrose, and common sowthistle. Additional special-status plant species detected within the plot included western ponysfoot, San Diego barrel cactus, and ashy spikemoss. A coastal California gnatcatcher (*Polioptila californica californica*) was heard vocalizing outside of the monitoring plot.

### **Monitoring Plot Number COOR7\_1SMGU006\_1**

Monitoring plot COOR7\_1SMGU006\_1 is located in the northwest portion of the Orcutt's bird's-beak population. A total of 5 Orcutt's bird's-beak plants were detected within the monitoring plot; over 75 percent were vegetative, the remaining were flowering. Zero to 10 percent of all plants showed potential sign of herbivory. Total vegetative cover within the plot was 69.0 percent, with 61.6 percent native cover and 7.4 percent non-native plant cover. The dominant native plant species within the monitoring plot were bladderpod spiderflower (*Peritoma arborea*) and spiny redberry. Invasive non-native plant species included wild oat, Saharan mustard, foxtail brome, tocalote, and shortpod mustard. Least Bell's vireo was the only additional special-status species detected within the plot.

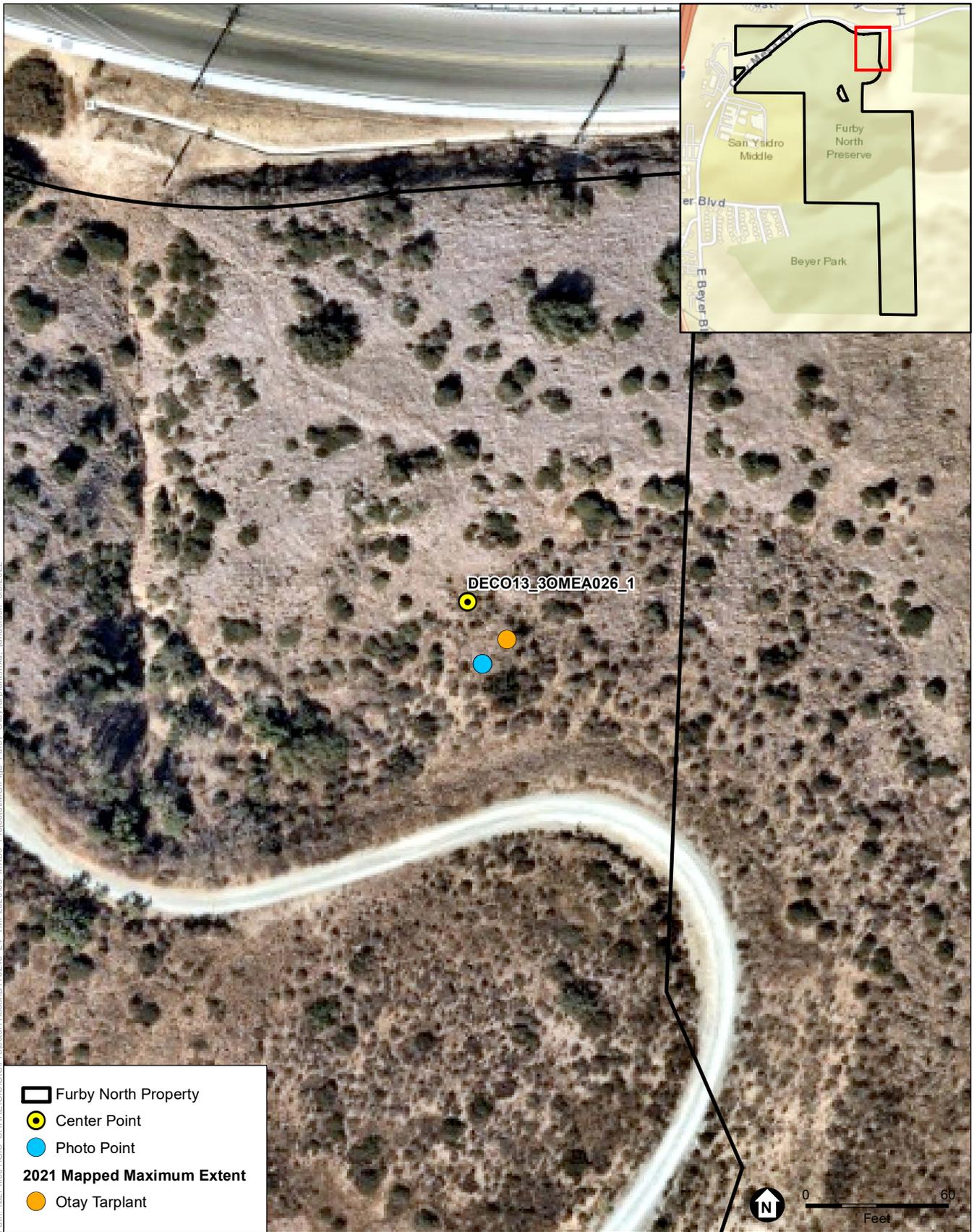
### **Adaptive Management Recommendations**

The TMP recommends the control of invasive grasses and forbs, protecting soils, and controlling unauthorized human access (ESA and ICF 2019). To ensure the persistence of Orcutt's bird's-beak at Tijuana River Valley Regional Park, invasive non-native plant control by a qualified restoration specialist is recommended to reduce invasive grass and mustard species. Application of vertical mulch is also recommended to protect soils and deter unauthorized human access within and adjacent to suitable habitat for Orcutt's bird's-beak.

## **4.2.3 Otay Tarplant**

### **4.2.3.1 Furby-North Preserve**

The one monitoring plot previously established within the Otay tarplant population in Furby-North Preserve was monitored by ESA in 2021. One Otay tarplant individual was detected within the monitoring plot. The entire population of Otay tarplant within Furby-North Preserve in 2021 is estimated to be one plant. The location of the monitoring plot, center point, photo point, and maximum extent of the Otay tarplant population is shown in **Figure 5**. No additional special-status species were observed within the monitoring plot. D&D performed routine management in 2021. Photo monitoring and representative photographs, including pre- and post-management conditions, are included in Appendix B.



SOURCE: Nearmap, 9/21/2020

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**Figure 5**  
Otay Tarplant Monitoring Results  
Furby-North Property

Based on incidental reporting across the San Diego region, Otay tarplant numbers in 2021 were low – likely due to drought conditions. Specifically, for the Furby-North Preserve population, high thatch cover and invasive non-native plant cover likely contributed to a further reduced Otay tarplant population size. The Otay tarplant habitat contained invasive non-native grasses and herbs, particularly soft brome, red brome, Italian rye grass (*Festuca perennis*), and crown daisy.

### **Monitoring Plot Number DECO13\_3OMEA026\_1**

Monitoring plot DECO13\_3OMEA026\_1 is located in the western portion of the Otay tarplant population. One Otay tarplant individual was detected within the monitoring plot; this individual was flowering. Total vegetative cover within the plot was 46.4 percent, with 21.4 percent native cover and 25.0 percent non-native plant cover. The dominant native plant species within the monitoring plot was California sagebrush. Invasive non-native plant species included slender oat, black mustard, soft brome, foxtail brome, tocalote, Italian rye grass, crown daisy, shortpod mustard, and common sowthistle. No additional special-status plant species were detected within the plot.

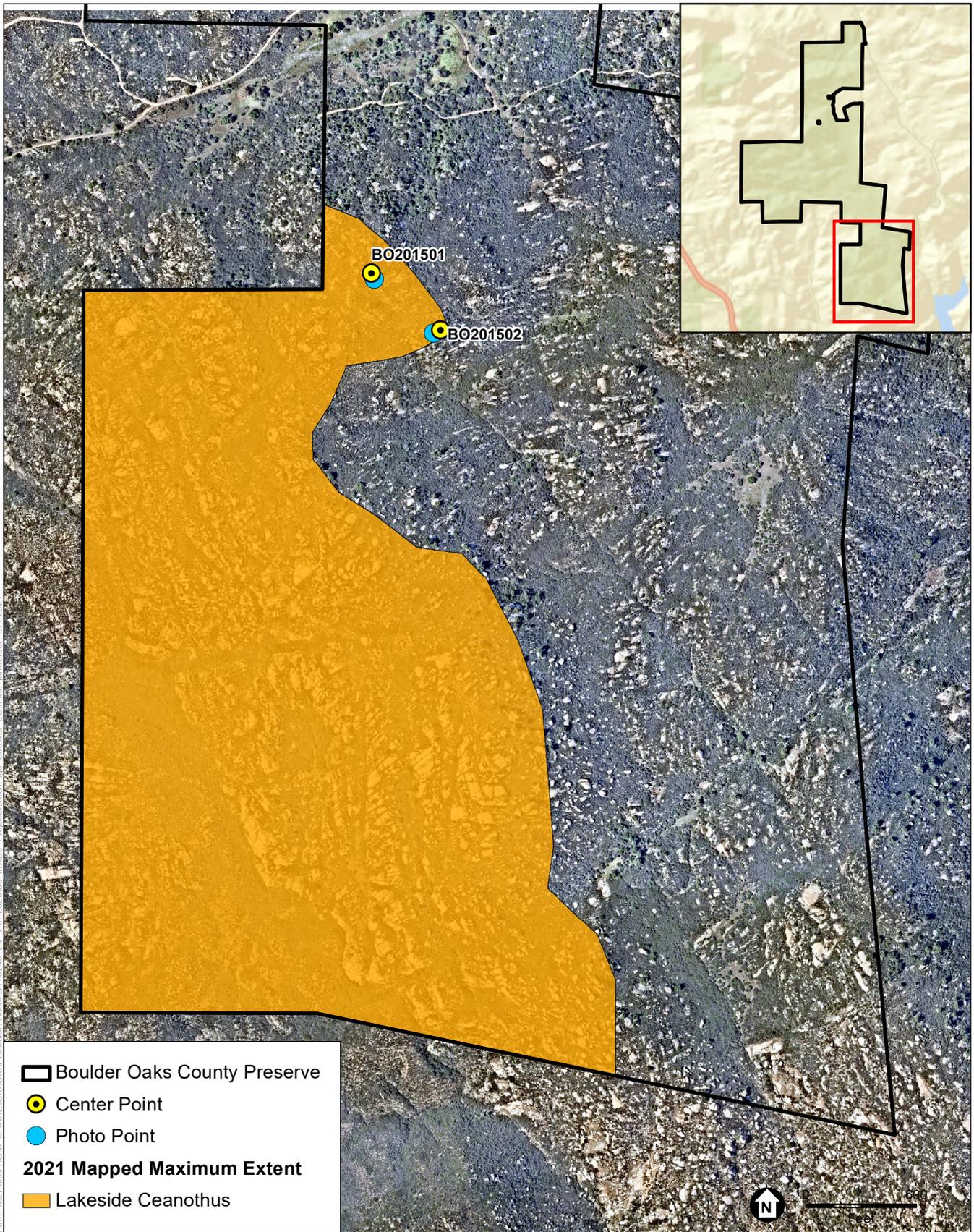
### **Adaptive Management Recommendations**

The TMP recommends overall invasive non-native plant cover be kept to less than 20 percent and thatch to be removed (ESA and ICF 2015). Routine management occurred in 2021 in response to the low number of Otay tarplant individuals and high thatch and invasive non-native plant cover observed. To ensure the persistence of Otay tarplant at Furby-North Preserve, it is recommended that thatch removal and invasive non-native plant control be continued by a qualified restoration specialist. Total non-native plant cover within the monitoring plot was 25.0 percent and thatch cover was estimated to be 20.0 percent. Thatch removal should be implemented with weed eaters and rakes; debris should be hauled out and disposed of off-site at a County landfill. If Otay tarplant numbers continue to be low during future monitoring, seed collection or seeding efforts should be considered to enhance the Furby-North Preserve population.

## **4.2.4 Lakeside Ceanothus**

### **4.2.4.1 Boulder Oaks County Preserve**

The two monitoring plots previously established within the Lakeside ceanothus population in Boulder Oaks County Preserve were monitored by ESA in 2021. A total of 41 Lakeside ceanothus plants were detected as alive within the monitoring plots. The entire population of Lakeside ceanothus within Boulder Oaks County Preserve in 2021 is estimated to be approximately 1,100 plants. While the estimated population size of Lakeside ceanothus at Boulder Oaks County Preserve is higher than what was estimated in 2015, dead Lakeside ceanothus plants were observed within both monitoring plots. It is likely that these individuals died from old age or possibly drought conditions, as no herbivory or apparent damage was observed on the plants. The location of the monitoring plots, center points, photo points, and maximum extent of the Lakeside ceanothus is shown in **Figure 6**. Photo monitoring and representative photographs are shown in Appendix B. No additional special-status plant species were observed within the monitoring plots. Across both monitoring plots, Lakeside ceanothus habitat contained limited invasive non-native grasses and herbs, particularly crimson fountaingrass.



SOURCE: Nearmap, 4/18/2021

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**Figure 6**  
Lakeside Ceanothus Monitoring  
Boulder Oaks Preserve

### **Monitoring Plot Number BO201501**

Monitoring plot BO201501 is located in the northern portion of the Lakeside ceanothus population. A total of 24 Lakeside ceanothus plants were detected as alive within the monitoring plot; 50 to 75 percent were flowering; the remaining were dead. Total vegetative cover within the plot was 61.8 percent, with 58.6 percent native cover and 2.6 percent non-native plant cover. The dominant native plant species within the monitoring plot was chamise. Invasive non-native plant species included slender oat, foxtail brome, long-flowered veldtgrass (*Ehrharta longiflora*), redstem stork's bill, annual fescue, smooth cat's ear, narrowleaf cottonrose, crimson fountaingrass, and spiny sowthistle. No additional special-status species were detected within the plot.

### **Monitoring Plot Number BO201502**

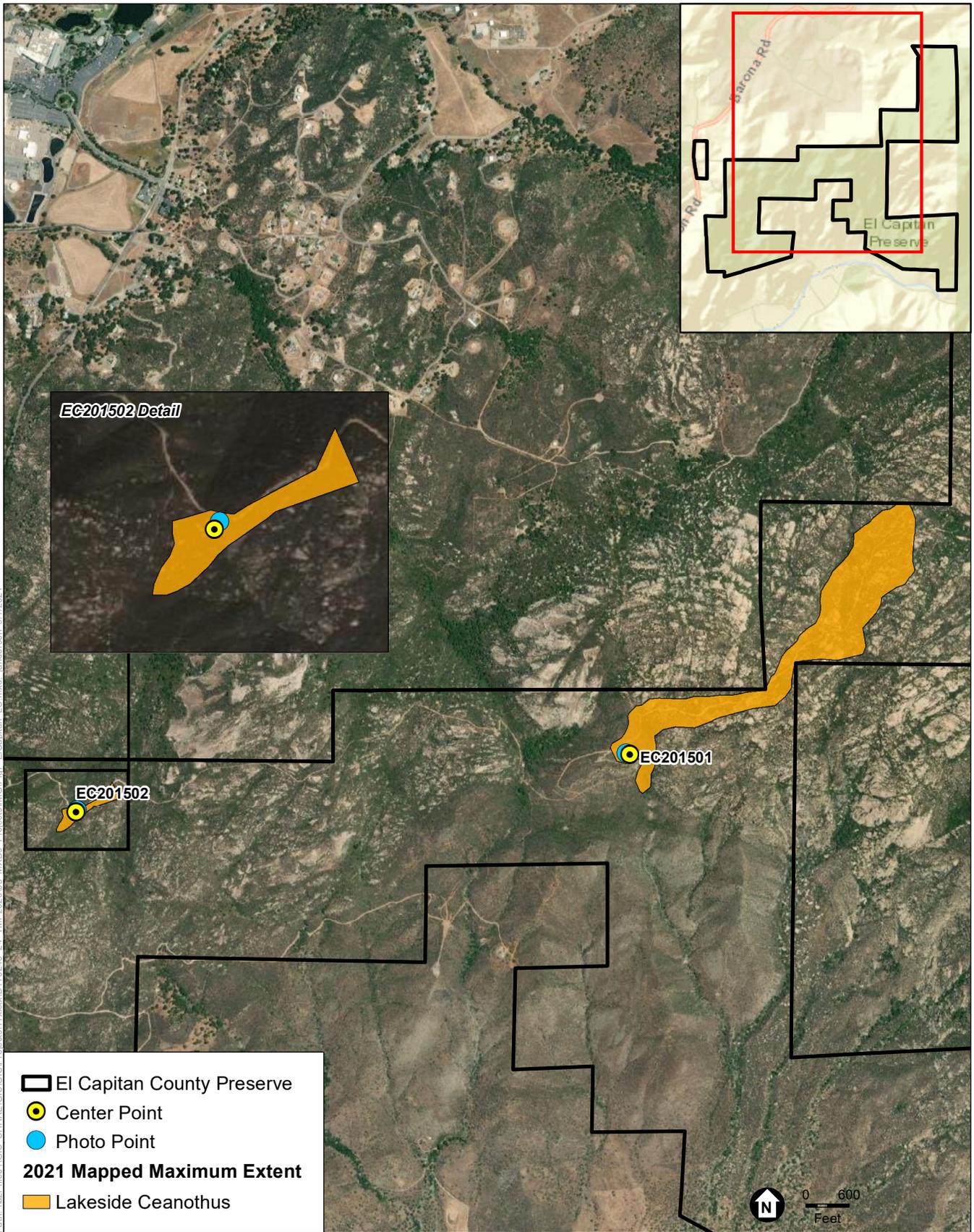
Monitoring plot BO201502 is located in the northeastern portion of the Lakeside ceanothus population. A total of 17 Lakeside ceanothus plants were detected as alive within the monitoring plot; over 75 percent were flowering, the remaining were vegetative or dead. Total vegetative cover within the plot was 61.4 percent, with 60.8 percent native cover and 0.6 percent non-native plant cover. The dominant native plant species within the monitoring plot was Mission manzanita. Invasive non-native plant species included red brome, annual fescue, and smooth cat's ear. No additional special-status species were detected within the plot.

### **Adaptive Management Recommendations**

The TMP recommends overall invasive non-native plant cover be kept to less than 20 percent and implementing pre-fire actions to prevent mortality from wildfire (ESA and ICF 2015). While invasive non-native plant cover for both monitoring plots is below 20 percent, it is recommended that invasive non-native plant control be implemented by a qualified restoration specialist, specifically for crimson fountaingrass. Seed collection and prescribed fire should be considered to augment and diversify the age structure of the Lakeside ceanothus population within Boulder Oaks County Preserve (CBI and Endangered Habitats Conservancy 2009).

#### **4.2.4.2 El Capitan County Preserve**

The two monitoring plots previously established within the Lakeside ceanothus population in El Capitan County Preserve were monitored by ESA in 2021. A total of 23 Lakeside ceanothus plants were detected as alive within the monitoring plots. The entire population of Lakeside ceanothus within El Capitan County Preserve in 2021 is estimated to be approximately 450 plants. 50 to 75 percent of all Lakeside ceanothus plants observed within both monitoring plots were noted as dead. It is likely that these individuals died from old age or possibly drought conditions, as no herbivory or apparent damage was observed on the plants. The location of the monitoring plots, center points, photo points, and maximum extent of the Lakeside ceanothus is shown in **Figure 7**. Photo monitoring and representative photographs are shown in Appendix B. One special-status plant species was observed within the EC201501 monitoring plot, Engelmann oak. Across both monitoring plots, Lakeside ceanothus habitat contained limited invasive non-native grasses and herbs, particularly crimson fountaingrass.



Path: \\azr-fil01\GIS-SHARE\GIS\GIS\Projects\17xxxx\170240\_24\_TMP\2020\03\_MXD\Projects\IMG\Fig7\_ElCapitan\_LC.mxd, landerson, 9/1/2021

SOURCE: ESRI, 2020, 2021.

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**Figure 7**  
Lakeside Ceanothus Monitoring  
El Capitan Preserve

### **Monitoring Plot Number EC201501**

Monitoring plot EC201501 is located in the southwest portion of the Lakeside ceanothus population. A total of 12 Lakeside ceanothus plants were detected as alive within the monitoring plot; 25 to 50 percent were flowering, 0 to 10 percent were vegetative, and the remaining were dead. Total vegetative cover within the plot was 79.8 percent, with 74.4 percent native cover and 5.4 percent non-native plant cover. The dominant native plant species within the monitoring plot was chamise. Invasive non-native plant species included scarlet pimpernel and crimson fountaingrass. One special-status species was detected within the plot, Engelmann oak.

### **Monitoring Plot Number EC201502**

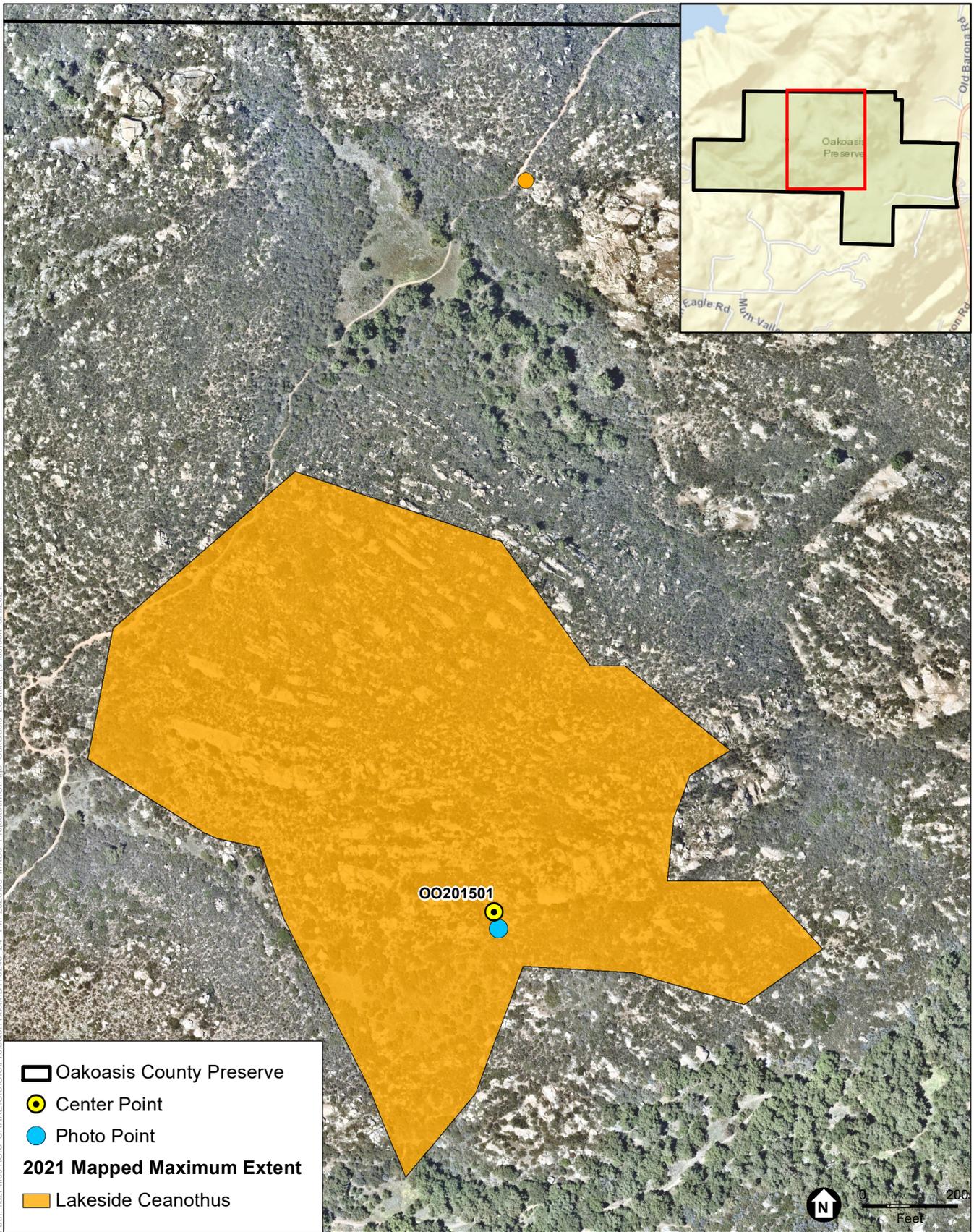
Monitoring plot EC201502 is located in the northern portion of the Lakeside ceanothus population. A total of 11 Lakeside ceanothus plants were detected as alive within the monitoring plot; 25 to 50 percent were flowering; the remaining were dead. Total vegetative cover within the plot was 82.6 percent, with 81.8 percent native cover and 0.8 percent non-native plant cover. The dominant native plant species within the monitoring plot were Mission manzanita and chamise. Invasive non-native plant species included slender oat, tocalote, smooth cat's ear, and crimson fountaingrass. No special-status species were detected within the plot.

### **Adaptive Management Recommendations**

The TMP recommends overall invasive non-native plant cover be kept to less than 20 percent and implementing pre-fire actions to prevent mortality from wildfire (ESA and ICF 2015). While, invasive non-native plant cover at both monitoring plots is below 20 percent, it is recommended that invasive non-native plant control be implemented by a qualified restoration specialist, specifically for crimson fountaingrass. The crimson fountaingrass cover increased from 1 percent to 5 percent since 2015 monitoring. Seed collection and prescribed fire should be considered to augment and diversify the age structure of the Lakeside ceanothus population within El Capitan County Preserve (CBI and Endangered Habitats Conservancy 2009).

#### **4.2.4.3 Oakoasis County Preserve**

The one monitoring plot previously established within the Lakeside ceanothus population in Oakoasis County Preserve was monitored by ESA in 2021. A total of three Lakeside ceanothus plants were detected as alive within the monitoring plot. The entire population of Lakeside ceanothus within Oakoasis County Preserve in 2021 is estimated to be approximately 573 plants. The location of the monitoring plots, center points, photo points, and maximum extent of the Lakeside ceanothus is shown in **Figure 8**. Photo monitoring is shown in Appendix B. No special-status plant species were observed within the monitoring plot. Within the monitoring plot, Lakeside ceanothus habitat contained invasive non-native grasses and herbs, particularly natal grass.



SOURCE: Nearmap, 4/18/2021

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**Figure 8**  
Lakeside Ceanothus Monitoring  
Oakoasis Preserve

### **Monitoring Plot Number OO201501**

Monitoring plot OO201501 is located in the southern portion of the Lakeside ceanothus population. A total of three Lakeside ceanothus plants were detected as alive within the monitoring plot; over 75 percent were vegetative, the remaining were either flowering, fruiting, or dead. Total vegetative cover within the plot was 70.8 percent, with 65.2 percent native cover and 5.6 percent non-native plant cover. The dominant native plant species within the monitoring plot were chamise and laurel sumac. Invasive non-native plant species included oat, compact brome (*Bromus madritensis*), crimson fountaingrass, and natal grass. No special-status species were detected within the plot.

### **Adaptive Management Recommendations**

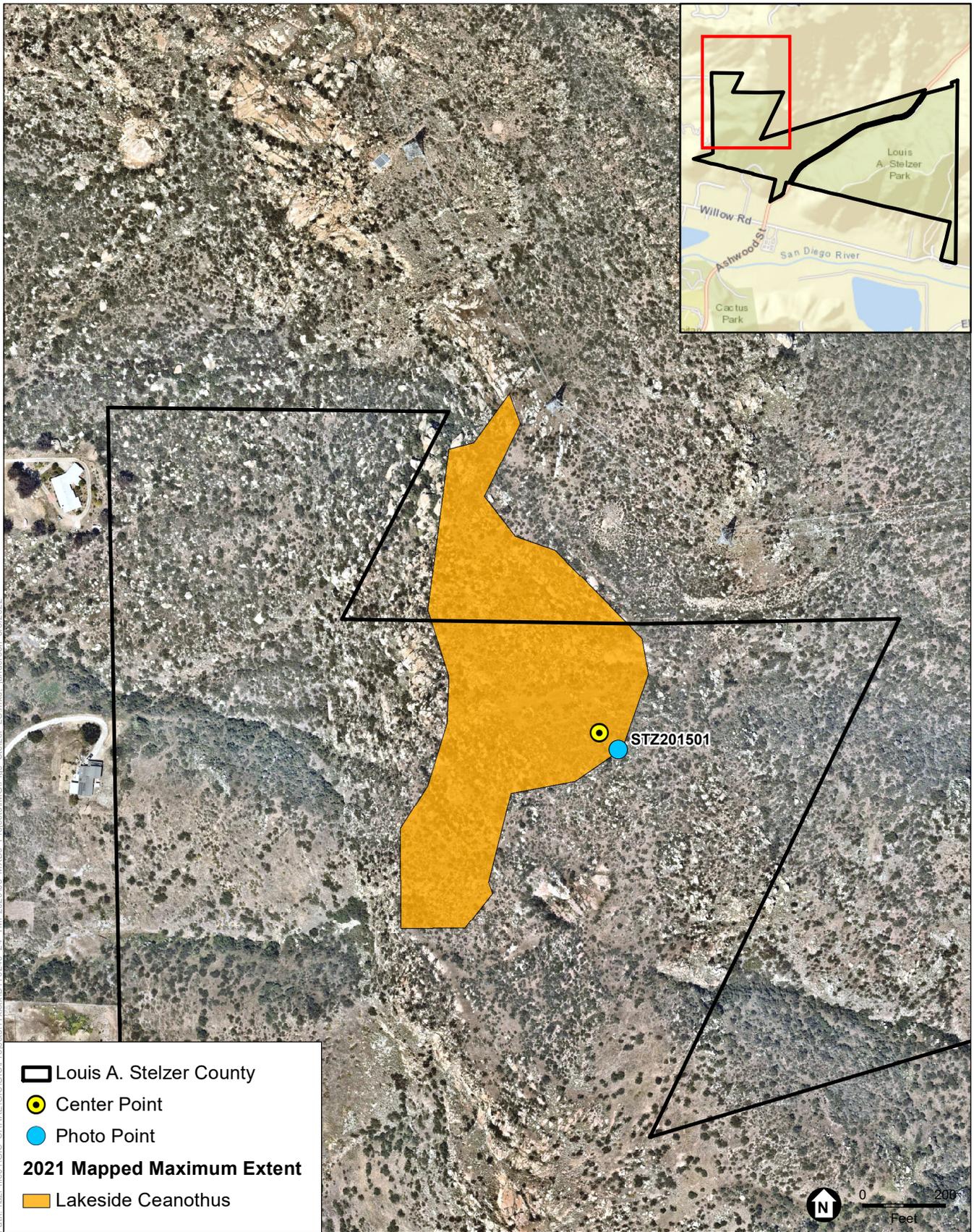
The TMP recommends overall invasive non-native plant cover be kept to less than 20 percent and implementing pre-fire actions to prevent mortality from wildfire (ESA and ICF 2015). While invasive non-native plant cover within the monitoring plot is below 20 percent, it is recommended that invasive non-native plant control be implemented by a qualified restoration specialist, specifically for natal grass and crimson fountaingrass. Seed collection and prescribed fire should be considered to augment and diversify the age structure of the Lakeside ceanothus population within Oakoasis County Preserve (CBI and Endangered Habitats Conservancy 2009).

#### **4.2.4.4 Louis A. Stelzer County Park**

The one monitoring plot previously established within the Lakeside ceanothus population in Louis A. Stelzer County Park was monitored by ESA in 2021. A total of 4 Lakeside ceanothus plants were detected as alive within the monitoring plot. The entire population of Lakeside ceanothus within Louis A. Stelzer County Park in 2021 is estimated to be approximately 428 plants. The location of the monitoring plots, center points, photo points, and maximum extent of the Lakeside ceanothus is shown in **Figure 9**. Photo monitoring and representative photographs are shown in Appendix B. One special-status species was observed within the monitoring plot, coastal California gnatcatcher. Within the monitoring plot, Lakeside ceanothus habitat contained invasive non-native grasses and herbs, particularly soft brome, stork's bill, and annual fescue.

### **Monitoring Plot Number STZ201501**

Monitoring plot STZ201501 is located in the southwest portion of the Lakeside ceanothus population. A total of four Lakeside ceanothus plants were detected as alive within the monitoring plot; 25 to 50 percent were flowering, 10 to 25 percent were vegetative, 10 to 25 percent were dead, and the remaining were fruiting. Total vegetative cover within the plot was 69.6 percent, with 57.0 percent native cover and 12.6 percent non-native plant cover. The dominant native plant species within the monitoring plot were California sagebrush and laurel sumac. Invasive non-native plant species included oat, ripgut grass, soft brome, red brome, tocalote, filaree, annual fescue, shortpod mustard, smooth cat's ear, narrowleaf cottonrose, and field hedge parsley (*Torilis arvensis*). One additional special-status species was detected within the plot, a male coastal California gnatcatcher.



SOURCE: Nearmap, 4/18/2021

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**Figure 9**  
Lakeside Ceanothus Monitoring  
Louis A. Stelzer County Park

## **Adaptive Management Recommendations**

The TMP recommends overall invasive non-native plant cover be kept to less than 20 percent and implementing pre-fire actions to prevent mortality from wildfire (ESA and ICF 2015). While, invasive non-native plant cover within the monitoring plot is below 20 percent, it is recommended that invasive non-native plant control be implemented by a qualified restoration specialist, specifically for soft brome, stork's bill, and annual fescue. Seed collection and prescribed fire should be considered to augment and diversify the age structure of the Lakeside ceanothus population within Louis A. Stelzer County Park (CBI and Endangered Habitats Conservancy 2009).

### **4.2.5 Willowy Monardella**

#### **4.2.5.1 Sycamore Canyon/Goodan Ranch County Preserve**

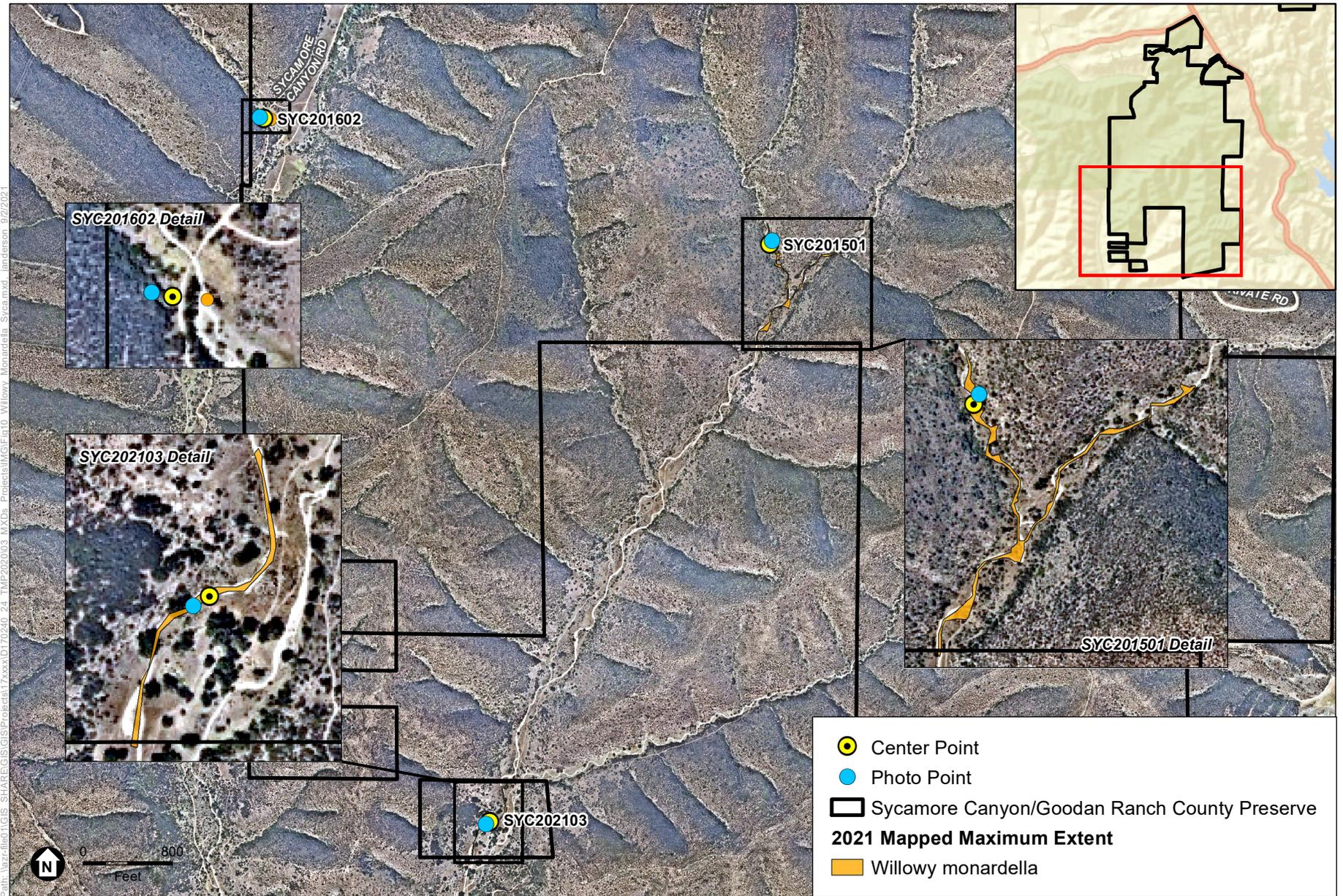
The two previously established plots and the new 2021 established monitoring plot within the willowy monardella population in Sycamore Canyon/Goodan Ranch County Preserve were monitored by ESA in 2021. A total of 57 willowy monardella plants were detected within the monitoring plots. The entire population of willowy monardella within Sycamore Canyon/Goodan Ranch County Preserve is estimated to be 305 individual plants. The location of the monitoring plots, center points, photo points, and maximum extent of the willowy monardella is shown in **Figure 10**. Photo monitoring and representative photographs are shown in Appendix B. No special-status plant species were observed within the three monitoring plots; however, an adult female and two young southern mule deer were observed while biologists were travelling between monitoring plots. Across all monitoring plots, willowy monardella habitat contained by invasive non-native grasses and herbs, particularly oat grasses, purple false brome, and brome grasses. 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 56**.

#### **Monitoring Plot Number SYC201501**

Monitoring plot SYC201501 is located in the central portion of the willowy monardella population. A total of 50 willowy monardella plants were detected within the monitoring plot; over 75 percent were in flower, the remaining were vegetative or fruiting. Total vegetative cover within the plot was 28.6 percent, with 19.2 percent native cover and 9.4 percent non-native cover. The dominant native plant species within the monitoring plot was California buckwheat and spiny redberry. Non-native plants included slender oat, wild oat, purple false brome, ripgut grass, soft brome, foxtail brome, tocalote, and filaree. 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 19.0 percent, with 11.8 percent native cover and 7.2 percent non-native cover. The dominant native plant species within the monitoring plot was California buckwheat. Invasive non-native plant species included slender oat, ripgut grass, soft brome, foxtail brome, tocalote, filaree, annual fescue, shortpod mustard, goldentop grass (*Lamarckia aurea*), and common catchfly. No additional special-status plant species were detected within the plot.



SOURCE: Nearmap, 4/18/2021.

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**Figure 10**  
 Willow Monardella Monitoring Results  
 Sycamore Canyon/Goodan Ranch County Preserve

**TABLE 56**  
**WILLOWY MONARDELLA ADDITIONAL MONITORING DATA: SYCAMORE CANYON/GOODAN RANCH**  
**COUNTY PRESERVE**

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	1.60	5.40	0.65	8.64	5.62	9	9 Adult
	2	0.80	1.20	0.70	0.96	0.67	1	1 Adult
	3	3.50	5.00	0.70	17.50	12.25	6	6 Adult
	4	0.95	0.95	0.60	0.90	0.54	1	1 Adult
	5	1.65	2.30	0.60	3.80	2.28	1	1 Adult
	6	4.90	4.90	0.70	24.01	16.81	21	21 Adult
	7	1.15	2.15	0.70	2.47	1.73	3	3 Adult
SYC201602	1	0.80	0.90	0.65	0.72	0.47	3	3 Adult
SYC202103	1	1.10	1.30	0.80	1.43	1.14	1	1 Adult
	2	0.75	1.30	0.80	0.98	0.78	3	3 Adult
	3	1.10	1.30	0.50	1.43	0.72	6	1 Adult 4 Mature 1 Juvenile
	4	1.35	1.50	0.60	2.03	1.22	1	1 Adult

### **Monitoring Plot Number SYC202103**

Monitoring plot SYC202103 is located in the southern portion of the willowy monardella population. A total of four willowy monardella plants were detected to be within the monitoring plot; over 75 percent were flowering and 50 to 75 percent were fruiting. Total vegetative cover within the plot was 27.6 percent, with 19.0 percent native cover and 8.6 percent non-native cover. The dominant native plant species within the monitoring plot was California buckwheat. Invasive non-native plant species included slender oat, purple false brome, ripgut grass, soft brome, foxtail brome, tocalote, filaree, annual fescue, shortpod mustard, smooth cat's ear, and prickly lettuce (*Lactuca serriola*). No additional special-status plant species were detected within the plot.

### **Adaptive Management Recommendations**

The TMP recommends overall invasive non-native plant and thatch cover be kept to less than 10 percent around high-intensive weed management areas (e.g., immediately adjacent to willowy monardella plants) and less than 20 percent in areas between high-intensive weed management areas (ESA and ICF 2015). While, invasive non-native plant cover within all three monitoring plots are below 10 percent, on-site observations demonstrated the non-native cover surrounding certain willowy monardella individuals and clumps to be higher than 10 percent (see Appendix B). It is recommended that invasive non-native plant control be implemented by a qualified restoration specialist, specifically for non-native annual grasses. 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. For SYC201602 specifically, thinning of California buckwheat can be considered to reduce potential native competition to the willowy monardella plants.

## 4.2.6 Encinitas Baccharis

### 4.2.6.1 Del Dios Highlands County Preserve

The three monitoring plots previously established within the Encinitas baccharis population in Del Dios Highlands County Preserve were monitored by ESA in 2021. A total of 46 Encinitas baccharis plants were detected within the monitoring plots. The entire population of Encinitas baccharis within Del Dios Highlands County Preserve in 2021 is estimated to be 350 plants. The location of the monitoring plots, center points, photo points, and maximum extent of the Encinitas baccharis is shown in **Figure 11**. Photo monitoring and representative photographs are shown in Appendix B. One additional special-status plant species, wart-stemmed ceanothus, was also observed within all three of the monitoring plots. Coastal California gnatcatcher was also heard vocalizing at monitoring plot DD201502. Only monitoring plot DD201501 contained non-native grasses and herbs, including compact brome.

#### ***Monitoring Plot Number DD201501***

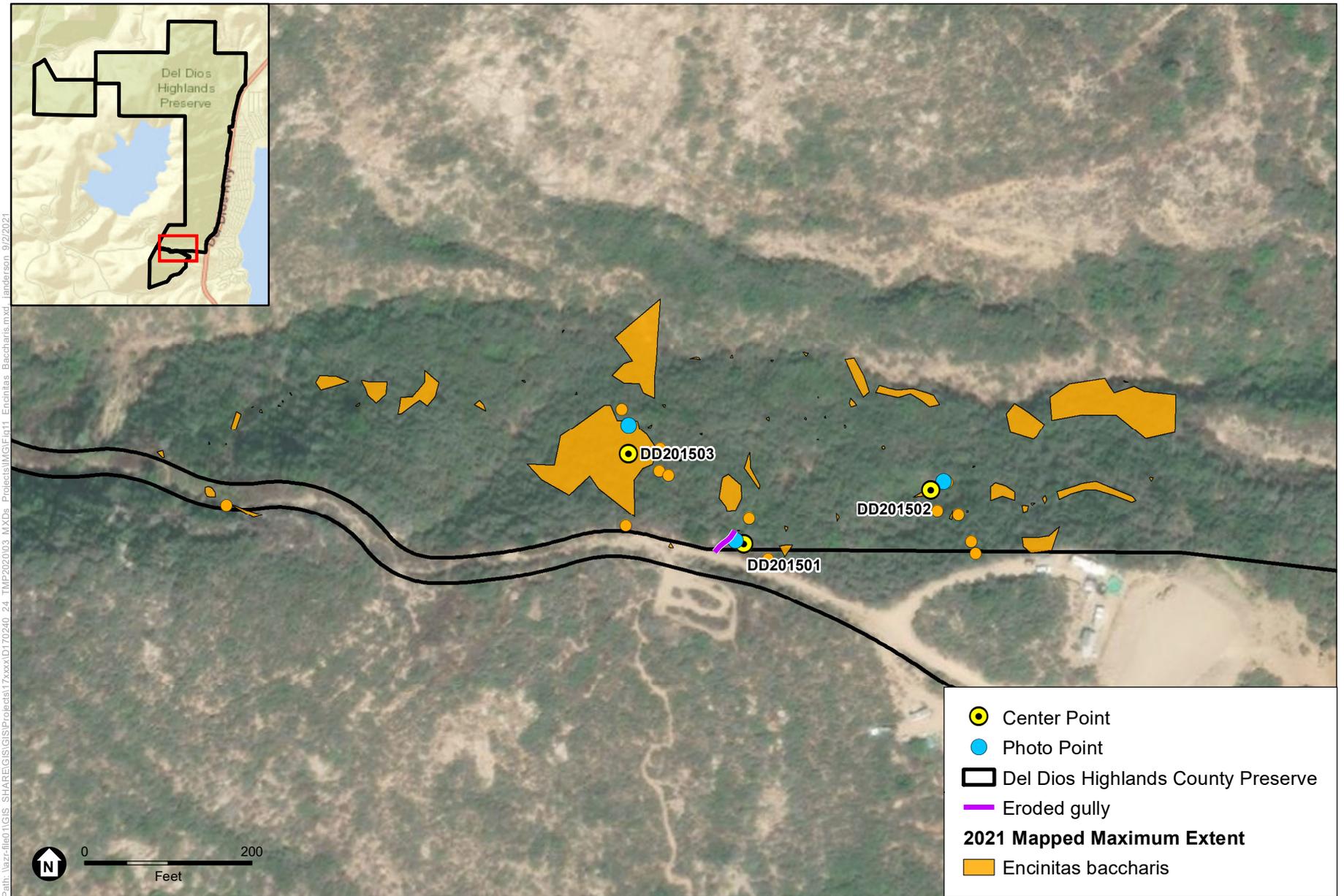
Monitoring plot DD201501 is located in the south-central portion of the Encinitas baccharis population. A total of approximately four Encinitas baccharis plants were estimated to be within the monitoring plot; one was an adult female and three were vegetative adults. Total vegetative cover within the plot was 67 percent, with 66.8 percent native cover and 0.2 percent non-native plant cover. The dominant native plant species within the monitoring plot was wart-stemmed ceanothus. Invasive non-native plant species included compact brome. Wart-stemmed ceanothus was the only additional special-status plant species detected within the plot.

#### ***Monitoring Plot Number DD201502***

Monitoring plot DD201502 is located in the eastern portion of the Encinitas baccharis population. A total of 4 Encinitas baccharis plants were detected within the monitoring plot; all four were vegetative adults. Total vegetative cover within the plot was 74.0 percent, with all cover being native. The dominant native plant species within the monitoring plot was wart-stemmed ceanothus and lemonade berry. No invasive non-native plant species were detected within the monitoring plot. Wart-stemmed ceanothus was the only additional special-status plant species detected within the plot.

#### ***Monitoring Plot Number DD201503***

Monitoring plot DD201503 is located in the western portion of the Encinitas baccharis population. A total of 38 Encinitas baccharis plants were detected within the monitoring plot; one was an adult female and the remaining were vegetative adults. Total vegetative cover within the plot was 68.0 percent, with all cover being native. The dominant native plant species within the monitoring plot were wart-stemmed ceanothus and Mission manzanita. No invasive non-native plant species were detected within the monitoring plot. Wart-stemmed ceanothus was the only additional special-status plant species detected within the plot.



SOURCE: ESRI, 2020.

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**Figure 11**  
 Encinitas Baccharis Monitoring Results  
 Del Dios Highlands County Preserve

### **Adaptive Management Recommendations**

Management objectives for Encinitas baccharis at Del Dios Highlands County 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. Selective trimming of native plants can be considered to reduce potential native competition to the Encinitas baccharis plants.

## **4.2.7 San Miguel Savory**

### **4.2.7.1 Boulder Oaks County Preserve**

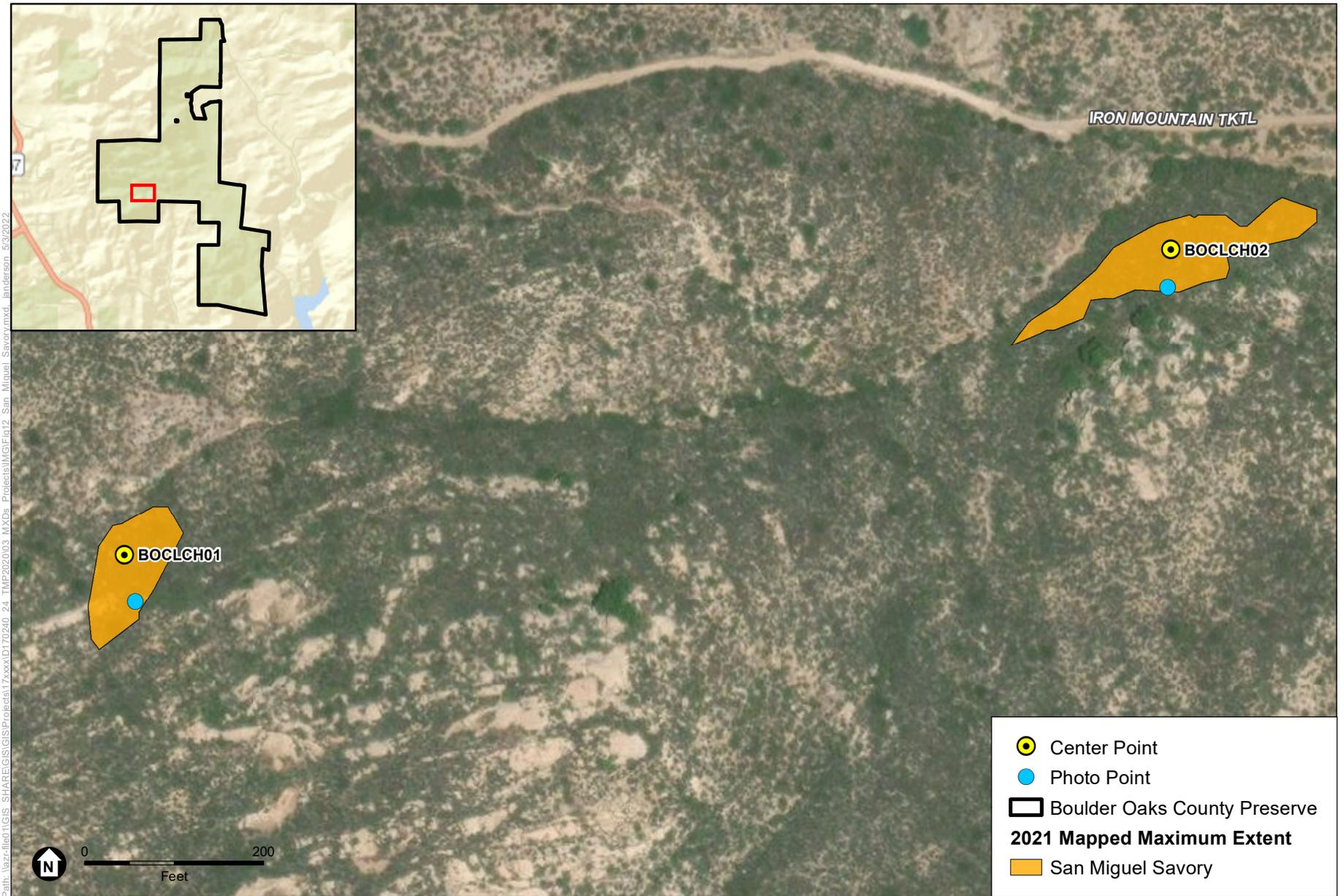
The two monitoring plots previously established within the San Miguel savory population in Boulder Oaks County Preserve were monitored by ESA in 2021. A total of 75 San Miguel savory plants were detected within the monitoring plots. The entire population of San Miguel savory within Boulder Oaks County Preserve is estimated to be 127 plants. The location of the monitoring plots, center points, photo points, and maximum extent of the San Miguel savory is shown in **Figure 12**. Photo monitoring and representative photographs are shown in Appendix B. One additional special-status plant, southern mountain misery (*Chamaebatia australis*), was observed at BOCLCH02. Across both monitoring plots, San Miguel savory habitat contained invasive non-native grasses, particularly perennial veldtgrass (*Ehrharta calycina*) and annual fescue. D&D performed routine management in 2021. Photo monitoring and representative photographs, including pre- and post-management conditions, are included in Appendix B.

#### **Monitoring Plot Number BOCLCH01**

Monitoring plot BOCLCH01 is located in the western portion of the San Miguel savory population. A total of 30 San Miguel savory 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 66.6 percent, with 66.0 percent native cover and 0.6 percent non-native cover. The dominant native plant species within the monitoring plot was chamise. Invasive non-native plant species included annual fescue, smooth cat's ear, and narrowleaf cottonrose. 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 45 San Miguel savory plants were detected within the monitoring plot; 50 to 75 percent were flowering and the remaining were vegetative. Total vegetative cover within the plot was 73.0 percent, with 71.2 percent native cover and 1.8 percent non-native cover. The dominant native plant species within the monitoring plot was chamise. Invasive non-native plant species included foxtail brome, perennial veldtgrass, annual fescue, smooth cat's ear, and narrowleaf cottonrose. Southern mountain misery was the only additional special-status plant species detected within the plot.



SOURCE: ESRI, 2020.

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**Figure 12**  
San Miguel Savory Monitoring Results  
Boulder Oaks County Preserve

## **Adaptive Management Recommendations**

Management objectives for San Miguel savory at Boulder Oaks County Preserve include maintaining invasive non-native plant cover to less than 20 percent cover (ESA and ICF 2015). D&D performed routine management in 2021. This year's monitoring results demonstrated a healthy San Miguel savory habitat at Boulder Oaks County Preserve, with limited non-native plant cover, averaging at approximately 1.2 percent cover between the two plots and consisting primarily of perennial veldtgrass and annual fescue. 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. Follow-up herbicide applications should be conducted when invasive non-native grasses have reached 2 to 3 inches in height during the peak of the growing season. 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.

### **4.2.8 Variegated Dudleya**

#### **4.2.8.1 Sycamore Canyon/Goodan Ranch County Preserve**

The one previously established plot and the new 2021 established monitoring plot within the variegated dudleya population in Sycamore Canyon/Goodan Ranch County Preserve were monitored by ESA in 2021. A total of 773 variegated dudleya plants were detected within the monitoring plots. The entire population of variegated dudleya within Sycamore Canyon/Goodan Ranch County Preserve is estimated to be 1,275 individual plants. The location of the monitoring plots, center points, photo points, and maximum extent of the variegated dudleya is shown in **Figure 13**. Photo monitoring and representative photographs are shown in Appendix B. Additional special-status species observed within the two monitoring plots included San Diego thornmint, small-flowered bindweed, Palmer's grappling hook, Douglas' silverpuffs (*Microseris douglasii* ssp. *platycarpa*), coastal California gnatcatcher, and turkey vulture. Across all monitoring plots, variegated dudleya habitat contained by invasive non-native grasses and herbs, particularly purple false brome.

#### **Monitoring Plot Number SYGODUVA01**

Monitoring plot SYGODUVA01 is located in the southeastern portion of the variegated dudleya population. A total of 205 variegated dudleya plants were detected to be within the monitoring plot and all were vegetative. Total vegetative cover within the plot was 65.6 percent, with 35.0 percent native cover and 30.6 percent non-native cover. The dominant native plant species within the monitoring plot was laurel sumac. Invasive non-native plant species included purple false brome, tocalote, redstem filaree, and spiny sowthistle. Additional special-status plant species detected within the plot included San Diego thornmint, small-flowered bindweed, Palmer's grappling hook, and coastal California gnatcatcher.



SOURCE: Nearmap, 4/18/2021.

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**Figure 13**  
 Variegated Dudleya Monitoring Results  
 Sycamore Canyon/Goodan Ranch County Preserve

### **Monitoring Plot Number SYGODUVA02**

Monitoring plot SYGODUVA02 is located in the northwestern portion of the variegated dudleya population. A total of 568 variegated dudleya plants were detected to be within the monitoring plot and all were vegetative. Total vegetative cover within the plot was 68.0 percent, with 27.6 percent native cover and 40.4 percent non-native cover. The dominant native plant species within the monitoring plot were spiny redberry, woollyleaf ceanothus (*Ceanothus tomentosus*), and laurel sumac. Invasive non-native plant species included purple false brome, tocalote, redstem filaree, spiny sowthistle, and common sowthistle. Additional special-status plant species detected within the plot included Palmer's grappling hook, Douglas' silverpuffs, and turkey vulture.

### **Adaptive Management Recommendations**

The TMP recommends overall invasive non-native plant cover be kept to less than 20 percent (ESA and ICF 2015); both monitoring plots had over 20 percent invasive non-native plant cover in 2021. To ensure the persistence of variegated dudleya at Sycamore Canyon/Goodan Ranch County Preserve, it is recommended that thatch removal and invasive non-native plant control be implemented by a qualified restoration specialist. Management areas should be delineated around each polygon (group) of plants and include a buffer of 10 meters around plants or clumps (ESA and ICF 2015). Weeds next to variegated dudleya plants should be pulled by hand; the remaining area can be controlled with herbicide or mechanical methods (ESA and ICF 2015). Sign of herbivory and presence of gophers should continue to be monitored to determine if adaptive management recommendations such as fence installation are required.

### **4.2.8.2 Lusardi Creek County Preserve**

The monitoring plot previously established within the variegated dudleya population in Lusardi Creek County Preserve was monitored by ESA in 2021. No variegated dudleya plants were detected within the monitoring plot. The location of the monitoring plot, center point, photo point, and maximum extent of the variegated dudleya is shown in **Figure 14**. One special-status plant species, San Diego barrel cactus, was observed within the monitoring plot. Within the monitoring plot, variegated dudleya habitat contained high density of invasive non-native grasses, particularly purple false brome, and thatch cover. Signs of herbivory were observed on a wide range of native and non-native plants, suggesting a high level of herbivory (Appendix B). D&D performed routine management in 2021. Photo monitoring and representative photographs, including pre- and post-management conditions, are included in Appendix B.

### **Monitoring Plot Number LCDUVA01**

Monitoring plot LCDUVA01 is located in the eastern portion of the variegated dudleya population. No variegated dudleya plants were detected to be within the monitoring plot. Total vegetative cover within the plot was 43.8 percent, with 31.0 percent native cover and 12.8 percent non-native cover. The dominant native plant species within the monitoring plot was black sage. Non-native plants included purple false brome, soft brome, foxtail brome, longbeak stork's bill, and annual fescue. Special-status plant species detected within the plot included San Diego barrel cactus.



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SOURCE: ESRI, 2021

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**Figure 14**  
 Variegated Dudleya Monitoring Results  
 Lusardi Creek County Preserve

### **Adaptive Management Recommendations**

In compliance with the stay-at-home order, resource-specific management activities for 2020 were postponed to 2021; therefore, thatch removal and invasive non-native plant control was not conducted in 2020. Because of this pause in management, non-native cover increased from 6.8 percent in 2019 to 12.8 percent in 2021. D&D performed routine management in 2021.

While the non-native cover is under the TMP management objective of maintaining invasive non-native plant cover at less than 20 percent for variegated dudleya (ESA and ICF 2015), continued thatch removal and invasive non-native plant treatment by a qualified restoration specialist is recommended. Herbivory fencing was installed in 2021 around the variegated dudleya monitoring plot. Continued monitoring for sign of herbivory and any potential human foot traffic and illegal off-road vehicles is recommended.

## **4.3 Arroyo Toad**

ESA monitored status of occupancy and breeding arroyo toads, habitat conditions, and threats to inform management needs on Santa Margarita County Preserve and Ramona Grasslands County Preserve. Representative photographs of the survey area and stream reach photographs are provided in **Appendix D**.

At the time of the initial habitat assessments and presence/absence surveys conducted within the survey area, Southern California was in the midst of a drought. A query of the USACE Antecedent Precipitation Tool (APT; USACE 2020) was run for the general vicinity of each preserve (~47 square mile sampling area), to attempt to quantify the degree to which they may be affected by these regional drought conditions. The APT is a modeling program developed by the USACE, used to compare recorded precipitation levels at a given general location(s) and date to the normal precipitation range at that location(s) over the preceding 30 years. The results of the query were based on sample points randomly chosen within each sampling area that were quantified using the Palmer Drought Severity Index (PDSI) and Average Antecedent Precipitation Scores (AAPS). The PDSI is intended to measure the duration and intensity of the long-term drought-inducing circulation patterns at each sampling point, and the AAPS is used to determine how “wet” or “dry” a particular location(s) (i.e., sampling point and/or date) is. The query revealed that at the time of the initial habitat and presence/absence survey, both preserves had a PDSI of Extreme Drought, and an AAPS between 9.3 and 9.8, i.e., were experiencing Drier Than Normal conditions.

### **4.3.1 Santa Margarita County Preserve**

Vegetation along the Santa Margarita River generally consists of riparian forest/woodland, characterized by a prominence of mulefat, western sycamore, sandbar willow, red willow and arroyo willow in the tree canopy. This canopy remained very dense throughout the downstream reaches (reaches 346 and 347) of the river, shading up to 75 percent of the open channel in many areas; however, was less dense along the upstream reaches (reach 348 and 349), where much of the channel remained open. Emergent vegetation (e.g., common threesquare [*Schoenoplectus pungens*]) and algae was observed throughout, particularly along the central portions of the river

(reach 347 and 348). Submerged, aquatic vegetation was observed as well; however, in much lower concentrations. Substrate observed along the bed and banks varied between a dominance of sand along reach 346 and 347, and a relatively even mixture of boulder, cobble, pebble, gravel, sand and silt within reach 348 and 349. Despite drought conditions reported in the region, as discussed above, flow within the Santa Margarita River was high, and much of the width of the channel was fully inundated. During the follow-up survey conducted in late June; however, flows had receded substantially, which resulted in an increase in shallow pooling and exposed banks. The results of the initial habitat assessment are provided in **Table 57**.

No arroyo toad clutches (i.e., egg stands, larvae, or metamorphs), juveniles or adults were observed within the Santa Margarita River during the surveys (**Figure 15**). The labeled reach points depicted on Figure 15 represent the start of the specified reach. A single, unidentified larval clutch of 250 individuals (~8mm in size), was observed within the northern (upstream) portion of the Santa Margarita River (reach B349) during the initial presence/absence survey; however, due to the size/age of the larvae, the clutch could not be differentiated between arroyo toad and western toad (*Bufo boreas*). This clutch was not observed during the follow-up survey conducted in June.

ESA biologists noted that during the initial presence/absence survey, very few individual tree frog larvae (*Pseudacris* sp.), and no other amphibian species (i.e., western toad), were observed within the survey area. During the late-season survey, numerous tree frog clutches were observed throughout the survey area, and two adult western toads were observed within the adjacent upland areas.

The majority of the habitat (i.e., shallow pooling and adjacent unshaded banks), suitable to support arroyo toad calling and breeding, was observed along the upstream margins of the Santa Margarita River. However, as stated above, with the exception of a few tree frog larvae, very few amphibians were seen utilizing the bed and banks of the channel during the presence/absence survey. During the late-season survey conducted in June; however, it was noted that flows in the channel were much lower than previously observed. This resulted in a visible increase in suitable habitat for arroyo toad, as well as a notable increase in the quantity of tree frog larvae observed along the creek. Based on these findings, it is conceivable that arroyo toads, as well as other amphibians within the river (i.e., tree frogs) may have attempted breeding early in the season; however, were washed downstream during periods of high flow. While numerous tree frog larvae were observed during the late-season survey, once flows had reduced, the arroyo toads, assuming they had bred previously, may not have been detected due to the fact that it was late in the season, and they may not have attempted to breed again (USFWS 1999).

### 4.3.1.1 Threats

Threats and habitat were assessed during surveys to determine: (1) if identified threats are having a direct negative effect on the species or habitat, and (2) if adaptive management actions need to be implemented. The following threats were assessed.

- **Unauthorized human access.** Signs of disturbance noted during the initial habitat assessment typically consisted of limited off-trail pedestrian traffic and signs of litter

observed along the bed and banks of the creek. No other forms of disturbance were noted during the surveys.

- **Altered hydrology.** It is presumed that the increased rate of flow observed along the river during the initial habitat assessment was unseasonable, and likely originated from an artificial source, located upstream of the survey area. Beavers were observed in the river; however, adverse effects from altered hydrology from beaver dams was not observed.
- **Invasive non-native plant species.** Two invasive non-native plant species, Uruguayan primrose-willow (*Ludwigia hexapetala*) and castor bean (*Ricinus communis*), were observed at moderate and low densities, respectively, throughout the upstream reaches (reach 349) of Santa Margarita River (Figure 15). Both species hold a Cal-IPC rating of “High” due to their severe impacts on physical processes and plant and animal communities (Cal-IPC 2021).
- **Exotic predators.** No exotic predators were detected within the Santa Margarita River.

### 4.3.1.2 Adaptive Management Recommendations

The Santa Margarita River supports adequate instream habitat for breeding arroyo toad; however, threats such as disturbances resulting from recreation, unseasonably high streamflow, and invasive non-native plant species may diminish the success of the species over time, without effective management. The following adaptive management actions are recommended.

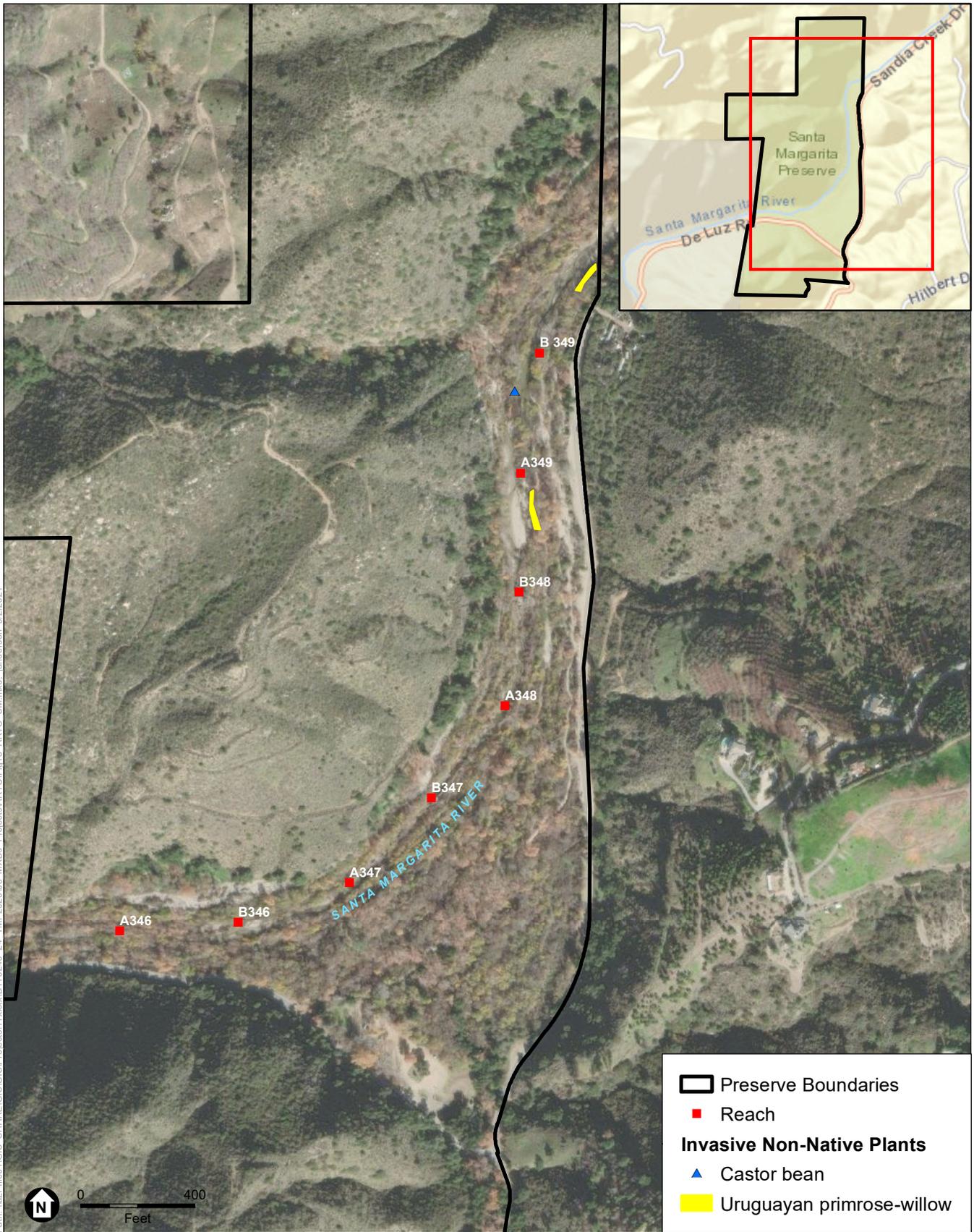
- **Increase signage.** The limited off-trail pedestrian traffic and litter observed along the bed and banks of the Santa Margarita River may be addressed by increasing signage at each river-crossing. The additional signage should speak to the biological value of the river, particularly for the arroyo toad, and the potential implications of wandering off-trail (i.e., trampling viable egg strands, larvae [tadpoles] and/or metamorphs [toadlets]).
- **Identify and regulate source of unseasonably high flows.** The unseasonably high flows observed during the initial surveys conducted in April suggest that an artificial point source(s) may be supplying additional water to the Santa Margarita River, which has the potential to have long term effects on arroyo toad breeding success. These high flows, when occurring between March and July (arroyo toad breeding season), have the potential to reduce available habitat for arroyo toads and prevent breeding and/or displace viable arroyo toad clutches that have been deposited, downstream. Some level of investigation should be initiated to determine a potential source of the high flows. If a target source(s) is identified, efforts should be made to regulate flows and restrict/eliminate this artificial input into the river during the arroyo toad breeding season (USFWS 1999).
- **Treat invasive non-native plant species.** The castor bean and Uruguayan primrose-willow observed along the northern portion of the survey area, may result in a reduction in breeding habitat along the river, and should be treated to prevent their spread, downstream of the survey area. Foliar application of an herbicide, suitable for aquatic use, should be implemented to treat these species. Treatment activities should be completed outside of the arroyo toad breeding season to avoid impacts to the species (ESA and ICF 2015).

**TABLE 57**  
**ARROYO TOAD HABITAT ASSESSMENT OF SANTA MARGARITA RIVER ON SANTA MARGARITA COUNTY PRESERVE**

Waterbody	Survey Reach	Segment	Start/End Time	Start/End Air Temperature (C)	Start/End Cloud Cover	Slope (%)	Channel Width/Flood Prone Width (m)	Entrenchment Ratio	Plunge Pools (#)	Overhead Canopy (%)	Dominant Species*	Portion Wet (%)	Pooling (%)			Aquatic Vegetation			Substrate (%)								Comments		
													Sh	Med	De	Su/Flo	Em	Al	Cla	S	Sa	G	P	Co	B	LL		FL	
Santa Margarita River	346	A	1434/1528	22/21	PC/PC	0-5	3.8/3.8	1	0	75	<i>Platanus racemosa, Salix laevigata, Salix lasiolepis</i>	100	10	10	0	10	10	25	0	0	75	0	0	15	10	0	0	No suitable breeding habitat.	
Santa Margarita River	--	B	1402/1434	22/22	PC/PC	0-5	17/17	1	0	10	<i>Platanus racemosa, Salix laevigata, Salix exigua</i>	100	0	10	10	10	10	10	0	25	65	10	0	0	0	0	0	0	Little suitable breeding habitat; steep banks with heavy vegetation.
Santa Margarita River	347	A	1312/1359	21/22	PC/PC	0-5	7.9/9.9	1.25	0	25	<i>Platanus racemosa, Salix laevigata, Salix lasiolepis,</i>	100	10	25	25	10	25	25	0	0	65	0	0	10	25	0	0	one location marginally suitable for breeding; partially shaded.	
Santa Margarita River	--	B	1222/1308	17/21	O/PC	0-5	7.6/7.6	1	0	25	<i>Platanus racemosa, Salix laevigata, Salix lasiolepis</i>	100	10	10	25	10	25	25	0	0	65	10	0	0	25	0	0	Limited habitat, primarily in middle of reach; pools formed partially by boulders.	
Santa Margarita River	348	A	1142/1217	18/17	PC/O	0-5	9.7/9.7	1	0	25	<i>Platanus racemosa, Salix laevigata, Salix exigua</i>	100	10	25	25	10	25	25	0	10	30	10	10	110	10	10	10	very minimal breeding habitat present along reach.	
Santa Margarita River	--	B	1110/1140	19/19	M/PC	0-5	4.6/5.7	1.2	0	10	<i>Baccharis salicifolia, Salix exigua, Salix lasiolepis</i>	100	25	10	0	10	10	10	--	--	--	--	--	--	--	--	--	--	banks suitable for breeding along 50%-75% of reach.
Santa Margarita River	349	A	1008/1104	19/19	M/O	0-5	6.2/11.6	1.9	5	10	<i>Salix exigua, Salix laevigata, Salix lasiolepis</i>	100	10	10	10	10	10	10	0	10	25	15	10	10	10	10	10	Suitable breeding habitat at end of reach.	
Santa Margarita River	--	B	0855/1008	18/19	O/O	0-3	8/8.2	1.025	0	10	<i>Baccharis salicifolia, Populus fremontii, Salix lasiolepis</i>	100	10	10	0	10	10	10	0	30	10	10	10	10	10	10	10	Suitable margins along left bank; minimal vegetation, sandy substrate; average depth 1-2 inches. recent high flow may have washed clutches out.	

NOTES: C – Celsius; Cl – clear, M – misting, O – overcast, PC – partly cloudy; m – meters; Sh – shallow, Med – medium depth, De – Deep; Su/Flo – submerged/floating, Em – emergent, Al – algae; Cla – clay, S – silt, Sa – sand, G – gravel, P – pebbles, Co – cobble, B – boulder, LL – leaf litter, FL – fallen logs; -- – no value.

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SOURCE: ESRI; ESA

COSD DPR 557744\_TO 24 TMP Implementation

**Figure 15**  
 Arroyo Toad Monitoring Results  
 Santa Margarita County Preserve



### 4.3.2 Ramona Grasslands County Preserve

Vegetation along Santa Maria Creek generally consists of riparian forest/woodland, characterized by a prominence of arroyo willow, mulefat, red willow and sandbar willow in the tree canopy. This canopy remains dense within upstream portions of the creek (reach 36–45), with up to 75 percent cover along the open channel in many areas; however, was much less dense throughout the downstream portions of the creek (reach 24–27). Flow within Santa Maria Creek was low throughout, and almost entirely dry along its southernmost reaches (reach 38–53). Where wetted, the channel (reach 23–37) generally supported slow-moving water and/or isolated pools with dense, emergent vegetation (e.g., common threesquare)/algae along its margins. During the follow-up survey conducted in late June, water levels had only receded further, which resulted in the majority of the survey area being completely dry, with even fewer scattered, isolated pools. In general, substrate observed along the bed and banks of the creek generally varied between a dominance of sand or silt, with boulder, cobble and gravel periodically mixed in. However, as noted in the 2019 annual report, north of reach 24, the creek enters a rocky gorge and becomes intersected by large boulders, forming a channel comprised of sandy and gravelly substrate. The results of the initial habitat assessment are provided in **Table 58**.

No arroyo toad clutches, juveniles or adults were observed within Santa Maria Creek during the initial habitat assessment; however, two juvenile arroyo toads were observed in the adjacent upland area along reach A28 (downstream), during the follow-up survey conducted in June (**Figure 16**). (The labeled reach points depicted on Figure 16 represent the start of the specified reach.) Based on the timing of the observation and the size of the individuals (45–47 mm), it is presumed that the two toads are the product of the previous years' breeding activities, and were likely foraging at the time of the observation. Many larval and adult tree frogs and western toads, and juvenile/adult two-striped garter snakes (*Thamnophis hammondi*) were observed along the creek during the initial habitat assessment and presence/absence survey, as well as, during the late-season survey conducted in June.

Habitat (i.e., shallow pooling and adjacent unshaded banks), suitable to support arroyo toad calling and breeding, observed along Santa Maria Creek in the past (i.e., 2019 monitoring) was limited during the 2021 surveys. Much of the creek that previously supported shallow pooling and adjacent, unvegetated calling banks was now either dry or supported low flows and/or isolated pooling, which was dominated by either emergent vegetation or floating algae. Based on the conditions observed in April, it is conceivable that flows may have been slightly higher earlier in the year (i.e., March), which may have resulted in a truncated breeding season for the arroyo toad. However, due to the fact that older larvae (~ 25–35mm) and/or metamorphs were not observed during the survey, it is more likely that breeding activities did not take place this year in response to the regional drought conditions. As previously stated, the two juvenile arroyo toads were likely the result the previous year's breeding activities.

**TABLE 58**  
**ARROYO TOAD HABITAT ASSESSMENT OF SANTA MARIA CREEK ON RAMONA GRASSLANDS COUNTY PRESERVE**

Waterbody	Survey Reach	Segment	Start/End Time	Start/End Air Temperature (C)	Start/End Cloud Cover	Slope (%)	Channel Width/Flood Prone Width (m)	Entrenchment Ratio	Plunge Pools (#)	Overhead Canopy (%)	Dominant Species*	Portion Wet (%)	Pooling (%)			Aquatic Vegetation			Substrate (%)									Comments
													Sh	Med	De	Su/Flo	Em	Al	Cla	S	Sa	G	P	Co	B	LL	FL	
Santa Maria Creek	23	B	0820/1910	11/20	C/C	5-10	1/10	10	0	10	--	100	90	10	0	0	0	25	0	0	50	0	0	0	50	0	0	Marginal breeding habitat; however very low flow and dense in-stream vegetation
Santa Maria Creek	24	A	1915/1015	20/17	C/C	5-10	4.3/9.5	2.21	0	10	<i>Baccharis salicifolia</i> , <i>Platanus racemosa</i>	100	10	90	0	10	40	50	0	10	80	0	0	0	10	0	0	Flow is extremely low, heavy algae/vegetation throughout. currently marginal/low quality habitat.
Santa Maria Creek	--	B	1020/1041	19/20	C/C	0-5	5.6/7.3	1.3	0	10	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	100	75	10	0	0	50	50	0	10	80	0	0	0	10	0	0	Marginal breeding habitat; however very low flow and dense in-stream vegetation.
Santa Maria Creek	25	A	1045/1107	20/21	C/C	0-5	8.3/11	1.32	0	10	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	100	75	0	0	0	25	50	0	10	90	0	0	0	0	0	0	Marginal breeding habitat; however very low flow and dense in-stream vegetation.
Santa Maria Creek		B	1107/1124	21/20	C/C	0-5	5.7/11.2	1.96	0	10	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	100	100	0	0	0	10	25	--	--	--	--	--	--	--	--	--	Marginal breeding habitat; however very low flow and dense in-stream vegetation.
Santa Maria Creek	26	A	1126/1145	19/22	C/C	0-5	4.8/9.4	1.96	0	10	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	100	90	10	0	0	10	50	0	10	80	0	0	0	10	0	0	Marginal breeding habitat; however very low flow and dense in-stream vegetation.
Santa Maria Creek		B	1146/1203	22/26	C/C	0-5	5/9	1.8	0	10	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	100	75	10	0	0	25	50	--	--	--	--	--	--	--	--	--	Marginal breeding habitat; however very low flow and dense in-stream vegetation.
Santa Maria Creek	27	A	1205/1223	28/24	C/C	0-5	5.1/7	1.37	0	10	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	100	90	10	0	0	10	50	0	10	80	0	0	0	10	0	0	Marginal breeding habitat; however very low flow and dense in-stream vegetation.
Santa Maria Creek		B	1223/1254	22/25	C/C	0-5	7.4/11.2	1.51	0	10	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	100	90	10	0	0	25	50	0	10	80	0	0	0	10	0	0	Marginal breeding habitat; however very low flow and dense in-stream vegetation.
Santa Maria Creek	28	A	1255/1319	26/25	C/C	0-5	15.8/17	1.08	0	75	<i>Salix laevigata</i>	100	--	--	--	--	--	--	0	25	75	0	0	0	0	0	0	No suitable habitat due to dense canopy cover and heavy veg/algae.
Santa Maria Creek		B	1318/1350	26/25	C/C	0-5	10.6/10.6	1	0	10	<i>Salix laevigata</i>	100	10	25	0	0	25	50	0	25	25	0	0	0	10	0	0	Marginal breeding habitat in few locations; deep water, low flow, and heavy veg/algae throughout.
Santa Maria Creek	29	A	1350/1411	25/26	C/C	0-5	6/16	2.67	0	25	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	100	10	25	10	0	25	50	0	10	80	0	0	0	10	0	0	Limited suitable breeding habitat; generally low flow, deep water, and heavy veg/algae throughout.
Santa Maria Creek		B	1411/1435	27/28	C/C	0-5	5.6/8	1.43	0	25	<i>Salix laevigata</i>	100	10	75	10	0	50	50	0	10	80	0	0	0	10	0	0	No suitable habitat due to dense canopy cover and heavy veg/algae.
Santa Maria Creek	30	A	1443/1510	26/28	C/C	0-5	11/11	1	0	10	<i>Schoenoplectus pungens</i>	100	80	10	10	0	50	50	0	10	80	0	0	0	10	0	0	No suitable habitat due to dense canopy cover and heavy veg/algae.
Santa Maria Creek		B	1510/1533	24/24	C/C	0-5	7.6/7.6	1	0	10	<i>Schoenoplectus pungens</i>	100	90	10	0	0	50	50	0	10	80	0	0	0	10	0	0	No suitable habitat due to dense canopy cover and heavy veg/algae.

**TABLE 58**  
**ARROYO TOAD HABITAT ASSESSMENT OF SANTA MARIA CREEK ON RAMONA GRASSLANDS COUNTY PRESERVE**

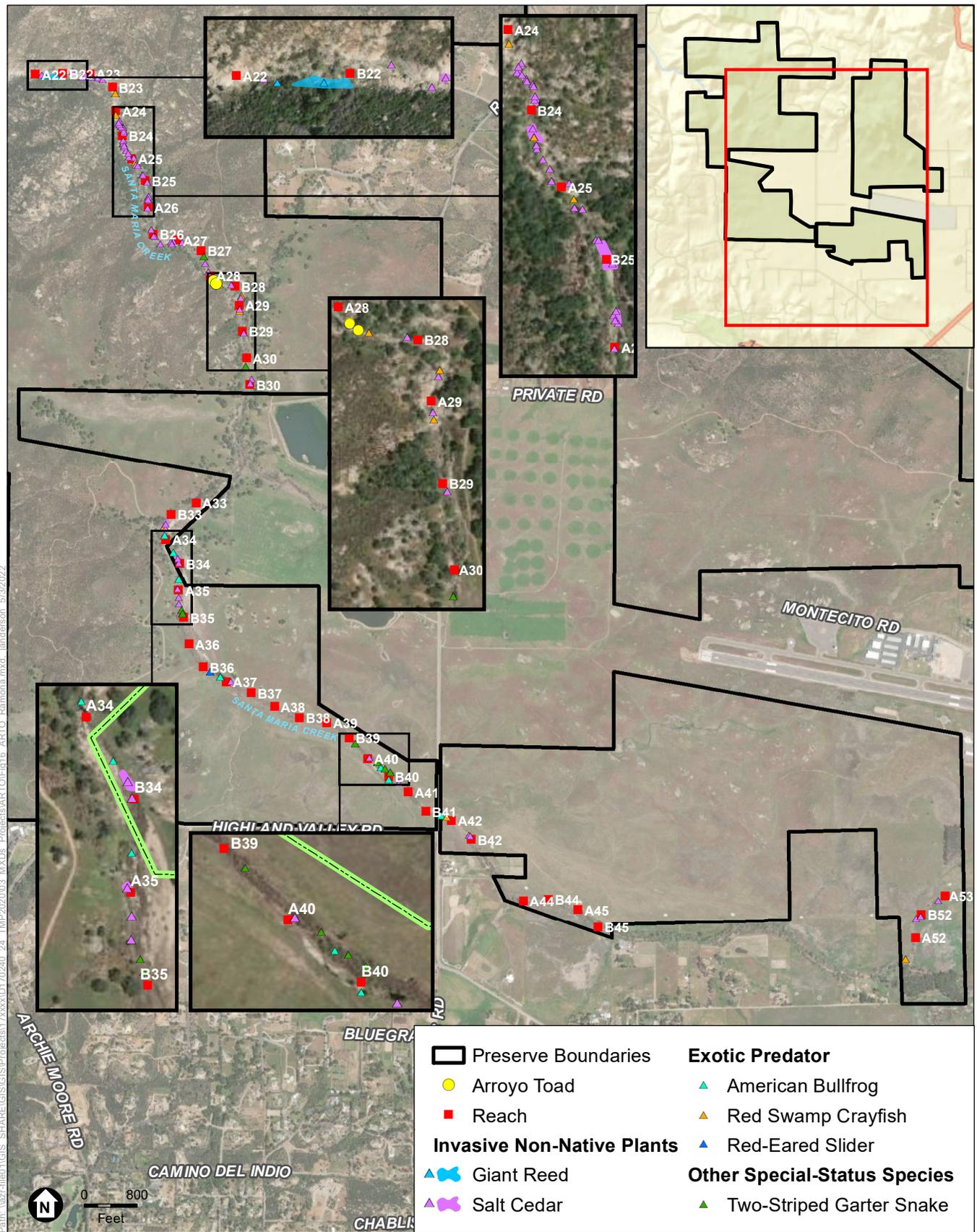
Waterbody	Survey Reach	Segment	Start/End Time	Start/End Air Temperature (C)	Start/End Cloud Cover	Slope (%)	Channel Width/Flood Prone Width (m)	Entrenchment Ratio	Plunge Pools (#)	Overhead Canopy (%)	Dominant Species*	Portion Wet (%)	Pooling (%)			Aquatic Vegetation			Substrate (%)									Comments	
													Sh	Med	De	Su/Flo	Em	Al	Cla	S	Sa	G	P	Co	B	LL	FL		
Santa Maria Creek	33	A	0729/0818	13/18	C/C	0-5	8/13.5	1.69	0	50	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	100	50	10	0	0	25	75	0	10	80	10	0	0	0	0	0	0	No suitable habitat due to dense canopy cover and heavy veg/algae.
Santa Maria Creek		B	0818/0911	18/26	C/C	0-5	8/16	2	0	25	<i>Baccharis salicifolia</i> , <i>Salix lasiolepis</i>	100	65	25	10	0	10	50	0	10	80	0	0	0	10	0	0	--	
Santa Maria Creek	34	A	0916/0948	32/32	C/C	0-5	7.7/29	3.77	0	10	<i>Baccharis salicifolia</i> , <i>Salix lasiolepis</i>	100	75	10	0	0	75	10	0	10	80	0	0	0	10	0	0	--	
Santa Maria Creek		B	0949/1039	34/38	C/C	0-5	10.4/14.7	1.41	0	10	<i>Baccharis salicifolia</i> , <i>Salix exigua</i> , <i>Salix lasiolepis</i>	100	50	10	10	0	25	25	0	10	80	0	0	0	10	0	0	--	
Santa Maria Creek	35	A	1043/1118	38/37	C/C	0-5	6.2/14.7	2.37	0	10	<i>Baccharis salicifolia</i> , <i>Salix exigua</i>	100	75	10	10	0	25	75	0	55	35	0	0	10	0	0	0	--	
Santa Maria Creek		B	1121/1153	38/38	C/C	0-5	39/39	1	0	10	<i>Baccharis salicifolia</i> , <i>Salix exigua</i>	75	50	10	0	0	90	10	0	10	90	0	0	0	0	0	0	--	
Santa Maria Creek	36	A	1157/1224	38/38	C/C	0-5	49/52	1.06	0	50	<i>Baccharis salicifolia</i>	100	25	50	25	0	50	10	0	10	90	0	0	0	0	0	0	--	
Santa Maria Creek		B	1227/1303	38/36	C/C	0-5	11/25	2.27	0	10	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	100	25	25	50	0	25	10	0	10	90	0	0	0	0	0	0	--	
Santa Maria Creek	37	A	1303/1339	34/34	C/C	0-5	27/66	2.44	0	50	<i>Baccharis salicifolia</i> , <i>Salix exigua</i>	25	10	0	25	0	10	10	0	0	90	10	0	0	0	0	0	--	
Santa Maria Creek		B	1339/1357	34/34	C/C	0-5	24/24	1	0	50	<i>Baccharis salicifolia</i> , <i>Salix exigua</i>	0	0	0	0	0	10	0	0	10	90	0	0	0	0	0	0	--	
Santa Maria Creek	38	A	1346/1400	16/18	PC/PC	0-5	26.8/28	1.04	0	25	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	No suitable breeding habitat due to a lack of water.	
Santa Maria Creek		B	1400/1420	18/18	PC/PC	0-5	23.8/23.8	1	0	50	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	No suitable breeding habitat due to a lack of water.	
Santa Maria Creek	39	A	1420/1431	23/22	PC/PC	0-5	16.8/16.8	1	0	50	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	No suitable breeding habitat due to a lack of water.	
Santa Maria Creek		B	1432/1450	22/20	PC/PC	0-5	21.2/21.2	1	0	50	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	0	0	0	0	0	0	0	0	90	10	0	0	0	0	0	0	No suitable breeding habitat due to a lack of water.	
Santa Maria Creek	40	A	1451/1531	22/19	PC/PC	0-5	4/27.5	6.875	0	25	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	10	10	10	0	0	10	25	0	10	90	0	0	0	0	0	0	Heavily vegetated, isolated pools.	
Santa Maria Creek		B	1531/1553	19/18	PC/PC	0-5	22/22	1	0	25	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	10	0	0	10	0	10	0	0	10	90	0	0	0	0	0	0	Heavily vegetated, isolated pools.	

**TABLE 58**  
**ARROYO TOAD HABITAT ASSESSMENT OF SANTA MARIA CREEK ON RAMONA GRASSLANDS COUNTY PRESERVE**

Waterbody	Survey Reach	Segment	Start/End Time	Start/End Air Temperature (C)	Start/End Cloud Cover	Slope (%)	Channel Width/Flood Prone Width (m)	Entrenchment Ratio	Plunge Pools (#)	Overhead Canopy (%)	Dominant Species*	Portion Wet (%)	Pooling (%)			Aquatic Vegetation			Substrate (%)								Comments			
													Sh	Med	De	Su/Flo	Em	Al	Cl	S	Sa	G	P	Co	B	LL		FL		
Santa Maria Creek	41	A	1554/1610	18/17	PC/PC	0-5	8.8/18.8	2.14	0	50	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	0	0	0	0	0	0	0	0	25	75	0	0	0	0	0	0	0	0	No suitable breeding habitat due to a lack of water.
Santa Maria Creek		B	1611/1637	18/19	PC/PC	0-5	3.9/18.1	4.64	0	10	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	10	0	10	0	0	0	10	0	10	90	0	0	0	0	0	0	0	0	Majority of reach dry with no moving water and one isolated pool under a road bridge.
Santa Maria Creek	42	A	0945/1026	20/19	PC/PC	0-5	10.3/17.9	1.74	0	0	<i>Baccharis salicifolia</i> , <i>Schoenoplectus acutus</i> , <i>Schoenoplectus pungens</i>	10	10	0	0	0	10	0	0	90	10	0	0	0	0	0	0	0	0	No suitable breeding habitat due to a lack of water.
Santa Maria Creek		B	1026/1056	19/19	PC/PC	0-5	22/26.3	1.2	0	75	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	0	0	0	0	0	0	0	90	10	0	0	0	0	0	0	0	0	No suitable breeding habitat due to a lack of water.	
Santa Maria Creek	44	A	1106/1126	19/24	PC/PC	0-5	8.6/15.8	1.84	0	25	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	0	0	0	0	0	0	0	10	90	0	0	0	0	0	0	0	0	No suitable breeding habitat due to a lack of water.	
Santa Maria Creek		B	1126/1149	24/21	C/C	0-5	10/10	1	0	50	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	10	10	0	0	0	10	0	0	0	100	0	0	0	0	0	0	0	No suitable breeding habitat due to a lack of water.	
Santa Maria Creek	45	A	1150/1211	20/19	C/C	0-5	11/16	1.45	0	25	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	10	0	10	0	0	0	0	0	100	0	0	0	0	0	0	0	0	No suitable breeding habitat due to a lack of water.	
Santa Maria Creek		B	1211/1237	19/17	C/C	0-5	5.5/36	6.54	0	50	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	10	0	10	0	0	0	0	0	100	0	0	0	0	0	0	0	0	No suitable breeding habitat due to a lack of water.	
Santa Maria Creek	52	A	0727/0801	10/12	C/C	0-5	2.5/9.5	3.8	0	25	<i>Baccharis salicifolia</i> , <i>Salix exigua</i>	10	10	0	0	0	0	0	10	90	0	0	0	0	0	0	0	0	No suitable breeding habitat due to a lack of water.	
Santa Maria Creek		B	0802/0833	13/10	C/PC	0-5	2.4/6	2.5	0	25	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	0	0	0	0	0	0	0	10	90	0	0	0	0	0	0	0	0	No suitable breeding habitat due to a lack of water.	
Santa Maria Creek	53	A	0835/0900	11/14	PC/PC	0-5	2.3/8.3	3.6	0	25	<i>Baccharis salicifolia</i> , <i>Salix laevigata</i>	0	0	0	0	0	0	0	10	90	0	0	0	0	0	0	0	0	No suitable breeding habitat due to a lack of water.	

NOTES: C – Celsius; Cl – clear, M – misting, O – overcast, PC – partly cloudy; m – meters; Sh – shallow, Med – medium depth, De – Deep; Su/Flo – submerged/floating, Em – emergent, Al – algae; Cl – clay, S – silt, Sa – sand, G – gravel, P – pebbles, Co – cobble, B – boulder, LL – leaf litter, FL – fallen logs; -- – no value.

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SOURCE: ESRI; ESA

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**Figure 16**  
 Arroyo Toad Monitoring Results  
 Ramona Grasslands County Preserve



### 4.3.2.1 Threats

Threats and habitat were assessed during surveys to determine: (1) if identified threats are having a direct negative effect on the species or habitat, and (2) if adaptive management actions need to be implemented. The following threats were assessed.

- **Disturbance.** Signs of disturbance noted during the initial habitat assessment typically consisted of low to moderate levels of livestock activity (i.e., tracks and manure) within the bed and banks of the creek. No other substantial forms of disturbance were noted during the surveys.
- **Invasive non-native plant species.** One invasive non-native plant species, tamarisk, occurs at low to moderate densities throughout Santa Maria Creek, increasing in density downstream of reach 30 (reach 23–30) (Figure 16). Tamarisk has a Cal-IPC rating of High. While not observed during the 2021 surveys, giant reed, also a Cal-IPC High species, was mapped along reach 22 in 2018, in an inaccessible portion of the creek, and is presumed extant (Figure 16).
- **Exotic predators.** Three exotic predators were also noted during surveys, the red-eared slider, red-swamp crayfish and American bullfrog. One red-eared slider was observed in an isolated pool, along reach B36; numerous red-swamp crayfish were observed throughout wetted portions of the creek, primarily between reach 23 and 37; and numerous American bullfrogs were observed, primarily within isolated pools, upstream of reach 34.

### 4.3.2.2 Adaptive Management Recommendations

The Santa Maria Creek supports adequate instream habitat for breeding arroyo toad; however, threats such as invasive non-native plant species, exotic predators, and disturbances resulting from livestock may diminish the success of the species over time, without effective management. The following adaptive management actions are recommended.

- **Maintain cattle grazing outside of Santa Maria Creek.** 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 of arroyo toad individuals/larval clutches, as well as erosion and sedimentation of the creek, which may degrade the habitat over time.
- **Treat invasive non-native plant species.** The density of tamarisk throughout the Santa Maria Creek is expected to reduce available breeding habitat along the channel over time, and therefore, should be treated to prevent its spread throughout the survey area. 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. Large tamarisk (e.g., greater than 10 feet high) may be removed using cut-and-daub practices with an herbicide (suitable for aquatic use) on a case-by-case basis, as necessary. The County should also assess the feasibility of removing the giant reed on-site, as well. While this species has only been documented in the northernmost (downstream) reaches of the survey area, it is known to spread readily throughout stream courses, resulting in sediment occlusion, and effectively, less habitat suitable to support arroyo toad. Removal of this species may be achieved using the cut-and-daub method. All treatment activities should take place outside of the arroyo toad breeding season.

- **Control exotic predators.** Due to the prevalence of American bullfrog along the upstream reaches of the creek, continuation of bullfrog eradication is likely warranted to ensure success of the current eradication program. This should be accomplished through targeted removal of breeding-size adult bullfrogs to avoid and minimize impacts to aquatic species and habitats. Red-swamp crayfish should be targeted for eradication, as well, and in the interest of efficiency, can be completed concurrent with bullfrog eradication efforts.

## 4.4 Burrowing Owl

During the 2021 burrowing owl habitat assessment surveys within Hellhole Canyon County Preserve, no burrowing owls, sign of burrowing owls, and/or suitable 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). Representative photographs of the survey area and completed field forms are provided in **Appendix F**.

No suitable burrows and California ground squirrel colonies were observed on the preserve. While the majority of the preserve consists of moderately dense shrublands, there was one area in the main area of the preserve that was dominated by low-level native grassland/wildflowers (Appendix F, Photo 1). This area was extensively surveyed with no suitable burrows and California ground squirrels observed. This suitable habitat was east of the burrowing owl observed during 2008 baseline biodiversity surveys. When surveying the area where the historic burrowing owl was observed, old, collapsed burrows were noted but no suitable burrows, California ground squirrels, or burrowing owl sign were observed. The area is dense with tall shrubs and appears unsuitable for burrowing owl use (Appendix F, Photo 2). The parcel known as Addition 1 on the Hellhole Canyon County Preserve was extensively surveyed with only two surrogate burrows observed, created due to water flow at the bottom of dry creek beds (Appendix F, Photo 3). These surrogate burrows may no longer be present after the spring rain events. California ground squirrels were observed just south of Addition 1 at the off-site stock pond, but no suitable burrows were noted on the preserve. The parcel known as Sierra Verde on the Hellhole Canyon Preserve was extensively surveyed with no suitable burrows, California ground squirrels, or burrowing owl sign were observed. The areas identified as non-native grassland in the northeast portion and abandoned orchards in the middle of the parcel provides suitable habitat due to low-height vegetation but lacks current burrows. California ground squirrels were observed adjacent to the Sierra Verde parcel towards the east on Rancho Guejito and west on private property.

### 4.4.1 Threats

Threats and habitat were assessed during surveys to determine: (1) if identified threats are having a direct negative effect on the species or habitat, and (2) if adaptive management actions need to be implemented. The habitat and threats assessment survey included an evaluation of the threats as it pertains to the needs of the burrowing owl (e.g., vegetation height, California ground squirrel presence) (**Appendix F**). The following threats were assessed.

- **Observation of predators.** A coyote was seen to the east of the Sierra Verde Parcel of the preserve.

- **Signs of unauthorized access.** Unauthorized off-road vehicle signs (tracks, trash) were seen on the Addition 1 parcel and there were signs of equestrian and foot traffic (tracks) on the Sierra Verde parcel.
- **Lack of mammal burrows.** No suitable burrows and California ground squirrel colonies were observed on the preserve.
- **Use of rodenticide.** No signs of rodenticide use on or adjacent to the preserve were observed. Use of rodenticide is not a threat to the species in the preserve.
- **Thick or tall vegetation.** On the main preserve parcel, the majority of the vegetation is currently too thick and tall for suitable burrowing owl use including in the area of a historic observation. Vegetation on the Sierra Verde and Addition 1 parcels are currently suitable for burrowing owl, but are threatened by non-native vegetation encroaching upon the parcels.

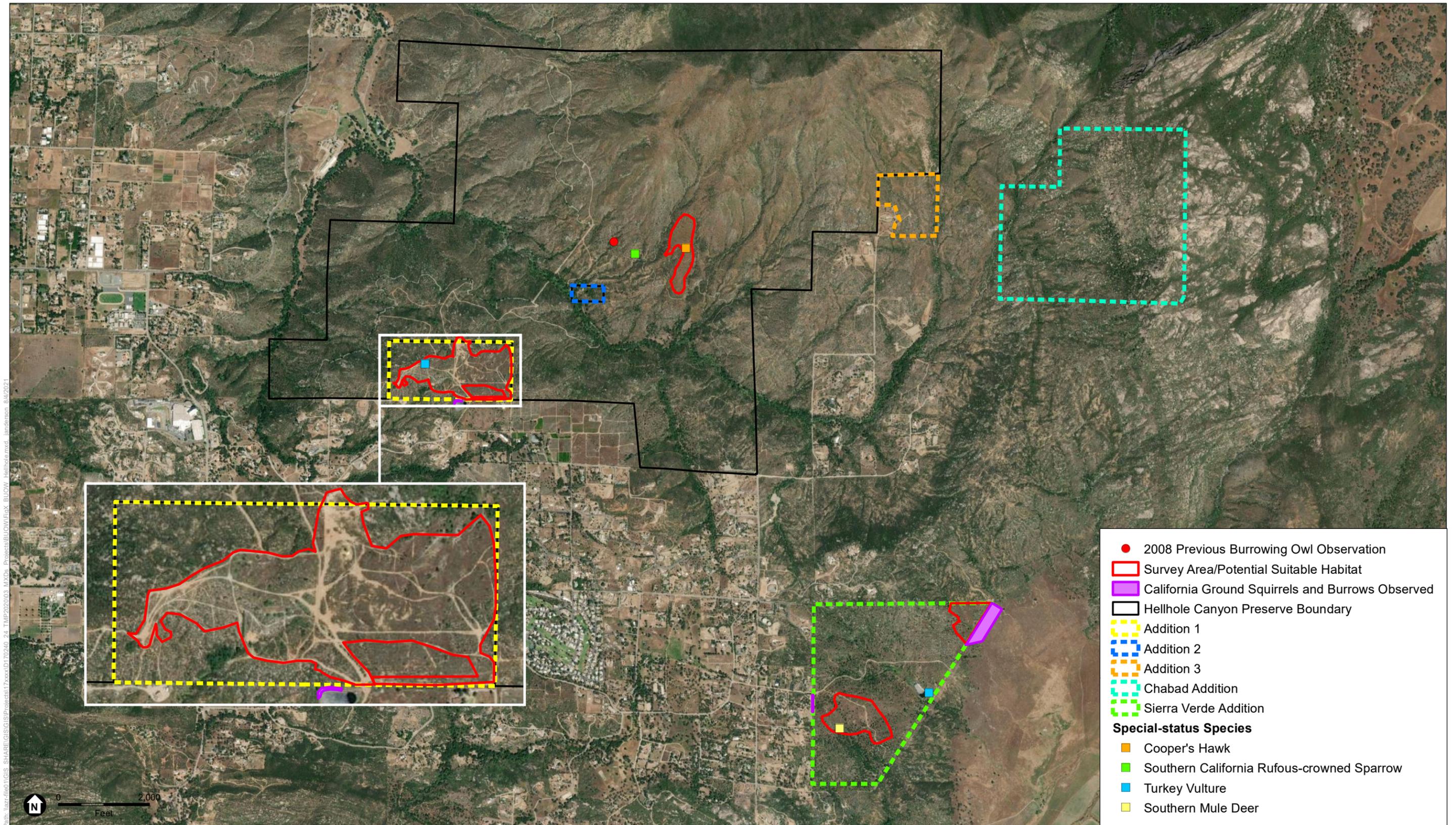
#### 4.4.2 Adaptive Management Recommendations

The Hellhole Canyon County Preserve currently lacks suitable burrows and a breeding population on-site, therefore, adaptive management measures for this species is not necessary. However, if DPR wishes to improve habitat suitability for burrowing owls, the following adaptive management actions are recommended.

- **Reduce unauthorized access.** Patrol Addition 1 and Sierra Verde parcels to reduce unauthorized off-road vehicular and foot traffic use, which would improve habitat suitability by reducing human disturbance, improving habitat quality, and may encourage use by adjacent off-site California ground squirrel colonies.
- **Survey potential suitable habitat areas next monitoring cycle.** Survey polygons marked as “Potential Suitable Habitat” on **Figure 17** when surveys are scheduled in 3 years to determine if burrows are present given the moderate suitable habitat (e.g., low vegetation height).

### 4.5 Northern Harrier

The 2021 northern harrier nesting surveys focused on areas with low scrub and/or vegetation cover and areas with previous documented northern harrier use in Tijuana River Valley Regional Park. These areas include the coastal sage scrub vegetation community in the western portion of the park, north of Monument Road and west of Hollister Street, the southern willow scrub vegetation community in the northwestern portion of the park near the intersection of Saturn Boulevard and Sunset Avenue, the Diegan coastal sage scrub vegetation community northeast of the Hollister Street and Monument Road intersection, the mule fat/southern willow scrub habitat east of the Tijuana River Valley Sports Complex, and the riparian vegetation community along the eastern park boundary. (Due to the lack of accessibility along the eastern park boundary, lack of northern harrier observations during the first site visit, and limited survey time, this area was not surveyed after the April survey.) The abandoned agricultural field along the northern boundary of the park, north of Sunset Avenue was observed to be used by northern harriers for foraging during the April survey and was surveyed throughout the 2021 nesting surveys to document use. Representative photographs of the survey areas and completed field forms are provided in **Appendix G**.



- 2008 Previous Burrowing Owl Observation
- ▭ Survey Area/Potential Suitable Habitat
- ▭ California Ground Squirrels and Burrows Observed
- ▭ Hellhole Canyon Preserve Boundary
- ▭ Addition 1
- ▭ Addition 2
- ▭ Addition 3
- ▭ Chabad Addition
- ▭ Sierra Verde Addition
- Special-status Species**
- ▭ Cooper's Hawk
- ▭ Southern California Rufous-crowned Sparrow
- ▭ Turkey Vulture
- ▭ Southern Mule Deer

SOURCE: ESRI; SanGIS.

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**Figure 17**  
 Burrowing Owl Habitat Assessment  
 Hellhole Canyon County Preserve



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Northern harriers were observed during all surveys with the highest observations during the month of May. Fledglings were observed during the June survey. Territorial behavior documented by northern harriers during the survey include prey exchange from a male to female, female delivering food to a probable nest site location, two adult females displaying territorial aggression by briefly locking talons, and fledglings seen/heard begging and following the adult female. All of these territorial behaviors were documented in Territory #1. This may indicate that this territory is highly sought after and is highly suitable for nesting northern harriers. Up to five northern harrier territories could be present within the Tijuana River Valley Regional Park (Table 59 and Figure 18).

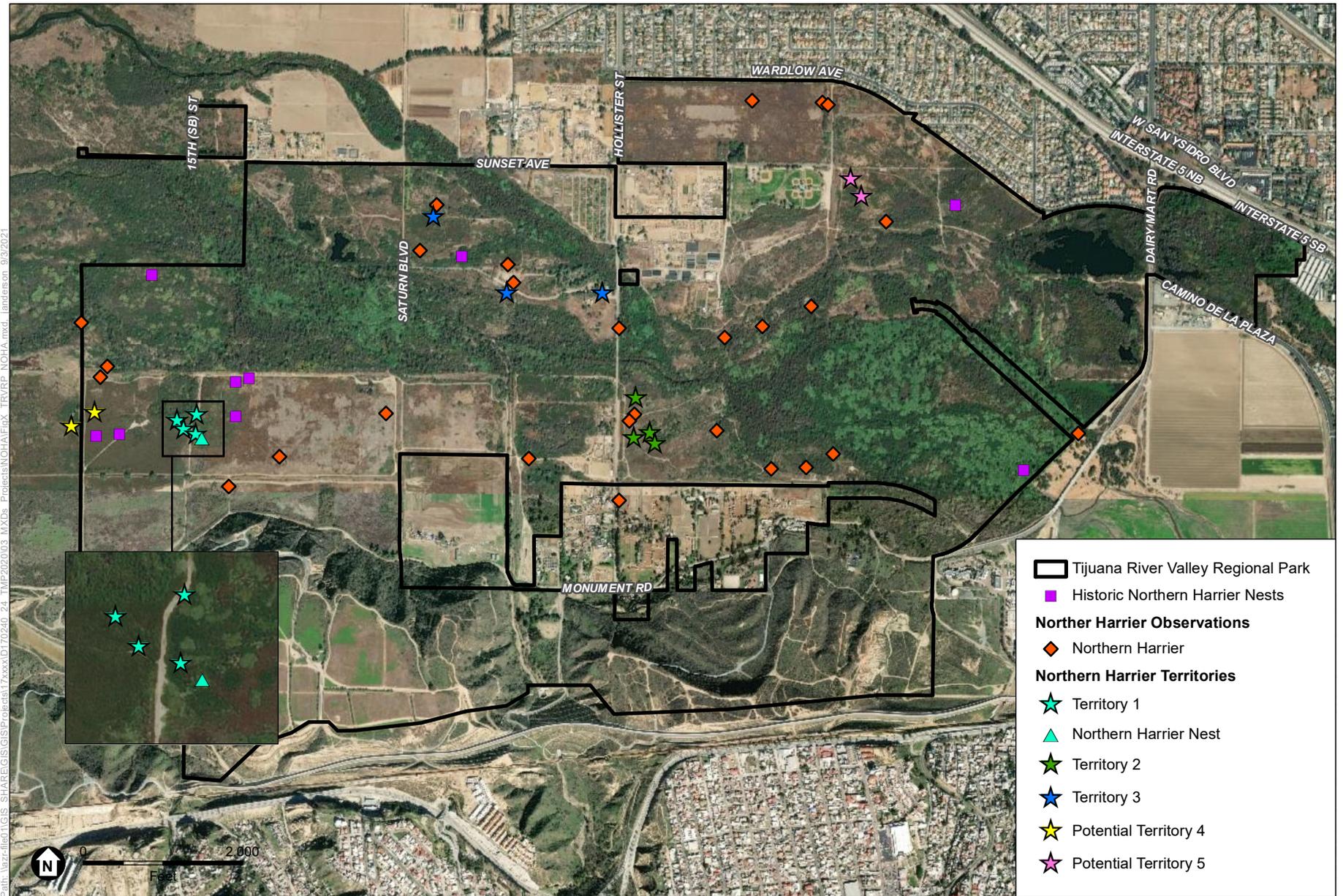
**TABLE 59**  
**NORTHERN HARRIER NESTING SURVEY RESULTS**

Territory	Type	Nest Success	Location	Observation Summary
#1	Pair	Fledged	North of the newly constructed TRVRP campground. Location of historic nesting.	Pair was seen in April/May. Two fledglings and female seen in June. Male only in July.
#2	Pair	Failed	Northeast of the Hollister St/Monument Rd Intersect	Male seen in May. Pair seen in June.
#3	Individual	Fledged	West of the TRVRP Bird & Butterfly Garden	Male seen in April/May. Fledgling seen in June.
#4*	Individual	Unknown	North of the newly constructed TRVRP campground.	A second female was seen in April/May in Territory #1 and territorial behavior was observed. Habitat could support a second territory. Likely to the west of Territory #1 off of County property.
#5*	Individual	Unknown	East of Tijuana River Valley Sports Complex	Male seen in April. Female seen in May. Individual female & male seen separately in June. Female seen in July.

NOTE:

\* Potential territories due to evidence of territorial disputes and/or distances from other territories.

Three territories (Territories #1, #2, and #3) were confirmed within the Tijuana River Valley Regional Park (Table 59 and Figure 18). The Territory #1 fledged and the nest site was located in proximity to a public trail and known historic nest location. The Territory #2 and Territory #3 nest sites were not located. Territory #2 was assumed to have failed given the presence of individual/pair sightings and lack of fledglings observed. Territory #3 was determined to have fledged because a fledgling was seen during the June survey. Up to two other territories (Territories #4 and #5) could potential occur in the park but were not confirmed. Territory #4 is a potential territory adjacent to Territory #1. This was determined based on an observed territorial dispute between two adult females during the May survey. While no nesting was confirmed in Territory #5, an individual male and female were seen on separate occasions throughout the 2021 nesting surveys in the area. Territory #5 would be the northernmost territory. It is adjacent to a historic nest location and the abandoned agricultural field that was used extensively for foraging. Individuals were foraging in this field during every 2021 nesting survey.



SOURCE: ESRI, 2020; ESA, 2021.

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**Figure 18**  
Northern Harrier Monitoring Results  
Tijuana River Valley Regional Park

There were multiple areas in the park where individual northern harriers were seen foraging. The abandoned agricultural field north of the Tijuana River Valley Sports Complex appeared to have the highest suitability due to the high number of observations. Other areas include the scrub habitat within, west, and east of Territory #1, the mule fat scrub to the east of the Tijuana River Valley Sports Complex, and the scrub habitat south of Sunset Avenue and west of Saturn Boulevard.

### 4.5.1 Threats

Threats and habitat were assessed during surveys to determine: (1) if identified threats are having a direct negative effect on the species or habitat, and (2) if adaptive management actions need to be implemented. The habitat and threats assessment survey included an evaluation of the threats as it pertains to the needs of the northern harrier (e.g., nest success, prey abundance, **Appendix G**). The following threats were assessed.

- **Nest disturbance.** Territory #1 nest site is in the vicinity of a trail. The nest successfully fledged; however, increase in public use (e.g., campground users) and border patrol activities could affect future nesting success.
- **Nest predation.** Unauthorized dumping of trash and an expected increase of trash from the recently opened campground could encourage the park to be used more frequently by northern harrier nesting predators (e.g., coyotes, raccoons, ravens). An adult female northern harrier was seen in Territory #2 extensively harassing a coyote along a trail during the June survey and an adult female was seen in Territory #1 extensively harassing an unknown predator.
- **Invasive non-native vegetation.** Current nesting habitat conditions are ideal as scrub vegetation height is between 2 and 4 feet tall and small trees are present adjacent to open space habitat (scrub or grassland habitat). Invasive non-native vegetation is not a threat to the species in the park.
- **Use of rodenticide.** No signs of rodenticide use on or adjacent to the park were observed. Use of rodenticide is not a threat to the species in the park.

### 4.5.2 Adaptive Management Recommendations

The Tijuana River Valley Regional Park supports suitable foraging and nesting habitat; however, threats such as nest disturbance and nest predation may diminish the success of the species over time, without effective management. Survey observations suggest that the monitoring period should be adjusted to improve detections of nest building behaviors and fledglings. The following adaptive management actions are recommended.

- **Monitor trail use in vicinity of the Territory #1 nest site.** Install a trail counter on the trail in the vicinity of the Territory #1 nest site to track trail use. This will provide a trail use baseline and inform if seasonal trail closure is warranted to prevent nest disturbance. Trail closure is not recommended at this time.
- **Clean up trash.** Regularly maintain trash cans and remove trash around the campground to prevent attraction of nest predators. Trash removal is especially important during the nesting season due to the approximate of the campground to Territory #1.
- **Adjust survey timing.** Begin nesting surveys in March to detect nest building behavior. The 2021 surveys commenced in April and concluded in July. Nest building behavior was not observed in April and nesting was no longer observed in July. Adjusting the survey period to commence in March would likely improve detection of nest locations and nesting success over the same four surveys.

## 4.6 Least Bell's Vireo

ESA monitored status of breeding least Bell's vireo populations and habitat conditions and threats to inform management needs in Tijuana River Valley Regional Park and Santa Margarita County Preserve. The submitted 45-day reports are included in **Appendix H**.

### 4.6.1 Santa Margarita County Preserve

The survey area encompasses a portion of the Santa Margarita River and adjacent upland areas, recreational trails and access roads, and the preserve staging area north and off of De Luz Road. All vegetation communities within the Santa Margarita channel were surveyed. Potentially suitable nesting habitat for least Bell's vireo only occur in southern riparian woodland (20.41 acres), southern riparian forest (13.41 acres), southern willow scrub (4.94 acres), southern cottonwood-willow riparian forest (2.71 acres), southern riparian scrub (0.67 acres), southern sycamore-alder riparian woodland (0.47 acres), and southern coast live oak riparian forest (0.43 acres) totaling 43.04 acres.

Survey results are summarized in **Table 60** below and depicted on **Figure 19**. Least Bell's vireos were detected during all 2021 focused surveys. Based on the results of the protocol-level least Bell's vireo surveys, the survey area contains least Bell's vireo habitat that was occupied by up to 11 least Bell's vireo territories, including five pairs. Brown-headed cowbirds were also detected within the survey area during the surveys (**Table 61**). A least Bell's vireo nest was incidentally found during the June 4<sup>th</sup> survey and the nest contained two vireo eggs and a brown-headed cowbird egg. Biologists did not touch or manipulate the nest contents and the pair of vireo continued to incubate the nest. The following survey, biologists discovered that the vireo nest had failed and the nest was on the ground with a vireo egg in the vicinity. Additionally, a brown-headed cowbird fledgling was seen being fed by least Bell's vireo during two surveys. Southwestern willow flycatcher and yellow-billed cuckoo were not detected. Additional common species detected during the survey are included in Appendix H.

**TABLE 60**  
**LEAST BELL'S VIREO TERRITORY SURVEY RESULTS:**  
**SANTA MARGARITA COUNTY PRESERVE**

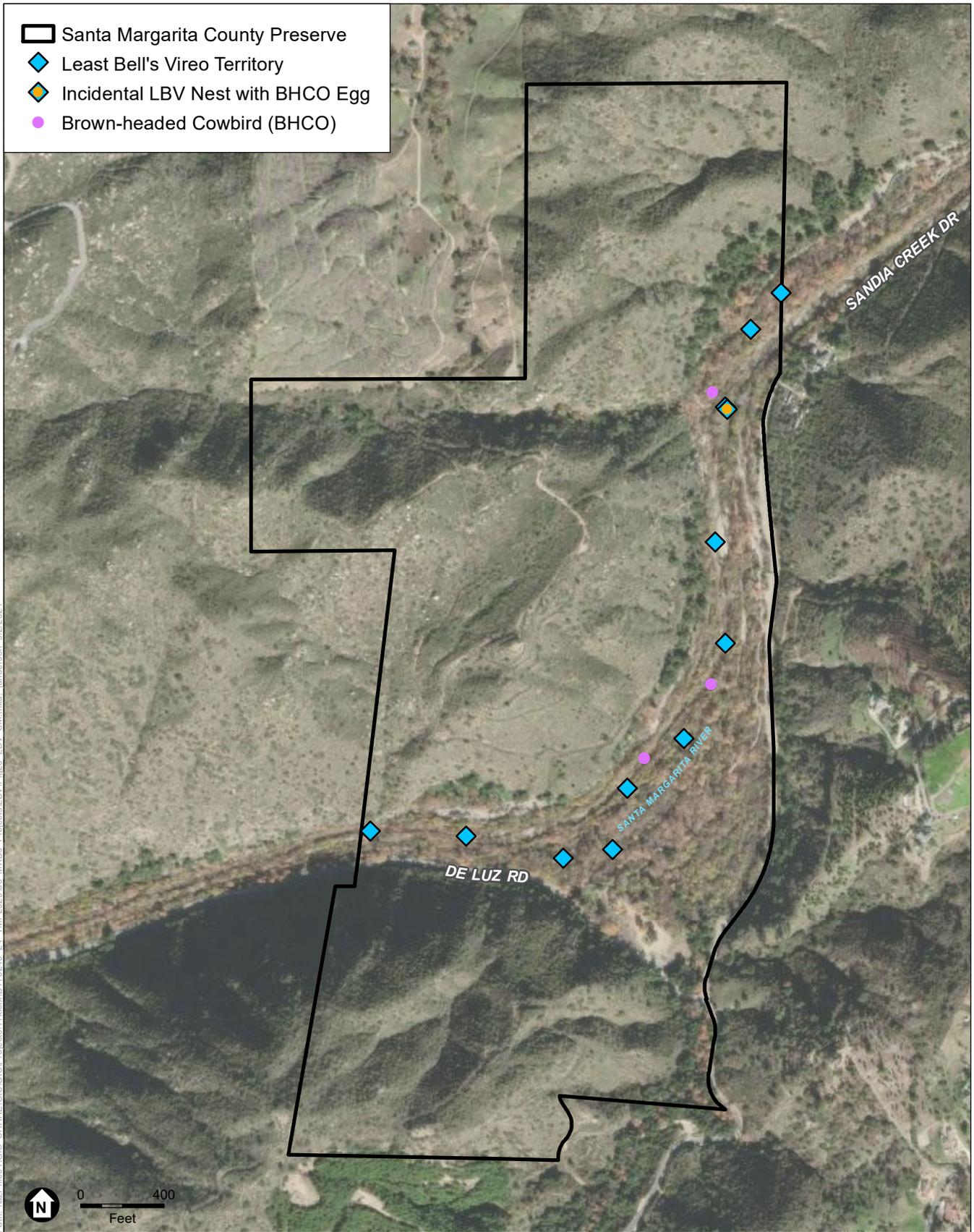
Species	Pairs	Single Males	Total
Least Bell's Vireo	5	6	11

**TABLE 61**  
**BROWN-HEADED COWBIRD DETECTIONS:**  
**SANTA MARGARITA COUNTY PRESERVE**

Date	Count
4/14/2021	2
5/11/2021	1
6/4/2021	1*
6/16/2021	1*
6/30/2021	1

NOTE:

\* Likely same brown-headed cowbird fledgling.



SOURCE: ESRI; ESA

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**Figure 19**  
Least Bell's Vireo Monitoring Results  
Santa Margarita County Preserve



### 4.6.1.1 Threats

Threats and habitat were assessed during species surveys to determine: (1) if identified threats are having a direct negative effect on the species or habitat, and (2) if adaptive management actions need to be implemented. The following threats were observed.

- **Nest Parasitism by Brown-headed Cowbird.** The observations of adult, fledgling, and a cowbird egg in a least Bell's vireo nest is indicative of parasitism within Santa Margarita County Preserve. A pair of cowbirds was observed copulating during the first survey and cowbirds were observed five out of the eight protocol surveys. While the number of observations of cowbirds are relatively low, at least two vireo territories suffered direct impacts to productivity this season. A vireo male feeding a cowbird fledgling on consecutive surveys indicates that the vireo pair likely did not produce any fledglings of their own this season. In an incidentally found vireo nest, a cowbird egg was observed along with two vireo eggs. This nest was on the ground the following survey and it is unknown if the failure was due to nest abandonment or instability of the host plant. Regardless, that vireo pair also likely did not produce any vireo fledglings this season. Over time, as cowbird become more abundant in the preserve, reproductive rates for local vireo and native songbird populations may decline as a result.
- **Invasive non-native plant species.** Invasive non-native plant species occur on the preserve in scattered locations; however, several of these species have the ability to become established in a short period of time. Tamarisk, an invasive non-native plant species is rated "High" by Cal-IPC for the severe impacts it can have on hydrological processes and plant and animal communities (Cal-IPC 2021). This invasive non-native species can outcompete and displace native plant species, resulting in degraded riparian habitats. Mature trees and seedlings of salt-cedar were observed in riparian habitats throughout the preserve. Additionally, arundo and perennial pepperweed, both rated "High" by Cal-IPC are present in small numbers on the preserve. Similar to salt-cedar, these non-native plant species can quickly become established in disturbed soils along the river and outcompete native plant species. Displacement of native vegetation can negatively impact vireo prey availability and nesting habitat.

### 4.6.1.2 Adaptive Management Recommendations

The following are adaptive management recommendations to maintain suitable breeding habitat for least Bell's vireo and maintain breeding pairs within Santa Margarita County Preserve.

- **Brown-headed cowbird trapping program.** Initiate a brown-headed cowbird trapping program for Santa Margarita County Preserve and other parks/reserves in the area for next breeding season. Partnering with land managers in the area to provide trapping in suitable habitat will improve catch rates and decrease parasitism impacts to vireo and songbird species in the area. The northwestern corner of the preserve parking lot off of De Luz Road would be the most suitable location for a cowbird trap due to the disturbed nature of the area and close proximity to both equestrians and riparian habitat.
- **Least Bell's vireo nest monitoring.** Least bell's vireo monitoring should include nest monitoring. Nest monitoring can only be conducted by USFWS permitted biologists. Although nest monitoring would require additional resources, it could be a feasible option due to the size of the Santa Margarita County Preserve and small number of vireo territories present. Nest monitoring could provide important data on reproductive success and identify threats to nesting success.
- **Habitat restoration and habitat enhancement.** Removal of invasive non-native plant species through mechanical or chemical methods is recommended outside of the avian

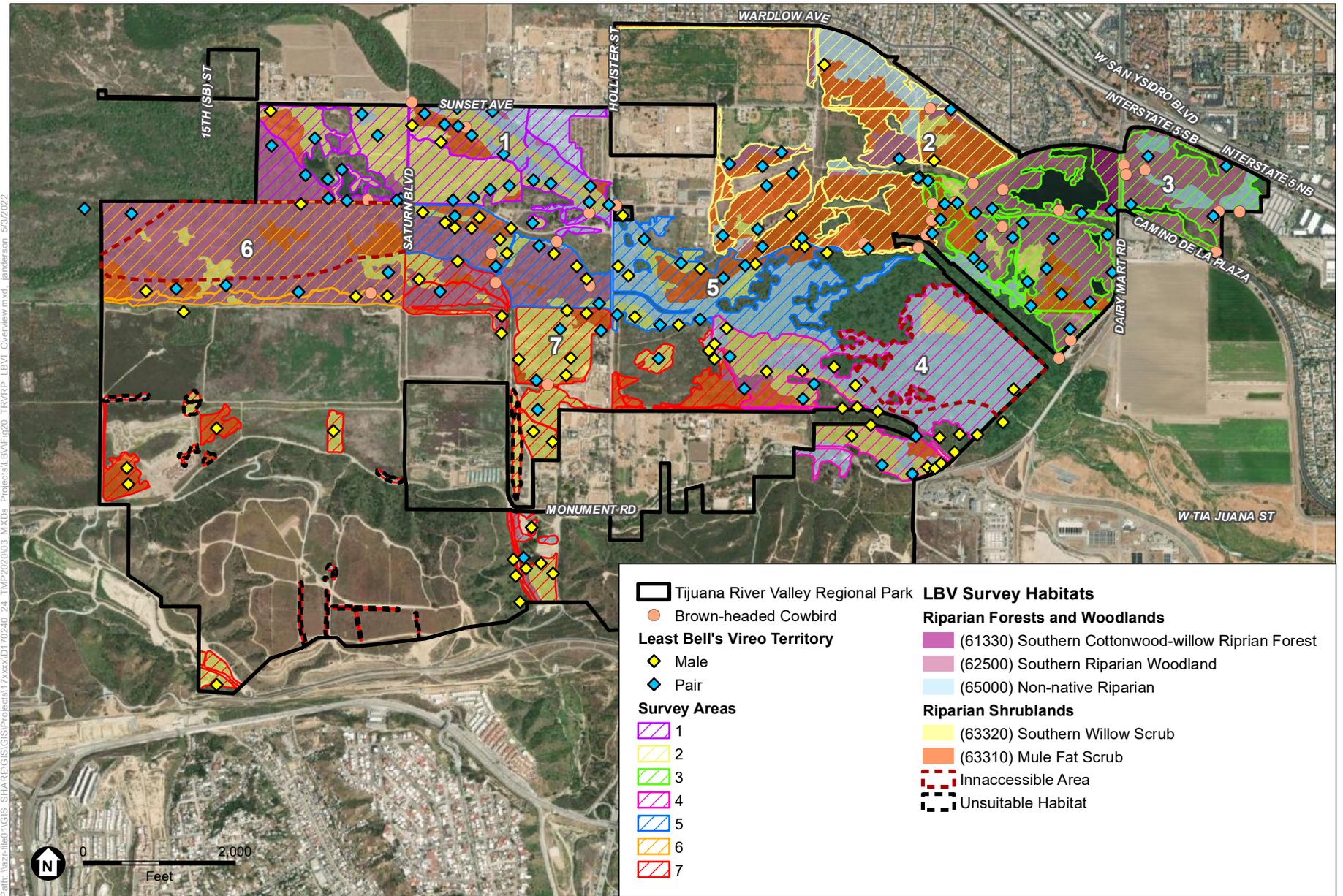
nesting season (March-September). The use of hand tools and herbicide (water safe) could be used during the nesting season, if a biologist is present to clear the impact areas in front of the restoration crew. This may be needed for annual and perennial non-native species that grow and seed out during nesting season. Poison hemlock and fennel are annual invasive species with growing seasons that coincide with nesting season. Ideally, herbicide should be applied before seed sets on plants, which may involve multiple treatment visits throughout the season. The current distribution and density of invasive plants is low on the preserve, which would make it an ideal time to control these small populations before they increase substantially. Furthermore, removal or treatment of invasive non-native plants creates an opportunity for habitat enhancement and restoration in areas that have low plant diversity.

- **Collaboration with partner agencies and land managers.** Coordination with adjacent land managers is essential to managing brown-headed cowbirds and non-native plant populations in the area. Partnering with land managers upstream and downstream of the preserve will vastly increase the efficiency of the cowbird trapping program and spread of non-native plants from upstream properties. Brown-headed cowbird traps are generally spaced at least a mile apart for trap efficiency, as traps placed closer together do not equate to higher trap rates.

#### 4.6.2 Tijuana River Valley Regional Park

The survey area encompasses a large portion of the Tijuana River, just inland of its terminus with the Pacific Ocean, and its wide swath of associated wetlands, floodplains and riparian habitats. Much of the habitat within the survey area was dense and lush, thriving off fertile soils with permanent water sources, frequent rainy season flooding events, and a high-water table. The survey area contains recreational trails and access roads between and within the survey blocks, though large portions of the survey area were inaccessible due to flooding, ponding, flowing, polluted waters, and/or dense riparian vegetation that precluded practical mobility. The survey area encompasses a portion of the Tijuana River and adjacent upland areas, recreational trails and access roads. The overall survey area included southern riparian woodland (262 acres), non-native riparian (184 acres), mulefat scrub (178 acres), southern willow scrub (175 acres) and southern cottonwood willow riparian forest (5 acres), for a totaling of 804 acres. The 804-acre survey area was divided into seven survey blocks, with each block encompassing approximately 115 acres. All 804 acres were initially targeted to be surveyed, though inaccessible areas were not surveyed. Therefore, a total of 668 acres were ultimately surveyed (surveyable area).

Survey results are summarized in **Table 62** and depicted on **Figure 20**. Least Bell's vireo were detected commonly on all survey passes. The results of the modified protocol-level least Bell's vireo surveys conducted within the accessible portions of the study area (668 total accessible acres) contain least Bell's vireo habitat that was occupied by approximately 178 least Bell's vireo territories, including at least 101 pairs and 77 single males (a large portion of which were likely paired). Several least Bell's vireo nests were documented incidentally during the surveys. Brown-headed cowbirds were detected within the survey area as summarized in **Table 63**. Brown-headed cowbirds were not observed in large numbers or concentrations, likely reflective of years of ongoing cowbird trapping efforts in and around the TRVRP. Southwestern willow flycatcher and yellow-billed cuckoo were not detected. Additional common species detected during the survey are included in Appendix H.



SOURCE: ESRI, 2020; ESA, 2021.

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**Figure 20**  
Least Bell's Vireo Monitoring Results  
Tijuana River Valley Regional Park

**TABLE 62**  
**LEAST BELL'S VIREO TERRITORIES BY SURVEY BLOCK: TIJUANA RIVER VALLEY**  
**REGIONAL PARK**

<b>Survey Block</b>	<b>Pairs</b>	<b>Single Males</b>	<b>Total</b>
Survey Block 1	28	3	31
Survey Block 2	14	3	17
Survey Block 3	27	0	27
Survey Block 4	7	20	27
Survey Block 5	12	21	33
Survey Block 6	6	5	11
Survey Block 7	7	25	32
<b>Total</b>	<b>101</b>	<b>77</b>	<b>178</b>

**TABLE 63**  
**BROWN-HEADED COWBIRD DETECTIONS: TIJUANA RIVER VALLEY REGIONAL PARK**

<b>Date</b>	<b>Pass #</b>	<b>Survey Block</b>	<b>Count</b>
4/12/21	1	2	2
4/12/21	1	2	2
4/13/21	1	3	3
4/13/21	1	3	1
4/13/21	1	3	1
4/13/21	1	3	3
4/14/21	1	1	1
4/14/21	1	1	1
4/15/21	1	1	1
4/15/21	1	6	1
4/19/21	1	7	1
5/3/21	2	3	3
5/3/21	2	2	2
5/3/21	2	3	2
5/3/21	2	3	1
5/3/21	2	3	1
5/3/21	2	3	1
5/3/21	2	1	1
5/7/21	2	5	2
6/8/21	3	3	1
6/8/21	3	3	1
6/8/21	3	2	1
6/8/21	3	3	1
6/8/21	3	2	1

**TABLE 63**  
**BROWN-HEADED COWBIRD DETECTIONS: TIJUANA RIVER VALLEY REGIONAL PARK**

Date	Pass #	Survey Block	Count
7/12/21	4	3	1
7/12/21	4	5	1
7/12/21	4	7	1
7/13/21	4	3	1
7/13/21	4	3	1
7/13/21	4	3	1
7/15/21	4	5	1
7/15/21	4	5	1

### 4.6.2.1 Threats

Threats and habitat were assessed during species surveys to determine: (1) if identified threats are having a direct negative effect on the species or habitat, and (2) if adaptive management actions need to be implemented. The following threats were assessed.

- Invasive non-native plant species.** In areas of dense invasive non-native vegetation there was a significant reduction in bird activity even when adjacent to occupied least Bell’s vireo habitat. Invasive non-native plant species occur throughout the park; however, several of these species have the ability to become established in a short period of time. Salt-cedar, an invasive non-native plant species is rated “High” by Cal-IPC for the severe impacts it can have on hydrological processes and plant and animal communities (Cal-IPC 2021). This invasive species can outcompete and displace native plant species, resulting in degraded riparian habitats. Mature stands of salt-cedar were observed along trails and adjacent to riparian habitats throughout the property and interrupting the continuity of willow dominated vireo habitat. Arundo is rated “High” by Cal-IPC and is present in large numbers and occurring in monotypic stands on the park. Extensive dense stands were observed in western-most portions of the park and adjacent to the Monument Road bridge in non-native dominated vegetation. Similar to salt-cedar, it can quickly become established along the river and outcompete native plant species. Castor bean is found throughout the native and non-native riparian areas along the Tijuana River. It is rated at limited by Cal-IPC but is locally problematic and invasive. Very large individuals were observed on the edges of mature southern cottonwood-willow woodlands and large patches were observed adjacent to Monument Road bridge and was associated with other invasive species dominating the area. Crystalline iceplant (*Mesembryanthemum crystallinum*) occurs in large patches in several areas of the park, adjacent to riparian habitats outcompeting many native species for water. Additionally, the accumulation of released salts can retard the growth or establishment of native species. Within the riparian zone floodplain and associated upland vegetation crown daisy, mustards (shortpod mustard, wild radish), and thistles (Italian thistle [*Carduus pycnocephala*], bull thistle [*Cirsium vulgare*]) dominate leaving little area for natives to become established. Displacement of native vegetation can negatively impact vireo prey availability and nesting habitat.
- Unauthorized human use.** Unauthorized vegetation trimming along trails was observed in occupied nesting habitat. Trimming species such as arroyo willow during breeding season has the potential to disrupt active nesting activities. Unauthorized trails were found associated

with rest areas (e.g., shade, benches) that meander into vegetation for use as a restroom. Unauthorized trail use increases the risk of invasive non-native plant species establishment, trash dumping, and can encourage other park users to go off-trail.

- **Nest parasitism by brown-headed cowbird.** Brown-headed cowbirds were observed scattered throughout the park, though not in large numbers or concentrations, likely reflective of years of ongoing cowbird trapping efforts in and around Tijuana River Valley Regional Park. The observations of adult, fledgling, and cowbird eggs in a least Bell's vireo nest is indicative of parasitism within the park.
- **Nest predation.** Waste and trash accumulation from flood events as well as from day use was observed. Daily use trash build-up adds to the growing problem of trash and waste accumulation in the Tijuana River, which can impact the habitat by reducing available resources for plants and wildlife and encourage the park to be used more frequently by least Bell's vireo nesting predators (e.g., coyotes, raccoons, ravens).

#### 4.6.2.2 Adaptive Management Recommendations

The following are adaptive management recommendations to maintain suitable breeding habitat for least Bell's vireo and maintain breeding pairs within Tijuana River Valley Regional Park.

- **Brown-headed cowbird trapping program.** Continue brown-headed cowbird control efforts within the park to reduce and prevent nest parasitism. Partnering with land managers in the area to provide trapping in suitable habitat will improve catch rates and decrease parasitism impacts to vireo and songbird species in the area.
- **Habitat restoration and enhancement.** Least Bell's vireo suitable nesting habitat would benefit from treatment and removal of invasive non-native species. Tamarisk, eucalyptus, Peruvian and Brazilian pepper trees, castor bean, and arundo should be targeted for removal from riparian habitats. Outside the riparian zone and within least Bell's vireo occupied areas, mustards and crown daisy should be targeted for removal and control to support the expansion of mulefat and sand bar willow. Removal of invasive non-native plant species through mechanical or chemical methods is recommended outside of the avian nesting season (March-September). The use of hand tools and herbicide (water safe) could be used during the nesting season, if a biologist is present to clear the impact areas in front of the restoration crew. This may be needed for annual and perennial non-native species that grow and set seed during the nesting season. Ideally, herbicide should be applied before seed sets and starts to drop, which may involve multiple treatment visits throughout the season. Furthermore, removal or treatment of invasive non-native plants creates an opportunity for habitat enhancement and restoration in areas that have low plant diversity by replanting with native species known to occur in the areas that border the riparian zone.
- **Monitor shothole borer and habitat recovery at Tijuana River Valley Regional Park annually or based on Emergent Tree Pest Plan recommendations.** Trees should be monitored for signs and symptoms of shothole borer in accordance with the methods outlined in the DPR Emergent Tree Pests Plan. As this species is already documented within the Tijuana River Valley Regional Park, long-term monitoring efforts may consist of trapping to document presence/absence and/or tree health surveys to document infestation levels. Isolated trees and/or treatment of branches on high-value trees with SHB infestations should be removed, per U.C. Riverside guidelines. Tree maintenance should occur outside of bird breeding season to avoid impacts to least Bell's vireo.

- **Collaboration with adjacent partner agencies and land managers.** Implementation of brown-headed cowbird control and SHB monitoring and management should be coordinated with adjacent land managers (e.g., California State Parks, USFWS National Wildlife Refuge, National Oceanic and Atmospheric Administration [NOAA]).
- **Unauthorized human use.** Continue to close unauthorized and abandoned trails to help reduce unauthorized off trail use. Provide educational boards for day use within the park that includes reminders to stay on designated trails and to pack in and pack out personal trash. Adjacent landowners should be notified of trail maintenance restrictions (i.e., outside of avian nesting season) and TRVRP regulations regarding removal of native vegetation.
- **Clean up trash.** Regularly maintain trash cans and remove trash. Place additional trash receptacles at trail heads and in areas near trails that cross and meander into more densely vegetated areas.

## 4.7 Stephens' Kangaroo Rat

ESA and Blackhawk conducted a burrow/sign search and habitat characterization to inform management needs in Ramona Grasslands County Preserve and Hellhole Canyon County Preserve.

### 4.7.1 Ramona Grasslands County Preserve

Habitat assessments were conducted at 28 monitoring plots within Ramona Grasslands County Preserve. Of these plots, 14 were determined to be occupied by SKR and 14 were determined to be unoccupied (**Figure 21, Appendix I**). Each plot was rated for SKR potential and, in total, 17 monitoring plots were characterized as having a high potential, 5 were characterized as having a medium potential, and 6 were characterized as having a low potential (**Table 64**). No monitoring plots were found to have no potential for SKR.

**TABLE 64**  
**SKR OCCUPANCY RESULTS AND POTENTIAL FOR OCCUPANCY:**  
**RAMONA GRASSLANDS COUNTY PRESERVE**

Occupancy/Potential		# of Monitoring Plots
SKR Occupancy	Occupied	14
	Unoccupied	14
SKR Potential	High	17
	Medium	5
	Low	6
	No	0

NOTE: SKR = Stephens' kangaroo rat.

While some permanent monitoring plots changed between low, medium, and high SKR suitability, overall SKR habitat suitability remained generally equivalent within SKR monitoring areas between winter 2019 and fall 2021 monitoring efforts (**Table 65**). These findings may be partly attributed to the randomized assignment of non-permanent monitoring plots that varies

between monitoring years, annual grazing practices, precipitation/drought, and survey timing. The following variables influenced the survey results.

- **Drought.** Drought can artificially appear beneficial for SKR suitability because it is likely to decrease vegetation density and height; however, 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 fall of 2021 was marked by below-average rainfall, as it occurred before the typical onset of the rainy season after the hot, dry summer months.
- **Grazing.** 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 monitoring areas are actively grazed, thereby reducing significant vegetative growth during years of above-average rainfall.
- **Vegetation composition.** The overwhelming majority of the annual vegetation present in most of the SKR monitoring plots consists of broadleaf filaree, a low-growing annual plant that facilitates SKR movement and is a potential food source. Taller growths of annual vegetation that may preclude or reduce SKR movement were generally not observed.
- **Survey timing.** The 2021 monitoring effort occurred earlier in the typical rainfall season than the winter 2019 monitoring effort. This timing is the major contributing factor to the lower living herb density and higher dead plant litter observed in 2021.

Additional information, including plot photographs, can be found in Appendix I, *Stephens' Kangaroo Rat Monitoring Memorandums*.

#### 4.7.1.1 Adaptive Management Recommendations

The following is the adaptive management recommendation to ensure persistence of SKR at Ramona Grasslands County Preserve:

- **Cattle grazing.** Continue cattle grazing within SKR Management Areas. Cattle grazing assists in keeping dead plant litter to a minimum, which allows for SKR movement, facilitating foraging and breeding behaviors.
- **Survey timing.** To enable consistent data comparisons on a year-to-year basis, future monitoring efforts should be conducted within the fall dry season during the 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. Live-trapping surveys should be conducted every 10 years during the same seasonal window.

**TABLE 65**  
**SKR HABITAT ASSESSMENT SUMMARY: RAMONA GRASSLANDS COUNTY PRESERVE**

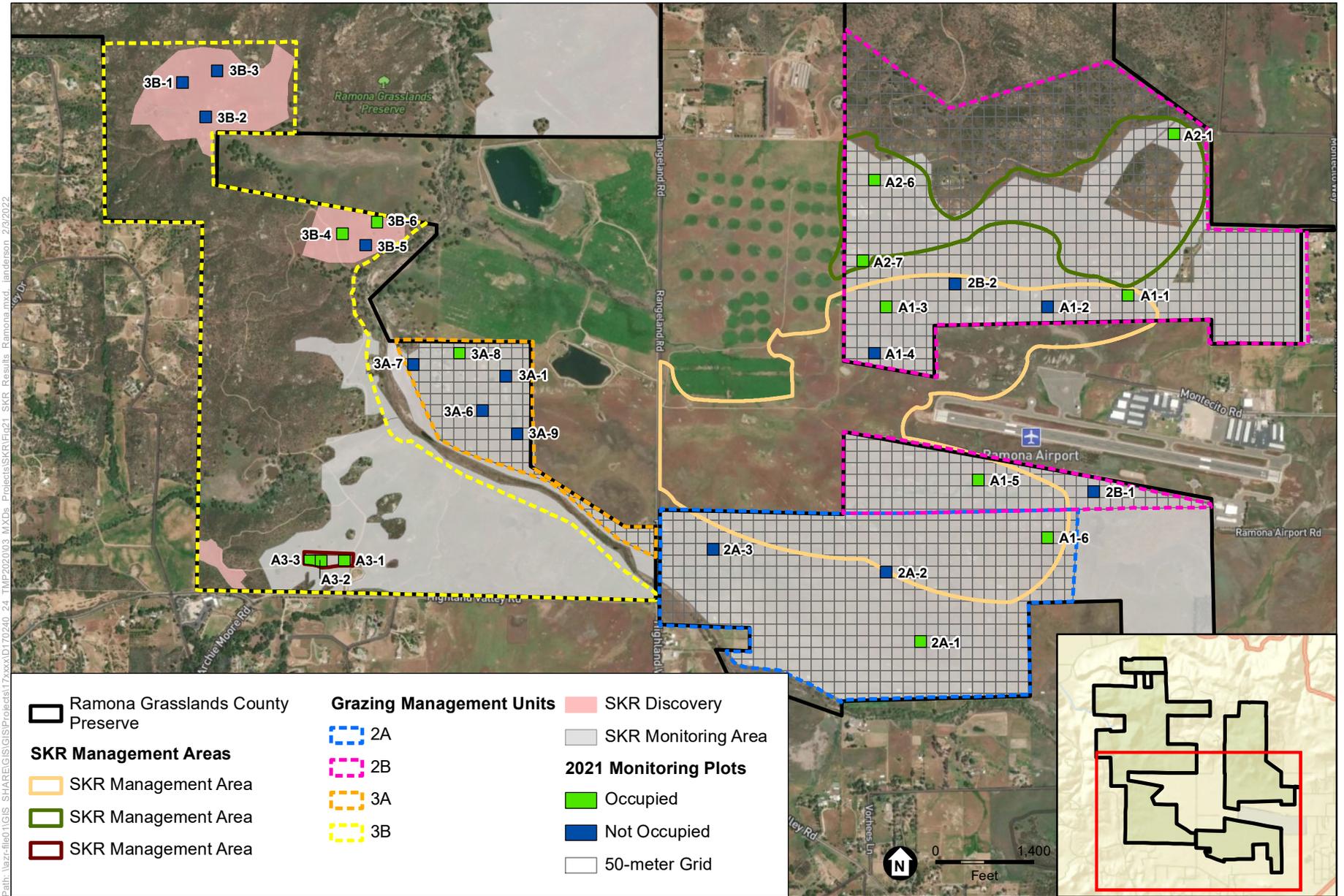
Plot ID	% Bare Ground	Living Herb Density	Shrub/Tree Density (%)	Plant Litter (Dead) (%)	Gopher/Ground Squirrel Density	Obstruction Factor	*Potential K-Rat Sign	SKR Occupancy Determination	Fall 2021		Winter 2019
									Rating†	Rating†	Rating†
A1-1	0-5	Low	0	75-95	Low/High	Low	S	Occupied	High**	High**	High**
A1-2	0-5	High	0	75-95	Medium/Low	High	None	Not Occupied	Low	Medium	Medium
A1-3	5-25	Medium	0	75-95	Medium/High	Medium	B, S, TV	Occupied	High**	High**	High**
A1-4	0-5	High	0-5	75-95	Medium/Low	High	None	Not Occupied	Low	High**	High**
A1-5	5-25	Low	0-5	25-50	Medium/Low	Low	B	Occupied	High**	High**	High**
A1-6	5-25	Low	0-5	75-95	High/Low	Low	B, S, TV	Occupied	High**	High**	High**
A2-1	5-25	Low	0-5	50-75	High/High	Low	B, S, TV	Occupied	High**	High**	High**
A2-6	0-5	Low	0-5	50-75	Medium/Medium	Low	B, S, TV	Occupied	High**	High**	High**
A2-7	5-25	Medium	0	75-95	Medium/Medium	Low	B, S, TV	Occupied	High**	High**	High**
A3-1	5-25	Low	0	75-95	High/Medium	Low	B, S	Occupied	High**	High**	High**
A3-2	5-25	Low	0	75-95	Medium/Medium	Low	B, S	Occupied	High**	Low	Low
A3-3	5-25	Low	0	75-95	Medium/Medium	Low	B, S	Occupied	High**	Low	Low
2A-1	5-25	Low	0-5	75-95	Low/Low	Low	B	Occupied	High**	N/A	N/A
2A-2	5-25	Low	0-5	50-75	High/Low	Low	None	Not Occupied	High	N/A	N/A
2A-3	5-25	Low	0-5	75-95	High/Low	Low	None	Not Occupied	High	N/A	N/A
2B-1	5-25	High	0	75-95	Low/Low	Medium	None	Not Occupied	Medium	N/A	N/A
2B-2	0-5	Medium	0	75-95	High/Low	Low	None	Not Occupied	Low	N/A	N/A
3A-1	0-5	High	0	75-95	High/Low	Medium	None	Not Occupied	Low	High**	High**
3A-6	5-25	Low	0	75-95	High/Medium	Low	None	Not Occupied	High	High**	High**
3A-7	0-5	High	0-5	75-95	Low/Low	Medium	None	Not Occupied	Low	High**	High**
3A-8	5-25	Low	0	75-95	Medium/High	Low	B, S	Occupied	High**	High**	High**
3A-9	0	High	0	95-100	Low/Low	High	None	Not Occupied	Low	N/A	N/A
3B-1	5-25	Medium	0	75-95	High/High	Medium	None	Not Occupied	Medium	N/A	N/A
3B-2	5-25	Low	5-25	75-95	High/High	Medium	None	Not Occupied	Medium	N/A	N/A
3B-3	5-25	Low	25-50	75-95	Medium/High	Medium	None	Not Occupied	Medium	N/A	N/A
3B-4	5-25	Medium	0	75-95	Low/High	Low	B, S	Occupied	High	N/A	N/A
3B-5	5-25	Low	0-5	75-95	Medium/High	Low	None	Not Occupied	Medium	N/A	N/A
3B-6	5-25	Low	0	75-95	High/Medium	Low	B, S	Occupied	High	N/A	N/A

NOTES: SKR = Stephens' kangaroo rat.

\* = 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.



SOURCE: Digital Globe; ESA, 2021.

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**Figure 21**  
2021 SKR Monitoring Results  
SKR Monitoring – Ramona Grasslands County Preserve

## 4.7.2 Hellhole Canyon County Preserve

Habitat assessments were conducted at three monitoring plots within the Sierra Verde Addition of Hellhole Canyon County Preserve. All three plots were determined to be occupied or potentially occupied by SKR (**Figure 22**, Appendix I). Each plot was rated for SKR potential and, in total, all three monitoring plots were characterized as having a high potential (**Table 66**).

**TABLE 66**  
**SKR OCCUPANCY RESULTS AND POTENTIAL FOR OCCUPANCY: HELLHOLE CANYON COUNTY PRESERVE**

Occupancy/Potential		# of Monitoring Plots
SKR Occupancy	Occupied	3*
	Unoccupied	0
SKR Potential	High	3
	Medium	0
	Low	0
	No	0

NOTES: SKR = Stephens' kangaroo rat.

\* Occupancy status was determined as "potentially occupied" based on the positive detection of one SKR in plot 2 during fall 2020 live-trapping surveys, positive kangaroo rat sign during fall 2021 monitoring, the proximity of all three plots (within 150 feet of one another), and no factors that could reasonably be expected to entirely preclude SKR movement between the three plots.

SKR occupancy potentially increased across the three monitoring plots between fall 2020 and fall 2021. SKR was found present at only one of the three monitoring plots during the fall 2020 live-trapping effort, but *Dipodomys simulans* (DKR, *Dipodomys simulans*) was also found present during the live-trapping effort. Based on sign detected during the fall 2021 habitat assessment monitoring effort, SKR was potentially detected at all three monitoring plots; however, habitat assessment monitoring cannot conclusively differentiate between SKR and DKR. Based on the fall 2020 live-trapping effort, SKR and DKR are both present on-site and there are no obstruction factors that could preclude the possibility of SKR from any of the three monitoring plots, especially considering the proximity of the three plots (all within 150 feet of one another). Therefore, SKR was considered to be potentially present at all three monitoring plots (**Table 67**).

**TABLE 67**  
**SKR HABITAT ASSESSMENT SUMMARY: HELLHOLE CANYON COUNTY PRESERVE**

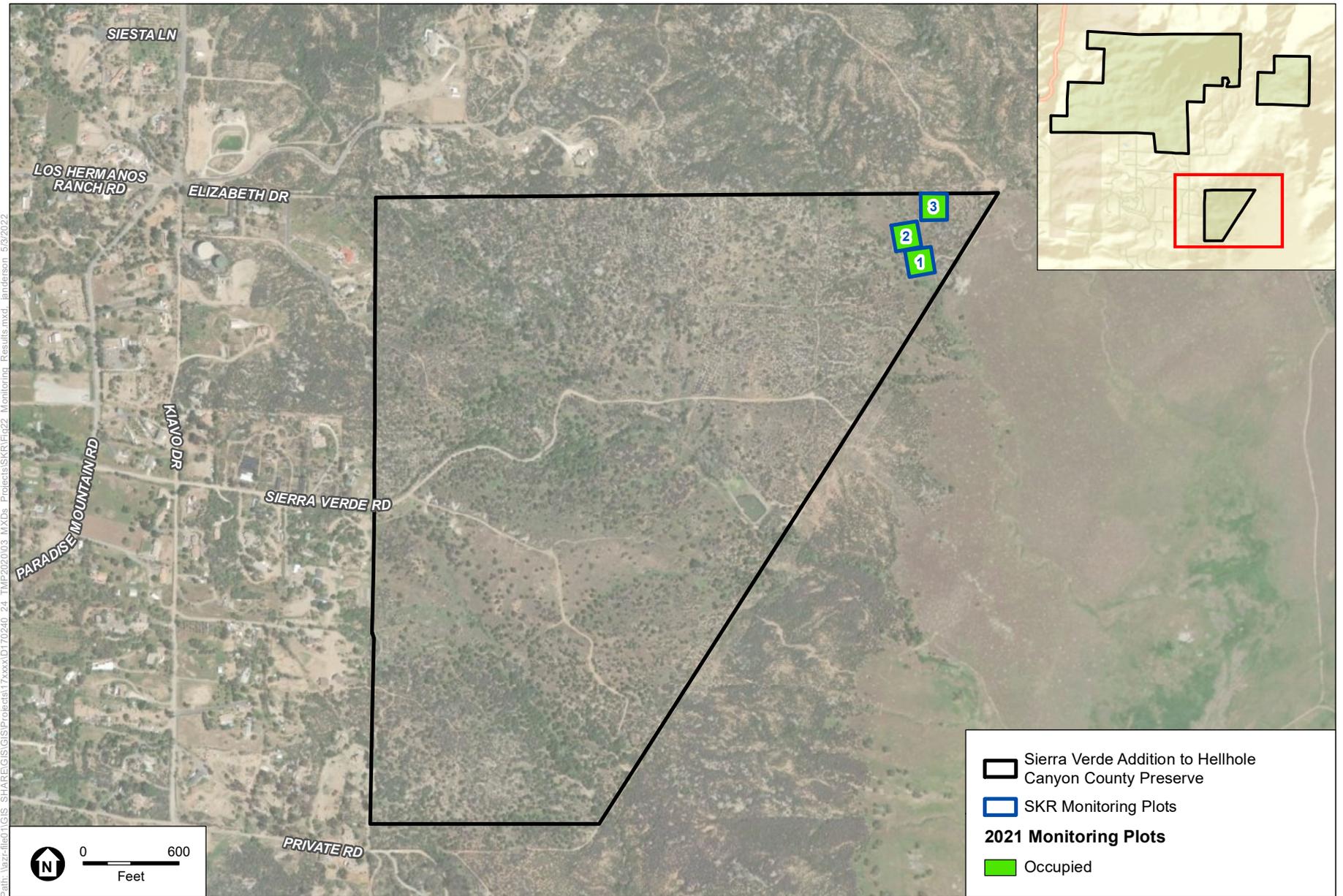
Plot ID	Fall 2021							*Potential K-Rat Sign	SKR Occupancy Determination	Fall 2020
	% Bare Ground	Living Herb Density	Shrub/Tree Density (%)	Plant Litter (Dead) (%)	Gopher/Ground Squirrel Density	Obstruction Factor	Rating†			Rating†
1	5–25	Low	5–25	50–75	High/Low	Low	B, S	Occupied	High**	High**
2	5–25	Low	5–25	75–95	High/Low	Low	B, S, TV	Occupied	High**	High**
3	5–25	Low	25–50	75–95	High/Low	Medium	B, S	Occupied	High**	High**

NOTES: SKR = Stephens' kangaroo rat.

\* = 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.



SOURCE: ESRI, 2020; SanGIS, 2021; ESA, 2021.

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**Figure 22**  
SKR Monitoring Results  
SKR Monitoring – Hellhole Canyon County Preserve

Habitat suitability is high for SKR within the Sierra Verde Addition of Hellhole Canyon County Preserve. These findings may vary seasonally due to a number of variables such as precipitation, survey timing, food availability, and competition among sympatric species. The following variables influenced survey results.

- **Drought.** 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 fall of 2021 was marked by below-average rainfall, as it occurred before the typical onset of the rainy season after the hot, dry summer months.
- **Grazing.** 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. The monitoring plots are not grazed. This reduction of habitat suitability was not observed.
- **Vegetation composition.** The open areas within the SKR monitoring plots are primarily vegetated with low-growing filarees, with a smaller percentage of taller-growing ruderal species (e.g., tocalote and short-pod mustard) that provide low obstruction factors without grazing practices. Most of the annual vegetation present in the SKR monitoring plots consists of broadleaf fillaree, a low-growing annual plant that facilitates SKR movement and is a potential food source. Taller growths of annual vegetation that may preclude or reduce SKR movement were generally not observed.

Additional information, including plot photographs, can be found in Appendix I, *Stephens' Kangaroo Rat Monitoring Memorandums*.

#### 4.7.2.1 Adaptive Management Recommendations

The following is the adaptive management recommendations to ensure persistence of SKR at Hellhole Canyon County Preserve.

- **Habitat enhancement.** Focused SKR management is necessary to maintain suitable SKR habitat within the Sierra Verde Addition of Hellhole Canyon County Preserve. An approximate 5.8-acre management area is recommended for focused SKR management. Focused SKR management can include targeted dethatching, mowing, and/or scraping. Targeted dethatching and mowing can reduce the overall height of the existing vegetation to a desired level and assist with disarticulation of herbaceous weeds. Scraping can reduce vegetation density and increase open ground, maximizing the ability of SKR to move across the landscape.
- **Survey timing.** To enable consistent data comparisons on a year-to-year basis, future monitoring efforts should be conducted during the fall dry season during the 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. Live-trapping surveys should be conducted every 10 years during the same seasonal window.

## 4.8 Pallid Bat

ESA and SDNHM conducted surveys to monitor the status of pallid bat occupancy and roosting and foraging habitat and document current distribution and threat data to inform management needs in Hellhole Canyon County Preserve, Mount Olympus County Preserve, and Wilderness Gardens County Preserve.

### 4.8.1 Roosting Habitat Assessment

The pallid bat is a multiple-habitat roosting species. It has an affinity for roosting in human-made structures, but can also be found roosting in a variety of natural crevice and cavity situations, such as rock crevices, natural caves, mines, under tree bark, and in tree cavities and hollows.

#### 4.8.1.1 Hellhole Canyon County Preserve

There is an abundance of rocky outcrops and boulders that could provide suitable roosting habitat for the pallid bat in Hellhole Canyon County Preserve. The rocky and boulder-strewn areas that appear most suitable for pallid bat and other crevice- and cavity-roosting bat species include the rocky/boulder draw near the “grotto” and along Hell Creek from the beginning of significant boulder habitat to the western end of Hell Creek within the preserve (**Figure 23**). There are also a number of oaks and other tree species on-site that have the potential for providing pallid bat roosting opportunities under bark and/or in tree hollows and cavities. Most of the suitable trees are found along Hell Creek within the preserve. There are no human-made structures that could serve as roosting habitat for the pallid bat in the Hellhole Canyon County Preserve.

#### 4.8.1.2 Mount Olympus County Preserve

There is an abundance of rocky outcrops and boulders throughout the Mount Olympus County Preserve that could provide suitable roosting habitat for the pallid bat. There are some oaks and other tree species on-site that have the potential for providing pallid bat roosting opportunities under bark and/or in tree hollows and cavities. Most of the suitable trees are found in the forested eastern portion of the Preserve along Pala Temecula Road. There are no human-made structures that could serve as roosting habitat for the pallid bat in the Mount Olympus County Preserve.

#### 4.8.1.3 Wilderness Gardens County Preserve

The abandoned buildings near the center of Wilderness Gardens County Preserve and the exposed rocky habitat such as the rocky outcrops near the northern boundary of the Preserve provide potential pallid bat roosting habitat (**Figure 25**). There are also potential suitable trees that could have loose bark, cavities, and hollows along the San Luis Rey River, along the base of and in the draws of the chaparral-covered hillside that dominates the Preserve, and near the two ponds on-site that have the potential for providing pallid bat roosting opportunities.

### 4.8.2 Passive Acoustic Surveys

Pallid bat foraging echolocation calls were possibly recorded at Mount Olympus County Preserve and Wilderness Gardens County Preserve during spring passive acoustic surveys. Other potential pallid bat foraging detections include a bat pass at Hellhole Canyon County Preserve during

spring passive acoustic surveys and a bat pass at Mount Olympus County Preserve during fall passive acoustic surveys. There were no detections of roosting pallid bats on any of the three preserves. Passive acoustic detector locations at Hellhole Canyon County Preserve, Mount Olympus County Preserve, and Wilderness Gardens County Preserve, and the bat species detected at each detector location are depicted in **Figure 23**, **Figure 24**, and **Figure 25**, respectively. **Table 68** presents the bat species detected during passive acoustic surveys and the number of bat passes recorded per Anabat detector location at each of the three preserves.

### 4.8.3 Threats Assessment

Threats and habitat were assessed during species surveys to determine: (1) if identified threats are having a direct negative effect on the species or habitat, and (2) if adaptive management actions need to be implemented. Threats are as follows.

- **Invasive non-native grasses.** Invasive non-native grass cover at all three preserves presents a potentially significant impact to pallid bat foraging habitat. Invasive non-native grass cover and associated thatch cover vary across each preserve, but can be characterized as dense cover, particularly within grassland habitats on-site. Pallid bats require open and sparsely vegetated areas for foraging such that they can easily access terrestrial arthropods; therefore, dense invasive non-native grass cover reduces suitable foraging habitat.
- **Dumping/trash.** A significant amount of trash and litter was observed at Mount Olympus County Preserve. The trash degrades the habitat quality for wildlife, including bats.
- **ORV activity.** ORV activity was observed adjacent to Mount Olympus County Preserve. If ORV activity expands into the preserve, it could potentially impact terrestrial arthropods and negatively affect foraging pallid bats.
- **Illegal trail use.** Illegal trail/unauthorized off-trail usage was detected near the gate at Mount Olympus County Preserve. Continued illegal trail usage could potentially degrade foraging habitat for pallid bats.

**TABLE 68**  
**TMP PASSIVE ACOUSTIC BAT SURVEY RESULTS**

Bat Species Detected	Hellhole Canyon				Mount Olympus				Wilderness Gardens				Total	
	Survey Period 1 (May 17–19, 2021)		Survey Period 2 (August 31– September 2, 2021)		Survey Period 1 (May 17–19, 2021)		Survey Period 2 (August 31– September 2, 2021)		Survey Period 1 (May 17–19, 2021)		Survey Period 2 (August 31– September 2, 2021)		Survey Period 1 (May 17–19, 2021)	Survey Period 2 (August 31– September 2, 2021)
Detector Location	1	2	1	2	1	2	1	2	1	2	1	2	Total	Total
Pallid bat <sup>a,b</sup> ( <i>Antrozous pallidus</i> )	1 <sup>c</sup>	–	–	–	9	5	1 <sup>c</sup>	–	–	3	–	–	18 <sup>c</sup>	1 <sup>c</sup>
Townsend's big-eared bat <sup>a,b</sup> ( <i>Corynorhinus townsendii</i> )	–	–	–	–	–	1 <sup>c</sup>	–	–	1 <sup>c</sup>	–	–	1	2 <sup>c</sup>	1
Big brown bat ( <i>Eptesicus fuscus</i> )	–	4	155	205	12	178	–	–	28	94	17	149	316	526
Greater western mastiff bat <sup>a,b</sup> ( <i>Eumops perotis californicus</i> )	–	–	–	–	–	–	–	–	–	8	–	34	8	34
Western red bat <sup>a,b</sup> ( <i>Lasiurus blossevillii</i> )	–	–	–	–	–	–	–	–	–	1 <sup>c</sup>	–	1	1 <sup>c</sup>	1
Hoary bat ( <i>Lasiurus cinereus</i> )	2	16	–	–	2	–	–	–	4	197	1	2	221	3
Western yellow bat <sup>a</sup> ( <i>Lasiurus xanthinus</i> )	–	–	–	–	–	–	–	–	–	1 <sup>c</sup>	–	–	1 <sup>c</sup>	–
California myotis ( <i>Myotis californicus</i> )	72	1,175	29	4	56	18	–	–	–	2	32	1	1,323	66
Western small-footed myotis <sup>b</sup> ( <i>Myotis ciliolabrum</i> )	–	28	5	48	47	333	11	56	10	5	44	30	423	194
Western long-eared myotis <sup>b</sup> ( <i>Myotis evotis</i> )	–	1	–	2	2	7	3	–	–	–	1	–	10	6

**TABLE 68**  
**TMP PASSIVE ACOUSTIC BAT SURVEY RESULTS**

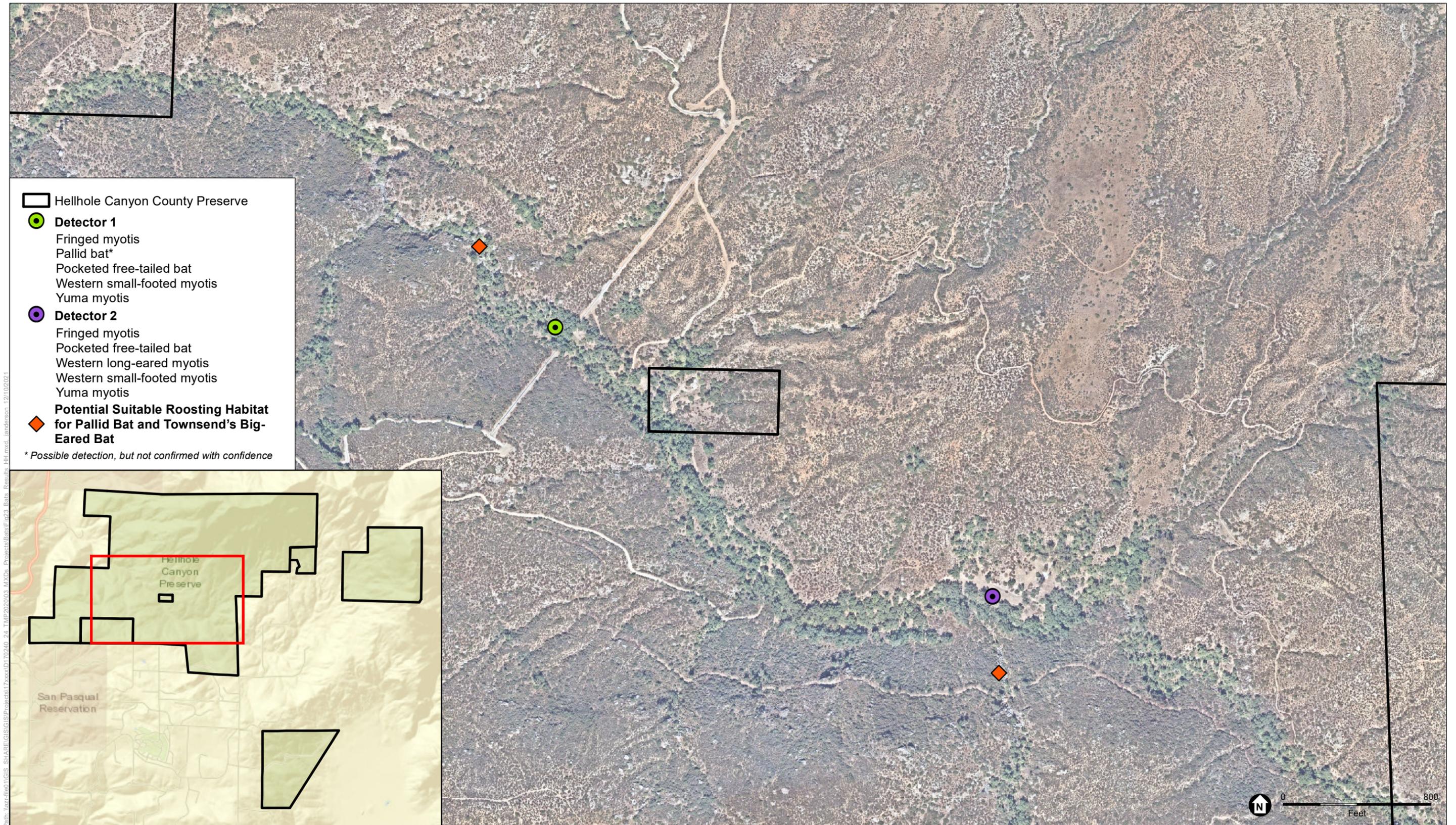
Bat Species Detected	Hellhole Canyon				Mount Olympus				Wilderness Gardens				Total	
	Survey Period 1 (May 17–19, 2021)		Survey Period 2 (August 31– September 2, 2021)		Survey Period 1 (May 17–19, 2021)		Survey Period 2 (August 31– September 2, 2021)		Survey Period 1 (May 17–19, 2021)		Survey Period 2 (August 31– September 2, 2021)		Survey Period 1 (May 17–19, 2021)	Survey Period 2 (August 31– September 2, 2021)
Fringed myotis <sup>b</sup> ( <i>Myotis thysanodes</i> )	17	–	52	1	–	–	–	–	–	–	–	–	17	53
Yuma myotis <sup>b</sup> ( <i>Myotis yumanensis</i> )	–	–	6	35	24	24	34	–	848	32	657	31	928	763
Pocketed free-tailed bat <sup>a</sup> ( <i>Nyctinomops femorosaccus</i> )	17	33	–	4	1	–	–	–	2	305	3	19	358	26
Big free-tailed bat <sup>a,b</sup> ( <i>Nyctinomops macrotis</i> )	–	–	–	–	–	–	1	–	–	–	–	–	–	1
Canyon bat ( <i>Parastrellus hesperus</i> )	–	8	–	65	–	–	–	5	3	7	–	131	18	201
Mexican free-tailed bat ( <i>Tadarida brasiliensis</i> )	24	33	23	12	26	33	11	1	143	227	34	65	486	146
<b>TOTAL</b>	<b>133</b>	<b>1,298</b>	<b>270</b>	<b>376</b>	<b>179</b>	<b>599</b>	<b>61</b>	<b>62</b>	<b>1,039</b>	<b>882</b>	<b>789</b>	<b>464</b>	<b>4,130</b>	<b>2,022</b>

## NOTES:

<sup>a</sup> California Species of Special Concern.

<sup>b</sup> County of San Diego Sensitive Animal Group 2 Species.

<sup>c</sup> Includes possible detection, but not confirmed with confidence.



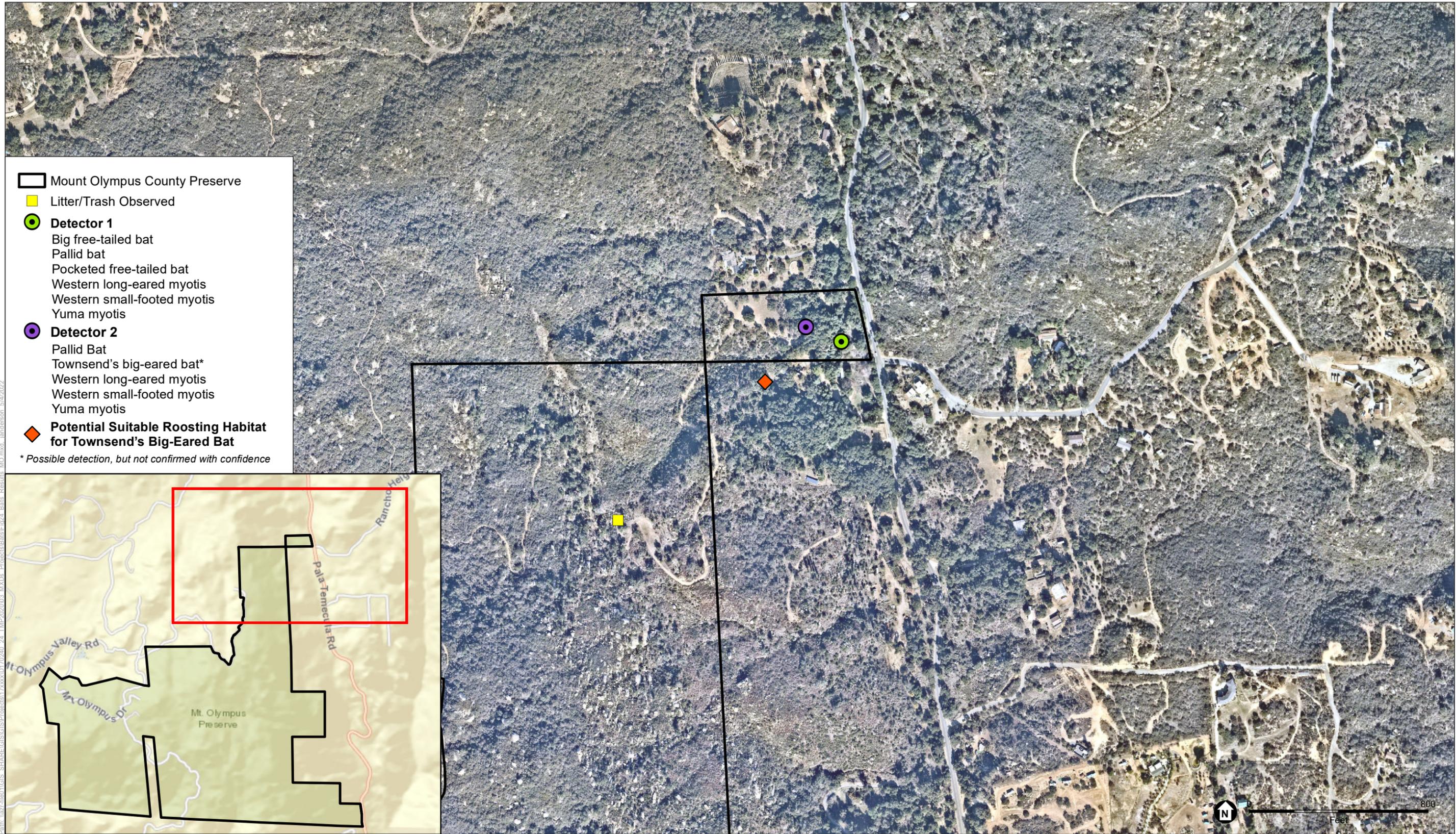
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SOURCE: Nearmap, 2020; ESA, 2021.

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**Figure 23**  
 Bat Monitoring Results  
 Hellhole Canyon County Preserve



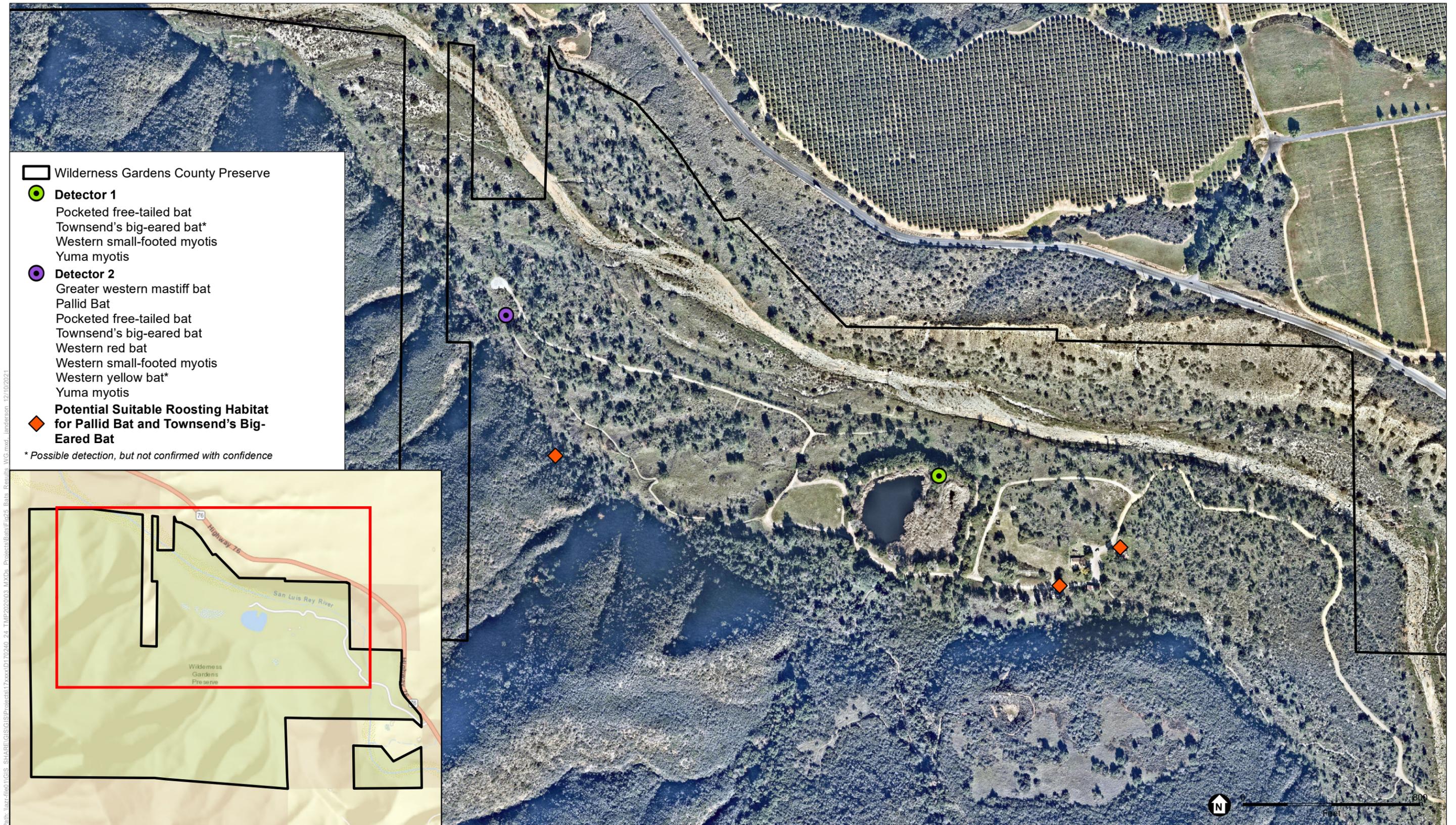


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SOURCE: Nearmap, 2021; ESA, 2021.

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**Figure 24**  
Bat Monitoring Results  
Mount Olympus County Preserve



SOURCE: Nearmap, 2021; ESA, 2021.

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**Figure 25**  
 Bat Monitoring Results  
 Wilderness Gardens County Preserve



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#### 4.8.4 Adaptive Management Recommendations

The following are adaptive management recommendations to maintain and enhance suitable roosting and foraging habitat for pallid bat.

- **Invasive non-native plant species treatment.** Remove invasive non-native plant species, particularly grass species, through mechanical or chemical methods, outside of the avian nesting season (March–September) at Hellhole Canyon County Preserve and Wilderness Gardens County Preserve. The use of hand tools and herbicide (water safe) could be used during the avian nesting season, if a biologist is present to clear the impact areas in front of the restoration crew. Ideally, herbicide should be applied before seed sets on plants, which may involve multiple treatment visits throughout the season. Removal or treatment of invasive non-native plants creates an opportunity for habitat enhancement and restoration in areas that have low plant diversity.
- **Installation and enhancement of drinking sources.** Install and enhance drinking sources for pallid bats at Hellhole Canyon County Preserve and Mount Olympus County Preserve. Spring- and/or water-table-fed artificial drinking troughs should be installed in the preserves where such aquatic features are present and logistically feasible (i.e., near roads and/or trails).
- **Creation of roost structures.** Create and install artificial roost structures in Hellhole Canyon County Preserve, Mount Olympus County Preserve, and Wilderness Gardens County Preserve. Artificial roosts that are large, thermally stable, and provide roosting opportunities for crevice- and cave-roosting bats are recommended. This can include cinderblock style “combat town” structures typically found on military bases. Artificial roost locations that are near foraging habitat such as riparian areas, oak woodlands, and near water sources are ideal, but they should be put in areas where they would not be subject to disturbance and vandalism.
- **Clean up trash.** Regularly remove trash and litter at Mount Olympus County Preserve. Place additional signage at known unauthorized access points stating Mount Olympus County Preserve is not open to the public and littering on-site is illegal. Trash and litter are centralized around the old homestead; however litter was observed scattered throughout the preserve.
- **Continue monitoring on an annual basis.** Pallid bats are most readily detected by mist net capture and by finding their guano and culled insect parts in their night roosts. In absence of mist netting or obvious roosts to detect pallid bat sign, the alternative is to use electronic bat detectors. Pallid bats appear to have low detection rates and their echolocation calls can resemble other more common species such as the big brown bat (*Eptesicus fuscus*). Future pallid bat monitoring should implement a combination of acoustic monitoring and mist netting to confirm presence of species and document individual bat information to inform population dynamics.

### 4.9 Townsend’s Big-Eared Bat

ESA and SDNHM conducted surveys to monitor the status of Townsend’s big-eared bat occupancy and roosting and foraging habitat to document current distribution and threat data to inform management needs in Hellhole Canyon County Preserve, Mount Olympus County Preserve, and Wilderness Gardens County Preserve.

## 4.9.1 Roosting Habitat Assessment

Townsend's big-eared bat is an obligate cave-roosting species that depends on caves and cave-analogs for its roosting requirements. Roosting situations include natural caves including boulder caves, mines, tree hollows, and human-made structures that provide cave-like environments.

### 4.9.1.1 Hellhole Canyon County Preserve

There is an abundance of boulder habitat that could provide suitable roosting habitat in Hellhole Canyon County Preserve. The boulder strewn areas that appear most suitable for the Townsend's big-eared bat include the boulder draw near the "grotto" and along Hell Creek from the beginning of significant boulder habitat to the western end of Hell Creek (Figure 23). On-site trees with tree hollows and cavities also have the potential for providing Townsend's big-eared bat roosting opportunities. Most of the suitable trees are found along Hell Creek in the Preserve. There are no human-made structures that could serve as roosting habitat for the Townsend's big-eared bat in Hellhole Canyon County Preserve.

### 4.9.1.2 Mount Olympus County Preserve

There is an abundance of boulders throughout Mount Olympus County Preserve that could provide suitable roosting habitat. The most suitable location is a boulder cave near the east entrance and staging area (Figure 24). There are some oaks and other tree species on-site that have the potential for providing Townsend's big-eared bat roosting opportunities in tree hollows and cavities. Most of the suitable trees are found in the forested eastern portion of the Preserve along Pala Temecula Road. There are no human-made structures that could serve as roosting habitat for the Townsend's big-eared bat in Mount Olympus County Preserve.

### 4.9.1.3 Wilderness Gardens County Preserve

The abandoned buildings near the center of Wilderness Gardens County Preserve and the exposed rocky habitat such as the rocky outcrops near the northwest boundary of the Preserve provide potential Townsend's big-eared bat roosting habitat (Figure 25). Exposed rocky habitat such as the rocky outcrops near the northern boundary of the Preserve serve as potential roosting habitat for the Townsend's big-eared bat as well. There are also potential suitable trees that could have loose bark, cavities, and hollows along the San Luis Rey River, along the base of and in the draws of the chaparral-covered hillside that dominates the Preserve, and near the two ponds on-site that have the potential for providing Townsend's big-eared bat roosting opportunities.

## 4.9.2 Passive Acoustic Surveys

Townsend's big-eared bat monitoring is currently required only at Hellhole Canyon County Preserve and Wilderness Gardens County Preserve (ESA and ICF 2019); however, passive acoustic monitoring for Townsend's big-eared bat occurred concurrently with passive acoustic monitoring for pallid bat at Hellhole Canyon County Preserve, Mount Olympus County Preserve, and Wilderness Gardens County Preserve in 2021. Townsend's big-eared bat presence was confirmed at Wilderness Gardens County Preserve during fall passive acoustic surveys. Potential Townsend's big-eared bat detections include a bat pass at Wilderness Gardens County Preserve and a bat pass at Mount Olympus County Preserve during spring passive acoustic surveys. This

suggests that Townsend’s big-eared bat also occurs at Mount Olympus County Preserve. No confirmed or potential Townsend’s big-eared bat detections were detected at Hellhole Canyon County Preserve in 2021. Passive acoustic detector locations at Hellhole Canyon County Preserve, Mount Olympus County Preserve, and Wilderness Gardens County Preserve and the bat species detected at each detector location are depicted in Figures 23, 24, and 25, respectively. Table 68 presents the bat species detected during passive acoustic surveys and the number of bat passes recorded per Anabat detector location at each of the three preserves.

### 4.9.3 Threats Assessment

Threats and habitat were assessed during species surveys to determine: (1) if identified threats are having a direct negative effect on the species or habitat, and (2) if adaptive management actions need to be implemented. Threats are as follows.

- **Dumping/trash.** A significant amount of trash and litter was observed at Mount Olympus County Preserve. The trash degrades the habitat quality for wildlife, including bats.
- **Illegal trail use.** Illegal trail/unauthorized off-trail usage was detected near the gate at Mount Olympus County Preserve. Continued illegal trail usage could potentially degrade foraging habitat for pallid bats.

### 4.9.4 Adaptive Management Recommendations

The following are adaptive management recommendations to maintain and enhance suitable roosting and foraging habitat for Townsend’s big-eared bat.

- **Invasive non-native plant species treatment.** Remove invasive non-native plant species, particularly grass species, through mechanical or chemical methods, outside of the avian nesting season (March–September) at Hellhole Canyon County Preserve and Wilderness Gardens County Preserve. The use of hand tools and herbicide (water safe) could be used during the avian nesting season, if a biologist is present to clear the impact areas in front of the restoration crew. Ideally, herbicide should be applied before seed sets on plants, which may involve multiple treatment visits throughout the season. Removal or treatment of invasive non-native plants creates an opportunity for habitat enhancement and restoration in areas that have low plant diversity.
- **Installation and enhancement of drinking sources.** Install and enhance drinking sources for pallid bats at Hellhole Canyon County Preserve and Mount Olympus County Preserve. Spring- and/or water-table-fed artificial drinking troughs should be installed in the preserves where such aquatic features are present and logistically feasible (i.e., near roads and/or trails).
- **Creation of roost structures.** Create and install artificial roost structures in Hellhole Canyon County Preserve, Mount Olympus County Preserve, and Wilderness Gardens County Preserve. Artificial roosts that are large, thermally stable, and provide roosting opportunities for crevice- and cave-roosting bats are recommended. This can include cinderblock style “combat town” structures typically found on military bases. Artificial roost locations that are near foraging habitat such as riparian areas, oak woodlands, and near water sources are ideal, but they should be put in areas where they would not be subject to disturbance and vandalism.
- **Clean up trash.** Regularly remove trash and litter at Mount Olympus County Preserve. Place additional signage at known unauthorized access points stating Mount Olympus County Preserve is not open to the public and littering on-site is illegal. Trash and litter are

centralized around the old homestead; however litter was observed scattered throughout the preserve.

- **Continue monitoring on an annual basis.** The potential detection of Townsend's big-eared bat at Mount Olympus County Preserve suggests this species may occur at the preserve. Future monitoring of Townsend's big-eared bat should continue to occur at Hellhole Canyon County Preserve, Mount Olympus County Preserve, and Wilderness Gardens County Preserve. Townsend's big-eared bat is known to have low detection probabilities when using only acoustic techniques; future Townsend's big-eared bat monitoring should implement a combination of acoustic monitoring and mist netting to confirm presence of species and document individual bat information to inform population dynamics.

## 4.10 Harbison's Dun Skipper

### 4.10.1 Host Plant Mapping

Locations of San Diego sedge, the larval host plant of HDS, within suitable habitat of Hell Creek and its southern tributary within Hellhole Canyon County Preserve are depicted in **Figure 26**. Approximately 2,638 San Diego sedge plants were observed within Hell Creek and its southern tributary during host plant mapping in 2021. Representative photographs from host plant mapping, including potential HDS hibernaculum, are included in **Appendix J**.

### 4.10.2 Adult Flight Surveys

HDS adult flight surveys were conducted at two locations around large patches of San Diego sedge within suitable habitat along Hell Creek and its southern tributary. Two adult HDS were observed nectaring and mating on non-native annual yellow sweetclover (*Melilotus indicus*) during the second adult flight survey on June 15, 2021. One HDS individual was later observed moving on to nectar on invasive non-native shortpod mustard. This observation is significant as typical known nectar sources of HDS fall under plants with white, pink, and purple flowers, while shortpod mustard have yellow flowers. Monitoring locations, HDS detections, and incidental special-status species detections are depicted in **Figure 27**. All butterfly species and potential nectar sources observed during the two adult flight surveys are presented in **Table 69**. Representative photographs from adult surveys, including HDS observations, are included in Appendix J.

Habitat assessments were conducted at both adult flight survey locations concurrently with the first adult flight survey. The woodland habitat at survey location 1 consisted of 10 percent oaks, 35 percent sycamores, 25 percent willows, and 30 percent cottonwoods. The woodland habitat at survey location 2 consisted of 40 percent oaks, 20 percent sycamores, and 40 percent willows. The condition of San Diego sedge at both survey locations ranged from all green (healthy) to mostly brown (dead), but were predominantly green with brown tips, suggesting drought or water stress, especially for the time of the survey. Drought was also the main threat detected at the survey locations during the threats assessment as other plant species within the habitat, such as willows, showed similar signs of drought stress. The full habitat assessment data matrix can be found in Appendix J.

**TABLE 69**  
**HARBISON'S DUN SKIPPER ADULT FLIGHT SURVEY RESULTS: HELLHOLE CANYON COUNTY PRESERVE**

Butterflies Observed		Potential Nectar Sources Observed	
Common Name	Scientific Name	Common Name	Scientific Name
California sister	<i>Adelpha brewdowii californica</i>	Lotus	<i>Acmispon</i> sp.
Funereal duskywing	<i>Erynnis funeralis</i>	California false indigo	<i>Amorpha californica</i>
San Bernardino blue	<i>Euphilotes bernardino</i>	Italian thistle*	<i>Carduus pycnocephalus</i> *
Harbison's dun skipper	<i>Euphyes vestris harbisoni</i>	Common sandaster	<i>Corethrogyne filaginifolia</i>
Acmon blue	<i>Icaricia acmon</i>	California buckwheat	<i>Eriogonum fasciculatum</i>
Common buckeye	<i>Junonia coenia grisea</i>	Golden yarrow	<i>Eriophyllum confertiflorum</i>
Marine blue	<i>Leptotes marina</i>	Seep monkey flower	<i>Erythranthe guttata</i>
Lorquin's admiral	<i>Limenitis lorquini</i>	Shortpod mustard <sup>a*</sup>	<i>Hirschfeldia incana</i> <sup>a*</sup>
Mourning cloak	<i>Nymphalis antiopa</i>	Honeysuckle	<i>Lonicera</i> sp.
Pale swallowtail	<i>Papilio eurymedon</i>	Arroyo lupine	<i>Lupinus succulentus</i>
Western tiger swallowtail	<i>Papilio rutulus</i>	Chaparral bush mallow	<i>Malacothamnus fasciculatus</i>
Cloudless sulphur	<i>Phoebus sennae marcellina</i>	Annual yellow sweetclover <sup>a*</sup>	<i>Melilotus indicus</i> <sup>a*</sup>
Sulphur sp.	<i>Phoebus</i> sp.	Caterpillar phacelia	<i>Phacelia cicutaria</i>
Umber skipper	<i>Poanes melane</i>	Branching phacelia	<i>Phacelia ramosissima</i>
Checkered white	<i>Pontia protodice</i>	Ladies' tobacco	<i>Pseudognaphalium californicum</i>
Hedgerow hairstreak	<i>Satyrium saepium</i>	California wild rose	<i>Rosa californica</i>
Purplish hedgerow hairstreak	<i>Satyrium saepium chlorophora</i>	Black sage	<i>Salvia mellifera</i>
Gray hairstreak	<i>Strymon melinus pudica</i>	Hedge nettle	<i>Stachys rigida</i>
Red admiral	<i>Vanessa atalanta rubria</i>		
California dogface	<i>Zerene eurydice</i>		

## NOTES:

<sup>a</sup> Harbison's dun skipper was observed nectaring on this species during adult flight surveys.

\* Non-native plant species.

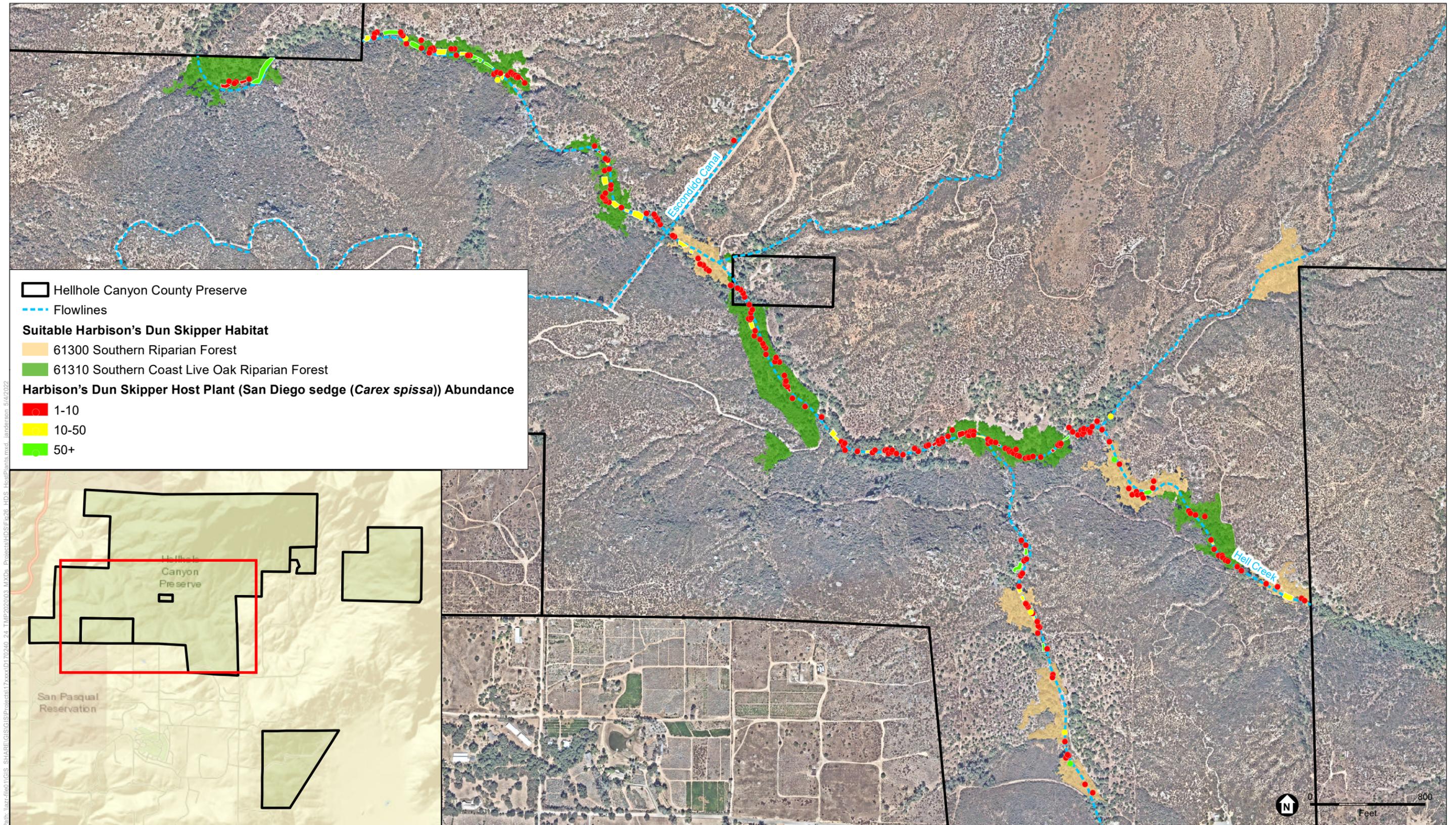
### 4.10.3 Adaptive Management Recommendations

Based on host plant mapping, the San Diego sedge host plant population is abundant within Hell Creek and its southern tributary, but drought conditions can impact the health of the larval host plant as it requires relatively higher soil moisture. Based on adult flight surveys, HDS adults have very limited nectar sources immediately adjacent to San Diego sedge plants. Observing HDS nectaring on non-native plants, especially shortpod mustard that has a flower color not typical of known HDS nectar sources, suggests that HDS at Hellhole Canyon County Preserve are in short supply of native nectar sources. Seeding of potential native nectar sources should be implemented

around the two adult flight survey monitoring locations and a grassy area adjacent to Hell Creek and large patches of San Diego sedge (Figure 26). Seeding considerations include:

- Potential native nectar sources can include hedge nettle (*Stachys rigida*), cobweb thistle (*Cirsium occidentale*), California loosestrife (*Lythrum californicum*), and chaparral bushmallow (*Malacothamnus fasciculatus*) (Marschalek and Deutschman 2015, Marschalek and Deutschman 2016).
- Document the seed source (collection location) and confirm it is ecologically appropriate for Hellhole Canyon County Preserve. Seed may be rejected based on its source.
- Document seed purity and germination percentages to determine pure live seed (PLS) quantity.
- Apply seed in the fall, prior to first rains (e.g., November). Seed applied at other times of the year are more likely to be lost to predation and/or not receive sufficient rainfall to support germination and survival of seedlings.
- Prepare seeding areas in willow riparian and oak riparian woodland areas by thinning thatch and reducing weed presence/competition, as needed. The optimal seeding condition is to provide seed direct contact with the soil and space to grow while retaining some organic debris (e.g., organic mulch) and existing native plant growth in place.
- Apply seed by hand. Select method (e.g., selective hand application or use of ‘belly spreader’, etc.) based on the quantity of seed and size of seeding areas. Lightly rake seed into the top ¼ inch of soil and provide ‘light’ natural organic mulch cover (approximately less than 80% cover to provide light and space for germinates).
- Apply species in ecologically appropriate areas (i.e., closer or further from the creek) within willow riparian and oak riparian woodland areas. Depending on the species and habitat conditions, species may be seeded together or in separate locations.
- Document species and quantities of seed applied (including dates and personnel), and locations via GPS coordinates.
- Conduct follow-up maintenance and monitoring to assess seeding success, site conditions, and implement as needed follow-up management activities.

Dan Marschalek conducted weekly adult flight survey monitoring within Hellhole Canyon County Preserve in 2021 as well. Based on preliminary results presented at the August 25, 2021, SDMMMP meeting, he and his team detected 2 HDS individuals within Hellhole Canyon County Preserve. Future monitoring for HDS should be coordinated with Dan Marschalek to implement consistent monitoring protocols, limit duplication of efforts, provide cumulative adaptive management recommendations, and provide transparency on any implemented management activities.

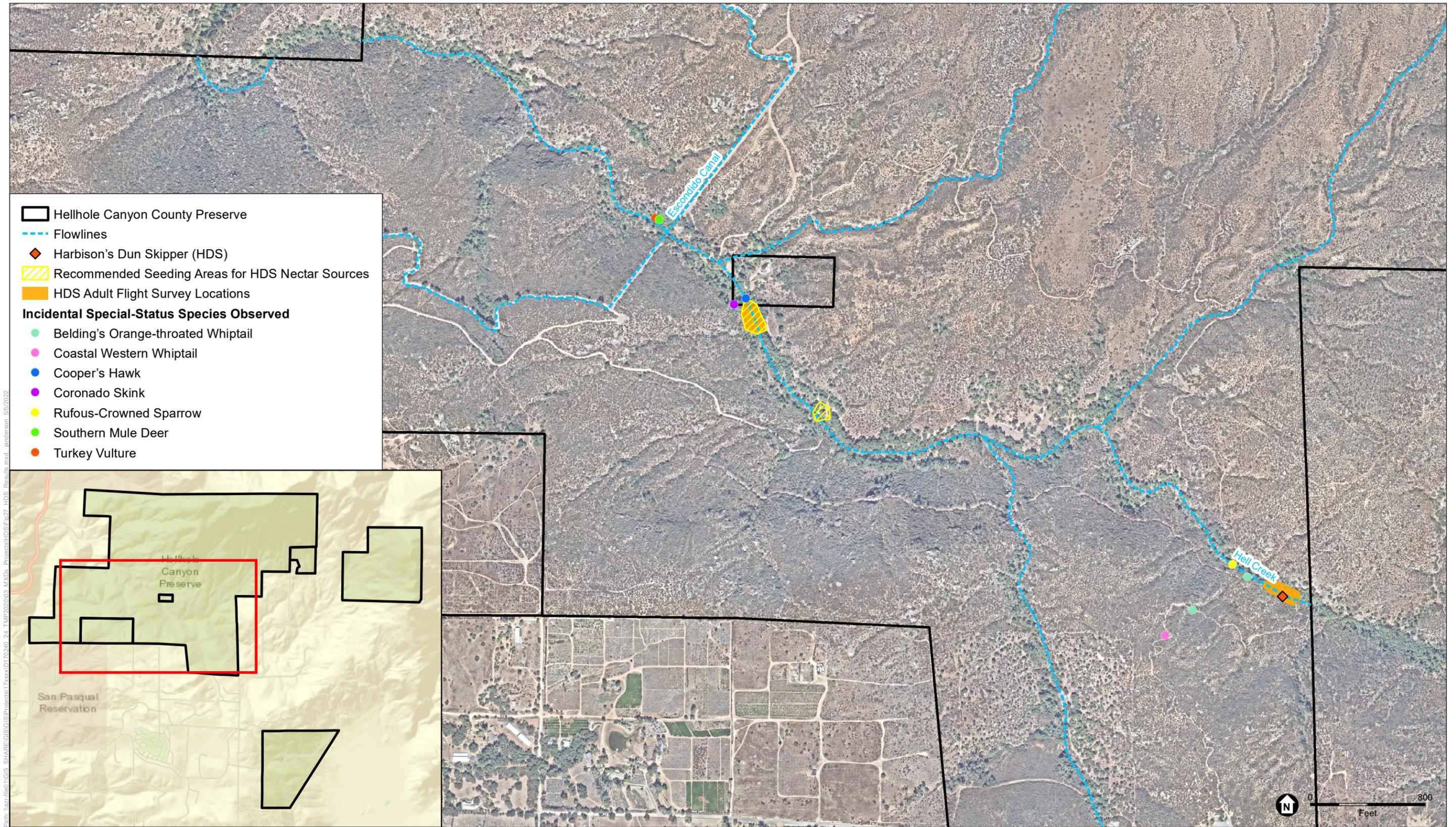


SOURCE: Nearmap, 2020; ESA, 2021.

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**Figure 26**  
 Harbison's Dun Skipper Host Plant Mapping  
 Hellhole Canyon County Preserve





SOURCE: Nearmap, 2020; ESA, 2021.

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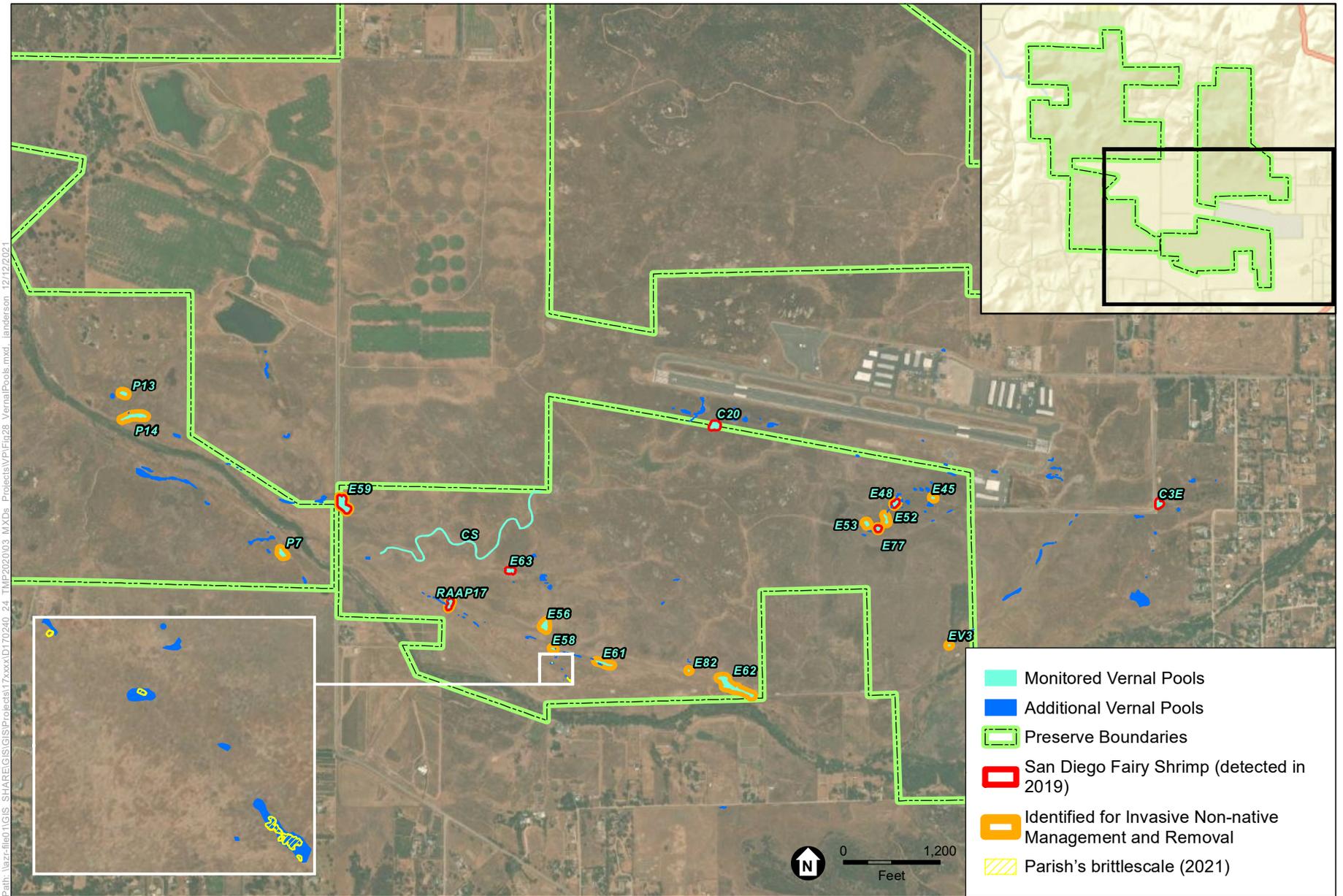
**Figure 27**  
 Harbison's Dun Skipper Monitoring Results  
 Hellhole Canyon County Preserve

## 4.11 Vernal Pool/Alkali Playa

Rainfall in 2021 was below average, with 7.41 inches of rain reported by Ramona Airport during the hydrologic period of July 1, 2020, to June 30, 2021 (TWC 2021). The largest storm events occurred in December 2020, January and March 2021 and accounted for 6.26 inches of rain.

Overall, the pools observed as part of the qualitative monitoring effort (**Figure 28**) appear to reflect evidence of dry climate conditions. It is assumed that lower than average rainfall combined with high temperatures harmed overall pool inundation as well as the duration of pool inundation. This is evidenced in the low presence and diversity of USACE vernal pool faunal indicator species globally. During the May survey visit, 7 of the 20 pools monitored were found to have received sufficient rainfall to yield measurable ponding. Of the seven pools with measurable ponding, one pool was observed to support faunal indicator species. Six USACE vernal pool indicator species (faunal and floral) previously detected during the 2018/2019 survey season (which received higher than average rainfall) were notably absent during this qualitative monitoring effort: starwort (*Callitriche* sp.), San Diego fairy shrimp (*Branchinecta sandiegonensis*), flowering quillwort (*Triglochin [Lilaea] scilloides*), hairy water clover (*Marsilea vestita*), California waterwort (*Elatine californica*), and toothed downingia (*Downingia cuspidata*). Nevertheless, it is assumed that the low presence of faunal indicator species is not indicative of the overall functionality of the vernal pools. In fact, despite the dry climate conditions, floral indicator species were observed at 15 of the 20 pools monitored (one less pool than was observed during the 2018/2019 survey season). Additionally, coastal plantain (*Plantago elongata*), a USACE vernal pool floral indicator species, which had not been previously recorded, was observed at pools p14 and c20. Of the 15 pools observed to support at least one USACE indicator species, aquatic pygmyweed (*Crassula aquatica*), wavy-stemmed popcorn flower (*Plagiobothrys undulatus*), and woolly marbles (*Psillocarphus brevissimus* var. *brevissimus*) were the most abundant indicator species observed, being recorded at 6, 6, and 14 pools respectively. Aquatic pygmyweed was observed only during the March survey period during moist pool conditions, while wavy-stemmed popcorn flower and woolly marbles were observed during the March and May survey periods. Special-status species Coulter's saltbush (*Atriplex coulteri*) was detected again in pool raap17. Special status 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 surveyed vernal pools; however, SDMMP mapped a population of Parish's brittlescale just south of managed pool E58, within previously mapped vernal pools that are not currently being monitored or managed (Figure 28).

Of significance, once again, was the abundance of grass poly (*Lythrum hyssopifolia*) and Italian rye grass. Grass poly was identified in 16 of the 20 surveyed pools, while Italian fescue was observed in 15 of 20 pools. Algal growth was largely absent from the pools (present only at e62); however, this is also likely due to lower-than-average rainfall and lack of overall moisture. Therefore, all pools should continue to be monitored through quantitative methods per the TMP to determine any changes to species composition or reduction in native species abundance that may result from competitive exclusion with non-natives species such as these.



SOURCE: ESRI; ESA 2019

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**Figure 28**  
 Vernal Pool Monitoring Results  
 Ramona Grasslands Preserve



As previously observed during the 2018/2019 monitoring effort, pools e56, e58, e82, e62, e45, e48, e52, and e77 were again noted to be largely dominated by non-native grasses through both survey periods. Pool ev3 was additionally observed during this monitoring effort to be largely dominated by non-native grasses through both survey periods. Non-native grass cover within these pools ranged from 60-percent to 100-percent total ground cover. Representative photographs of these pools are included in **Appendix L, Attachment A** (Photographs 1, 2, and 3). Once again, the most abundant grass observed within the pool boundaries was seaside barley (*Hordeum marinum*) which may impact pool quality but is generally not considered “inundation tolerant.” This is evidenced by a general absence of the species from expected deeper portions of pools (Appendix L, Attachment A, Photograph 4). However, nearly all pools were also observed to support more inundation tolerant species such as Italian rye grass, annual beard-grass (*Polypogon monspeliensis*), and occasional black mustard. It should be noted that these pools also generally showed the lowest signs of cattle traffic presence. 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 (Appendix L, Attachment A, Photographs 5 and 6).

Summarized observations of qualitative vernal pool monitoring, including information on water quality, edge effects, and disturbances, are included in **Table 70**. Observed vernal pool indicator plant species and invasive non-native plant species are summarized in **Table 71**. Additional information, including representative photographs, can be found in Appendix L, *Aquatic Phase Qualitative Monitoring of Vernal Pools Memo*. Field forms can be found in Appendix L, **Attachment B**.

#### 4.11.1 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 16 of the 20 surveyed pools were identified for invasive non-native management and removal (p13, p14, p7, RAAP17, e56, e58, e61, e82, e62, e53, e77, e52, e48, e45, ev3, e59). All pools with the exception of Cagney Swale (cs), c3e, c20, and e63 had an invasive non-native cover of approximately 20 percent or greater and were determined to benefit from invasive species management (Figure 28). Invasive non-native plants were removed from these 16 pools in July 2021; methods for removal followed those in the TMP (ESA and ICF 2015) and are detailed in the methods section of this report under Vernal Pool/Alkali Playa. 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 woolly marbles and salt grass, were carefully avoided. Representative photographs of the maintenance activities are provided in **Appendix L, Attachment C**. 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.

**TABLE 70**  
**QUALITATIVE VERNAL POOL MONITORING OBSERVATIONS: RAMONA GRASSLANDS COUNTY PRESERVE**

Pool #	Avg. Depth (cm) <sup>1</sup>	Approximate Size of Ponding		Water Quality/Edge Effects: <sup>2</sup> (Turbidity, sediments, herbicides, pesticides, fertilizer, algae, <sup>3</sup> etc.)	Trespass/Topographic Disturbances: <sup>4</sup> OHV, trail use, erosion, cattle grazing, etc.
		Length (ft)	Width (ft)		
e59	NC (Pool large and inaccessible due to potential for contamination)	160 estimated	65 estimated	Low turbidity; oil sheen present in pool margins. Evidence of 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 patties observed. Grazing evident in pool margins. Cattle gate located approximately 90 feet north of pool appears to direct cattle traffic in pool proximity. Tire tracks observed immediately east of the pool, leading from cattle gate and running southward.
P14	3	13	9	Low to absent visual turbidity levels.	Sign of recent grazing; fresh cow patties observed. No erosion or sedimentation present. Parallel indentations that appear to look like relic tilling lines within pool margins.
P13	4	NC (Pool largely dry with a complex of cattle hoof prints still inundated)	NC (Pool largely dry with a complex of cattle hoof prints still inundated)	Low to absent turbidity, no algae present, no sediments, no erosion.	Sign of recent cattle grazing; cow patties present.
P7	NA	0	0	Soil damp, no ponding.	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 March survey, the CS feature was actively flowing. During both the March and May visits, turbidity was observed in isolated areas due to cattle grazing and traffic, while others were clear with low turbidity. No algae present.	Swale bottom scoured, eroded, and 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. Cattle trails, cow patties observed throughout swale complex.
E63	NA	0	0	Soil damp, no ponding.	Cow patties observed and cattle prints observed. Cattle traffic heavy in area, bisected by numerous trails.
E56	NA	0	0	Soil damp, no ponding.	Cow patties observed. Evidence of cattle grazing observed.
E58	2.5	10.5	1.5	No turbidity, sediment, algae, etc. observed. Very little ponding.	Cow patties observed. Evidence of cattle grazing observed.

**TABLE 70**  
**QUALITATIVE VERNAL POOL MONITORING OBSERVATIONS: RAMONA GRASSLANDS COUNTY PRESERVE**

Pool #	Avg. Depth (cm) <sup>1</sup>	Approximate Size of Ponding		Water Quality/Edge Effects: <sup>2</sup> (Turbidity, sediments, herbicides, pesticides, fertilizer, algae, <sup>3</sup> etc.)	Trespass/Topographic Disturbances: <sup>4</sup> OHV, trail use, erosion, cattle grazing, etc.
		Length (ft)	Width (ft)		
E61	15	29	8	Discontinued ponding within pool margins, which appear to connect during periods of greater inundation. High turbidity and foamy sheen likely from cattle traffic. Trash (bubble wrap, and old gloves) observed within pool margins. No algae present.	Cattle observed grazing within and adjacent to pool during March visit. Cow patties and trails through and alongside pool observed during May visit.
E82	NA	0	0	Soil damp, no ponding.	Evidence of cattle grazing observed. Cow patties and hoof prints observed.
E62	6	19	4.5	Low to moderate turbidity. Oil sheen, and patches of algae observed within pool margins.	Evidence of cattle grazing, and cow patties observed. Two-track road running through center and eastern end of pool.
Raap17	NA	0	0	Soil damp, no ponding.	Relic two-track road running through pool currently in use as well-traveled cattle trail, with cattle tracks present and cow patties observed.
C3e	NA	0	0	Soil damp, no ponding.	No sign of cattle activity or trespass. Area secured by wire fencing. Broken glass fragments observed within pool margins.
E45	NA	0	0	Soil damp, no ponding.	Cow patties observed. Active two-track road with crushed grasses observed immediately north of pool.
E48	NA	0	0	Soil damp, no ponding.	Cow patties observed.
E52	NA	0	0	Soil damp, no ponding.	Cow patties observed, however do not appear recent; minimal evidence of cattle grazing.
E53	NA	0	0	Soil damp, no ponding.	No evidence of recent grazing or cow patties.
E77	NA	0	0	Soil damp, no ponding.	Cow patties observed, however do not appear recent, minimal evidence of cattle grazing. Evidence of gopher burrows within pool margins.
C20	NA	0	0	Soil damp, no ponding.	Cow patties and evidence of cattle grazing observed.
Ev3	NA	0	0	Soil damp, no ponding.	Some evidence of adjacent cattle grazing. Cow patties present. Active two-track road with crushed grasses observed immediately southeast of pool.

**TABLE 70  
QUALITATIVE VERNAL POOL MONITORING OBSERVATIONS: RAMONA GRASSLANDS COUNTY PRESERVE**

Pool #	Approximate Size of Ponding			Water Quality/Edge Effects: <sup>2</sup> (Turbidity, sediments, herbicides, pesticides, fertilizer, algae, <sup>3</sup> etc.)	Trespass/Topographic Disturbances: <sup>4</sup> OHV, trail use, erosion, cattle grazing, etc.
	Avg. Depth (cm) <sup>1</sup>	Length (ft)	Width (ft)		

NOTES:

- \* Depth and pool dimensions measured on March 04, 2021, expected to reflect at or near maximum ponding area of pools. "NC" indicates areas where data was not collected due to pool configuration or to prevent intrusion or additional impacts to the pool.
- \*\* Described during the 3-04-21 survey.
- \*\*\* 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.
- \*\*\*\* Described during both the 3-04-21 and 5-11-21 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 71  
OBSERVED VERNAL POOL INDICATOR AND INVASIVE NON-NATIVE PLANT SPECIES: RAMONA GRASSLANDS COUNTY PRESERVE**

Pool ID #	e59	p14	p13	p7	cs	e63	e56	e58	e61	e82	e62	raap17	c3e	e45	e48	e52	e53	e77	c20	ev3
<b>USACE 1997 Vernal Pool Floral Indicators Observed</b>																				
<i>Atriplex coulter</i> <sup>a,b,c</sup> Coulter's saltbush												X								
<i>Callitriche</i> sp. Water starwort																				
<i>Crassula aquatica</i> <sup>a</sup> Water pygmy weed	X		X								X		X		X				X	
<i>Deschampsia danthonioides</i> <sup>b</sup> Annual hairgrass						X														
<i>Downingia cuspidata</i> Toothed calicoflower																				
<i>Elatine californica</i> California waterwort																				
<i>Marsilea vestita</i> Hairy waterclover																				

**TABLE 71**  
**OBSERVED VERNAL POOL INDICATOR AND INVASIVE NON-NATIVE PLANT SPECIES: RAMONA GRASSLANDS COUNTY PRESERVE**

Pool ID #	e59	p14	p13	p7	cs	e63	e56	e58	e61	e82	e62	raap17	c3e	e45	e48	e52	e53	e77	c20	ev3
<i>Plagiobothrys undulatus</i> <sup>a</sup> Coast allocarya					X	X		X							X		X		X	
<i>Plantago elongata</i> <sup>a</sup> Coastal plantain		X																	X	
<i>Psilocarphus brevissimus</i> var. <i>brevissimus</i> <sup>a,b</sup> Woolly marbles	X	X	X	X	X	X	X	X	X		X		X				X	X	X	
<i>Triglochin [Lilea] scilloides</i> Flowering-quillwort																				
<b>USACE 1997 Vernal Pool Faunal Indicators Observed</b>																				
<i>Branchinecta sandiegonensis</i> San Diego fairy shrimp																				
<i>Cladocera</i> sp. Water flea																				
<i>Copepoda</i> sp. <sup>a</sup> Copepod					X															
<i>Ostracoda</i> sp. <sup>a</sup> Ostracod					X															
<b>Invasive Non-Native Plant Species Observed</b>																				
<i>Avena barbata</i> <sup>a,b</sup> Slender oat	X	X		X	X		X	X	X	X			X	X	X	X	X	X	X	
<i>Brassica nigra</i> <sup>a,b</sup> Black mustard		X	X	X	X	X	X	X					X		X					
<i>Bromus hordeaceus</i> <sup>a,b</sup> Soft chess brome		X		X		X		X	X	X		X								
<i>Bromus madritensis</i> ssp. <i>Rubens</i> <sup>a,b</sup> Red brome	X			X							X		X						X	

**TABLE 71**  
**OBSERVED VERNAL POOL INDICATOR AND INVASIVE NON-NATIVE PLANT SPECIES: RAMONA GRASSLANDS COUNTY PRESERVE**

Pool ID #	e59	p14	p13	p7	cs	e63	e56	e58	e61	e82	e62	raap17	c3e	e45	e48	e52	e53	e77	c20	ev3
<i>Cotula coronopifolia</i> * a,b Brass buttons	X		X	X			X													
<i>Cynodon dactylon</i> * a,b Bermuda grass	X			X	X		X		X	X	X									
<i>Erodium botrys</i> a,b Longbeak stork's bill	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Festuca myuros</i> <sup>b</sup> Rattail fescue					X															
<i>Festuca perennis</i> * a,b Italian rye grass	X		X	X	X	X	X	X	X		X	X	X	X	X				X	X
<i>Hordeum murinum</i> a,b Foxtail barley	X				X	X	X	X	X	X	X		X	X	X	X	X	X	X	X
<i>Hypochaeris glabra</i> <sup>b</sup> Smooth cat's-ear			X		X								X					X	X	X
<i>Lepidium latifolium</i> * Perennial pepperweed																				
<i>Lythrum hyssopifolia</i> * a,b Hyssop loosestrife	X	X		X	X	X	X	X	X		X		X	X	X	X	X	X		X
<i>Malva parviflora</i> a,b Cheeseweed mallow	X						X													
<i>Medicago polymorpha</i> a,b Bur clover	X	X		X	X	X	X	X	X		X	X							X	X
<i>Polygonum aviculare</i> a,b Prostrate knotweed				X		X	X										X		X	
<i>Polypogon monspeliensis</i> * b Rabbitsfoot grass		X	X	X	X		X													
<i>Rumex crispus</i> * a,b Curly dock		X		X	X		X	X					X							X

**TABLE 71**  
**OBSERVED VERNAL POOL INDICATOR AND INVASIVE NON-NATIVE PLANT SPECIES: RAMONA GRASSLANDS COUNTY PRESERVE**

Pool ID #	e59	p14	p13	p7	cs	e63	e56	e58	e61	e82	e62	raap17	c3e	e45	e48	e52	e53	e77	c20	ev3
<i>Salsola tragus</i> <sup>b</sup> Russian thistle																X				
<i>Silene gallica</i> <sup>b</sup> Common catchfly																			X	
<i>Spergularia bocconi</i> * <sup>a,b</sup> Boccone's sand spurry	X			X		X			X		X	X	X						X	

NOTES: CRPR = California Rare Plant Rank; TMP = Targeted Monitoring Plan.

<sup>a</sup> Observed on 3-04-21.

<sup>b</sup> Observed on 5-11-21.

<sup>c</sup> 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. Not a vernal pool indicator species; however, it is a target species of the TMP.

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. Pool e62 showed evidence of two recent paths for vehicular traffic through the pool margins originating from a more developed dirt road south of the pool (Appendix L, Attachment A, Photograph 7). Due to available vehicular access to the area, installation of fiberglass markers, or other delineators may minimize or prevent the risk of unauthorized vehicular traffic within these pool areas/complexes.

Nearly all pools, except c3e, showed signs of cattle traffic and grazing. Historic grazing has been occurring on the preserve and is on-going throughout the preserve; grazing is currently managed under the Ramona Grasslands, Santa Ysabel, and Boulder Oaks Preserves Grazing Management Plan (ESA 2019c). Grazing sign was visible through the removal of plant growth above ground, as well as entire clumps of vegetation removed from the ground. Evidence of cattle traffic, hoof prints, patties, and grazing were observed through most of the survey area, with evidence of particularly high cattle traffic at crossing points in the Cagney Swale (cs), pool e63 (adjacent to cs), e59 (see discussion below), and e61 (Photographs 8, 9, and 10). While the specific effects of cattle grazing on vernal pool water quality, biota richness, diversity and/or abundance is not known, the vernal pools on this site appear to be persisting as a healthy system.

Pool e59 is located immediately adjacent to Rangeland Road. During the previous 2018/2019 monitoring effort, a large sediment deposit was observed along the roadside margin of the pool where sediment transport from the road had been deposited and appeared to result in pollutant transport by surface water runoff from Rangeland Road. Sediment deposit and pollutant transport (oil sheen) were present during the 2020/2021 wet season; however, the amount was greatly reduced, likely due to low precipitation. The presence/diversity of vernal pool indicators was observed to be drastically reduced during the 2020/2021 survey season, again likely due to dry climate conditions. However, due to the previously recorded vernal pool indicator species abundance and diversity (9 vernal pool faunal/floral indicator species), it can still be concluded that this pool is of high value. Therefore, 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. This pool showed signs of heavy grazing and cattle traffic likely related to the use of a ranch gate located about 90 feet north of the pool. The gate appears to direct cattle activity toward the pool.

Impacts resulting from two-track vehicular access were observed running immediately adjacent to the southeast perimeter of pool ev3 (Appendix L, Attachment A, Photograph 12). As previously suggested installation of fiberglass markers, or other delineators may minimize or prevent the risk of unauthorized vehicular traffic within this pool area/complex. Oil sheen noted during the 2018/2019 monitoring effort, was not observed during the 2020/2021 monitoring effort due to lack of ponding or surface water. However, it is likely that based on its location at the

downstream end of a swale complex, it is subject to oil/pollutant deposit from Ramona Airport Road, located north and upstream of the pool. Installation of sediment and velocity dissipation devices on the south side of Ramona Airport Road may reduce turbidity due to decreased sediment transport.

As was recorded during the 2018/2019 monitoring effort, pool e45 was not observed to support any vernal pool indicator species. Possible threats to water quality from topographic disturbance are not apparent; however, ponding or surface water was not observed. Ground cover in this pool is largely dominated by seaside barley and although not inundation tolerant, presence during dry conditions allows for thatching to accumulate and restrict open areas within the pool margins. As previously discussed, this may be inhibiting the presence of floral vernal pool indicators. Minimal signs of cattle grazing were observed at this pool however, increasing grazing could reduce thatching and allow floral vernal pool indicator species to take hold. Additionally, due to its proximity to pools occupied by San Diego fairy shrimp, this pool could become occupied via cyst transport between pools by cattle, birds, or wind transport.

Pool raap17 was notable during the 2018/2019 monitoring effort in that it was found to support San Diego fairy shrimp, where this species had not been recorded during previous monitoring efforts. Of additional significance is that no floral indicator species were observed at this pool during the 2018/2019 monitoring effort. There were again no observed floral indicator species observed at this pool during the 2020/2021 monitoring effort. Additionally, the presence of San Diego fairy shrimp could not be confirmed due to a lack of ponding or surface water. However, it is expected that this species will be detected again during future monitoring visits with the presence of ponding or surface water. Coulter's saltbush (*Atriplex coulteri*), a target species of the TMP was again observed at this pool, as was previously recorded during the 2018/2019 monitoring effort.

Pool c20 was observed to have a moderate sign of cattle grazing. This pool is unique in that it is bisected by a barbed-wire fence at the perimeter of the Ramona Airport. During the 2018/2019 monitoring effort, toothed downingia was found to be in higher concentration on the airport side of the fence, than on the preserve side of the fence. Although toothed downingia was not observed, the floral species abundance and diversity were also in higher concentration on the airport side of the fence. This illustrates the potential result of grazing on pool species abundance and diversity. It also illustrates the effectiveness of cattle exclusion in maintaining floral abundance in vernal pools. Due to a lack of ponding or surface water, faunal indicator species were not observed at this pool. However, this pool showed the highest diversity of floral indicator species. Coastal plantain, one of these floral indicator species was previously unrecorded at this pool (Appendix L, Attachment A, Photograph 11).

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# CHAPTER 5

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