

Tijuana River Valley Regional Park Project

Baseline Biodiversity Survey Report

August 2019 | CSD-02.44

Prepared for:

County of San Diego
Department of Parks and Recreation
5500 Overland Avenue, Suite 410
San Diego, CA 92123

Prepared by:

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7578 El Cajon Boulevard
La Mesa, CA 91942

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ACRONYMS AND ABBREVIATIONS

°F	degree Fahrenheit
AMSL	above mean sea level
APN	Assessor's Parcel Number
ASMD	Area Specific Management Directive
BLM	Bureau of Land Management
CAL FIRE	California Department of Forestry and Fire Protection
Cal-IPC	California Invasive Plant Council
CBP	U.S. Customs Border Protection
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CIAP	Coastal Impact Assistance Program
City	City of San Diego
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRA	Core Resource Area
CRPR	California Rare Plant Rank
County	County of San Diego
DPR	Department of Parks and Recreation
FRAP	Fire and Resource Assessment Program
GIS	Geographic Information Systems
GPS	Global Positioning Unit
HELIX	HELIX Environmental Planning, Inc.
MHPA	Multi-Habitat Planning Area
MSCP	Multiple Species Conservation Program
NPS	National Park Service
RMP	Resource Management Plan
SANDAG	San Diego Association of Governments
SDMMP	San Diego Management and Monitoring Program
SSC	Species of Special Concern
TNERR	Tijuana National Estuarine Research Reserve
TRVRP	Tijuana River Valley Regional Park
TSNWR	Tijuana Slough National Wildlife Refuge

ACRONYMS AND ABBREVIATIONS (cont.)

WL	Watch List
U.S.	United States
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VCM	Vegetation Classification Manual

EXECUTIVE SUMMARY

This report describes the biological conditions of the Tijuana River Valley Regional Park (TRVRP) as documented during 2018 baseline biological resources surveys. The approximately 1,800-acre (2.8-square-mile) TRVRP is located in the City of San Diego (City), in the southwestern portion of San Diego County (County), California. The TRVRP is bound to the north by Sunset Avenue, to the south by the U.S.-Mexico International Border, to the west by Border Field State Park and the Tijuana River National Estuarine Research Preserve, and to the east by Dairy Mart Road and the residential community of San Ysidro (with the exception of the portion of the Dairy Mart Ponds that extend further east between the Interstate [I-] 5 corridor and Camino de la Plaza).

The purpose of the baseline biological resources report is to identify and map existing biological resources within the TRVRP, of which the data will be used to update the Resource Management Plan (RMP) for TRVRP. The RMP will be used to generate management directives for individual areas, providing the management framework for monitoring and managing the TRVRP's resources while balancing the need to provide appropriate passive recreation opportunities.

Baseline biological diversity surveys of the TRVRP were conducted by HELIX Environmental Planning, Inc. (HELIX) biologists between January and November 2018. Surveys included habitat/vegetation mapping, rare plant surveys, invasive non-native plant species mapping, butterfly surveys, aquatic herpetological (amphibian) surveys, terrestrial herpetological drift fence with box funnel trap surveys, diurnal and nocturnal avian point count surveys, acoustical bat surveys, small mammal trapping, and passive medium and large mammal camera surveys.

Vegetation communities present within the TRVRP were mapped based on the Vegetation Classification Manual (VCM) for Western San Diego County and cross-walked to the Holland/Oberbauer classification system. There are 34 plant alliances, associations, or semi-natural stands present within the TRVRP. For communities not described by the VCM, of which there are six, the communities were described using the Holland/Oberbauer code distribution.

A total of 239 plant species were observed within the TRVRP during the 2018 baseline surveys, consisting of 133 native plant species and 106 invasive non-native plant species. In total, 16 special status plant species were identified within the TRVRP during 2018 baseline biological surveys, including three species covered under the City's Multiple Species Conservation Program (MSCP) Subarea Plan.

Of the 80 non-native plant species observed in the TRVRP in 2018, 22 target non-native invasive species were selected as a high priority for removal based on their invasive potential, prevalence throughout the TRVRP, and ability for management.

A total of 183 wildlife species were observed or detected within the TRVRP during the 2018 baseline biological diversity surveys including 46 invertebrates, 5 amphibians, 10 reptiles, 97 birds, and 25 mammal species. In total, 31 special status species were observed or detected, including 28 species listed as sensitive by the County and seven species covered under the City's MSCP Subarea Plan.

Management recommendations for special status plant species in the TRVRP include monitoring and removing non-native plant species, particularly invasive plants. Management recommendations also include limiting human access to known populations of special status plant species. Recommended future monitoring and surveying protocols for wildlife are included to update existing data; infer

conclusions on species presence, abundance, distribution, and health; review success of implemented management directives, modify existing management directives to be more effective, remove management directives that are not effective or are no longer warranted, and formulate new management directives if required; and influence management directives at the TRVRP to provide a dynamic adaptive management program. Areas that may have been previously a part of the riparian system in the TRVRP that were subject to dumping, fill, or other disturbances resulting in an upland setting have potential for re-habilitation, with the goal of returning natural/historic functions to a former aquatic resource. Multiple upland areas are also suitable for restoration, where non-native plants would be removed, and native upland plants would be installed to restore the area to a native vegetation community.

1.0 INTRODUCTION

1.1 PURPOSE OF THE REPORT

Baseline biological resources surveys were conducted in spring, summer, and fall of 2018 to identify and map existing biological resources within the County of San Diego (County) Department of Parks and Recreation (DPR) 2,018-acre Tijuana River Valley Regional Park (TRVRP) (Figures 1 through 3a). The purpose of these surveys was to identify and map biological resources that exist on the Park. The data and information collected during the 2018 survey effort will be utilized to update the existing RMP and associated management directives. These management directives will provide the management framework for monitoring and managing of the TRVRP's resources while balancing the need to provide appropriate passive recreation opportunities.

1.2 MULTIPLE SPECIES CONSERVATION PROGRAM CONTEXT

The City MSCP Subarea Plan (City 1997) is a cooperative habitat program that encompasses 582,000 acres in San Diego County. The City's MSCP Subarea Plan encompasses 206,124 acres within the MSCP Subregion. Within the City's MSCP Subregion, the City has delineated a 56,831-acre MHPA that would serve to protect critical sensitive biological resources. The TRVRP was identified as a biological Core Resource Area (CRA) in the Final MSCP Plan (City 1998), and the City proposes to retain approximately 94 percent of the Tijuana River Valley core area within the MHPA. As such, the TRVRP lies almost entirely in the MHPA (Figures 3b and 3c). Restoration of the Tijuana River Valley to a natural floodplain that contains appropriate habitats for endangered, threatened, and other special status species and vegetation communities would help achieve and maintain the conservation goals of the Subarea Plan.

Explicit management policies and directives have been outlined for the TRVRP, where the primary concerns include maintenance of human use areas, non-sustainable agriculture, vandalism, illegal dumping, water quality, control of invasive species introduction, and management of land use adjacent to habitat for special status species. Specific management policies and directives that pertain to the MHPA within the TRVRP include:

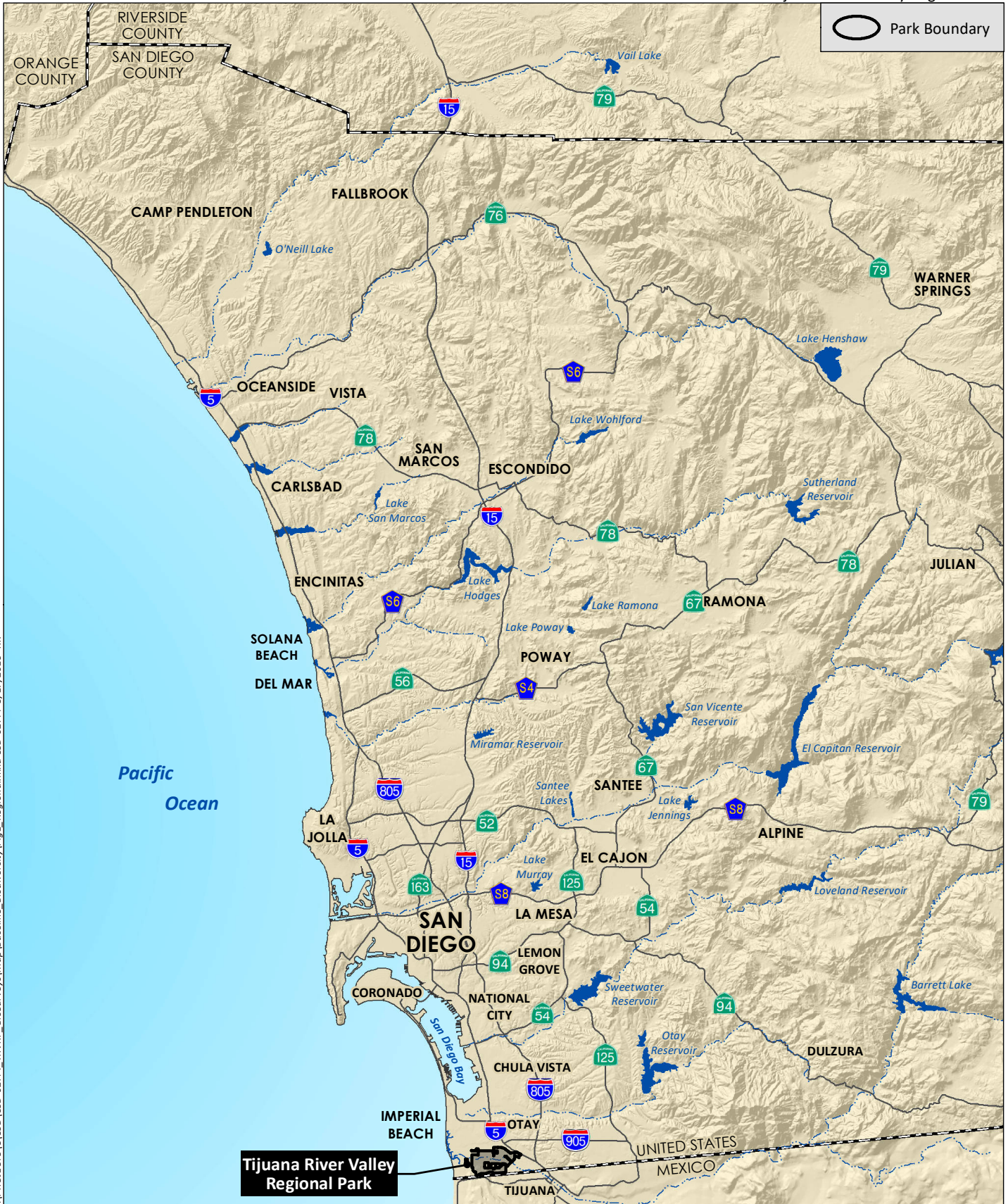
- Maintain existing Reserve (estuary) and park uses;
- Maintain buffers around all wetland areas;
- Maintain existing agricultural uses on Spooner's Mesa, with the long-term goal of phased restoration to coastal sage scrub, maritime succulent scrub, or native grassland habitat;
- Maintain agricultural use on County-owned lands, with the long-term goal of restoration to native vegetation where possible, consistent with the County's Framework Management Plan (County 1998); and
- Retain and enhance, where possible, existing riparian habitat along the Tijuana River.

2.0 TIJUANA RIVER VALLEY REGIONAL PARK DESCRIPTION

2.1 PROJECT LOCATION

The approximately 1,800-acre (2.8-square-mile) TRVRP is in the City of San Diego, in the southwestern portion of San Diego County, California (Figure 1). Approximately 1,617 acres are owned by the County with other landowners consisting of the City and California Department of Fish and Wildlife (CDFW). It is bound to the north by Sunset Avenue, to the south by the U.S.-Mexico International Border, to the west by Border Field State Park and the Tijuana River National Estuarine Research Preserve (TNERR), and to the east by Dairy Mart Road and the residential community of San Ysidro (with the exception of the portion of the Dairy Mart Ponds that extend further east between the Interstate [I-] 5 corridor and Camino de la Plaza). The area is situated within Sections 2, 3, 4, 5, 32, 33, 34 and 35, Townships 18 and 19 South, and Range 2 West of the U.S. Geological Survey (USGS) Imperial Beach topographic quadrangle map (Figure 2). Designated federal and state open space is located adjacent to the TRVRP and includes Border Field State Park, Tijuana River National Estuarine Research Preserve, and the Tijuana Slough National Wildlife Refuge (TSNWR; Figure 3c).

The TRVRP is composed of 88 Assessor's Parcel Numbers (APNs) owned by the County, City, state of California, U.S. federal government, and private land owners (Table 1; Figure 3b; San Diego Association of Governments [SANDAG] 2018). The County owns the largest portion consisting of 69 parcels that total 1,617 acres and account for 90.7 percent of the TRVRP. The City owns 10 parcels that total 148.61 acres (7.4 percent of the area), the state of California owns one parcel that totals seven acres (0.3 percent of the area), the U.S. federal government owns two parcels that total 6.25 acres (0.3 percent of the area), and private land owners own six parcels that total 26.38 acres (1.3 percent of the area).

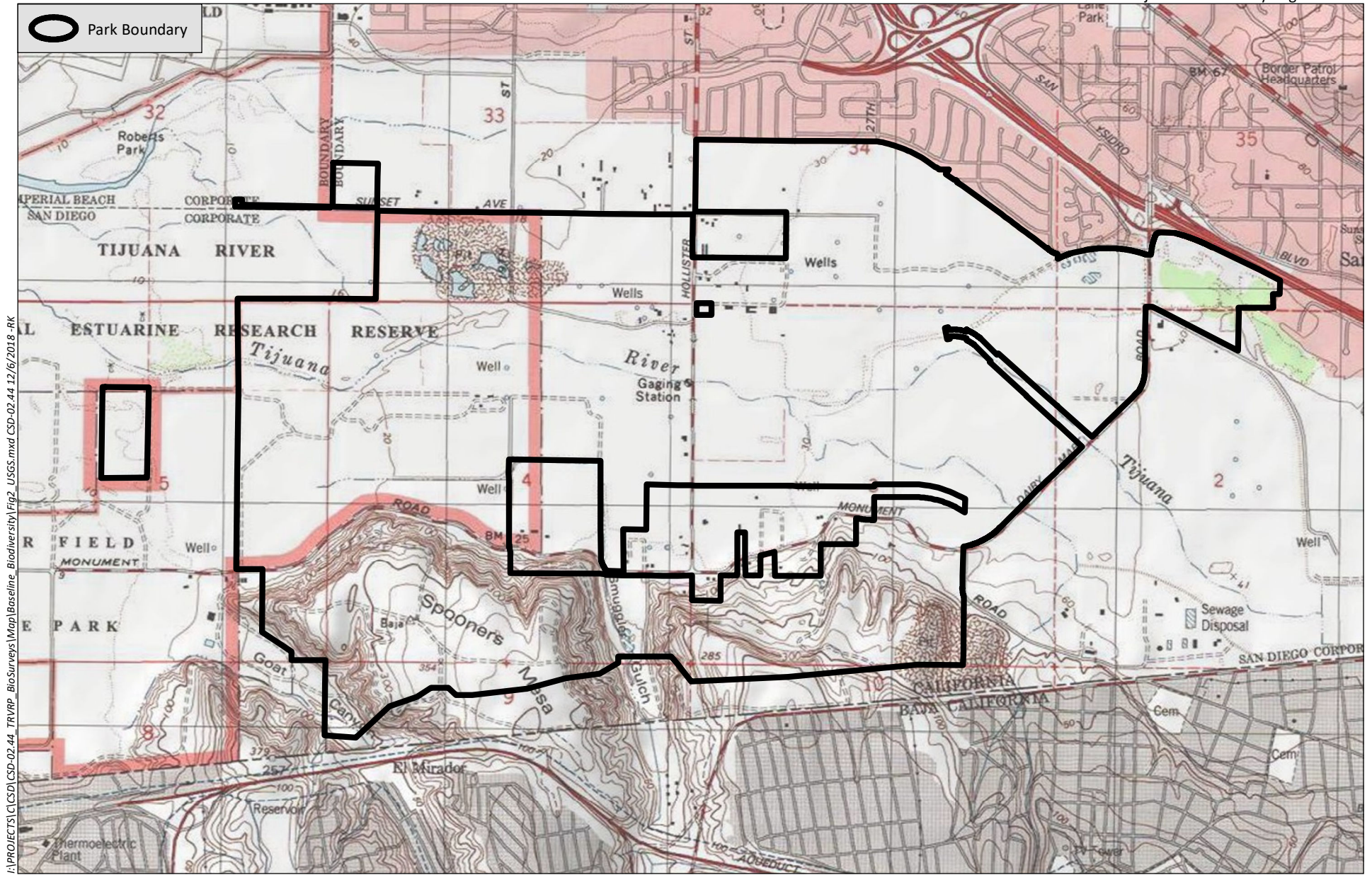


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Source: Base Map Layers (SanGIS, 2016)

Regional Location

Figure 1

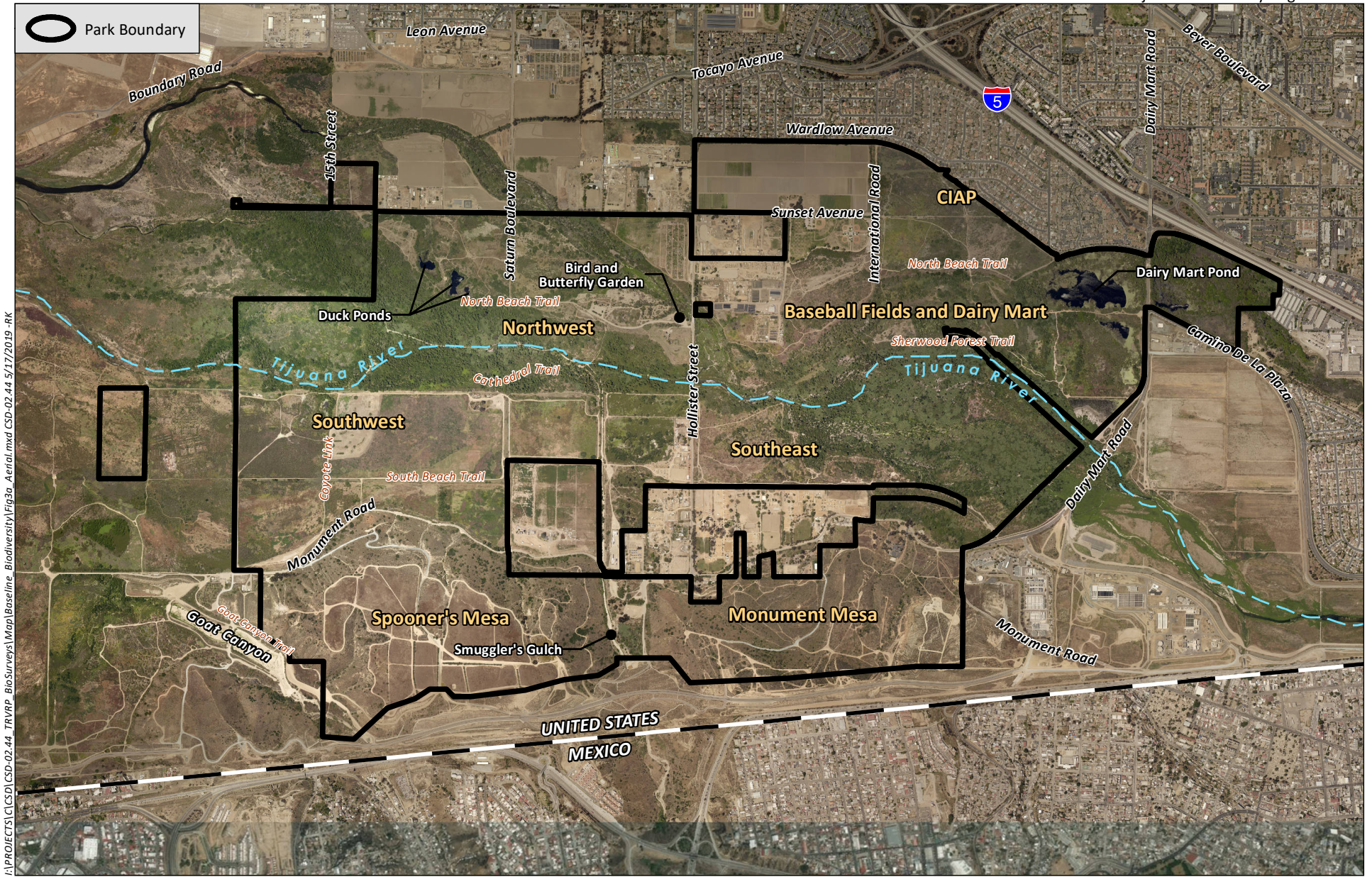


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Source: Imperial Beach 7.5' Quad (USGS)

Park/Preserve Vicinity Map

Figure 2



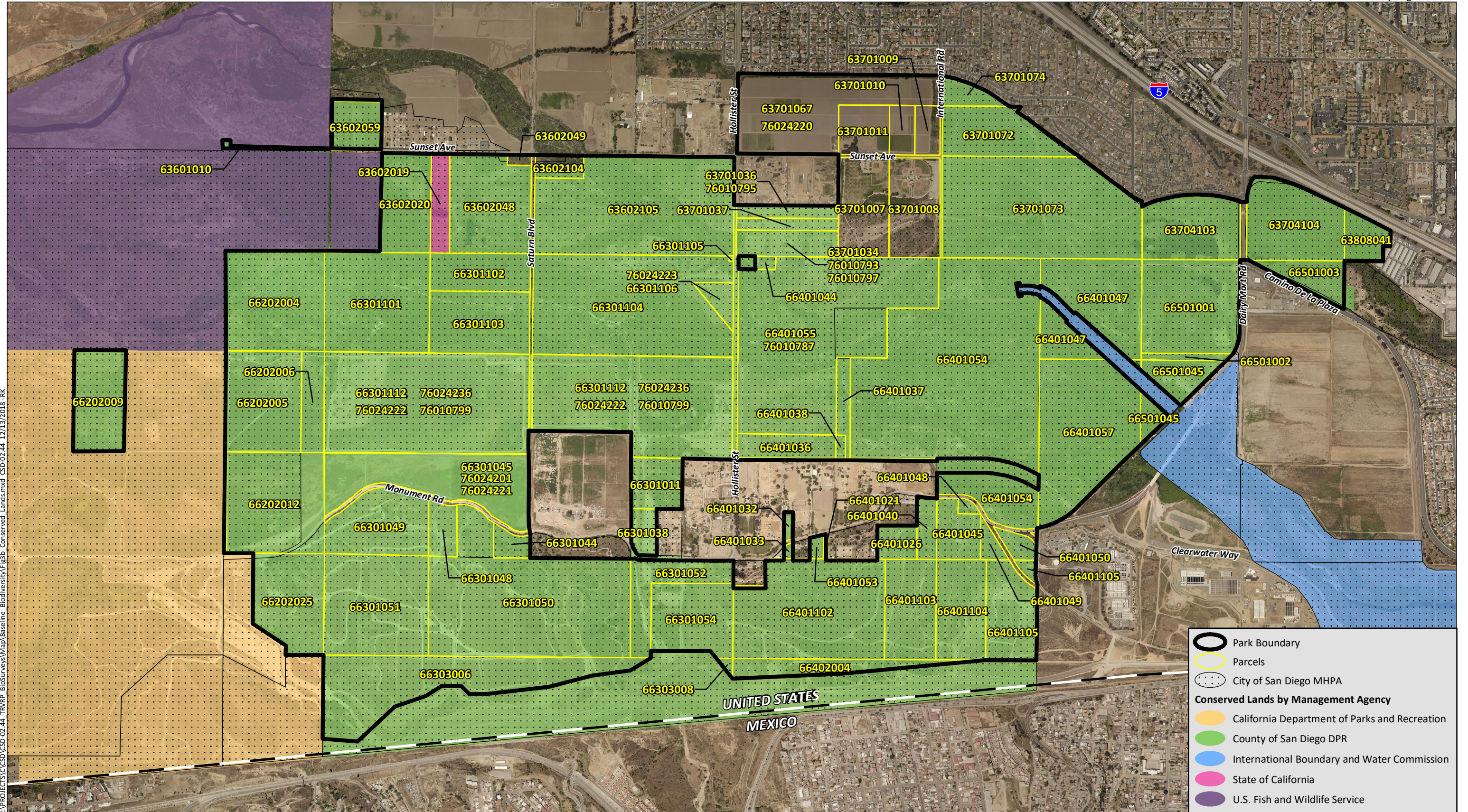
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Source: Aerial Photo (SanGIS 2017)



Aerial Photograph

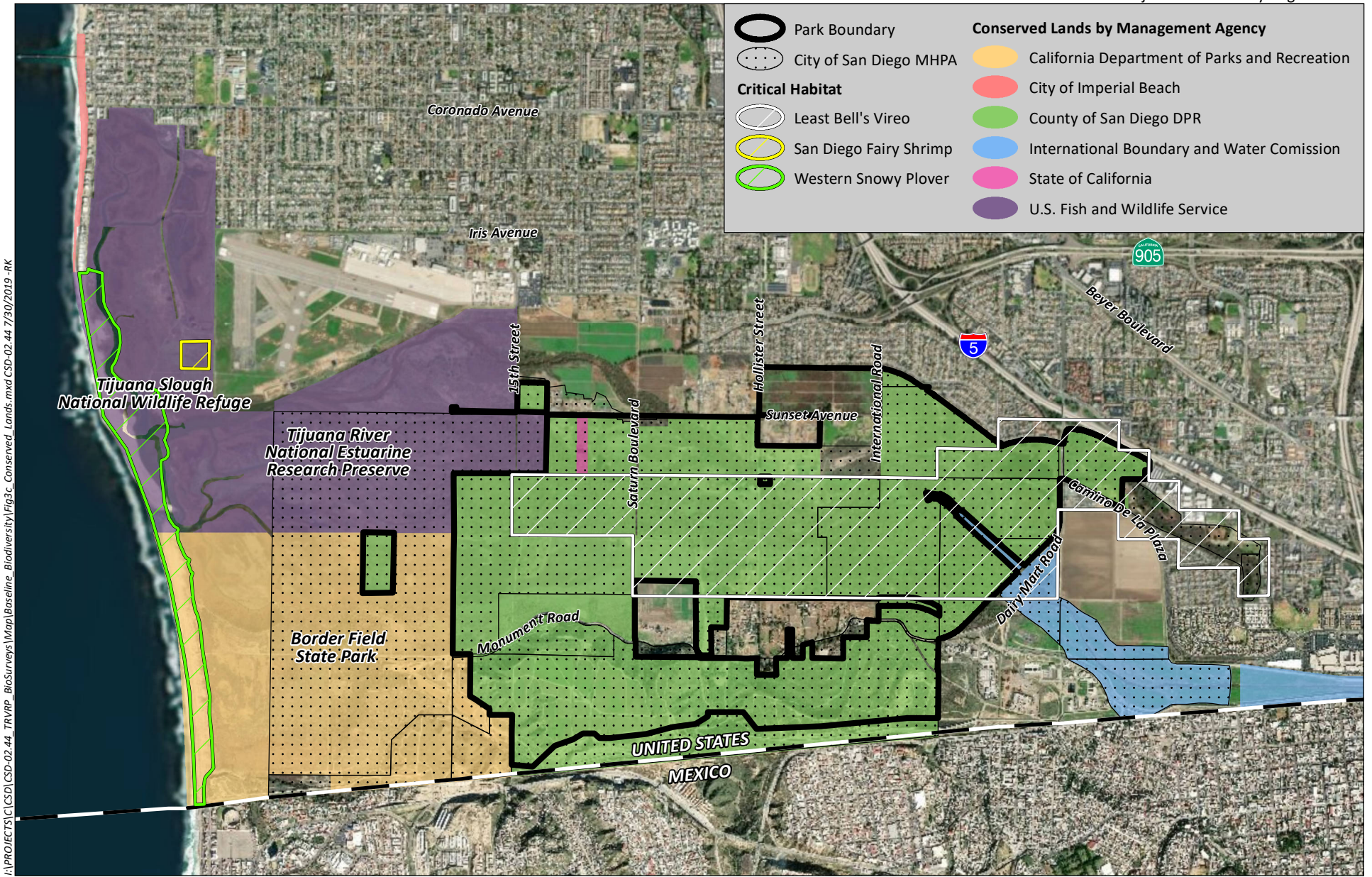
Figure 3a



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0 1,200 Feet

Source: Aerial Photo (SanGIS 2017); Conserved Lands (SANDAG Technical Services - GIS 2018); MHPA (SanGIS 2006); Critical Habitat (U.S. Fish and Wildlife Service 2018)



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Source: Aerial Photo (Esri 2015); Conserved Lands (SANDAG Technical Services - GIS 2018); MHPA (SanGIS 2006); Critical Habitat (U.S. Fish and Wildlife Service 2018)



MSCP Designations and Conserved Lands

Figure 3c

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**Table 1
TIJUANA RIVER VALLEY REGIONAL PARK (TRVRP) OWNERSHIP SUMMARY**

Land Owner	Assessor's Parcel Number(s) ^{1, 2}	Percent Owned	Total Acres ²
County of San Diego	63601010, 63602020, 63602048, 63602059, 63602105, 63701007, 63701008, 63701009, 63701010, 63701011, 63701034, 63701036, 63701037, 63701067, 63701072, 63701073, 63704103, 63704104, 63808041, 66202005, 66202006, 66202009, 66202012, 66202013, 66202025, 66301044, 66301045, 66301048, 66301049, 66301050, 66301051, 66301052, 66301054, 66301104, 66301106, 66301112, 66303006, 66303008, 66401021, 66401026, 66401032, 66401033, 66401036, 66401037, 66401038, 66401040, 66401044, 66401045, 66401047, 66401048, 66401049, 66401050, 66401053, 66401054, 66401055, 66401057, 66401102, 66401103, 66401104, 66401105, 66402004, 66501001, 66501002, 66501045, 76010799, 76024201, 76024220, 76024221, 76024223	90.7	1,617
City of San Diego	63701074, 66202004, 66301011, 66301038, 66301101, 66301102, 66301103, 66301105, 66401035, 66501003	7.4	146
State of California	63602019	0.3	7.00
United States of America	63602049, 63602104	0.3	7.00
Private	76010795, 76010797, 76024222, 76010793, 76024236, 76010787	1.3	85
Total Acres			1,800

Source: SanGIS 2018

¹ Assessor's Parcel Numbers (APNs) are provided as eight-digit numbers, the last two numbers of each APN being 00.

² Data provided in SanGIS includes multiple APNs for some parcel boundaries and recorded acreages that don't reflect GIS calculated acreages for an APN.

2.2 GEOGRAPHICAL SETTING

The TRVRP is located west of the Peninsular Ranges of southern California in the relatively stable Coastal Plain province of San Diego County. The area is composed of flat floodplain, riverbed, and hilly terrain with mesa tops. Approximately half of the TRVRP has a slope gradient of 25 percent or greater ranging in elevation from approximately eight to 434 feet above mean sea level (AMSL).

The topography of the TRVRP is bisected by the Tijuana River. The Tijuana River flows in a northwesterly direction originating in Mexico, flows through the TRVRP, continues west into the Tijuana River National Estuarine Research Preserve, and drains into the Pacific Ocean just south of the Tijuana Slough National Wildlife Refuge. The TRVRP is bounded on three sides by urban development, open space to the west, and generally consists of a broad floodplain with natural mesas in the south. The eastern boundary of the area is demarcated by the Dairy Mart Ponds. The area contains a mixture of riparian woodland, native scrub habitats, and disturbed habitats, as well as fallow agricultural fields. Equestrian facilities and rural housing are located directly adjacent to the TRVRP.

The TRVRP is generally divided into seven sections: the northwest, the Coastal Impact Assistance Program (CIAP) area in the northeast, the Baseball Fields and Dairy Mart in the northeast, the southwest, the southeast, Spooner's Mesa, and Monument Mesa (Figure 3a). The northwest portion is located north of Tijuana River, south of Sunset Avenue, and west of Hollister Street and contains the

Duck Ponds and the Bird and Butterfly Gardens. The CIAP area is located to the east of Sunset Avenue and north of North Beach Trail. The Baseball Fields and Dairy Mart occur to the south of Sunset Avenue, north of Tijuana River, and west of Dairy Mart Road and contain the Southwest Little League baseball fields and Dairy Mart Pond. The southwest is located south of Tijuana River, north of Monument Road, and west of Hollister Street. The southeast is located south of Tijuana River, west of Dairy Mart Pond, north of Monument Road, and east of Hollister Street. Spooner's Mesa and Monument Mesa are located south of Monument Road and separated by Smuggler's Gulch. Goat Canyon is located directly west of Spooner's Mesa outside of the TRVRP.

2.3 GEOLOGY AND SOILS

The TRVRP is in the relatively stable Coastal Plain province of San Diego County. The area contains alluvium, terrace deposits, recent and old alluvial fan deposits, and fill. Higher elevations within the Tijuana River Valley have conglomerates consisting of San Diego Formation materials. The valley soils are characterized by coarse sands with a medium to low amount of fines (silts and clays). The alluvial deposits contain rocky zones consisting of large amounts of boulders, cobbles, and gravels. Operating mines have not been identified in the TRVRP.

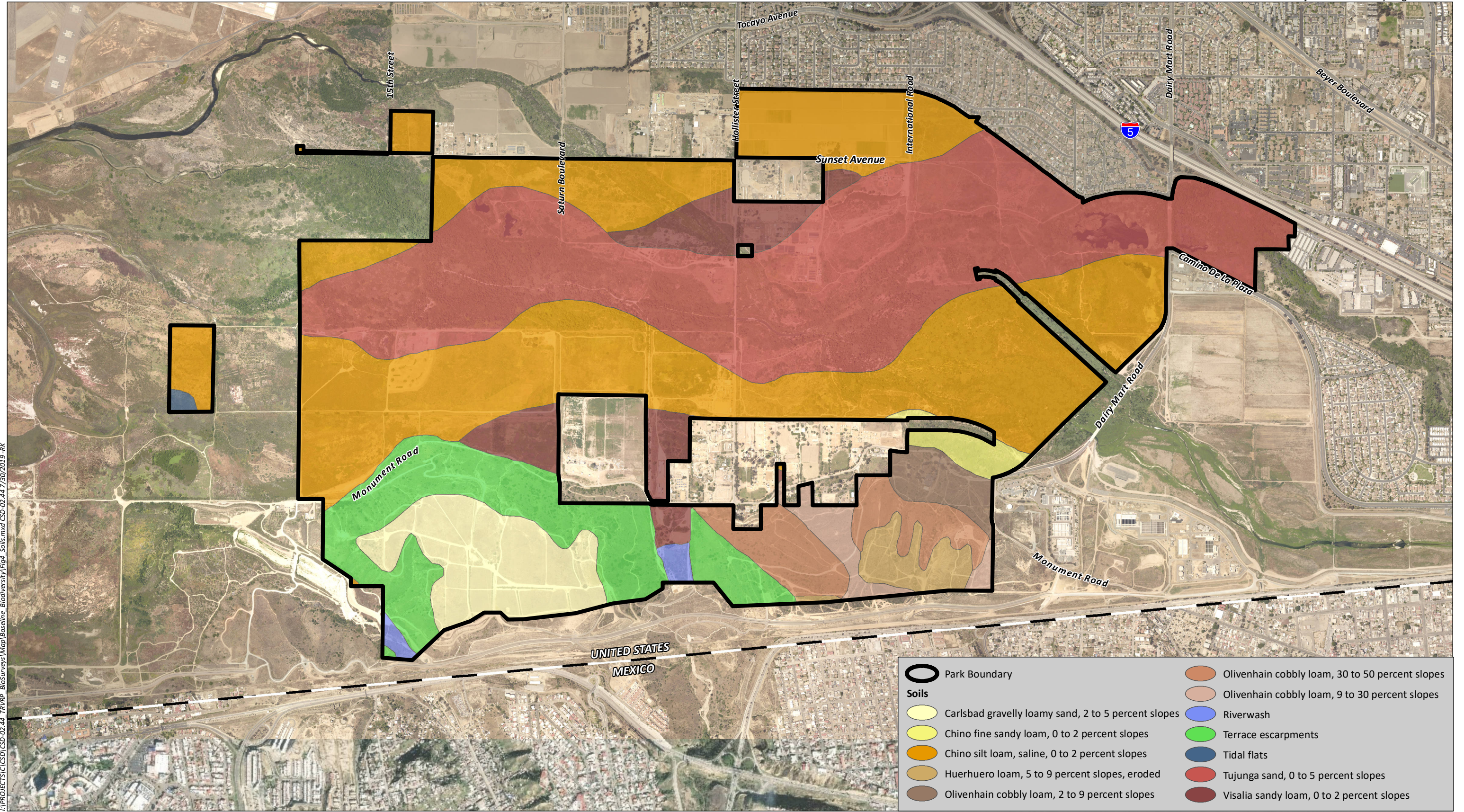
The TRVRP contains 12 soil types belonging to nine soil series: Carlsbad gravelly loamy sand, 2 to 5 percent slopes; Chino fine sandy loam, 0 to 2 percent slopes; Chino silt loam, saline, 0 to 2 percent slopes; Huerhuero loam, 5 to 9 percent slopes, eroded; Olivenhain cobbly loam, 2 to 9 percent slopes; Olivenhain cobbly loam, 30 to 50 percent slopes; Olivenhain cobbly loam, 9 to 30 percent slopes; riverwash; terrace escarpments; tidal flats; Tujung sand, 0 to 5 percent slopes; Visalia sandy loam, 0 to 2 percent slopes (Figure 4; U.S. Department of Agriculture [USDA] 2018). A brief description of each soil series and the associated soil type is provided below.

Carlsbad Series

Carlsbad gravelly loamy sand is the representative soil type of the Carlsbad series and is mapped within the southwest portion of the TRVRP at Spooner's Mesa in the TRVRP. Carlsbad series are moderately well drained and are characterized by very low runoff and high permeability. Carlsbad series are found in hillslopes and side slopes varying from 2 percent to 5 percent slopes in the TRVRP. Typical vegetation found on this soil series within the TRVRP includes laurel sumac (*Malosma laurina*), black sage (*Salvia mellifera*), white sage (*Salvia apiana*), California buckwheat (*Eriogonum fasciculatum*), San Diego County viguiera (*Bahiopsis laciniata*), and annual grasses (USDA 2018).

Chino Series

Chino fine sandy loam and Chino saline silt loam are the representatives soil types of the Chino series found along the southwestern-most boundary of the TRVRP within the Goat Canyon sediment basins as well as flat portions of the TRVRP north of Spooner's/Monument Mesa and north of the Tijuana River. This series is formed from alluvium derived from granite. The Chino Series are found on alluvial fans, toe of slopes, and base slopes varying from 0 percent to 2 percent slopes. The Chino Series are moderately well drained and are characterized by medium runoff and moderately high permeability. Typical vegetation found on this soil series within the TRVRP includes annual grasses, crystalline iceplant (*Mesembryum crystallinum*), Russian thistle (*Salsola tragus*), and other shrubs (USDA 2018).



Source: Aerial Photo (SanGIS 2017); Soils (U.S. Department of Agriculture, Natural Resources Conservation Service 2005)



Soils
Figure 4

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Huerhuero Series

Huerhuero loam, 5 to 9 percent slopes, eroded is the representative soil type of the Huerhuero series and is mapped within the southeast portion of the TRVRP at Monument Mesa. This series is found on marine terraces and characterized by very high runoff with very low to moderately low permeability. This series is composed of moderately well-drained soils formed from calcareous alluvium derived from sedimentary rock. Annual grasses forbs, San Diego County viguiera, black sage, and California buckwheat are typical native vegetation found on soils in the Huerhuero Series within the TRVRP (USDA 2018).

Olivenhain Series

Olivenhain cobbly loam, 2 to 9 percent slopes, Olivenhain cobbly loam, 30 to 50 percent slopes, and Olivenhain cobbly loam, 9 to 30 percent slopes are the representative soil types of the Olivenhain series and are in the southeast portion of the TRVRP at Monument Mesa. The Olivenhain series consists of well-drained soils that are formed from gravelly alluvium derived from mixed sources. Olivenhain series are found on marine terraces and have very high runoff with very low to moderately low permeability. Within the TRVRP, California buckwheat, black sage, and San Diego County viguiera, and invasive non-native grasses such as oats (*Avena* spp.), filaree (*Erodium* spp.), and soft brome (*Bromus hordeaceus*) are typical plant species found in this soil series (USDA 2018).

Riverwash Series

Riverwash is mapped in Goat Canyon immediately south of the sediment basins in the TRVRP. Riverwash soils are excessively drained and are characterized by very high permeability. Riverwash soils are derived from stratified extremely gravelly coarse sand to gravelly sand. Within the TRVRP, Fremont Cottonwood (*Populus fremontii* ssp. *fremontii*) and willows (*Salix* spp.) are typical native plant species found in this soil series (USDA 2018).

Terrace Escarpments Series

Terrace Escarpments are found on the north facing slopes of Spooner's Mesa, the western portion of Monument Mesa, and southwest of Goat Canyon within the TRVRP. This soil series is formed in variable alluvium on terraces or barrancas, may have exposed gravel, cobblestones, stones, or large boulders (USDA 2018).

Tidal Flat Series

Tidal Flats are level muddy surfaces found within estuaries that meet the Pacific Ocean in the western portion of the TRVRP. This series consists of very poorly drained soils with negligible runoff. Influences of fresh river water and saline marine waters cause temperature, salinity, and acidity to fluctuate. Vegetation may be sparse depending on wave erosion, but presence of plankton and organic debris support large numbers of small mobile/burrowing animals (USDA 2018).

Tujunga Series

Tujunga sand, 0 to 5 percent slope is the representative soil type of the Tujunga Sand series and is found along the Tijuana River within the TRVRP. This series consists of somewhat excessively drained soils formed from alluvium derived from granite. The Tujunga Sand series soil is found on floodplains and is characterized by high to very high permeability with negligible runoff. Within the TRVRP, Fremont

cottonwood, willows, and annual grasses/forbs are typical native vegetation found on soils in the Tujunga Sand Series (USDA 2018).

Visalia Series

Visalia Sandy Loam, 0 to 2 percent slopes is the representative soil type of the Visalia series and is found south of Sunset Avenue between Saturn Boulevard and Dairy Mart Road in the northwest/northeast portion of the TRVRP, and north of Monument Road in the southwest portion of the TRVRP. This series consists of well-drained soils formed from alluvium derived from granitic rocks. The Visalia Series is found on alluvial fans and toe of slopes. Visalia Series is characterized by very low runoff and high permeability.

2.4 CLIMATE

Weather patterns within the County and TRVRP are greatly influenced by its proximity to the Pacific Ocean. The climate of San Diego is classified as a Mediterranean climate, which indicates hot, sunny, and dry summers, and cooler, wetter winters. However, San Diego is more arid than most Mediterranean climates and averages 267 sunny days per year. Proximity of the TRVRP to the ocean also results in cooler summers and warmer winters in comparison with other places on the same latitude.

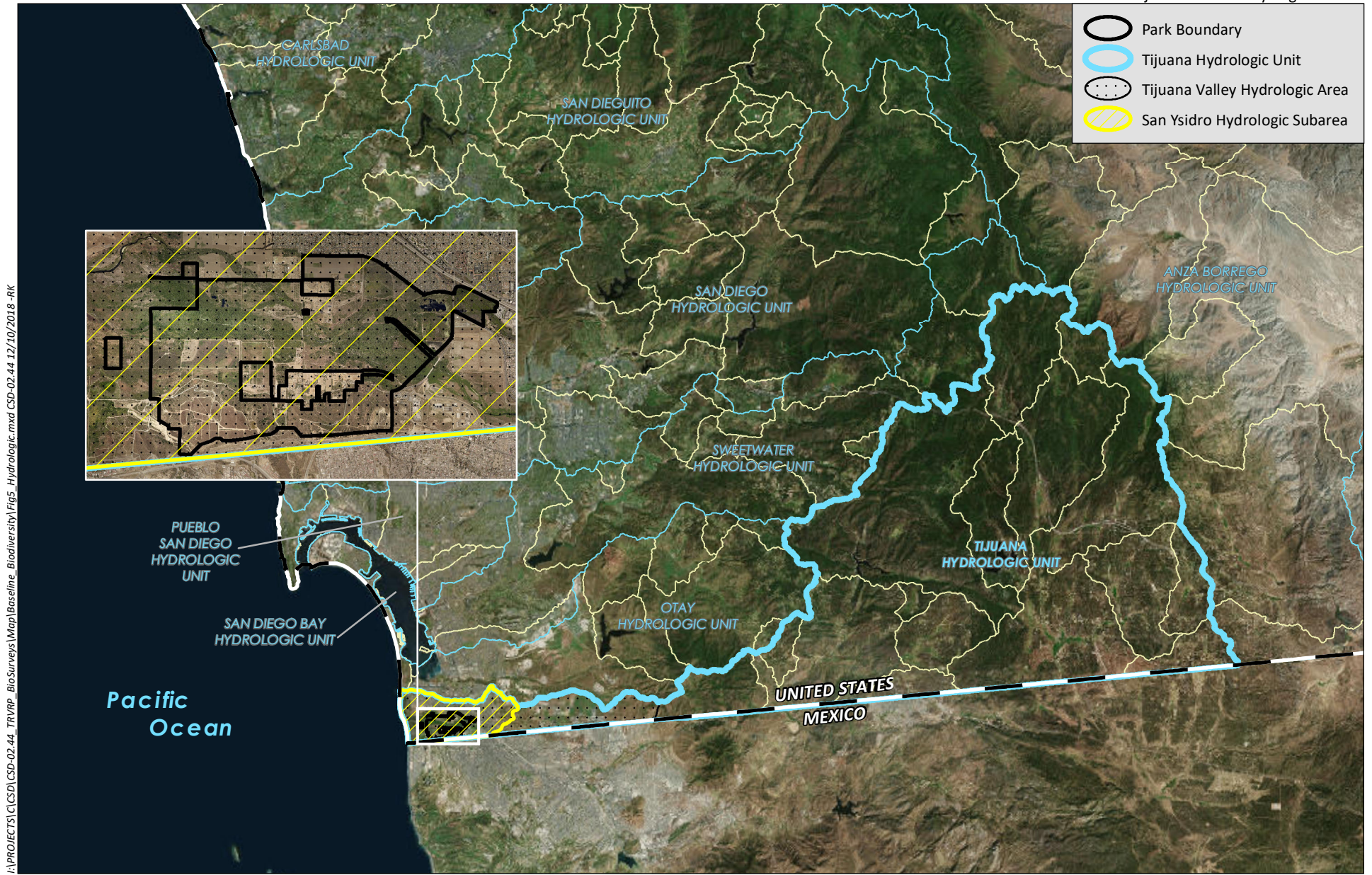
Average monthly temperatures range from 57 degrees Fahrenheit (°F) in January to 72 °F in August. The highest recorded temperature for the region was 108°F on September 27, 1963 (recorded in Chula Vista, approximately 2.7 miles north of the TRVRP; Western Regional Climate Center 2012). The record low temperature for the region was 15°F recorded April 14, 2003 (also recorded in Chula Vista; Western Regional Climate Center 2012).

The mean annual precipitation for the region is less than 12 inches, with most rainfall occurring between December and March. On average, precipitation occurs 21 days per year. In San Diego, the 2017–2018 water year (October through September) recorded 3.34 inches of rain, while the 2016–2017 water year recorded 12.73 inches of rain (National Oceanic and Atmospheric Association 2018).

A weather phenomenon that occurs in the TRVRP is marine layer clouds, which occur most frequently between May and August. The marine layer results in cool temperatures, cloudy weather, and fog in the morning. Marine layer conditions linger until the heat of the sun becomes strong enough to evaporate the clouds. In May and June, the early morning fog and cool, cloudy conditions often last into the afternoon or even all day. The thick marine layer keeps the air cool and damp within a few miles of the coast. An additional weather phenomenon that occurs in the region is the Santa Ana winds. Santa Ana winds occur when easterly winds bring hot, dry air from the inland deserts. These occur most frequently in autumn but can occur any time of the year.

2.5 HYDROLOGY

The TRVRP is located within the Tijuana River Watershed, which is a binational watershed since the river originates in Mexico but flows into the United States, terminating at the Pacific Ocean. The watershed is divided into approximately 1,245 square miles (mi²; 65 percent) in Mexico and 455 mi² (35 percent) in the United States, totaling approximately 1,700 mi² (Figure 5). Three surface water reservoirs are present in addition to the Tijuana National Estuarine Research Reserve (TNERR) and various flood control networks. There are three major drainages, the Rio Las Palmas system in Mexico, and



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Source: Aerial Photo (Esri 2016); NWI (U.S. Fish and Wildlife Service 2018); Hydrologic Units (California Interagency Watershed Mapping Committee 2004)



Hydrology Map

Figure 5

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Cottonwood and Campo Creeks in the United States. Precipitation varies annually from 11 inches to 25 inches farther inland near the Laguna Mountains. Eight hydrological areas exist within the Tijuana River Watershed: the Tijuana Valley, Potrero, Barrett Lake, Monument, Morena, Cottonwood, Cameron, and Campo. Morena Reservoir and Barrett Lake on Cottonwood Creek capture runoff. The Tijuana River accounts for the highest concentrations of suspended solids discharging as runoff to the southern California coastal ocean, even though the Tijuana River accounts for a small percentage of total gauged runoff among the eight largest creeks and rivers in southern California. Runoff from Mexico has affected surface water runoff, while ground water contamination has occurred as a result of seawater intrusion and waste discharges.

2.6 FIRE HISTORY

Based on historical fire perimeter data from the California Department of Forestry and Fire Protection (Cal Fire 2018a) Fire and Resource Assessment Program (FRAP; Cal Fire 2018b), two fires have affected the TRVRP (Figure 6). FRAP compiled a statewide spatial database of fire perimeters from Bureau of Land Management (BLM), National Park Service (NPS), and U.S. Fish and Wildlife Service (USFWS) fires totaling at least 10 acres and greater in size, and Cal Fire fires totaling 300 acres and greater in size. While an active fire regime is characteristic of the surrounding region, only two historic fires were recorded within the TRVRP, one in 1953 on Monument Mesa and one in 1983 on Spooner's Mesa. Table 2 presents the fire interval data for the TRVRP.

Table 2
TRVRP FIRE INTERVAL DATA

Fire Year ¹	Fire Name	Interval (years)	Acreage Burned	Percent of TRVRP Burned ²
1953	Lazy A	--	128.0	7.1%
1983	Assist #49	30	358.4 (134 within TRVRP)	7.4%

¹ California Department of Forestry and Fire Protection (Cal Fire; 2018b)

² Based on the 248-acre total acreage of the TRVRP.

2.7 TRAILS

The TRVRP contains a formal 22.5-mile trail network, in addition to an existing informal network of unplanned and unauthorized dirt roads and pathways. The unplanned, unauthorized, and haphazard dirt roads and pathways total approximately 71.5 miles. The 22.5-mile formal trail network includes the following types of trails, as shown on Figure 7:

- 21.19 miles of multi-use trails (i.e., pedestrian/equestrian/bicycle) within existing dirt road and pathway alignments; and
- 1.31 miles of multi-use trails (i.e., pedestrian/equestrian) within existing dirt road and pathway alignments.

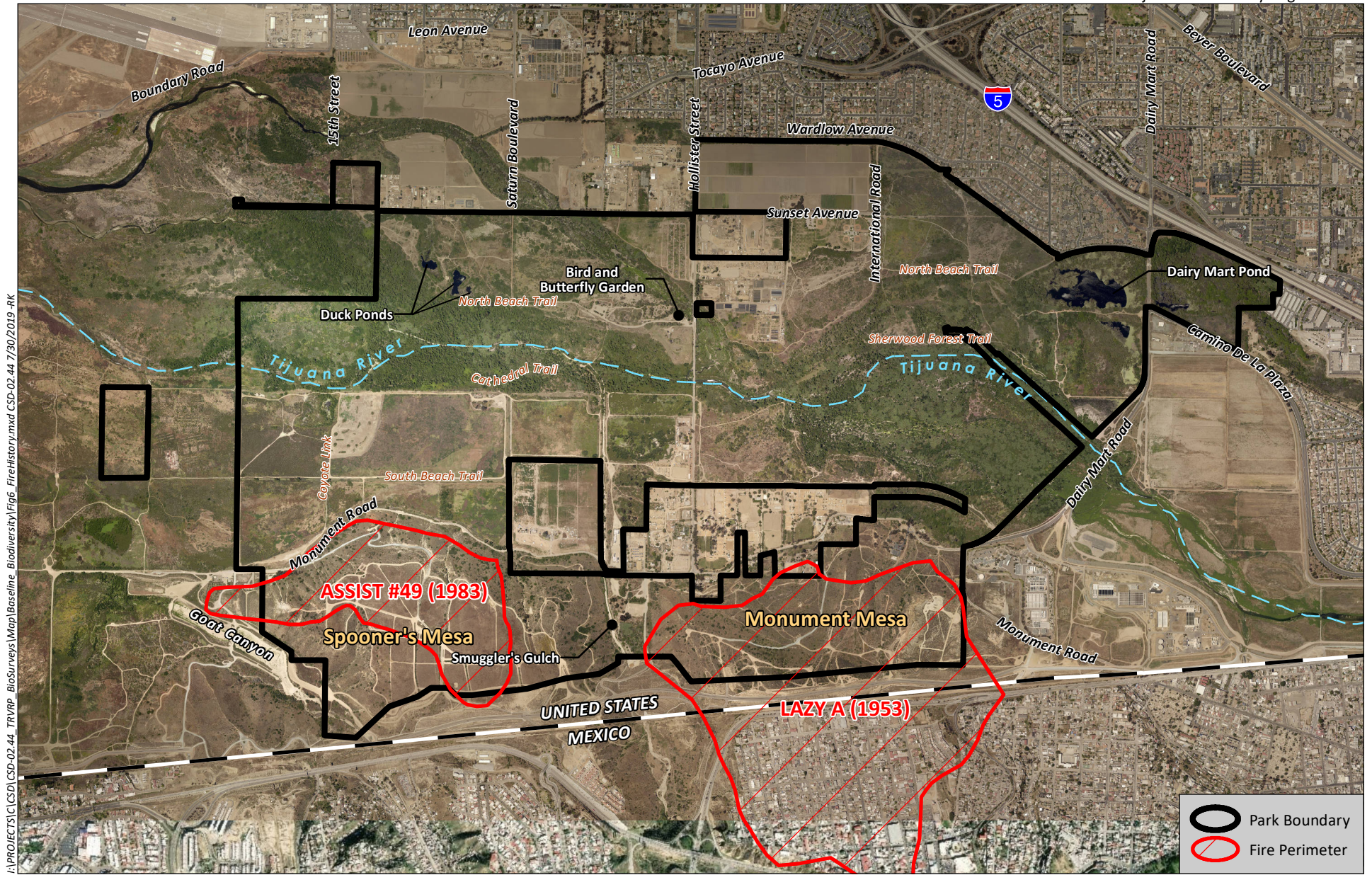
Revegetation of 40.9 miles of existing informal trails and dirt roads has been on-going since December 2015 and is designed to allow and facilitate native habitat re-growth resulting in the active and passive restoration of approximately 34.11 acres of riparian and upland vegetation communities. The CBP will retain 8.1 miles of existing informal trails.

3.0 METHODS



Baseline biological diversity surveys of the TRVRP were conducted by HELIX Environmental Planning, Inc. (HELIX) biologists between January and November 2018. Surveys included habitat/vegetation mapping, rare plant surveys, invasive non-native plant species mapping, butterfly surveys, aquatic herpetological (amphibian) surveys, terrestrial herpetological drift fence with box funnel trap surveys, diurnal and nocturnal avian point count surveys, acoustical bat surveys, small mammal trapping, and passive medium and large mammal camera surveys. A summary of the schedule of all baseline biological surveys completed in 2018 for the TRVRP is provided in Table 3.

Table 3
SCHEDULE OF SURVEYS¹

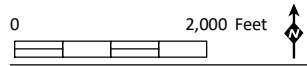
Survey Date	Survey Number	Personnel	Conditions ²
Vegetation Mapping (additionally invasive and rare plant mapping, if observed)			
January 11-14, 2018	N/A	Benjamin Rosenbaum Talaya Rachels Laura Moreton Amy Mattson	NR ³
Rare Plant Surveys (additionally invasive plant mapping, if observed)			
April 23-27, 2018	1	Talaya Rachels	NR
May 23-25, 2018	2	Laura Moreton Talaya Rachels	NR
Butterfly Surveys			
April 23-24, 2018	1, 2	Hannah Lo Amy Mattson	67-75 °F; wind 0-6 mph; 5-70% clouds
April 25, 2018	3	Hannah Lo Laura Moreton	67-74 °F; wind 2-7 mph; 0-70% clouds
Amphibian Surveys			
April 24, 2018	1	Benjamin Rosenbaum Dane Van Tamelen	54-67 °F; wind 2-5 mph; 50-50% clouds
June 7, 2018	2	Benjamin Rosenbaum Dane Van Tamelen	63-70 °F; wind 2-5 mph; 20-20% clouds
August 8, 2018	3	Benjamin Rosenbaum Erica Harris	67-73 °F; wind 2-5 mph; 0-0% clouds
Reptile Trapping Surveys			
April 16, 2018	1	Benjamin Rosenbaum Vince Rivas	62-63 °F; wind 2-5 mph; 5-100% clouds
April 17, 2018	1	Benjamin Rosenbaum	62-68 °F; wind 2-5 mph; 5-50% clouds
April 18, 2018	1	Benjamin Rosenbaum	63-69 °F; wind 2-5 mph; 100-100% clouds
April 19, 2018	1	Benjamin Rosenbaum	63-68 °F; wind 2-5 mph; 2-40% clouds
April 20, 2018	1	Benjamin Rosenbaum Laura Moreton	63-69 °F; wind 2-5 mph; 0-20% clouds
June 11, 2018	2	Benjamin Rosenbaum Laura Moreton	NR
June 12, 2018	2	Benjamin Rosenbaum	68-72 °F; wind 2-5 mph; 60-70% clouds



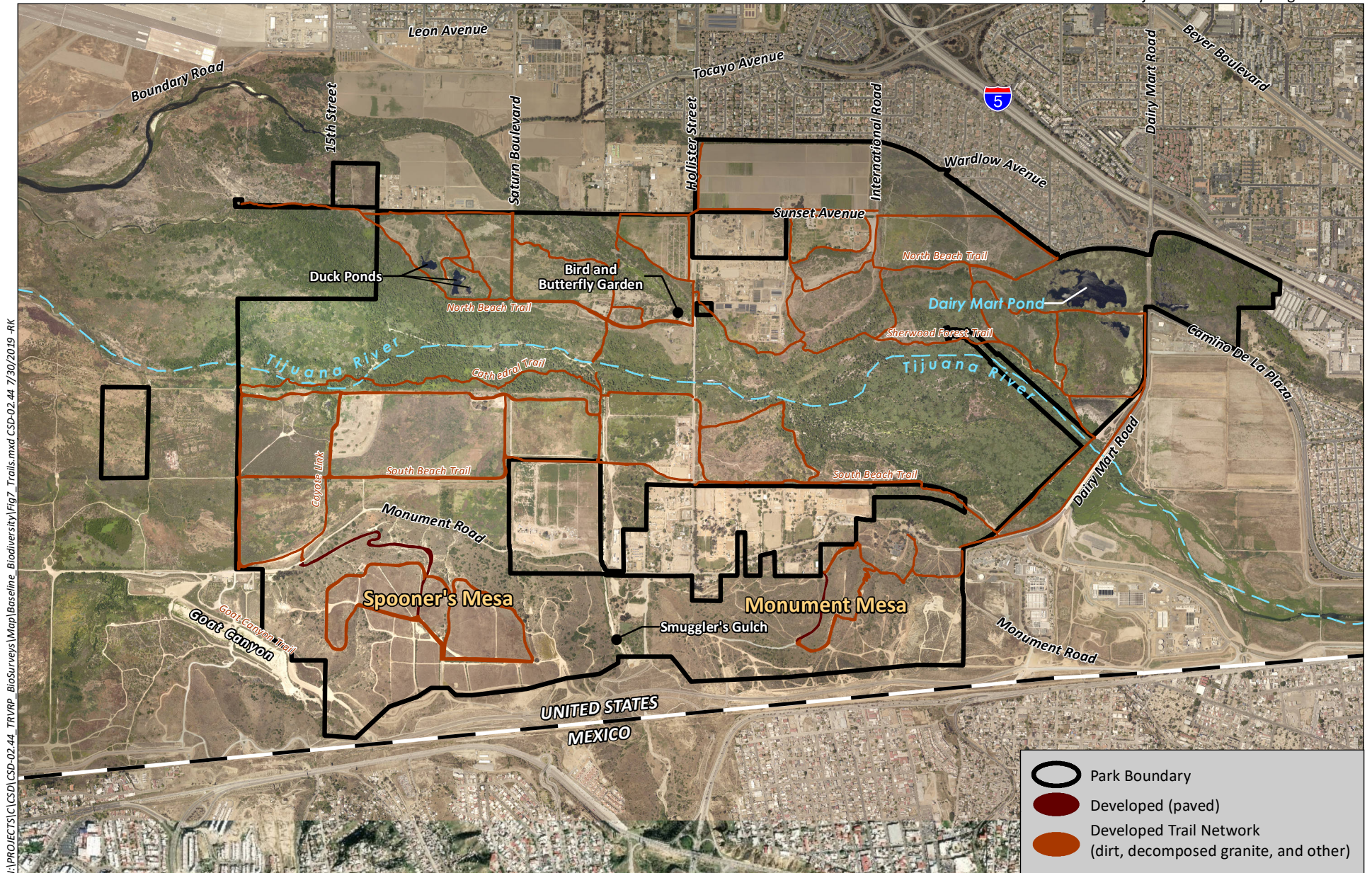
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-  Park Boundary
-  Fire Perimeter

Source: Aerial Photo (SanGIS 2017); Fire History (CAL FIRE 2018)



Fire History
Figure 6



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Source: Aerial Photo (SanGIS 2017)

TRVRP Trails
Figure 7

Table 3 (cont.)
SCHEDULE OF SURVEYS¹

Survey Date	Survey Number	Personnel	Conditions ²
Reptile Trapping Surveys (cont.)			
June 13, 2018	2	Benjamin Rosenbaum	70-75 °F; wind 2-5 mph; 5-10% clouds
June 14, 2018	2	Benjamin Rosenbaum	70-74 °F; wind 2-5 mph; 10-20% clouds
June 15, 2018	2	Benjamin Rosenbaum	68-72 °F; wind 2-5 mph; 45-55% clouds
August 13, 2018	3	Benjamin Rosenbaum Laura Moreton	NR
August 14, 2018	3	Benjamin Rosenbaum	71-75 °F; wind 2-5 mph; 5-5% clouds
August 15, 2018	3	Erica Harris	NR
August 16, 2018	3	Benjamin Rosenbaum	70-76 °F; wind 2-5 mph; 20-30% clouds
August 17, 2018	3	Benjamin Rosenbaum Laura Moreton	70-74 °F; wind 2-5 mph; 0-0% clouds
Avian Point Count Surveys			
April 26, 2018	1 (diurnal)	Erica Harris Desiree Johnson	58-65 °F; wind 0-3 mph; 85-100% clouds
April 26, 2018	1 (nocturnal)	Erica Harris Desiree Johnson	56-61 °F; wind 0-8 mph; 70-100% clouds
June 27, 2018	2 (diurnal)	Erica Harris Dane Van Tamelen	62-64 °F; wind 0-2 mph; 0-100% clouds
June 27, 2018	2 (nocturnal)	Erica Harris Dane Van Tamelen	76-79 °F; wind 0-6 mph; 5-100% clouds
November 14, 2018	3 (diurnal)	Erica Harris Dane Van Tamelen	48-54 °F; wind 0-1 mph; 0-0% clouds
November 15, 2018	3 (nocturnal)	Erica Harris Dane Van Tamelen	52-82 °F; wind 1-7 mph; 40-40% clouds
Bat Surveys			
April 16, 2018	1 (active)	Laura Moreton Dane Van Tamelen	57-60 °F; wind 3-8 mph; 40-65% clouds
May 7-22, 2018	1 (passive)	Laura Moreton Erica Harris Katie Bellon	NR
July 3-17, 2018	2 (passive)	Laura Moreton, Samantha Edgley	NR
August 6, 2018	2 (active)	Laura Moreton, Samantha Edgley	67-80 °F; wind 0-3 mph; 5-0% clouds
Small Mammal Trapping			
April 10, 2018	1	Katie Bellon Kelly Rios ⁴	57-68 °F; wind 1-3 mph; 0-5% clouds
April 11, 2018	1	Katie Bellon Kelly Rios	58-64 °F; wind 2-4 mph; 0-100% clouds
April 12, 2018	1	Katie Bellon Kelly Rios	57-57 °F; wind 1-12 mph; 80-100% clouds
April 13, 2018	1	Katie Bellon Kelly Rios	53-65 °F; wind 3-7 mph; 0-0% clouds
June 19, 2018	2	Katie Bellon Kelly Rios	63-66 °F; wind 2-5 mph; 100-100% clouds

Table 3 (cont.)
SCHEDULE OF SURVEYS¹

Survey Date	Survey Number	Personnel	Conditions ²
Small Mammal Trapping (cont.)			
June 20, 2018	2	Katie Bellon Kelly Rios	63-65 °F; wind 2-5 mph; 100-100% clouds
June 21, 2018	2	Katie Bellon Kelly Rios	62-64 °F; wind 2-4 mph; 100-100% clouds
June 22, 2018	2	Katie Bellon Kelly Rios	63-66 °F; wind 1-3 mph; 70-100% clouds
Wildlife Camera Survey			
March 7-21, 2018	1	Erica Harris Dane Van Tamelen Stephen Zetterberg	NR
May 7-22, 2018	2	Erica Harris, Katie Bellon, Laura Moreton	NR
July 3-17, 2018	3	Laura Moreton Samantha Edgley	NR

¹ Surveys conducted in 2018; does not include incidental observations made in 2019.

² °F = degrees Fahrenheit; mph = miles per hour

³ NR = Not Recorded

⁴ U.S. Fish and Wildlife Service Recovery Permit TE-018909-05

3.1 LITERATURE SEARCH

A thorough review of relevant maps, federal and state databases, and literature pertaining to biological resources known to occur within the TRVRP was conducted prior to HELIX conducting baseline biological surveys. Recent and historical aerial imagery, USGS topographic maps, soils maps (USDA 2018), and other relevant maps of the TRVRP and vicinity were acquired and reviewed to obtain updated information on the natural environmental setting. A query of special status species and habitats databases was also conducted, including the CDFW California Natural Diversity Database (CNDDB; CDFW 2018a), USFWS species records, SanBIOS, California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (California Native Plant Society [CNPS] 2018), and additional information provided by the CDFW (formerly the California Department of Fish and Game [CDFG]; 2018b-c). Any recorded locations of species, habitat types, wetlands, and other resources were mapped and overlain onto aerial imagery using Geographic Information Systems (GIS).

3.2 SURVEY LIMITATIONS

Baseline biological diversity surveys within the TRVRP were conducted between January and November 2018. Additional surveys may be desired at a later date to establish a more thorough inventory of wildlife and plant species. Focused plant surveys were conducted in April and May to correspond with the blooming periods of the special status species with the highest potential to occur within the TRVRP. Not all plant species would have bloomed during the survey period, and it is possible that detection of some special status plant species may not have been possible due to the timing of the focused plant surveys and variable seasonal conditions (e.g., rainfall and temperatures) that influence growth and flowering. Noted animal species were identified by direct observation, vocalizations, or the observance of scat, tracks, or other signs. However, the lists of species identified are not necessarily comprehensive

accounts of all species that utilize the TRVRP, as species that are nocturnal, secretive, or seasonally restricted may not have been observed or detected.

3.3 NOMENCLATURE

Nomenclature used in this report generally comes from the Holland (1986), Oberbauer et al. (2008), and the Manual of California Vegetation (Sawyer et al. 2008); Jepson eFlora (2018) and Baldwin et al. (2012) for plants; North American Butterfly Association (2018) for butterflies; Society for the Study of Amphibians and Reptiles (2018) for reptiles and amphibians; American Ornithological Society (2018) for birds; and Bradley et al. (2014) for mammals. Plant species status is from the CNPS's Rare Plant Inventory (CNPS 2018), CDFW (2018a), County (2010a), and City (1997). Animal species status is from the CDFW (2018b), County (2010a), and City (1997).

3.4 VEGETATION COMMUNITY MAPPING

HELIX biologists Benjamin Rosenbaum, Talaya Rachels, Laura Moreton, and Amy Mattson mapped vegetation communities and land cover types within the TRVRP between January 11 and 14, 2018 (Table 3). Vegetation communities and land cover types were mapped in the field directly onto 200-scale (1 inch = 200 feet) base maps of the TRVRP using 7.5-centimeter resolution color aerial imagery from 2017 (Nearmap 2017) with the aid of Global Positioning System (GPS). Mapping of the site included a 100-foot buffer pursuant to County's biology guidelines (County 2010a and 2010b). Vegetation surveys were conducted throughout the TRVRP, both on foot and using vehicles where access was available. Vegetation community classification was based on two separate systems: Holland (1986) as modified by Oberbauer et al. (2008); and the Vegetation Classification Manual (VCM) for Western San Diego County (SANDAG 2011a and b). The field mapping was conducted according to the VCM and then cross-walked to the Holland/Oberbauer classification system. Following the completion of fieldwork, vegetation polygons were scanned and digitized using ArcGIS, and a GIS coverage was created. Acreage calculations of vegetation communities and land cover types were determined using ArcGIS. Vegetation community classifications used in this report follow the VCM.

3.5 FLORISTIC SURVEYS

Plant identifications were made in the field or in the lab through comparison with voucher specimens or photographs. All plant species observed during the 2018 biological surveys within the TRVRP are included in Appendix A.

3.5.1 Rare Plant Surveys

Ms. Rachels and Ms. Moreton surveyed the TRVRP for special status plant species during the spring of 2018 (Table 3). Special status plant species include species that are: listed as threatened or endangered, proposed for listing, or are candidate species by the USFWS or the CDFW; those with a California Rare Plant Rank (CRPR) 1 through 4 as designated by the CNPS; those that are listed as sensitive by the County (2010a); and those covered by the City MSCP Subarea Plan (City 1997). The spring rare plant survey consisted of two survey periods to increase the likelihood of detection for annual special status plant species. The survey periods were determined based on the recorded blooming periods of special status plant species known to occur within the TRVRP and surrounding area. The first survey period was conducted in April 2018 to detect early-blooming spring annual species. The second survey period was

conducted in May 2018, which corresponded with the blooming period of the majority of the special status plant species.

Field survey methods conformed to County Biological Survey Guidelines (County 2010b); CNPS Botanical Survey Guidelines (CNPS 2001); Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities (CDFW 2000); and Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants (U.S. Fish and Wildlife Service [USFWS] 1996). All plant species encountered during the field surveys were identified to subspecies or variety, if applicable, to determine sensitivity status. The surveys were conducted on foot and were completed by walking meandering transects in areas of suitable habitat for special status plant species with potential to occur in the TRVRP. Special status plant species encountered were mapped using a hand-held GPS unit and/or on an aerial photograph. Biologists also looked for special status plant species opportunistically during other surveys and recorded their numbers and locations when encountered.

3.5.2 Invasive Non-native Plant Species Mapping

HELIX biologists Mr. Rosenbaum, Ms. Rachels, Ms. Moreton, and Ms. Mattson mapped the locations of invasive non-native plant species encountered during vegetation mapping surveys in January 2018, during rare plant surveys in April and May 2018, and as observed during subsequent biodiversity surveys (Table 3). Invasive plant species include those rated as moderate to highly invasive by the California Invasive Plant Council (Cal-IPC; 2018). The focus of the mapping effort was on invasive species with the greatest potential to invade native habitats (e.g., giant reed [*Arundo donax*], black mustard [*Brassica nigra*], tree tobacco [*Nicotiana glauca*], etc.), or species that may not be rated as moderate or high, but are considered to have a localized potential for habitat invasion (e.g., rose natal grass [*Melinis repens* ssp. *repens*]). Ubiquitous species scattered across the TRVRP that pose limited potential for invasion into established habitats and that would be impractical to control on an individual basis (e.g., brome grasses [*Bromus* spp.] or mustards [family Brassicaceae]) were not mapped as individual occurrences; however, their presence was noted as components of non-native grasslands mapped in the TRVRP.

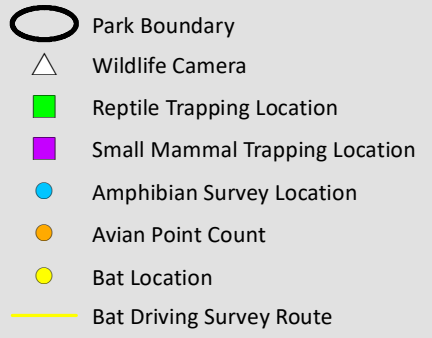
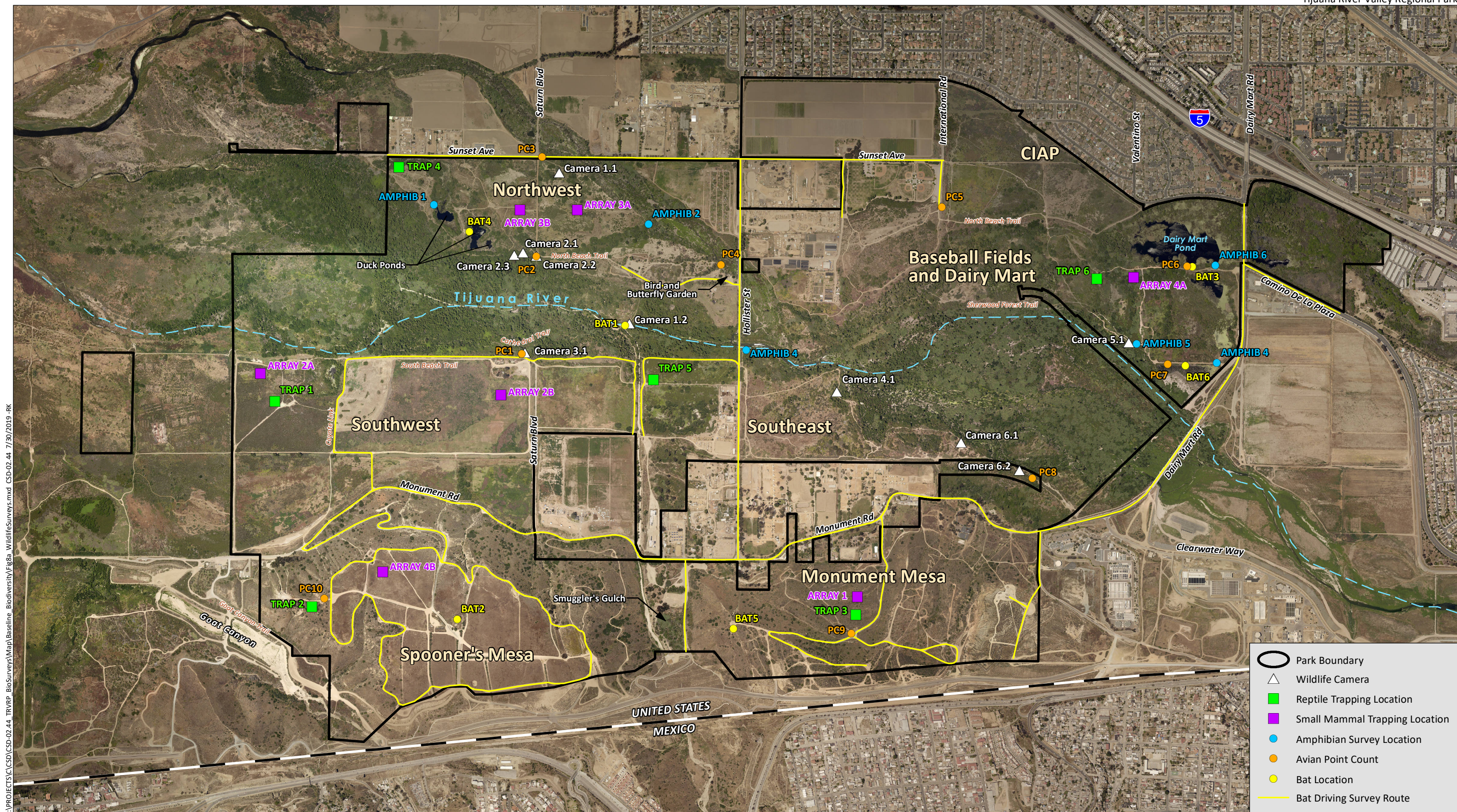
Invasive species locations were mapped using a hand-held GPS unit and/or hand mapped on an aerial photograph. All collected data were combined into a GIS data layer with points and polygons representing species locations. Biologists also looked for invasive plant species opportunistically during other surveys and recorded their locations when encountered.

3.6 WILDLIFE SURVEYS

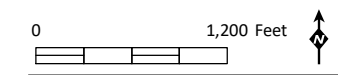
Wildlife species were identified by direct observation (visually and by photograph), vocalizations, or the observance of scat, tracks, or other signs and recorded. Binoculars were used to aid in the identification of observed wildlife. A list of animal species observed or otherwise detected within the TRVRP during the baseline biological surveys is included in Appendix B. Surveys occurred within representative habitats throughout the TRVRP and specific survey locations were recorded with GPS (Figures 8a-8e).

3.6.1 Invertebrates

One general butterfly survey was performed from April 23 to April 25, 2018, by HELIX biologists Hannah Lo, Ms. Mattson, and Ms. Moreton. The surveys were conducted throughout the TRVRP at end of April



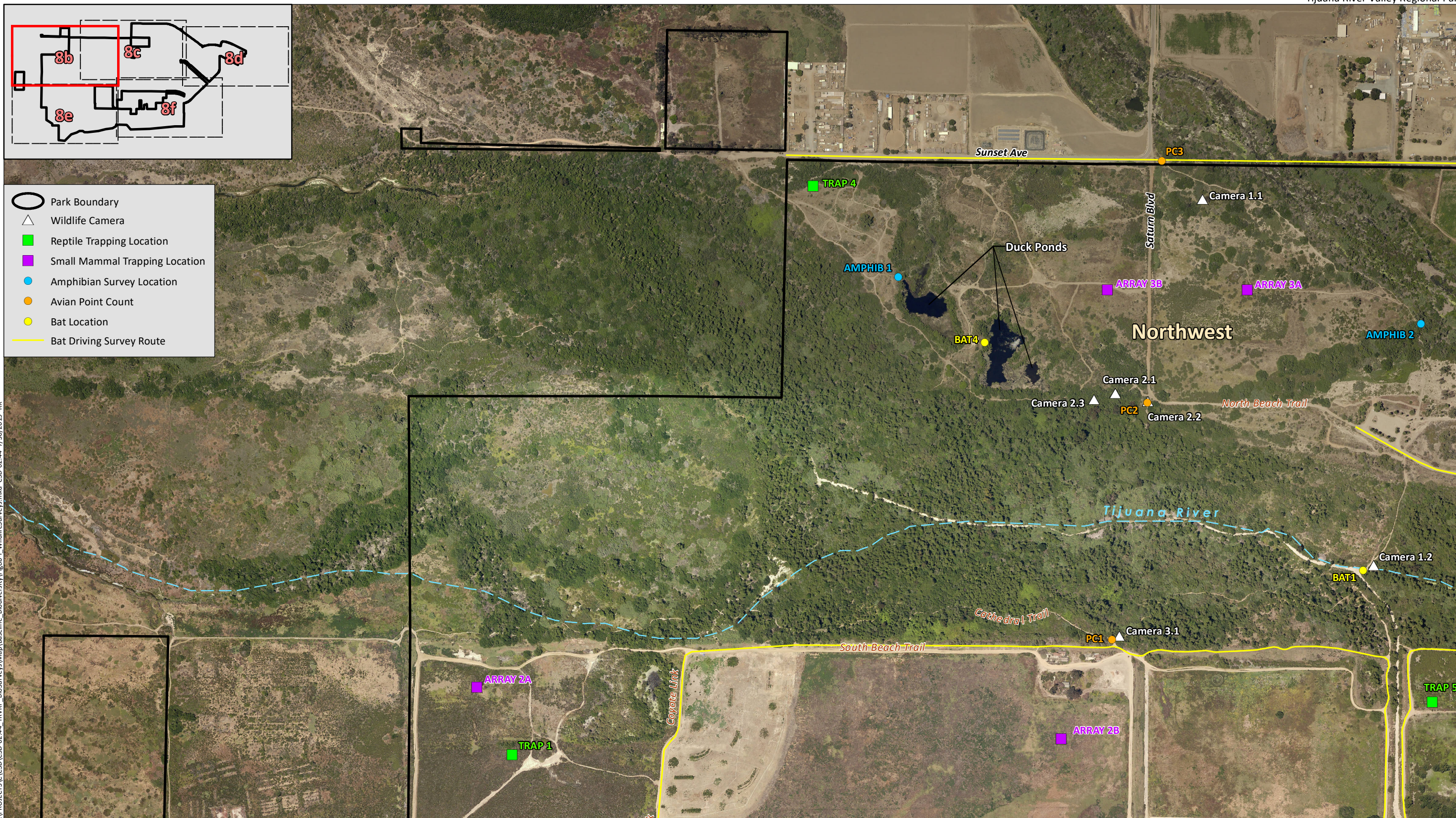
Aerial Photo: SanGIS 2017



Biological Inventory Locations

Figure 8a

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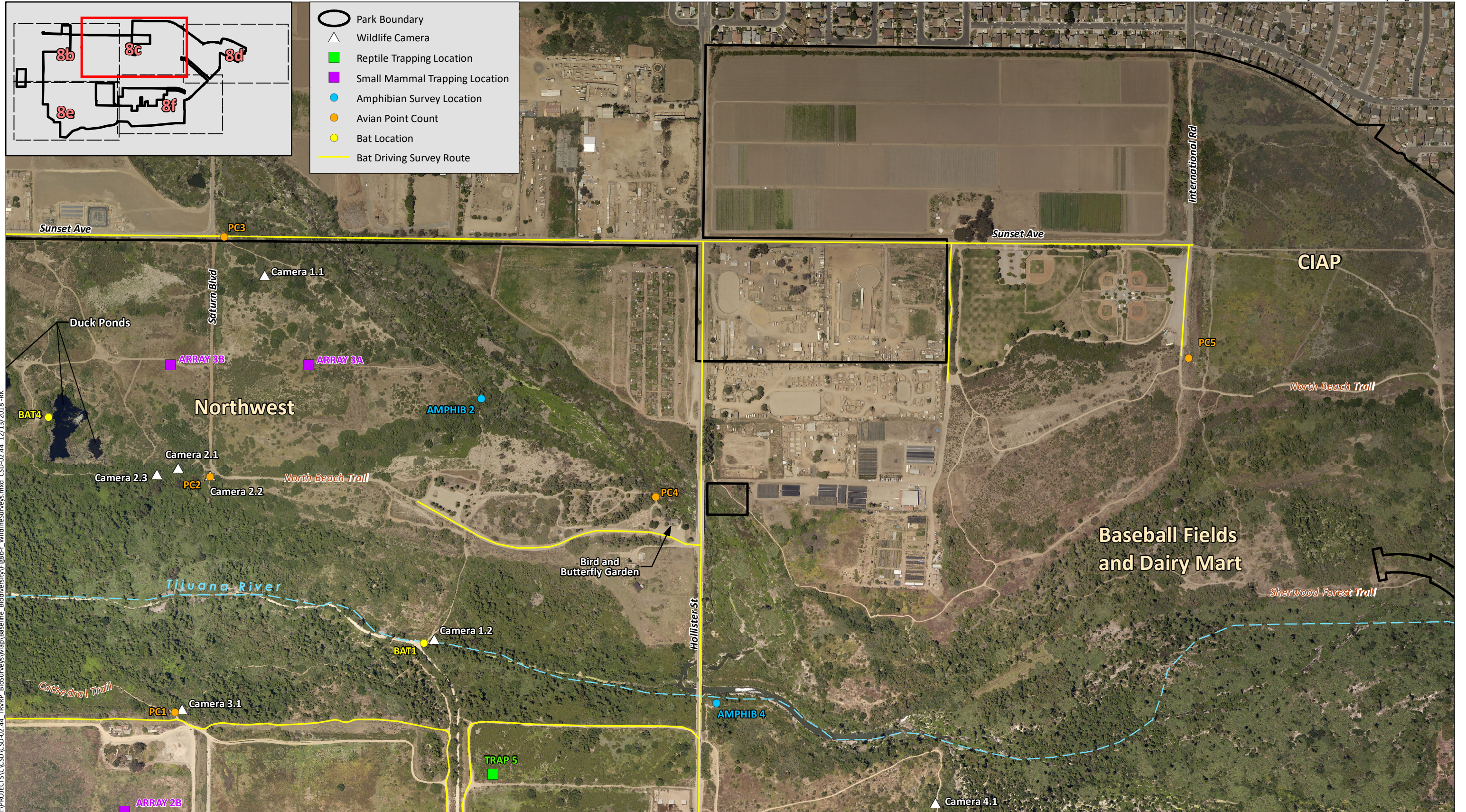
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Aerial Photo: SanGIS 2017



Biological Inventory Locations

Figure 8b



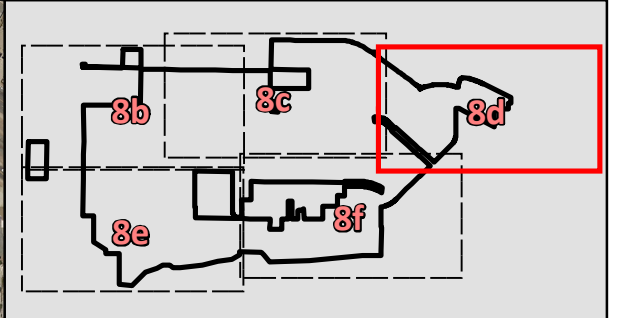
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Aerial Photo: SanGIS 2017



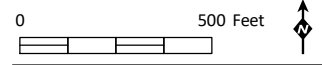
Biological Inventory Locations

Figure 8c



- Park Boundary
- Wildlife Camera
- Reptile Trapping Location
- Small Mammal Trapping Location
- Amphibian Survey Location
- Avian Point Count
- Bat Location
- Bat Driving Survey Route

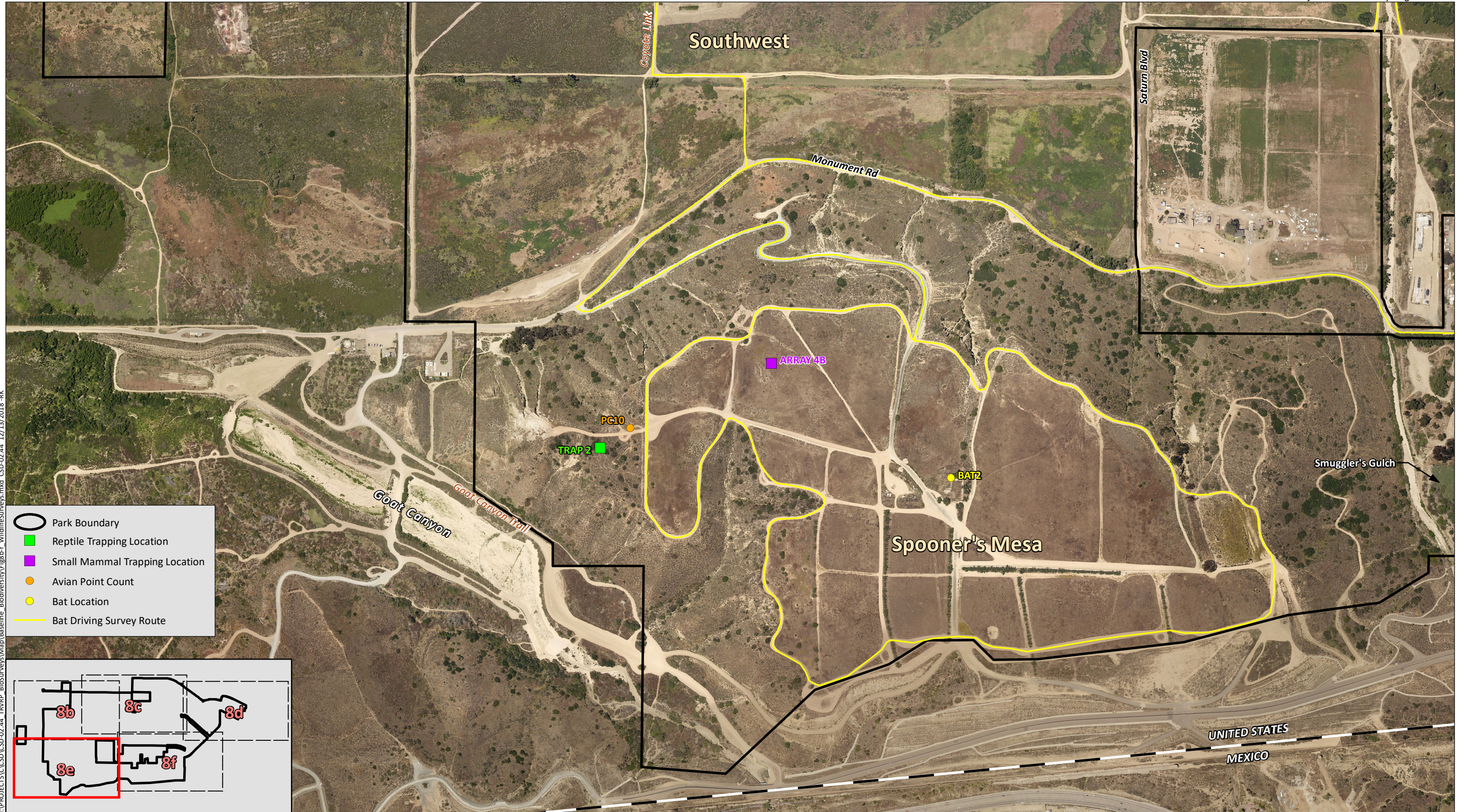
Aerial Photo: SanGIS 2017



Biological Inventory Locations

Figure 8d

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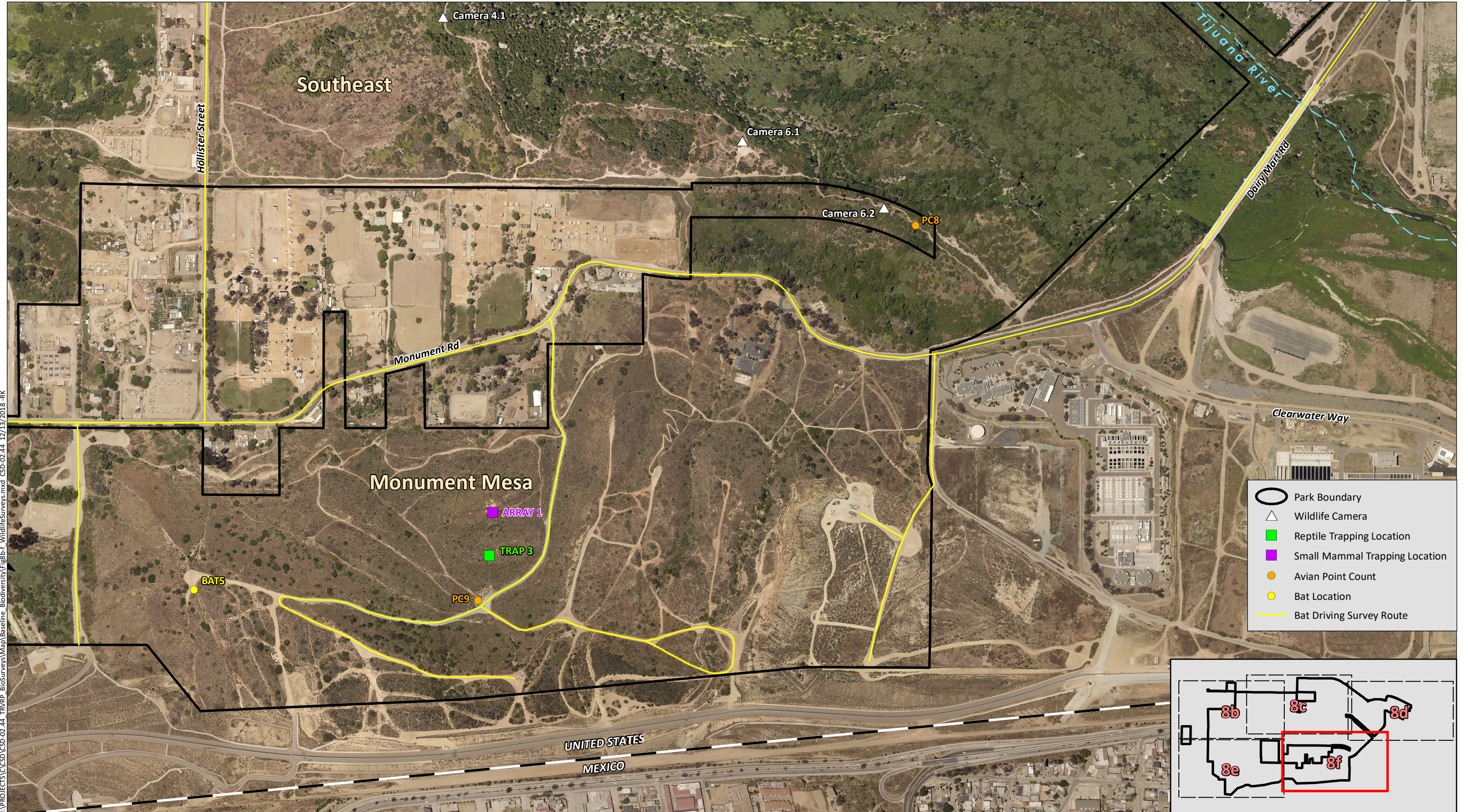
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Aerial Photo: SanGIS 2017



Biological Inventory Locations

Figure 8e



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Aerial Photo: SanGIS 2017



Biological Inventory Locations

Figure 8f

to census the height of flight season based on blooming periods of most local plant species. A handheld Kestrel meter was used to record environmental conditions at the beginning and end of each survey.

Surveys followed the survey conditions required for Quino checkerspot butterfly (*Euphydryas editha quino*) surveys (USFWS 2014). Surveys were not conducted during rain, high winds greater than 15 mph, or when temperatures were less than 60°F on a clear day or less than 70°F on days with 50 percent cloud cover or more. Surveys followed a Pollard style methodology where the biologist walked a pace that was slow and steady along established trails and recorded all butterflies encountered (Taron and Ries 2015). Surveys focused on upland habitat, high ridges, and the edges of riparian corridors. Potential nectar sources were also recorded. Although the surveys focused on butterflies, other invertebrates observed incidentally were identified down to the smallest identifiable taxonomic group. Incidental butterfly observations and other invertebrate species during other biological surveys were also recorded. Representative photographs were taken of the butterflies observed when possible.

3.6.2 Herpetofauna

Aquatic and terrestrial herpetofauna surveys were conducted to census both amphibian and reptile species that may utilize different resources and habitats present within the TRVRP. Aquatic surveys were focused primarily on passive methods including visual and auditory detection of species. Terrestrial surveys consisted of active trapping of species utilizing drift fence with funnel traps. Aquatic and terrestrial surveys were conducted by HELIX biologists Mr. Rosenbaum, Dane van Tamelen, Ms. Moreton, and Erica Harris in the months of April, June, and August 2018 (Table 3). The surveys were timed such that they occurred within five days surrounding a new moon phase to capture peak amphibian and reptile activity. All amphibian survey locations and drift fences with funnel trap locations were digitally recorded with a hand-held GPS unit (Figures 8a-8f).

3.6.2.1 Aquatic Surveys

Aquatic herpetofauna surveys were performed at five locations within the TRVRP (Figures 8a-8e). An attempt was made to establish the survey locations across different habitat types to capture species diversity and distribution within the area. Aquatic surveys consisted of diurnal and nocturnal efforts. Diurnal surveys focused on the identification of suitable amphibian habitat (i.e., aquatic areas that are suitable to support species presence and those that may provide breeding opportunities) and visual detection of individuals, egg masses, and tadpoles. Nocturnal surveys included aural detection of vocalizing individuals and visual detection with the aid of flashlights. A passive survey period was initially conducted when biologists approached the survey location, during which surveyors listened for and recorded any vocalizing individuals. Following the passive survey period, biologists scanned the banks, shoreline, and open water for potential wildlife looking for eye shine, signs of water disturbance, and movement to locate and identify species within the area. Additionally, hand capture and dip netting were utilized, as necessary, to identify individuals to the species level.

3.6.2.2 Terrestrial Surveys

Drift fences with funnel traps were established in six locations throughout the TRVRP to survey for terrestrial herpetofauna (Figures 8a-8f). Trap locations were strategically placed to survey a variety of habitats within representative locations of the TRVRP. The terrestrial herpetofauna survey methods and trap design generally follow those described in the *Herpetological Monitoring Using a Pitfall Trapping Design in Southern California* (U.S. Geological Survey 2008). The drift fences consisted of 100-foot

segments of black silt fence secured upright into the ground with wooden stakes. The funnel traps were constructed with wood segments and mesh hardware cloth to create a box with a lid. Two funnels per box were constructed with mesh hardware cloth that were cut and rolled into cylindrical funnel shapes. The small end of each funnel was cut to have an opening of approximately two inches in diameter, which allowed animals, including large snakes, to enter the cylinder. The two funnel ends were fit into the traps with the small ends pointing inwards. All sharp points and edges were trimmed off during the cutting process to prevent injury to captured animals and field personnel. The funnel traps were positioned with the seams of both the body and end cones facing upwards to prevent animals from becoming injured on any rough edges of the hardware cloth. The funnel traps were covered with vegetation to avoid exposure to sunlight and precipitation. Small rocks were also placed on top of the closed container lids to prevent them from being opened by animals or wind. The funnel traps were set up and then sampled for four consecutive days and then removed from the site (for example, set up on Monday, sampled daily Tuesday through Friday, and removed from the site on Friday). The trapping events were timed such that implementation occurred within five days surrounding a new moon phase.

3.6.3 Birds

Diurnal and nocturnal point count surveys were conducted during the spring, summer, and fall seasons to census migratory, breeding, and non-breeding conditions of avian species within the TRVRP. Three point count survey events were completed by HELIX biologists Ms. Harris, Desiree Johnson, and Mr. van Tamelen in the months of April (migratory), June (breeding), and November (non-breeding/wintering; Table 3). Ten point count locations were established a minimum of 250 meters apart across a variety of habitat types (e.g., open water, riparian, coastal sage scrub, non-native grassland, and disturbed habitat) throughout the TRVRP (Figures 8a-8f). All point count locations were digitally recorded with a hand-held GPS unit.

The point counts consisted of a 10-minute survey period conducted at each count location. The diurnal surveys were conducted in the early morning hours directly following sunrise and completed no later than 10:30 a.m. The nocturnal surveys were conducted during the nighttime hours commencing no earlier than 30 minutes following sunset. Surveys did not occur during inclement weather conditions (e.g., high winds, rain, and dense fog) that would have reduced detectability. The order in which the count locations were surveyed was varied during each survey visit. The point counts generally followed methods described in the *Handbook of Field Methods for Monitoring Landbirds* (Ralph et al. 1993) and detailed below.

The point counts were conducted by a two-person survey team, consisting of one observer and one recorder, to aid in maximizing detections. The survey team approached each point location cautiously to minimize disturbance to any birds in the area. Surveyors waited at least one minute after arrival before starting the point count survey to allow for birds to adjust to their presence and record field conditions. Each point count survey lasted for a 10-minute period during which the species, abundance, behavior, and distance of all birds detected, both visually and aurally, were recorded on standardized data sheets. The distance of the individual(s) detected during the survey period was estimated up to 50 meters. The distance of individuals over 50 meters was generalized as greater than 50 meters since the accuracy of estimation diminishes as the distance from the observer increases. An attempt was made to count individuals only once to minimize double counting the same individual. Incidental observations of avian species between point locations were also recorded. No differentiation between sex or adult and juvenile birds was recorded as part of the surveys. Individuals observed during surveys that were not able to be identified to a species level were instead identified to the closest taxonomic group.

No broadcasting of recordings or other methods for soliciting individuals were implemented during the diurnal surveys. However, recorded vocalizations of three common non-listed nocturnal species (great horned owl [*Bubo virginianus*], barn owl [*Tyto alba*], and common poorwill [*Phalaenoptilus nuttallii*]) were broadcasted during the nocturnal surveys in June and November to aid in the detection of these species. The same methods described above were implemented for the nocturnal surveys with the following modifications. The first minute of the 10-minute survey period consisted of a passive observation during which surveyors visually searched for birds and listened for vocalizations. In minute two, a recorded vocalization of one of the above species was broadcasted over a hand-held bluetooth speaker for 30 seconds followed by another passive observation period. In minute five, the third species was played, and again in minute eight. The recordings played were selected from iBird Pro, a digital application available on smart phones and tablets.

3.6.4 Mammals

Baseline biological diversity surveys for mammals consisted of several separate methods to inventory for bat species, small mammal, and medium to large mammal species. The following sections detail these survey methods.

3.6.4.1 Bat Surveys

Passive and active bat surveys were conducted by HELIX biologists Ms. Moreton, Mr. van Tamelen, Ms. Harris, and Samantha Edgley between May and July 2018 (Table 3). Prior to initiation of these surveys, a site reconnaissance visit was conducted to determine locations with high potential for roosting and/or foraging bats (e.g., abandoned building, water bodies, rock outcrops, etc.). The results of the reconnaissance informed the locations of the passive survey effort.

Passive Surveys

Passive acoustical monitoring for bats was conducted in six locations throughout the TRVRP (Figures 8a-8f). Three AnaBat Express detectors were deployed in three locations (Locations 1-3) in May 2018 (spring), and then in three new locations (Locations 4-6) in July 2018 (summer). Detectors were moved to maximize the detection of all bat species potentially occurring in the TRVRP. Locations were selected based on proximity to water, and an effort was made to survey multiple vegetation communities that occur within the TRVRP. Detectors were deployed for two weeks at each of the six locations. Location 1 was within the Tijuana River channel, Location 2 was on Spooner's Mesa, Location 3 was at Dairy Mary Pond, Location 4 was at the Duck Ponds, Location 5 was on Monument Mesa, and Location 6 was along Tijuana River to the south of Dairy Mart Pond (Figures 8a-8f).

Active Surveys

Two active bat surveys were conducted during April 2018 (spring) and August 2018 (summer). The surveys consisted of slowly driving along an established route that adequately covered the entire TRVRP as shown on Figures 8a-8f. Two biologists conducted the survey: one biologist operated the vehicle while the second biologist held a microphone attached to an AnaBat Express detector outside the passenger window. Driving surveys were conducted from approximately one hour before sunset to approximately two hours after sunset. Vehicular speed was kept below 5 miles per hour (mph) where safe to do so, and the vehicle was stopped in several locations along the route for approximately 10 minutes where there was high potential for bat activity. The survey route was driven in different

directions during each survey (i.e., the survey started at the west end of the TRVRP in April, whereas it started at the east end of the TRVRP in August) to maximize the detection of different bat species.

Analog software was used to process the AnaBat Express recordings and aid in species identification. All bat calls were analyzed and compared with recordings from a library of voucher calls (Corbin and Livengood 2018) of species with potential to occur in the TRVRP. The number of species detected was determined for each passive detector survey location and for each driving survey.

3.6.4.2 Small Mammal Trapping

Small mammals were inventoried with the use of live trapping techniques that generally followed procedures described in the *Field Methods and Techniques for Monitoring Mammals* (Hoffman et al. 2010). Four small mammal trapping arrays (i.e., Array-1, Array-2, Array-3, and Array 4) were established within various habitats and locations within the TRVRP (Figures 8a-8f). HELIX biologists Katie Bellon and Kelly Rios conducted the small mammal trapping surveys; Ms. Rios is permitted by the USFWS (TE 018909-05) to handle special status species, including San Bernardino Kangaroo rat (*Dipodomys merriami parvus*), which has potential to occur within the TRVRP. Two rounds of trapping sessions were conducted in the spring (April 2018) and summer (June 2018) seasons to coincide with the breeding season and peak small mammal activity (Table 3). Each trapping session spanned four trap-days (one week) and was timed to occur within five days surrounding a new moon phase. No daytime trapping occurred.

Each trapping array extended approximately 225 meters and covered approximately 1.1 acres. Each array consisted of two meandering, parallel trap-lines (approximately 20-meter spacing) with 15 traps along each line (approximately 15-meter spacing), for a total of 30 traps per array. Traps were sign-set (e.g., set at burrow entrances, runs, and dust baths) to the extent feasible to capture the greatest diversity possible. Traps consisted of Sherman live traps (model LFATDG). Traps were baited with peanut butter and bird seed within two hours of sunset each evening and were checked the following morning near dawn (prior to 10:00 a.m.), or before daytime temperatures reached levels that could result in animal mortality. Traps were set in locations that provided the greatest chance for diversified data collection (e.g., interface between vegetation community types, areas of microhabitat changes, etc.). Trapping Arrays -2, -3, and -4 were relocated during the second trapping session in an attempt for greater trapping success. On Figures 8a-8f, trapping arrays during the first session are identified with an "A", while second session arrays are identified with a "B." All array locations were digitally recorded in the field with a hand-held GPS unit and marked with flagging tape during each trapping session.

All captured animals were processed (i.e., data collected included recapture status and location captured), identified to species, and marked with a semi-permanent marker on their foot to determine if it was recaptured during subsequent trapping events. No ear notching, toe clipping, fur cutting, microchipping, or any other means of semi-permanent/permanent marking was performed as part of the trapping surveys. All captured animals were released within the immediate area following data collection. If the animal did not immediately leave the area, they were placed under cover to reduce the risk of predation. All traps were closed during the day so that no additional animals would be captured. Representative photos were taken of captured mammals.

3.6.4.3 Medium to Large Mammals

Motion-activated cameras were deployed within the TRVRP to document the presence of wildlife, specifically medium and large mammals. Six Brown Spec Ops Extreme cameras were installed throughout the TRVRP in areas where signs of movement and use, such as tracks and scat, were observed (Figures 8a-8f). The majority of the cameras were placed along dirt roads as these represent high-use areas that lead to important resources, such as canyons, creeks, or ponds, and minimized potential disturbance to native vegetation in the area. The locations of some of the cameras were altered between survey periods to maximize detections of mammal species potentially present within the TRVRP. Specifically, Cameras 1 and 6 were moved between at the first and second survey periods and have two locations shown (i.e., Camera 1.1 and Camera 1.2). Camera 2 was moved between each of three survey periods and has three locations shown (i.e., Camera 2.1, 2.2., and 2.3). Cameras 3, 4, and 5 were deployed at the same location during three survey periods and have only one location shown (i.e., Camera 3.1). The camera stations were digitally recorded in the field with a hand-held GPS unit.

Three rounds of camera surveys were conducted during spring and summer seasons (March, May, and July) to coincide with the breeding season and peak mammal activity (Table 3). The cameras were deployed for two weeks during each survey period and were timed to be active during a new moon phase. The ground in front of the camera was baited with a scent lure (Carman's Superior Animal Lure) and installed at each camera location to aid in the detection and identification of wildlife species.

Following the surveys, all images were downloaded and reviewed by HELIX biologists Ms. Harris, Mr. van Tamelen, Ms. Edgley, Krista Catelani, and Mr. Rosenbaum. All photographs were analyzed for the presence of wildlife species and all species recorded were identified to the closest taxonomic group possible.

4.0 BASELINE SURVEY RESULTS

This section summarizes habitat types present within the TRVRP, and plant and wildlife species observed or otherwise detected during biological surveys. Special status plant and animal species identified in the TRVRP as part of the baseline surveys are presented, as well as those with high potential to occur. Completed lists of all plant and animal species detected within the TRVRP are included as Appendices A and B, respectively. Special status plant and animal species that were not detected during the baseline surveys but have potential to occur are included as Appendices C and D, respectively. An explanation of special status codes is included in Appendix E. Representative photographs are included as Appendix F.

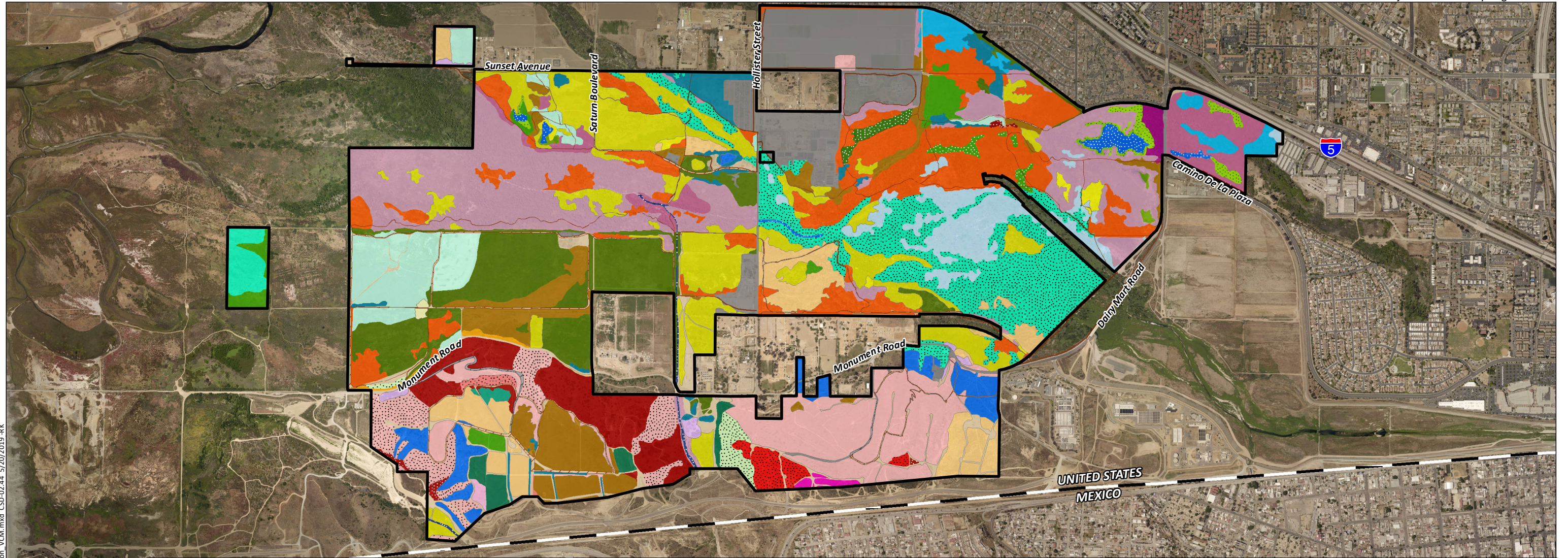
4.1 VEGETATION COMMUNITIES/HABITATS

Vegetation communities present within the TRVRP were mapped based on the VCM and cross-walked to the Holland/Oberbauer classification system. There are thirty-four plant alliances, associations, or semi-natural stands present within the TRVRP (Table 4). Figures 9a-9f depict the VCM code distribution of vegetation communities and land covers within the TRVRP; Figures 10a-10f show the Holland/Oberbauer code distribution. Descriptions of the vegetation communities follow the VCM code (SANDAG 2011a). For communities not described by the VCM, of which there are six, the communities were described using the Holland/Oberbauer code distribution. The 2018 vegetation mapping determined the TRVRP generally comprises approximately 22 percent riparian forests and woodlands, 20 percent riparian shrublands, 5 percent hydrophytic herbaceous vegetation, less than one percent

upland forests and woodlands, less than one percent sclerophyllous evergreen shrubs, 25 percent soft-leaved drought-deciduous shrublands, 15 percent upland herbaceous vegetation, and 12 percent unvegetated habitat.

**Table 4
VEGETATION COMMUNITIES AND LAND COVERS**

Vegetation Classification Manual (VCM) Code	VCM Alliance/ Association	VCM Common Name	Holland Code	Holland Classification	Acres on Site
Riparian Forests and Woodlands					
3.5.1	<i>Populus fremontii/ Baccharis salicifolia</i> Association	Fremont Cottonwood/Mule Fat Association	61330	Southern Cottonwood-willow Riparian Forest	5.25
3.8.1	<i>Salix gooddingii</i> Association	Goodding's Black Willow Association	62500	Southern Riparian woodland	219.49
3.9.1	<i>Salix laevigata</i> Association	Red Willow Association	62500	Southern Riparian woodland	42.32
3.12	<i>Tamarix</i> spp. Semi-Natural Stands	Tamarisk Semi-Natural Stands	65000	Non-native Riparian	27.51
N/A	Not Available	Not Available	65000	Non-native Riparian	101.41
Riparian Forests and Woodlands Total					395.98
Riparian Shrublands					
3.10.1	<i>Salix lasiolepis</i> Association	Arroyo Willow Association	63320	Southern Willow Scrub	167.79
4.11.1	<i>Baccharis salicifolia</i> Association	Mule Fat Association	63310	Mule Fat Scrub	177.94
4.36.1	<i>Pluchea sericea</i> Association	Arrow Weed Association	63320	Southern Willow Scrub	1.14
N/A	<i>Salix exigua</i> Alliance	Sandbar Willow Alliance	63320	Southern Willow Scrub	6.27
Riparian Shrublands Total					353.14
Hydrophytic Herbaceous Vegetation					
5.4	<i>Arundo donax</i> Semi-Natural Stands	Giant Reed Semi-Natural Stands	65110	Arundo-dominated Riparian	53.47
5.14.1	<i>Distichlis spicata</i> -Annual Grasses Association	Salt Grass-Annual Grasses Association	42120	Valley Sacaton Grassland	4.97
5.25	Naturalized Warm-Temperate Riparian and Wetland Semi-Natural Stands	Naturalized Warm-Temperate Riparian and Wetland Semi-Natural Stands	65000	Non-native Riparian	19.97
5.31.1	<i>Schoenoplectus californicus</i> Association	Bulrush Association	52410	Coastal and Valley Freshwater Marsh	10.37
5.35	<i>Typha (angustifolia/ domingensis/latifolia)</i> Alliance	Cattail Alliance	52410	Coastal and Valley Freshwater Marsh	1.99
Hydrophytic Herbaceous Vegetation Total					90.77



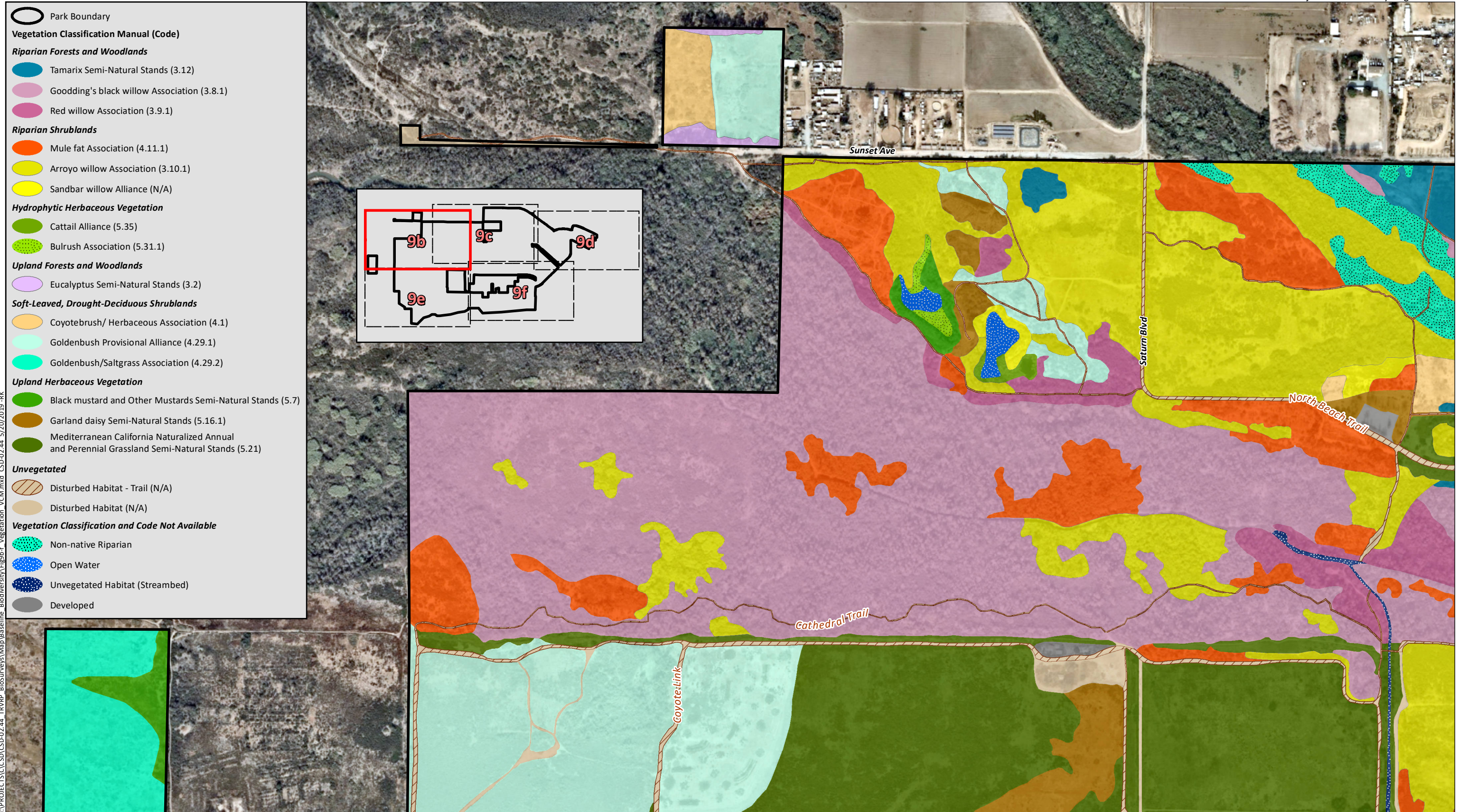
<p>Park Boundary</p> <p>Riparian Forests and Woodlands</p> <ul style="list-style-type: none"> Tamarix Semi-Natural Stands (3.12) Goodding's black willow Association (3.8.1) Red willow Association (3.9.1) Fremont cottonwood/mule fat Association (3.5.1) <p>Riparian Shrublands</p> <ul style="list-style-type: none"> Mule fat Association (4.11.1) Arroyo willow Association (3.10.1) Sandbar willow Alliance (N/A) Arrowweed Association (4.36.1) <p>Hydrophytic Herbaceous Vegetation</p> <ul style="list-style-type: none"> Cattail Alliance (5.35) Salt grass-Annual Grasses Association (5.14.1) 	<ul style="list-style-type: none"> Naturalized Warm-Temperate Riparian and Wetland Semi-Natural Stands (5.25) Giant Reed Semi-Natural Stands (5.4) Bulrush Association (5.31.1) <p>Upland Forests and Woodlands</p> <ul style="list-style-type: none"> Eucalyptus Semi-Natural Stands (3.2) <p>Sclerophyllous, Evergreen Shrubs</p> <ul style="list-style-type: none"> Wart-stemmed ceanothus Association (4.19.1) <p>Soft-Leaved, Drought-Deciduous Shrublands</p> <ul style="list-style-type: none"> California encelia-California sagebrush Association (4.22.1) Broom baccharis Association (4.12.1) Coyotebrush/ Herbaceous Association (4.1) Goldenbush Provisional Alliance (4.29.1) Deerweed Association (4.32.1) Goldenbush/Saltgrass Association (4.29.2) 	<ul style="list-style-type: none"> Laurel sumac-Deerweed Association (4.35.1) California sagebrush-buckwheat-laurel sumac Association (4.7.1) California buckwheat Association (4.23.1) San Diego viguiera-California sagebrush-California buckwheat Association (4.13.1) White sage-California sagebrush Association (4.43.2) California sagebrush-buckwheat-beavertail cactus/lady fingers Association (4.7.2) California sagebrush-black sage Association (4.8) Lemonadeberry Association (4.42.1) <p>Upland Herbaceous Vegetation</p> <ul style="list-style-type: none"> Black mustard Semi-Natural Type (5.7.1) Black mustard and Other Mustards Semi-Natural Stands (5.7) Fasciated tarplant Association (5.13.1) Garland daisy Semi-Natural Stands (5.16.1) Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands (5.21) 	<p>Unvegetated</p> <ul style="list-style-type: none"> Disturbed Habitat - Trail (N/A) Disturbed Habitat (N/A) <p>Vegetation Classification and Code Not Available</p> <ul style="list-style-type: none"> Non-native Grassland Non-native Riparian Open Water Unvegetated Habitat (Streambed) Developed (Trail) Developed
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Aerial Photo: SanGIS 2017



Vegetation Communities/Habitats (Vegetation Classification Manual)

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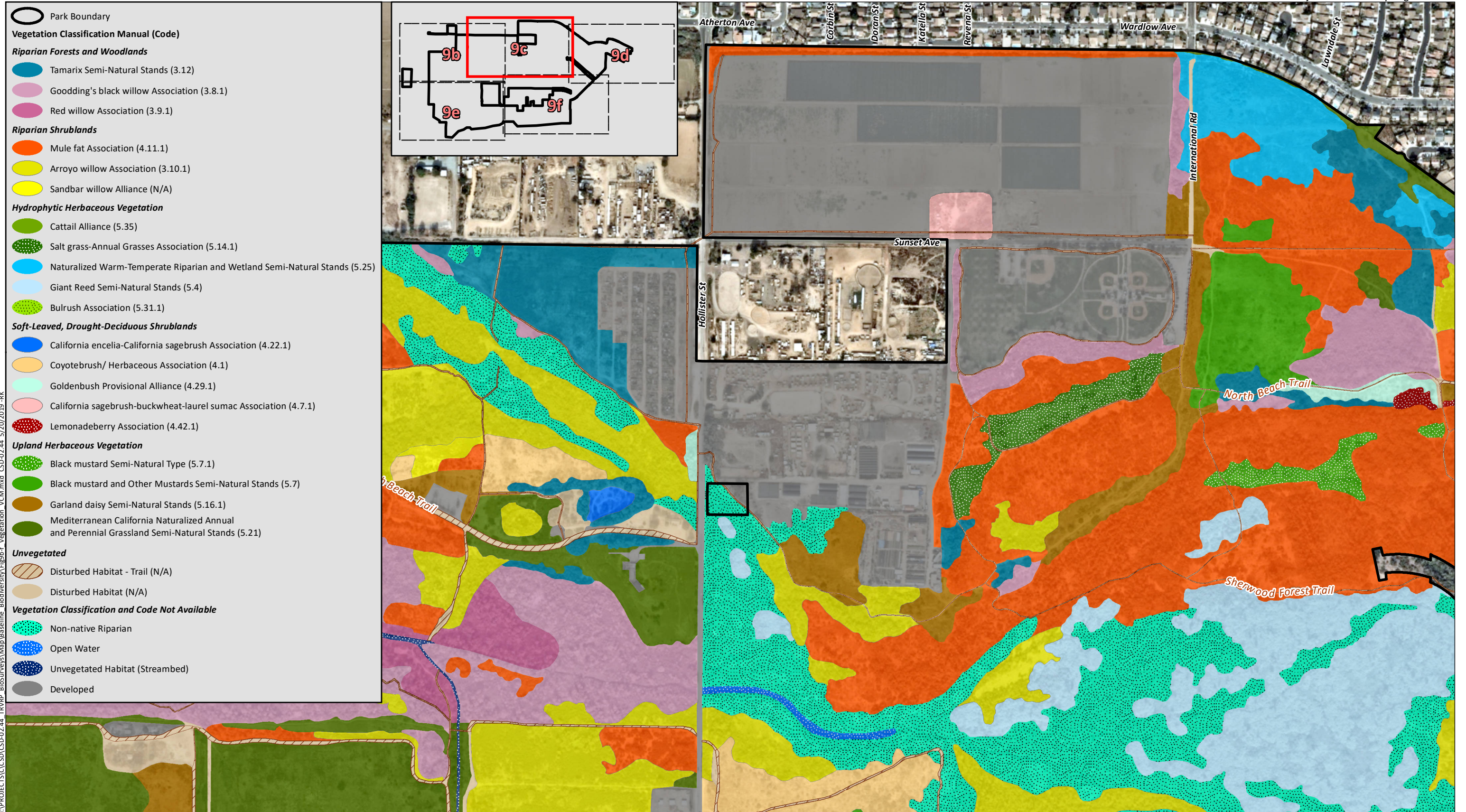


Aerial Photo: Nearmap 2017



Vegetation Communities/Habitats (Vegetation Classification Manual)

Figure 9b



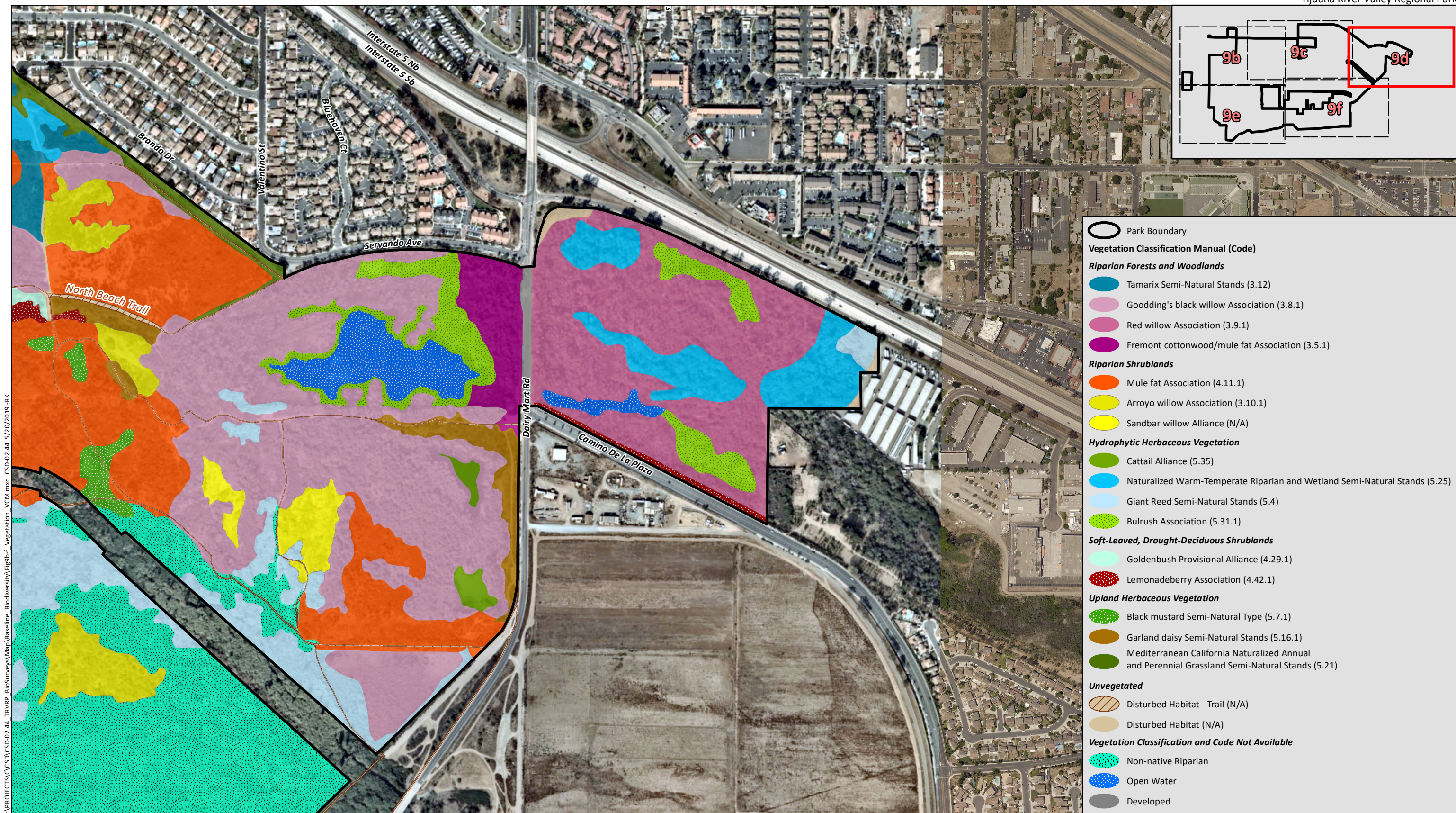
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Aerial Photo: Nearmap 2017



Vegetation Communities/Habitats (Vegetation Classification Manual)

Figure 9c



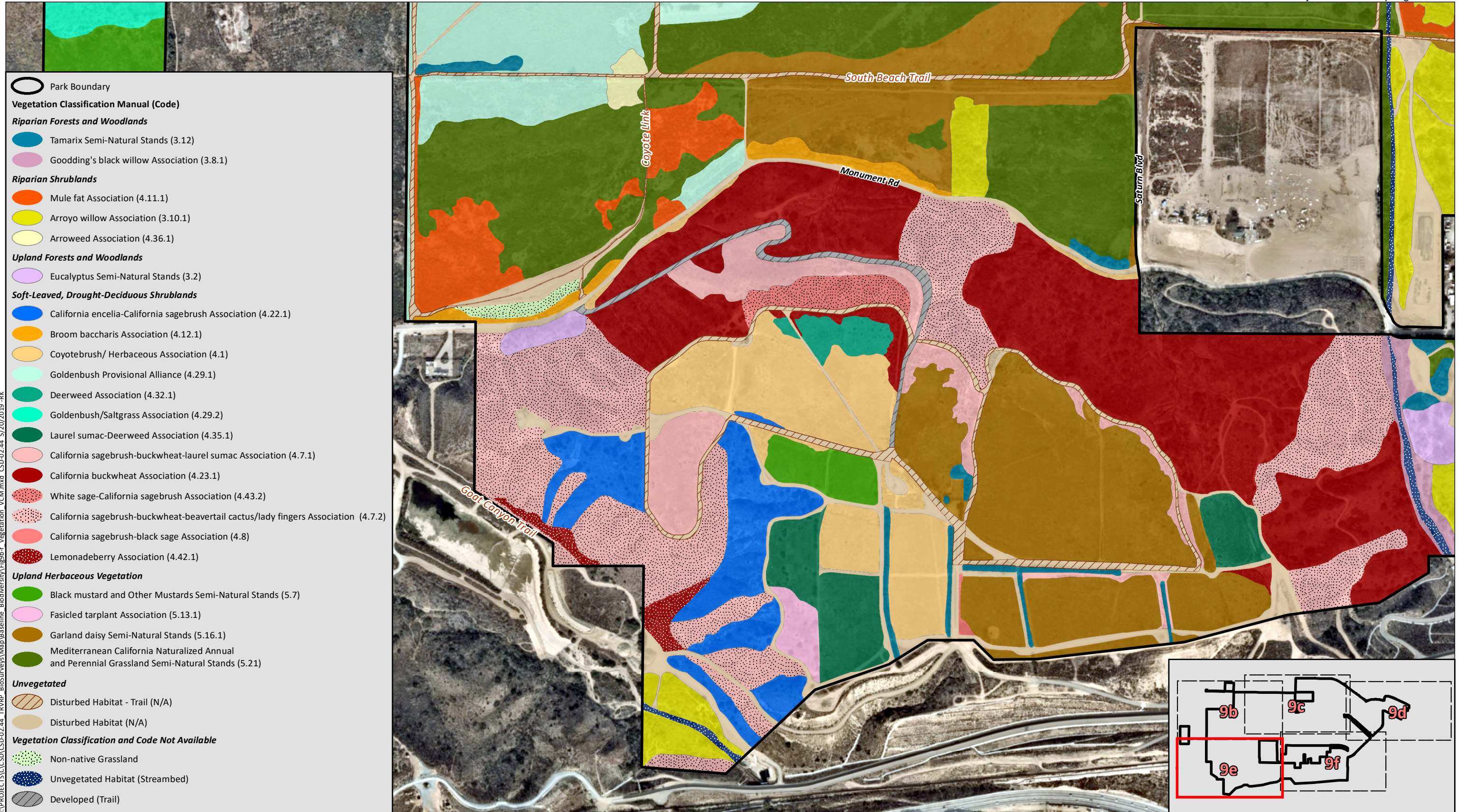
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Aerial Photo: Nearmap 2017



Vegetation Communities/Habitats (Vegetation Classification Manual)

Figure 9d

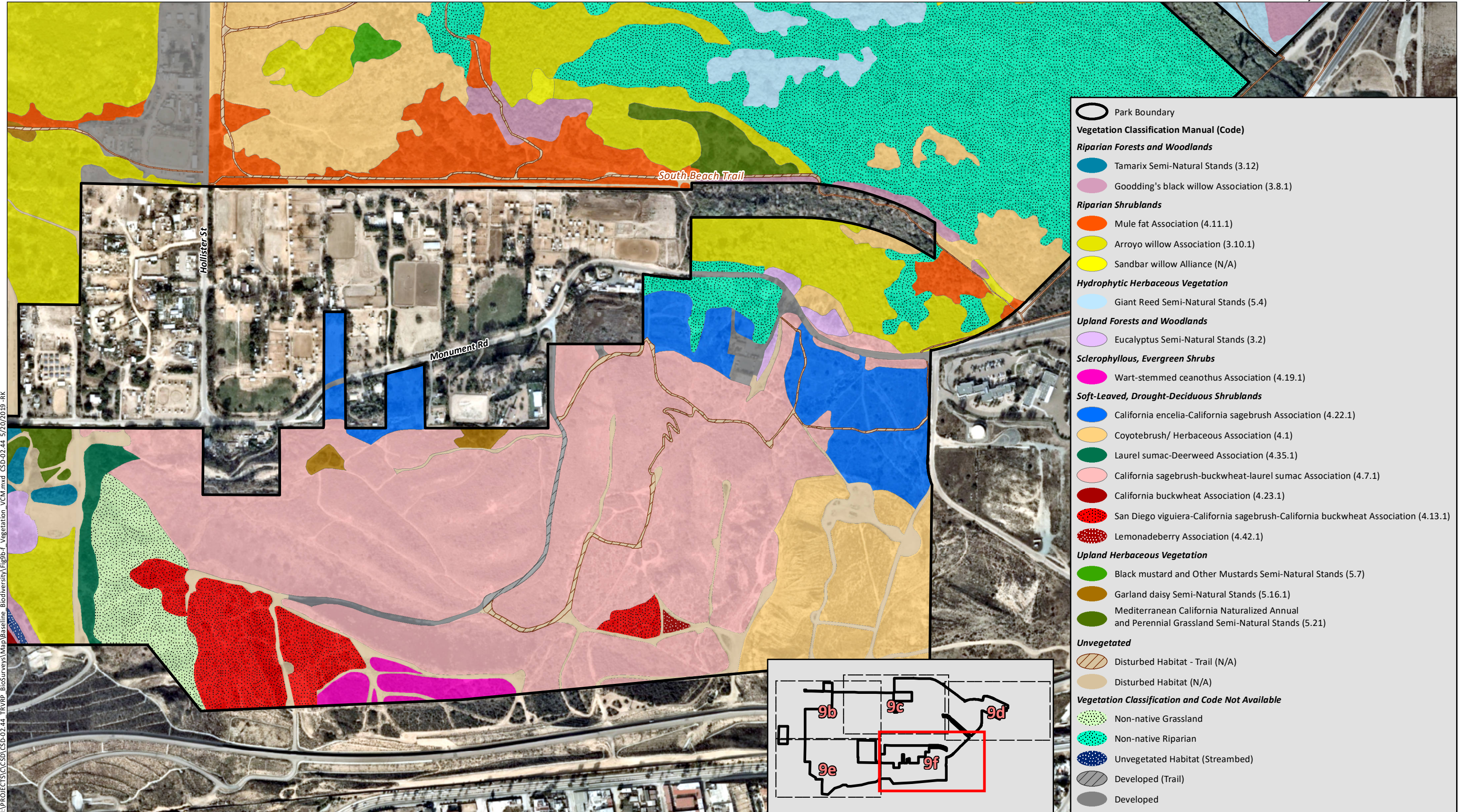


Aerial Photo: Nearmap 2017



Vegetation Communities/Habitats (Vegetation Classification Manual)

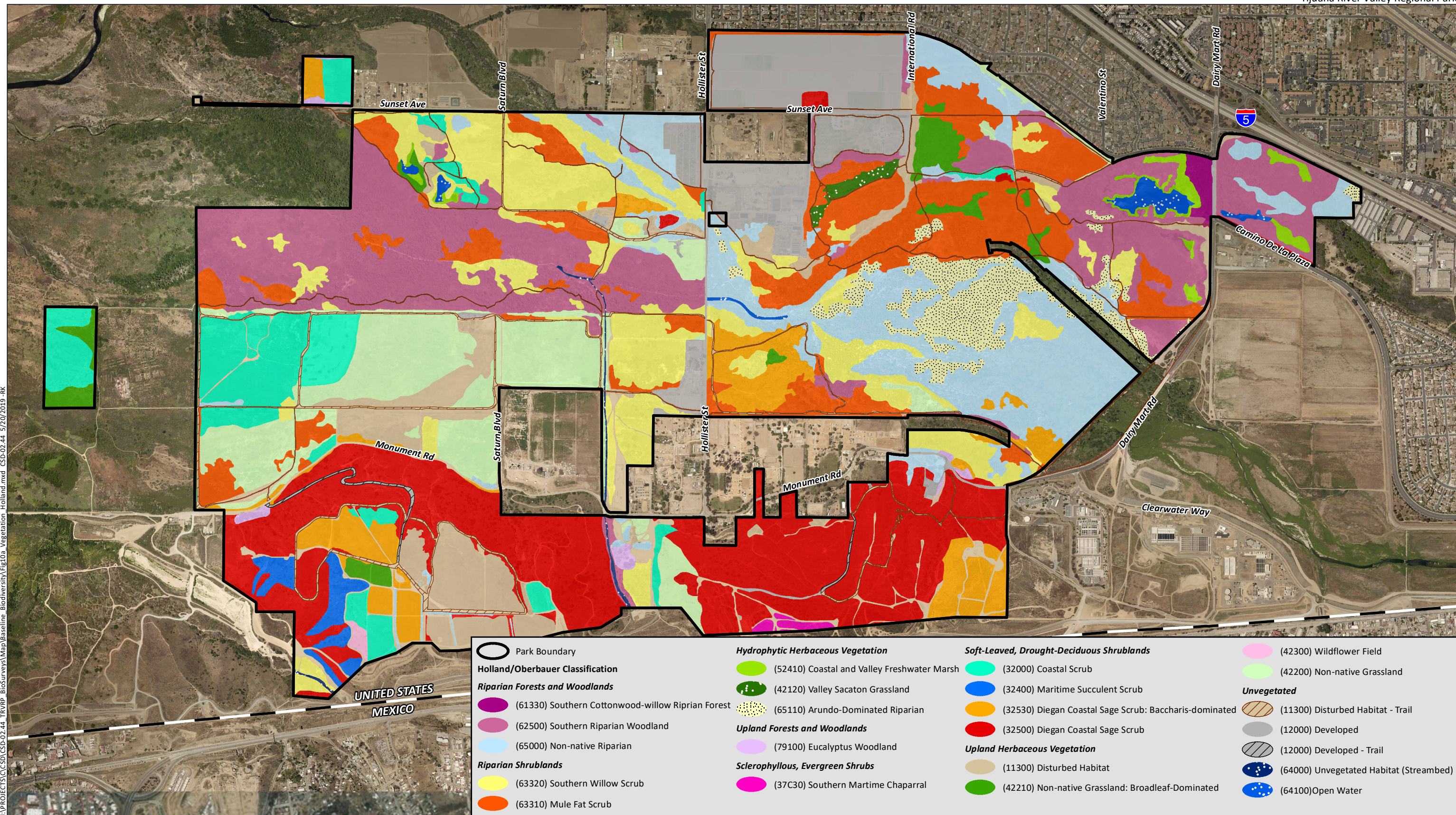
Figure 9e



Aerial Photo: Nearmap 2017



Vegetation Communities/Habitats (Vegetation Classification Manual)











Aerial Photo: SanGIS (2017)

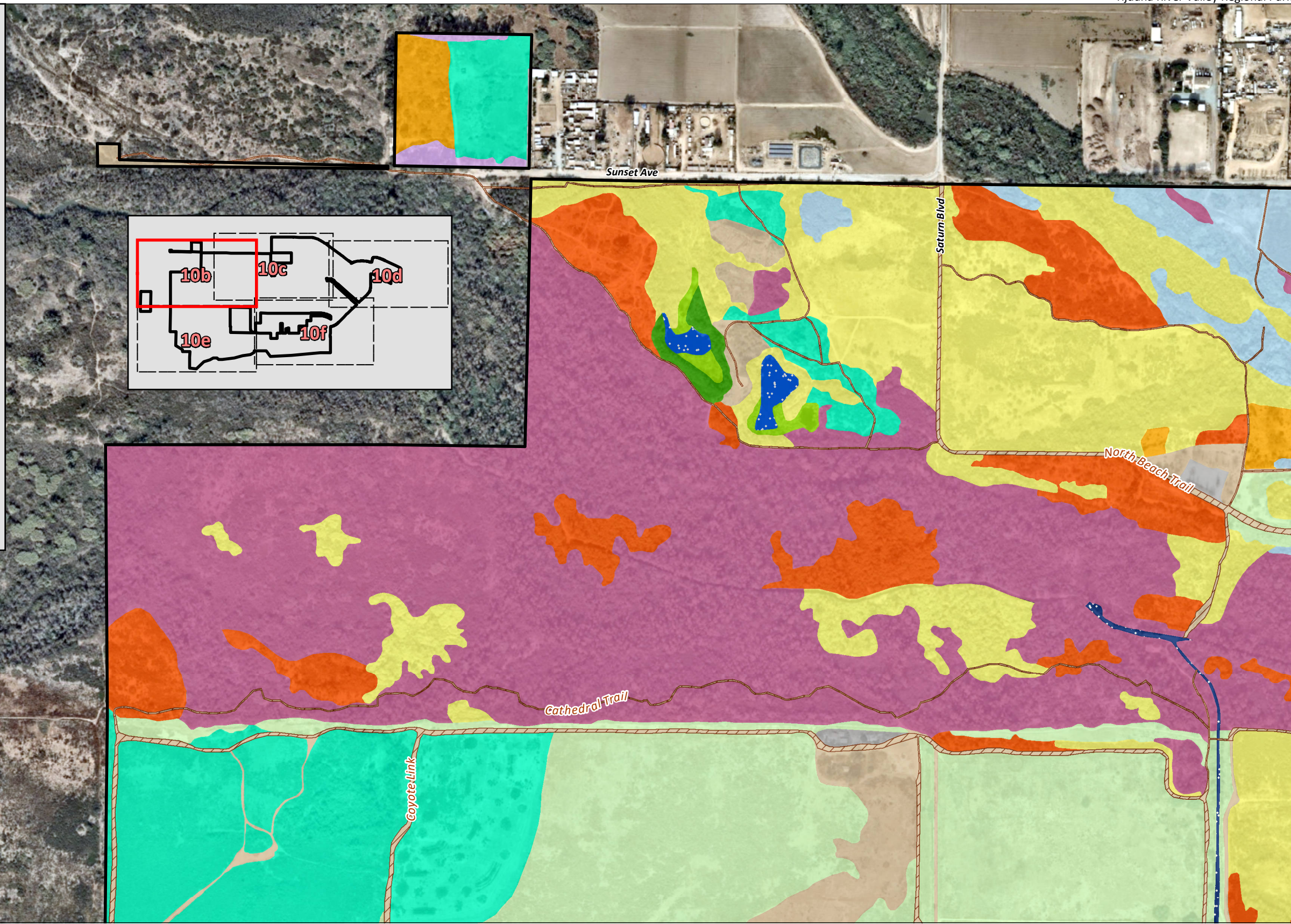


Vegetation Communities/Habitats (Holland/Oberbauer)

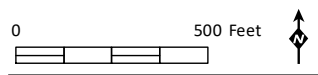
Figure 10a

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-  Park Boundary
- Holland/Oberbauer Classification**
- Riparian Forests and Woodlands**
-  (62500) Southern Riparian Woodland
-  (65000) Non-native Riparian
- Riparian Shrublands**
-  (63320) Southern Willow Scrub
-  (63310) Mule Fat Scrub
- Hydrophytic Herbaceous Vegetation**
-  (52410) Coastal and Valley Freshwater Marsh
- Upland Forests and Woodlands**
-  (79100) Eucalyptus Woodland
- Soft-Leaved, Drought-Deciduous Shrublands**
-  (32000) Coastal Scrub
-  (32530) Diegan Coastal Sage Scrub: Baccharis-dominated
- Upland Herbaceous Vegetation**
-  (11300) Disturbed Habitat
-  (42210) Non-native Grassland: Broadleaf-Dominated
-  (42200) Non-native Grassland
- Unvegetated**
-  (11300) Disturbed Habitat - Trail
-  (12000) Developed
-  (64000) Unvegetated Habitat (Streambed)
-  (64100) Open Water



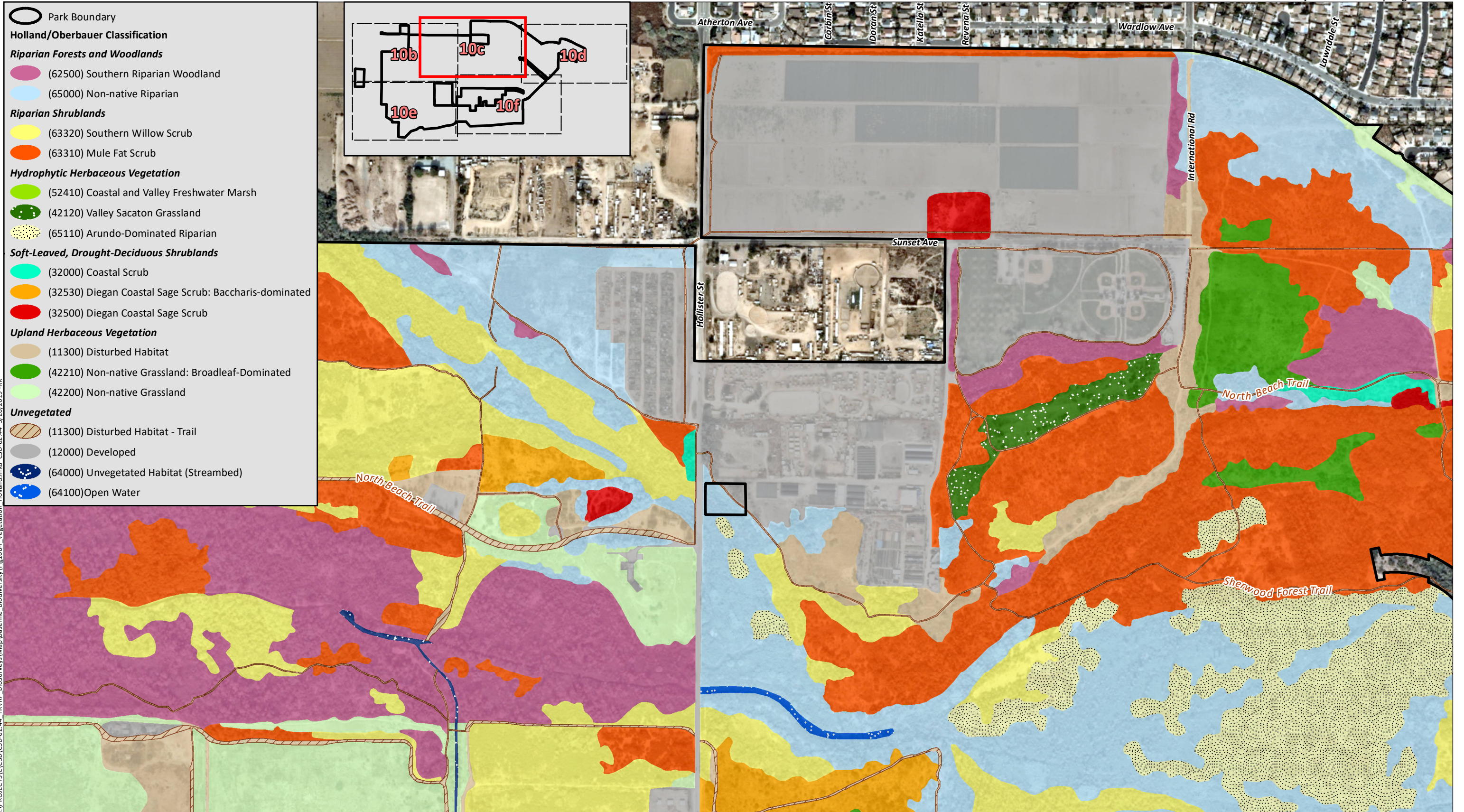
Aerial Photo: Nearmap 2017



Vegetation Communities/Habitats (Holland/Oberbauer)

Figure 10b

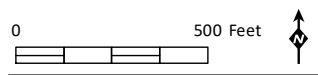
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- Park Boundary
- Holland/Oberbauer Classification**
- Riparian Forests and Woodlands**
- (62500) Southern Riparian Woodland
- (65000) Non-native Riparian
- Riparian Shrublands**
- (63320) Southern Willow Scrub
- (63310) Mule Fat Scrub
- Hydrophytic Herbaceous Vegetation**
- (52410) Coastal and Valley Freshwater Marsh
- (42120) Valley Sacaton Grassland
- (65110) Arundo-Dominated Riparian
- Soft-Leaved, Drought-Deciduous Shrublands**
- (32000) Coastal Scrub
- (32530) Diegan Coastal Sage Scrub: Baccharis-dominated
- (32500) Diegan Coastal Sage Scrub
- Upland Herbaceous Vegetation**
- (11300) Disturbed Habitat
- (42210) Non-native Grassland: Broadleaf-Dominated
- (42200) Non-native Grassland
- Unvegetated**
- (11300) Disturbed Habitat - Trail
- (12000) Developed
- (64000) Unvegetated Habitat (Streambed)
- (64100) Open Water

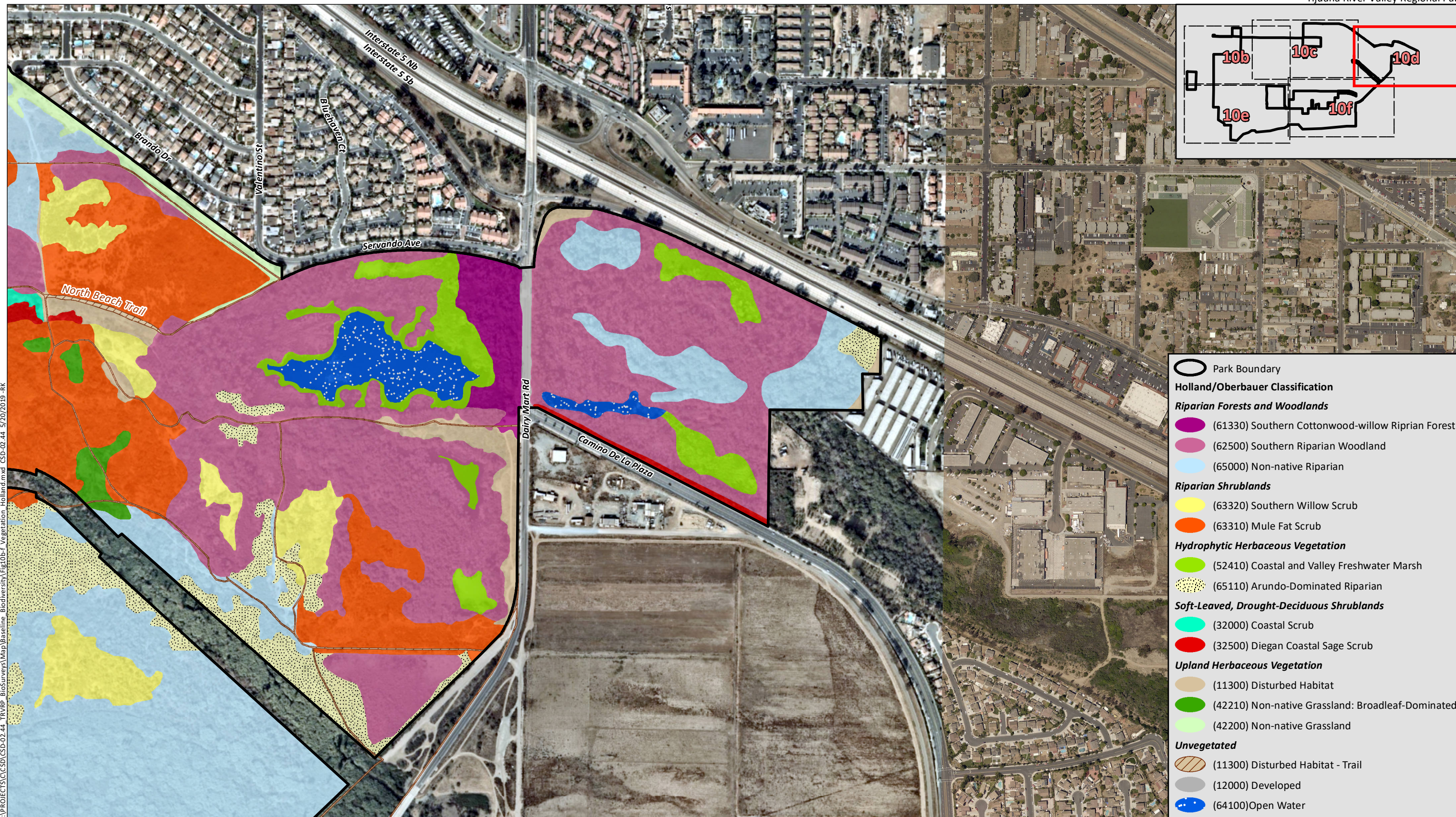
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Aerial Photo: Nearmap 2017



Vegetation Communities/Habitats (Holland/Oberbauer)

Figure 10c



- Park Boundary
- Holland/Oberbauer Classification**
- Riparian Forests and Woodlands**
- (61330) Southern Cottonwood-willow Riparian Forest
- (62500) Southern Riparian Woodland
- (65000) Non-native Riparian
- Riparian Shrublands**
- (63320) Southern Willow Scrub
- (63310) Mule Fat Scrub
- Hydrophytic Herbaceous Vegetation**
- (52410) Coastal and Valley Freshwater Marsh
- (65110) Arundo-Dominated Riparian
- Soft-Leaved, Drought-Deciduous Shrublands**
- (32000) Coastal Scrub
- (32500) Diegan Coastal Sage Scrub
- Upland Herbaceous Vegetation**
- (11300) Disturbed Habitat
- (42210) Non-native Grassland: Broadleaf-Dominated
- (42200) Non-native Grassland
- Unvegetated**
- (11300) Disturbed Habitat - Trail
- (12000) Developed
- (64100) Open Water

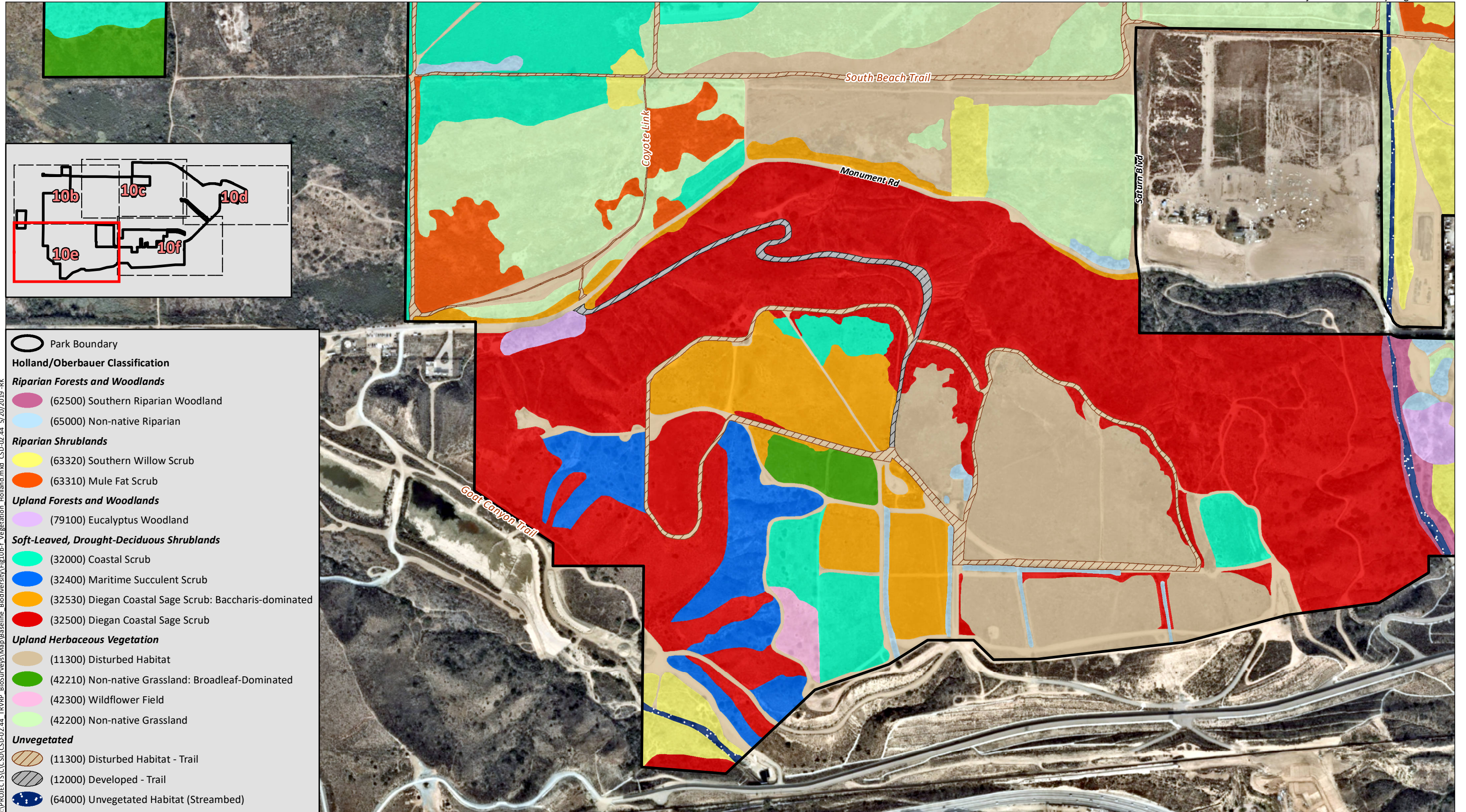
Aerial Photo: Nearmap 2017



Vegetation Communities/Habitats (Holland/Oberbauer)

Figure 10d

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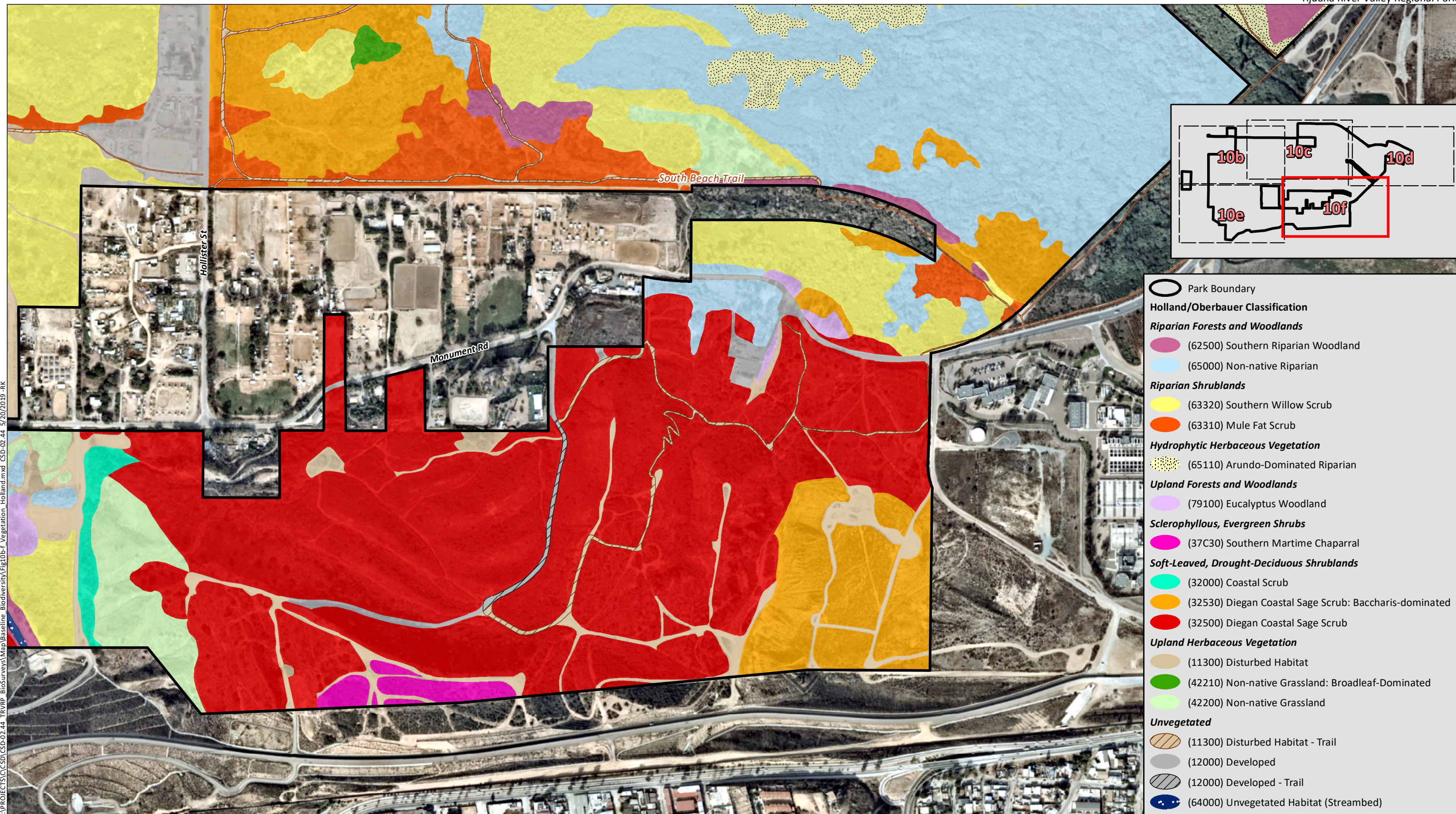


Aerial Photo: Nearmap 2017



Vegetation Communities/Habitats (Holland/Oberbauer)

Figure 10e



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Aerial Photo: Nearmap 2017



Vegetation Communities/Habitats (Holland/Oberbauer)

Figure 10f

Table 4 (cont.)
VEGETATION COMMUNITIES AND LAND COVERS

Vegetation Classification Manual (VCM) Code	VCM Alliance/ Association	VCM Common Name	Holland Code	Holland Classification	Acres on Site
Upland Forests and Woodlands					
3.2	<i>Eucalyptus (globulus/camaldulensis)</i> Semi-Natural Stands	Eucalyptus Semi-Natural Stands	79100	Eucalyptus Woodland	5.50
Upland Forests and Woodlands Total					5.50
Sclerophyllous, Evergreen Shrubs					
4.19.1	<i>Ceanothus verrucosus</i> Association	Wart-stemmed Ceanothus Association	37C30	Southern Maritime Chaparral	3.18
Sclerophyllous, Evergreen Shrubs Total					3.18
Soft-Leaved, Drought-Deciduous Shrublands					
4.1	<i>Baccharis pilularis</i> / Herbaceous Association	Coyote Brush/Herbaceous Association	32530	Diegan Coastal Sage Scrub: Baccharis-dominated	76.09
4.7.1	<i>Artemisia californica-Eriogonum fasciculatum-Malosma laurina</i> Association	California Sagebrush-California Buckwheat-Laurel Sumac Association	32500	Diegan Coastal Sage Scrub	112.87
4.7.2	<i>Artemisia californica-Eriogonum fasciculatum-Opuntia littoralis/Dudleya (edulis)</i> Association	California Sagebrush-California Buckwheat-Beavertail Cactus/Lady Fingers Association	32500	Diegan Coastal Sage Scrub	46.01
4.8.1	<i>Artemisia californica-Salvia mellifera</i> Association	California Sagebrush-Black Sage Association	32500	Diegan Coastal Sage Scrub	0.19
4.12.1	<i>Baccharis sarothroides</i> Association	Broom Baccharis Association	32530	Diegan Coastal Sage Scrub: Baccharis-dominated	2.95
4.13.1	<i>Bahiopsis laciniata-Artemisia californica-Eriogonum fasciculatum</i> Association	San Diego Viguiera-California Sagebrush-California Buckwheat Association	32500	Diegan Coastal Sage Scrub	12.95
4.22.1	<i>Encelia californica-Artemisia californica</i> Association	California Encelia-California Sagebrush Association	32400	Maritime Succulent Scrub	33.22
4.23.1	<i>Eriogonum fasciculatum</i> Association	California Buckwheat Association	32500	Diegan Coastal Sage Scrub	60.94

**Table 4 (cont.)
VEGETATION COMMUNITIES AND LAND COVERS**

Vegetation Classification Manual (VCM) Code	VCM Alliance/ Association	VCM Common Name	Holland Code	Holland Classification	Acres on Site
Soft-Leaved, Drought-Deciduous Shrublands (cont.)					
4.29.1	<i>Isocoma menziesii</i> Provisional Association	Goldenbush Provisional Association	32000	Coastal Scrub	68.51
4.29.2	<i>Isocoma menziesii</i> / <i>Distichlis spicata</i> Association	Goldenbush/Saltgrass Association	32000	Coastal Scrub	13.80
4.32.1	<i>Acmispon glaber</i> (MCV Synonym: <i>Lotus scoparius</i>) Association	Deerweed Association	32000	Coastal Scrub	2.34
4.35.1	<i>Malosma laurina</i> - <i>Lotus scoparius</i> Association	Laurel Sumac-Deerweed Association	32000	Coastal Scrub	11.99
4.42.1	<i>Rhus integrifolia</i> Association	Lemonadeberry Association	32500	Diegan Coastal Sage Scrub	3.89
4.43.2	<i>Salvia apiana</i> - <i>Artemisia californica</i> Association	White Sage-California Sagebrush Association	32500	Diegan Coastal Sage Scrub	3.17
Soft-Leaved, Drought-Deciduous Shrublands Total					448.91
Upland Herbaceous Vegetation					
5.7	<i>Brassica (nigra)</i> and Other Mustards Semi-Natural Stands	Black Mustard and Other Mustards Semi-Natural Stands	42210	Non-native Grassland: Broadleaf - dominated	22.03
5.7.1	<i>Brassica nigra</i> Semi-Natural Stand Type	Black Mustard Semi-Natural Stand Type	42210	Non-native Grassland: Broadleaf - dominated	4.90
5.13.1	<i>Deinandra fasciculata</i> Association	Fascicled Tarplant Association	42300	Wildflower Field	1.80
5.16.1	<i>Glebionis coronaria</i> Semi-Natural Stands	Garland Daisy Semi-Natural Stands	11300	Disturbed Habitat	89.33
5.21	Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands	Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands	42200	Non-native Grassland	131.14
N/A	Not Available	Not Available	42200	Non-native Grassland	9.60
Upland Herbaceous Vegetation Total					258.80

**Table 4 (cont.)
VEGETATION COMMUNITIES AND LAND COVERS**

Vegetation Classification Manual (VCM) Code	VCM Alliance/ Association	VCM Common Name	Holland Code	Holland Classification	Acres on Site
Unvegetated¹					
N/A	Not Available	Not Available	11300	Disturbed Habitat	71.03
N/A	Not Available	Not Available	12000	Developed	130.59
N/A	Not Available	Not Available	64100	Open Water	9.53
N/A	Not Available	Not Available	64000	Unvegetated Habitat (Streambed)	3.08
Unvegetated Total					214.23
TOTAL					1,770.51

¹ The San Diego Association of Governments Vegetation Classification Manual does not classify generally unvegetated habitats such as those found in the Oberbauer updated Holland classification system: developed, disturbed habitat, open water, and unvegetated habitat (streambed).

The following vegetation community and land cover descriptions for the TRVRP follow the VCM codes.

Riparian Forests and Woodlands

Fremont Cottonwood/Mule Fat Association (3.5.1)

Fremont cottonwood/mule fat association is found with these two plant species occurring together as co-dominants. Subdominant riparian shrubs may include blue elderberry (*Sambucus nigra* ssp. *caerulea*), coastal goldenbush (*Isocoma menziesii* var. *vernonioides*), and willows (*Salix* sp.). Herbaceous diversity is low and includes salt grass (*Distichlis spicata*), western ragweed (*Ambrosia psilostachya*), and ruderal species. This association has less than 5 percent absolute cover in the tree canopy, or if the tree canopy is between 5 and 10 percent absolute cover, the shrub canopy should not be continuous. Cottonwoods should account for at least 5 percent relative cover in the tree canopy. If western sycamores (*Platanus racemosa*) are present, they should have lower percent cover than cottonwoods. Mule fat is expected to occur with a probability of 80 percent or greater, while Goodding’s black willow (*Salix gooddingii*) must be absent.

There are 5.25 acres of Fremont cottonwood/mule fat association mapped within the TRVRP. It is found west of Dairy Mart Road and east of Dairy Mart Pond, in the northwest corner of the park. Fremont cottonwood/mule fat association makes up approximately 0.3 percent of the TRVRP.

Goodding’s Black Willow Association (3.8.1)

Goodding’s black willow association is found when Goodding’s black willow is the dominant plant species in an open to closed tree canopy with other willows and cottonwoods. Herbaceous wetland affiliates include western ragweed, mugwort (*Artemisia douglasiana*), and salt grass. Shrub species affiliated with this association area mule fat, arrow weed (*Pluchea sericea*), singlewhorl burrobrush (*Ambrosia monogyra*), and coyote brush (*Baccharis pilularis*). The tree canopy in this association must have at least 5 percent cover and the shrub cover should not be continuous. Goodding’s black willow

must account for at least 5 percent relative cover in the tree canopy, and other trees such as western sycamore and cottonwoods must account for less than 5 percent relative cover.

There are 219.49 acres of Goodding's black willow association mapped within the TRVRP. It is found throughout the TRVRP along the Tijuana River. Goodding's black willow association makes up approximately 12.4 percent of the TRVRP and is the most abundant vegetation community within the TRVRP.

Red Willow Association (3.9.1)

In this vegetation association, red willow (*Salix laevigata*) must account for at least 5 percent relative cover. Arroyo willow (*Salix lasiolepis*), if present, must have a lower percent cover than red willow. Additionally, if present, western sycamore, cottonwood, and Goodding's black willow must have less than 5 percent relative cover. Co-dominant shrubs may include mule fat, coyote brush, poison oak (*Toxicodendron diversilobum*), and San Diego sagewort (*Artemisia palmeri*). Herbaceous plants such as mugwort make up the herbaceous canopy.

There are 42.32 acres of red willow association mapped within the TRVRP. It is found in the Tijuana River in the west end of the TRVRP, in the center of the river in the center of the TRVRP, and along the north side of the river in the east end of the TRVRP. Red willow association makes up approximately 2.4 percent of the TRVRP.

Tamarisk Semi-Natural Stands (3.12)

Tamarisk (*Tamarix* spp.) species easily displace native species and form dense, monotypic stands in floodplains, wetlands, and lake margins where they thrive under altered hydrologic regimes. They are known to increase soil salinity, lower water tables, and contribute to increased fire frequency. Tamarisk growth forms range from shrubs to trees. The herbaceous layer of this community is sparse, and the shrub canopy is continuous or open.

There are 27.51 acres of tamarisk semi-natural stands mapped within the TRVRP. It is found along roads on Spooner's Mesa and sporadically along roads north of the Tijuana River. A few small patches also occur south of the river adjacent to roads and trails. Tamarix semi-natural stands make up approximately 1.6 percent of the TRVRP.

Non-Native Riparian (Holland Code 65000)

Non-native riparian habitats are densely vegetated and dominated by invasive non-native plant species. Invasive non-native plant species must make up 50 percent cover or greater. This community is often found in areas that have experienced disturbance. It is common in many of the river channels in San Diego County. Species often encountered include giant reed, eucalyptus (*Eucalyptus* spp.), palms (*Washingtonia* spp., *Phoenix* spp.), Bermuda grass (*Cynodon dactylon*), and castor bean (*Ricinus communis*). Associated native plant species include arrow weed, cottonwoods, and willows.

There are 101.41 acres of non-native riparian mapped within the TRVRP. It is found throughout the Tijuana River, but is most common in the eastern portion of the TRVRP. Non-native riparian habitat makes up approximately 5.7 percent of the TRVRP.

Riparian Shrublands

Arroyo Willow Association (3.10.1)

This vegetation community must consist of arroyo willows with at least 5 percent relative cover, red willow must have a lower percent cover, and pacific willow (*Salix lasiandra* var. *lasiandra*) must be absent. Sub-dominants may include sandbar willow (*Salix exigua*), mule fat, or Goodding's black willow as emergent trees with trace cover. Herbaceous plants such as western ragweed, mugwort, and southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*) may be included as sub-dominants. Trees such as western sycamore, red willow, and Goodding's black willow may be present but must have less than 5 percent relative cover. If coast live oak (*Quercus agrifolia* var. *agrifolia*) is present, it must account for less than 5 percent relative cover in the tree canopy.

There are 167.79 acres of arroyo willow association mapped within the TRVRP. The community is present throughout the Tijuana River, as well as occurring east of the channel running north from Smuggler's Gulch and the drainage west of Spooner's Mesa. Arrow willow association makes up approximately 9.5 percent of the TRVRP.

Mule Fat Association (4.11.1)

Mule fat association is dominated by a single riparian shrub species: mule fat. Emergent trees may include western sycamore, willows, and cottonwood. This habitat association forms in both seasonally or intermittent flooded habitats such as canyon bottoms, floodplains, and stream channels. Canopy height is generally under 5 meters with the shrub canopy open to continuous, and the herbaceous layer usually sparse. The tree canopy must be absent or less than 5 percent absolute cover or the tree canopy may be present with 5 to 10 percent absolute cover when the shrub cover is continuous. Mule fat must account for at least 30 percent relative cover in the shrub layer.

There are 177.94 acres of mule fat association mapped within the TRVRP. This habitat community is the most abundant riparian shrubland mapped throughout the Tijuana River corridor, with the largest contiguous area of the association occurring in the north eastern portion of the TRVRP. Mule fat association makes up approximately 10.1 percent of the TRVRP.

Arrow Weed Association (4.36.1)

The arrow weed association contains dense arrow weed stands that must account for at least 75 percent relative cover in the shrub canopy with baccharis (*Baccharis* spp.) as sub-dominant species. A diverse assemblage of wetland and upland plants may be found in the herbaceous layer, including western ragweed and salt grass. This association occurs on sites that are transitional from wetland and riparian associations. This vegetation association must have less than 5 percent absolute cover in the tree canopy, or the tree canopy may be present with 5 to 10 percent absolute cover when the shrub canopy is continuous.

There are 1.14 acres of arrow weed association mapped within the TRVRP. It is mapped in the southwest portion of the TRVRP, north of Monument Road. Arrow weed association makes up approximately 0.06 percent of the TRVRP.

Sandbar Willow Alliance/Southern Willow Scrub (Holland 63320)

Sandbar willow alliance/southern willow scrub is made up of dense winter deciduous riparian thickets dominated by willows. Cottonwood and western sycamore are scattered throughout this habitat. The understory contains minimal herbs and shrubs due to the density of the tree layer. It is often found on loose sandy soils near stream channels. In the TRVRP, sandbar willow was the dominant tree species.

There are 6.27 acres of sandbar willow alliance/southern willow scrub mapped within the TRVRP. The alliance is found in the Tijuana River corridor in the northwest, southeast, and Baseball Fields/Dairy Mart areas of the TRVRP. Sandbar willow alliance/southwestern willow scrub makes up approximately 0.35 percent of the TRVRP.

Hydrophytic Herbaceous Vegetation

Giant Reed Semi-Natural Stands (5.4)

The giant reed semi-natural stands contain less than 5 percent absolute cover of tree and shrub cover, while giant reed accounts for at least 75 percent relative cover. Giant reed, which dominates this community, is a large, aggressive, perennial rye grass that is an introduced, invasive non-native plant species. This plant may form dense floating mats in riparian areas, streams, ditches, and coastal marshes. Propagation occurs when the rhizomes and culms detach from the plant and are carried downstream. Stands may be up to eight meters in height and will exclude many native trees, especially willows. This community is less dominant in drier riparian systems that may be dominated by mule fat or arrow weed.

There are 53.47 acres of giant reed semi-natural stands mapped within the TRVRP. This species is found throughout the Tijuana River; however, the largest stands of giant reed are found at the eastern end of the TRVRP. Giant reed semi-natural stands make up approximately three percent of the TRVRP and are the most abundant hydrophytic herbaceous vegetation community in the TRVRP.

Salt Grass-Annual Grasses Association (5.14.1)

Salt grass is the dominant herb in this association and makes up at least 5 percent cover with non-native grasses occurring as a sub-dominant. Associated herb species include western ragweed, beardless wildrye (*Elymus triticoides*), San Diego sand aster (*Corethrogyne filaginifolia* var. *incana*), sand-spurrey (*Spergularia* spp.), and coast weed (*Amblyopappus pusillus*). Shrubs associated with the habitat type include Pacific pickleweed (*Salicornia pacifica*), fleshy jaumea (*Jaumea carnosa*), goldenbush (*Isocoma menziesii*), California buckwheat, and coyote brush. Trees are absent or makeup less than 5 percent cover.

There are 4.97 acres of salt grass-annual grasses association mapped within the TRVRP. It is found north of the Tijuana River and south of Sunset Avenue in the eastern portion of the TRVRP. Salt grass-annual grasses association makes up approximately 0.28 percent of the TRVRP.

Naturalized Warm-Temperate Riparian and Wetland Semi-Natural Stands (5.25)

This community is based on the group level, where distinction cannot be made to the alliance or association level, and where none of the following invasive non-native species are clearly dominant or co-dominant: giant reed, perennial pepperweed (*Lepidium latifolium*), or English ryegrass

(*Festuca perennis*). This vegetation type is highly variable throughout drainage channels where native species diversity is low or ruderal flora has replaced native vegetation. Repeated soil disturbance and the introduction of invasive non-native species leads to the development of this vegetation type.

There are 19.97 acres of naturalized warm-temperate riparian and wetland semi-natural stands mapped within the TRVRP. It is found in the northeast portion of the TRVRP. Naturalized warm-temperate riparian and wetland semi-natural stands make up approximately 1.1 percent of the TRVRP.

Bulrush Association (5.31.1)

This vegetation association is dominated by bulrush (*Schoenoplectus* spp.) with a closed canopy in the herbaceous canopy. The tree and shrub canopies must be absent or less than 5 percent absolute cover, while bulrush species must account for at least 50 percent relative cover in the herbaceous canopy. Additionally, California bulrush (*Schoenoplectus californicus*) must be the dominant bulrush species. Many other wetland plant species may be present but are not fully aquatic emergent wetland plant species. Bulrushes often grow in dense colonies forming uniform stands as they are perennial and rhizomatous plants. Other emergent wetland plants may be present and could include cattails (*Typha* spp.) or prairie bulrush (*Bolboschoenus maritimus*). Associated riparian plants include western ragweed, mule fat, salt grass, cottonwoods, sycamores, and coastal goldenbush.

There are 10.37 acres of bulrush association mapped within the TRVRP. It is found around the edges of Dairy Mart Pond and Duck Ponds in the northwest portion of the TRVRP, and north of Camino De La Plaza. Bulrush association makes up approximately 0.59 percent of the TRVRP.

Cattail Alliance (5.35)

The cattail alliance vegetation community includes all three species of cattails, (*Typha* spp.) as they have similar ecologies and commonly hybridize and grow in mixed stands. This alliance in California includes narrow-leaved cattail (*Typha angustifolia*), southern cattail (*Typha domingensis*), or broad-leaved cattail (*Typha latifolia*) as dominant or co-dominant in the herbaceous layer. Willow trees may be present as emergent vegetation generally and under two meters in height, with the canopy intermittent to continuous.

There are 1.99 acres of cattail alliance mapped within the TRVRP. It is associated with the eastern portion of the TRVRP, just west of the intersection of Dairy Mart Road and Camino de la Plaza. Cattail alliance makes up approximately 0.1 percent of the TRVRP.

Upland Forests and Woodlands

Eucalyptus Semi-Natural Stands (3.2)

The two most common eucalyptus species that form semi-natural stands are blue gum (*Eucalyptus globulus*) and river red gum (*Eucalyptus camaldulensis*). For this vegetation community, eucalyptus trees must account for at least 50 percent relative cover in the tree canopy. The tree canopy must have at least 5 percent absolute cover, but the shrub canopy should not be continuous.

There are 5.50 acres of eucalyptus semi-natural stands mapped within the TRVRP. They are found to the east and west of Spooner's Mesa and within the northwestern-most parcel of the TRVRP. Eucalyptus semi-natural stands make up approximately 0.3 percent of the TRVRP.

Sclerophyllous, Evergreen Shrubs

Wart-Stemmed Ceanothus Association (4.19.1)

This association occurs when wart-stemmed ceanothus (*Ceanothus verrucosus*) forms a continuous canopy with other shrub species. Associated species include lemonadeberry (*Rhus integrifolia*), monkey flower (*Mimulus aurantiacus*), black sage, laurel sumac, bushrue (*Cneoridium dumosum*), saw-toothed goldenbush (*Hazardia squarrosa* var. *grindelioides*), Mohave yucca (*Yucca schidigera*), and our Lord's candle (*Hesperoyucca whipplei*). Herbaceous species are common in openings in the shrub layer. It is known from coastal mesas and foothills in southwest San Diego County.

There are 3.18 acres of wart-stemmed ceanothus association mapped within the TRVRP. It is found on the southern edge of Monument Mesa. Wart-stemmed ceanothus association makes up approximately 0.2 percent of the TRVRP.

Soft-Leaved, Drought-Deciduous Shrublands

Coyote brush/Herbaceous Association (4.1)

Coyote brush is the dominant species in the shrub canopy in this association. Associated species include California sagebrush (*Artemisia californica*), California buckwheat, and goldenbush. The herbaceous layer contains codominant species which includes bromes (*Bromus* spp.), barleys (*Hordeum* spp.), Bermuda grass, giant wild rye (*Elymus condensatus*), purple needlegrass (*Stipa pulchra*), and deergrass (*Muhlenbergia rigens*). The association is usually open and often occurs on floodplains as a transition between riparian and upland habitat types.

There are 76.09 acres of coyote brush/herbaceous association mapped within the TRVRP. It is found on Spooner's and Monument Mesa, as well as to the east of Hollister Street, south of the Tijuana River. Coyote brush/herbaceous association makes up approximately 4.3 percent of the TRVRP.

California Sagebrush-California Buckwheat/Laurel Sumac Association (4.7.1)

This association contains California sagebrush, California buckwheat, and laurel sumac as co-dominants accounting for at least 50 percent relative shrub cover with a relatively open shrub canopy. The sub-dominant shrub species may include lemonadeberry, San Diego County viguiera (*Bahiopsis laciniata*), white sage (*Salvia apiana*), prickly pear (*Opuntia littoralis*), monkey flower, and other common Diegan coastal sage scrub shrub species. The herbaceous layer is usually open with high species diversity. This association can occur as an early transitional stage in response to fire/disturbance, or as a mature stable shrub community.

There are 112.87 acres of California sagebrush-California buckwheat/laurel sumac association mapped within the TRVRP. It is found on Spooner's Mesa and is the most common association on Monument Mesa. California sagebrush-California buckwheat/laurel sumac association makes up approximately 6.4 percent of the TRVRP and is the most abundant upland shrubland in the TRVRP.

California Sagebrush-California Buckwheat-Beavertail Cactus/Lady Fingers Association (4.7.2)

This association contains California sagebrush and California buckwheat as co-dominants, with a relatively open canopy, and prickly pear and/or lady fingers (*Dudleya edulis*) in the understory.

Sub-dominant shrub species are common coastal sage scrub species such as lemonadeberry, San Diego viguiera, white sage, and black sage. Plants such as lady fingers, chalk-lettuce (*Dudleya pulverulenta*), and barrel cactus (*Ferocactus viridescens*) may be present in a well-developed understory. As long as the shrub canopy is continuous, the tree canopy may be present with 5 to 10 percent absolute cover, or the tree canopy must be absent or less than 5 percent absolute cover. The combined cover of white sage, black sage, California sagebrush, and California buckwheat must account for more shrub cover than any other species. Succulent species must account for at least 5 percent relative cover in the shrub canopy, or two or more succulent species must occur with California sagebrush and California buckwheat.

There are 46.01 acres of California sagebrush-California buckwheat-beavertail cactus/lady fingers association mapped within the TRVRP. It is found on the slopes of Spooner's Mesa. California sagebrush-California buckwheat-beavertail cactus/lady fingers association makes up approximately 2.6 percent of the TRVRP.

California Sagebrush-Black Sage Association (4.8.1)

This association has a relatively open canopy with California sagebrush and black sage as co-dominants. Sub-dominant plants may include California buckwheat, laurel sumac, monkey flower, broom baccharis (*Baccharis sarothroides*), and other coastal sage scrub plant species. Ocean locoweed (*Astragalus trichopodus* var. *lonchus*) and morning glory (*Calystegia macrostegia*) may be included in a well-developed understory. The tree canopy may be present with 5 to 10 percent absolute cover as long as the shrub canopy is continuous, or the tree canopy must be absent or less than 5 percent absolute cover. Jojoba (*Simmondsia chinensis*) and San Diego viguiera must be absent or less than 5 percent relative cover in the shrub canopy.

There is 0.19 acre of California sagebrush-black sage association mapped within the TRVRP. It is found on the slopes of Spooner's Mesa. California sagebrush-black sage association makes up approximately less than 0.01 percent of the TRVRP.

Broom Baccharis Association (4.12.1)

Broom baccharis is the dominant species in this association. The shrub canopy is generally open. Associated species include goldenbush, California sagebrush, black sage, and California buckwheat. On occasion, wetland trees and shrubs may occur including blue elderberry and tarragon (*Artemisia dracunculus*). The herbaceous layer tends to be well developed and includes rushes (*Juncus* spp.), stinging nettle (*Urtica dioica*), and non-native grasses and herbs. It can be found on disturbed sites but is also known from native upland shrubland locations, or as a transitional habitat between uplands and wetlands.

There are 2.95 acres of broom baccharis association mapped within the TRVRP. It is found throughout the park, north of Monument Road, usually in the floodplain of the Tijuana River. Broom baccharis association makes up approximately 0.17 percent of the TRVRP.

San Diego Viguiera-California Sagebrush-California Buckwheat Association (4.13.1)

San Diego viguiera, California sagebrush, and California buckwheat are the dominant species in this association. The shrub canopy can be open or closed. Associated species include laurel sumac, chamise, and mission manzanita (*Xylococcus bicolor*). Herbaceous cover includes dudleya (*Dudleya* spp.), cholla (*Cylindropuntia* spp.), and our Lord's candle. The tree canopy must be absent or less than 5 percent

cover, or 5 to 10 percent cover if shrub cover is continuous. Microphyllous, succulent, or drought-deciduous, soft-leaved species must account for at least 50 percent cover in the shrub canopy. San Diego viguiera must make up at least 5 percent relative cover.

There are 12.95 acres of San Diego viguiera-California sagebrush-California buckwheat association mapped within the TRVRP. It is found on Monument Mesa. San Diego viguiera-California sagebrush-California buckwheat association makes up approximately 0.73 percent of the TRVRP.

California Encelia-California Sagebrush Association (4.22.1)

In this association, California encelia (*Encelia californica*) and California sagebrush occur as co-dominants and must make up at least 50 percent cover in the shrub layer. The habitat generally consists of an open shrub canopy. Sub-dominant shrubs may include goldenbush, California box-thorn (*Lycium californicum*), California buckwheat, white sage, black sage, lemonadeberry, bladderpod (*Peritoma arborea*), coastal cholla (*Cylindropuntia prolifera*), and laurel sumac. Herb cover is diverse and is found in openings of the shrub cover and may include ocean locoweed, morning glory, wild heliotrope (*Phacelia distans*), and woodland threadstem (*Pterostegia drymarioides*). The tree canopy is absent or less than 5 percent cover.

There are 33.22 acres of California encelia-California sagebrush association mapped within the TRVRP. It is found on Spooner's and Monument Mesa. California encelia-California sagebrush association makes up approximately 1.9 percent of the TRVRP.

California Buckwheat Association (4.23.1)

The dominant or co-dominant species in an open shrub canopy must be California buckwheat in this association. Sub-dominant shrubs include common coastal sage species such as California sagebrush, chamise, laurel sumac, black sage, white sage, and coyote brush. This association may occur as a relatively stable association in ecotonal areas or as an early transitional phase of other shrub associations. Herbaceous cover in most openings is diverse, and includes fascicled tarplant (*Deinandra fasciculata*), miniature lupine (*Lupinus bicolor*), and beard-tongue (*Penstemon spectabilis*).

There are 60.94 acres of California buckwheat association mapped within the TRVRP. It is found on the slopes of Monument Mesa. California buckwheat association makes up approximately 3.4 percent of the TRVRP.

Goldenbush Provisional Association (4.29.1)

Goldenbush is dominant in this association. It tends to be open with non-native grasses and herbs making up the herbaceous layer. Associated species include western ragweed and English ryegrass. It is common in coastal areas and usually occupies the habitat between upland and freshwater or brackish wetlands.

There are 68.51 acres of goldenbush provisional association mapped within the TRVRP. It is found north of Monument Road, to the north and south of the Tijuana River, and predominantly in the western portion of the TRVRP. Goldenbush provisional association makes up approximately 3.9 percent of the TRVRP.

Goldenbush/Saltgrass Association (4.29.2)

Goldenbush is dominant in this association. It tends to be open with salt grass making up at least a portion of the herbaceous layer. Associated species include frankenia (*Frankenia* spp.), San Diego marsh-elder (*Iva hayesiana*), Pacific pickleweed, and fleshy jaumea. It is common in coastal areas and usually occupies the habitat between upland and freshwater or brackish wetlands.

There are 13.80 acres of goldenbush/salt grass association mapped within the TRVRP. It is found within the western-most portion of the TRVRP. Goldenbush/salt grass association makes up approximately 0.78 percent of the TRVRP.

Deerweed Association (4.32.1)

In this community deerweed (*Acmispon glaber*; MCV synonym *Lotus scoparius*) is dominant in an open shrub canopy. Shrub species associated with this association include California buckwheat, California sagebrush, saw-toothed goldenbush, chaparral mallow (*Malacothamnus fasciculatus*), chamise, ceanothus (*Ceanothus* spp.), sage (*Salvia* spp.), and scrub oaks. Herb cover varies from location to location but often includes morning glory, everlasting nest straw (*Stylocline gnaphaloides*), cudweed (*Pseudognaphalium* spp.), and eucrypta (*Eucrypta chrysanthemifolia*). This is a transitional community. The tree canopy is absent or makes up less than 5 percent cover.

There are 2.34 acres of deerweed association are mapped within the TRVRP. It is found on Spooner's Mesa. Deerweed association makes up approximately 0.13 percent of the TRVRP.

Laurel Sumac-Deerweed Association (4.35.1)

In this association, laurel sumac and deerweed are co-dominants. The association tends to be open. Associated species include California sagebrush, Ramona ceanothus (*Ceanothus tomentosus*), chaparral whitethorn (*Ceanothus leucodermis*), sage (*Salvia* spp.), California buckwheat, spiny redberry (*Rhamnus crocea*), and our Lord's candle. Herbaceous cover is widespread and diverse. Members of the herbaceous layer include morning glory, artemisia pincushion (*Chaenactis artemisiifolia*), wild cucumber (*Marah macrocarpus*), wishbone bush (*Mirabilis laevis*), California thread stem (*Pterostegia drymarioides*), blow-wives (*Achyrrachaena mollis*), rattlesnake weed (*Daucus pusillus*), narrow-leaf filago (*Logfia gallica*), and lupines (*Lupinus* spp.). This association is often observed after fires.

There are 11.99 acres of laurel sumac-deerweed association mapped within the TRVRP. It is found on Spooner's and Monument Mesa. Laurel sumac-deerweed association makes up approximately 0.68 percent of the TRVRP.

Lemonadeberry Association (4.42.1)

Lemonadeberry is the dominant species in this association or is at least twice as common as any other shrub species. Associated species include chamise, California sagebrush, monkey flower, California encelia, California buckwheat, toyon (*Heteromeles arbutifolia*), laurel sumac, spiny redberry, black sage, and mission manzanita. Generally, cover by herbaceous species is low and where herbs do occur, they are often restricted to openings in the shrub layer. Tree cover is generally absent or makes up less than 5 percent cover.

There are 3.89 acres of lemonadeberry association mapped within the TRVRP. It is found on both Spooner's and Monument Mesa, and a small patch is in the northeastern portion of the TRVRP. Lemonadeberry association makes up approximately 0.22 percent of the TRVRP.

White Sage-California Sagebrush Association (4.43.2)

In the white sage-California sagebrush association, these two species occur as co-dominants. Other species often associated with this community include California buckwheat, laurel sumac, spiny redberry, our Lord's candle, and saw-toothed goldenbush. The herb layer is present and well developed with a diversity of species and most often occurs in openings in the shrub layer. This community can be observed as part of mature sage scrub or chaparral or as an early transitional phase following disturbance.

There are 3.17 acres of white sage-California sagebrush association are mapped within the TRVRP. It is found on the north facing slope of Spooner's Mesa. White sage-California sagebrush association makes up approximately 0.18 percent of the TRVRP.

Upland Herbaceous Vegetation

Black Mustard and Other Mustards Semi-Natural Stands (5.7)

This vegetation community includes stands of non-native annual mustards that occupy fallow fields, grasslands, roadsides, slopes, and disturbed areas. Mustards form dense stands that preclude native or non-native species from the area. Mustards tend to invade heavily disturbed areas. Associated species include black mustard, field mustard (*Brassica rapa*), Sahara mustard (*Brassica tournefortii*), short-pod mustard (*Hirschfeldia incana*), dyer's woad (*Isatis tinctoria*), and wild radish (*Raphanus sativus*). Native trees or shrubs may be present, but their cover is low.

There are 22.03 acres of black mustard and other mustards semi-natural stands mapped within the TRVRP. It is found sporadically throughout the TRVRP with large stands in the northeast, on Spooner's Mesa, and in the western-most parcel of the TRVRP. Black mustard and other mustards semi-natural stands make up approximately 1.2 percent of the TRVRP.

Black Mustard Semi-Natural Stand Type (5.7.1)

Black mustard is dominant and forms a continuous canopy in the herb layer in this stand type. Black mustard can reach heights of over six feet, so it can also dominate in the shrub layer. Other non-native mustards that may be dominant include field mustard, Sahara mustard, short-pod mustard, and wild radish. Black mustard is capable of invading native habitat on clay soils. Black mustard occurs throughout San Diego County but is most often encountered in drier locations.

There are 4.90 acres of the black mustard semi-natural stand type mapped within the TRVRP. It is found in the northeast, north of the Tijuana River. Black mustard semi-natural stand type makes up approximately 0.28 percent of the TRVRP.

Fascicled Tarplant Association (5.13.1)

The fascicled tarplant association occurs most often with sparse to trace cover in herb-dominated openings within many shrub-dominated vegetation types. Fascicled tarplant can be co-dominant or

dominant in the herbaceous layer. The association is also known from grasslands with vernal pools. Associated species can include needlegrass (*Nassella* spp.), paintbrush (*Castilleja* spp.), osmadenia (*Osmadenia tenella*), graceful tarplant (*Holocarpha virgata* ssp. *elongata*), goldfields (*Lasthenia gracilis*), sand aster (*Corethrogyne filaginifolia*), vernal barley (*Hordeum intercedens*), tidy-tips (*Layia platyglossa*), soap plant (*Chlorogalum* spp.), wild onion (*Allium* spp.), golden star (*Bloomeria* spp.), Brodiaea (*Brodiaea* spp.), and blue dicks (*Dichelostemma capitatum*). Oats (*Avena* spp.) are usually present though not usually co-dominant except on disturbed sites with clay soils. Tree and shrub canopy must be absent or less than 5 percent cover. Fascicled tarplant must make up at least 5 percent of the herb layer.

There are 1.80 acres of fascicled tarplant association mapped within the TRVRP. It is found on Spooner's Mesa. Fascicled tarplant association makes up approximately 0.1 percent of the TRVRP.

Garland Daisy Semi-Natural Stands (5.16.1)

Garland daisy (*Glebionis coronaria*) is the dominant species in this vegetation community. It may also be a co-dominant but must make up at least 30 percent cover in the herb layer. Associated species include ice plant (*Mesembryanthemum* spp.), wild radish, bromes, Russian thistle (*Salsola tragus*), sweet clover (*Melilotus* spp.), red-stem filaree (*Erodium cicutarium*), and tocalote (*Centaurea melitensis*). Trees are absent or make up less than 5 percent cover. Non-native grasses make up less than 50 percent cover.

There are 89.33 acres of garland daisy semi-natural stands mapped within the TRVRP. It is found throughout the park with the largest stands occurring on Spooner's Mesa, and north of Monument Road, south of the Tijuana River. Garland daisy semi-natural stands make up approximately 5.0 percent of the TRVRP.

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

This classification describes a community where non-native grasses and forbs are dominant over native species; however, none of the following species are dominant: oats, bromes, purple false brome (*Brachypodium distachyon*), ryegrass (*Lolium* spp.), fountain grass (*Pennisetum* spp.), black mustard, garland daisy, or poison hemlock (*Conium maculatum*). Other naturalized species present may include bent grass (*Agrostis* spp.), coarse fescue (*Festuca arundinacea*), cottontop (*Digitaria* spp.), Russian thistle, filaree (*Erodium* spp.), Johnson grass (*Sorghum* spp.), thistle (*Centaurea* spp.), Bermuda grass, Mediterranean grass (*Schismus* spp.), and milk thistle (*Silybum marianum*). There is much variation within this community and it occurs all over San Diego County. It is most often found in areas where native habitat has been displaced due to repeated soil disturbance.

There are 131.14 acres of Mediterranean California naturalized annual and perennial grassland semi-natural stands are mapped within the TRVRP. It is found in the western half of the TRVRP, north of Monument Road and south of the Tijuana River. Mediterranean California naturalized annual and perennial grassland semi-natural stands make up approximately 7.4 percent of the TRVRP and is the most abundant upland herbaceous vegetation community.

Non-Native Grassland (Holland Code 42200)

Non-native grassland may be composed of dense to sparse cover of annual grasses. It is generally 0.2 to one meter tall. In years of high rainfall, it can be associated with native wildflowers. In San Diego County, associated species include oats, bromes, filaree, mustards, tocalote, California poppy (*Eschscholzia californica*), lupines, and plantain (*Plantago* spp.), among others. In some areas, depending on rainfall,

forbs can be dominant. Germination often occurs with the onset of fall rains and occurs through the spring. Grass species are often dead in the summer and fall. It is usually found on fine textured to clay soils. This code was used to describe communities when the dominant species non-native grass species observed did not fit into one of the VCM associations or alliances.

There are 9.60 acres of non-native grassland mapped within the TRVRP. It occurs on the west side of Monument Mesa and the north of Monument Road, north of Spooner's Mesa. Non-native grassland makes up approximately 0.54 percent of the TRVRP.

Unvegetated

Disturbed Habitat (Holland Code 11300)

Disturbed habitat includes those areas that have been disturbed and are no longer considered native habitat, but still have a soil substrate. Vegetation is usually made up of invasive non-native species and ornamentals, and in particular those species that take advantage of disturbed areas. Commonly associated species include thistles (*Sonchus* spp.), Russian thistle, mustards (*Brassica* spp.), pampas grass (*Cortaderia* spp.), and fountain grass. The habitat no longer provides animal species with any beneficial uses, other than for dispersal. Examples of areas that are considered disturbed habitat include graded pads, areas actively managed for fuels, dirt parking lots, firebreaks, off-road vehicle trails, and home sites.

There are 71.03 acres of disturbed habitat mapped within the TRVRP. This habitat type occurs sporadically throughout the TRVRP. Disturbed habitat makes up approximately 4.0 percent of the TRVRP.

Developed (Holland Code 12000)

Developed areas are those that have been built on or physically altered to the extent that native vegetation is not supported. Developed land is often characterized by permanent or semi-permanent structures, pavement, hardscape, or landscaped areas that require irrigation. Areas where no natural land is evident due to a large amount of debris or other material being placed upon it are also considered developed. Usually plants in these areas are invasive non-native plants or ornamental. Developed (Trail) indicates trails that are established and open to the public as part of the formal trail network within the park. These trails are maintained by the County DPR.

There are 130.59 acres of developed land mapped within the TRVRP. The largest areas of developed land are mapped in the northern portion of the TRVRP towards the center. Land uses in these areas include a community garden, housing, roads, a park, ranches, and a former organic farm. Developed land makes up approximately 7.4 percent of the TRVRP.

Open Water (Holland Code 64100)

Open water is an unvegetated habitat. It is made up of year-round bodies of saline or fresh water. Fresh water bodies include lakes, streams, ponds, or rivers.

There are 9.53 acres of open water mapped within the TRVRP. Open water in the TRVRP consists of three ponds which include Dairy Mart pond, and two additional unnamed ponds north of the Tijuana

River in the northwestern corner of the park. Open water makes up approximately 0.54 percent of the TRVRP.

Unvegetated Habitat – Streambed (Holland Code 64000)

Unvegetated habitat (streambed) includes areas that are unvegetated and within the corridor of a stream or river. The stream or river may be ephemeral or intermittent, making open water an inappropriate name for this habitat type at the time vegetation mapping was conducted; however, these areas may contain water depending on time of year.

A total of 3.08 acres of streambed were mapped within the TRVRP. The drainage that flows north from Smuggler’s Gulch was mapped as unvegetated habitat (streambed). Unvegetated habitat (streambed) makes up approximately 0.17 acre of the TRVRP.

Disturbed Habitat – Trail (Holland Code 11300)

Disturbed habitat-trail includes areas of unauthorized trails that have been established throughout the TRVRP without the consent of the County DPR. Many of these trails have been officially closed to the public as a formal trail network is established. These trails were observed throughout the TRVRP.

4.2 PLANTS

A total of 239 plant species were observed within the TRVRP during the 2018 baseline surveys, consisting of 133 native plant species and 106 invasive non-native plant species. Appendix A lists all of the plant species observed during the 2018 baseline surveys.

4.2.1 Special Status Plant Species Observed

Special status plant species include species that are listed as threatened or endangered, proposed for listing, or are candidate species by the federal (USFWS) or state (CDFW) governments; those with CRPR 1 through 4 as designated by the CNPS (CNPS 2018); those that are listed as sensitive by the County (2010a); and those covered by the City MSCP Subarea Plan (City 1997). In total, 16 special status plant species were identified within the TRVRP during 2018 baseline biological surveys (Figures 11a-11f), including three species covered under the City’s MSCP Subarea Plan (City 1997). Special status plant species observed were singlewhorl burrobrush (*Ambrosia monogyra*), San Diego sagewort (*Artemisia palmeri*), San Diego County viguiera, golden-spined cereus (*Bergerocactus emoryi*), wart-stemmed ceanothus (*Ceanothus verrucosus*), western dichondra (*Dichondra occidentalis*), cliff spurge (*Euphorbia misera*), San Diego barrel cactus (*Ferocactus viridescens*), San Diego marsh-elder (*Iva hayesiana*), Southern California black walnut (*Juglans californica*), southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*), sea dahlia (*Leptosyne maritima*), Baja California birdbush (*Ornithostaphylos oppositifolia*), Torrey pine (*Pinus torreyana* ssp. *torreyana*), Nuttall’s scrub oak (*Quercus dumosa*), and ashy spike-moss (*Selaginella cinerascens*). Torrey pine, San Diego barrel cactus, and wart-stemmed ceanothus are covered under the City’s MSCP Subarea Plan. Plant descriptions are from the Jepson eFlora (2018), Rare Plants of San Diego County (Reiser 2001), and Calflora (2018).

Singlewhorl burrobrush (*Ambrosia monogyra*)**Status: --/--; CRPR 2B.2**

Singlewhorl burrobrush is a perennial shrub that occurs in washes and dry riverbeds at elevations below 1,640 feet (500 meters). This species occurs in San Diego, Los Angeles, Orange, Santa Barbara, San Luis Obispo, and Ventura counties, as well as on several islands: Anacapa Island, Santa Barbara Island, San Clemente Island, Santa Catalina Island, Santa Cruz Island, San Nicolas Island, and Santa Rosa Island. In San Diego County, most observations of this species occur in the southwestern part of the county.

Patches of singlewhorl burrobrush are mapped in the northern and southeastern portions of the TRVRP (Figures 11a, 11d, and 11e). A total of 1,327 individuals were mapped in 2018 within the TRVRP. These patches were observed in areas with historical sightings, and new sightings occurred adjacent to the Dairy Mart Pond and Duck Ponds, south of the Baseball Fields, at the base of Monument Mesa, and adjacent to the Butterfly Gardens.

San Diego sagewort (*Artemisia palmeri*)**Status: --/--, CRPR 4.2; County List D**

San Diego sagewort is a biennial or perennial herb that is typically found in sandy soil along stream courses below 1,969 feet (600 meters). This species often occurs within a shaded understory beneath riparian woodland, but may occur in coast live oak woodland, within coastal sage scrub, or in southern mixed chaparral. San Diego sagewort occurs in San Diego County and Baja California. This species is declining as a result of urbanization.

This species was mapped at three locations in 2018 in and near riparian areas within the northwestern portion of the TRVRP (Figures 11a and 11b). Eighty-five individuals were mapped within the TRVRP. This species was previously mapped on Monument Mesa in 2004.

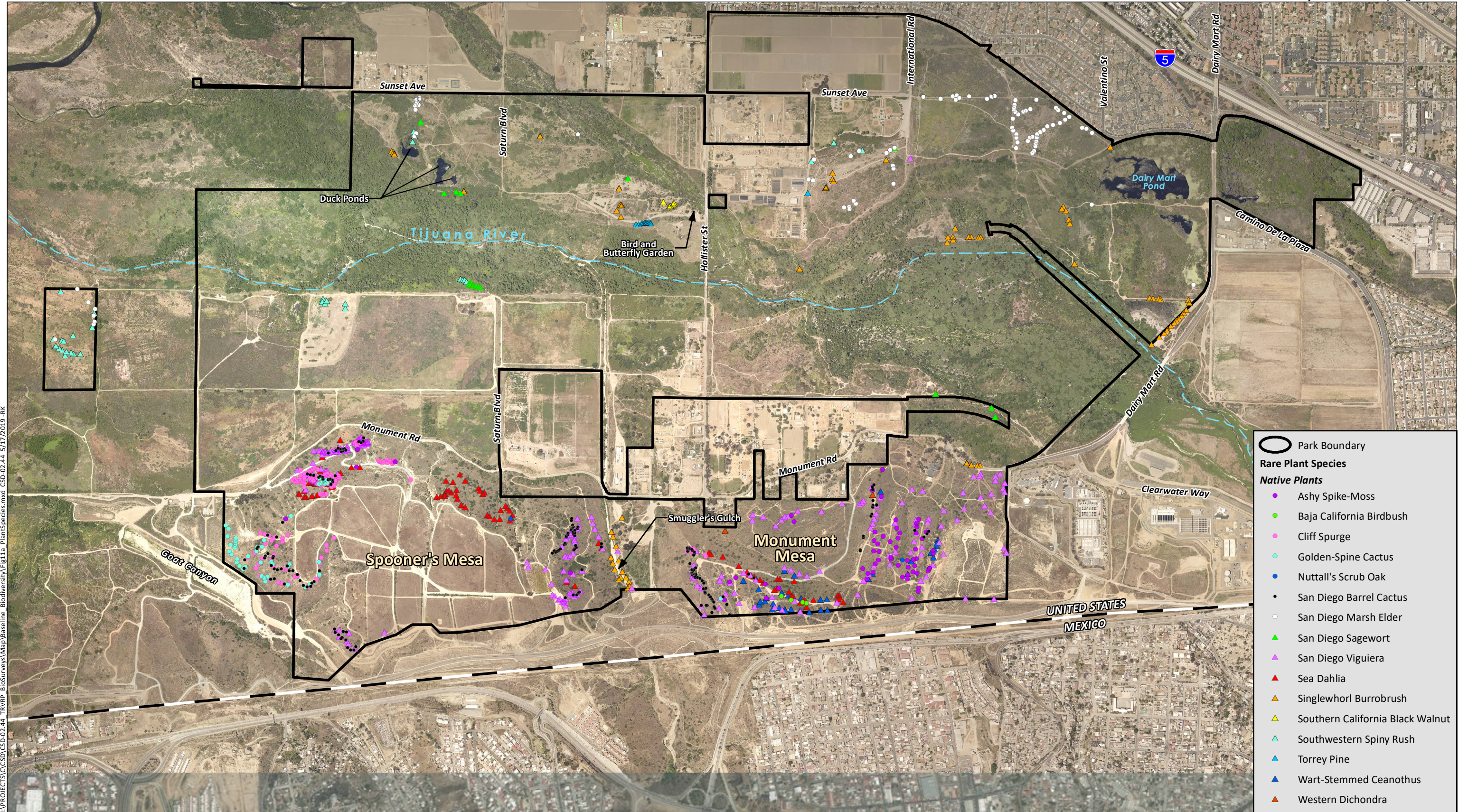
San Diego County viguiera (*Bahiopsis [=Viguiera] laciniata*)**Status: --/--, CRPR 4.3; County List D**

San Diego viguiera is a perennial shrub that occurs on a variety of soil types in arid Diegan coastal sage scrub. Generally, shrub cover is more open than at mesic, coastal locales supporting sage scrub. This species occurs at elevations between 295 and 2,461 feet (90 to 750 meters). San Diego viguiera occurs in San Diego and Orange Counties, and in Baja California. Although this species is declining due to urbanization, it may be locally dominant and may colonize mildly disturbed areas.

This species is mapped in abundance within Diegan coastal sage scrub and maritime succulent scrub communities in the southern half of the TRVRP (Figures 11a, 11c, and 11e). A total of 3,672 individuals were mapped in 2018 within the TRVRP. Multiple new occurrences of this plant were observed on Monument Mesa, around the base of Spooner's Mesa, and south of the Baseball Fields.

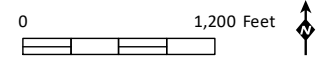
Golden-spined cereus (*Bergerocactus emoryi*)**Status: --/--, CRPR 2B.2; County List B**

Golden-spined cereus is a stem succulent shrub that occurs on sandy soils and dry bluffs along the coast and is typically associated with maritime succulent scrub. It may also be found within chaparral, coastal sage scrub, and closed-cone pine forests. This species occurs at elevations below 328 feet (100 meters). Golden-spined cereus is known from southern San Diego County, San Clemente Island, Santa Catalina Island, and Baja California. It is near its northernmost range in San Diego County, and its population is declining.



- Park Boundary
- Rare Plant Species**
- Native Plants**
- Ashy Spike-Moss
- Baja California Birdbush
- Cliff Spurge
- Golden-Spine Cactus
- Nuttall's Scrub Oak
- San Diego Barrel Cactus
- San Diego Marsh Elder
- San Diego Sagewort
- San Diego Viguiera
- Sea Dahlia
- Singlewhorl Burrobrush
- Southern California Black Walnut
- Southwestern Spiny Rush
- Torrey Pine
- Wart-Stemmed Ceanothus
- Western Dichondra

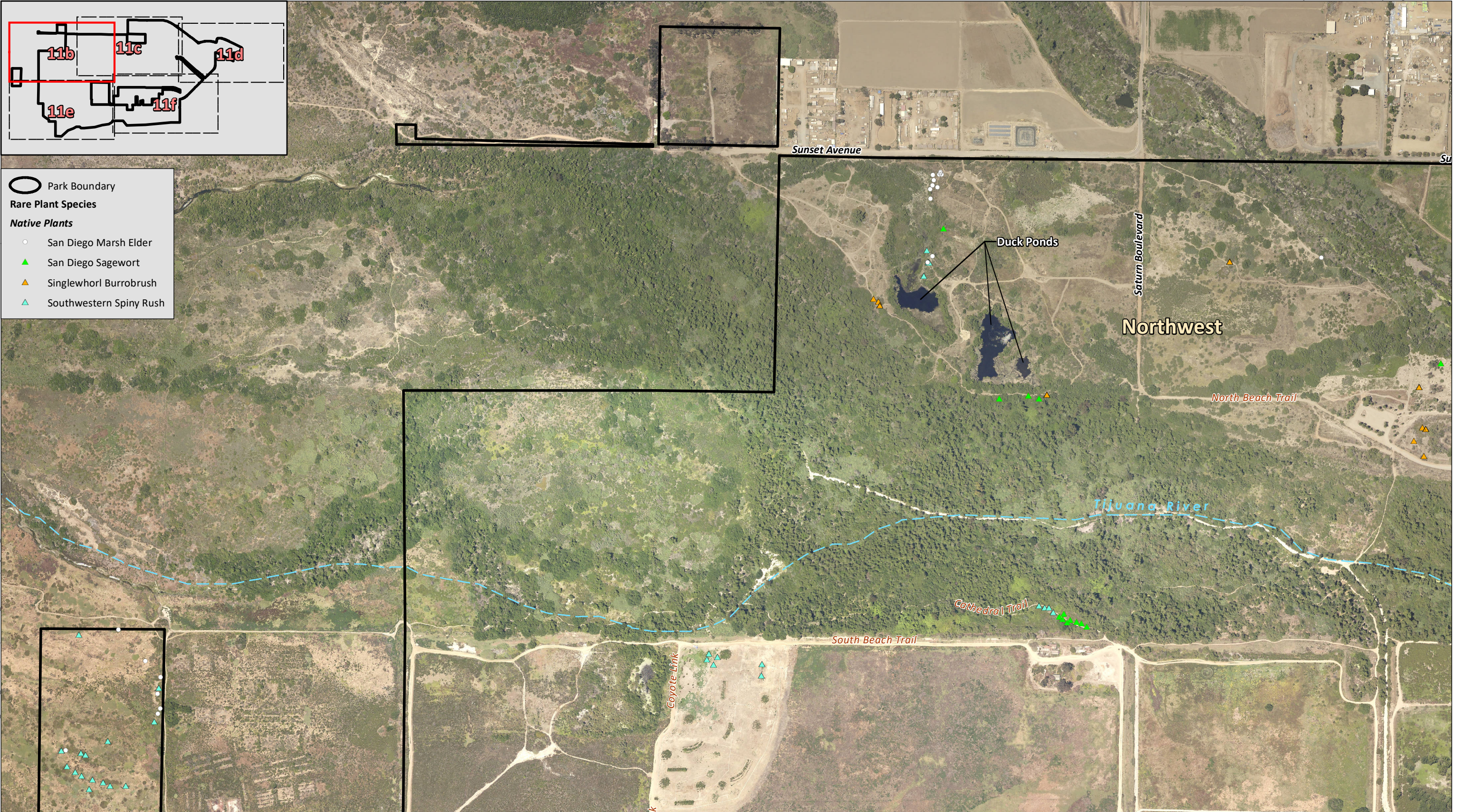
Aerial Photo: SanGIS (2017)



Special Status Plant Species

Figure 11a

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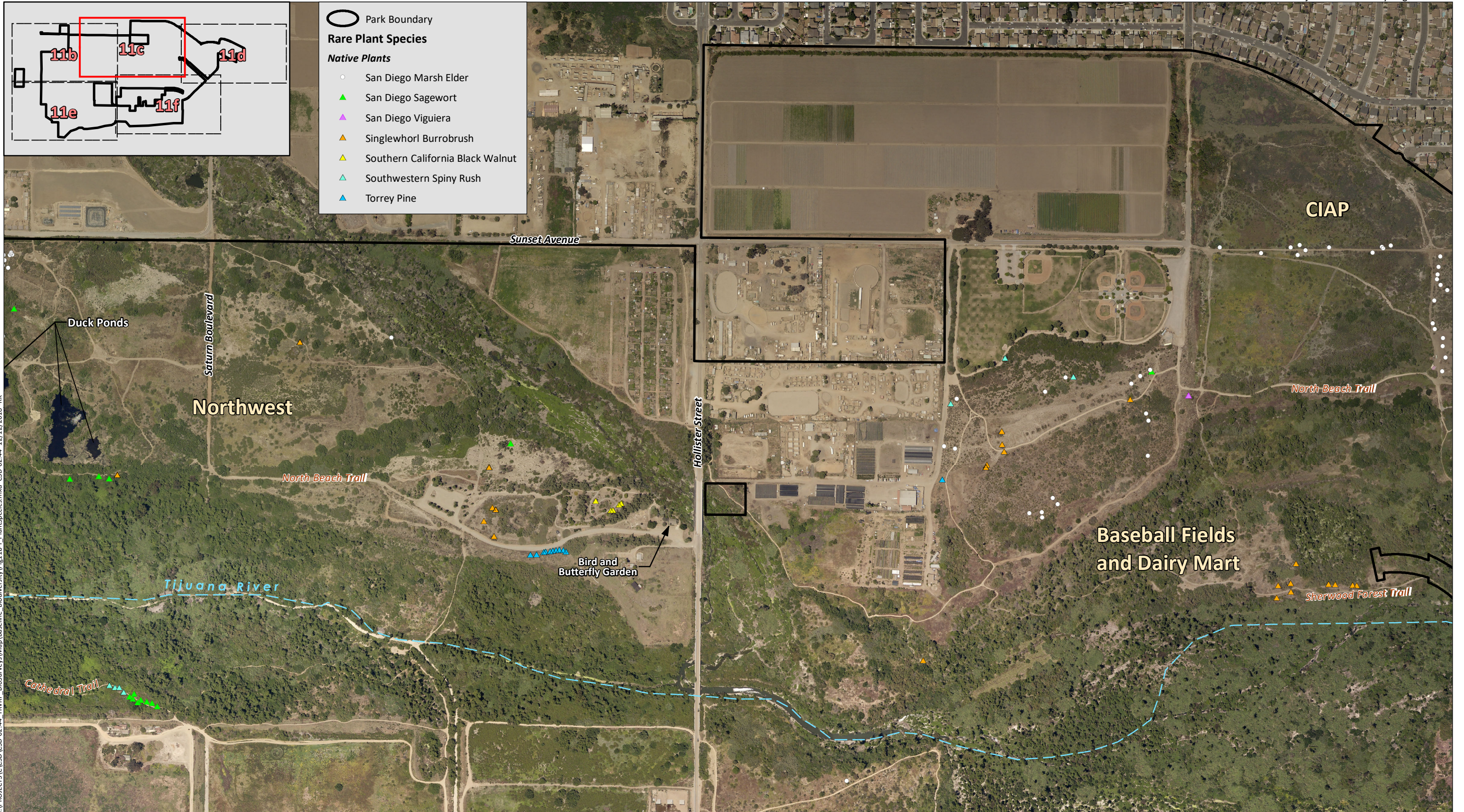
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Aerial Photo: SanGIS 2017



Special Status Plant Species

Figure 11b



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Aerial Photo: SanGIS 2017



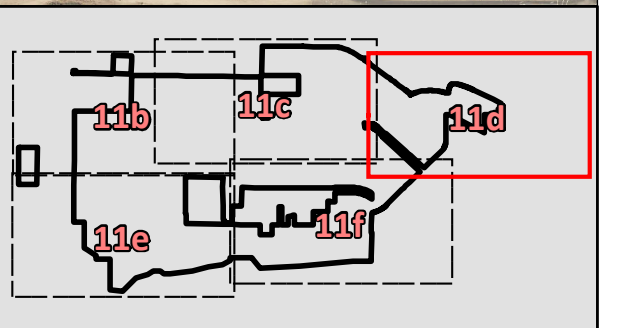
Special Status Plant Species

Figure 11c



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- Park Boundary
- Rare Plant Species**
- Native Plants*
- San Diego Marsh Elder
- ▲ Singlewhorl Burrobrush

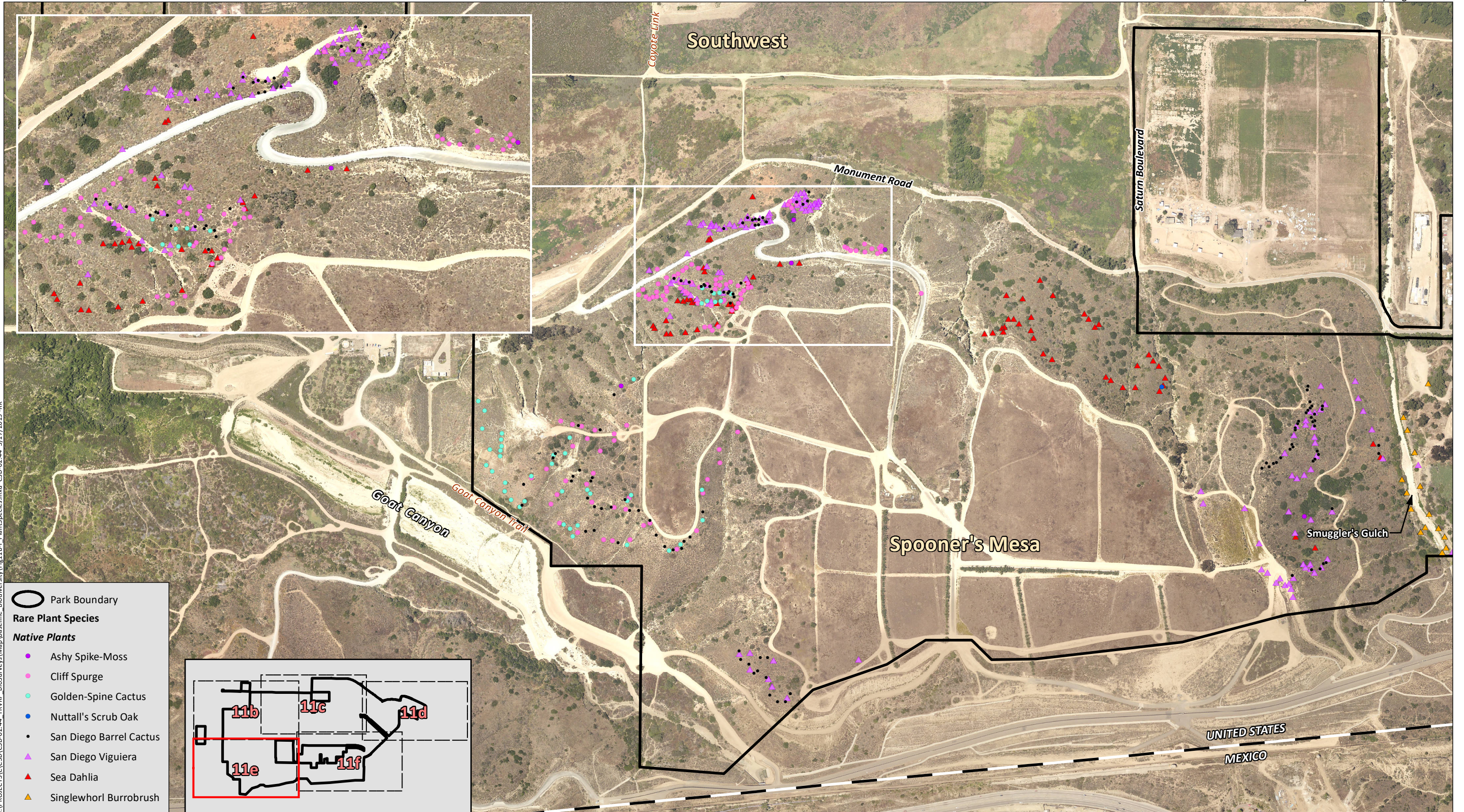


Aerial Photo: SanGIS 2017



Special Status Plant Species

Figure 11d



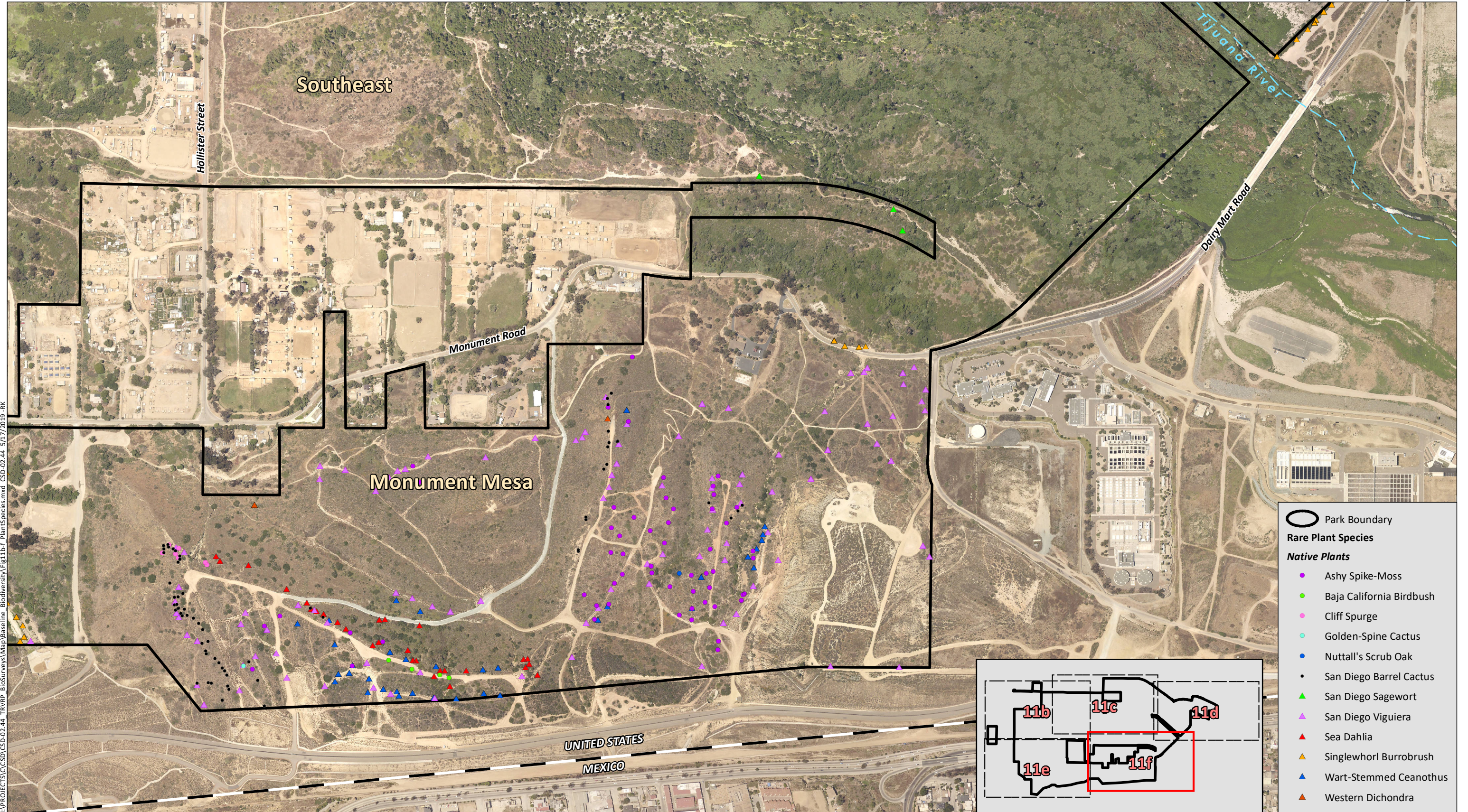
Aerial Photo: SanGIS 2017



Special Status Plant Species

Figure 11e

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○ Park Boundary

Rare Plant Species

Native Plants

- Ashy Spike-Moss
- Baja California Birdbush
- Cliff Spurge
- Golden-Spine Cactus
- Nuttall's Scrub Oak
- San Diego Barrel Cactus
- ▲ San Diego Sagewort
- ▲ San Diego Viguiera
- ▲ Sea Dahlia
- ▲ Singlewhorl Burrobrush
- ▲ Wart-Stemmed Ceanothus
- ▲ Western Dichondra

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Aerial Photo: SanGIS 2017



Special Status Plant Species

Figure 11f

This species was mapped in Diegan coastal sage scrub and maritime succulent scrub in the southwest portion of the TRVRP (Figures 11a and 11c). A total of 1,753 individuals were mapped in 2018 within the TRVRP. This cactus was also observed on the western slope of Spooner's Mesa where it has been historically observed.

Wart-stemmed ceanothus (*Ceanothus verrucosus*)

Status: --/--; CRPR 2B.2; County List B; City MSCP Covered

Wart-stemmed ceanothus is a perennial evergreen shrub occurring in xeric chamise or southern maritime chaparral at elevations below 1,148 feet (350 meters). Preferred habitat is coastal chaparral intermixed with chamise (*Adenostoma fasciculatum*) and mission manzanita (*Xylococcus bicolor*). It may be restricted to metavolcanic and gabbroic peaks in western San Diego County. It is known to occur on Exchequer rocky silt loam, San Miguel-Exchequer rocky silt loam, terrace escarpment, and Gaviota fine sandy loam. Wart-stemmed ceanothus occurs in San Diego County and Baja California and appears to have been relatively common on suitable soils prior to urban development.

This species was mapped within the TRVRP in Diegan coastal sage scrub on Monument Mesa (Figures 11a and 11e). A total of 277 individuals were mapped in 2018 within the TRVRP. This plant was observed on Monument Mesa in the same location as observations documented in 2004.

Western dichondra (*Dichondra occidentalis*)

Status: --/--; CRPR 4.2; County List D

Western dichondra is a perennial rhizomatous herb. It occurs on a variety of soil types in Diegan coastal sage scrub, southern mixed chaparral, chamise chaparral, and rocky outcrops in grasslands, and often proliferates on recently burned slopes. It occurs at elevations below 1,706 feet (520 meters). Western dichondra occurs in several counties (San Diego, Santa Barbara, Ventura, Los Angeles, Orange, and possibly Marin), multiple islands (Santa Catalina, Santa Cruz, San Miguel, and Santa Rosa), and Baja California.

This species was mapped at one location on the northwest end of Monument Mesa (Figures 11a and 11e). A total of 526 individuals were mapped in 2018 within the TRVRP. This species was previously observed on Spooner's Mesa.

Cliff spurge (*Euphorbia misera*)

Status: --/--; CRPR 2B.2; County List B

Cliff spurge is a perennial shrub. It occurs on coastal bluffs and rocky slopes within maritime sage scrub at elevations below 1,640 feet (500 meters). This species occurs in San Diego County, Orange County, Riverside County, San Clemente Island, and Baja California.

This species was observed in the western half of Spooner's Mesa and Monument Mesa within the TRVRP (Figures 11a, 11c, and 11e). A total of 1,962 individuals were mapped in 2018 within the TRVRP. This species was generally observed in the same locations as observations documented in 2009.

San Diego barrel cactus (*Ferocactus viridescens*)

Status: --/--; CRPR 2B.1; County List B; City MSCP Covered

San Diego barrel cactus is a stem succulent shrub. Optimal habitat for this cactus appears to be Diegan coastal sage scrub hillsides, often at the crest of slopes and growing among cobbles. It is occasionally found on vernal pool periphery and mima mound topography in Otay Mesa. It occurs at elevations between 33 to 492 (10 to 150 meters). San Diego barrel cactus occurs in coastal San Diego County and Baja California.

This species was observed in Diegan coastal sage scrub and maritime succulent scrub in Spooner's Mesa and Monument Mesa (Figures 11a, 11c, and 11e). A total of 1,367 individuals were mapped in 2018 within the TRVRP. This cactus species was generally observed in the same locations as observations from 2009 and was additionally observed on the eastern slopes of Spooner's Mesa and the western slopes of Monument Mesa.

San Diego marsh elder (*Iva hayesiana*)

Status: --/--; CRPR 2B.2; County List B

San Diego marsh elder is a conspicuous, perennial herb typically found in creeks or intermittent streambeds, where open canopy allows sunlight to reach the species. It is rarely observed at seeps near creeks. Sandy alluvial embankments with cobbles are frequently utilized. In the southwestern portion of the County, this plant may occur in steep watercourses where other riparian vegetation is not present, and on other soil types (e.g., San Miguel-Exchequer or Huerhuero loam). Most occur at elevations below 984 feet (300 meters). San Diego marsh elder occurs in San Diego County and Baja California. Although the population is considered stable, it may be affected by modifications and degradation of coastal drainages.

This species was mapped in riparian areas in the northern side of the TRVRP (Figures 11a, 11b, and 11d). A total of 804 individuals were mapped in 2018 within the TRVRP. This species was generally observed in the same locations as observations from 2009, and was additionally observed throughout the CIAP area, south of the Baseball Fields, and north of the Duck Ponds.

Southern California black walnut (*Juglans californica*)

Status: --/--; CRPR 4.2; County List D

Southern California black walnut is a long-lived tree that reaches heights of 20 to 50 feet. It occurs in open savannah, with preference for deep alluvial soils with high water-retention capacity. This species tends to grow in creek beds, alluvial terraces, and north-facing slopes. It occurs at elevations of 98 to 2,953 feet (30 to 900 meters). Southern California black walnut occurs in San Diego, Orange, Riverside, Santa Barbara, San Bernardino, Ventura, and Los Angeles Counties.

This species is declining throughout its range, due to hybridization with introduced walnut species, habitat overgrazing and loss of young trees, urban development, and crown rot.

A patch of five plants was mapped in 2018 at Butterfly Gardens in non-native riparian/Diegan coastal sage scrub (Figures 11a and 11b). It is believed that these trees were planted.

Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*)

Status: --/--; CRPR 4.2; County List D

Southwestern spiny rush is a perennial herb that occurs in coastal salt marshes at brackish locales, alkaline meadows, and riparian marshes. This species may also occur along drainages with willow vegetation or sycamore woodland at mid-elevations, or in palm oases in the desert. Southwestern spiny rush generally occurs at elevations below 984 feet (300 meters). This species occurs in San Diego County, Los Angeles County, Santa Barbara County, Ventura County, Orange County, San Luis Obispo County, Santa Catalina Island, and Baja California. Populations in San Diego County are relative stable.

This species was mapped at five locations in the northern part of the TRVRP (Figures 11a, 11b, and 11d). A total of 207 individuals were mapped in 2018.

Sea dahlia (*Leptosyne maritima*)**Status: --/--; CRPR 2B.2; County List B**

Sea dahlia is a perennial herb that occurs on sandstone bluffs near the ocean. This species typically chooses highly eroding slopes where competition from other shrubs is limited and is known to occur on Gaviota fine sandy loam and Terrace Escarpment sandstone. This species occurs at elevations below 66 feet (20 meters). Sea dahlia occurs in San Diego County and Baja California. This species is declining in San Diego County due to natural herbivory, erosion, and development.

This species was mapped in Diegan coastal sage scrub on Spooner's Mesa and Monument Mesa (Figures 11a, 11c, and 11e). A total of 842 individuals were mapped in 2018 within the TRVRP. This species was generally observed in the same locations as observations from 2007, 2008, and 2012.

Baja California birdbush (*Ornithostaphylos oppositifolia*)**Status: --/SE; CRPR 2B.1; County List B**

Baja California birdbush is a perennial shrub that occurs in coastal chaparral hills south of Tijuana River Valley. It occurs at elevations between 328 and 2,625 feet (100 to 800 meters). This species occurs in southern San Diego County and Baja California. It is declining at its one United States location.

A patch of this species was mapped in Diegan coastal sage scrub/southern maritime chaparral along the southern edge of Monument Mesa (Figures 11a and 11e). Nine individuals were mapped in 2018 within the TRVRP. This species was generally observed in the same locations as observations from 1999.

Torrey pine (*Pinus torreyana* ssp. *torreyana*)**Status: --/--; CRPR 1B.2; County List A; City MSCP Covered**

Torrey pine is a tree. This subspecies occurs naturally in only one San Diego County location: in closed coniferous forest along the coast near the City of Del Mar, although it has been planted in other locations. It also occurs naturally on Santa Rosa Island. This species occurs at elevations below 656 feet (200 meters). The San Diego County population of Torrey pine is somewhat declining due to beetle infestation and human induced fires.

Torrey pine trees were observed at two locations in the TRVRP and are not naturally occurring (Figures 11a and 11b). One individual was mapped on developed land in the northeastern portion of the TRVRP. In 2018 ten trees were present at the Bird and Butterfly Garden.

Nuttall's scrub oak (*Quercus dumosa*)**Status: --/--; CRPR 1B.1; County List A**

Nuttall's scrub oak is a perennial shrub. It is generally found on sandy or clay loam soils in open coastal chaparral in flat terrain or as monotypic stands on north-facing slopes. It occurs throughout San Diego County at elevations below 656 feet (200 meters). This species occurs in San Diego County, Orange County, Santa Barbara County, and Baja California.

This species was mapped in a few locations in the southern portion of the TRVRP (Figures 11a, 11c, and 11e). Four individuals were mapped in 2018 within the TRVRP. This species was generally observed in the same locations as observations from 2007.

Ashy spike-moss (*Selaginella cinerascens*)**Status: --/--; CRPR 4.1; County List D**

Ashy spike-moss is a rhizomatous fern, occurring in undisturbed chaparral and Diegan coastal sage scrub. A good indicator of site degradation, as it rarely inhabits disturbed soils. This species occurs at

elevations below 1,804 feet (550 meters). Ashy spike-moss occurs in San Diego and Orange Counties and Baja California. This species is declining due to urban development but is locally abundant.

This species was mapped in Diegan coastal sage scrub on Spooner's Mesa and Monument Mesa (Figures 11a, 11c, and 11e). Because of the growth form of ashy spike-moss, the number of individuals was not estimated, but is likely in excess of thousands.

4.2.2 SPECIAL STATUS PLANT SPECIES WITH HIGH POTENTIAL TO OCCUR

Based on an analysis of elevation, soils, vegetation communities, previous rare plant surveys conducted within the TRVRP, and recorded observations of special status plant species in and near the TRVRP, 23 special status plant species have a high potential to occur in the TRVRP (Appendix C): Nuttall's acmispon (*Acmispon prostratus*), San Diego bur-sage (*Ambrosia chenopodiifolia*), aphanisma (*Aphanisma blitoides*), Coulter's saltbush (*Atriplex coulteri*), south coast saltscale (*Atriplex pacifica*), San Diego goldenstar (*Bloomeria [Muilla] clevelandii*), Lewis' evening-primrose (*Camissoniopsis lewisii*), Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana*), salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*), seaside calandrinia (*Cistanthe maritima*), Orcutt's bird's-beak (*Dicranostegia orcuttiana*), Orcutt's dudleya (*Dudleya attenuata* ssp. *attenuata*), Blochman's dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*), variegated dudleya (*Dudleya variegata*), Palmer's frankenia (*Frankenia palmeri*), California box-thorn (*Lycium californicum*), spreading navarretia (*Navarretia fossalis*), Brand's star phacelia (*Phacelia stellaris*), Santa Catalina Island currant (*Ribes viburnifolium*), chaparral ragwort (*Senecio aphanactis*), estuary seablite (*Suaeda esteroa*), woolly seablite (*Suaeda taxifolia*), and California screw moss (*Tortula californica*). Based on regional observations, 2018 may have been a poor year to observe annual plants that may be present in the seed bank.

The potential for special status plant species to occur within the TRVRP was evaluated based on the elevation, soils, vegetation communities, and level of disturbance of the TRVRP, as well as species status and distribution in the vicinity of the TRVRP and the results of rare plant surveys.

Nuttall's acmispon (*Acmispon [Lotus] prostratus*)

Status: --/--; CRPR 1B.1

Nuttall's acmispon is an annual herb typically found in coastal dunes, particularly well protected back dunes with minimal foot traffic, within coastal strand and coastal sage scrub. It may also occur in disturbed areas. It occurs on beach sands and riverwash at elevations below 98 feet (30 meters). Nuttall's acmispon occurs in San Diego County and Baja California.

Recent observations within San Diego County occur in the immediate vicinity of the coast. Near the site, recent recorded observations are to the southwest in Border Field State Park, but there are several older observations recorded throughout the TRVRP.

Shaw's agave (*Agave shawii* var. *shawii*)

Status: --/--; CRPR 2B.1; County List B; City MSCP Covered

Shaw's agave is a perennial succulent most often found on coastal bluffs and along mesas and foothills. It occurs in coastal Diegan coastal sage scrub and maritime succulent scrub at elevations below 984 feet (300 meters). Shaw's agave is abundant in Baja California but is almost extirpated from San Diego County.

A natural population is present near the site at Border Field State Park, directly west of the Park, and a few plants just south of Point Loma College may be native. This species has been introduced at various coastal locations in San Diego. Coastal mesas in southern portion of TRVRP may support this species.

San Diego bur-sage (*Ambrosia chenopodiifolia*)

Status: --/--; CRPR 2B.1; County List B

San Diego bur-sage is a perennial shrub that occurs within arid coastal sage scrub at elevations below 820 feet (250 meters). Most of this species' range occurs in Baja California, although it extends into southern San Diego County. This species is declining in the United States with the development of Otay Mesa.

This species has not previously been observed within the TRVRP. Areas of the TRVRP with coastal sage scrub habitat (Spooner's Mesa and Monument Mesa) have potential to support this species.

Aphanisma (*Aphanisma blitoides*)

Status: --/--; CRPR 1B.2; County List A; City MSCP Covered

Aphanisma is an annual herb. It is typically found along the coast, on bluffs and saline sand within sage scrub communities. It may be associated with sea cliff buckwheat (*Eriogonum parvifolium*), California orach (*Extriplex californica*), and seaside calandrinia. This species has been observed at elevations below 656 feet (200 meters). Aphanisma is close to or may be extirpated in San Diego County. This species is known from San Diego, Orange, Los Angeles, Santa Barbara, and Ventura counties; Anacapa, Santa Barbara, San Clemente, Santa Catalina, Santa Cruz, San Nicolas, and Santa Rosa Islands; and Baja California.

Historical observations are recorded to occur along the west side of the TRVRP, and suitable sage scrub habitat is present.

Coulter's saltbush (*Atriplex coulteri*)

Status: --/--; CRPR 1B.2; County List A

Coulter's saltbush is a perennial herb. It is typically found on alkaline or clay soils on open sites such as dunes within coastal strand and coastal sage scrub communities, and less often in valley grasslands. Sea bluffs are its preferred habitat, although it has been noted that it is sometimes found at inland locations that mimic beach bluff or salt marsh edge habitat. Coulter's saltbush has been observed at elevations below 1,640 feet (500 meters). This species may be extirpated from San Diego County, as well as nearing extirpation elsewhere in mainland California. It is known from San Diego, Orange, Riverside, Los Angeles, Santa Barbara, and San Bernardino Counties; San Clemente, Santa Catalina, San Miguel, Santa Rosa, Santa Cruz, Anacapa, and San Nicolas Islands; Baja California; and San Benito Island in Mexico.

Multiple recent observations have been recorded in the southern portion of TRVRP and directly west of TRVRP. This species could occur in coastal sage scrub habitat in the southern portion of the TRVRP.

South coast saltscale (*Atriplex pacifica*)

Status: --/--; CRPR 1B.2; County List A

South coast saltscale is an annual herb. It is found coastally on dunes and within playas in alkali sinks, and sage scrub and wetland riparian communities at elevations below 984 feet (300 meters). It occurs in xeric areas, often in mildly disturbed areas surrounded by open Diegan coastal sage scrub. It is known from several counties (San Diego, Orange, Los Angeles, Ventura, and Riverside) and islands (San Clemente, Anacapa, Santa Catalina, Santa Cruz, San Nicolas, and Santa Rosa), Baja California, and Sonora, Mexico. However, its population is declining throughout its coastal range on the mainland.

This species was not observed during 2018 surveys; however, there are multiple observations from 2008 recorded in southern portion of the TRVRP, and this species could occur in coastal sage scrub in Spooner's Mesa and Monument Mesa.

San Diego goldenstar (*Bloomeria [Muilla] clevelandii*)

Status: --/--; CRPR 1B.1; County List A; City MSCP Covered

San Diego goldenstar is a perennial bulbiferous herb. It occurs in valley grasslands and coastal scrub, particularly near mima mound topography or in the vicinity of vernal pools, on clay soils. San Diego goldenstar has been observed at elevations below 328 feet (100 meters). This species occurs in San Diego County and Baja California.

The nearest recorded observation of San Diego goldenstar is approximately 3.9 miles northeast of the TRVRP.

Lewis' evening-primrose (*Camissoniopsis lewisii*)

Status: --/--; CRPR 3; County List C

Lewis' evening-primrose is an annual herb. It occurs in very sandy substrates near the beach, typically on beach bluffs at elevations below 984 feet (300 meters). This species occurs in San Diego, Orange, and Los Angeles Counties, and Baja California.

Nearest the Park, this species is rare near the coastal strand at Border Field State Park, Spooner's Mesa, and the western edge of Otay Mesa. A historical observation prior to 1974 occurs in the eastern end of the TRVRP.

Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana*)

Status: --/--; CRPR 1B.1; County List A

Orcutt's pincushion is an annual herb, that occurs in sandy coastal bluff scrub and coastal dunes at elevations below 328 feet (100 meters). This species occurs along the coast in San Diego, Orange, Los Angeles, and Ventura Counties, and Baja California, and is declining with habitat development.

A historical observation prior to 2001 occurs within the Park, and a 2018 CNPS observation is recorded directly north of the eastern portion of the Park. During 2007 surveys of the site, one population of approximately 50 plants was observed on the bluffs adjacent to Smuggler's Gulch. A single individual pincushion (*Chaenactis* sp.) was observed in the TRVRP during 2018 surveys; however, this specimen lacked diagnostic features and was not identifiable to species level.

Salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*)

Status: FE/SE; CRPR 1B.2; County List A

Salt marsh bird's-beak is an annual herb that typically occurs along the coast. It is found within coastal strand, salt marsh, and wetland riparian communities below 33 feet (10 meters). This species is approaching extirpation in San Diego County. Salt marsh bird's-beak is known from San Luis Obispo County, Santa Barbara County, Ventura County, Los Angeles County, Orange County, San Diego County, and Baja California.

Historical observations are recorded to occur in the central portion of the TRVRP.

Seaside calandrinia (*Cistanthe [Calandrinia] maritima*)**Status: --/--; CRPR 4.2; County List D**

Seaside calandrinia is an annual herb that occurs on sandy bluffs near the beach and sandy openings in Diegan coastal sage scrub. This species occurs at elevations below 984 feet (300 meters). This species is known from Santa Barbara County, Ventura County, Los Angeles County, Orange County, San Diego County, Anacapa Island, Santa Barbara Island, San Clemente Island, Santa Catalina Island, Santa Cruz Island, Santa Rosa Island, and Baja California.

This species has been recorded to occur on Spooner's Mesa in 2017. Suitable sandy bluffs associated with Diegan coastal sage scrub are found as a narrow strip along the western cliffside of Spooner's Mesa, but higher quality habitat for this plant species occurs further west outside the park along the coast.

Orcutt's bird's-beak (*Dicranostegia orcuttiana*)**Status: --/--; CRPR 2B.1; County List B**

Orcutt's bird's-beak is an annual herb that is found in seasonally dry drainages and upland adjacent to riparian habitat. This species occurs at elevations below 1,148 feet (350 meters). Orcutt's bird's-beak is known from southern San Diego County and Baja California.

Historical observations are recorded to occur in the southern portion of the TRVRP.

Orcutt's dudleya (*Dudleya attenuata* ssp. *attenuata*)**Status: --/--; CRPR 2B.1; County List B**

Orcutt's dudleya is a perennial herb succulent that occurs on coastal bluffs within chaparral and coastal sage scrub communities. It occurs at elevations below 164 feet (50 meters). Orcutt's dudleya is known from San Diego County (Border Field State Park) and Baja California.

Historical observations have been recorded to occur northeast and southwest of the TRVRP.

Blochman's dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*)**Status: --/--; CRPR 1B.1; County List A**

Blochman's dudleya is a perennial herb succulent that grows on open, rocky slopes, often on serpentine or clay dominated soils in coastal sage scrub and valley grassland communities. It occurs at elevations below 1,476 feet (450 meters). Blochman's dudleya is known to occur in San Diego County, Orange County, Los Angeles County, Ventura County, Santa Barbara County, San Luis Obispo County, and Baja California.

Historical observations have been recorded in the southern portion of the TRVRP.

Variegated dudleya (*Dudleya variegata*)**Status: --/--; CRPR 1B.2; County List A; City MSCP Covered**

Variegated dudleya is a perennial herb succulent that occurs on dry hillsides and mesas within chaparral, valley grassland, foothill woodland, and coastal sage scrub communities. It occurs at elevations below 984 feet (300 meters). Variegated dudleya is known to occur in San Diego County and Baja California.

Historical observations have been recorded to occur directly east of the TRVRP.

Palmer's frankenia (*Frankenia palmeri*)**Status: --/--, CRPR 2B.1, County List B**

Palmer's frankenia is a perennial herb that occurs on alkali flats, the edges of coastal salt marsh, and dunes. It occurs at elevations below 1,476 feet (450 meters). Palmer's frankenia is known from coastal San Diego County, Baja California, and Sonora, Mexico.

A 2015 CNPS observation was located 0.3 mile west of the TRVRP.

California box-thorn (*Lycium californicum*)**Status: --/--; CRPR 4.2; County List D**

California box-thorn is a perennial shrub that occurs in a narrow band of habitat inland of the immediate coast, both in upper areas of coastal salt marsh and on sandstone slopes. This species occurs at elevations below 492 feet (150 meters). This species occurs in San Diego County, Orange County, Los Angeles County, Channel Islands, and Baja California. California box-thorn was observed in the TRVRP in association with cliff spurge (*Euphorbia misera*; County 2007).

This genus was observed during 2018 HELIX surveys, but specimens lacked diagnostic features and were not identifiable to species level.

Spreading navarretia (*Navarretia fossalis*)**Status: FT/--; CRPR 1B.1; County List A; City MSCP Covered**

Spreading navarretia is an annual herb that occurs in vernal pools, chenopod scrub, marshes, swamps, and playas. It is known from elevations between 98 and 4,265 feet (30 to 1,300 meters). Spreading navarretia is known to occur in Riverside County, San Diego County, and Baja California.

One historical observation has been recorded within the TRVRP in the northwest, south of the Baseball Fields.

Brand's star phacelia (*Phacelia stellaris*)**Status: --/--; CRPR 1B.1; County List A**

Brand's star phacelia is an annual herb that occurs in open areas and on dunes within coastal strand and coastal sage scrub communities. It is known from elevations below 1,312 feet (400 meters). Brand's star phacelia is almost extirpated in the United States. This species is known to occur in San Diego County, Los Angeles County, and Baja California.

Historical observations have been recorded to occur directly west of the TRVRP near Goat Canyon.

Santa Catalina Island currant (*Ribes viburnifolium*)**Status: --/--; CRPR 1B.2; County List A**

Santa Catalina Island currant is a shrub that occurs in openings within chaparral. It is known from elevations between 98 and 1,968 feet (30 to 600 meters). Santa Catalina Island currant has been observed in San Diego County, Santa Catalina Island, and Baja California.

Historical observations have been recorded to occur within the TRVRP on the west side of Spooner's Mesa.

Chaparral ragwort (*Senecio aphanactis*)**Status: --/--; CRPR 2B.2; County List B**

Chaparral ragwort is an annual herb that occurs in alkali flats and dry, open, rocky areas within foothill woodland, northern coastal scrub, and coastal sage scrub communities. It is known from elevations between 33 to 1,804 feet (10-550 meters). Chaparral ragwort is known to occur in San Diego County, Los Angeles County, and Baja California.

Historical observations have been recorded to occur approximately one mile west of the TRVRP near the U.S./Mexico border.

Estuary seablite (*Suaeda esteroa*)**Status: --/--; CRPR 1B.2; County List A**

Estuary seablite is a perennial herb that occurs in the periphery of coastal salt marshes. Often, this species occurs as a narrow band along the edge of the salt marsh. This species occurs at elevations below 16 feet (5 meters). Estuary seablite occurs in San Diego County, Ventura County, Orange County, Los Angeles County, Santa Barbara County, and Baja California. This species is substantially declining in coastal southern California due to human disturbance and urban development.

This species was observed immediately west of the TRVRP during 2018 surveys. Suitable habitat within the western parcel of the TRVRP has potential to support this plant species.

Woolly seablite (*Suaeda taxifolia*)**Status: --/--; CRPR 4.2; County List D**

Woolly seablite is a perennial shrub usually restricted to coastal salt marsh. This species rarely occurs in peripheral scrublands adjacent to salt marshes or as isolated plants along beaches. It occurs at elevations below 49 feet (15 meters). Woolly seablite occurs in several counties (San Diego, Orange, Los Angeles, Ventura, and Santa Barbara), offshore (Anacapa Island, Santa Barbara Island, San Clemente Island, Santa Cruz Island, Santa Catalina Island, San Nicolas Island, and Santa Rosa Island), and in Baja California.

Woolly seablite occurs at Border Field State Park, and recent historical observations were recorded on the west side of the TRVRP along the Tijuana River. During 2007 surveys, approximately 350 plants were observed on the Park south of the Tijuana River corridor and east of the Southwest Trails restoration site. Drought conditions persisting through 2018 and monotypic stands of invasive non-native plants in this area may have been contributing factors why this plant was not observed in 2018.

California screw moss (*Tortula californica*)**Status: --/--; CRPR 1B.2**

California screw moss is a moss that occurs in damp sandy soil in chenopod scrub and valley and foothill grassland. It is known to occur in Kern, Monterey, Modoc, Santa Barbara, Los Angeles, Ventura, and San Diego counties and on Santa Rosa Island.

There is abundant damp wetland habitat within the TRVRP, but this species was not observed during the 2018 surveys. It has been historically observed north of the Dairy Mart Ponds and outside of the TRVRP.

4.2.3 INVASIVE NON-NATIVE PLANTS

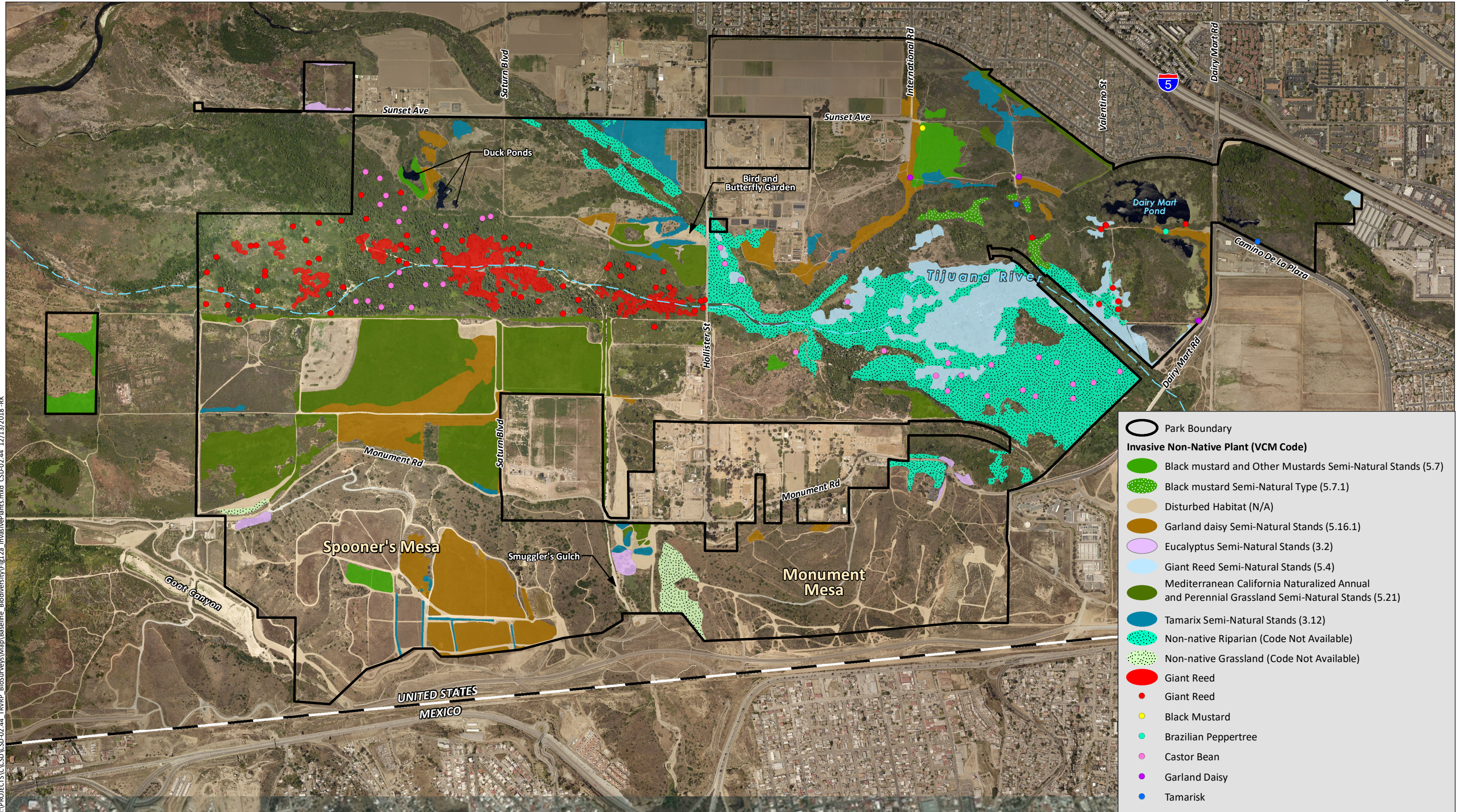
A total of 106 invasive non-native plant species were identified in the TRVRP during the 2018 baseline botanical surveys (Appendix A). Of the 106 invasive non-native plant species, 22 of those species were

identified and mapped as invasive non-native target species of concern in need of removal and control. While multiple species of invasive non-native plants were observed in the TRVRP, most were sporadically observed and not prevalent throughout the TRVRP. Invasive non-native species that were observed sporadically are not considered target species of concern in need of removal and control. Additionally, many of these species are considered to have become “naturalized” in southern California.

Of the 106 invasive non-native plant species observed in the TRVRP in 2018, 22 target invasive non-native species were selected as a high priority for removal based on their invasive potential, prevalence throughout the TRVRP, and ability for management (Table 5). Non-native grasses were not included as target invasive non-native species because they are abundant both within the TRVRP and in the surrounding habitat and remain between six to 12 inches in height so as to not pose a risk to native vegetation. Invasive non-native plant species occur throughout the TRVRP, with the highest concentration in the eastern portion along the Tijuana River and in the southeastern portion including Spooner’s Mesa (Figures 12a-12f). The source populations for the invasive non-native plants that have been identified should also be controlled, as eradication of these plants from the TRVRP would only be temporary. Invasive non-native plants that were mapped within the TRVRP and determined as target species of concern in need of removal are presented below with their associated Cal-IPC Inventory Ranking (Table 5). The definitions for the Cal-IPC ratings are as follows:

- **High:** Species have severe ecological impacts, are conducive to moderate to high rates of dispersal/establishment, and most are widely spread;
- **Moderate:** Species have substantial and apparent, but generally not severe, ecological impacts; are conducive to moderate to high rates of dispersal, though establishment is generally dependent on ecological disturbance; and distribution may range from limited to widespread;
- **Limited:** Species are invasive, but their ecological impacts are minor on a State-wide level, or there was not enough information to justify a higher score; have low to moderate rates of invasiveness; and are generally limited but may be locally persistent and problematic; and
- **None:** Species has not been listed by Cal-IPC.

A comprehensive list of all invasive non-native plants observed, and their removal/management priority is also located in Section 5.4 (Invasive Non-native Species Removal and Control).



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Aerial Photo: SanGIS 2017



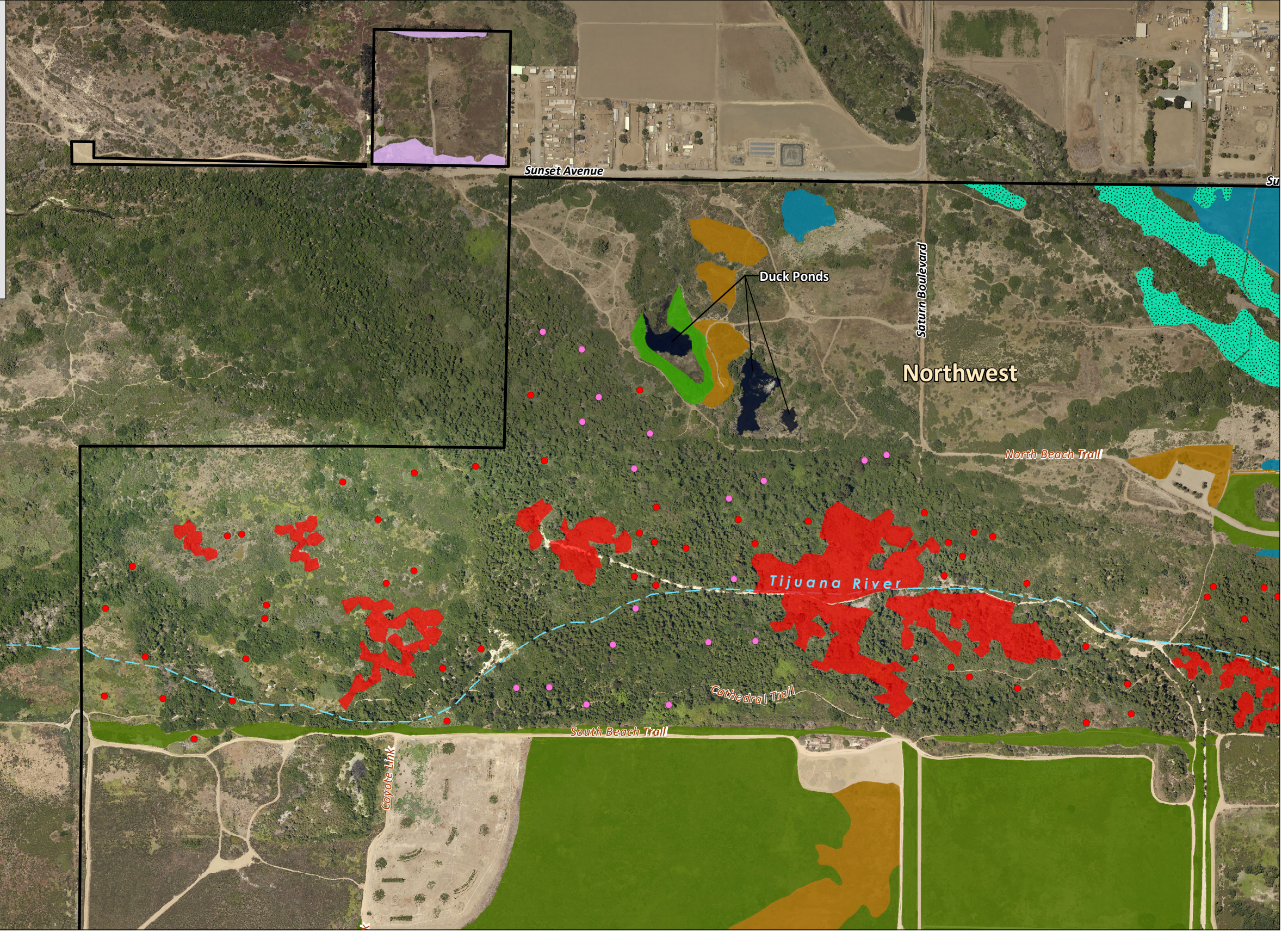
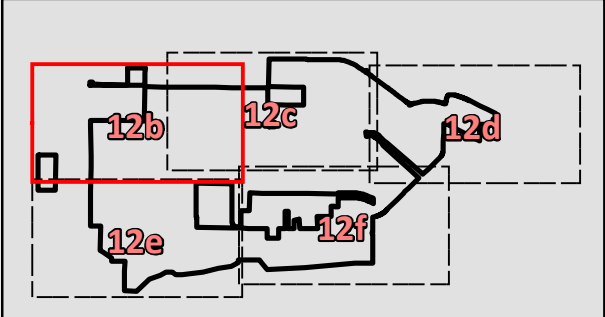
Invasive Plant Species

Figure 12a

○ Park Boundary

Invasive Non-Native Plant (VCM Code)

- Black mustard and Other Mustards Semi-Natural Stands (5.7)
- Disturbed Habitat (N/A)
- Garland daisy Semi-Natural Stands (5.16.1)
- Eucalyptus Semi-Natural Stands (3.2)
- Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands (5.21)
- Tamarix Semi-Natural Stands (3.12)
- Non-native Riparian (Code Not Available)
- Giant Reed
- Giant Reed
- Castor Bean



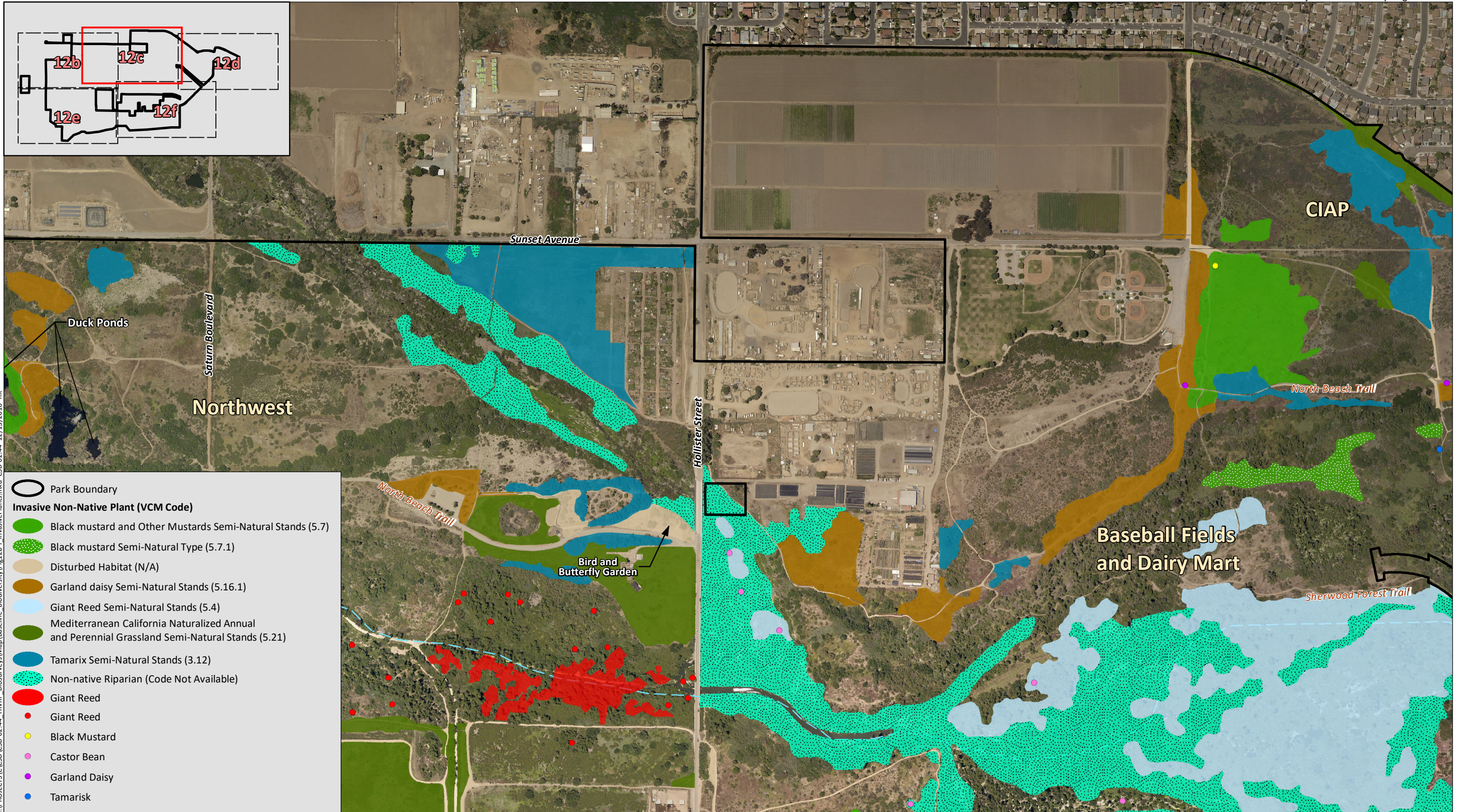
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Aerial Photo: SanGIS 2017



Invasive Plant Species

Figure 12b



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Aerial Photo: SanGIS 2017



Invasive Plant Species

Figure 12c



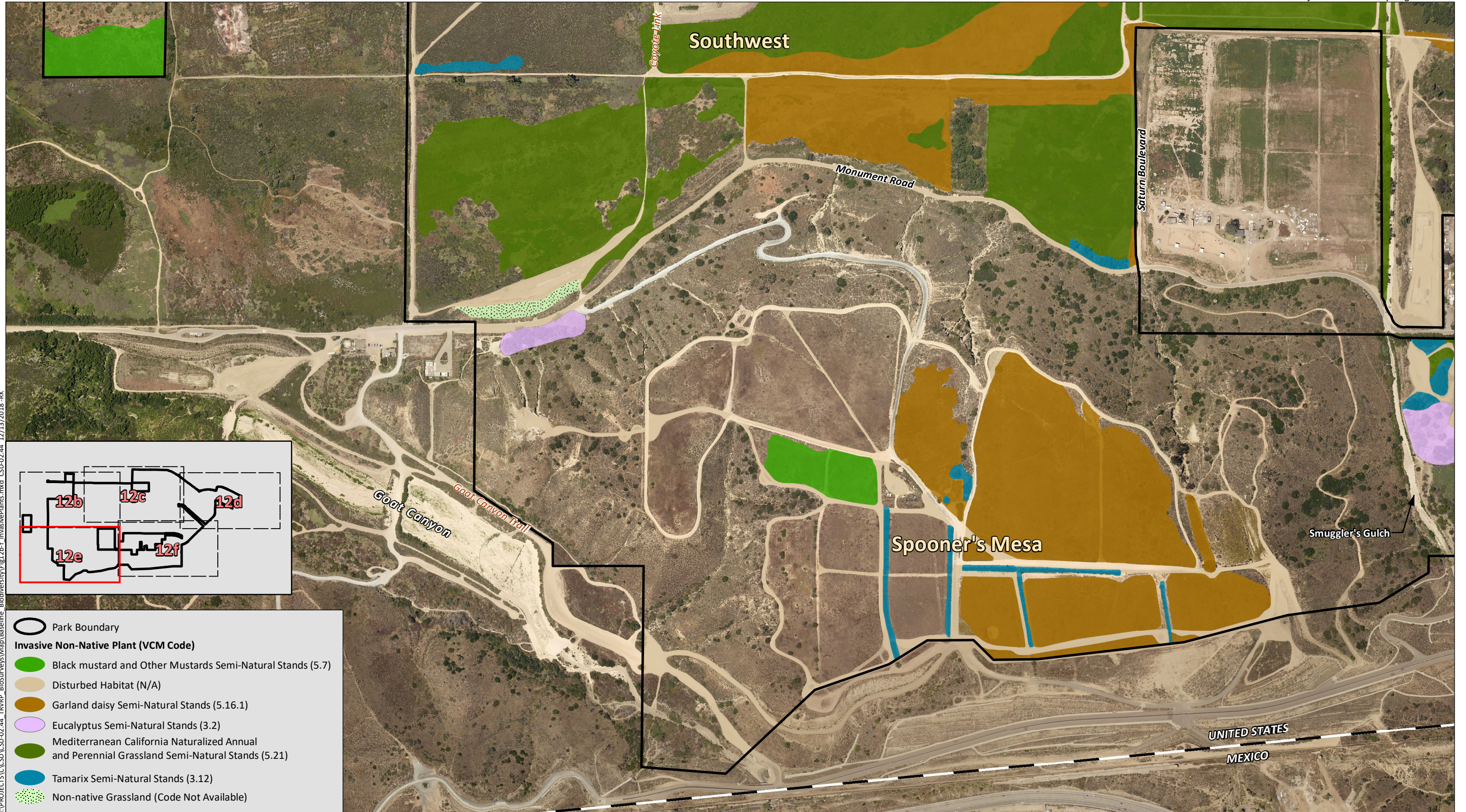
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Aerial Photo: SanGIS 2017



Invasive Plant Species

Figure 12d



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Legend

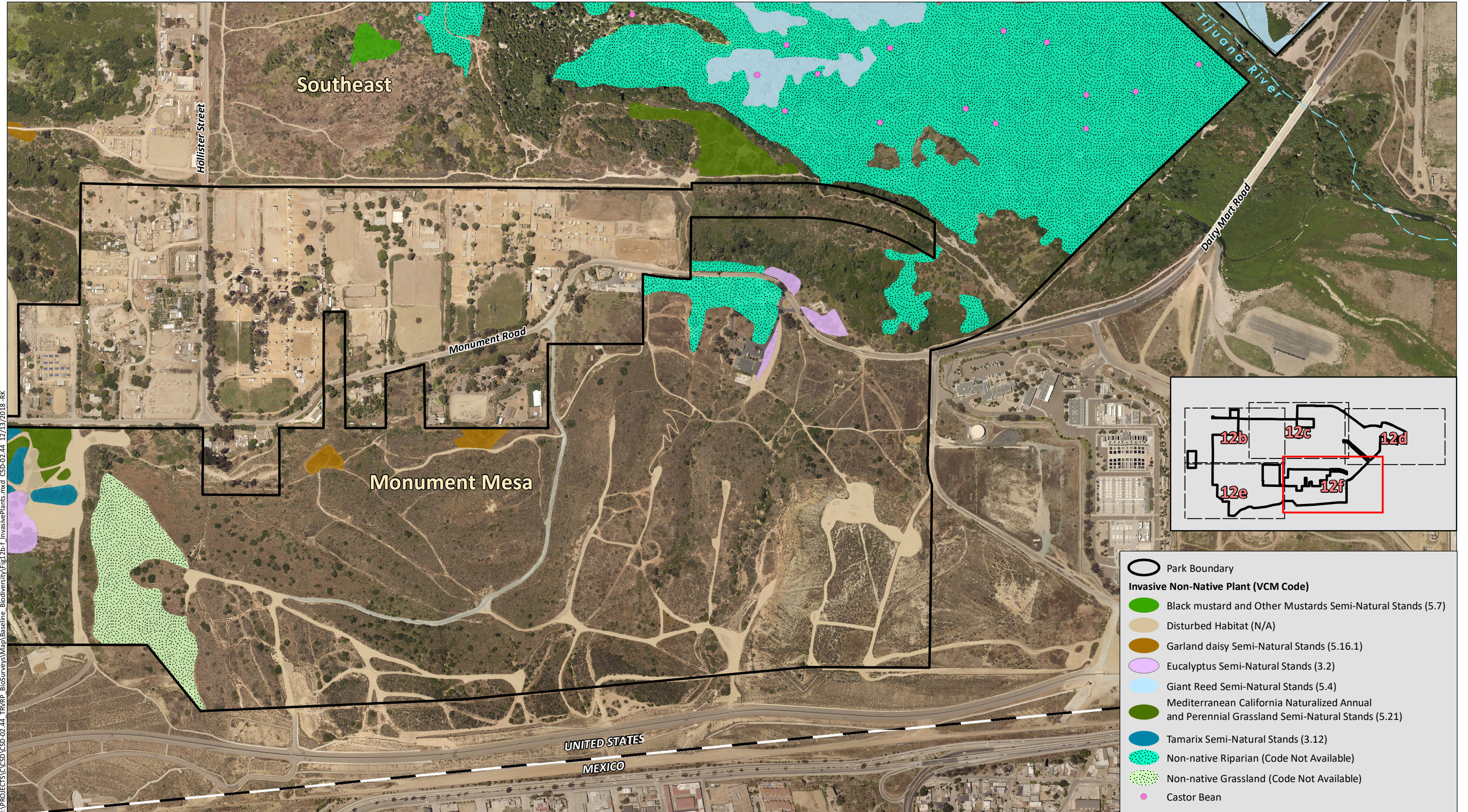
- Park Boundary
- Invasive Non-Native Plant (VCM Code)**
- Black mustard and Other Mustards Semi-Natural Stands (5.7)
- Disturbed Habitat (N/A)
- Garland daisy Semi-Natural Stands (5.16.1)
- Eucalyptus Semi-Natural Stands (3.2)
- Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands (5.21)
- Tamarix Semi-Natural Stands (3.12)
- Non-native Grassland (Code Not Available)

Aerial Photo: SanGIS 2017



Invasive Plant Species

Figure 12e



I:\PROJECTS\CSD-02-44_TRRP_BioSurveys\Map\Baseline_Biodiversity\Fig12b-f_invasivePlants.mxd CSD-02-44 12/13/2018 -RK

Aerial Photo: SanGIS 2017



Invasive Plant Species

Figure 12f

Table 5
INVASIVE NON-NATIVE PLANT SPECIES OF CONCERN
WITHIN THE TRVRP

Common Name	Scientific Name
California Invasive Plant Council (Cal-IPC) Ranking High¹	
giant reed	<i>Arundo donax</i>
hottentot fig/highway ice plant	<i>Carpobrotus edulis</i>
poison hemlock	<i>Conium maculatum</i>
fennel	<i>Foeniculum vulgare</i>
perennial pepperweed	<i>Lepidium latifolium</i>
tamarisk	<i>Tamarix ramosissima</i>
Cal-IPC Ranking Moderate¹	
Italian thistle	<i>Carduus pycnocephalus</i>
star thistle	<i>Centaurea melitensis</i>
stinkwort	<i>Dittrichia graveolens</i>
garland daisy	<i>Glebionis coronaria</i>
short pod mustard	<i>Hirschfeldia incana</i>
crystalline ice plant	<i>Mesembryanthemum crystallinum</i>
London rocket	<i>Sisymbrium irio</i>
Mexican fan palm	<i>Washingtonia robusta</i>
Cal-IPC Ranking Limited¹	
five-hook bassia	<i>Bassia hyssopifolia</i>
Canary island date palm	<i>Phoenix canariensis</i>
rabbitsfoot grass	<i>Polypogon monspeliensis</i>
castor bean	<i>Ricinus communis</i>
Russian thistle	<i>Salsola tragus</i>
Peruvian pepper tree	<i>Schinus molle</i>
Brazilian pepper tree	<i>Schinus terebinthifolius</i>
milk thistle	<i>Silybum marianum</i>

¹ Source: Cal-IPC 2018. Overall rating listed for southwest region, factoring impact, invasiveness, distribution, and documentation level.

4.2.3.1 Cal-IPC Ranking “High”

Giant Reed (*Arundo donax*)

Giant reed is in the Poaceae family and considered an old-world species that has been introduced to North America. It is commonly found in riparian areas along rivers, creeks, and ponds. This invasive species primarily spreads during flood events that tear out and fragment clumps of vegetation which are distributed downstream. Giant reed is rated by the Cal-IPC (2018) as highly invasive. Multiple stands totaling at least 53.47 acres of giant reed were mapped within the TRVRP (Figures 12a-12f). It should be noted that these are not pure stands of giant reed, and additional native/invasive non-native plants may be intermixed within the giant reed.

Hottentot Fig (highway ice plant; *Carpobrotus edulis*)

Hottentot fig/highway ice plant is a member of the Aizoaceae ice plant family, which generally consists of succulent herbs. Hottentot fig is commonly planted to stabilize slopes or to provide a less flammable buffer between homes and brush. Hottentot fig has a High Cal-IPC Inventory Ranking, (Cal-IPC 2018).

Multiple patches of this plant was mapped within the TRVRP as a component of soft-leaved, drought-deciduous shrublands and upland herbaceous vegetation communities (Figures 12a-12f) and were not mapped as pure stands.

Poison Hemlock (*Conium maculatum*)

Poison hemlock is a member of the Apiaceae family, which generally consists of aromatic flowering plants including celery and carrots. It is a biennial plant with first year plants producing ground-level rosettes, and second year plants growing from two to ten feet tall. This plant does best in disturbed, moist soils, but may also form stands in dry, open areas. This species has a High Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple individuals were mapped within the TRVRP as a component of non-native grassland and disturbed habitat communities.

Fennel (*Foeniculum vulgare*)

Fennel is a member of the Apiaceae family, which generally consists of aromatic flowering plants including celery and carrots. It is an erect perennial herb that may grow four to 10 feet tall, producing copious amounts of flowers between April and July. It may be found from sea level to 2,000 feet in elevation, usually colonizing disturbed sites. Fennel may reproduce from both the root crown and seeds. This species has a High Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple individuals were mapped within the TRVRP as a component of non-native grassland and disturbed habitat communities.

Perennial Pepperweed (*Lepidium latifolium*)

Perennial pepperweed is a perennial weed of Eurasian origin, often found along rivers and their tributaries. It propagates primarily from root sprouts, and seed establishment occurs less frequently. This species has a High Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple individuals were mapped within the TRVRP as a component of riparian forests and woodlands, and hydrophytic herbaceous vegetation communities (Figures 12a-12f).

Tamarisk (*Tamarix ramosissima*)

Tamarisk trees are well adapted to very saline soils and will absorb salt through the roots and secrete it through leaf glands. The leaves/tiny twigs are continuously shed and accumulate on the ground below the tree, which creates a layer of highly saline soil at the soil surface and inhibits the establishment of seedlings of other plants. This specific species is native to Asia. It utilizes seed dispersal as well as flooding to redistribute and bury limbs, which can take root. This tree will also develop deep roots that tap into groundwater and extract it so efficiently that it may reduce stream flows or lower the water table. This species has a High Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple individuals/patches were mapped within the TRVRP intermixed with and as a component of riparian forests and woodlands, riparian shrublands, hydrophytic herbaceous vegetation communities, upland forests and woodlands and soft-leaved, drought-deciduous shrubland vegetation communities (Figures 12a-12f). These patches were not pure stands and were intermixed with other native and invasive non-native plants.

4.2.3.2 Cal-IPC Ranking “Moderate”

Italian thistle (*Carduus pycnocephalus*)

Italian thistle is a winter annual plant species that may grow up to six feet in height, found in areas below 3,000 feet in elevation. It is spread by seeds on wind, vehicles, and animals, and commonly colonizes disturbed sites. It has potential to dominate sites, where it will exclude native plants and native animals will avoid grazing on it because of its many thistle spines. This species has a Moderate Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple individuals were mapped within the TRVRP as a component of non-native grassland and disturbed habitat communities.

Star thistle (*Centaurea melitensis*)

Star thistle is a winter annual plant species widely distributed throughout California. This plant generally flowers from April through June, and inflorescences may produce up to 100 heads with 60 seeds per head. This species has a Moderate Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple individuals were mapped within the TRVRP as a component of non-native grassland and disturbed habitat communities.

Stinkwort (*Dittrichia graveolens*)

Stinkwort is an annual shrub plant species that produces a foul smell when touched or crushed. Barbs on the seeds may damage animal digestive systems, and it is known to cause allergic reactions and dermatitis when it comes in contact with skin. This plant generally flowers from September to November. This species has a Moderate Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple individuals were mapped within the TRVRP as a component of non-native grassland communities.

Garland Daisy (*Glebionis coronaria*)

Garland daisy is a coastal weed that may form nearly pure stands in abandoned fields and vacant lots near the coast. It has been introduced from Europe. This species has a Moderate Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple patches totaling 89.33 acres were mapped within the TRVRP as garland daisy semi-natural stands, and additionally as a component of black mustard and other mustards semi-natural stands (22.03 acres), black mustard semi-natural type (4.9 acres), disturbed habitat (71.03 acres), Mediterranean California naturalized annual and perennial grassland semi-natural stands (131.14 acres), and non-native grassland (9.6 acres) (Figures 12a-12f). Although these patches were dominated by garland daisy, there were not pure stands and were intermixed with other native and invasive non-native plants.

Short-pod mustard (*Hirschfeldia incana*)

Short-pod mustard is an annual to perennial herb that may form dense stands in disturbed areas. It may flower year-round and forms a wide basal rosette of lobed leaves which lie flat on the ground, and remain with the plant while flowering. This species has a Moderate Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple individuals were mapped within the TRVRP as a component of non-native grassland and disturbed habitat communities.

Crystalline iceplant (*Mesembryanthemum crystallinum*)

Crystalline iceplant is a member of the Aizoaceae ice plant family, which generally consists of succulent herbs. Crystalline iceplant is commonly planted to stabilize slopes or to provide a less flammable buffer between homes and brush. Crystalline iceplant has a Moderate Cal-IPC Inventory Ranking, (Cal-IPC 2018). Multiple patches of this plant was mapped within the TRVRP as a component of soft-leaved, drought-deciduous shrublands and upland herbaceous vegetation communities (Figures 12a-12f) and were not mapped as pure stands.

London rocket (*Sisymbrium irio*)

London rocket is a plant in the Brassicaceae family, whose common name comes from its abundance following fires or disturbance events. The leaves, seeds, and flowers are edible, and may also be used for medicinal purposes. This species has a Moderate Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple individuals were mapped within the TRVRP as a component of non-native grassland and disturbed habitat communities.

Mexican Fan Palm (*Washingtonia robusta*)

Mexican fan palm originates in Baja California, Mexico. It is wide at the base and slender above and may reach 30 meters in height. The fruits of this plant are consumed and dispersed by birds and mammals such as coyotes. This species has a Moderate Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple individuals were mapped within the TRVRP as a component of riparian forests and woodlands, riparian shrublands, hydrophytic herbaceous vegetation communities, and soft-leaved, drought-deciduous shrubland vegetation communities (Figures 12a-12f). Cal-IPC Ranking “Limited”

4.2.3.3 Cal-IPC Ranking “Limited”

Five-hook Bassia (*Bassia hyssopifolia*)

Five-hook bassia is an annual weed of European origin with five tiny hooks on the fruit that make it an effective “hitch-hiker” on fur and clothing. It is known to form pure stands in areas where there is alkaline soil and the water table is close to the surface. This species has a Limited Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple individuals were mapped within the TRVRP and are commonly found in fallow agricultural areas and as a component of soft-leaved, drought-deciduous shrublands and upland herbaceous vegetation communities (Figures 12a-12f). Pure stands of five-hook bassia were not observed within the TRVRP.

Canary Island Date Palm (*Phoenix canariensis*)

Canary island date palm is a tree native to the Canary Islands off the coast of Africa. This tree species has escaped cultivation in southern California and invaded stream corridors, orchards, and occasionally landscaped areas. These trees may grow up to 25 meters tall and grow in clusters that form a dense canopy that may shade out native plants in the understory. This species has a Limited Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple stands were mapped within the TRVRP as a component of riparian forests and woodlands (Figures 12a-12f). These patches were not pure stands and were intermixed with other native and invasive non-native plants.

Rabbitsfoot Grass (*Polypogon monspeliensis*)

Rabbitsfoot grass is a winter or summer annual grass that may form dense stands in moist to wet areas. This species has a Limited Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple individuals/patches were mapped within the TRVRP as a component of riparian forests and woodlands, riparian shrublands, and hydrophytic herbaceous vegetation communities (Figures 12a-12f). These patches were not pure stands and were intermixed with other native and invasive non-native plants.

Castor Bean (*Ricinus communis*)

Castor bean originates from Africa, and is a short-lived, semi-woody perennial found throughout river bottoms. It may become an aggressive weed when soils are rich, sandy, and moist. It may reach a height of 4 meters. This plant contains a highly toxic poison, ricin, as well as castor oil. This species has a Limited Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple individuals/patches were mapped within the TRVRP as a component of riparian forests and woodlands, riparian shrublands, hydrophytic herbaceous vegetation communities, and soft-leaved, drought-deciduous shrubland vegetation communities (Figures 12a-12f). These patches were not pure stands and were intermixed with other native and invasive non-native plants.

Russian Thistle (*Salsola tragus*)

Russian thistle is an annual herb found throughout California, especially in disturbed areas, agricultural areas, and roadsides and grows best on loose, sandy soils. These plants may grow up to three feet in height. At senescence, the main stem will break off at ground level, allowing the plants to disperse seeds as they tumble with the wind. This species has a Limited Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple individuals/patches were mapped within the TRVRP as a component of non-native grassland and disturbed habitat communities (Figures 12a-12f).

Peruvian Peppertree (*Schinus molle*)

Peruvian peppertree is an invasive non-native plant introduced from South America and a common ornamental. These trees drop numerous fruits and leaves onto the ground that create a thick mulch in which few native seeds may germinate due to chemical inhibitors in the droppings. Seeds are also dispersed by animals that eat from these trees. This species has a Limited Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple individuals/patches were mapped within the TRVRP as a component of riparian forests and woodlands, riparian shrublands, upland forests and woodlands, and soft-leaved, drought-deciduous shrubland vegetation communities (Figures 12a-12f). These patches were not pure stands and were intermixed with other native and invasive non-native plants.

Brazilian Peppertree (*Schinus terebinthifolius*)

Brazilian peppertree is an invasive non-native plant introduced from South America and a common ornamental. The tree's fruits grow in small clusters that give the tree an overall reddish appearance. The fruits of this tree are dispersed by birds and other animals that may eat the fruit. If the roots of this tree are injured, it may begin to produce root sprouts at the point of injury. This species has a Limited Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple individuals/patches were mapped within the TRVRP as a component of riparian forests and woodlands, riparian shrublands, upland forests and woodlands, and soft-leaved, drought-deciduous shrubland vegetation communities (Figures 12a-12f). These patches were not pure stands and were intermixed with other native and invasive non-native plants.

Milk thistle (*Silybum marianum*)

Milk thistle is an annual or biennial plant of the Asteraceae family originating from the Mediterranean region of southern Europe and Asia that has been introduced throughout much of the world. This plant may grow between one foot to six feet tall. Milk thistle has a Limited Cal-IPC Inventory Ranking (Cal-IPC 2018). Multiple individuals were mapped within the TRVRP as a component of riparian communities along the Tijuana River corridor.

4.3 WILDLIFE

A total of 183 wildlife species were observed or detected within the TRVRP including 46 invertebrates, 5 amphibians, 10 reptiles, 97 birds, and 25 mammal species. In total, 31 special status species were observed or detected, including 28 species listed as sensitive by the County (County 2010a), and seven species covered under the City's MSCP Subarea Plan (City 1997). A complete list of all wildlife species observed or detected within the TRVRP during the 2018 biological surveys is included as Appendix B. Special status wildlife species with potential to occur within the TRVRP are detailed in Appendix D. All special status wildlife species locations are shown on Figures 13a-13f. An explanation of special status codes is included in Appendix E.

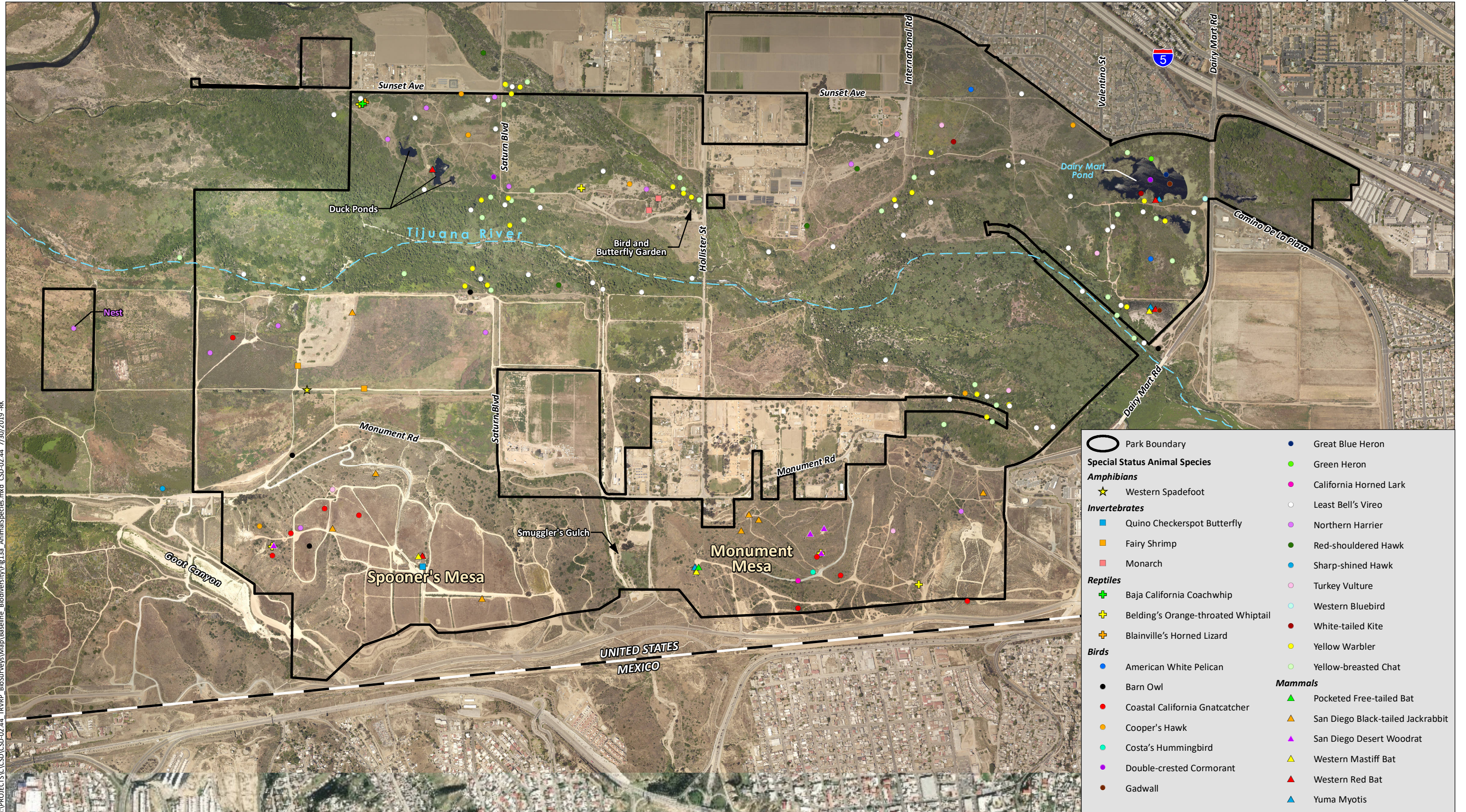
4.3.1 Invertebrates

4.3.1.1 Butterflies

A total of 200 butterfly individuals composed of 22 species were observed during the butterfly surveys within the TRVRP (Table 6). Two species are from the family Hesperiidae (skippers), five species are from the family Lycaenidae (gossamer-wing), seven species are from the family Nymphalidae (brush-footed), three species are from the family Papilionidae (parnassians and swallowtails), four species are from the family Pieridae (whites and sulphurs), and one species is from the family Riodinidae (metalmarks). The most abundant butterfly species observed was Behr's metalmark (*Apodemia mormo virgulti*) with a total of 42 individuals observed, followed by 27 western pygmy blues (*Brephidium exila*), 25 western tiger swallowtails (*Papilio rutulus*), and 16 Pacific Sara's orangetips (*Anthocharis sara sara*).

Eighteen butterfly species and 128 individuals were observed in upland habitats, and 14 species and 70 individuals were observed in wetland habitats (Table 6). Upland habitat types within the TRVRP include Diegan coastal sage scrub (including baccharis dominated), maritime succulent scrub, non-native grassland, and disturbed habitat. Wetland habitat types consist of southern riparian woodland, southern willow scrub, and non-native riparian. A variety of potential nectar resources were recorded in the survey areas, including California buckwheat, California encelia, San Diego County viguiera, wild radish, garland daisy, garden nasturtium, and mustards.

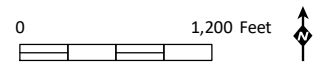
One special status species, monarch butterfly (*Danaus plexippus*), was detected during the surveys. The monarch butterfly is a County Group 2 sensitive animal species (County 2010a). Two individuals were observed during the April 23, 2018 survey in the northwestern portion of the TRVRP within the Butterfly Gardens (Figure 13c). Additionally, one Quino checkerspot butterfly was observed incidentally on Spooner's Mesa on April 15, 2019, during a monitoring of adjacent habitat enhancement area within the TRVRP (Figure 13e). The Quino checkerspot butterfly is a federally-listed endangered, County Group 1, and MSCP narrow endemic species (County 2010a). The total number of butterfly species detected during the survey effort, listed according to general survey location, is included in Appendix F.



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Park Boundary	Great Blue Heron
Special Status Animal Species	Green Heron
Amphibians	California Horned Lark
Western Spadefoot	Least Bell's Vireo
Invertebrates	Northern Harrier
Quino Checkerspot Butterfly	Red-shouldered Hawk
Fairy Shrimp	Sharp-shinned Hawk
Monarch	Turkey Vulture
Reptiles	Western Bluebird
Baja California Coachwhip	White-tailed Kite
Belding's Orange-throated Whiptail	Yellow Warbler
Blainville's Horned Lizard	Yellow-breasted Chat
Birds	Mammals
American White Pelican	Pocketed Free-tailed Bat
Barn Owl	San Diego Black-tailed Jackrabbit
Coastal California Gnatcatcher	San Diego Desert Woodrat
Cooper's Hawk	Western Mastiff Bat
Costa's Hummingbird	Western Red Bat
Double-crested Cormorant	Yuma Myotis
Gadwall	

Aerial Photo: SanGIS (2017)



Special Status Wildlife Species

Figure 13a

○ Park Boundary

Special Status Animal Species

Invertebrates

- Fairy Shrimp

Reptiles

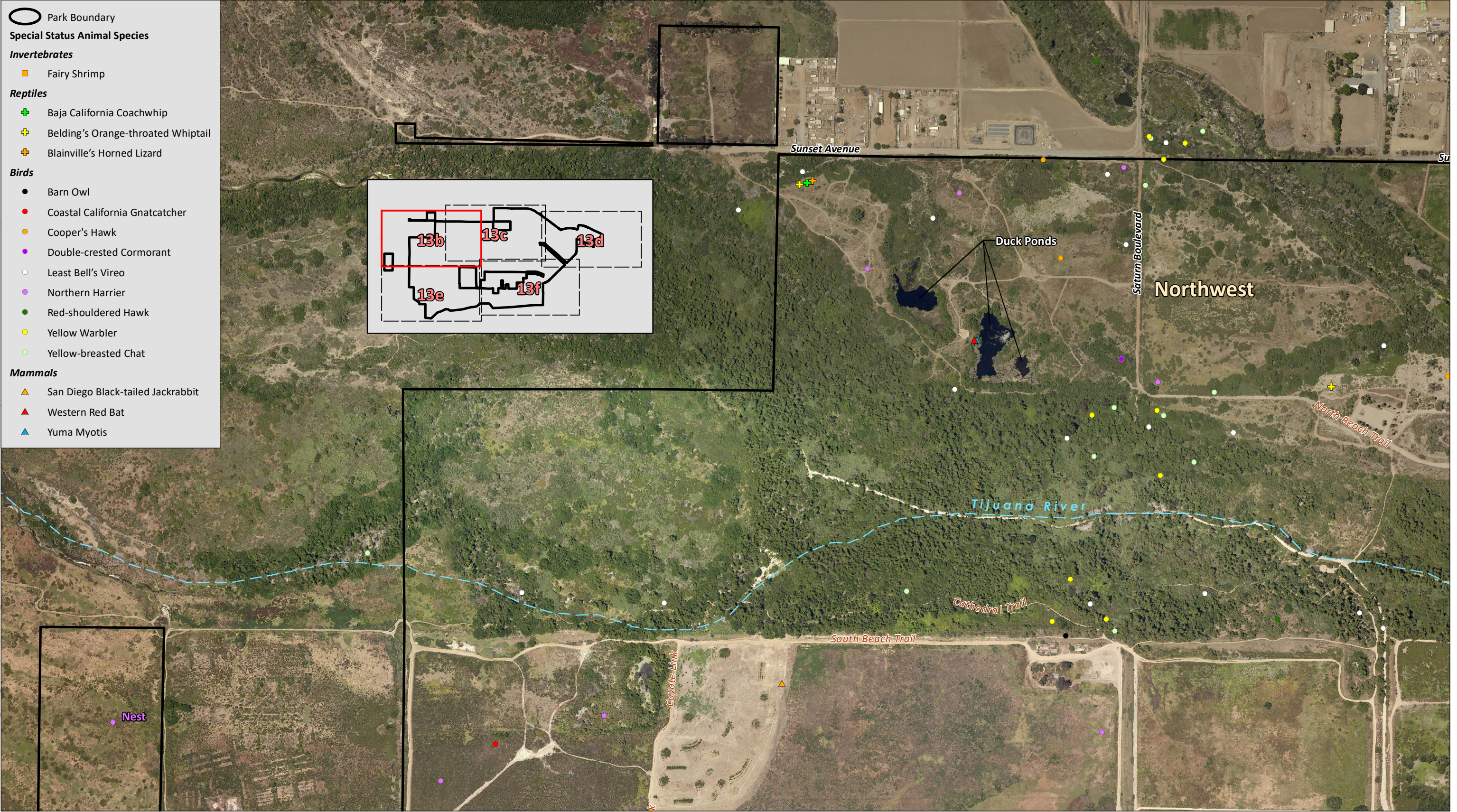
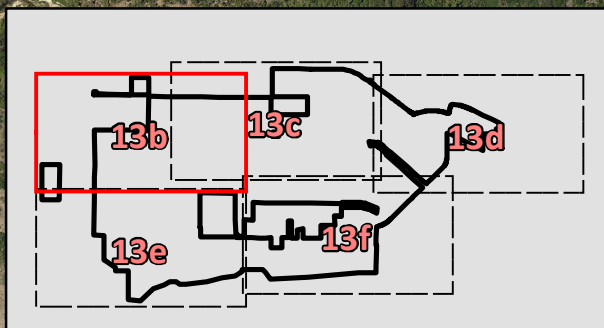
- +** Baja California Coachwhip
- +** Belding's Orange-throated Whiptail
- +** Blainville's Horned Lizard

Birds

- Barn Owl
- Coastal California Gnatcatcher
- Cooper's Hawk
- Double-crested Cormorant
- Least Bell's Vireo
- Northern Harrier
- Red-shouldered Hawk
- Yellow Warbler
- Yellow-breasted Chat

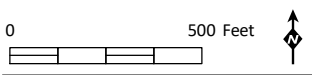
Mammals

- ▲** San Diego Black-tailed Jackrabbit
- ▲** Western Red Bat
- ▲** Yuma Myotis



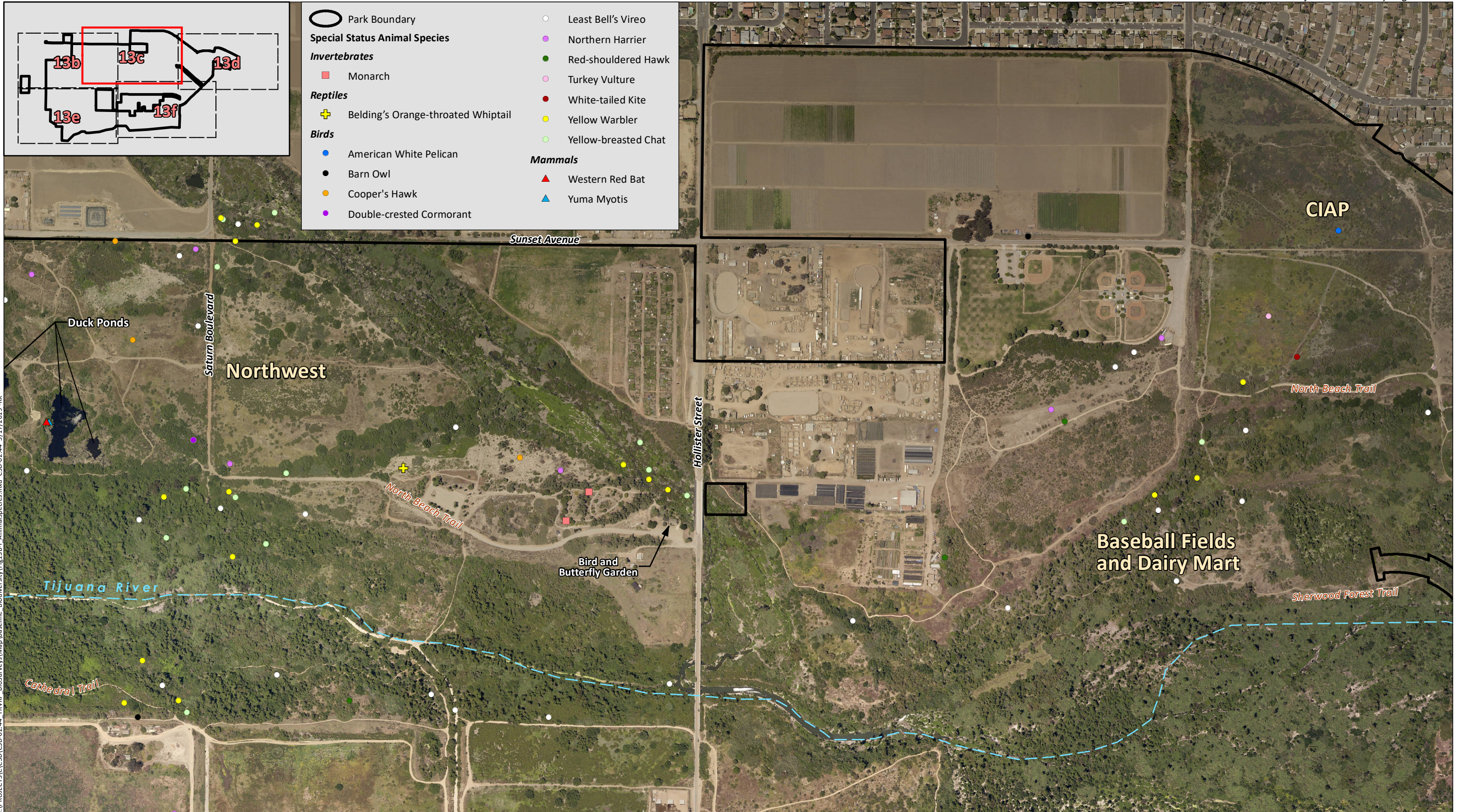
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Aerial Photo: SanGIS 2017



Special Status Wildlife Species

Figure 13b



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Aerial Photo: SanGIS 2017



Special Status Wildlife Species

Figure 13c



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- Park Boundary
- Special Status Animal Species**
- Birds*
- American White Pelican
- Barn Owl
- Cooper's Hawk
- Double-crested Cormorant
- Gadwall
- Great Blue Heron
- Green Heron
- Least Bell's Vireo
- Turkey Vulture
- Western Bluebird
- White-tailed Kite
- Yellow Warbler
- Yellow-breasted Chat
- Mammals*
- ▲ Western Mastiff Bat
- ▲ Western Red Bat
- ▲ Yuma Myotis

Aerial Photo: SanGIS 2017



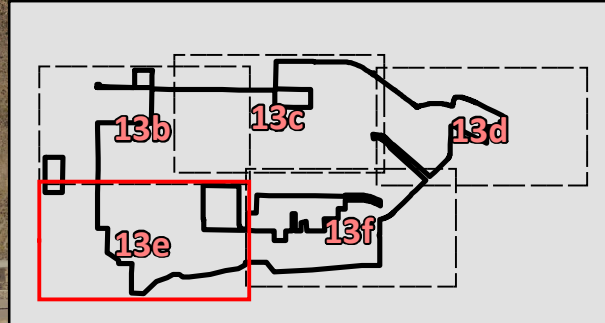
Special Status Wildlife Species

Figure 13d

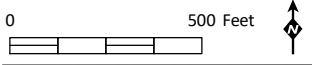


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- Park Boundary
- Special Status Animal Species**
- Amphibians**
- ★ Western Spadefoot
- Invertebrates**
- Quino Checkerspot Butterfly
- Fairy Shrimp
- Reptiles**
- ⊕ Belding's Orange-throated Whiptail
- Birds**
- Barn Owl
- Coastal California Gnatcatcher
- Cooper's Hawk
- Northern Harrier
- Sharp-shinned Hawk
- Turkey Vulture
- Mammals**
- ▲ San Diego Black-tailed Jackrabbit
- ▲ San Diego Desert Woodrat
- ▲ Western Mastiff Bat
- ▲ Western Red Bat

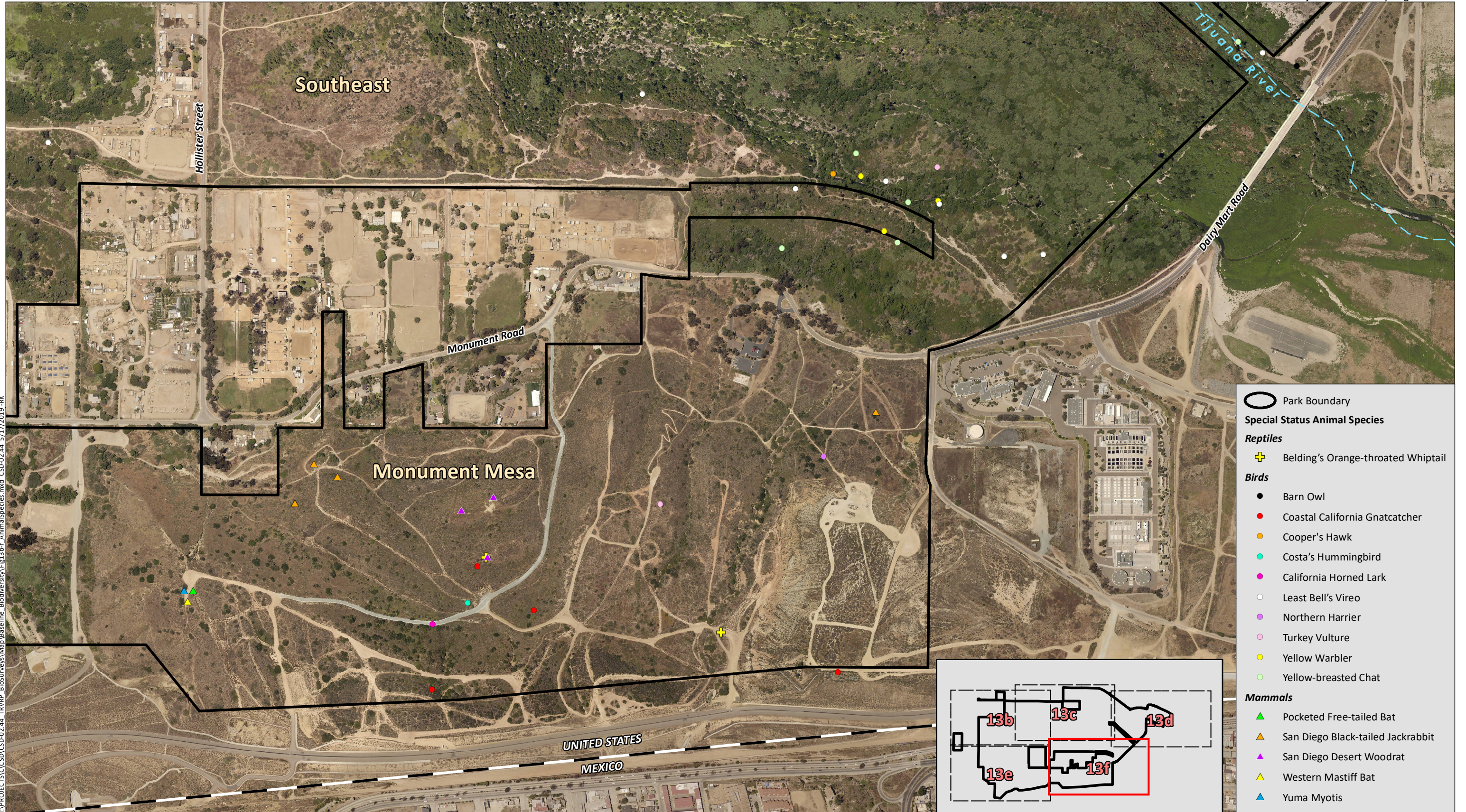


Aerial Photo: SanGIS 2017



Special Status Wildlife Species

Figure 13e



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Aerial Photo: SanGIS 2017



Special Status Wildlife Species

Figure 13f

Table 6
BUTTERFLY SURVEY RESULTS

Species		Status	Upland		Wetland		Total ¹	
Common Name	Scientific Name		Total Individuals	Species Richness	Total Individuals	Species Richness	Total Individuals	Species Richness
Total Individuals								
Funeral duskywing	<i>Erynnis funeralis</i>	--	4	1	1	1	5	X
Umber skipper	<i>Poanes melane</i>	--	1	1	0	0	1	X
Unidentified skipper	--		0	0	0	0	1	-
Family Lycaenidae (Gossamer-wing Butterflies)								
Western pygmy-blue	<i>Brephidium exila</i>	--	13	1	14	1	27	X
Bernardino square-spotted blue	<i>Euphilotes battoides bernardino</i>	--	10	1	3	1	13	X
Marine blue	<i>Leptotes marina</i>	--	2	1	0	0	2	X
Acmon blue	<i>Plebejus acmon</i>	--	8	1	0	0	8	X
Gray hairstreak	<i>Strymon melinus</i>	--	2	1	2	1	4	X
Unidentified blue	---	--	8	0	1	0	9	-
Family Nymphalidae (Brush-footed Butterflies)								
Common ringlet	<i>Coenonympha tullia</i>	--	1	1	0	0	1	X
Monarch	<i>Danaus plexippus</i>	County Group 2	0	0	2	1	2	X
Lorquin's admiral	<i>Limenitis lorquini</i>	--	2	1	6	1	8	X
Mourning cloak	<i>Nymphalis antiopa</i>	--	0	0	3	1	3	X
Satyr comma	<i>Polygonia satyrus</i>	--	0	0	0	0	1	X
West Coast lady	<i>Vanessa annabella</i>	--	1	0	1	1	2	X
Red admiral	<i>Vanessa atalanta</i>	--	2	1	1	1	3	X
Unidentified lady	<i>Vanessa sp.</i>	--	3	1	4	0	7	-
Family Papilionidae (Parnassians and Swallowtails)								
Pale swallowtail	<i>Papilio eurymedon</i>	--	0	0	1	1	1	X
Western tiger swallowtail	<i>Papilio rutulus</i>	--	12	1	13	1	25	X
Anise swallowtail	<i>Papilio zelicaon</i>	--	2	1	0	0	2	X

Table 6 (cont.)
BUTTERFLY SURVEY RESULTS

Species		Status	Upland		Wetland		Total ¹	
Common Name	Scientific Name		Total Individuals	Species Richness	Total Individuals	Species Richness	Total Individuals	Species Richness
Family Pieridae (Whites and Sulphurs)								
Pacific sara orangetip	<i>Anthocharis sara</i>	--	7	1	9	1	16	X
Dainty sulphur	<i>Nathalis iole</i>	--	1	1	0	0	1	X
Cabbage white	<i>Pieris rapae</i>	--	5	1	8	1	13	X
Checkered white	<i>Pontia protodice</i>	--	2	1	0	0	2	X
Unidentified sulphur	--	--	0	0	1	1	1	-
Family Riodinidae (Metalmarks)								
Behr's metalmark	<i>Apodemia mormo virgulti</i>	--	42	1	0	0	42	X
TOTAL			128	18	70	14	200	22

¹ Total includes incidental observations.

4.3.1.2 Other Invertebrates

In addition to butterflies, 23 other invertebrate taxa were observed (Appendix B). Other invertebrate taxa observed includes those from the orders Branchinectidae (fairy shrimp), Coleoptera (beetles), Diptera (flies), Hemiptera (true bugs, cicadas, hoppers, aphids, and allies), hymenoptera (ants, bees, wasps, and sawflies), isopoda (isopods), lepidoptera (butterflies and moths), odonata (dragonflies and damselflies), orthopteran (grasshoppers, crickets, and katydids), and pulmonata (land snails).

Fairy shrimp (*Branchinecta* sp.) were observed on February 19, 2019, during monitoring of restoration areas within the TRVRP within ephemeral ponds present along trails in the southwestern portion of the site to the north of Monument Road, west of Hollister Street, and south of the Tijuana River (Figure 13a). The fairy shrimp were not able to be identified to the species level as no focused surveys or collection of species was conducted. However, they were able to be visually identified to the genus *Branchinecta*, which could be either the federally-listed endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*) or the non-listed versatile fairy shrimp (*Branchinecta lindahli*).

4.3.2 Herpetofauna

4.3.2.1 Amphibians

Four amphibian species were observed within the TRVRP, all of which were detected during the focused aquatic amphibian surveys. Amphibian species observed during the aquatic amphibian surveys were western toad (*Anaxyrus boreas*), California treefrog (*Pseudacris cadaverina*), Baja California treefrog (*Pseudacris hypochondriaca hypochondriaca*), and American bullfrog (*Lithobates catesbeianus*). One reptile species, red-eared slider (*Trachemys scripta elegans*), was also observed during the surveys. The species observed during the aquatic amphibian surveys are shown below in Table 7.

Table 7
AMPHIBIAN SURVEY RESULTS¹

Species		Status	Survey Location					
Common Name	Scientific Name		1	2	3	4	5	6
Western toad	<i>Anaxyrus boreas</i>	--	--	--	--	--	--	X
American bullfrog	<i>Lithobates catesbeianus</i>	--	X	--	--	--	--	X
California treefrog	<i>Pseudacris cadaverina</i>	--	X	--	--	--	--	--
Baja California treefrog	<i>Pseudacris hypochondriaca hypochondriaca</i>	--	X	X	X	X	--	X
Red-eared slider	<i>Trachemys scripta elegans</i>	--	X	--	X	--	--	--

¹ See Figures 8a-8e for amphibian survey locations

The most common species detected was the Baja California treefrog, which was detected at all the surveys locations except location 5. Amphibian survey Location 5 is located south of Dairy Mart Pond in the eastern portion of the TRVRP north of the Tijuana River (Figure 8d). No amphibians or reptiles were detected at Location 5 during the amphibian survey effort (Table 6). Amphibian survey Location 1 had the highest species diversity with four species (three amphibians and one reptile) followed by Location 6 with three species (three amphibians). Amphibian survey Location 1 is in the northwestern portion of the TRVRP at an unnamed pond south of Sunset Avenue and west of Saturn Boulevard (Figure 8b). Amphibian survey Location 6 is located at Dairy Mart Pond in the northeastern portion of the TRVRP (Figure 8d). Two introduced species, American bullfrog and red-eared slider, were detected during the surveys at survey Locations 1 and 3. Amphibian survey Location 3 is located at a bridge crossing over the

Tijuana River off Hollister Street in the central portion of the TRVRP (Figure 8b). Appendix G details species detected during each survey session at each survey location during the surveys. In addition to amphibians detected during the aquatic surveys, western spadefoot (*Spea hammondi*) tadpoles were observed within an ephemeral pond present along trails in the southwestern portion of the site to the north of Monument Road, west of Hollister Street, and south of the Tijuana River (Figure 13a). The tadpoles were incidentally observed on February 19, 2019, during monitoring of restoration areas within the TRVRP.

4.3.2.2 Reptiles

Ten reptile species were observed within the TRVRP (Appendix B), five of which were caught in the drift-fence funnel traps. Reptile species captured in the drift-fence funnel traps were Belding's orange-throated whiptail (*Aspidoscelis hyperythra beldingi*), Baja California coachwhip (*Coluber fuliginosus*), Blainville's horned lizard (*Phrynosoma blainvillii*), great basin fence lizard (*Sceloporus occidentalis longipies*), and western side-blotched lizard (*Uta stansburiana elegans*). Reptile species incidentally observed during the trapping surveys include southern pacific rattlesnake (*Crotalus oreganus helleri*), California kingsnake (*Lampropeltis californiae*), and San Diego gopher snake (*Pituophis catenifer annectens*). Reptile species incidentally observed during other survey efforts include red-eared slider (*Trachemys scripta elegans*) and granite spiny lizard (*Sceloporus orcutti*),

Thirty-eight reptile individuals were captured within the drift-fence funnel traps (Table 8). Belding's orange-throated whiptail was the most abundant reptile species captured with 22 individuals found within the funnel traps, followed by western side-blotched lizard with 10 individuals, and great basin fence lizard with four individuals. No reptile species were captured at Trap 1, which is in the southwestern portion of the TRVRP north of Monument Road and west of Hollister Street (Figure 8b). Trap 1 was in an area of dense vegetation primarily consisting of a monotypic stand of goldenbush. The low species diversity or presence of dense vegetation at the trap location may have resulted in the lack of reptile captures either because abundance of herpetofauna in the area was low or the movements of individuals were precluded/obstructed as result of dense vegetation and trap placement. Trap 4 had the greatest number of captures (17) and greatest species diversity with four reptile species. Trap 4 was located in the northwestern portion of the TRVRP just south of Sunset Avenue (Figure 8b). Appendix H details species captured at each drift-fence funnel trap on each day of the trapping effort.

Three special status reptile species were captured: Belding's orange-throated whiptail, Baja California coachwhip, and Blainville's horned lizard (Figures 13a-13f). Orange-throated whiptail is a CDFW Watch List (WL) species. Baja California coachwhip and Blainville's coachwhip are CDFW Species of Special Concern (SSC). Blainville's horned lizard and orange-throated whiptail are both County Group 2 sensitive animal species (County 2010a) and covered under the City's MSCP Subarea Plan (City 1997). Orange-throated whiptail was captured at trapping Locations 2, 3, and 4. Trap 2 is located at Spooner's Mesa in the southwestern portion of the TRVRP (Figure 8e). Trap 3 is located at Monument Mesa in the southeastern portion of the TRVRP (Figure 8f). Baja California coachwhip and Blainville's horned lizard were both captured at Trap 4 (Figure 8b).

Mortality of one ornate shrew (*Sorex ornatus*), one brush mouse (*Peromyscus boylii*), and one California mouse (*Peromyscus californicus*) occurred during the trapping events. The individuals were an incidental bycatch within the drift-fence tunnel traps. The traps were checked once within every 24-hour period during the trapping sessions; however, these individuals perished for unknown causes with one individual being partially predated.

Table 8
DRIFT-FENCE FUNNEL TRAP RESULTS

Reptile Species		Status	Trapping Location						Total
Common Name	Scientific Name		1	2	3	4	5	6	
Session 1 (April 2018)									
Belding's orange-throated whiptail	<i>Aspidoscelis hyperythra beldingi</i>	CDFW WL County Group 2 MSCP Covered	0	0	0	1	0	0	1
Baja California coachwhip	<i>Coluber fuliginosus</i>	CDFW SSC County Group 2	0	0	0	0	0	0	0
Blainville's horned lizard	<i>Phrynosoma blainvillii</i>	CDFW SSC County Group 2 MSCP Covered	0	0	0	0	0	0	0
Great basin fence lizard	<i>Sceloporus occidentalis longipies</i>	--	0	0	0	0	0	0	0
Western side-blotched lizard	<i>Uta stansburiana elegans</i>	--	0	0	0	4	0	0	4
Session 1 Total			0	0	0	5	0	0	5
Session 2 (June 2018)									
Belding's orange-throated whiptail	<i>Aspidoscelis hyperythra beldingi</i>	CDFW WL County Group 2 MSCP Covered	0	7	3	3	0	0	13
Baja California coachwhip	<i>Coluber fuliginosus</i>	CDFW SSC County Group 2	0	0	0	0	0	0	0
Blainville's horned lizard	<i>Phrynosoma blainvillii</i>	CDFW SSC County Group 2 MSCP Covered	0	0	0	0	0	0	0
Great basin fence lizard	<i>Sceloporus occidentalis longipies</i>	--	0	3	0	0	0	1	4
Western side-blotched lizard	<i>Uta stansburiana elegans</i>	--	0	0	1	2	1	2	6
Session 2 Total			0	10	4	5	1	3	23

Table 8 (cont.)
DRIFT-FENCE FUNNEL TRAP RESULTS

Reptile Species		Status	Trapping Location						Total
Common Name	Scientific Name		1	2	3	4	5	6	
Session 3 (August 2018)									
Belding's orange-throated whiptail	<i>Aspidoscelis hyperythra beldingi</i>	CDFW WL County Group 2 MSCP Covered	0	1	2	5	0	0	8
Baja California coachwhip	<i>Coluber fuliginosus</i>	CDFW SSC County Group 2	0	0	0	1	0	0	1
Blainville's horned lizard	<i>Phrynosoma blainvillii</i>	CDFW SSC County Group 2 MSCP Covered	0	0	0	1	0	0	1
Great basin fence lizard	<i>Sceloporus occidentalis longipies</i>	--	0	0	0	0	0	0	0
Western side-blotched lizard	<i>Uta stansburiana elegans</i>	--	0	0	0	0	0	0	0
Session 3 Total			0	1	2	7	0	0	10
Total Captures									
Belding's orange-throated whiptail	<i>Aspidoscelis hyperythra beldingi</i>	CDFW WL County Group 2 MSCP Covered	0	8	5	9	0	0	22
Baja California coachwhip	<i>Coluber fuliginosus</i>	CDFW SSC County Group 2	0	0	0	1	0	0	1
Blainville's horned lizard	<i>Phrynosoma blainvillii</i>	CDFW SSC County Group 2 MSCP Covered	0	0	0	1	0	0	1
Great basin fence lizard	<i>Sceloporus occidentalis longipies</i>	--	0	3	0	0	0	1	4
Western side-blotched lizard	<i>Uta stansburiana elegans</i>	--	0	0	1	6	1	2	10
TOTAL			0	11	6	17	1	3	38

4.3.3 Birds

A total of 1,448 individuals comprised 97 avian species detected within the TRVRP during avian point count surveys (Table 9). The most abundant species detected was the northern rough-winged swallow (*Stelgidopteryx serripennis*) with 238 individuals, followed by cliff swallow (*Petrochelidon pyrrhonota*) with 142 individuals and house finch (*Haemorhous mexicanus*) with 95 individuals. Point count 6 had the highest number of individuals detected with 340 birds consisting of 36 species. This point count is located at the Dairy Mart Pond in the eastern portion of the TRVRP (Figure 8d). Vegetation at this location consists primarily of open water, freshwater marsh, and southern riparian woodland (Figure 10d). Point counts 3, 6, and 7 had the highest species diversity with 36 species detected at each location. Point count 3 is located in the northwestern portion of TRVRP at the intersection of Saturn Boulevard and Sunset Avenue (Figure 8b). Vegetation at this location consists primarily of mule fat scrub, southern willow scrub, southern riparian woodland, and fallow agriculture fields (Figure 10b). Point count 7 is located south of Dairy Mart Pond in the western portion of TRVRP (Figure 8d). Vegetation at this location consists primarily of mule fat scrub, southern riparian woodland, non-native riparian, and arundo-dominated riparian (Figure 10d). It should be noted that open water was also present at this location in the spring and early summer months. The water level had begun to subside, and vegetation began emerging at this location in the late summer months. No open water was present at this location during the November survey.

Table 9
AVIAN POINT COUNT SURVEY RESULTS

Point Count	April 2018		June 2018		November 2018		Total	
	Individuals	Species	Individuals	Species	Individuals	Species	Individuals	Species
1	78	21	95	15	20	10	193	29
2	34	18	42	18	22	9	98	31
3	43	18	26	16	60	14	129	36
4	38	16	55	13	16	9	109	23
5	47	16	50	15	53	16	150	35
6	92	18	114	20	134	19	340	36
7	77	19	61	17	59	12	197	36
8	39	16	77	12	22	10	138	28
9	24	13	15	11	18	9	57	20
10	10	10	21	17	6	2	37	20
TOTAL	482	55	556	46	410	51	1,448	79

Twenty-two individuals representing 10 species were detected during the nocturnal surveys (Table 10). The following species were observed during the nocturnal surveys: mallard (*Anas platyrhynchos*), great horned owl (*Bubo virginianus*), killdeer (*Charadrius vociferus*), pacific-slope flycatcher (*Empidonax difficilis*), American coot (*Fulica americana*), common yellowthroat (*Geothlypis trichas*), yellow-breasted chat (*Icteria virens*), common poorwill (*Phalaenoptilus nuttallii*), barn owl (*Tyto alba*), and white-crowned sparrow (*Zonotrichia leucophrys*). A single juvenile great horned owl was observed with an adult at point count 9 during the June survey. The owls were observed perched on a telephone wire and a light pole that illuminates a steep north facing slope. Point count 9 is located at Monument Mesa in the southeastern portion of the TRVRP (Figure 8f). Vegetation at this location consists of Diegan coastal sage scrub (Figure 10f).

Table 10
AVIAN POINT COUNT SURVEY – NOCTURNAL SURVEY RESULTS

Species		Status	Point Count Location										Total
Common Name	Scientific Name		1	2	3	4	5	6	7	8	9	10	
American Coot	<i>Fulica americana</i>	--	0	0	0	0	0	1	0	0	0	0	1
Barn Owl	<i>Tyto alba</i>	County Group 2	1	0	0	0	2	0	1	0	0	1	5
Common Yellowthroat	<i>Geothlypis trichas</i>	--	0	0	0	0	0	1	0	0	0	0	1
Common Poorwill	<i>Phalaenoptilus nuttallii</i>	--	0	0	0	0	0	0	0	0	0	1	1
Great Horned Owl	<i>Bubo virginianus</i>	--	0	1	0	0	0	0	0	0	3	0	4
Killdeer	<i>Charadrius vociferus</i>	--	0	0	0	0	2	1	0	0	0	0	3
Mallard	<i>Anas platyrhynchos</i>	--	0	1	0	0	0	0	0	0	0	0	1
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>	--	0	0	0	1	0	0	0	0	0	0	1
White Crowned Sparrow	<i>Zonotrichia leucophrys</i>	--	0	0	1	0	0	0	0	0	0	0	1
Yellow-breasted Chat	<i>Icteria virens</i>	CDFW SSC County Group 1	0	1	0	1	0	0	1	0	1	0	4
TOTAL			1	3	1	2	4	3	2	0	4	2	22

Sixteen special status bird species were observed during avian point count surveys (Figure 13a-13f). One federally- and State-listed endangered species, least Bell’s vireo (*Vireo bellii pusillus*), was detected. One federally-listed threatened species, coastal California gnatcatcher (*Poliophtila californica californica*), was detected. One USFWS Bird of Conservation Concern (BCC), yellow warbler (*Setophaga petechia*), was detected. One CDFW Fully Protected (FP) species, white-tailed kite (*Elanus leucurus*), was detected. Three CDFW WL species were detected: Cooper’s hawk (*Accipiter cooperii*), horned lark (*Eremophila alpestris*), and double-crested cormorant (*Phalacrocorax auritus*). Six CDFW SSC species were detected: least Bell’s vireo, coastal California gnatcatcher, northern harrier (*Circus hudsonius*), yellow-breasted chat (*Icteria virens*), yellow warbler, and American white pelican (*Pelecanus erythrorhynchos*). Eight County Group 1 sensitive animal species were detected (County 2010a): least Bell’s vireo, coastal California gnatcatcher, white-tailed kite, Cooper’s hawk, northern harrier, yellow-breasted chat, red-shouldered hawk (*Buteo lineatus*), and turkey vulture (*Cathartes aura*). Eight County Group 2 sensitive animal species (County 2010a) were detected: yellow warbler, horned lark, double-crested cormorant, American white pelican, barn owl, great blue heron (*Ardea herodias*), green heron (*Butorides virescens*), and gadwall (*Mareca strepera*). Four species covered under the City’s MSCP Subarea Plan (City 1997) were detected: least Bell’s vireo, coastal California gnatcatcher, Cooper’s hawk, and northern harrier.

Detailed results of the avian survey effort, including the total number of individuals and species detected at each point count location for both the diurnal and nocturnal surveys, are included as Appendix I.

4.3.4 Mammals

4.3.4.1 Bats

The results of the bat survey, including the number of species detected at each location, are presented below (Table 11). Six bat species were identified within the TRVRP during the active and passive bat surveys. Species detected included big brown bat (*Eptesicus fuscus*), western mastiff bat (*Eumops perotis*), western red bat (*Lasiurus blossevillii*), Yuma myotis (*Myotis yumanensis*), pocketed free-tailed bat (*Nyctinomops femorosaccus*), and Mexican free-tailed bat (*Tadarida brasiliensis*). Four

special status bat species were detected during the survey: western mastiff bat, western red bat, pocketed free-tailed bat, and Yuma myotis. The western mastiff bat, western red bat, and pocketed free-tailed bat are CDFW SSC and County Group 2 sensitive animal species (County 2010a). The Yuma myotis is a County Group 2 sensitive animal species (County 2010a).

The number of bat calls recorded at each location is not necessarily indicative of the total number of bats present, as one bat may fly back and forth in front of a detector for an extended period of time. Therefore, the number of recorded calls does not directly relate to the number of bats present. However, Mexican free-tailed bats were by far the most commonly recorded species and were documented during five of the passive surveys and one of the active surveys. The second most commonly recorded species were big brown bats, which were also recorded during five of the six passive surveys and during one of the active surveys. However, fewer calls of big brown bat were recorded overall as compared to Mexican free-tailed bat. Yuma myotis calls were common in the locations where they were recorded, which included Locations 3, 4, 5, and 6 (Figures 8a-8f). Western red bats were recorded only in riparian habitat within the TRVRP at Locations 3, 4, and 6 (Figures 8a-8f). It should be noted that surveys conducted during the month of July had the highest species richness of all the survey efforts.

**Table 11
BAT SPECIES RICHNESS BY SURVEY LOCATION**

Species		Status	Passive Survey Results ¹						Active Survey Results ¹	
Common Name	Scientific Name		AnaBat Location ²						April	August
			1	2	3	4	5	6		
Big brown bat	<i>Eptesicus fuscus</i>	--	--	X	X	X	X	X	--	X
Western mastiff bat	<i>Eumops perotis</i>	CDFW SSC County Group 2	--	X	--	--	X	X	--	--
Western red bat	<i>Lasiurus blossevillii</i>	CDFW SSC County Group 2	--	--	X	X	--	X	X	--
Yuma myotis	<i>Myotis yumanensis</i>	County Group 2	--	--	X	X	X	X	--	--
Pocketed free-tailed bat	<i>Nyctinomops femorosaccus</i>	CDFW SSC County Group 2	--	--	--	--	X	--	--	--
Mexican free-tailed bat	<i>Tadarida brasiliensis</i>	--	--	X	X	X	X	X	--	X
Species Richness			0	3	4	4	5	5	1	2

¹ Refer to Table 2 for the specific dates of each bat survey location.

² AnaBat locations 1, 2, and 3 were sampled in May 2018; Locations 4, 5, and 6 were sampled in July 2018.

4.3.4.2 Small Mammals

Nine mammal species (eight rodent and one rabbit species) were captured during the small mammal trapping surveys (Table 12). The most abundant mammal species captured was the California deermouse (*Peromyscus californicus*) with 136 captures, followed by California pocket mouse (*Chaetodipus californicus*) with 100 captures, and the North American deermouse (*Peromyscus maniculatus*) with 50 captures. A total of 172 captures with 140 new individuals and 32 recaptures occurred during the first trapping session in April 2018. Array 1 had the most captures totaling 76 with 63 new individuals and 13 recaptures composed of three species. Array 1 was located at Monument Mesa in the southeastern portion of the TRVRP (Figure 8a and 8e). A total of 180 captures occurred during Session 2 in June 2018 with 124 new individuals and 56 recaptures. Array 1 had the most

captures totaling 67, representing 42 new individuals and 25 recaptures made up of four species. Array 2, which is in the southwestern portion of TRVRP north of Monument Road and west of Hollister Street (Figure 8a and 8c), had the greatest species richness with seven species captured.

One special status species, San Diego desert woodrat (*Neotoma lepida intermedia*), was captured within the small mammal traps. The desert woodrat is a CDFW SSC and County Group 2 sensitive animal species (County 2010a). Three individuals were captured, with one recapture, all at Array 1 located at Monument Mesa in the southeastern portion of the TRVRP (Figure 13f). Additionally, two incidental captures of California towhee (*Melospiza crissalis*) occurred during small mammal trapping.

Table 12 provides the total number of individuals captured at each trapping array during each trapping session. The first number represents the number of new individuals captured while the second number, in parentheses, represents the total number of individuals captured, including recaptured individuals. The total number of species captured at each trapline at each array during each trapping session is included in Appendix J.

Table 12
SMALL MAMMAL TRAPPING RESULTS

Species		Status	Location ¹ (New individuals captured [total individuals captured])					Total
Common Name	Scientific Name		Array 1 Monument Mesa	Array 2 Southwest	Array 3 Northwest	Array 4.1 Baseball Fields and Dairy Mart ²	Array 4.2 Spooners Mesa ²	
Session 1 (April 2018)								
California pocket mouse	<i>Chaetodipus californicus</i>	--	22 (28)	2 (2)	8 (11)	5 (5)	NA	37 (46)
San Diego desert woodrat	<i>Neotoma lepida intermedia</i>	CDFW SSC County Group 2	1 (1)	0 (0)	0 (0)	0 (0)	NA	1 (1)
Brush deermouse	<i>Peromyscus boylii</i>	--	0 (0)	11 (13)	2 (2)	5 (8)	NA	18 (23)
California deermouse	<i>Peromyscus californicus</i>	--	40 (47)	28 (31)	2 (3)	2 (4)	NA	72 (85)
Western harvest mouse	<i>Reithrodontomys megalotis</i>	--	0 (0)	6 (10)	0 (0)	5 (6)	NA	11 (16)
Desert woodrat	<i>Thomomys bottae</i>	--	0 (0)	0 (0)	1 (1)	0 (0)	NA	1 (1)
Session 1 Total			63 (76)	47 (56)	13 (17)	17 (23)	NA	140 (172)
Session 2 (June 2018)								
California pocket mouse	<i>Chaetodipus californicus</i>	--	12 (19)	0 (0)	9 (18)	NA	12 (17)	33 (54)
San Diego desert woodrat	<i>Neotoma lepida intermedia</i>	CDFW SSC County Group 2	2 (3)	0 (0)	0 (0)	NA	0 (0)	2 (3)
California ground squirrel	<i>Otospermophilus beecheyi</i>	--	0 (0)	1 (1)	0 (0)	NA	0 (0)	1 (1)
Brush deermouse	<i>Peromyscus boylii</i>	--	0 (0)	1 (1)	5 (7)	NA	0 (0)	6 (8)
California deermouse	<i>Peromyscus californicus</i>	--	27 (44)	0 (0)	0 (0)	NA	6 (7)	33 (51)
North American deermouse	<i>Peromyscus maniculatus</i>	--	0 (0)	3 (3)	11 (17)	NA	23 (30)	37 (50)
Western harvest mouse	<i>Reithrodontomys megalotis</i>	--	1 (1)	8 (8)	2 (3)	NA	0 (0)	11 (12)
Desert cottontail	<i>Sylvilagus audubonii</i>	--	0 (0)	1 (1)	0 (0)	NA	0 (0)	1 (1)
Session 2 Total			42 (67)	14 (14)	27 (45)	NA	41 (54)	124 (180)

**Table 12 (cont.)
SMALL MAMMAL TRAPPING RESULTS**

Species		Status	Location ¹ (New individuals captured [total individuals captured])					Total
Common Name	Scientific Name		Array 1 Monument Mesa	Array 2 Southwest	Array 3 Northwest	Array 4.1 Baseball Fields and Dairy Mart ²	Array 4.2 Spooners Mesa ²	
Total Captures								
California pocket mouse	<i>Chaetodipus californicus</i>	--	34 (47)	2 (2)	17 (29)	5 (5)	12 (17)	70 (100)
San Diego desert woodrat	<i>Neotoma lepida intermedia</i>	CDFW SSC County Group 2	3 (4)	0 (0)	0 (0)	0 (0)	0 (0)	3 (4)
California ground squirrel	<i>Otospermophilus beecheyi</i>	--	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	1 (1)
Brush deermouse	<i>Peromyscus boylii</i>	--	0 (0)	12 (14)	7 (9)	5 (8)	0 (0)	24 (31)
California deermouse	<i>Peromyscus californicus</i>	--	67 (91)	28 (31)	2 (3)	2 (4)	6 (7)	105 (136)
North American deermouse	<i>Peromyscus maniculatus</i>	--	0 (0)	3 (3)	11 (17)	0 (0)	23 (30)	37 (50)
Western harvest mouse	<i>Reithrodontomys megalotis</i>	--	1 (1)	14 (18)	2 (3)	5 (6)	0 (0)	22 (28)
Desert cottontail	<i>Sylvilagus audubonii</i>	--	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	1 (1)
Botta's pocket gopher	<i>Thomomys bottae</i>	--	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)	1 (1)
TOTAL			105 (143)	61 (70)	40 (62)	17 (23)	41 (54)	264 (352)

¹ Refer to Table 2 for the specific dates of each bat survey location.

² The trapping array at Baseball Fields and Dairy Mart was relocated to Spooner's Mesa after Session 1 in an attempt to increase trapping success and trap in more suitable habitat.

4.3.4.3 Medium and Large Mammals

Eight mammal species were detected at the wildlife camera stations (Table 13). Species detected included desert cottontail, California ground squirrel, coyote (*Canis latrans*), opossum (*Didelphis virginiana*), bobcat (*Lynx rufus*), woodrat (*Neotoma* sp.), raccoon (*Procyon lotor*), and brush rabbit (*Sylvilagus bachmani*). Camera Stations 3 and 5 had the greatest species diversity with seven mammal species detected at each location. Camera 3 is located in the southwestern portion of the TRVRP, south of Tijuana River, north of Monument Road, and west of Hollister Street (Figure 8a). Camera 5 is located in the northeastern portion, north of the Tijuana River, and south of Dairy Mart Pond (Figure 8a). Camera station 4 had the next highest species diversity with six mammal species detected. Camera Station 4 is located in the southeastern portion, south of Tijuana River, north of Monument Road, and east of Hollister Street (Figure 8a).

Coyote was detected at all six camera stations. Detections included single individuals, groups of two and three, and a family group (two adults with at least three pups). Lactating females were detected at Camera Stations 3, 4, and 6. Coyote pups were detected at Camera 3 in May and July. At least three pups were observed together at one time at Camera 3 in May, and at least two older coyote pups were identified later in July. A lactating female coyote was also observed carrying a prey item, a domestic chicken, in March at Camera 3. Bobcats were detected at four of the camera stations, being absent from Cameras 2 and 5. All detections of bobcat were of a single individual. Bobcats were captured carrying prey items twice, which were one California ground squirrel at Camera 3 and the other was an unidentified mammal species at Camera 4. Raccoons were detected at five of the camera stations, only being absent at Camera 6. One of the raccoons captured had a short tail, about half the length of a fully-grown tail, and was blunt at the end possibly indicating that it had been injured in the past. This individual was readily recognized in the photographs and was identified at Cameras 1, 3, and 5. Cameras 1 and 3 are located to the west of Hollister Street, and Camera 5 is located east of Hollister Street to the south of Dairy Mart Pond (Figure 8a), showing connectivity between the western and eastern portion of the TRVRP.

Table 13 provides a summary of the wildlife camera surveys results. A total of 382 detections of mammal species occurred at the camera stations between all three survey sessions. The number of detections represents each detection event, not the number of individuals detected. The surveys did not include any capture and release or individual marking methods, therefore, individual animals cannot be identified and counted. The total number of detections often represents the same individual(s) making multiple trips within the area, either within the same night or over a period of time. The number of detections made during each session was relatively the same. Coyote was the most detected species with 141 total detections, following by desert cottontail with 111 detections, and then California ground squirrel with 45 detections. The most detections occurred at Camera 3 (131 detections), followed by Camera 4 (104), and then Camera 5 (92).

Table 13
WILDLIFE CAMERA RESULTS

Species		Status	Number of Detections ¹						
Common Name	Scientific Name		Camera Station						Total
			1	2	3	4	5	6	
Session 1 (March 2018)									
Coyote	<i>Canis latrans</i>	--	3	5	11	12	3	5	39
Opossum	<i>Didelphis virginiana</i>	--	--	--	1	2	--	--	3
Bobcat	<i>Lynx rufus</i>	--	--	--	2	2	--	--	4
Woodrat	<i>Neotoma sp.</i>	--	--	--	--	2	1	--	3
Raccoon	<i>Procyon lotor</i>	--	--	--	4	1	19	--	24
California ground squirrel	<i>Spermophilus beecheyi</i>	--	--	--	7	--	--	--	7
Desert cottontail	<i>Sylvilagus audubonii</i>	--	--	--	2	39	7	--	48
Brush rabbit	<i>Sylvilagus bachmani</i>	--	--	--	--	--	--	--	0
Session 1 Total			3	5	27	58	30	5	128
Session 2 (May 2018)									
Coyote	<i>Canis latrans</i>	--	1	--	13	24	5	18	61
Opossum	<i>Didelphis virginiana</i>	--	2	--	7	--	2	--	11
Bobcat	<i>Lynx rufus</i>	--	1	--	1	4	--	2	8
Woodrat	<i>Neotoma sp.</i>	--	--	--	1	--	1	--	2
Raccoon	<i>Procyon lotor</i>	--	2	--	3	--	2	--	7
California ground squirrel	<i>Spermophilus beecheyi</i>	--	--	--	9	--	--	--	9
Desert cottontail	<i>Sylvilagus audubonii</i>	--	--	--	1	17	16	--	34
Brush rabbit	<i>Sylvilagus bachmani</i>	--	--	--	--	--	1	--	1
Session 2 Total			6	0	35	45	27	20	133
Session 3 (July 2018)									
Coyote	<i>Canis latrans</i>	--	4	1	31	1	3	1	41
Opossum	<i>Didelphis virginiana</i>	--	--	--	--	--	2	--	2
Bobcat	<i>Lynx rufus</i>	--	4	--	10	--	--	--	14
Woodrat	<i>Neotoma sp.</i>	--	--	--	--	--	--	--	0
Raccoon	<i>Procyon lotor</i>	--	1	1	2	--	2	--	6
California ground squirrel	<i>Spermophilus beecheyi</i>	--	--	--	26	--	3	--	29
Desert cottontail	<i>Sylvilagus audubonii</i>	--	4	--	--	--	25	--	29
Brush rabbit	<i>Sylvilagus bachmani</i>	--	--	--	--	--	--	--	0
Session 3 Total			13	2	69	1	35	1	121
Total Detections									
Coyote	<i>Canis latrans</i>	--	8	6	55	37	11	24	141
Opossum	<i>Didelphis virginiana</i>	--	2	--	8	2	4	--	16
Bobcat	<i>Lynx rufus</i>	--	5	--	13	6	--	2	26
Woodrat	<i>Neotoma sp.</i>	--	--	--	1	2	2	--	5
Raccoon	<i>Procyon lotor</i>	--	3	1	9	1	23	--	37
California ground squirrel	<i>Spermophilus beecheyi</i>	--	--	--	42	--	3	--	45
Desert cottontail	<i>Sylvilagus audubonii</i>	--	4	--	3	56	48	--	111
Brush rabbit	<i>Sylvilagus bachmani</i>	--	--	--	--	--	1	--	1
TOTAL			22	7	131	104	92	26	382

¹ Number represents the total number of detections, not individuals.

No special status species were detected at the wildlife camera stations. Several incidental non-mammal species were detected by the cameras including great horned owl, mallard, house finch, great basin fence lizard, Anna's hummingbird (*Calypte anna*), thrush (*Catharus* sp.), greater roadrunner (*Geococcyx californianus*), song sparrow (*Melospiza melodia*), California towhee (*Melospiza crissalis*), black-crowned night-heron (*Nycticorax nycticorax*), western tiger swallowtail (*Papilio rutulus*), bushtit (*Psaltriparus minimus*), black phoebe (*Sayornis nigricans*), lesser goldfinch (*Spinus psaltria*), white-crowned sparrow (*Zonotrichia leucophrys*), and an unidentified species of moth (family Lepidoptera). Detailed results of all species captured by the wildlife cameras during each survey session, at each camera station are included in Attachment K. Representative photographs of species captured by the wildlife cameras are included in Appendix L.

4.3.5 Special Status Wildlife Detected

Special status wildlife species are those listed as endangered, threatened, or rare, or a candidate for those listings by the federal government (USFWS) or State of California (CDFW); included on the County's Sensitive Animal List (County 2010a); or covered by the City MSCP Subarea Plan (City 1997). Thirty-one special status wildlife species were observed or detected within the TRVRP (Figures 13a-13e). Seven of these species are covered under the City MSCP Subarea Plan (Belding's orang-throated whiptail, Blainville's horned lizard, Cooper's hawk, northern harrier, coastal California gnatcatcher, western bluebird, and least Bell's vireo). An explanation of special status codes is included in Appendix E. A description of special status species detected within the TRVRP is included in the following sections.

4.3.5.1 Invertebrates

Two special status invertebrate species, monarch and Quino checkerspot butterfly, were observed within the TRVRP, as described below:

Monarch (*Danaus plexippus*)

Status: --/--; County Group 2

The monarch butterfly is found from southern Canada south through the United States into Central and South America. The species breeds in areas that have a suitable abundance of their host plant, milkweed (*Asclepias* sp.). The population west of the Rocky Mountains migrates to, and overwinters along, the coast of central and southern California into Baja Mexico (Tuskes 1978). The species inhabits a wide variety of open habitats including fields, meadows, marshes, and roadsides and roosts on wind-protected tree groves (such as eucalyptus, Monterey pine [*Pinus radiata*], cypress [*Hesperocyparis* sp.]), with nectar and water sources nearby.

Two individuals were observed during the butterfly surveys in April in the northwestern portion of the TRVRP within the Bird and Butterfly Gardens (Figure 13c).

Quino Checkerspot Butterfly (*Euphydryas editha quino*)

Status: Federal Endangered/--; County Group 1; MSCP Narrow Endemic

The Quino checkerspot butterfly occurs in western Riverside County, southern San Diego County, and northern Baja California Mexico (USFWS 2009). The species inhabits patchy shrublands or small tree landscapes with openings. Several vegetation types are known to support the species including coastal sage scrub, open chaparral, juniper woodland, and native grassland. Males, more so than females, are frequently observed on hilltops and ridgelines and exhibit a tendency to occur in barren spots amidst

low-growing vegetation (USFWS 2003). Females deposit eggs on the species primary host plants which include dwarf plantain (*Plantago erecta*), desert plantain (*P. ovata*), woolly plantain (*P. patagonica*), white snapdragon (*Antirrhinum coulterianum*), thread-leaved bird's beak (*Cordylanthus rigidus*). Secondary larval host plants, plants that may be consumed by larvae but not used by adults for ovipositing include purple owl's clover (*Castilleja exserta*) and Chinese houses (*Collinsia heterophylla*). Nectaring resources also play an important role in the species life cycle with butterflies documented frequently taking nectar from California buckwheat, goldfields (*Lasthenia* spp.), goldenstar (*Bloomeria* spp.), popcorn flower (*Plagiobothrys* spp.; *Cryptantha* spp.), onion (*Allium* spp.), chia (*Salvia columbare*), and blue dicks (*Dichelostemma capitatum*), among others (USFWS 2003).

One Quino checkerspot butterfly was incidentally observed on Spooner's Mesa on April 15, 2019, during monitoring of an adjacent habitat enhancement area (Figure 13e).

4.3.5.2 Amphibians

One special status amphibian species, western spadefoot, was observed within the TRVRP as described below:

Western spadefoot toad (*Spea hammondi*)

Status: --/Species of Special Concern; County Group 2

The western spadefoot toad occurs from northern California southward to San Diego County and farther into Baja California to the west of the Sierra Nevada at elevations below 4,500 feet. This terrestrial species requires temporary pools for breeding. Suitable upland habitats include coastal sage scrub, chaparral, and grasslands but the species is most common in grasslands with vernal pools or mixed grassland-coastal sage scrub areas (Holland and Goodman 1998). The species breeds in temporary pools formed by heavy rains that hold standing water for more than three weeks to allow adequate time for tadpoles to metamorphose but is also found breeding in riparian habitats with suitable water resources (Feaver 1971). Breeding pools must lack exotic predators such as fish, bullfrogs, and crayfish for the species to successfully reproduce (Jennings and Hayes 1994). The species estivates in burrows within upland habitats adjacent to potential breeding sites (Stebbins and McGinnis 1972).

Western spadefoot tadpoles were incidentally observed within an ephemeral pond located along a dirt trail in the southwestern portion of the TRVRP to the north of Monument Road (Figure 13a). The tadpoles were observed during monitoring of an adjacent restoration site on February 19, 2019.

The western spadefoot has potential to occur within the other areas of the TRVRP where suitable ephemeral ponds may occur. Previous occurrences of the species occur within the TRVRP and surrounding region. At least two individuals were captured between 1997 and 1999 in pit-fall traps within Border Field State Park, which lies immediately west of the park. Tadpoles were also reportedly observed in 2007 in a depression present within a dirt road on Spooner's Mesa (County 2007). Recreational ponds (i.e., Duck Ponds and Dairy Mart Pond) in the northern portion of the park have limited potential to provide suitable breeding habitat. American bullfrogs were observed in these ponds during the aquatic amphibian surveys, which may preclude any potential spadefoots in the area from utilizing these ponds for breeding purposes.

4.3.5.3 Reptiles

Three special status reptile species were detected within the TRVRP as described below:

Belding's orange-throated whiptail (*Aspidoscelis hyperythrus beldingi*)

Status: --/Watch List; County Group 2; City MSCP Covered

The Belding's orange-throated whiptail is found in the southwestern portion of California within San Diego, Orange, western Riverside, and southern San Bernardino Counties on the western slopes of the Peninsular ranges below 3,500 feet (Jennings and Hayes 1994). Suitable habitat includes coastal sage scrub, chaparral, juniper woodland, oak woodland, and grasslands along with alluvial fan scrub and riparian areas. Occurrence of the species appears to be correlated with the presence perennial plants (such as California buckwheat, California sagebrush, black sage, or chaparral) that provide a food base for its major food source, termites (Bostic 1966).

The Belding's orange-throated whiptail was detected in several locations throughout the Park, including being captured during the drift-fence and funnel trap surveys (Appendix H). Twenty-two individuals were captured between drift-fence and funnel Traps 2, 3, and 4 (Figures 13a-13f). Trap 2 was located in the southwestern portion of the TRVRP, south of Monument Road, on Spooner's Mesa (Figure 8e). Trap 3 was located in the southeastern portion of the TRVRP, south of Monument Road, on Monument Mesa (Figure 8f). Trap 4 was located in the northwestern portion of the TRVRP just south of Sunset Avenue (Figure 8b). Outside of the reptile trapping locations, the species was observed in the central portion of the Park, west of Hollister Street, at the Butterfly Gardens (Figure 13c).

Baja California Coachwhip (*Coluber fuliginosus*)

Status: --/Species of Special Concern

The Baja California coachwhip occurs from extreme southern San Diego County south to Baja California at elevations below 7,700 feet (Stebbins 1985). The species is a habitat generalist found in open terrain but is more common in grasslands, scrublands, and coastal sand dunes in California (Wilson 1970). Their diet consists of a wide variety of prey including rodents, lizards, snakes, turtles, insects, bird and lizard eggs, and carrion (Grismer 2002).

A single Baja California coachwhip was captured in August during the reptile drift-fence with funnel trapping surveys at Trap 4 in the northwestern portion of the park south of Sunset Avenue (Figure 13b; Appendix H).

Blainville's horned lizard (*Phrynosoma blainvillii*)

Status: --/Species of Special Concern; County Group 2; City MSCP Covered

The Blainville's horned lizard (formerly known as coast horned lizard [*Anota coronatum*] and San Diego horned lizard [*Phrynosoma coronatum blainvillii*]) occur from southern California to northern Baja California. In California, the species predominately occurs from Kern County south to San Diego County and west of the deserts at elevations below 8,000 feet (Brattstrom 1997). The species inhabits a wide variety of vegetation types including sagebrush scrub, chaparral, grasslands, forests, and woodlands but is restricted to areas with suitable loose, sandy soils with open areas for basking (Jennings and Hayes 1994). The horned lizard is an insectivore primarily feeding on native harvester ants (*Pogonmyrmex* sp.).

A single Blainville's horned lizard was captured in August during the reptile drift-fence with funnel trapping surveys at Trap 4 in the northwestern portion of the Park south of Sunset Avenue (Figure 13b; Appendix H).

4.3.5.4 Birds

Nineteen special status birds were detected within the TRVRP as described below:

Cooper's hawk (*Accipiter cooperii*)

Status: --/Watch List; County Group 1; City MSCP Covered

The Cooper's hawk is widespread throughout North America ranging from southern Canada south to Mexico and occurring as a year-round resident within the majority of the continental United States. In California, the species breeds from Siskiyou County south to San Diego County and east to the Owens Valley at elevations below 9,000 feet (Curtis et al. 2006). The species inhabits forests, riparian areas, and more recently suburban and urban areas nesting within dense woodlands and forests and isolated trees in open areas (Chiang et al. 2012).

The Cooper's hawk was detected within multiple locations of the TRVRP during several different survey efforts including the avian point count surveys (Appendix I). The species was heard calling, observed flying overhead, and observed perched on telephone poles and trees in the northwestern, northeastern, southeastern, and southwestern portions of the TRVRP (Figures 13a-13f). Suitable nesting habitat for the species is present throughout the TRVRP, particularly within riparian habitat located along the Tijuana River and other large trees (such as eucalyptus) present in the area. No nesting Cooper's hawks were observed within the Park.

Sharp-shinned hawk (*Accipiter striatus*)

Status: --/Watch List; County Group 1

The sharp-shinned hawk occurs throughout North America breeding from Alaska through Canada, the northern United States, southwestern states of Arizona and New Mexico, and into Mexico; winters from southern Canada to Central America. Primarily migrates through and winters in California with breeding records restricted to the northern and central portions of the State, but the species breeding range within California is poorly known (Bildstein and Meyer 2000). Breeding habitat consists of most closed-canopy woodlands and forests, including riparian habitats, located at sea level to near alpine elevations with nest sites generally placed in trees near openings (Platt 1976). Wintering habitat is similar to its breeding habitat but more expansive to include suburban and agricultural areas.

The sharp-shinned hawk was incidentally observed flying in the southeastern portion of the TRVRP north of Monument Road in April during the first small mammal trapping session and avian point count surveys (Figure 13e). The species is presumed to be a wintering visitor to the park as no later observations of the species occurred in the summer months and no breeding records for the species occur in the area (Unitt 2004). Sharp-shinned hawks are not known to nest within southern California, primarily being found as a migrant and wintering species. Summering and possible breeding records for the species within San Diego County are restricted to higher elevation areas in the eastern portion of the County, such as the Cuyamaca Mountains (Unitt 2004).

Great blue heron (*Ardea herodias*)

Status: --/--; County Group 2

The great blue heron is widespread throughout North America ranging from southern Canada southwards into Mexico, also wintering in Central and northern South America. In California, the species is a year-round resident occurring throughout most of the State in saline and freshwater wetlands and shallow estuaries (Zeiner et al. 1990). The species nests as single pairs and in small colonies with nest sites located on the ground, in trees and bushes, and on artificial structures that are usually adjacent to

water and secluded from human disturbance (Vennesland 2000). It is found in a wide variety of habitats, foraging in various wetland habitats, water bodies, and occasionally uplands.

A single great blue heron was observed at Dairy Mart Pond during the November avian point count survey (Figure 13b). The species was observed wading within the freshwater marsh habitat at the edge of the pond and foraging for food.

Red-shouldered hawk (*Buteo lineatus*)

Status: --/--; County Group 1

Two populations, an eastern and western, of red-shouldered hawk occur within North America (Wheeler 2003). The eastern population ranges from southeastern Canada south to Florida and northeastern Mexico, and as far east as central Texas. The western population occurs along the coastal regions of southern Oregon south to California into northern Baja California. In California, the species occurs to the west of Sierra Nevada occupying mature oak and riparian woodlands, eucalyptus groves, and suburban areas near forested areas (Dykstra et al. 2008). Nests in trees, both native and non-native, often located near a water source such as stream or pond (Rottenborn 2000).

The red-shouldered hawk was detected during multiple survey efforts including the avian point count surveys (Appendix I). Individuals were heard calling within riparian habitat along the Tijuana River and observed flying overhead in the northwestern, northeastern, and southwestern portions of the Park (Figures 13a, 13b, 13c, and 13d). Suitable nesting habitat for the species within the Park primarily consists of riparian habitat located along the Tijuana River. No nesting red-shouldered hawks were observed within the Park.

Green Heron (*Butorides virescens*)

Status: --/--; County Group 2

The green heron occurs throughout the majority of North America ranging from southeastern Canada, south to Florida, west to the Pacific Coast, and south into Mexico and the northern portion of South America. In California, the species is a year-round resident found generally west of the Sierra Nevada and within appropriate habitat in the southern deserts. Found in a wide variety of wetland habitats such as swamps, marshes, riparian habitat along creeks and streams, lake edges, and man-made ditches, canals, and ponds preferring thick vegetation and avoiding open areas (Davis and Kushlan 1994).

A single green heron was detected during the June avian point county survey at Dairy Mart Pond in the northeastern portion of the TRVRP (Figure 13b).

Costa's Hummingbird (*Calypte costae*)

Status: Birds of Conservation Concern/--

The Costa's hummingbird is found in deserts and xeric habitats west of the Continental Divide and south of the Great Basin from southern Utah, western and southern Arizona, to southern California and further into Baja California and Mexico (Baltosser et al. 1996). The species occurs year-round in southern California breeding along the coast in sage scrub and chaparral habitats from Santa Barbara County south to San Diego County, and east into the desert regions of Inyo County and south to Imperial County (Garrett and Dunn 1981). Breeding habitats include Sonoran Desert scrub, Mojave Desert scrub, coastal sage scrub, and chaparral.

The Costa's hummingbird was detected during the avian point count survey in April (Appendix I). A single individual was present at point count 9 in the southeastern portion of the TRVRP at Monument Mesa (Figure 13f).

Turkey Vulture (*Cathartes aura*)**Status: --/--; County Group 1**

The turkey vulture occurs throughout most of North America from southern Canada south to Mexico and into Central and South America. In California, the species occurs as a year-round resident along the coastal regions but breeds throughout the entire state. Preferred habitat includes farmland and forests but the species is also found at pastures and agricultural areas in the west and has an increased presence in urban areas in the winter (Gaby 1982). The species nests in partly forested to forested areas isolated from humans with nest sites placed on rock outcrops, fallen trees, and abandoned buildings (Kirk and Mossman 1998). Vultures roost communally preferring stands of large trees or hilly areas, usually away from human disturbance (Evans and Sordahl 2009). They are opportunistic feeders of domestic and wild carrion, primarily mammals but also non-mammals, foraging and locating food through both sight and smell (Stager 1964).

Turkey vultures were observed flying over the TRVRP during multiple survey efforts including the avian point count surveys (Appendix I). The species was detected in the northeastern, southeastern, and southern portions of the park including Monument Mesa and Spooner's Mesa (Figures 13a-13f). Suitable nesting habitat for the species within the Park would be restricted to rocky crevices present in the southern portion of the site at Spooner's and Monument Mesa, particularly steeper slopes bordering Smuggler's Gulch. No nesting turkey vultures were observed within the Park.

Northern harrier (*Circus hudsonius*)**Status: --/Species of Special Concern; County Group 1; City MSCP Covered**

The northern harrier is a widely distributed species occurring throughout North America from Canada to Mexico and further south into Central America. In California, the species occurs as a year-round resident, migratory breeder, and wintering individual. Inhabits open areas including wetlands, marshes, marshy meadows, grasslands, riparian woodlands, desert scrub, and pastures and agricultural areas. The northern harrier breeds at elevations below 8,000 feet from the northern portion of the state, south through the central coast and valley, and into the southern portion of the state, though harriers are largely absent from the southern desert regions. Breeding populations in southern California occurring from Ventura County to San Diego County are highly fragmented with many local populations extirpated, mostly likely as a result of habitat loss and degradation (Shuford and Gardali 2008). Harriers nest on the ground in wetlands and uplands within patches of dense, often tall, vegetation in undisturbed areas (Smith et al. 2011).

The northern harrier was detected during multiple survey efforts, including the avian point count surveys (Appendix I). The species was observed foraging and flying overhead in the northwestern, northeastern, and southwestern portions of the TRVRP as well at Monument Mesa and Spooner's Mesa (Figures 13a, 13b, and 13c, 13e). Additionally, a nest was detected in the southwestern portion of the Park to the north of Monument Road during rare plant surveys, confirming positive breeding status within the TRVRP (Figure 13b).

White-tailed kite (*Elanus leucurus*)**Status: --/Fully Protected; County Group 1**

The white-tailed kite occurs in small portions of Washington south to California and east to Texas and Florida, as well as further south to Mexico and South America. In California, the species is a year-long resident of coasts and valleys west of the Sierra Nevada foothills and southeast deserts, though the species has been documented breeding in arid regions east of the Sierra Nevada and within Imperial County (Small 1994). The species inhabits low elevation grasslands, wetlands, oak woodlands, and open

woodlands, and is associated with agricultural areas. Kites breed in riparian areas adjacent to open spaces nesting in isolated trees or relatively large stands trees (Dunk 1995).

The white-tailed kite was observed in January, April, and June during multiple survey efforts including the avian point surveys (Appendix I). A family group of three individuals was observed at point count 5 in June in the northeastern portion of the TRVRP, to the east of the baseball fields, at the terminus of Sunset Avenue (Figures 8c and 13c). The family group was observed flying within the area and perched on vegetation. A single kite was observed in June flying over Diary Mart Pond at point count 6 in the northeastern portion of the TRVRP (Figure 13b). Suitable nesting habitat for the species within the TRVRP includes riparian habitat located along the Tijuana River. No nesting white-tailed kites were observed within the Park.

California horned lark (*Eremophila alpestris actia*)

Status: --/Watch List; County Group 2

The California horned lark is one of 21 recognized subspecies occurring in the coastal ranges of California from San Joaquin Valley to northern Baja California (American Ornithologists' Union 1957). The species inhabits a variety of open habitats with low, sparse vegetation where trees and large shrubs are absent. Suitable habitats include grasslands along the coast, deserts within the inland regions, shrub habitat at higher elevations, and agricultural areas (Beason 1995).

The horned lark was detected during the avian point count surveys in April (Appendix I). A single individual was heard signing in the vicinity of point count 9 in the southeastern portion of the TRVRP at Monument Mesa (Figure 13f). Although the species was not identified to the subspecies level, the presumption is the species has a high likelihood to be of the California special status subspecies and it is appropriate to assume presence of the subspecies within the TRVRP.

Yellow-breasted chat (*Icteria virens*)

Status: --/Species of Special Concern; County Group 1

The yellow-breasted chat occurs throughout North America from Canada south to Baja California and Mexico. The species' breeding range includes southern British Columbia south to Baja California with the species wintering from southern Baja California and south Texas, south to Mexico and Panama (Eckerle and Thompson 2001). In California, the species occurs as a migrant and summer resident breeding from the coastal regions of northern California east of the Cascades, and throughout the central and southern portions of the state. Chats breed in early successional riparian habitats with a well-developed shrub layer and an open canopy with nest sites often placed on the borders of streams, creeks, rivers, and marshes (Shuford and Gardali 2008).

The yellow-breasted chat was detected within the TRVRP in the spring and summer months during multiple survey efforts including the avian count surveys in multiple locations (Appendix I). The species was found within riparian habitat long Tijuana River and associated floodplain in areas north of Monument Road (Figures 13a-13e). Males were observed singing at the top of vegetation and engaged in flight, which indicates that the species likely breeds within the Park.

Gadwall (*Mareca strepera*)**Status: --/-- County Group 2**

The gadwall is found throughout North America from southern Alaska south to Canada and Mexico. The species winters and breeds within California occupying interior valleys, wetlands, ponds, and streams (Leschack et al. 1997). Gadwalls nest in short, dense herbaceous habitats adjacent to suitable shallow-water feeding areas, such as islands surrounded by open water (Zeiner et al. 1990).

Five gadwalls were observed during the avian point count surveys in April and June (Appendix I). The species was observed at point count locations 6 and 7. Point count 6 is located at Dairy Mart Pond and point count 7 is located south of Dairy Mart Pond just north of Tijuana River (Figures 8b and 13b).

American white pelican (*Pelecanus erythrorhynchos*)**Status: --/Species of Special Concern; County Group 2**

The American white pelican is found in the western and southern portions of North America from central Canada south to the western two-thirds of the United States as far east as Florida and then further south into Mexico. The species is mainly an overwintering visitor to California found along the Pacific Coast and lowlands of central California, although birds also winter at the Salton Sea in Imperial County (Shuford and Gardali 2008). In California, the species breeds at lakes and marshes in the Klamath Basin, Modoc Plateau, and Great Basin Desert in the northeastern portion of the state (Shuford 2005). The species breeds in colonies on isolated islands of freshwater lakes and overwinters at marine estuaries and inland lakes where suitable habitat for feeding, loafing, and roosting is present (Knopf 2004).

The American white pelican was observed flying over the TRVRP during the avian point count survey in November (Appendix I). A group of 10 individuals was observed flying in the distance to the northwest of Dairy Mart Pond at point count 5 (Figures 8c and 13c). A group of 11 individuals was observed flying north of point count 7 to the south of Dairy Mart Pond (Figures 8b and 13b). The species has potential to utilize the TRVRP for loafing and foraging opportunities during the winter but is not expected to breed within the TRVRP.

Double-crested cormorant (*Phalacrocorax auritus*)**Status: --/Watch List; County Group 2**

The double-crested cormorant is widely distributed throughout North America ranging as far north as Alaska and south toward Canada and Mexico. In California, the species is a year-round resident along the entire coast, occupying fresh and saltwater estuaries, and inland lakes. The species also occurs east of the coast within the Central Valley, lower Colorado River, and Salton Sea (Dorr et al. 2014). Habitat requirements include suitable places for feeding, resting, loafing, and nighttime roosts. The species diet mostly consists of fish but may include other aquatic animals, and at times terrestrial animals based on opportunity (Robertson 1974). Cormorants breed in colonies at sites safe from predators and adjacent to feeding areas such as rocky or sandy islands, bridges, docks, nesting towers, trees, emergent marsh vegetation, and on the ground (Meier 1981).

The double-crested cormorant was observed flying over and utilizing aquatic habitat within the TRVRP during the avian point count surveys (Figures 13a, 13b, and 13d). Ten individuals were observed during the avian point count surveys with the species recorded at point count locations 2 and 6 (Appendix I). Point count 2 is located in the northwestern portion of the TRVRP south of Sunset Avenue (Figure 8b). Point count 6 is located at Dairy Mart Pond in the northeastern portion of the TRVRP (Figure 8d). The

species was observed loafing and foraging at the Dairy Mart Pond, but no nesting cormorants were observed.

Coastal California gnatcatcher (*Poliioptila californica californica*)

Status: Federal Threatened/Species of Special Concern; County Group 1; City MSCP Covered

The coastal California gnatcatcher is a year-round resident occurring from southern California south to northwest Baja California (Atwood and Bolsinger 1992). In California, the species is found from Ventura County south to San Diego County and east to the western portions of San Bernardino and Riverside Counties. Coastal California gnatcatchers typically occur in arid, open sage scrub habitats on gently sloping hillsides to relatively flat areas at elevations below 1,640 feet but may occur as high as 3,000 feet (Grishaver et al. 1998). The composition of sage scrub in which gnatcatchers are found is variable; however, California sagebrush is at least present as dominant or co-dominant species (Atwood and Bontrager 2001). The species is mostly absent from areas dominated by black sage, white sage, or lemonadeberry, though in inland areas the species may occur more regularly in areas dominated by black sage (Mock 2004).

The coastal California gnatcatcher was detected within the southern portion of the TRVRP during multiple survey efforts including the avian point count surveys (Appendix I). The species was detected at multiple locations within Spooner's Mesa and Monument Mesa (Figures 13e and 13f). A single individual was detected in the southwestern portion of the TRVRP north of Monument Road and west of Hollister Street (Figure 13b). No breeding pairs were confirmed during the surveys, however, observations included territorial males and the species is presumed to nest within suitable coastal sage scrub habitat present in the TRVRP.

Yellow warbler (*Setophaga petechia*)

Status: Birds of Conservation Concern/Species of Special Concern; County Group 2

The yellow warbler is a common to locally abundant species breeding throughout California, excluding most of the Mojave Desert and all of the Colorado Desert, and wintering in northern Mexico (Lowther et al. 1999). The species breeds in riparian areas dominated by willows near rivers, streams, lakes, and wet meadows. Also breeds in montane shrub and conifer forests in higher elevation areas (Shuford and Gardali 2008).

The yellow warbler was found during several efforts, including the avian point surveys, in the spring and summer months (Appendix I). The species was detected throughout the TRVRP, primarily within riparian habitat along the Tijuana River and associated floodplain (Figures 13a-13f).

Western bluebird (*Sialia mexicana*)

Status: --/--; County Group 2; City MSCP Covered

The western bluebird is found throughout the western United States, Mexico, and southwestern Canada. The species is a common year-round resident throughout California but is absent from the higher mountain regions and eastern deserts (Guinan et al. 2008). Western bluebirds breed in open woodlands, riparian habitats, grasslands, and farmlands. They nest and roost in cavities of trees and snags, often in holes previously created by woodpeckers, and nest boxes. Bluebirds are found in a wider variety of habitats in the winter.

The western bluebird was detected in April during the first small mammal trapping session in the northwestern portion of the TRVRP at Dairy Mart Pond (Figure 13d).

Barn owl (*Tyto alba*)**Status: --/--; County Group 2**

The barn owl is a wide-ranging species found throughout the continental United States and San Diego County. The species is a common, yearlong resident found in open habitats such as grassland, chaparral, riparian, and wetlands avoiding dense forests and open desert habitats (Zeiner et al. 1990). The species is also found in urban and suburban areas. Barn owls' nest in sheltered areas of cliffs or man-made structures, on ledges, and in crevices, culverts, nest boxes, and cavities in trees. The species roosts in dense vegetation, and on cliffs, buildings, and other man-made structures.

Barn owls were detected during the evening avian point count surveys in April, June, and November as single individuals and groups of two throughout the TRVRP (Appendix I). The species was observed foraging within uplands and perched on telephone poles and wires during the nocturnal surveys within the southwestern and northeastern portions of TRVRP including Spooner's Mesa, south of Dairy Mart Pond, and north of baseball fields (Figures 13a-13e).

Least Bell's vireo (*Vireo bellii pusillus*)**Status: Federal Endangered/State Endangered, Species of Special Concern; County Group 1; City MSCP Covered**

The least Bell's vireo is the western-most of the four subspecies of Bell's vireo (*Vireo bellii*) breeding within California and northern Baja California and wintering in southern Baja California (Kus 2002). In California, the species breeds along the coast and western edge of the Mojave Desert from Santa Barbara County south to San Diego County and east to Inyo County, San Bernardino, and Riverside Counties. Preferred breeding habitat consists of early to mid-successional riparian habitat, often where flowing water is present, but the species is also found in dry watercourses within the desert. A structurally diverse canopy and dense shrub cover is required for nesting and foraging (Kus 2002). Dominant species within breeding habitat includes cottonwood and willows with mule fat, oaks, and sycamore, and mesquite (*Prosopis glandulosa*) and arrowweed (*Pluchea sericea*) within desert habitats. The species can be tolerant of the presence of invasive non-native species such as tamarisk.

The least Bell's vireo was detected within the TRVRP during the spring and summer months during multiple survey efforts including the avian count surveys in multiple locations (Appendix I). The species occurs within riparian habitat along Tijuana River and associated floodplain in areas north of Monument Road (Figures 13a and 13f). Though no breeding pairs or juveniles were identified, observations included territorial males and the species is presumed to nest within suitable riparian habitat present within the TRVRP.

4.3.5.5 Mammals

Six special status mammal species were detected within the TRVRP as described below:

Western mastiff bat (*Eumops perotis*)**Status: --/Species of Special Concern; County Group 2**

The western mastiff bat has three widely separated populations with one occurring in southwestern United States from California east toward Texas and south across northern Mexico (Tremor et al. 2017). In California, the species occurs from Monterey County to San Diego County from the coast eastward to the Colorado Desert (Zeiner et al. 1990). The western mastiff bat is found in open, semi-arid to arid habitats including coastal and desert scrub, grasslands, woodlands, and palm oases. The species prefers

to roost in high situations above the ground on vertical cliffs, rock quarries, outcrops of fractured boulders, and occasionally tall buildings.

The western mastiff bat was detected during the passive bat surveys in May and July with calls recorded at AnaBat locations 2, 5, and 6 (Figures 13d, 13e, and 13f; Table 10). Location 2 is located on Spooner's Mesa in the southwestern portion of the TRVRP (Figure 8e). Location 5 is located at Monument Mesa in the southeastern portion of the TRVRP (Figure 8f). The device was positioned at the western end of the mesa at the top of a hillside that borders a canyon known as Smuggler Gulch. Location 6 is located just north of Tijuana River south of Dairy Mart Pond in the northeastern portion of the TRVRP (Figure 8d).

Western red bat (*Lasiurus blossevillii*)

Status: --/ Species of Special Concern; County Group 2

The western red bat has a broad distribution ranging from southern British Columbia to the western United States and further south through Mexico, Central America, and South America. In California, the species is locally common being found from Shasta County south to San Diego County and west of the Sierra Nevada/Cascade Range and deserts (Zeiner et al. 1990). The species mainly occurs in riparian woodlands populated by willows, cottonwoods, sycamores, and oak trees but can be found in invasive non-native vegetation such as tamarisk, eucalyptus, and orchards. The western red bat typically forages along river and stream courses but also feeds at forested meadow edges and suburban and urban parks (Tremor et al. 2017). The species primarily roosts in trees preferring heavily shaded areas which are open underneath (Zeiner et al. 1990).

The western red bat was detected during the passive bat surveys in April, May, and July, with calls recorded at AnaBat locations 3, 4, and 6 (Figures 13b and 13d; Table 10). Location 3 is located at Dairy Mart Pond in the northeastern portion of the TRVRP (Figure 8d). Location 4 is located at the Duck Ponds in the northwestern portion of the TRVRP south of Sunset Avenue, west of Saturn Boulevard, and north of the Tijuana River (Figure 8b). Location 6 is located just north of the Tijuana River south of Dairy Mart Pond in the northeastern portion of the TRVRP (Figure 8b). The species was also detected during the April active driving survey (Table 10).

San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)

Status: --/ Species of Special Concern; County Group 2

The San Diego black-tailed jackrabbit is one of nine subspecies of black-tailed-jackrabbit that occur in the United States (Hall 1951). It occurs along the coastal regions of southern California south to northern Baja California (Hall 1951). The species is found in arid regions preferring grasslands, agricultural fields, and sparse scrub. They are typically absent from areas with high-grass or dense brush, such as closed-canopy chaparral, primarily occupying short-grass and open scrub habitats.

The San Diego black-tailed jackrabbit was observed at seven separate locations in the southern portion of the TRVRP including Spooner's Mesa and Monument Mesa, and in the southwestern portion north of Monument Road (Figures 13e and 13f).

Yuma myotis (*Myotis yumanensis*)

Status: --/--; County Group 2

Yuma myotis occurs in western North America ranging from British Columbia to Central Mexico and eastward toward Colorado and Oklahoma (Sims 2000). The species is widespread in California but uncommon in the Mojave and Colorado Deserts, except in the mountain ranges bordering Colorado River Valley (Zeiner et al. 1990). Yuma myotis is found in a variety of habitats including juniper and

riparian woodlands, riparian forests, and desert regions where bodies of water (i.e., rivers, streams, ponds, lakes, etc.) are present. The species is closely associated with water, which it uses for foraging and as a source of drinking water. They roost within caves, attics, buildings, mines, and other similar structures, and underneath bridges.

Yuma myotis was detected during the passive bat surveys in May and July with calls recorded at AnaBat locations 3, 4, 5, and 6 (Figures 13b, 13d, and 13f; Table 10). Location 3 is located at Dairy Mart Pond in the northeastern portion of the TRVRP (Figure 8d). Location 4 is located at the Duck Ponds in the northwestern portion of the TRVRP south of Sunset Avenue, west of Saturn Boulevard, and north of the Tijuana River (Figure 8b). Location 5 is located at Monument Mesa in the southeastern portion of the TRVRP (Figure 8f). The device was positioned at the western end of the mesa at the top of a hillside that borders Smuggler Gulch. Location 6 is located just north of Tijuana River south of Dairy Mart Pond in the northeastern portion of the TRVRP (Figure 8d).

San Diego desert woodrat (*Neotoma lepida intermedia*)

Status: --/ Species of Special Concern; County Group 2

The San Diego desert woodrat occurs along the coastal regions of Central California south to northern Baja California (Verts and Carrawaay 2002). In California, the species is found as far north as San Luis Obispo County and south to San Diego County, and in the western portions of San Bernardino and Riverside Counties. The San Diego desert woodrat occupies a variety of shrub and desert habitats such as coastal sagebrush scrub, chaparral, pinyon-juniper woodland, and Joshua tree woodland among others. The species is often associated with rock outcroppings, boulders, cacti patches, and areas with dense understories. Woodrats construct dens used for shelter, food storage, and nesting around rock outcroppings and cacti using various materials such as twigs, sticks, and other debris.

The San Diego desert woodrat was captured during the small mammal trapping efforts in April and June (Appendix J) and incidentally captured during the reptile trapping efforts in April (Appendix H). Three individuals were captured, with one recapture, during the small mammal trapping efforts all at Array 1 located at Monument Mesa in the southeastern portion of the TRVRP (Figures 8f and 13f). Two individuals were captured in reptile Trap 2 located on Spooner's Mesa, and one individual was captured in reptile Trap 3 located on Monument Mesa, both located south of Monument Road (Figures 8e and 8f, and 13e and 13f).

Pocketed free-tailed bat (*Nyctinomops femorosaccus*)

Status: --/ Species of Special Concern; County Group 2

The pocketed free-tailed bat inhabits semiarid habitats including pinyon-juniper woodland, desert scrub, succulent scrub, desert riparian, desert washes, alkali desert scrub, Joshua tree woodland, and palm oases (Lancaster 2000). The species roosts in caves, mines, tunnels, and rock crevices but is also known to occasionally roost in buildings and holes in trees. The pocketed free-tailed bat occurs in southwestern United States and northern Mexico. The species is rare in California, occurring in Riverside, San Diego, and Imperial counties (Zeiner et al. 1990).

The pocketed free-tailed bat was detected during the passive bat surveys with calls of the species recorded at AnaBat location 5 in July (Figure 13e; Table 10). Location 5 is located at Monument Mesa in the southeastern portion of the TRVRP (Figure 8f). The device was positioned at the western end of the mesa at the top of a hillside that borders a canyon known as Smuggler Gulch.

4.3.6 Special Status Wildlife with High Potential to Occur

The potential for special status wildlife species to occur on the TRVRP were evaluated based on the elevation, vegetation communities, level of disturbance, recorded status, and distribution of the species within the vicinity, and the results of wildlife surveys conducted on the TRVRP. Fifteen wildlife species have a high potential to occur on the TRVRP including two invertebrates, four reptiles, eight birds, and one mammal species.

4.3.6.1 Invertebrates

Two special status invertebrate species was determined to have high potential to occur within the TRVRP as detailed below and in Appendix D.

San Diego fairy shrimp (*Branchinecta sandiegoensis*)

Status: Federal Endangered/--; County Group 1; City MSCP Narrow Endemic and Covered

The San Diego fairy shrimp is generally restricted to vernal pools and other ephemeral basins in coastal Orange and San Diego Counties of southern California and south into northwestern Baja California. The species occurs in seasonally astatic pools, which occur in tectonic swales or earth slump basins and other areas of shallow, standing water, often in patches of grassland and agriculture interspersed in coastal sage scrub and chaparral. They are commonly found within vernal pool complexes, or groups of pools. Their life cycle requires periods of inundation as well as dry periods (USFWS 2007). Such habitats typically require clay soils with limited drainage conducive to pooling.

The USFWS-designated critical habitat for the species occurs outside of the TRVRP to the northwest and east (See Section 5.3.5 and Figure 3c). Fairy shrimp belonging to the genus *Branchinecta* were incidentally observed within ephemeral ponds present along trails in the southwestern portion of the TRVRP on February 19, 2019, during monitoring of adjacent restoration areas (Figure 13a). Though these individuals were not identified to the species level, there is the potential that they were the federally-listed San Diego fairy shrimp. Additional potentially suitable habitat for the species occurs in the southern portion of the Park on Monument Mesa and Spooner's Mesa where suitable depressions were reported to be present in 2007 along dirt roads on Spooner's Mesa (County 2007).

Riverside fairy shrimp (*Streptocephalus woottoni*)

Status: Federal Endangered/--; County Group 1; City MSCP Narrow Endemic and Covered

The Riverside fairy shrimp is restricted to southwestern California and northwestern Baja California, occurring from Los Angeles County south to northern Ensenada in Baja California. Riverside fairy shrimp require deep seasonal vernal pools, vernal pool like ephemeral ponds, stock ponds, and other human modified depressions (USFWS 1993 and 2001). Riverside fairy shrimp prefer warm-water pools that have low to moderate dissolved solids, are less predictable, and remain filled for extended periods of time (Eriksen and Belk 1999). All known habitat occurs within annual grasslands, which may be interspersed through chaparral or coastal sage scrub vegetation. Suitable soils typically require clay with restricted drainage conducive to pooling.

The USFWS-designated critical habitat for the species occurs outside of the TRVRP to the east of the I-5 transportation corridor in Otay Mesa (See Section 5.3.5). Potentially suitable habitat for the species occurs in the southern portion of the Park on Monument Mesa and Spooner's Mesa. While vernal pools were not documented during biological surveys in 2018, suitable depressions were reported to be present in 2007 along dirt roads on Spooner's Mesa (County 2007).

4.3.6.2 Reptiles

Four special status reptile species were determined to have high potential to occur within the TRVRP as detailed below and in Appendix D.

San Diegan legless lizard (*Anniella stebbinsi*)

Status: --/ Species of Special Concern; County Group 2

The San Diegan legless lizard occurs from southern California to northern Baja California, Mexico. Preferred habitat consists of coastal sand dunes and a variety of interior habitats, including sandy washes and alluvial fans. Soil moisture is essential for the species with individuals commonly found in moist warm loose soil with plant cover (Stebbins and McGinnis 2012). Sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks are also suitable habitats. Leaf litter under trees and bushes in sunny areas and dunes stabilized with vegetation can also indicate suitable habitat. Individuals can be found under surface objects such as rocks, boards, driftwood, and logs, or within leaf litter under bushes and trees (Parham and Papenfuss 2013).

Suitable sandy habitats and moist soils occur in the TRVRP. Reported occurrences of these are present within the park and further west in Border Field State Park. One adult was reportedly observed in the southwestern portion of the TRVRP, north of Monument Road and south of Tijuana River in May and July 2004.

California glossy snake (*Arizona elegans occidentalis*)

Status: --/ Species of Special Concern

California glossy snakes are found from the eastern part of the San Francisco Bay Area south to northwestern Baja California, though the species is absent along the central coast, at elevations below 6,000 feet (Lemm 2006). The species is a nocturnal snake feeding primarily on lizards and small mammals (Klauber 1956). They retreat to burrowing during the day either using existing mammal burrows, excavations under rocks, or creating burrows themselves (Degenhardt et al. 1996). They are found in a wide variety of habitat types including grasslands, shrublands, chaparral, woodlands, and open desert area preferring loose soils, which allow for burrowing.

Suitable sandy soils and appropriate open habitat is present within the TRVRP. The species was reportedly observed within the TRVRP at an undisclosed location in 2007 (County 2007). However, the species was not found during surveys conducted at the Border Field State Park in 1999. Historical records of the species from the 1930s and 1940s indicate presence in the surrounding area, including Border Field State Park.

Coronado skink (*Plestiodon skiltonianus interparietalis*)

Status: --/ Species of Special Concern; County Group 2

The Coronado skink occurs from inland southern San Diego County west to the coast and south into northern Baja California though they can occur up into Riverside County where it intergrades Skilton's skink (*Plestiodon skiltonianus skiltonianus*; Tanner 1957). Suitable habitats include grassland, woodlands, pine forests, and chaparral, especially in open sunny areas such as clearings and edges of creeks or rivers. This skink prefers rocky areas near streams with lots of vegetation but can also be found in areas away from water. They are occasionally seen foraging in leaf litter but more commonly found underneath surface objects, such as bark or rocks, where they live in extensive burrows (Stebbins and McGinnis 2012).

Suitable habitat for the species is present within the TRVRP and multiple occurrences of the species are reported to occur within the TRVRP and surrounding area. Most recently within the TRVRP, this species has been observed on the north side of the Tijuana River, 0.2 mile southwest of the intersection of Sunset Avenue and Hollister Street, in July 2004.

Two-striped garter snake (*Thamnophis hammondi*)

Status: --/ Species of Special Concern; County Group 1

The two-striped garter snake ranges from Monterey County south along the coast into northern Baja California at elevations below 7,000 feet (Atsatt 1913). Commonly inhabits perennial and intermittent streams with rocky beds bordered by riparian habitats dominated by willows and other dense vegetation (Fitch 1941). The species has also been found in stock ponds and other artificially created aquatic habitats if bordered by dense vegetation with potential prey, such as amphibians and fish (Jennings and Hayes 1994).

Suitable aquatic and riparian habitats for the species are present within the TRVRP. A single individual was also reported in the northwestern portion of the park along Tijuana River in 2004.

4.3.6.3 Birds

Eight special status bird species were determined to have high potential to occur within the TRVRP as detailed below and in Appendix D.

Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)

Status: --/Watch List; County Group 1; City MSCP Covered

The southern California rufous-crowned sparrow range is restricted to southwestern California occurring from Santa Barbara south into northern Baja California, at elevations below 5,000 feet (Grinnell and Miller 1944). The species generally inhabits moderate to steep slopes vegetated with grassland, coastal sage scrub, and chaparral. They have been documented to prefer areas with California sagebrush but are generally absent from areas of dense stands of coastal sage scrub or chaparral (Collins 1999). The species may occur on steep grassy slopes without shrubs if rock outcrops are present (Zeiner et al. 1990).

Suitable habitat is present within the TRVRP in the southern portion of the park at Spooner's Mesa and Monument Mesa. The species was reportedly observed in the TRVRP at an undisclosed location in 2007 (County 2007). Several reported occurrences of the species occur in the southern portion of the TRVRP and surrounding area.

Burrowing owl (*Athene cunicularia*)

Status: Birds of Conservation Concern/ Species of Special Concern; County Group 1; City MSCP Covered

The burrowing owl has a wide range of distribution from southern Canada throughout the western half of the United States down to central Mexico. The winter range is much the same as the breeding range, except that most burrowing owls apparently vacate the northern areas of the Great Plains and Great Basin (Poulin et al. 2011). In California, burrowing owls are restricted to the central valley extending from Redding south to the Grapevine, east through the Mojave Desert, west to San Jose, the San Francisco Bay area, and the outer coastal foothills area, which extends from Monterey south to San Diego and the Sonoran desert (Grinnell and Miller 1944). The species is a resident in the open areas of the lowlands over much of the southern California region (Garrett and Dunn 1981). Although the

burrowing owl prefers grassland and agricultural rangeland habitat, it can be found in prairies, scrub, coastal dunes, desert floors, and some artificial or developed open areas as a year-long resident (Poulin et al. 2011). They require large expanses of sparsely vegetated areas on gently rolling or level terrain with an abundance of active small mammal burrows, such as California ground squirrel, that they require for roosting and nesting cover (Poulin et al. 2011).

Suitable open habitat including grasslands, fallow agricultural fields, and disturbed habitat for the species is found in the TRVRP. There are historical records of the species to the northwest of the park, west of the Imperial Beach Naval Station. In addition, there is one recent sighting off Sunset Avenue reported to eBird from December 2011.

Canada goose (*Branta canadensis*)

Status: --/--; County Group 2; City MSCP Covered

The Canada goose is the most widely distributed species in North America, but only winters in southern California. It occupies a broad range of habitats in temperate to low-arctic regions, including flat, featureless tundra, boreal forest, prairies and parklands, high mountain meadows, and a variety of managed refuge conditions and areas of human habitation (Mowbray et al. 2002). Wintering rounds consist of fresh and brackish water environments with low grass or succulent leaves for the grazing (Unitt 2004).

Open fields and agricultural lands within the TRVRP and immediate vicinity provide suitable foraging habitat for wintering Canada geese.

Merlin (*Falco columbarius*)

Status: --/Watch List; County Group 2

Merlins breed in North America from Alaska through most of Canada, eastward to Newfoundland southward to Washington and Maine. The species winters from the large majority of the breeding range southward to northern South America (Warkentin et al. 2005). Within California, it is an uncommon winter migrant from September to May and is found in most of the western half of the state below 5,000 feet (Zeiner et al. 1990). Within southern California, the species is often found in open woodland, grasslands, cultivated fields, marshes, estuaries, and sea coasts, and are rarely found in heavily wooded areas or over open deserts (Garrett and Dunn 1981).

Suitable wintering habitat for the species is found within the TRVRP and several historical and recent sightings of the species have been reported to eBird.

Loggerhead shrike (*Lanius ludovicianus*)

Status: Birds of Conservation Concern /Species of Special Concern; County Group 1

The loggerhead shrike is found year-round throughout of the southern United States and southwards into Baja California and Mexico, with breeding populations also present in the north-central portion of the United States and southcentral Canada. In California, the species is found throughout the foothills and lowlands of California, with winter migrants found coastally north of Mendocino County (Zeiner et al. 1990). Shrikes are found in a variety of habitats seen foraging over open ground within areas of low lying vegetation, pastures with fence rows, old orchards, mowed roadsides, cemeteries, golf courses, riparian areas, open woodland, agricultural fields, desert washes, desert scrub, grassland, broken chaparral, and beach with scattered shrubs (Yosef 1996). Individuals forage by perching to search for prey (such as large insects, small mammals, amphibians, reptiles, fish, and invertebrates) and using impaling as a means of handling prey (Zeiner et al. 1990).

Suitable habitat for the species is present within the TRVRP. Several historical and recent occurrences of the species are reported in the TRVRP and surrounding region, including photo documentation of recent sightings in eBird confirming species presence.

California gull (*Larus californicus*)

Status: --/Watch List; County Group 2

The California gull is found throughout western North America with breeding populations occurring from northern Canada south to Utah. In California, the species winters along coastal regions with breeding populations localized at Mono Lake and southern San Francisco Bay (Winkler 1996). Breeding colonies nearly always occur on islands in natural lakes, rivers, or reservoirs. Individuals can forage up to 37 miles away from their colony, which can take them to any fairly open habitat with food availability (Jones 1986). California gulls rarely forage in densely vegetated habitats. In the winter, the species is found along coastal California at beaches, rocky coasts, mudflats, coastal estuaries, and deltas of rivers and streams.

Suitable wintering habitat is present within the TRVRP for loafing and foraging habitat for the species. Multiple occurrences of the species are reported within the TRVRP and surrounding region, particularly along the coast. The species is not known to breed within the region.

Vermilion flycatcher (*Pyrocephalus rubinus*)

Status: --/Watch List; County Group 1

The vermilion flycatcher occurs in southern United States south into Mexico rarely nesting in Southern California. A few individuals winter regularly along the California coast from Ventura County south to San Diego County, with individuals occasionally present as far north as San Luis Obispo County (Ellison et al. 2009). Suitable habitat includes arid scrub, farmlands, parks, golf courses, desert, savanna, cultivated lands, and riparian woodland, usually near water. Wintering individuals can be found in open and semi-open areas with hedges, scattered trees and bushes, and often near water. The species is known to both breed and winter at selected sites within San Diego County (Unitt 2004).

The species has been reported wintering and breeding in the TRVRP at the baseball fields south of Sunset Avenue. Multiple sightings of the species have been reported to eBird with photo documentation confirming the species presence.

Light-footed Ridgway's rail (*Rallus obsoletus levipes*)

Status: Federal Endangered/State Endangered, Fully Protected; County Group 1; MSCP Narrow Endemic and Covered

The light-footed Ridgway's rail is one of six recognized subspecies occurring as a resident in coastal salt marshes and lagoons from Santa Barbara County south to Baja California (Eddleman et al. 2018). The species is found primarily in tall, dense cordgrass (*Spartina foliosa*) and occasionally pickleweed (*Salicornia pacifica*) in the low marsh zone and is also found in freshwater marshes in winter.

Two pairs were reportedly detected in the northeast portion of the TRVRP in 2007 (County 2007). Several reported occurrences of the species are present in the TRVRP at Dairy Mart Pond and along the Tijuana River in the northern portion of the park, though dates are not associated with these sightings. The species breeds to the west within Border Field State Park and further northwest Tijuana Slough National Wildlife Preserve which supports the second of the largest population in California (Zemba et al. 2017).

4.3.6.4 Mammals

One special status mammal species was determined to have high potential to occur within the TRVRP, as described below and in Appendix D.

Northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*)

Status: --/Species of Special Concern; County Group 2

The northwestern San Diego pocket mouse occurs from western Riverside County throughout southwestern California to northern Baja California at elevations below 6,000 feet (McClenaghan 1983). The species inhabits coastal sage scrub, grasslands, and chaparral communities, and generally exhibits a strong microhabitat affinity for moderately gravelly and rocky substrates (Price and Waser 1984). They tend to forage for seeds from California sagebrush, California buckwheat, lemonade berry, and grasses under shrub and tree canopies, or around rock crevices (Reichman and Price 1993).

Suitable habitat for the species occurs in the TRVRP and surrounding region. The species was reportedly captured in low numbers within the Imperial Beach Naval Station located northwest of the TRVRP during surveys conducted in 2002. Multiple occurrences of San Diego pocket mouse (*Chaetodipus fallax*) are reported within the TRVRP, especially in the southern portion of the park on Monument Mesa and Spooner's Mesa.

4.3.7 Invasive Animal Species

Several introduced and naturalized animal species were observed within the TRVRP during baseline surveys. Prominent invasive species that were detected include American bullfrog, red-eared slider, brown-headed cowbird (*Molothrus ater*), and Kuroshio shot hole borer (*Euwallacea* sp.). American bullfrog and red-eared slider were detected at the Duck Ponds and Dairy Mart Pond, and along the Tijuana River. Both species are not native to California, having been introduced throughout the western United States by means of human influences (Snow and Witmer 2010). These species are known to prey on larvae and tadpoles and compete for food and space with native amphibians that inhabit aquatic areas and utilize these areas for breeding purposes. These species can negatively affect native amphibian populations including reducing reproductive success through predation of young and displaying, potentially excluding the species from the area (Fisher and Shaffer 1996). Special status species such as the western spadefoot toad were historically observed within the TRVRP and populations are susceptible to being displaced by opportunistic non-native amphibians.

The brown-headed cowbird was detected in multiple locations within the TRVRP along the Tijuana River and surrounding areas. Cowbirds were also recorded during avian point count surveys at locations 2, 4, and 6 (Appendix I; Figures 8b and 8d). Cowbirds are found throughout the United States, occurring year-round along the coastal regions of California and breeding within the interior portion of the state. The species historically occurred in the United States as far east the Great Plains but have expanded west into California in the last century as regions became settled, habitats were modified, and agricultural and pasture lands expanded (Laymon 1987). They are found in a variety of habitats including prairies, riparian areas, pastures and agricultural fields, orchards, and residential areas showing a preference for human-modified habitats (Airola 1986). Cowbirds are brood parasites opportunistically laying eggs in the nests of other birds. They have been reported to parasitize the nests of over 220 species including special status species such as the coastal California gnatcatcher, yellow warbler, and least Bell's vireo (Lowther 1993; Kus 1999). Cowbird nestlings often out-compete nestlings of the host species and have been implicated in the decline of many species including the least Bell's vireo (USFWS 1998).

Kuroshio shot hole borer is an invasive beetle from Asia that has been recently introduced within southern California and was first detected within San Diego County in 2012 (Eskalen et al. 2013; Umeda et al. 2016). The species has been documented residing within the Tijuana River Valley since 2015 (Boland 2016). The shot hole borer creates a gallery of tunnels in the trunk of native and invasive non-native tree species, laying eggs and depositing the tunnels with a fungus (*Fusarium* sp.) that is used as a food resource (Biedermann et al. 2009). The fungus diseases the trees stopping the flow of water and nutrients to the host plant which causes individual branch death, or in severe cases, mortality to the entire tree. This process is generally referred to as *Fusarium* dieback. Reproductive host plants include a wide range of native and invasive non-native trees with the species having been documented utilizing at least 63 different species (Eskalen 2018). The presence of the shot hole borer within the TRVRP and surrounding area has caused extensive damage to native riparian vegetation, resulting in damage and mortality to a large number of trees along Tijuana River (Boland 2018). The invasion of the species, and subsequent damage to native trees, has caused a reduction in the willow canopy along the Tijuana River floodplain, particularly in wetter areas. This has led to an increase in the presence and cover of invasive plant species, such as giant reed and castor bean, in areas previously dominated by native vegetation.

4.4 WILDLIFE CORRIDORS MOVEMENT

Wildlife corridors connect otherwise isolated pieces of habitat and allow movement or dispersal of plants and animals. Local wildlife corridors allow access to resources such as food, water, and shelter within the framework of their daily routine. Regional corridors provide these functions over a larger scale and link two or more large habitat areas, allowing the dispersal of organisms and the consequent mixing of genes between populations. A corridor is a specific route that is used for the movement and migration of species and may be different from a linkage in that it represents a smaller or narrower avenue for movement. A linkage is an area of land that supports or contributes to the long-term movement of animals and genetic exchange by providing live-in habitat that connects to other habitat areas. Many linkages occur as stepping-stone connections that are made up of a fragmented archipelago arrangement of habitat over a linear distance.

The TRVRP is not located within a mapped biological linkage but is defined as a biological CRA (Area 1) under the Final MSCP Plan (City 1998). Biological core resource areas are defined as “areas that support a high concentration of sensitive wildlife resources which, if lost or fragmented, could not be replaced.” The TRVRP is located along the Tijuana River supporting a relatively wide riparian corridor and undeveloped habitat to the north and west. However, the presence of rural and agricultural development, residential development, transportation corridors, international border fence, and the Pacific Ocean to the west constrains the ability of the TRVRP to function as regional wildlife movement corridor. The TRVRP is geographically isolated from adjacent open space areas to the north (Otay Valley Regional Park) and east (Pacific Gateway Park) as it is surrounded by a rural and residential development, and other anthropogenic influences.

The Naval Outlying Landing Field Imperial Beach (herein referred to as the Imperial Beach Naval Station) occurs to the northwest of the TRVRP with flight practices and demonstrations occurring in the area. The Southwestern Little League baseball fields occur within the north-central portion of the Park immediately south of the eastern terminus of Sunset Avenue. Open fields and residential development occur to the north of Sunset Avenue. Agricultural fields consisting of row crops and open fields occur north of the TRVRP. Residential development occurs to the north of the site abutting the Park’s northeastern boundary. Row crops, open fields, and residential development occur to the east of the Park with residential development and the I-5 and I-805 transportation corridor occurring further east.

Agricultural and rural development occurs along Hollister Road and north of Monument Road with horse stables and community gardens located in the central portion of the Park, though outside Park boundaries, along Hollister Street. The U.S.-Mexico border fence occurs to the south of Spooner's Mesa and Monument Mesa. Conserved lands occur to the west with Border Field State Park located immediately west of the Park, Tijuana River National Estuarine Research Preserve to the northwest, and the Tijuana Slough National Wildlife Refuge further northwest (Figure 3b).

Several medium- to small-sized mammal species were observed within the TRVRP including bobcat, coyote, and raccoon. Larger mammal species such as mule deer and mountain lion were not detected and are presumed to be absent from the Park. The TRVRP most likely functions as a local movement corridor for wildlife species found in the region, particularly those that would utilize coastal, estuarine, and riparian habitats. The TRVRP abuts conserved lands that occur to the west and north providing access to coastal and beach habitats. Residential development, transportation corridors, and the international fence to the north, east, and south of the TRVRP act as barriers to wildlife movement into and out of the TRVRP. These barriers impede wildlife movement from the TRVRP to open space areas that occur further north and east of the TRVRP.

Local roadways within the TRVRP are generally two-lane streets with light vehicular usage associated with agricultural and recreation usage. Though these roads lack wildlife culverts or crossings, excluding bridges that cross over the river, they are not expected to impede wildlife movement within the TRVRP. The roads are generally not heavily traveled, are relatively narrow, and often bisect open areas with undeveloped habitat present on either side of the road. These roads could potentially be a barrier to small mammal species through direct mortality and indirect barrier effects to species that are behaviorally sensitive to roads. Riparian habitat in the extreme northeastern portion of the Park abuts the I-5 sloping up toward the interstate. A wildlife culvert or crossing does not occur in the area, but residential development occurs immediately east of the I-5 which further prevents wildlife access and movement to and from the park.

5.0 CONCLUSIONS AND MANAGEMENT RECOMMENDATIONS

Biological surveys conducted by HELIX in 2018 documented a diversity of vegetation communities, plant species, and wildlife species present within the TRVRP. In total, HELIX mapped 34 vegetation alliances, associations, or semi-natural stands according to VCM classification and 21 vegetation communities according to Holland classification. A total of 238 species of plants and 180 animal species were observed or otherwise detected within the TRVRP. A total of 45 special status species, comprising 16 plant and 29 animal species, were detected within the TRVRP. Of the 16 special status plant species, one is State-listed as endangered, 15 are considered sensitive by the County, and three are covered by the City MSCP Subarea Plan. Of the 29 special status animal species detected, two are federally and/or State-listed, two are considered BCC by the USFWS, one is a CDFW FP species, 12 are CDFW SSC species, five are CDFW WL species, 27 are considered sensitive by the County, and seven are covered under the City MSCP Subarea Plan.

Management recommendations and resource-specific conclusions for each vegetation alliance, association, or semi-natural stand and taxonomic group assessed during the 2018 survey effort are provided in this section. The results of the baseline biological diversity surveys, management and monitoring guidelines and conservations goals provided in the City MSCP Subarea Plan Framework

Management Plan (County 2008, City 1997), and existing Area Specific Management Directives for the TRVRP (County 2007) were the basis for the following recommendations. Area-specific management directives for TRVRP areas will include specific guidelines for monitoring and managing MSCP-covered species and their habitats. Overall, efforts to control invasive species management are the highest management priority for the TRVRP.

5.1 VEGETATION COMMUNITIES/HABITATS

The TRVRP consists of 34 vegetation alliances, associations, or semi-natural stands, and six communities described using the Holland/Oberbauer code distribution as detailed in Table 3 and Section 4.1. As part of the Final MSCP (City 1998), the TRVRP was identified as a biological CRA, and as such, conservation goals for the TRVRP include restoration of the Tijuana River Valley to a more natural floodplain that contains appropriate habitat for endangered, threatened, and other covered species, and native vegetation communities. Attaining these goals is feasible as long as management focuses on land use adjacent to covered species habitat, water quality, dumping and vandalism, non-sustainable agriculture, and invasive species introduction and control, illegal immigration traffic, restoration needs, excavation activities, flood control, and maintenance of human use areas.

5.1.1 Management

The TRVRP consists of a diverse assemblage of riparian scrub/forests/woodlands, drought-deciduous shrublands, and unvegetated/disturbed habitat areas located within a regional matrix of undisturbed land and rural development. Control of invasive plant species within each of these habitat types should be considered an ongoing management goal. Several invasive species or stands of invasive species were documented throughout the TRVRP that have potential to proliferate and spread throughout the TRVRP. Invasive species treatment recommendations are discussed in Section 5.4 and target invasive species treatment recommendations are discussed in Section 5.4.1. Fire management recommendations are discussed in Section 5.6.

Riparian habitat is located throughout the TRVRP, most notably along the Tijuana River but extending throughout the Tijuana River floodplain. The riparian habitat located on the Tijuana River floodplain will require more substantial and continual management as it is more easily accessible and prone to the creation of unauthorized trails utilized by hikers, bikers, and equestrian use. The areas within the floodplain are also more at risk for dumping, litter, and vandalism. Riparian vegetation along the river is less prone to impacts from public use due to the perennial flow of water and thick impenetrable vegetation. Management for public access is discussed in Section 5.8.1.

Impacts to hydrology are also concerns in these riparian areas, as this habitat supports special status plant species including southwestern spiny rush, singlewhorl burrobrush, San Diego marsh elder, and San Diego sagewort. Additionally, alterations to the riparian areas may alter the flood plain regime during flood events. Specific recommendations regarding hydrology are discussed in Section 5.8.4.

Additional recommendations include on-going habitat monitoring to maintain a current inventory of plant and wildlife species (management recommendations for wildlife are discussed in Section 5.3).

It is recommended that the vegetation mapping be updated every five years in conformance with the City's MSCP Subarea Plan. Methods for vegetation mapping and habitat monitoring should follow those provided by the San Diego Management and Monitoring Program (SDMMP) and the Institute for

Ecological Monitoring and Management. Updated vegetation mapping will help to track changes in the composition and distribution of habitat types within the TRVRP, including non-native and disturbed areas. This will aid in identifying any adverse changes occurring within the TRVRP such as constrictions in the native habitat, expansion of invasive non-native plant species, creation of newly disturbed areas such as unauthorized trails, and other reductions in habitat quality. These changes may occur from the introduction of new invasive non-native plant species, further spread of invasive non-native plant species already present within the area, decline in existing native species, and/or occurrence of unplanned fires. The data collected will assist the DPR in prioritizing management directives, identifying new restoration opportunities, evaluating and modifying current management procedures, and applying additional adaptive management measures where needed.

5.2 PLANTS

Sixteen (16) special status plant species were observed within the TRVRP during surveys in 2018 (Figures 1a-11e; Section 4.2.1); however, due to the below-average rainfall in 2018, additional rare plant surveys during years of sufficient rainfall are recommended to increase the likelihood of observing special status plant species with potential to occur. Due to their location within the TRVRP, special status plant species are generally protected from development. This protection does not, by itself, guarantee long-term conservation of the species or its habitat. A variety of threats to these populations may result in species decline and habitat degradation or loss. Threats to special status plant species may include human activity, competition with invasive species, suppressed or increased fire regime, and altered hydrology. Effective conservation of special status species should include monitoring the status of the population, identification of threats to the species, and management efforts to maintain or enhance the condition of a population (McEachern et al. 2007).

5.2.1 Management

The observed special status plant species, as well as other special status species with potential to occur on site, are generally threatened by development, human activity, and competition with invasive species. An altered fire regime may also affect special status plant species. Some species may tolerate or benefit from infrequent fires, which may allow some species to colonize an area or regenerate. A fire regime consisting of extended periods without fire (the regime that exists when fires are suppressed) may result in hotter fire conditions when an area does burn due to accumulated biomass in the area. In this scenario, some special status plant species adapted to regular fires might not survive. Conversely, a fire regime consisting of too frequent fires may inhibit certain plants' ability to establish and propagate within an area.

Management recommendations for special status plant species in the TRVRP include monitoring and removing invasive non-native plant species, particularly target invasive non-native plants (discussed in Section 5.4.1). Management recommendations also include limiting human access to known populations of special status plant species. The TRVRP Trails and Habitat Enhancement Project established a formal recreational trail network in the TRVRP and included closure for active or passive revegetation of some existing informal trails and dirt roads. This project included fencing and signage along formal trails. Additionally, the long-term habitat management plan for the TRVRP trails includes a sensitive species monitoring program, a mechanism to evaluate the impacts of the trail system on sensitive habitats, and a commitment to eliminate or relocate trails as needed to ensure the long-term viability of these habitats. Where any special status plant populations are declining due to human intrusion, fences or other barriers should be installed where reasonable to discourage unauthorized public access, and trails

adjacent to these populations could be considered for relocation. Although some species may benefit from a maintained natural fire regime, prescribed burns are not recommended within the TRVRP due to public safety concerns. Fire management is discussed in Section 5.6.

Current and proposed grant funded restoration projects at the Bird and Butterfly Gardens and the Brown Fill property are opportunities to expand populations of special status plant species within the TRVRP. The tamarisk treatment and invasive removal project (California River Parkways Grant 2015) included installation of singlewhorl burrobrush following the removal of tamarisk trees at the Bird and Butterfly Gardens. The proposed Brown Fill project includes the removal of invasive non-native fill material and restoration of riparian habitat. This project's restoration may include singlewhorl burrobrush, San Diego marsh elder, southwestern spiny rush, and San Diego sagewort. Any special status plant species used in restoration activities in the TRVRP should be collected from the TRVRP, a nearby source, or local nurseries.

Management recommendations also include continued monitoring of identified special status plant populations and subsequently recommending management efforts. The SDMMMP Inspect and Manage Rare Plant Monitoring Protocol should be implemented for species targeted by the SDMMMP (SDMMMP 2018). Plant surveys should be conducted at an appropriate time of year to monitor the known populations of special status plant species and identify special status plant species with high potential to occur in the TRVRP. Ideally, plant surveys should be conducted in a year with average or above-average rainfall, when annual species are likely to be observed.

Lastly, there is one new management recommendation specific to monitoring of sea dahlia. This species was observed in 2018 to occur on steep, eroding slopes at Monument Mesa and Spooner's Mesa. Future monitoring of this population should evaluate whether the population is declining due to loss of habitat from erosion or sedimentation. Future management recommendations may include implementation of erosion control methods in areas with sea dahlia or the propagation of this species.

5.2.2 MSCP Covered Plant Species-Specific Conditions

Three MSCP-covered plant species were observed in the TRVRP during 2018: wart-stemmed ceanothus, San Diego barrel cactus, and Torrey pine. In addition to the general management recommendations discussed above, monitoring and management efforts for these species should follow the MSCP requirements outlined in Table 3-5 of the City's MSCP Subarea Plan (City 1997). Area specific management directives for TRVRP areas will include specific guidelines for monitoring and managing MSCP-covered species and their habitats. MSCP directives for the three species observed in 2018 are copied, below. If additional MSCP-covered species are observed on site during future monitoring efforts, MSCP requirements should also be followed for these species. Additional protocols for MSCP-covered species have been outlined in the MSCP Rare Plant Monitoring Review and Revision (McEachern et al. 2007). These include the use of monitoring to address "key management questions" for each species and adaptive management. Suggested monitoring approaches include qualitative status checks, trend monitoring, and hypothesis-based effectiveness and validation monitoring.

Wart-stemmed Ceanothus

The monitoring method for this species is listed as "Monitoring Plan – Habitat Based and Photo Plot and Management Plans/Directives." Area specific management directives for the protected populations of wart-stemmed ceanothus must include specific measures to increase populations, including specific

management measures to address the autecology and natural history of the species and to reduce the risk of catastrophic fire.

San Diego Barrel Cactus

The monitoring method for this species is listed as “Monitoring Plan – Habitat Based and Photo Plot.” Area specific management directives for San Diego barrel cactus must include measures to protect this species from edge effects and unauthorized collection. Directives should also include appropriate fire management/control practices to protect against a too frequent fire cycle.

Torrey Pine

The monitoring method for this species is listed as “Monitoring Plan – Habitat Based.” This species will be covered by the MSCP because the single naturally occurring population at Torrey Pines State Reserve will be conserved and appropriately managed. The MSCP does not provide any management directives for landscaped Torrey pine trees, which are the trees observed in the TRVRP.

5.3 WILDLIFE

The current survey effort documented 29 special status wildlife species (Figures 13a-13f), including 27 that are listed on the County’s Sensitive Animal List (County 2010a) and seven that are covered under the City MSCP Subarea Plan (City 1997). In the following sections are species-specific management directives for MSCP covered species present within the TRVRP or with high potential to occur (Appendix D). These management directives are based on Table 3-5 of the City’s MSCP Subarea Plan (City 1997). If applicable, previously recommended ASMDs detailed in the TRVRP RMP (County 2007) are summarized. Finally, updated ASMDs are recommended based on updated survey results and current environmental conditions.

Overall, an adaptive management program is recommended with ASMDs that can be modified based on the most recent research, literature, and successful management strategies implemented at other open space areas and preserves in the region. Recommended future monitoring and surveying protocols for wildlife are included to update existing data; infer conclusions on species presence, abundance, distribution, and health; review success of implemented ASMDs, modify existing ASMDs to be more effective, remove ASMDs that are not effective or are no longer warranted, and formulate new ASMDs if required; and influence management directives at the TRVRP to provide a dynamic adaptive management program. While regional MSCP monitoring protocols are being developed, preserve-level protocols have not yet been revised or identified. At a minimum, the DPR will follow habitat- and species-specific monitoring requirements detailed in the City’s MSCP Subarea Plan (City 1997).

5.3.1 Invertebrates

Two special status invertebrate species, monarch butterfly and Quino checkerspot butterfly, were detected within the TRVRP. Neither species is covered under the MSCP; therefore, no management directives for monarch butterfly or Quino checkerspot butterfly are included in the City MSCP Subarea Plan. However, since the TRVRP is located within the City’s MHPA preserve system, native habitats will be preserved and managed in place to continue providing habitat for the monarch butterfly (especially within the on-site Bird and Butterfly Garden) and Quino checkerspot butterfly (particularly on the southern mesa tops of Monument and Spooner’s Mesa).

Two special status invertebrate species were determined to have high potential to occur within the TRVRP, both of which are MSCP covered species: San Diego fairy shrimp and Riverside fairy shrimp. Management directives for both species include protection of potential habitat within the Park for the species.

Recommended Management Directives

Though no MSCP covered invertebrate species were found in the TRVRP, ephemeral ponds supporting fairy shrimp of the genus *Branchinecta* sp. were observed in the southwestern portion of the Park. The following general Management Directives are recommended to maintain habitat within the TRVRP that could support fairy shrimp:

- Control and remove invasive non-native and target invasive non-native plant species to improve habitat quality and prevent the further degradation of native habitats;
- Enhance and restore disturbed areas to improve habitat quality and provide additional native habitat for plant and animal species; and
- Limit off-road vehicle activity and off-trail pedestrian foot traffic to reduce potential disturbance to native plant and animal species, prevent the formation of unauthorized trails, and prevent damage to native habitats.

These measures would aid in reducing potential disturbance, injury, and mortality to fairy shrimp that occur within the Park and would improve the quality of habitat with potential to support the species. Control of invasive non-native and target invasive non-native plant and animal species are discussed further in Section 5.4.1 and Section 5.4.2, respectively. Opportunities for restoring vernal pools within the TRVRP on Spooner's Mesa are discussed in more detail in Section 5.5. Prevention and management of off-road vehicular activity and unauthorized public access to off-trail areas are discussed further in Section 5.8.

5.3.2 Herpetofauna

No special status amphibian species were detected within the TRVRP. Three special status reptile species were observed within the TRVRP, including two species covered under the City MSCP Subarea Plan.

5.3.2.1 Amphibians

One special status amphibian species, western spadefoot, was detected within the TRVRP. The species is not covered by the MSCP, and there are no management directives detailed in the City's MSCP Subarea Plan (City 1997).

Recommended Management Directives

Though no MSCP covered amphibian species were found in the TRVRP or have high potential to occur, the western spadefoot toad, a CDFW SSC and County Group 2 sensitive animal, was observed. Management considerations should be mindful of this species since suitable upland and breeding habitat is present within the TRVRP. The following general Management Directives are recommended to promote conservation of the species:

- Control and remove invasive non-native and target invasive non-native plant species to improve habitat quality and prevent the further degradation of native habitats;
- Enhance and restore disturbed areas to improve habitat quality and provide additional native habitat for plant and animal species;
- Remove invasive animal species known to prey on and out compete native amphibian species (i.e., American bullfrog); and
- Limit off-road vehicle activity and off-trail pedestrian foot traffic to reduce potential disturbance to native plant and animal species, prevent the formation of unauthorized trails, and prevent damage to native habitats.

These measures would aid in reducing potential disturbance, injury, and mortality to spadefoots that may occur in the Park and improve the quality of potential habitat that could be occupied by the species. Control of invasive non-native and target invasive non-native plant and animal species are discussed further in Section 5.4.1 and Section 5.4.2, respectively. Opportunities for native habitat restoration within the TRVRP are discussed in Section 5.5; prevention and management of off-road vehicular activity and unauthorized public access to off-trail areas are discussed further in Section 5.8.

5.3.2.2 Reptiles

Three special status reptile species were detected within the TRVRP during the 2018 biology surveys, two of which are MSCP Covered species: Belding's orange-throated whiptail and Blainville's horned lizard.

Belding's Orange-throated Whiptail

Management guidelines for Belding's orange-throated whiptail include reducing detrimental edge effects to the species. Potential edge effects that could affect whiptails, among others, include the introduction and expansion of invasive non-native and target invasive non-native plant and animal species; habitat modification, degradation, and fragmentation; incidental mortality along roadways and trails including as a result of off-road vehicle use; and predation of the species from domestic pets (such as cats). Edge effects are expected to be more pronounced in the northern portion of the TRVRP where residential development abuts the Park boundary. However, agricultural and rural development, human visitation from recreational use, and off-road vehicle activity from public and federal agencies (particularly CBP) occur throughout the TRVRP.

Blainville's Horned Lizard

Management directives for Blainville's horned lizard include reducing detrimental edge effects to the species, maintaining populations of native ant species, and discouraging the presence of invasive non-native Argentine ants (*Linepithema humile*). Edge effects that may adversely affect horned lizards are the same as those detailed for Belding's orange-throated whiptail. Management considerations and recommendations relating to potential edge effects for orange-throated whiptails would also benefit Blainville's horned lizard.

Argentine ants are aggressive invaders that have been introduced by anthropocentric activities and have been documented to displace native ant populations, the primary food source for Blainville's horned

lizard (Human and Gordon 1996). Furthermore, horned lizards will avoid consuming Argentine ants resulting in reduced growth rates and mortality in juveniles where Argentine ants have displaced native ant populations (Suarez, Bolger, and Case 1998). Argentine ants are generally associated with moist soils with higher instances of presence documented in irrigated areas (Menke and Holway 2006). Argentine ants were not documented during the baseline biological surveys; however, this does not indicate absence of the species from the TRVRP.

5.3.2.3 Recommended Management Directives

The following general Management Directives are recommended to promote conservation of the species and reduce potential detrimental edge effects:

- Control and remove invasive plant species to improve habitat quality and prevent the further degradation of native habitats;
- Enhance and restore disturbed areas to improve habitat quality and provide additional native habitat for plant and animal species;
- Limit off-road vehicle activity and off-trail pedestrian foot traffic to reduce potential disturbance to native plant and animal species, prevent the formation of unauthorized trails, and prevent damage to native habitats; and
- Control domestic animal populations in the TRVRP to prevent the predation of native animal species.

Control and removal of invasive non-native plant species is further discussed in Section 5.4.1. Potential restoration opportunities are presented in Section 5.5. The prevention and management of off-road vehicle use and unauthorized public access to off-trail areas are discussed further in Section 5.8. Control and management of domestic animals within the TRVRP including feral animals, free-roaming pets, and off-leash pets are discussed in Sections 5.4.2 and 5.8

The following species-specific Management Directives are recommended to promote conservation of Blainville's horned lizard:

- Conduct visual surveys at least once per year in the summer months (June to August) for Argentine ants within the more mesic regions of the TRVRP, especially at high-use areas with irrigation or other water resources. These areas are generally located in the northern portion of the Park (which borders residential neighborhoods) and include the Duck Ponds south of Sunset Avenue adjacent to reptile trapping location 4 where Blainville's horned lizard was found (Figure 8b), Butterfly Gardens west of Hollister Street, the baseball fields south of Sunset Avenue, and Dairy Mart Pond (Figure 8d).
- If Argentine ants are detected, implement adaptive management measures to discourage the continued presence and spread of the species such as the following:
 - Inspect all container plantings installed as part of landscaping or habitat restoration;
 - Remove excess litter and food waste;

- Remove irrigation systems following the completion of restoration projects; and/or
- Educate nearby residents on measures they can take to reduce the introduction and further invasion of Argentine ants (such reducing or eliminating irrigation and landscaping with local natives).

Additionally, direct sampling of herpetofauna is being recommended as follows:

- Conduct visual surveys for reptiles opportunistically during monitoring for other species.
- Conduct pit-fall trapping once every five years to provide an updated inventory on species diversity, presence, and distribution within the TRVRP.
 - Trapping surveys should be conducted during the spring and summer months to coincide with peak mammal activity.

This monitoring data will allow DPR to infer conclusions on the overall abundance and health of herpetofauna and special status species within the Park, re-evaluate the methods and frequencies of monitoring protocols, and implement adaptive management strategies as deemed appropriate.

Potential management measures that could be implemented in the future if deemed necessary include, but are not limited to, coordination with local landowners to control pets, mesopredators, and other species that may prey on special status herpetofauna; installation of additional signage around the perimeter of TRVRP along the trail system to inform public of the impact of illegal collection of reptiles and other wildlife species, and provide notice that there are penalties for those found poaching or in possession of native species; and exclusion of rock outcrops or other areas known to be suitable habitat for special status species from future trail planning locations.

5.3.3 Birds

Nineteen special status bird species were detected within the TRVRP, and five of these species are covered under the MSCP: Cooper's hawk, northern harrier, coastal California gnatcatcher, western bluebird, and least Bell's vireo. Eight special status avian species were determined to have high potential to occur in the TRVRP, including four MSCP covered species: southern California rufous-crowned sparrow, burrowing owl, Canada goose, and light-footed Ridgway's rail (Appendix D). Management directives for these species generally focus on preservation and enhancement of suitable habitat (particularly wetlands and riparian habitats) to provide wintering, foraging, and breeding habitat for species; protection against detrimental edge effects; fire management; and public education on the potential harm feral domestic animals and unleashed pets pose to wildlife.

Cooper's Hawk

Management directives for Cooper's hawk include preservation of oak woodland and oak riparian woodland habitats suitable for nesting and foraging and minimization of any potential disturbances to active nests and habitat. The TRVRP is located within the City's MHPA preserve system. All riparian woodland and associated habitat are being conserved and managed in place and will continue to provide foraging and breeding habitat for the species. Cooper's hawk has shown adaptation to urbanized habitat indicating that continued passive recreation of the TRVRP would not adversely affect the species.

Northern Harrier

Management directives for the northern harrier include management of agricultural and disturbed lands within four miles of nesting habitat to provide foraging habitat. Northern harriers were observed throughout the TRVRP with an active nest found in the southeastern portion of the site north of Monument Road (Figure 13e). Wetlands, grasslands, and upland habitats within the Park will be conserved and managed in place such that they continue to provide wintering, foraging, and breeding habitat for the species.

Coastal California Gnatcatcher

Management directives for coastal California gnatcatcher include measures to reduce edge effects, minimize disturbance during the nesting period, and maintain or improve habitat quality, including vegetation structure, as well as measures for fire protection to reduce the potential for habitat degradation due to unplanned fire. Additionally, no clearing of occupied habitat within the biological CRA's should occur between March 1 and August 15. Potential edge effects that could adversely affect gnatcatchers include the modification or degradation of native habitats from the introduction and spread of invasive non-native plant species; disturbances to the species habitat from off-road vehicle activity, off-trail use, authorized passive recreation activities within the Park; and predation from domestic pets (such as cats).

Western Bluebird

Management directives for western bluebird focus on conservation of existing large populations of the species present on public lands in the MSCP. One incidental sighting of western bluebird occurred at Dairy Mart Pond in April 2018 (Figure 13d), which does not indicate that a large population of the species is present in the TRVRP. Regardless, the TRVRP is located within the City's MHPA preserve system and will be conserved and managed in place, continuing to provide wintering, foraging, and breeding habitat for the species.

Least Bell's Vireo

Management directives for the least Bell's vireo include measures to protect against detrimental edge effects to this species and monitoring and control of brown-headed cowbirds. Any clearing of occupied habitat must occur outside of the breeding season between September 15 and March 15. Potential edge effects to least Bell's vireo are the same as those presented for coastal California gnatcatcher. Management considerations and recommendations relating to potential edge effects for coastal California gnatcatcher are also appropriate for least Bell's vireo.

Recommended Management Directives

Five MSCP covered bird species were found in the TRVRP. Overall, the establishment of the MHPA preserve system, and continued management of the TRVRP, will continue to provide suitable wintering, foraging, and breeding habitat for these species and other avian species present, or with potential to occur, within the TRVRP. The following general Management Directives are recommended to promote conservation of avian species and reduce potential detrimental edge effects:

- Control and remove invasive plant species to improve habitat quality and prevent the further degradation of native habitats;

- Enhance and restore disturbed areas to improve habitat quality and provide additional native habitat for plant and animal species;
- Limit off-road vehicle activity and off-trail pedestrian foot traffic to reduce potential disturbance to native plant and animal species, prevent the formation of unauthorized trails, and to prevent damage to native habitats; and
- Control domestic animal populations in the TRVRP to prevent the predation of native animal species.

Control and removal of invasive plant species is further discussed in Section 5.4.1. Potential restoration opportunities are presented in Section 5.5. The prevention and management of off-road vehicle use and unauthorized public access to off-trail areas is discussed further in Section 5.8. Control and management of domestic animals within the TRVRP including feral animals, free-roaming pets, and off-leash pets are discussed in Sections 5.4.2 and 5.8

The following species-specific Management Directives are recommended to promote conservation and reproductive success of the least Bell's vireo:

- Prepare an updated Cowbird Management Plan. The plan should detail monitoring methods and population thresholds, and adaptive management strategies (including trapping) should be developed in conjunction with the DPR and wildlife agencies.
 - Specific thresholds on the abundance and/or rate of increase of brown-headed cowbirds would be determined. If these thresholds are met or exceeded, additional monitoring and adaptive management measures would be triggered.

Details for brown-headed cowbird monitoring are further detailed in Section 5.4.2.

Additionally, direct sampling of avian species is being recommended as follows:

- Conduct point count surveys every three years to census species presence, diversity, and distribution within the TRVRP.
 - A minimum of three surveys should be conducted to census migratory, breeding, and wintering species with one survey in late April/early May, one survey in June, and one survey in January.

Surveys will help the DPR infer conclusions on avian diversity, breeding and wintering status, and distribution within the TRVRP; increase detection of local population trends of special status species; and increase detection of invasive non-native avian species present or introduced in the park, especially those shown to adversely affect reproductive success of native species. This data may help direct management priorities and assist in re-evaluating and applying adaptive management measures. Additional adaptive management measures that may help support avian species within the TRVRP include limiting habitat management activities (e.g., controlled burns and herbicide application) during the bird breeding season (generally mid-February through August); maintenance of natural ecological processes (e.g., wildfires, habitat succession, and hydrologic processes); and coordination with managers of adjacent conserved lands to facilitate spread of information, especially with respect to migratory birds or birds with larger home ranges (e.g., northern harrier).

5.3.4 Critical Habitat

The TRVRP contains USFWS-designated critical habitat for least Bell's vireo (Figure 3c). Critical habitat for the species is located along the Tijuana River encompassing the majority of the riparian corridor. Multiple least Bell's vireos were found throughout the park during the baseline biological surveys occupying habitat within designed critical habitat and surrounding riparian habitat (Figures 13a-13f).

The surrounding area contains USFWS-designated critical habitat for spreading navarretia, San Diego fairy shrimp, Riverside fairy shrimp, and western snowy plover (*Charadrius nivosus nivosus*). Spreading navarretia critical habitat occurs approximately 2.1 miles east of the park's northeastern boundary, the east of the I-5 transportation corridor, within Otay Mesa. Critical habitat for San Diego fairy shrimp is located approximately 1.1 miles northwest of the park's northwestern boundary, to the west of the Imperial Beach Naval Station (Figure 3c). Critical habitat for San Diego fairy shrimp and Riverside fairy shrimp is located 1.9 miles southeast of the park's northeastern boundary, to the east of the I-5 transportation corridor, within Otay Mesa. Western snowy plover critical habitat occurs approximately 1.1 miles west of the TRVRP western boundary along beach habitat within Border Field State Park (Figure 3c). There is high potential for San Diego fairy shrimp, Riverside fairy shrimp, and spreading navarretia to occur within the TRVRP where suitable habitat for the species occur as presented in Sections 4.2.2. and 4.3.6.1.

5.4 INVASIVE NON-NATIVE SPECIES REMOVAL AND CONTROL

As part of the Tijuana River Valley Recovery Five-Year Action Plan (County 2015), specific invasive non-native species removal and control measures for the TRVRP include the removal of invasive, non-native species (e.g., habitat enhancement, re-habilitation, or establishment) to restore or enhance habitat quality.

5.4.1 Plants

In total, 105 invasive non-native plant species were identified within the TRVRP and 22 of those species were identified and mapped as non-native target species of concern in need of removal and control (Table 14). Invasive non-native plant species identified as target species of concern in need of removal and control are divided into three groups based on ranking by Cal-IPC. Those invasive non-native plant species grouped in the high priority category have potential to impose severe ecological impacts, are conducive to moderate to high rates of dispersal/establishment, and most are widely spread. Those invasive non-native plant species grouped in the moderate priority category have potential to impose substantial and apparent, but generally not severe, ecological impacts, and are conducive to moderate to high rates of dispersal, though establishment is generally dependent on ecological disturbance; distribution may range from limited to widespread. Those invasive non-native plant species grouped in the limited priority category are invasive, but their potential ecological impacts are minor on a state-wide level, or there was not enough information to justify a higher score; have low to moderate rates of invasiveness; and are generally limited but may be locally persistent and problematic.

Table 14
INVASIVE NON-NATIVE PLANT SPECIES OF CONCERN
WITHIN THE TRVRP

Common Name	Scientific Name
Cal-IPC Ranking High¹	
giant reed	<i>Arundo donax</i>
hottentot fig	<i>Carpobrotus edulis</i>
poison hemlock	<i>Conium maculatum</i>
fennel	<i>Foeniculum vulgare</i>
perennial pepperweed	<i>Lepidium latifolium</i>
tamarisk	<i>Tamarix ramosissima</i>
Cal-IPC Ranking Moderate¹	
Italian thistle	<i>Carduus pycnocephalus</i>
star thistle	<i>Centaurea melitensis</i>
stinkwort	<i>Dittrichia graveolens</i>
garland daisy	<i>Glebionis coronaria</i>
short pod mustard	<i>Hirschfeldia incana</i>
crystalline ice plant	<i>Mesembryanthemum crystallinum</i>
London rocket	<i>Sisymbrium irio</i>
Mexican fan palm	<i>Washingtonia robusta</i>
Cal-IPC Ranking Limited¹	
five-hook bassia	<i>Bassia hyssopifolia</i>
Canary island date palm	<i>Phoenix canariensis</i>
rabbitsfoot grass	<i>Polypogon monspeliensis</i>
castor bean	<i>Ricinus communis</i>
Russian thistle	<i>Salsola tragus</i>
Peruvian pepper tree	<i>Schinus molle</i>
Brazilian pepper tree	<i>Schinus terebinthifolius</i>
milk thistle	<i>Silybum marianum</i>

¹ Source: California Invasive Plant Inventory Database (Cal-IPC 2018). Overall rating listed for southwest region, factoring impact, invasiveness, distribution, and documentation level.

It is recommended that the species ranked as high priority are controlled as soon as possible; species ranked as moderate priority are recommended for control as soon as high-priority species are under control, and species ranked as low priority are recommended for control after high and moderate priority species are under control. Recommended removal methodologies for established invasive non-native plants are dependent on if the invasive non-native plant is herbaceous, perennial, recently germinated, or flowering in addition to size.

Prevention of invasions by non-native plants is the most effective and efficient control strategy, in addition to quickly detecting invasions occurring in the area so weeds can be eradicated or contained before they spread. Precautions to prevent invasions of invasive non-native plants may include removing seed sources from roads, trails, rights-of-way, watercourses, and other dispersal routes; minimizing soil disturbance or closing unnecessary roads and trails, limiting the use of construction materials that carry invasive non-native plant seeds (gravel, fill, mulch, straw); washing equipment wheels/tracks prior to entering work sites; revegetating disturbed areas with native plants as soon as possible; and conducting follow-up monitoring visits to recently disturbed areas to detect new weed populations while they are small and easily controlled (Bossard et al. 2000).

5.4.1.1 Eradication

Eradication of invasive non-native plants from a given area would be ideal, as no more effort is required once a species is completely eliminated and cannot spread unless it is re-introduced. This method yields the best results when a species has recently begun to establish in an area but much more challenging once an invasive non-native species has become established (Bossard et al. 2000).

5.4.1.2 Physical Removal

Physical removal of invasive non-native plants is generally labor intensive and more efficient with small populations and may be recommended as the least impactful to adjacent sensitive habitats. While physical removal of invasive non-native plants can be successful, it is important to not disturb nearby vegetation and soils, which may promote establishment of weedy species. All invasive non-native plants that are physically removed must be disposed of off site. Manual removal would be appropriate for any herbaceous or perennial invasive non-native plant that remains under six feet in height. Removal of larger trees and palms may require additional, larger mechanical equipment (Bossard et al. 2000).

5.4.1.3 Prescribed Fire

Prescribed fire may also be an effective means of reducing weed infestations; however, prescribed fires are not recommended within the TRVRP due to public safety concerns given the recreational components of the Park and active illegal immigration activity. If prescribed fire were to become a viable option in the TRVRP, it would require close coordination with the local office of Cal Fire to ensure safe, effective, and legal burns. Careful timing in regard to winds, moisture conditions, and effects on air quality should all be considered. Prescribing fire may eliminate old vegetation and litter in areas infested with perennial invasive non-native vegetation, thus, allowing follow-up herbicide treatments to reach living leaves and stems of target plants. Fires may also be effective for habitat restoration in areas that evolved with fire and when native seeds require some form of scarification to germinate. Careful attention should also be paid to non-native annual grasses that may colonize an area after fire, as well as fires sterilizing soils and killing off necessary soil microorganisms (Bossard et al. 2000).

5.4.1.4 Chemical Control

Chemical control of invasive non-native plants would kill or inhibit plant growth but must be administered with extreme care. Chemical control is most beneficial to a site when weeds are recently germinated or have not flowered/dropped seed. The potential for chemical drift may damage adjacent native plants or enter water bodies, and chemical control should not be utilized when wind speeds reach 10 mph. While chemical control is not recommended to occur adjacent to native plants (Bossard et al. 2000), in certain situations this must occur. Chemical control may be selected if it includes compounds that can be used selectively to kill only one for a few invasive non-native plant species. The method of application may also minimize the risk of harming non-target plants if one or more of the following methods are used: foliar spray, spot application, wick application, cut-stump, or pre-emergent application. The use of a dye mixed with the herbicide may further aid in seeing which plants have been treated and if the herbicide has been spread onto the maintenance crew or their equipment.

The timing of chemical control is also an important factor when administering herbicide in an area that may also contain native plant species. The growing season of native plants adjacent to target invasive non-native plant species shall be considered. Herbicide may be administered in areas where invasive

non-native plants germinate earlier than native annual plant species, or if the target invasive non-native plant species persist in an area after annual plant species have flowered and produced seed.

5.4.1.5 Additional Control Methods

Additional methods used to control invasive non-native plants species include flooding/draining, mulching, and soil solarization. Flooding may be useful for pastures or other areas where water levels can be controlled, such that invasive non-native plants are drowned. This method may not kill the seeds of the target species. Draining of ponds or irrigation canals may be an effective way to control water dependent plants but may be detrimental to native plants and wildlife. Mulching would include placing hay, manure, straw, or another organic material over plants in an effort to exclude light and prevent photosynthesizing. This method may only be suitable for small infestations and can be expensive (Bossard et al. 2000).

The appropriate method of invasive non-native plant removal must consider multiple variables such as access, time of year, presence of sensitive species, severity of infestation, proximity to surface water, and the degree of intermixing of invasive species with sensitive native habitats.

The CDFW, U.S. Army Corps of Engineers, and Regional Water Quality Control Board will most likely need to be consulted regarding potential permitting requirements if invasive removal using machinery or heavy equipment (e.g., for removal of large palm trees) will occur in waterways or wetlands under their jurisdiction.

A number of invasive non-native species that were not prioritized for removal should be included as species to monitor and control as components of general habitat management as they are commonly observed within the TRVRP, but management for these species would most likely not be cost-effective or successful. These invasive non-native plants may include non-native grasses, Australian saltbush (*Atriplex semibaccata*), filaree (*Erodium* sp.), eucalyptus (*Eucalyptus* sp.), cheese weed (*Malva parviflora*), white horehound (*Marrubium vulgare*), sweet clover (*Melilotus indicus*), tree tobacco (*Nicotiana glauca*), prickly sow-thistle (*Sonchus asper*), dwarf nettle (*Urtica urens*), and rabbitsfoot grass (*Polypogon monspeliensis*).

Specific management recommendations for invasive non-native plants noted as a high priority for removal are detailed below.

Giant Reed

Physical control: Hand-pulling can be effective with new plants less than six feet in height if all rhizome material is removed. Heavier tools such as chainsaws may facilitate biomass reduction but must be followed by rhizome removal or chemical treatment. Mechanical eradication with equipment such as a backhoe is extremely difficult since the rhizomes may become buried deep in the soil. Burning live or chemically treated giant reed is not recommended.

Chemical control: Most management recommendations for giant reed include chemical control with a wetland approved chemical such as glyphosate. The chemical treatment should be applied post-flowering and pre-dormancy, usually late August to early November. Foliar uptake may be effective if applied in the late spring through early fall. These methods would most likely require follow-up treatments.

Hottentot Fig (Highway Ice Plant)

Physical control: Highway ice plant is easily removed by hand-pulling, but all live shoot segments should be removed from contact with the soil to prevent re-sprouting. Use of a tractor is efficient in areas with no sensitive resources. Prescribed burns are not recommended due to the high-water content of these plants.

Chemical control: Most management recommendations for highway iceplant include chemical control with a wetland approved chemical such as glyphosate. These methods would most likely require follow-up treatments.

Poison Hemlock

Physical control: Manual methods such as hand pulling may be effective especially prior to seed set. Due to the biennial nature of the plant, the entire root system does not need to be removed. Mowing has proven effective in killing mature plants, especially when mowing occurs once during the spring and a second time during late summer to eliminate subsequent growth. Mowing may be necessary over a three-year period as the seed has been known to persist in the soil up to three years following mowing. Prescribed burns have not been tested on this plant and are not recommended.

Chemical control: Post-emergent herbicide application has been proven to be effective in late spring (especially in the rosette stage), including chemicals such as glyphosate plus surfactant, 2,4 D ester, and 2,4 D amine.

Fennel

Physical control: When infestations are light or locally restricted, manual methods may be most effective. While labor intensive, digging out individuals by hand would minimize soil disturbance in comparison to plowing or bulldozing. Methods such as cutting, mowing, or chopping would only temporarily reduce the height of the plant but would not be effective in reducing the spread of fennel stands because the root remains alive and ready to support re-growth of shoots. Repeated cuts with short intervals between the cuts may eventually exhaust the resources of the taproot over time. Cutting of fennel plants should be avoided when they are producing seed to prevent further dispersal. Prescribed burns have not been tested on this plant and are not recommended.

Chemical control: Application of amine and ester formulations of triclopyr (one pound active ingredient per acre) in early spring may kill entire populations of fennel, but lower concentrations may be less effective. Application in late summer may also not be as effective. Cutting prior to spraying, or spraying cut stems has not been found to increase the effectiveness of the herbicide.

Perennial Pepperweed

Physical control: Mechanical methods are unlikely to control this plant as it may regenerate from pieces of root left in the soil. Prescribed burns are not recommended since it has not proved effective in past management efforts. Inundation with water may reduce abundance of this plant but is not recommended due to the infeasibility within the TRVRP. Prescribed burns have not been tested on this plant and are not recommended.

Chemical control: The most effective herbicides appear to be chlorsulfuron, triclopyr, and glyphosate. It is recommended to treat this plant with chemical control prior to flowering and dropping seed. Spot spraying (not broadcast) is recommended. These methods would most likely require follow-up treatments.

Tamarisk

Physical control: This plant is difficult to control with physical methods as it may re-sprout following cutting or burning. Hand-pulling of seedlings may be an effective approach in some situations. Use of prescribed fire would require multiple follow up chemical treatment events and is not recommended. Flooding for a period of 1-2 years may also be an effective approach but is not feasible or recommended. Prescribed burns on this plant and are not recommended.

Chemical control: Herbicide treatments may occur as foliar treatments, but the most effective is the drill-and-kill method using an approved herbicide. Following physical cutting of tamarisk trees, multiple rounds of herbicide treatment would be required to control re-sprouts and the spread of this plant. There are generally no timing restrictions for chemical control, but it is recommended to occur during the growing season between late spring and early fall.

Italian Thistle

Physical control: Manual removal of this plant should occur before seed set. Hand pulling should include severing the root at least four inches below ground level so the plant does not regrow. This plant may regrow and continue to produce seed following mowing or slashing. Manual removal before seed set may need to occur annually for up to 10 years to deplete the seedbank in the soil. Prescribed burns have not been tested on this plant and are not recommended.

Chemical control: Herbicide treatments may occur as foliar treatments but may not be as effective if applied during the rosette stage. Spot spraying (not broadcast) is recommended. These methods would most likely require follow-up treatments.

Star Thistle

Physical control: Tillage that would detach the roots from short prior to seed production may be effective but would expose the soil to rapid reinfestation if subsequent rainfall occurs. Mowing should occur after the bolting or spiny stage to avoid increased light penetration that would result in vigorous plant growth and high seed production. Mowing should occur when two to five percent of seed heads are flowering and when the lowest branches of plants are above the height of the mower blades. Prescribed burns have not been tested on this plant and are not recommended.

Chemical control: Post-emergent herbicides have been most effective when applied in late winter or early spring to control seedlings without harming grasses. The best time to treat this invasive non-native plant with a chemical such as glyphosate is after annual grasses and forbs have senesced, but star thistle has not begun seed production.

Stinkwort

Physical control: Manual methods such as hand pulling may be effective especially prior to seed set. Prescribed burns have not been tested on this plant and are not recommended.

Chemical control: This plant species may be treated with herbicides commonly used to control other pest plants. It is recommended to treat this plant with chemical control prior to flowering and dropping seed. Spot spraying (not broadcast) is recommended.

Garland Daisy

Physical control: Hand-pulling is easily achieved following rain when the soil is loose and should be conducted prior to the plant dropping seed. Prescribed burns have not been tested on this plant and are not recommended.

Chemical control: This plant species may be treated with herbicides commonly used to control other pest plants. It is recommended to treat this plant with chemical control prior to flowering and dropping seed. Spot spraying (not broadcast) is recommended.

Short Pod Mustard

Physical control: Hand pulling may be effective if conducted prior to seed set and when the affected area is small. Prescribed burns have not been tested on this plant and are not recommended.

Chemical control: This plant species may be treated with herbicides commonly used to control other pest plants. It is recommended to treat this plant with chemical control prior to flowering and dropping seed. Spot spraying (not broadcast) is recommended.

Crystalline Ice Plant

Physical control: Crystalline ice plant is easily removed by hand-pulling, but all live shoot segments should be removed from contact with the soil to prevent re-sprouting. Use of a tractor is efficient in areas with no sensitive resources. Prescribed burns are not recommended due to the high-water content of these plants.

Chemical control: Most management recommendations for crystalline ice plant include chemical control with a wetland approved chemical such as glyphosate. These methods would most likely require follow-up treatments.

London Rocket

Physical control: Manual methods such as hand pulling may be effective especially prior to seed set. Prescribed burns have not been tested on this plant and are not recommended.

Chemical control: This plant species may be treated with herbicides commonly used to control other pest plants. It is recommended to treat this plant with chemical control prior to flowering and dropping seed. Spot spraying (not broadcast) is recommended.

Mexican Fan Palm

Physical control: Hand-pulling may be effective for saplings and young plants. Heavy equipment may be able to remove the entire plant and root system from the ground. Prescribed fire is not recommended since it has not proved effective in past management efforts.

Chemical control: Herbicide treatments (such as the drill-and-kill method) are an effective approach to management of these plants. Basal spot spraying has also been an effective management approach. Use of foliar herbicide is the fastest acting approach but is not as effective.

Five-hook Bassia

Physical control: Hand-pulling is easily achieved following rain when the soil is loose and should be conducted prior to the plant dropping seed. Pieces of the root that remain in the soil will not sprout again. Prescribed burns have not been tested on this plant and are not recommended.

Chemical control: This plant species may be treated with herbicides commonly used to control other pest plants. It is recommended to treat this plant with chemical control prior to flowering and dropping seed. Spot spraying (not broadcast) is recommended.

Canary Island Date Palm

Physical control: Hand-pulling may be effective for saplings and young plants. Heavy equipment may be able to remove the entire plant and root system from the ground. Prescribed fire is not recommended since it has not proved effective in past management efforts.

Chemical control: Herbicide treatments (such as the drill-and-kill method) are an effective approach to management of these plants. Basal spot spraying has also been an effective management approach. Use of foliar herbicide is the fastest acting approach but is not as effective.

Rabbitsfoot Grass

Physical control: Manual methods such as hand pulling may be effective especially prior to seed set. Prescribed burns have not been tested on this plant and are not recommended.

Chemical control: This plant species may be treated with herbicides commonly used to control other pest plants. It is recommended to treat this plant with chemical control prior to flowering and dropping seed. Spot spraying (not broadcast) is recommended.

Russian Thistle

Physical control: Manual methods such as hand pulling may be effective especially prior to seed set. Prescribed burns have not been tested on this plant and are not recommended.

Chemical control: This plant species may be treated with herbicides commonly used to control other pest plants. It is recommended to treat this plant with chemical control prior to flowering and dropping seed. Spot spraying (not broadcast) is recommended.

Castor Bean

Physical control: Manual methods such as hand pulling may be effective especially prior to seed set. Cut stalks will re-sprout vigorously, so this method is not recommended. Prescribed burns are not recommended since it has not proved effective in past management efforts.

Chemical control: If plants are less than two feet tall, foliar application of glyphosate may be effective. Foliar application of triclopyr on young to medium-sized plants may be effective. A combination of cutting followed by application of an herbicide to the stump surfaces may be effective following multiple treatments.

Peruvian and Brazilian Peppertree

Physical control: Hand-pulling may be effective for saplings and young plants. If as much as a quarter of the root system remains in the ground, it will re-sprout. Heavy equipment may be able to remove the entire plant and root system from the ground. Prescribed burns may be effective in preventing seeds from sprouting, but saplings over one meter in height prove to be fire resistant. Prescribed fire is not recommended since it has not proved effective in past management efforts.

Chemical control: Herbicide treatments using the frill-cut method are an effective approach to management of these plants. Basal spot spraying has also been an effective management approach. Use of foliar herbicide is the fastest acting approach but is not as effective.

Milk Thistle

Physical control: Manual methods such as hand pulling may be effective especially prior to seed set. Prescribed burns have not been tested on this plant and are not recommended.

Chemical control: This plant species may be treated with herbicides commonly used to control other pest plants. It is recommended to treat this plant with chemical control prior to flowering and dropping seed. Spot spraying (not broadcast) is recommended. Invasive Non-native Wildlife

5.4.2 Invasive Non-native Wildlife

Several introduced and naturalized animal species were observed within the TRVRP during baseline surveys. Four species considered to be particularly invasive and pose a threat to native species include American bullfrog, red-eared slider, brown-headed cowbird, and Kuroshio shot hole borer.

American Bullfrogs and Red-Eared Sliders

Amphibian surveys conducted within the TRVRP identified American bullfrogs and red-eared sliders at the Duck Ponds in the northwest and at the Dairy Mart pond in the northeastern portion of the TRVRP. American bullfrogs were also incidentally detected along the Tijuana River during baseline surveys. Visual surveys to document the presence and abundance of American bullfrogs and red-eared sliders are recommended to be conducted annually in June. Survey methods would include walking along the edges of the riparian corridor, river, and ponds where accessible. The abundance and location of any individuals encountered should be recorded and mapped during the survey. If the number of American bullfrogs and red-eared sliders are shown to be significantly increasing over a period of at least three breeding seasons, efforts to eradicate and control bullfrogs should be initiated on the watershed level, as source and satellite bullfrog populations likely occur throughout the Tijuana River. An aquatic invasive species management plan should be drafted if eradication of the species is deemed necessary. The plan should include survey methods, monitoring guidelines, population thresholds, management strategies, and details on eradication methods. Trapping of American bullfrogs and red-eared sliders may be an effective eradication program.

Brown-Headed Cowbird

The brown-headed cowbird was detected in several locations of the TRVRP along the Tijuana River and surrounding areas. Brown-headed cowbirds have become a wildlife management concern within the region because of the species brood parasitism, particularly of the least Bell's vireo. Brown-headed cowbirds were not overly abundant within the TRVRP with a total of 16 cowbirds recorded during the 2018 avian point count surveys (three during the April session and 13 during the July session); however, the data may not accurately reflect the level of cowbird parasitism on avian species in the TRVRP. Gathering additional information regarding the distribution and abundance of brown-headed cowbirds may help to understand the extent of breeding activity and the magnitude to which native species may be adversely impacting successful reproduction of special status avian species.

It is recommended that DPR monitor brown-headed cowbird populations within the TRVRP to determine whether substantial action is needed. A Cowbird Trapping Plan was previously prepared for the TRVRP as part of the RMP (County 2007), which should be reviewed and updated. Determination of the need for cowbird trapping may follow a two-tiered assessment process in which it should be determined if the abundance of cowbirds has increased, followed by host nest monitoring. Focused surveys for brown-headed cowbirds should be conducted at least once at the height of the breeding season (April to June). If the number of brown-headed cowbirds is shown to be significantly increasing following a period of yearly surveys, host nest monitoring for the least Bell's vireo should be initiated to determine the rate of parasitism. If nest parasitism is determined to be at a level at which action is necessary, as defined in the management plan, possible control methods include trapping adults using modified Australian crow traps or removing eggs from host nests (County 2007b). If a trapping program is implemented, special care should focus on non-target species that may be captured to avoid incidental fatalities. A trapping program may also require special approval by USFWS, CDFW, and local agencies.

Other methods that may reduce the brown-headed cowbird population include removing manure from trails used by horses and from any equestrian staging areas such that it would minimize risk of an increase in the brown-headed cowbird population. Improvement of habitat quality through the removal of invasive non-native vegetation throughout the TRVRP will also deter brood parasitism, as this will facilitate the development of native habitat that is too dense at nest height (one to three feet) for cowbirds to readily locate a host nest (Siegle and Ahlers 2004).

Kuroshio Shot Hole Borer

The Kuroshio shot hole borer has been documented within the TRVRP. The species, and associated pathogenic fungus responsible for Fusarium dieback, has severely impacted the riparian vegetation throughout the Tijuana River Valley. Known suitable reproductive host plants include but are not limited to willows, elderberry, western sycamore, cottonwood, coast live oak, mule fat, and the invasive castor bean. The species presence is detrimental to a host plant's health. Possible signs of infestation include a fungus on the surrounding tree bark that changes the bark color, wilted leaves, and dead branches. To limit the adverse effects to the host plant, limbs of the affected tree may be cut. To prevent the beetles from spreading to surrounding trees, limbs should be chipped and solarized for a minimum of six months to ensure eradication of the beetles and associated fungus. Once chipping/solarization is complete, the wood may be used for secondary use such as mulch or fire wood. Campers in County Parks are required to purchase firewood from the park where they are staying to avoid introduction or spread of Kuroshio shot hole borer or other invasive pests. Any trees that are trimmed or removed from

the TRVRP should be chipped/solarized prior to removal from the TRVRP (County 2018 and University of California, Riverside 2017).

The following are options for treating wood that is infected by Kuroshio shot hole borer:

- Chip to less than 1 inch and compost
- Chip to less than 1 inch and solarize
- Chip to less than 1 inch and deliver to landfill for use as Alternative Daily Coverage
- Cut into logs and solarize
- Cut into logs and kiln-dry

The University of California in Riverside is currently involved in research of potentially effective biological control agents for the invasive Kuroshio shot hole borer, and if successful, should be considered for treatment and/or preventative measures for TRVRP areas infected by the Kuroshio shot hole borer.

Further management details and guidelines for the KSHB are included in The Ecology and Management of the Kuroshio Shot Hole Borer in the Tijuana River Valley – Final Report (Boland 2017).

Argentine Ants

While not documented during the 2018 baseline surveys, invasive non-native Argentine ants may be present in the TRVRP or have potential to become established and displace native ants (e.g., Harvester ants), an important food source for the Blainville’s horned lizard, which was found in the TRVRP. It is recommended that visual surveys for Argentine ants be conducted annually within the more mesic regions of the TRVRP, especially at high-use areas with irrigation or other water resources. These areas are generally located in the northern portion of the Park (which borders residential neighborhoods) and include the Duck Ponds south of Sunset Avenue, Bird and Butterfly Gardens west of Hollister Street, the baseball fields south of Sunset Avenue, and Dairy Mart Pond in the northeast area of the TRVRP (Figure 3a). Measures to reduce the risk and extent of invasion include inspecting planting stock if active restoration occurs on site, restricting and removing litter and food waste in public use areas (discussed in Section 5.8), and educating nearby residents about Argentine ants and measures they can take to reduce the introduction and further invasion of Argentine ants (such as reducing irrigation and planting native species).

Feral Animals and Domestic Pets

While not considered to be invasive species, both feral animals and domestic pets occur in the TRVRP as a result of adjacent rural and residential development and passive recreational use of the public trail system. Stray dogs were observed during the 2018 baseline surveys and hikers with off-leash dogs were captured on the wildlife cameras along the trail system. Dogs have the potential to stress and kill native species, though they do not tend to kill nearly as many native species as pet cats do (particularly bird and lizard species). If adverse effects from pets or stray animals become increasingly pervasive within the TRVRP, an awareness program should be started with Park users and adjacent homeowners to

encourage them to keep animals indoors and not let them into the TRVRP. Additional control methods should be considered if pets or stray animals continue to be pervasive within the TRVRP.

5.5 RESTORATION OPPORTUNITIES

The TRVRP is generally composed of both high-quality native vegetation communities within riparian and upland areas, as well as moderately to significantly disturbed vegetation within riparian and upland areas. Restoration opportunities could include multiple forms of invasive non-native plant species control. Enhancement of disturbed streambed/riparian areas would include removal of target invasive non-native plant species for a period of time such that the non-native seed bank within the on-site soil is extirpated and allowing native vegetation to expand cover. Areas that may have been previously a part of the riparian system in the TRVRP that were subject to dumping, fill, or other disturbances resulting in an upland setting have potential for re-habilitation, with the goal of returning natural/historic functions to a former aquatic resource. Multiple upland areas are also suitable for restoration, where invasive non-native plants would be removed, and native upland plants would be installed to restore the area to a native vegetation community.

A Five-Year Action Plan (Action Plan) drafted by the Tijuana River Valley Recovery Team was prepared for the County (County 2015). The Action Plan identifies recovery methods to free the TRVRP of historical trash and sediment, protect future deposits of trash and sediment, restore a sustained physical, chemical, and biological integrity, and restore hydrologic functions while respecting the interests of current and future landowners and users. The Action Plan also identifies Tier 1 projects that are the highest priority projects. The Brown Fill Property Restoration was identified as a Tier 1 project and is currently in the planning phase as restoration (rehabilitation). The Brown Fill property was identified as a potential riparian restoration area directly adjacent to the Tijuana River, and could potentially be used as mitigation for wetland projects.

Opportunities for riparian habitat enhancement exist within the following vegetation communities/habitats:

- Giant reed semi-natural stands
- Naturalized warm temperate riparian and wetland semi-natural stands
- Tamarisk semi-natural stands
- Non-native riparian

Opportunities for riparian habitat rehabilitation exist within the following property areas:

- Brown Fill property
- Nelson Sloan Quarry (restoration at the Nelson Sloan Quarry property is currently being led by California State Parks partnering with the County)

Opportunities for upland habitat restoration exist within the following vegetation communities/habitats:

- Black mustard and other mustards semi-natural stands. This habitat type is located on Spooner's Mesa.
- Black mustard semi-natural type. This habitat is located south east of the baseball fields restoration site.

- Mediterranean California naturalized annual and perennial grassland semi-natural stands. This vegetation community is located in the areas surrounding the Southwest Trails restoration site, specifically to the east, south, and southwest.
- Disturbed habitat.
- Garland daisy semi-natural stands. This vegetation community exists on the mesa top of Spooner's Mesa, and is currently being treated and re-planted with native coastal sage scrub plant species. Additionally, this vegetation community can be found east of the Southwest Trails restoration site and south and east of the Baseball Fields restoration site.
- Eucalyptus semi-natural stands.
- Non-native grassland. This vegetation community exists along the western portion of Monument Mesa.

Light-footed Ridgway's Rail

There may be opportunities for light-footed Ridgway's rail habitat enhancement, restoration, or creation within the TRVRP. Specifically, but not limited to areas associated with the Dairy Mart Pond and areas of open water to the east and south of Dairy Mart Pond, the tributary/backflow channel of the Pilot Channel north of the crossing at Hollister Street, and the Duck Ponds and river channel south of Sunset Avenue. According to a USFWS observation from Griffith Wildlife Biology in 2004, light-footed Ridgway's rail was detected within the Dairy Mart Pond area. Additionally, two pairs were observed in the northeast of the TRVRP in 2007 (County 2007); however, there has been no recent documentation of light-footed Ridgway's Rail occurrences within the TRVRP. While light-footed Ridgway's rails prefer coastal salt marsh habitat and mudflats, they have been documented and are known to also occur within freshwater marsh, cismontane alkali marsh, and riparian habitats further upstream and inland of coastal salt marshes where appropriate vegetation cover and native plant species are present. A Habitat Restoration Plan should be prepared including establishment of more cattails and bulrushes along the edges of the existing Dairy Mart ponds to provide more suitable foraging and/or breeding habitat, increased movement/dispersal opportunities, and better concealment from predators.

Vernal Pool Restoration

There is an opportunity for restoring vernal pools within the TRVRP on Spooner's Mesa. According to historical aerial photos, Spooner's Mesa was cleared of native vegetation and used for agriculture at least 65 years ago. A search of records for vernal pool species on the Calflora website was understandably negative, given how long ago the mesa was cleared for agriculture and the current disturbed condition of the mesa. The soil type and topography are nonetheless suitable for the establishment/re-establishment of vernal pools. The soil type mapped for the mesa is Carlsbad gravelly loamy sand, 2 to 5 percent slopes. The soil description includes hydric depressions, which for this soil type in this region are vernal pools.

Vernal pool restoration would entail restoring mound-basin topography in the relatively level areas of the mesa. The location for this work should be preceded by soil testing to determine the presence and depth of the indurated layer. The pool basins should be located where the recontoured soil surface is, or could be graded, within 18 inches of the indurated layer. The pools would require inoculating with vernal pool propagules, the collection of which would necessitate coordination and potentially permitting with the resource agencies. The watersheds of the pools would require restoration with upland species. The watershed restoration is essential for the water quality of the pools.

Additional Habitat Restoration

Riparian habitat restoration would provide expanded breeding habitat for sensitive wildlife species such as least Bell's vireo, yellow warbler, and yellow-breasted chat. Upland habitat restoration would provide breeding habitat for special status wildlife species such as Belding's orange-throated whiptail, coast horned lizard, coastal California gnatcatcher, and California rufous crowned sparrow. Construction of bat boxes within restoration sites or installing wooden planks below bridges adjacent to restoration sites would provide roosting sites for special status bat species and increase the diversity of wildlife utilizing the TRVRP. Additional restoration opportunities within the TRVRP could focus on enhancing breeding habitat for western spadefoot toad previously observed in depressions along CBP roads on Spooner's Mesa and west of the TRVRP in Border Field State Park. This would include creation of shallow, temporary pools that would be filled by heavy winter rains, allowing the toad to breed and lay eggs.

5.6 FIRE MANAGEMENT

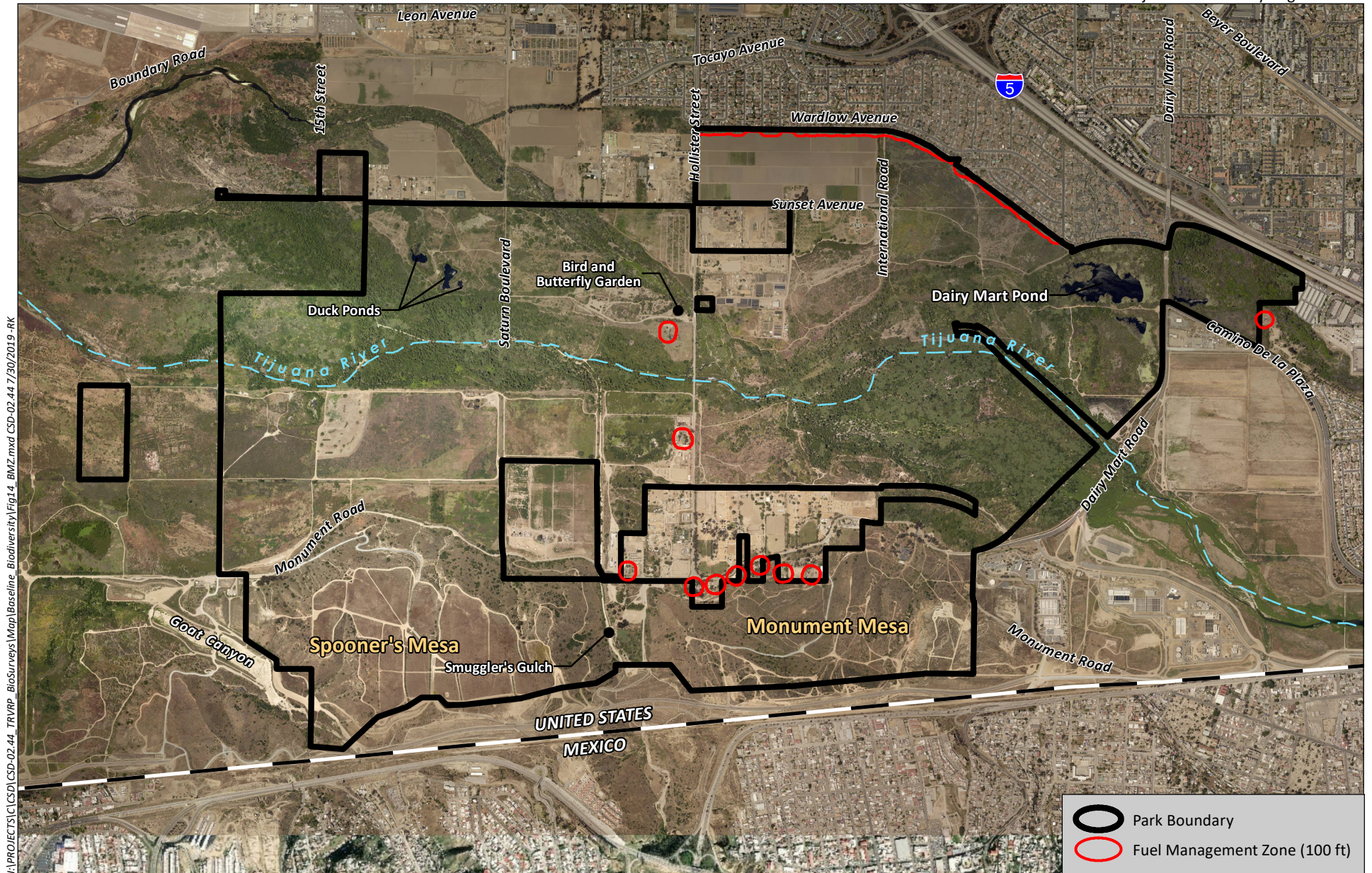
Fire is an important factor in maintaining the healthy status of native plant species throughout San Diego County. The TRVRP is dominated by both wetland and upland vegetation communities, all of which are vulnerable to wildfire burns depending on annual weather conditions and park management. Upland communities with components of sagebrush or non-native annual herbaceous plants have an increased fire fuel load as these plants either senesce at the end of summer or go dormant, leaving dry plant material that may easily ignite. While the most recent wildfire within the TRVRP occurred in 1983, the fire burned the majority of the Spooner's Mesa top, which is now currently a mix of upland sagebrush plants and non-native annual herbaceous plants. Regular clearing of dead non-native plant material that may act as a wildfire fuel, in addition to creating fire-breaks, may lessen the likelihood of fires or curtail how far they can spread.

Riparian habitats are not as susceptible to annual burning, especially once the riparian areas mature into forests where canopy closure may "shade out" herbaceous understory plants that can be fuel for fires. The riparian habitats are still susceptible to fire if the edges of the riparian areas occur along ecotones or roadways that include shrub or grass understories, which would provide fire fuel that allow the potential for canopy fire spread. If disturbed areas are restored to native riparian habitat, there may be an increased fire hazard at the onset of restoration if invasive non-native plants encroach into new open space areas.

The County amended an ordinance that requires residents to keep their property free of fire hazards, and residents can comply with this ordinance by creating a "defensible space" around their homes, which would be an area around a structure where combustible vegetation that can spread fire has been cleared, reduced, or replaced. The "defensible space" would serve as a barrier between a structure and an advancing fire and should encompass a 100-foot radius around a structure. The County also maintains "defensible space" within the TRVRP in areas adjacent to residencies (Figure 14).

5.7 WILDLIFE LINKAGES AND CORRIDORS

No regional wildlife linkages or corridors were determined to be present within the TRVRP as it is geographically isolated from open space and conserved lands within the adjacent area, as described in Section 4.4. Local movement corridors are present in the TRVRP that facilitate movement of medium and large sized mammals throughout the area. Wildlife is expected to move freely within the TRVRP given that it is relatively open, and the entire area is accessible to medium and large mammals. The



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Source: Aerial Photo (SanGIS 2017)



Fuel Management Zones

Figure 14

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Tijuana River and associated riparian corridor provides an important movement corridor for wetland species that are transition between saltwater and freshwater habitats and are found in estuarine environments (such as the light-footed Ridgway's rail).

DPR shall continue to implement the existing TRVRP RMP management recommendations to protect corridor functionality and support local wildlife daily and seasonal movement patterns within the TRVRP, including:

- Public access and use of park resources, such as trails, bird blinds, and picnicking areas, should be limited to the daylight hours to avoid potential conflicts between the public and wildlife.
- Signage should be posted at trail heads and staging areas denoting park usage hours.
- All night lighting, especially at the active recreation sites (i.e., baseball fields, Butterfly Gardens, etc.), will be shielded such that it does not shine directly into the adjacent habitat. All lighting not necessary for safety reasons should be extinguished by 10:00 p.m.

5.8 ADDITIONAL MANAGEMENT RECOMMENDATIONS

5.8.1 Public Access

The majority of the TRVRP is currently managed as a multiple habitat park area and a formal network of trails totaling 22.5 miles has been established. The County DPR should maintain access points to the TRVRP such that the public does not create new access points or impact undisturbed areas of the TRVRP.

5.8.2 Fencing and Gates

County DPR must ensure that unauthorized trails are closed to the public if sensitive resources are to be protected and/or re-established throughout the TRVRP. Fencing made of lodge poles or bollards that would deter access by the public yet keep potential wildlife movement areas intact have been installed ensuring unauthorized trails are closed. On-going maintenance activities should continue to focus on general up-keep of trail closure barricades and documenting newly created trails and access points within TRVRP native vegetation/sensitive resources.

5.8.3 Trails and Access Roads

TRVRP currently supports a 22.5-mile passive recreation trail network. During planning of the formal network of trails and access roads DPR consulted with U.S. Customs and Border Protection (CBP) who retained additional dirt roads, access roads, and trails outside of the formal trail network and has retained the right to use as necessary during a pursuit. DPR shall ensure that unauthorized trails that have been closed are barricaded from public access. Maintenance activities conducted by DPR should also focus on general up-keep of trail closure barricades and documenting newly created trails and pathways within native vegetation/sensitive resources. General maintenance of the established trails should also ensure that detrimental edge effects to native habitat is reduced or avoided through stabilization of eroded trails and strategic revegetation. Signage for closed trails should clearly indicate the primary reason for the closure (such as "sensitive habitat restoration") and if possible, include a

suggested substitute route. All formal trailheads and designated staging areas should be clearly marked with interpretive and directional signage.

5.8.4 Signage and Education

Interpretive signage has been installed throughout the TRVRP with maps of the formal trail network information on native plants/animals, and information on native habitat restoration. Signage for closed trails should clearly indicate the primary reason for the closure (such as “sensitive habitat restoration”) and if possible, include a suggested substitute route. All formal trailheads and designated staging areas should be clearly marked with interpretive and directional signage. Pamphlets on use of the formal trail network and habitat restoration will be provided to residents of the Tijuana River Valley and are currently being drafted by County DPR. Appropriate signage and education is especially important in areas of high public use/recreation, such as the Bird and Butterfly Garden, the Community Garden, the baseball fields, and the nature play nodes.

5.8.5 Litter/Trash Removal

Removal of litter and trash will maintain and enhance the sensitive resources on site, in addition to providing a safe and healthy environment for TRVRP users. The site has potential for debris to wash down the Tijuana River from the east, and diligent maintenance of the TRVRP will maintain a trash free environment. Materials may also flow from Tijuana across the United States border into Goat Canyon and Smuggler’s Gulch. The areas within the Park that allow water from Tijuana to flow into the United States should be monitored and screens/fencing that would block debris should be maintained. Holding pools, such as the sediment ponds present in Goat Canyon, may aid in collecting litter/trash debris that can be disposed of at appropriate landfill facilities. It should be noted that trash was not observed from common public use of trails. It is recommended that trash cans are placed and maintained next to trail heads, parking lots, and common use areas.

5.8.6 Illegal Off-road Activity

Off-road vehicular activity is not allowed within the Park, which is dedicated as an open space easement for the County. Exceptions have only been authorized for the CBP on access paths and roads dedicated for their use. Fencing should continue to protect restoration areas from off-road vehicle activities, and any unauthorized access points to the TRVRP should be blocked off with boulders or some other effective, natural material.

5.8.7 Hydrological Management

The Tijuana River watershed includes eight hydrological areas: Tijuana River, Potrero, Barrett Lake, Monument, Morena, Cottonwood, Cameron, and Campo. Discharges from the Tijuana River contain the highest concentrations of suspended solids among the eight largest creeks and rivers in southern California. Additionally, runoff from Mexico has affected surface water quality while ground water contamination has occurred as a result of seawater intrusion and waste discharges. Hydrologic threats such as pollution and invasive non-native species are best addressed at the watershed level. Management considerations should include the protection of riparian habitats from threats, such as unauthorized public disturbance or invasive non-native plant and animal species (City 1997). The Tijuana River Valley Recovery Team Five-Year Action plan includes restoration opportunities that would improve the hydrology of the Tijuana River Valley by reducing the need for the Pilot Channel maintenance by the

City, reducing flood risks, and reducing channel erosion. The restoration opportunities would also re-establish the braided channel condition expected in this type of river system, as well as reducing the risk of flood impacts for the 25-year and smaller storm events. These restoration opportunities include the Brown Fill Property project, as well as on-going restoration projects such as the Bird and Butterfly Garden wetland creation project.

5.8.8 Emergency and Safety Issues

Management of the TRVRP includes development of recreational opportunities that are compatible with the preservation of biological resources. Maintenance of sufficient access to the TRVRP and coordination with Emergency Service organizations in the event of natural disasters would increase safety and protection of human lives. Additionally, the TRVRP shares 6.6 miles of multi-use trails and 0.2 mile of pedestrian/equestrian trails with CBP that have been authorized for emergency use. The TRVRP can be accessed from various roads surrounding the Park, including Saturn Boulevard, Dairy Mart Ponds Road, Monument Road, and Hollister Street.

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Appendix A

Plant Species Observed

Appendix A Plant Species Observed

Family	Scientific Name ^{*,‡,†}	Common Name	Status ¹
LYCOPHYTES			
Selaginellaceae	<i>Selaginella cinerascens</i> [†]	ashy spike-moss	CRPR 4.1; County List D
LEPTOSPORANGIATE FERNS			
Polypodiaceae	<i>Polypodium californicum</i>	California polypody	--
GYMNOSPERMS			
Ephedraceae	<i>Ephedra californica</i>	desert tea	--
	<i>Ephedra</i> sp.	Mormon-tea	--
Pinaceae	<i>Pinus halepensis</i> [*]	Aleppo pine	--
	<i>Pinus torreyana</i> ssp. <i>torreyana</i> [†]	Torrey pine	CRPR 1B.2; County List A; MSCP Covered
	<i>Pinus</i> sp. [*]	Pine	--
Podocarpaceae	<i>Podocarpus elongatus</i> [*]	Breede River yellowwood	--
MAGNOLIIDS			
Saururaceae	<i>Anemopsis californica</i>	yerba mansa	--
MONOCOTS			
Agavaceae	<i>Yucca aloifolia</i> [*]	aloe yucca	--
	<i>Yucca schidigera</i>	Mohave yucca	--
	<i>Agave attenuata</i> [*]	fox tail agave	--
Araceae	<i>Lemna minuta</i>	pond weed	--
	<i>Phoenix canariensis</i> ^{* ‡}	Canary Island date palm	--
	<i>Washingtonia robusta</i> ^{* ‡}	Mexican fan palm	--
Asparagaceae	<i>Asparagus asparagoides</i> [*]	bridal creeper	--
Asphodelaceae	<i>Asphodelus fistulosus</i> [*]	onion weed	--
Cyperaceae	<i>Bolboschoenus maritimus</i> ssp. <i>paludosus</i>	prairie bulrush	--
	<i>Cyperus eragrostis</i>	tall flatsedge	--
	<i>Cyperus involucratus</i> [*]	umbrella plant	--
Juncaceae	<i>Juncus acutus</i> ssp. <i>leopoldii</i> [†]	southwestern spiny rush	CRPR 4.2; County List D
Liliaceae	<i>Calochortus splendens</i>	lilac mariposa lily	--
Melanthiaceae	<i>Toxicoscordion fremontii</i>	star-lily	--

**Appendix A (cont.)
Plant Species Observed**

Family	Scientific Name ^{*,‡,†}	Common Name	Status ¹
MONOCOTS (cont.)			
Poaceae	<i>Arundo donax</i> * ‡	giant reed	--
	<i>Avena barbata</i> *	slender oat	--
	<i>Bromus diandrus</i> *	common riggut grass	--
	<i>Bromus hordeaceus</i> *	soft brome	--
	<i>Bromus madritensis</i> *	foxtail chess	--
	<i>Cynodon dactylon</i> *	Bermuda grass	--
	<i>Distichlis spicata</i>	saltgrass	--
	<i>Lamarckia aurea</i> *	goldentop	--
	<i>Polypogon monspeliensis</i> * ‡	annual beardgrass	--
	<i>Schismus barbatus</i> *	Mediterranean grass	--
	<i>Stipa miliacea</i> *	smilo grass	--
Typhaceae	<i>Typha</i> sp.	cattail	--
DICOTS			
Adoxaceae	<i>Sambucus nigra</i> ssp. <i>caerulea</i>	blue elderberry	--
Aizoaceae	<i>Aptenia cordifolia</i> *	red apple ice plant	--
	<i>Carpobrotus edulis</i> * ‡	hottentot-fig	--
	<i>Mesembryanthemum crystallinum</i> * ‡	crystalline iceplant	--
	<i>Mesembryanthemum nodiflorum</i> *	slender-leaved iceplant	--
Amaranthaceae	<i>Amaranthus</i> sp.*	amaranth	--
Anacardiaceae	<i>Malosma laurina</i>	laurel sumac	--
	<i>Rhus integrifolia</i>	lemonadeberry	--
	<i>Schinus molle</i> * ‡	Peruvian pepper tree	--
	<i>Schinus terebinthifolius</i> * ‡	Brazilian pepper tree	--
Apiaceae	<i>Apium graveolens</i> *	celery	--
	<i>Conium maculatum</i> * ‡	poison-hemlock	--
	<i>Daucus pusillus</i>	rattlesnake weed	--
	<i>Foeniculum vulgare</i> * ‡	fennel	--

**Appendix A (cont.)
Plant Species Observed**

Family	Scientific Name ^{*,‡,†}	Common Name	Status ¹
DICOTS (cont.)			
Apocynaceae	<i>Asclepias</i> sp.	milkweed	--
	<i>Araujia sericifera</i> *	bladderflower	--
Asteraceae	<i>Achillea millefolium</i>	pacific yarrow	--
	<i>Amblyopappus pusillus</i>	coast weed	--
	<i>Ambrosia acanthicarpa</i>	annual bur-sage	--
	<i>Ambrosia monogyra</i> †	singlewhorl burrobrush	CRPR 2B.2
	<i>Ambrosia psilostachya</i>	western ragweed	--
	<i>Artemisia californica</i>	California sagebrush	--
	<i>Artemisia douglasiana</i>	mugwort	--
	<i>Artemisia dracuncululus</i>	tarragon	--
	<i>Artemisia palmeri</i> †	San Diego sagewort	CRPR 4.2; County List D
	<i>Baccharis pilularis</i>	coyote brush	--
	<i>Baccharis salicifolia</i>	mule fat	--
	<i>Bahiopsis laciniata</i> †	San Diego viguiera	CRPR 4.3; County List D
	<i>Bebbia juncea</i> var. <i>aspera</i>	sweetbush	--
	<i>Carduus pycnocephalus</i> * ‡	Italian thistle	--
	<i>Centaurea melitensis</i> * ‡	tochalote	--
	<i>Chaenactis glabriuscula</i> var. <i>glabriuscula</i>	yellow pinchusion	--
	<i>Corethrogyne filaginifolia</i>	San Diego sand aster	--
	<i>Cotula coronopifolia</i> *	common brassbuttons	--
	<i>Cynara cardunculus</i> *	artichoke thistle	--
	<i>Deinandra fasciculata</i>	fascicled tarplant	--
	<i>Dittrichia graveolens</i> * ‡	stinkwort	--
	<i>Encelia californica</i>	California encelia	--
	<i>Erigeron canadensis</i>	horseweed	--
	<i>Erigeron</i> sp.	fleabane	--
	<i>Eriophyllum confertiflorum</i>	golden-yarrow	--

**Appendix A (cont.)
Plant Species Observed**

Family	Scientific Name ^{*,‡,†}	Common Name	Status ¹
DICOTS (cont.)			
Asteraceae	<i>Glebionis coronaria</i> * ‡	garland daisy	--
	<i>Helianthus annuus</i>	western sunflower	--
	<i>Helminthotheca echioides</i> *	bristly ox-tongue	--
	<i>Heterotheca grandiflora</i>	telegraph weed	--
	<i>Hypochaeris glabra</i> *	smooth catsear	--
	<i>Isocoma menziesii</i>	goldenbush	--
	<i>Iva hayesiana</i> †	San Diego marsh-elder	CRPR 2B.2; County List B
	<i>Lactuca serriola</i> *	wild lettuce	--
	<i>Lasthenia californica</i> ssp. <i>californica</i>	goldfields	--
	<i>Lasthenia</i> sp.	goldfields	--
	<i>Leptosyne maritima</i> †	sea dahlia	CRPR 2B.2; County List B
	<i>Logfia gallica</i> *	narrow-leaf filago	--
	<i>Matricaria discoidea</i> *	pineapple weed	--
	<i>Osmadenia tenella</i>	osmadenia	--
	<i>Pluchea odorata</i>	salt marsh fleabane	--
	<i>Pluchea sericea</i>	arrow weed	--
	<i>Pseudognaphalium biolettii</i>	bicolor cudweed	--
	<i>Pseudognaphalium californicum</i>	California everlasting	--
	<i>Pseudognaphalium</i> sp.	everlasting	--
	<i>Senecio vulgaris</i> *	common groundsel	--
	<i>Silybum marianum</i> * ‡	milk thistle	--
	<i>Sonchus asper</i> *	prickly sow thistle	--
	<i>Sonchus oleraceus</i> *	common sow thistle	--
	<i>Stephanomeria virgata</i>	virgate wreath-plant	--
	<i>Xanthium strumarium</i>	cocklebur	--
Bignoniaceae	<i>Tecoma capensis</i> *	Cape honeysuckle	--
	<i>Amsinckia intermedia</i>	rancher's fiddleneck	--

**Appendix A (cont.)
Plant Species Observed**

Family	Scientific Name ^{*,‡,†}	Common Name	Status ¹
DICOTS (cont.)			
Bignoniaceae	<i>Cryptantha</i> sp.	cryptantha	--
	<i>Heliotropium curassavicum</i> var. <i>occulatum</i>	salt heliotrope	--
	<i>Pectocarya linearis</i> ssp. <i>ferocula</i>	slender pectocarya	--
	<i>Pectocarya</i> sp.	pectocarya	--
	<i>Phacelia distans</i>	wild heliotrope	--
	<i>Phacelia</i> sp.	phacelia	--
Brassicaceae	<i>Brassica nigra</i> [*]	black mustard	--
	<i>Descurainia pinnata</i>	tansy-mustard	--
	<i>Hirschfeldia incana</i> ^{* ‡}	short-pod mustard	--
	<i>Lepidium didymum</i> [*]	wart cress, spine cress	--
Brassicaceae	<i>Lepidium latifolium</i> ^{* ‡}	perennial pepperweed	--
	<i>Lobularia maritima</i> [*]	sweet alyssum	--
	<i>Raphanus sativus</i> [*]	wild radish	--
	<i>Sisymbrium irio</i> [*]	London rocket	--
Cactaceae	<i>Bergerocactus emoryi</i> [†]	golden-spined cereus	CRPR 2B.2; County List B
	<i>Cylindropuntia prolifera</i>	coastal cholla	--
	<i>Ferocactus viridescens</i> [†]	San Diego barrel cactus	CRPR 2B.1; County List B; MSCP Covered
Cactaceae	<i>Mammillaria dioica</i>	fishhook cactus	--
	<i>Opuntia ficus-indica</i> [*]	Indian-fig	--
	<i>Opuntia littoralis</i>	coastal prickly pear	--
Capparaceae	<i>Peritoma arborea</i>	bladderpod	--
Caryophyllaceae	<i>Cardionema ramosissima</i>	tread-lightly	--
Chenopodiaceae	<i>Atriplex canescens</i> ssp. <i>canescens</i>	shad scale	--
	<i>Atriplex lentiformis</i>	quail saltbush	--
	<i>Atriplex semibaccata</i> [*]	Australian saltbush	--
	<i>Bassia hyssopifolia</i> ^{* ‡}	five-hook bassia	--
	<i>Chenopodium californicum</i>	California pigweed	--

**Appendix A (cont.)
Plant Species Observed**

Family	Scientific Name ^{*,‡,†}	Common Name	Status ¹
DICOTS (cont.)			
Chenopodiaceae	<i>Chenopodium murale</i> *	nettle-leaf goosefoot	--
	<i>Salicornia pacifica</i>	Pacific pickleweed	--
	<i>Salsola tragus</i> * ‡	Russian thistle	--
Cistaceae	<i>Helianthemum scoparium</i>	peak rush-rose	--
Convolvulaceae	<i>Calystegia macrostegia</i>	morning-glory	--
	<i>Calystegia</i> sp. *	morning-glory	--
	<i>Convolvulus arvensis</i> *	bindweed	--
	<i>Cuscuta californica</i>	dodder	--
	<i>Dichondra occidentalis</i> †	western dichondra	CRPR 4.2; County List D
Crassulaceae	<i>Crassula connata</i>	pygmy-weed	--
	<i>Dudleya edulis</i>	ladies-fingers	--
	<i>Dudleya lanceolata</i>	coastal dudleya	--
	<i>Dudleya pulverulenta</i>	chalk-lettuce	--
Cucurbitaceae	<i>Marah macrocarpa</i>	wild cucumber	--
Ericaceae	<i>Ornithostaphylos oppositifolia</i> †	Baja California birdbush	SE; CRPR 2B.1; County List B
Ericaceae	<i>Xylococcus bicolor</i>	mission manzanita	--
Euphorbiaceae	<i>Croton californicus</i>	California croton	--
	<i>Croton setigerus</i>	dove weed	--
	<i>Euphorbia lathyris</i> *	caper spurge	--
	<i>Euphorbia misera</i> †	cliff spurge	CRPR 2B.2; County List B
	<i>Euphorbia peplus</i> *	petty spurge	--
	<i>Ricinus communis</i> * ‡	castor bean	--
Fabaceae	<i>Acacia confusa</i> *	acacia	--
	<i>Acacia</i> sp.*	small Philippine acacia	--
	<i>Acmispon glaber</i>	deerweed	--
	<i>Amorpha fruticosa</i>	false indigo	--
	<i>Astragalus trichopodus</i>	ocean locoweed	--

**Appendix A (cont.)
Plant Species Observed**

Family	Scientific Name ^{*,y,†}	Common Name	Status ¹
DICOTS (cont.)			
Fabaceae	<i>Lupinus bicolor</i>	miniature lupine	--
	<i>Medicago polymorpha</i> *	burclover	--
	<i>Melilotus albus</i> *	white sweet clover	--
	<i>Melilotus indicus</i> *	Indian sweet clover	--
	<i>Parkinsonia aculeata</i> *	Mexican palo verde	--
Fagaceae	<i>Quercus agrifolia</i> var. <i>agrifolia</i>	coast live oak	--
	<i>Quercus berberidifolia</i>	scrub oak	--
	<i>Quercus dumosa</i> †	Nuttall's scrub oak	CRPR 1B.1; County List A
Geraniaceae	<i>Erodium botrys</i> *	long-beak filaree	--
	<i>Erodium cicutarium</i> *	redstem filaree	--
Grossulariaceae	<i>Ribes speciosum</i>	fuschia-flowered gooseberry	--
Juglandaceae	<i>Juglans californica</i> var. <i>californica</i> †	Southern California black walnut	CRPR 4.2; County List D
Lamiaceae	<i>Lavandula</i> sp.*	lavender	--
	<i>Marrubium vulgare</i> *	horehound	--
	<i>Rosmarinus officinalis</i> *	rosemary	--
	<i>Salvia apiana</i>	white sage	--
	<i>Salvia mellifera</i>	black sage	--
Lythraceae	<i>Punica granatum</i> *	pomegranate	--
Malvaceae	<i>Malacothamnus fasciculatus</i>	chaparral mallow	--
	<i>Malva parviflora</i> *	cheeseweed	--
Meliaceae	<i>Melia azaderach</i> *	chinaberry	--
Moraceae	<i>Morus alba</i> *	white mulberry	--
Myrsinaceae	<i>Anagallis arvensis</i> *	scarlet pimpernel	--
Myrtaceae	<i>Callistemon citrinus</i> *	common bottle brush	--
	<i>Eucalyptus</i> sp.*	eucalyptus	--
	<i>Psidium littorale</i> *	lemon guava	--
	<i>Psidium cattleianum</i> *	strawberry guava	--

**Appendix A (cont.)
Plant Species Observed**

Family	Scientific Name ^{*,‡,†}	Common Name	Status ¹
DICOTS (cont.)			
Nyctaginaceae	<i>Mirabilis laevis</i> ssp. <i>crassifolia</i>	wishbone bush	--
Oleaceae	<i>Olea europaea</i> *	olive	--
Onagraceae	<i>Camissoniopsis bistorta</i>	California sun cup	--
	<i>Camissoniopsis cheiranthifolia</i>	beach evening-primrose	--
	<i>Camissoniopsis</i> sp.	sun cup	--
	<i>Epilobium ciliatum</i> ssp. <i>ciliatum</i>	willow herb	--
Oxalidaceae	<i>Oxalis pes-caprae</i> *	Bermuda buttercup	--
Papaveraceae	<i>Eschscholzia californica</i>	California poppy	--
Passifloraceae	<i>Passiflora caerulea</i> *	passionflower	--
Phrymaceae	<i>Mimulus aurantiacus</i>	monkey-flower	--
Phytolaccaceae	<i>Phytolacca americana</i> *	common pokeweed	--
Plantaginaceae	<i>Antirrhinum nuttallianum</i>	nuttall snapdragon	--
	<i>Penstemon gloxinioides</i> *	penstemon	--
	<i>Plantago major</i> *	common plantain	--
Platanaceae	<i>Platanus racemosa</i>	western sycamore	--
Plumbaginaceae	<i>Limonium perezii</i> *	Canarian sea lavender	--
	<i>Plumbago auriculata</i> *	cape leadwort	--
Polemoniaceae	<i>Navarretia hamata</i>	skunkweed	--
Polygonaceae	<i>Chorizanthe fimbriata</i>	fringed spineflower	--
	<i>Eriogonum fasciculatum</i>	California buckwheat	--
	<i>Rumex crispus</i> *	curly dock	--
	<i>Rumex</i> sp.*	dock	--
Proteaceae	<i>Grevillea robusta</i> *	silky oak	--
Ranunculaceae	<i>Clematis</i> sp.	Virgin's bower	--
Rhamnaceae	<i>Ceanothus</i> sp.	ceanothus	--
	<i>Ceanothus verrucosus</i> †	wart-stemmed ceanothus	CRPR 2B.2; County List B; MSCP Covered
Rosaceae	<i>Eriobotrya japonica</i> *	loquat	--

**Appendix A (cont.)
Plant Species Observed**

Family	Scientific Name ^{*,‡,†}	Common Name	Status ¹
DICOTS (cont.)			
Rosaceae	<i>Heteromeles arbutifolia</i>	toyon	--
	<i>Pyracantha coccinea</i> "Mojave"*	Mojave pyracantha	--
	<i>Pyracantha</i> sp.*	narrowleaf firethorn	--
	<i>Rosa californica</i>	California rose	--
	<i>Rubus ursinus</i>	California blackberry	--
Rubiaceae	<i>Galium</i> sp.	bedstraw	--
Rutaceae	<i>Cneoridium dumosum</i>	bushrue	--
Salicaceae	<i>Populus fremontii</i> ssp. <i>fremontii</i>	Fremont cottonwood	--
	<i>Salix exigua</i>	narrow-leaved willow	--
Salicaceae	<i>Salix gooddingii</i>	Goodding's black willow	--
	<i>Salix laevigata</i>	red willow	--
	<i>Salix lasiolepis</i>	arroyo willow	--
Scrophulariaceae	<i>Myoporum</i> sp.*	myoporum	--
	<i>Buddleja davidii</i> *	butterfly bush	--
Simmondsiaceae	<i>Simmondsia chinensis</i>	jojoba	--
Solanaceae	<i>Datura wrightii</i>	jimson weed	--
	<i>Lycopersicon esculentum</i> *	tomato	--
	<i>Nicotiana glauca</i> *	tree tobacco	--
	<i>Solanum</i> sp.	nightshade	--
Solanaceae	<i>Solanum xanti</i>	purple nightshade	--
Tamaricaceae	<i>Tamarix ramosissima</i> * ‡	saltcedar	--
Tropaeolaceae	<i>Tropaeolum majus</i> *	nasturtium	--
Urticaceae	<i>Urtica dioica</i> ssp. <i>holosericea</i>	stinging nettle	--
	<i>Urtica urens</i> *	dwarf nettle	--
Verbenaceae	<i>Lantana camara</i> *	lantana	--
	<i>Verbena menthifolia</i>	verbena	--
	<i>Verbena</i> sp.	verbena	--

Appendix A (cont.) Plant Species Observed

Family	Scientific Name ^{*,‡,†}	Common Name	Status ¹
DICOTS (cont.)			
Vitaceae	<i>Vitis californica</i>	california grape	--

* Non-native Species

‡ Target Invasive Species

† Special Status Species

¹ F = Federal; S = State of California; E = Endangered; T = Threatened; CE = Candidate Endangered; R = Rare

CRPR = California Native Plant Society Rare Plant Rank: 1A – presumed extirpated in California and either rare or extinct elsewhere; 1B – rare, threatened, or endangered in California and elsewhere; 2A – presumed extirpated in California, but more common elsewhere; 2B – rare, threatened, or endangered in California, but more common elsewhere; 3 – more information needed; 4 – watch list for species of limited distribution. Extension codes: .1 – seriously endangered; .2 – moderately endangered; .3 – not very endangered.

County of San Diego Sensitivity Status: Plant species are divided into Groups A through D on the County Rare Plant List. **Groups A and B** Plants include those that have a very high level of sensitivity, either because they are listed as threatened or endangered or because they have very specific natural history requirements that must be met. **Groups C and D** Plants include those species that are becoming less common but are not yet so rare that extirpation or extinction is imminent without immediate action. These species tend to be prolific within their suitable habitat types.

MSCP Covered Species: Covered Species under City MSCP Subarea Plan; NE = Narrow Endemic Species under City MSCP Subarea Plan.

Appendix B

Animal Species Observed
or Detected

Appendix B
Animal Species Observed or Detected

Taxon		Scientific Name†	Common Name	Status ¹
Order	Family			
INVERTEBRATES				
Anostraca	Branchinectidae	<i>Branchinecta</i> sp.	unidentified fairy shrimp	--
Coleoptera	Coccinellidae	unidentified	ladybug	--
	Curculionidae	<i>Euwallacea</i> sp.	Kuroshio shot hole borer	--
	Tenebrionidae	unidentified	darkling beetle	--
Diptera	Asilidae	unidentified	robber Fly	--
	Bombyliidae	unidentified	humblefly	--
	Culicidae	unidentified	mosquito	--
	Syrphidae	<i>Copestylum mexicanum</i>	Mexican cactus fly	--
		unidentified	hoverfly	--
	Tachinidae	unidentified	fly	--
Hemiptera	Cercopoidea	unidentified	spitbug	--
	Pentatomidae	<i>Murgantia histrionica</i>	harlequin bug	--
Hymenoptera	Apidae	<i>Apis mellifera</i>	European honeybee	--
		<i>Bombus</i> sp.	bumblebee	--
	Formicidae	unidentified	red ant	--
	Mutillidae	unidentified	velvet ant	--
	Pompilidae	unidentified	tarantula hawk	--
Isopoda	Armadillidiidae	unidentified	pill bug	--
		unidentified	woodlice	--
Lepidoptera	Hesperiidae	<i>Erynnis funeralis</i>	Funereal Duskywing	--
		<i>Poanes melane</i>	Umber Skipper	--
		unidentified	unidentified Skipper	--
	Lycaenidae	<i>Brephidium exila</i>	Western Pygmy-Blue	--
		<i>Euphilotes battoides bernardino</i>	Bernardino Square-spotted Blue	--

Appendix B (cont.)
Animal Species Observed or Detected

Taxon		Scientific Name†	Common Name	Status ¹
Order	Family			
INVERTEBRATES (continued)				
Lepidoptera	Lycaenidae	<i>Leptotes marina</i>	Marine Blue	--
		<i>Plebejus acmon</i>	Acmon Blue	--
		<i>Strymon melinus</i>	Gray Hairstreak	--
		unidentified	unidentified blue	--
	Nymphalidae	<i>Coenonympha tullia californica</i>	California Common Ringlet	--
		<i>Danaus plexippus</i> †	Monarch	County Group 2
		<i>Euphydryas editha quino</i> †	Quino Checkerspot	FE; County Group 1; MSCP NE
		<i>Limenitis lorquini</i>	Lorquin's Admiral	--
		<i>Nymphalis antiopa</i>	Mourning Cloak	--
		<i>Polygonia satyrus</i>	Satyr Comma	--
		<i>Vanessa annabella</i>	West Coast Lady	--
		<i>Vanessa atalanta</i>	Red Admiral	--
		<i>Vanessa</i> sp.	unidentified Lady	--
	Papilionidae	<i>Papilio eurymedon</i>	Pale Swallowtail	--
		<i>Papilio rutulus</i>	Western Tiger Swallowtail	--
		<i>Papilio zelicaon</i>	Anise Swallowtail	--
	Pieridae	<i>Anthocharis sara sara</i>	Pacific Sara Orangetip	--
		<i>Nathalis iole</i>	Dainty Sulphur	--
		<i>Pieris rapae</i>	Cabbage White	--
		<i>Pontia protodice</i>	Checkered White	--
		unidentified	unidentified Sulphur	--
	Riodinidae	<i>Apodemia mormo virgulti</i>	Behr's Metalmark	--
	unidentified	unidentified	unidentified moth	--
Odonata	unidentified	unidentified	unidentified dragonfly	--
Orthoptera	Stenopelmatidae	<i>Stenopelmatys</i> sp.	Jerusalem Cricket	--
	unidentified	unidentified	unidentified grasshopper	--
Pulmonata	unidentified	unidentified	brown snail	--

**Appendix B (cont.)
Animal Species Observed or Detected**

Taxon		Scientific Name†	Common Name	Status ¹
Order	Family			
VERTEBRATES				
Amphibians				
Anura	Bufonidae	<i>Anaxyrus boreas</i>	western toad	SSC; County Group 2
	Hylidae	<i>Pseudacris hypochondriaca</i>	Baja California treefrog	--
		<i>Pseudacris cadaverina</i>	California treefrog	--
	Ranidae	<i>Lithobates catesbeianus</i>	American bullfrog	--
	Scaphiopodidae	<i>Spea hammondi</i> †	western spadefoot	
Reptiles				
Cryptodira	Emydidae	<i>Trachemys scripta elegans</i>	red-eared slider	--
Squamata	Colubridae	<i>Coluber fuliginosus</i> †	Baja California coachwhip	SSC
		<i>Lampropeltis californiae</i>	California kingsnake	--
		<i>Pituophis catenifer annectens</i>	San Diego gopher snake	--
	Crotalidae	<i>Crotalus oreganus helleri</i>	southern pacific rattlesnake	--
	Phrynosomatidae	<i>Phrynosoma blainvillii</i> †	Blainville's horned lizard	SSC; County Group 2; MSCP Covered
		<i>Sceloporus occidentalis longipies</i>	great basin fence lizard	--
		<i>Sceloporus orcutti</i>	granite spiny lizard	--
		<i>Uta stansburiana elegans</i>	western side-blotched lizard	--
	Teiidae	<i>Aspidoscelis hyperythra beldingi</i> †	Belding's orange-throated whiptail	WL; County Group 2; MSCP Covered
Birds				
Accipitriformes	Accipitridae	<i>Accipiter cooperii</i> †	Cooper's Hawk	WL; County Group 1; MSCP Covered
		<i>Accipiter striatus</i> †	Sharp-shinned Hawk	WL; County Group 1
		<i>Buteo jamaicensis</i>	Red-tailed Hawk	--
		<i>Buteo lineatus</i> †	Red-shouldered Hawk	County Group 1
		<i>Circus hudsonius</i> †	Northern Harrier	SSC; County Group 1; MSCP Covered
		<i>Elanus leucurus</i> †	White-tailed Kite	FP; County Group 1
	Cathartidae	<i>Cathartes aura</i> †	Turkey Vulture	County Group 1
Anseriformes	Anatidae	<i>Anas platyrhynchos</i>	Mallard	--
		<i>Bucephala albeola</i>	Bufflehead	--

**Appendix B (cont.)
Animal Species Observed or Detected**

Taxon		Scientific Name†	Common Name	Status ¹
Order	Family			
VERTEBRATES (cont.)				
Birds (cont.)				
Anseriformes	Anatidae	<i>Mareca strepera</i> †	Gadwall	County Group 2
		<i>Oxyura jamaicensis</i>	Ruddy Duck	--
		<i>Spatula clypeata</i>	Northern Shoveler	--
		<i>Spatula cyanoptera</i>	Cinnamon Teal	--
Apodiformes	Apodidae	<i>Aeronautes saxatalis</i>	White-throated Swift	--
	Trochilidae	<i>Calypte anna</i>	Anna's Hummingbird	--
		<i>Calypte costae</i> †	Costa's Hummingbird	BCC
		<i>Selasphorus sasin</i>	Allen's Hummingbird	--
Caprimulgiformes	Caprimulgidae	<i>Chordeiles acutipennis</i>	Lesser Nighthawk	--
		<i>Phalaenoptilus nuttallii</i>	Common Poorwill	--
Charadriiformes	Charadriidae	<i>Charadrius vociferus</i>	Killdeer	--
	Laridae	<i>Larus delawarensis</i>	Ring-billed Gull	--
		<i>Larus occidentalis</i>	Western Gull	--
		<i>unidentified</i>	unidentified tern	--
Columbiformes	Columbidae	<i>Columbina passerina</i>	Common Ground-Dove	--
		<i>Streptopelia decaocto</i>	Eurasian Collared-Dove	--
		<i>Zenaida macroura</i>	Mourning Dove	--
Coraciiformes	Alcedinidae	<i>Megaceryle alcyon</i>	Belted Kingfisher	--
Cuculiformes	Cuculidae	<i>Geococcyx californianus</i>	Greater Roadrunner	--
Falconiformes	Falconidae	<i>Falco sparverius</i>	American Kestrel	--
Gruiformes	Rallidae	<i>Fulica americana</i>	American Coot	--
		<i>Gallinula galeata</i>	Common Gallinule	--
Passeriformes	Aegithalidae	<i>Psaltriparus minimus</i>	Bushtit	--
	Alaudidae	<i>Eremophila alpestris</i> †	Horned Lark	WL; County Group 2
	Cardinalidae	<i>Passerina caerulea</i>	Blue Grosbeak	--
		<i>Pheucticus melanocephalus</i>	Black-headed Grosbeak	--

**Appendix B (cont.)
Animal Species Observed or Detected**

Taxon		Scientific Name†	Common Name	Status ¹
Order	Family			
VERTEBRATES (cont.)				
Birds (cont.)				
Passeriformes	Corvidae	<i>Calocitta collieri</i>	Black-throated Magpie-Jay	--
		<i>Corvus brachyrhynchos</i>	American Crow	--
		<i>Corvus corax</i>	Common Raven	--
	Fringillidae	<i>Haemorhous mexicanus</i>	House Finch	--
		<i>Spinus psaltria</i>	Lesser Goldfinch	--
	Hirundinidae	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	--
		<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	--
		<i>Tachycineta bicolor</i>	Tree Swallow	--
	Icteria	<i>Icteria virens</i> †	Yellow-breasted Chat	SSC; County Group 1
	Icteridae	<i>Agelaius phoeniceus</i>	Red-winged Blackbird	--
		<i>Icterus cucullatus</i>	Hooded Oriole	--
		<i>Molothrus ater</i>	Brown-headed Cowbird	--
		<i>Quiscalus mexicanus</i>	Great-tailed Grackle	--
	Mimidae	<i>Mimus polyglottos</i>	Northern Mockingbird	--
		<i>Toxostoma redivivum</i>	California Thrasher	--
	Parulidae	<i>Cardellina pusilla</i>	Wilson's Warbler	--
		<i>Geothlypis trichas</i>	Common Yellowthroat	--
		<i>Oreothlypis celata</i>	Orange-crowned Warbler	--
		<i>Oreothlypis ruficapilla</i>	Nashville Warbler	--
		<i>Setophaga coronata</i>	Yellow-rumped Warbler	--
	Parulidae	<i>Setophaga nigrescens</i>	Black-throated Gray Warbler	--
		<i>Setophaga occidentalis</i>	Hermit Warbler	--
		<i>Setophaga petechia</i> †	Yellow Warbler	BCC; SSC; County Group 2
		<i>Setophaga townsendi</i>	Townsend's Warbler	--
	Passerellidae	<i>Melospiza lincolni</i>	Lincoln's Sparrow	--
		<i>Melospiza melodia</i>	Song Sparrow	--

**Appendix B (cont.)
Animal Species Observed or Detected**

Taxon		Scientific Name†	Common Name	Status ¹
Order	Family			
VERTEBRATES (cont.)				
Birds (cont.)				
Passeriformes	Passerellidae	<i>Melospiza crissalis</i>	California Towhee	--
		<i>Pipilo maculatus</i>	Spotted Towhee	--
		<i>Zonotrichia leucophrys</i>	White-crowned Sparrow	--
	Poliotilidae	<i>Poliotilta caerulea</i>	Blue-gray Gnatcatcher	--
		<i>Poliotilta californica californica</i> †	Coastal California Gnatcatcher	FT; SSC; County Group 1; MSCP Covered
	Ptilonotidae	<i>Phainopepla nitens</i>	Phainopepla	--
	Regulidae	<i>Regulus calendula</i>	Ruby-crowned Kinglet	--
	Sturnidae	<i>Sturnus vulgaris</i>	European Starling	--
	Sylviidae	<i>Chamaea fasciata</i>	Wrentit	--
	Troglodytidae	<i>Cistothorus palustris</i>	Marsh Wren	--
		<i>Thryomanes bewickii</i>	Bewick's Wren	--
		<i>Troglodytes aedon</i>	House Wren	--
	Turdidae	<i>Catharus guttatus</i>	Hermit Thrush	--
		<i>Sialia mexicana</i> †	Western Bluebird	County Group 2; MSCP Covered
	Tyrannidae	<i>Empidonax difficilis</i>	Pacific-slope Flycatcher	--
		<i>Myiarchus cinerascens</i>	Ash-throated Flycatcher	--
		<i>Sayornis nigricans</i>	Black Phoebe	--
		<i>Sayornis saya</i>	Say's Phoebe	--
		<i>Tyrannus verticalis</i>	Western Kingbird	--
		<i>Tyrannus vociferans</i>	Cassin's Kingbird	--
	Vireonidae	<i>Vireo bellii pusillus</i> †	Least Bell's Vireo	FE; SE; County Group 1; MSCP NE and Covered
		<i>Vireo huttoni</i>	Hutton's Vireo	--
Pelecaniformes	Ardeidae	<i>Ardea alba</i>	Great Egret	--
		<i>Ardea herodias</i> †	Great Blue Heron	County Group 2
		<i>Butorides virescens</i> †	Green Heron	County Group 2
		<i>Egretta thula</i>	Snowy Egret	--

**Appendix B (cont.)
Animal Species Observed or Detected**

Taxon		Scientific Name†	Common Name	Status ¹
Order	Family			
VERTEBRATES (cont.)				
Birds (cont.)				
Pelecaniformes	Pelecanidae	<i>Nycticorax nycticorax</i>	Black-crowned Night-Heron	--
		<i>Pelecanus erythrorhynchos</i> †	American White Pelican	SSC; County Group 2
Piciformes	Picidae	<i>Colaptes auratus</i>	Northern Flicker	--
		<i>Dryobates nuttallii</i>	Nuttall's Woodpecker	--
		<i>Dryobates pubescens</i>	Downy Woodpecker	--
Podicipediformes	Podicipedidae	<i>Podiceps nigricollis</i>	Eared Grebe	--
		<i>Podilymbus podiceps</i>	Pied-billed Grebe	--
Strigiformes	Strigidae	<i>Bubo virginianus</i>	Great Horned Owl	--
	Tytonidae	<i>Tyto alba</i> †	Barn Owl	County Group 2
Suliformes	Phalacrocoracidae	<i>Phalacrocorax auritus</i> †	Double-crested Cormorant	WL; County Group 2
Mammals				
Carnivora	Canidae	<i>Canis familiaris</i>	domestic dog	--
		<i>Canis latrans</i>	coyote	--
	Felidae	<i>Lynx rufus</i>	bobcat	--
	Mephitidae	<i>Mephitis mephitis</i>	striped skunk	--
	Procyonidae	<i>Procyon lotor</i>	raccoon	--
Chiroptera	Molossidae	<i>Eumops perotis</i> †	western mastiff bat	SSC; County Group 2
		<i>Nyctinomops femorosaccus</i> †	pocketed free-tailed bat	SSC; County Group 2
		<i>Tadarida brasiliensis</i>	Brazilian free-tailed bat	--
	Vespertilionidae	<i>Eptesicus fuscus</i>	big brown bat	--
		<i>Lasiurus blossevillii</i> †	western red bat	SSC; County Group 2
		<i>Myotis yumanensis</i> †	Yuma myotis	Group 2
Didelphimorphia	Didelphidae	<i>Didelphis virginiana</i>	Virginia opossum	--
Insectivora	Soricidae	<i>Sorex ornatus</i>	ornate shrew	--
Lagomorpha	Leporidae	<i>Lepus californicus bennettii</i> †	San Diego black-tailed jackrabbit	SSC; County Group 2
		<i>Sylvilagus audubonii</i>	desert cottontail	--

**Appendix B (cont.)
Animal Species Observed or Detected**

Taxon		Scientific Name†	Common Name	Status ¹
Order	Family			
VERTEBRATES (cont.)				
Mammals (cont.)				
Perissodactyla	Equidae	<i>Equus caballus</i>	feral horse	--
Rodentia	Cricetidae	<i>Neotoma lepida intermedia</i> †	San Diego desert woodrat	SSC; County Group 2
		<i>Peromyscus boylii</i>	brush deermouse	--
		<i>Peromyscus californicus</i>	California deermouse	--
		<i>Peromyscus maniculatus</i>	North American deermouse	--
		<i>Reithrodontomys megalotis</i>	western harvest mouse	--
	Geomyidae	<i>Thomomys bottae</i>	Botta's pocket gopher	--
	Heteromyidae	<i>Chaetodipus californicus</i>	California pocket mouse	--
	Sciuridae	<i>Otospermophilus beecheyi</i>	California ground squirrel	--

¹ F = Federal; S = State of California; E = Endangered; T = Threatened; CE = Candidate Endangered; R = Rare; BCC = Federal Bird of Conservation Concern; SSC = State Species of Special Concern; FP = State Fully Protected; WL = Watch List

County of San Diego Sensitivity Status: Animals are divided into Groups 1 and 2 on the Sensitive Animal List. **Group 1** Animals include those that have a very high level of sensitivity, either because they are listed as threatened or endangered or because they have very specific natural history requirements that must be met. **Group 2** Animals include those species that are becoming less common but are not yet so rare that extirpation or extinction is imminent without immediate action. These species tend to be prolific within their suitable habitat types.

MSCP Covered Species: Covered Species under City of San Diego MSCP Subarea Plan; NE = Narrow Endemic Species under City MSCP Subarea Plan

† Special Status Species

Appendix C

Special Status Plant Species Potential
to Occur

Appendix C

Special Status Plant Species Observed or With Potential to Occur

Species	Status ¹	Habit, Ecology and Life History	Potential to Occur ²
red sand-verbena (<i>Abronia maritima</i>)	--/-- CRPR 4.2 County List A	Perennial herb. Occurs as prostrate mats on well-developed beach dunes away from the heavy foot traffic of humans, which has severely degraded habitat on most of the southern California beaches. Flowering period: February – December. Elevation: below 328 feet (100 meters).	Presumed Absent. Not observed during 2018 HELIX TRVRP surveys and no historical observations recorded on or near the TRVRP. Suitable habitat does not occur within the TRVRP.
San Diego thorn-mint (<i>Acanthomintha ilicifolia</i>)	FT/SE CRPR 1B.1 County List A MSCP Covered	Annual herb. Occurs on clay soils near vernal pools and in grassy openings in coastal sage scrub and chaparral. Flowering period: April – June. Elevation: below 3,281 feet (3,000 meters).	Not Expected. Suitable soils do not occur within the TRVRP. No historical observations recorded within the TRVRP.
Nuttall’s acmispon (<i>Acmispon prostratus</i>)	--/-- CRPR 1B.1 County List A MSCP Covered	Annual herb. Typically found in disturbed areas and along dunes within coastal strand and coastal sage scrub. Flowering period: March – June. Elevation: below 98 feet (30 meters).	High. Recent historical observations recorded southwest of the TRVRP, with several older historical observations recorded throughout the TRVRP.
California adolphia (<i>Adolphia californica</i>)	--/-- CRPR 2B.1 County List B	Perennial shrub. Most often found in sage scrub but occasionally occurs in peripheral chaparral habitats, particularly hillsides near creeks. Flowering period: December–April. Elevation: below 1,312 feet (400 meters).	Low. Conspicuous plant not observed during 2018 HELIX TRVRP surveys. Historical observations located in currently developed northern portion of the TRVRP.
Shaw’s agave (<i>Agave shawii</i> var. <i>shawii</i>)	--/-- CRPR 2B.1 County List B MSCP Covered	Perennial succulent. Most often found on coastal bluffs and along mesas and foothills. Flowering period: September – May. Elevation: below 984 feet (300 meters).	Low. Conspicuous plant not observed during 2018 HELIX TRVRP surveys. Historical observations recorded directly west of the TRVRP. Coastal mesas in southern portion of the TRVRP have potential to support this species.
San Diego bur-sage (<i>Ambrosia chenopodiifolia</i>)	--/-- CRPR 2B.1 County List B	Perennial shrub. Occurs within coastal sage scrub communities. Flowering period: February – May. Elevation: below 820 feet (250 meters).	High. Conspicuous plant not observed during 2018 HELIX TRVRP surveys; it has not been historically observed within the TRVRP.
singlewhorl burrobrush (<i>Ambrosia monogyra</i>)	--/-- CRPR 2B.2	Perennial shrub. Found within washes and dry riverbeds within chaparral communities. Flowering period: September – November. Elevation: below 1,640 feet (500 meters).	Present. This species was observed during 2018 HELIX TRVRP surveys. Patches of singlewhorl burrobrush were mapped in the northern and southeastern portions of the TRVRP (Figure 10). A total of 1,327 individuals were mapped within the TRVRP.

Appendix C (cont.)
Special Status Plant Species Observed or With Potential to Occur

Species	Status ¹	Habit, Ecology and Life History	Potential to Occur ²
San Diego ambrosia (<i>Ambrosia pumila</i>)	FE/-- CRPR 1B.1 County List A MSCP Covered	Small perennial herb. Occurs on loam or clay soils. Found in native grassland, valley bottoms, dry drainages, stream floodplain terraces, and vernal pool margins. Also can occur on slopes, disturbed places, and in coastal sage scrub or chaparral. Flowering period: April – July. Elevation: 164–1,969 feet (50 – 600 meters).	Presumed Absent. Not observed during 2018 HELIX TRVRP surveys. Nearest recorded observation approximately 1.1 miles east of the TRVRP.
aphanisma (<i>Aphanisma blitoides</i>)	--/-- CRPR 1B.2 County List A MSCP Covered	Annual herb. Found coastally on bluffs and saline sand within sage scrub communities. Flowering period: June – September. Elevation: below 656 feet (200 meters).	High. Historical observations are recorded along the west side of the TRVRP. Suitable habitat occurs within the TRVRP.
San Diego sagewort (<i>Artemisia palmeri</i>)	--/-- CRPR 4.2 County List D	Biennial or perennial herb. Typically found along stream courses, often beneath riparian woodland. May occur in coast live oak woodland, coastal sage scrub, and southern mixed chaparral. Flowering period: June - October. Elevation: below 1,969 feet (600 meters).	Present. This species was observed during 2018 HELIX TRVRP surveys. This species was mapped at three locations in and near riparian areas within the northwestern portion of the TRVRP (Figure 10). A total of 85 individuals were mapped within the TRVRP.
Coulter's saltbush (<i>Atriplex coulteri</i>)	--/-- CRPR 1B.2 County List A	Perennial herb. Typically found on alkaline or clay soils on open sites such as dunes within coastal strand and coastal sage scrub communities. Less often found in valley grasslands. Flowering period: March – October. Elevation: below 1,640 feet (500 meters).	High. Multiple recent observations recorded in southern portion of the TRVRP and directly west of the TRVRP. Suitable coastal sage scrub habitat occurs throughout southern portion of the TRVRP.
south coast saltscale (<i>Atriplex pacifica</i>)	--/-- CRPR 1B.2 County List A	Annual herb. Found coastally on dunes and within playas in alkali sinks, sage scrub and wetland riparian communities. Flowering period: March – October. Elevation: below 984 feet (300 meters).	High. Multiple recent observations recorded in southern portion of the TRVRP. Suitable coastal sage scrub habitat occurs throughout southern portion of the TRVRP.
Parish's brittle scale (<i>Atriplex parishii</i>)	--/-- CRPR 1B.1 County List A	Annual herb. Occurs in Chenopod scrub, vernal pools, and playas. Alkaline flats on the periphery of salt pannes. Flowering period: June – October. Elevation: below 1,542 feet (470 meters).	None. Not observed during site surveys and no historical observations recorded on or near the TRVRP. Nearest recorded observation approximately 33 miles north of the TRVRP.

Appendix C (cont.)
Special Status Plant Species Observed or With Potential to Occur

Species	Status ¹	Habit, Ecology and Life History	Potential to Occur ²
San Diego County viguiera (<i>Bahiopsis laciniata</i>)	--/-- CRPR 4.3 County List D	Shrub. Occurs on a variety of soil types in Diegan coastal sage scrub. Generally, shrub cover is more open than at mesic, coastal locales supporting sage scrub. Flowering period: February – August (October – December). Elevation: 295 – 2,461 feet (90 - 750 meters).	Present. This species was observed during 2018 HELIX TRVRP surveys. This species was mapped in abundance within Diegan coastal sage scrub and maritime succulent scrub communities in the southern half of the TRVRP (Figure 10). A total of 3,672 individuals were mapped within the TRVRP.
golden-spined cereus (<i>Bergerocactus emoryi</i>)	--/-- CRPR 2B.2 County List B	Stem succulent shrub. Occurs coastally on sandy open hills within chaparral, sage scrub, and closed-cone pine forests. Flowering period: May – June. Elevation: below 328 feet (100 meters).	Present. This species was observed during 2018 HELIX TRVRP surveys. This species was mapped in Diegan coastal sage scrub and maritime succulent scrub in the southwest portion of the TRVRP (Figure 10). A total of 1,753 individuals were mapped within the TRVRP.
San Diego goldenstar (<i>Bloomeria [Muilla] clevelandii</i>)	--/-- CRPR 1B.1 County List A MSCP Covered	Perennial bulbiferous herb. Occurs in valley grasslands and coastal scrub, particularly near mima mound topography or in the vicinity of vernal pools, on clay soils. Flowering period: April – May. Elevation: below 328 feet (100 meters).	High. Suitable grassland and coastal scrub habitat present. Not observed during 2018 TRVRP surveys. Nearest recorded observation approximately 3.9 miles northeast of the TRVRP.
Lewis' evening-primrose (<i>Camissoniopsis lewisii</i>)	--/-- CRPR 3 County List C	Annual herb. Occurs in very sandy substrates near the beach, typically on beach bluffs. Flowering period: March -June. Elevation: below 984 feet (300 meters).	High. Suitable soils occur within the TRVRP. Recent historical observation recorded in the eastern end of the TRVRP.
wart-stemmed ceanothus (<i>Ceanothus verrucosus</i>)	--/-- CRPR 2B.2 County List B MSCP Covered	Perennial evergreen shrub occurring in xeric chamise or southern maritime chaparral on rocky soil. Flowering period: January -April. Elevation: below 1,148 feet (350 meters).	Present. This species was observed during 2018 HELIX TRVRP surveys. This species was mapped within the TRVRP in Diegan coastal sage scrub on Monument Mesa (Figure 10). A total of 277 individuals were mapped within the TRVRP.
Orcutt's pincushion (<i>Chaenactis glabriuscula</i> var. <i>orcuttiana</i>)	--/-- CRPR 1B.1 County List A	Annual herb. Occurs in sandy coastal bluff scrub and coastal dunes. Flowering period: April – July. Elevation: below 328 feet (100 meters).	High. Recent survey observation on site and 2018 CNPS observation recorded directly north of the eastern portion of the TRVRP. A single individual pincushion (<i>Chaenactis</i> sp.) was observed in the TRVRP during 2018 surveys, but this specimen lacked diagnostic features, and the plant was not identifiable to species level.

Appendix C (cont.)
Special Status Plant Species Observed or With Potential to Occur

Species	Status ¹	Habit, Ecology and Life History	Potential to Occur ²
southern mountain misery (<i>Chamaebatia australis</i>)	--/-- CRPR 4.2 County List B	Perennial shrub. Occurs on dry slopes in chaparral with gabbro and metavolcanic soils. Flowering period: November – May. Elevation: 984-4,035 feet (300-1,230 meters).	Presumed Absent. Conspicuous plant not observed during 2018 HELIX TRVRP surveys and no historical observations recorded on or near the TRVRP. Suitable habitat does not occur within the TRVRP.
salt marsh bird's-beak (<i>Chloropyron maritimum</i> ssp. <i>maritimum</i>)	FE/SE CRPR 1B.2 County List A	Annual herb. Typically occurring along the coast. Found within coastal strand, salt marsh, and wetland riparian communities. Flowering period: May – October. Elevation: below 33 feet (10 meters).	High. Suitable wetland riparian habitat occurs along northern portion of the TRVRP. Historical observations recorded in central portion of the TRVRP.
long-spined spineflower (<i>Chorizanthe polygonoides</i> var. <i>longispina</i>)	--/-- CRPR 1B.2 County List A	Annual herb. Occurs in chaparral, coastal scrub, and native grassland, often in sandy soils. Flowering period: April – June. Elevation: 98–4,921 feet (30 – 1,500 meters).	Low. Not observed during 2018 HELIX TRVRP surveys. Nearest recorded observation approximately 3.9 miles northeast of the TRVRP.
seaside calandrinia (<i>Cistanthe [Calandrinia] maritima</i>)	--/-- CRPR 4.2 County List D	Annual herb. Occurs on sandy bluffs near the beach and sandy openings in Diegan coastal sage scrub. Flowering period: February – June. Elevation: below 984 feet (300 meters).	High. Suitable sandy soils and Diegan coastal sage scrub habitat present within the TRVRP. Species has been recorded in the vicinity of the TRVRP.
delicate clarkia (<i>Clarkia delicata</i>)	--/-- CRPR 1B.2 County List A	Annual herb. Occurs in shaded areas or the periphery of oak woodlands and cismontane chaparral. Flowering period: April - May. Elevation: below 3,281 feet (1,000 meters).	Not Expected. Suitable habitat does not occur within the TRVRP. Not observed during 2018 HELIX TRVRP surveys and no historical observations recorded on or near the TRVRP. Nearest recorded observation approximately 10.9 miles northeast of the TRVRP.
Las Animas colubrina (<i>Colubrina californica</i>)	--/-- CRPR 2B.3 County List B	Shrub. Localized around springs and in mesic rocky canyon bottoms in Mojavean desert scrub. Flowering period: April - May. Elevation: 787 – 3,018 feet (240-920 meters).	None. No suitable habitat present, and nearest recorded observation approximately 105 miles northeast of the TRVRP.
summer holly (<i>Comarostaphylis diversifolia</i> ssp. <i>diversifolia</i>)	--/-- CRPR 1B.2 County List A	Perennial shrub. Occurs in chaparral and cismontane woodland. Flowering period: May – June. Elevation: 328 – 1,804 feet (100 – 550 meters).	Presumed Absent. Conspicuous plant not observed during 2018 HELIX TRVRP surveys. No historical observations recorded on or near the site; nearest recorded observation approximately 9.5 miles northeast of the TRVRP.

Appendix C (cont.)
Special Status Plant Species Observed or With Potential to Occur

Species	Status ¹	Habit, Ecology and Life History	Potential to Occur ²
small-flowered morning-glory (<i>Convolvulus simulans</i>)	--/-- CRPR 4.2 County List D	Annual herb. Occurs on clay and serpentinite seeps in openings within chaparral, coastal scrub, and native grassland. Flowering period: April –June. Elevation: 98–2,871 feet (30 - 875 meters).	Not Expected. Suitable clay and serpentine soils do not occur within the TRVRP. No historical observations recorded within the TRVRP.
San Diego sand aster (<i>Corethrogyne filaginifolia</i> var. <i>incana</i>)	--/-- CRPR 1B.1 County List A	Perennial herb. Found along the southern coast of San Diego County within coastal sage scrub. Flowering period: June – September. Elevation: 15 – 2,362 feet (5 – 720 meters).	Presumed Absent. Conspicuous plant not observed during site surveys. 2018 CNPS observation recorded directly north of the eastern portion of the TRVRP. Suitable coastal sage scrub occurs throughout southern portion of the TRVRP.
snake cholla (<i>Cylindropuntia californica</i> var. <i>californica</i>)	--/-- CRPR 1B.1 County List A MSCP Covered	Perennial herb stem succulent. Occurs within coastal sage scrub and coastal chaparral communities. Flowering period: April – July. Elevation: Below 820 feet (250 meters).	Presumed Absent. Conspicuous plant not observed during 2018 HELIX TRVRP surveys. Historical observations recorded directly east and west of the TRVRP. Suitable coastal sage scrub habitat occurs throughout southern portion of the TRVRP.
Otay tarplant (<i>Deinandra conjugens</i>)	FT/SE CRPR 1B.1 County List A MSCP Covered	Annual herb. Grows in clay soils within coastal scrub openings and grasslands. Flowering period: May – June. Elevation: 66 – 984 feet (20 – 300 meters).	Not Expected. Suitable clay soils do not occur within the TRVRP. Historical observations recorded northeast of the TRVRP.
paniculate tarplant (<i>Deinandra paniculata</i>)	--/-- CRPR 4.2 County List D	Annual herb. Occurs on vernal mesic and sometimes sandy soils in coastal scrub, native grassland, and vernal pools. Flowering period: April – November. Elevation: below 4,331 feet (1,320 meters).	Low. Suitable habitat present within the TRVRP, but species not observed within the TRVRP and nearest historical recorded observation from Chula Vista in areas that have been developed.
western dichondra (<i>Dichondra occidentalis</i>)	--/-- CRPR 4.2 County List D	Perennial rhizomatous herb. Occurs in Diegan coastal sage scrub, southern mixed chaparral, chamise chaparral, or rocky outcrops in grasslands. Often proliferates on recently burned slopes. Flowering period: March - June. Elevation: below 1,706 feet (520 meters).	Present. This species was observed during 2018 HELIX TRVRP surveys. This species was mapped at one location on the northwest end of Monument Mesa (Figure 10). A total of 526 individuals were mapped within the TRVRP.
Orcutt's bird's-beak (<i>Dicranostegia orcuttiana</i>)	--/-- CRPR 2B.1 County List B	Annual herb. Found in seasonally dry drainages and upland adjacent to riparian habitat. Flowering period: March – August. Elevation: below 1,148 feet (350 meters).	High. Historical observation recorded in southern portion of the TRVRP. Suitable coastal sage scrub occurs throughout southern portion of the TRVRP.

Appendix C (cont.)
Special Status Plant Species Observed or With Potential to Occur

Species	Status ¹	Habit, Ecology and Life History	Potential to Occur ²
Orcutt's dudleya (<i>Dudleya attenuata</i> ssp. <i>attenuata</i>)	--/-- CRPR 2B.1 County List B	Perennial herb succulent. Occurs on coastal bluffs within chaparral and coastal sage scrub communities. Flowering period: May – June. Elevation: below 164 feet (50 meters).	High. Historical observations recorded northeast and southwest of the TRVRP. Suitable coastal sage scrub occurs throughout southern portion of the TRVRP.
Blochman's dudleya (<i>Dudleya blochmaniae</i> ssp. <i>blochmaniae</i>)	--/-- CRPR 1B.1 County List A	Perennial herb succulent. Grows on open, rocky slopes, often on serpentine or clay dominated soils in coastal sage scrub and valley grassland communities. Flowering period: April – June. Elevation: below 1,476 feet (450 meters).	High. Historical observations recorded in southern portion of the TRVRP. Suitable open coastal sage scrub occurs throughout southern portion of the TRVRP, although clay and serpentine soils do not occur.
variegated dudleya (<i>Dudleya variegata</i>)	--/-- CRPR 1B.2 County List A MSCP Covered	Perennial herb succulent. Occurs on dry hillsides and mesas within chaparral, valley grassland, foothill woodland and coastal sage scrub communities. Flowering period: April – June. Elevation: below 984 feet (300 meters).	High. Historical observations recorded directly east of the TRVRP. Suitable coastal sage scrub habitat occurs on mesas in the southern portion of the TRVRP.
Palmer's goldenbush (<i>Ericameria palmeri</i> var. <i>palmeri</i>)	--/-- CRPR 1B.1 County List B MSCP Covered	Shrub. Occurs in coastal sage scrub communities. Flowering period: September – November. Elevation: below 1,968 feet (600 meters).	Presumed Absent. Conspicuous plant not observed during 2018 HELIX TRVRP surveys. Suitable coastal sage scrub habitat occurs throughout southern portion of the TRVRP. 2018 CNPS observation recorded northeast of the TRVRP.
San Diego button celery (<i>Eryngium aristulatum</i> var. <i>parishii</i>)	FE/SE CRPR 1B.1 County List A MSCP Covered	Annual or perennial herb. Grows in vernal pools within valley grassland, coastal sage scrub, and wetland communities. Flowering period: May – June. Elevation: below 2,313 feet (705 meters).	Not Expected. Suitable vernal pool habitat was not observed on site during the 2018 HELIX TRVRP surveys.
cliff spurge (<i>Euphorbia misera</i>)	--/-- CRPR 2B.2 County List B	Shrub. Found on coastal bluffs and rocky slopes within coastal sage scrub communities. Flowering period: January – August. Elevation: below 1,640 feet (500 meters).	Present. This species was observed during 2018 HELIX TRVRP surveys. This species was observed in the western half of Spooner's Mesa and Monument Mesa within the TRVRP (Figure 10). A total of 1,962 individuals were mapped within the TRVRP.
San Diego barrel cactus (<i>Ferocactus viridescens</i>)	--/-- CRPR 2B.1 County List B MSCP Covered	Stem succulent shrub. Grows in sandy to rocky areas within chaparral, valley grassland and coastal sage scrub communities. Flowering period: May – June. Elevation: 33 – 492 (10 – 150 meters).	Present. This species was observed during 2018 HELIX TRVRP surveys. This species was observed in Diegan coastal sage scrub and maritime succulent scrub in Spooner's Mesa and Monument Mesa (Figure 10). A total of 1,367 individuals were mapped within the TRVRP.

**Appendix C (cont.)
Special Status Plant Species Observed or With Potential to Occur**

Species	Status ¹	Habit, Ecology and Life History	Potential to Occur ²
Palmer's frankenia (<i>Frankenia palmeri</i>)	--/-- CRPR 2B.1 County List B	Perennial herb. Occurs on alkali flats, the edges of coastal salt marsh, and dunes. Flowering period: April - September. Elevation: below 1,476 feet (450 meters).	High. 2015 CNPS observation recorded 0.3 mile west of the TRVRP. May occur in wet areas along Tijuana River.
Mexican flannelbush (<i>Fremontodendron mexicanum</i>)	FE/SR CRPR 1B.1 County List A	Shrub. Occurs within chaparral, foothill woodland and closed-cone pine forest communities. Flowering period: March – June. Elevation: 33 – 2,349 feet (10 – 716 meters).	Not Expected. Suitable habitat does not occur within the TRVRP. No historical observations recorded within the TRVRP.
San Diego gumplant (<i>Grindelia hallii</i>)	--/-- CRPR 1B.2 County List A	Perennial herb. Grows in meadows, dry slopes, and open pine/oak woodland within chaparral, valley grassland, and yellow pine forest communities. Flowering period: July – October. Elevation: 2,625 – 5,577 feet (800 – 1,700 meters).	Not Expected. Suitable habitat does not occur within the TRVRP. No historical observations recorded within the TRVRP.
Palmer's grapplinghook (<i>Harpagonella palmeri</i>)	--/-- CRPR 4.2 County List D	Annual herb. Occurs on clay soils in grasslands and coastal sage scrub. Flowering period: Mar – May. Elevation: below 3,281 feet (1,000 meters).	Not Expected. Suitable soil not present within the TRVRP. Nearest recorded occurrence in Otay Mesa to the east of the TRVRP.
beach goldenaster (<i>Heterotheca sessiliflora</i> ssp. <i>sessiflora</i>)	--/-- CRPR 1B.1	Perennial herb. Occurs on beaches, dunes, and within mudflats. Flowering period: June – September. Elevation: below 197 (60 meters).	Presumed Absent. Not observed during 2018 HELIX TRVRP surveys and no historical observations recorded within the TRVRP. Suitable habitat limited to immediate vicinity of the Tijuana River.
graceful tarplant (<i>Holocarpha virgata</i> ssp. <i>elongata</i>)	--/-- CRPR 4.2 County List D	Annual herb. Occurs in grasslands on coastal mesas and in the foothills. Flowering period: May – November. Elevation: 66 – 3,675 feet (20 – 1,120 meters).	Low. Not observed during 2018 HELIX TRVRP surveys. Nearest recorded observation at Otay Mountain to the east of the TRVRP.
decumbent goldenbush (<i>Isocoma menziesii</i> var. <i>decumbens</i>)	--/-- CRPR 1B.2 County List A	Shrub. Occurs in sandy soil and disturbed areas on the landward side of dunes, hillsides, and arroyos within coastal sage scrub and chaparral communities. Flowering period: July – November. Elevation: below 656 feet (200 meters).	Presumed Absent. Conspicuous plant not observed during 2018 HELIX TRVRP surveys. A historical observation is recorded from the Tijuana River bottom adjacent to the TRVRP. Suitable disturbed areas on hillsides and coastal sage scrub occur within the TRVRP.
San Diego marsh-elder (<i>Iva hayesiana</i>)	--/-- CRPR 2B.2 County List B	Perennial herb. Found in alkali flats, depressions, and streambanks within wetland communities. Flowering period: March – September. Elevation: below 984 (2,953) feet (300 [900] meters).	Present. This species was observed during 2018 HELIX TRVRP surveys. This species was mapped in riparian areas in the northern side of the TRVRP (Figure 10). A total of 804 individuals were mapped within the TRVRP.

Appendix C (cont.)
Special Status Plant Species Observed or With Potential to Occur

Species	Status ¹	Habit, Ecology and Life History	Potential to Occur ²
Southern California black walnut (<i>Juglans californica</i> var. <i>californica</i>)	--/-- CRPR 4.2 County List D	Tree. Occurs in open savannah, with preference for deep alluvial soils with high water-retention capacity. Tends to grow in creekbeds, alluvial terraces, and north-facing slopes. Flowering period: March – May. Elevation: 98 – 2,953 feet (30 - 900 meters).	Present. This species was observed during 2018 HELIX TRVRP surveys. A patch of 5 plants was mapped at Butterfly Gardens in non-native riparian/Diegan coastal sage scrub (Figure 10). It is believed that these trees were installed.
southwestern spiny rush (<i>Juncus acutus</i> ssp. <i>leopoldii</i>)	--/-- CRPR 4.2 County List D	Perennial herb. Occurs in coastal dunes (mesic), meadows and seeps (alkaline seeps), and marshes and swamps (coastal salt). Flowering period: May – June. Elevation: generally below 984 feet (300 meters).	Present. This species was observed during 2018 HELIX TRVRP surveys. This species was mapped at five locations in the northern part of the TRVRP (Figure 10). A total of 207 individuals were mapped within the TRVRP.
Coulter’s goldfields (<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>)	--/-- CRPR 1B.1 County List A	Annual herb. Grows in vernal pools, playas, and saline habitats within alkali sinks, coastal salt marshes, and wetland communities. Flowering period: April – May. Elevation: below 3,281 feet (1,000 meters).	Low. Not observed during 2018 HELIX TRVRP surveys and no historical observations recorded on or near the TRVRP. Suitable wetland habitat occurs within the TRVRP.
Robinson’s pepper-grass (<i>Lepidium virginicum</i> var. <i>robinsonii</i>)	--/-- CRPR 4.3 County List A	Annual herb. Grows in openings in chaparral and sage scrub at the coastal and foothill elevations. Typically observed in relatively dry, exposed locales rather than beneath a shrub canopy. Flowering period: March – June. Elevation: below 9,186 feet (2,800 meters).	Low. Not observed during the 2018 HELIX TRVRP surveys and no historical observations recorded on or near the TRVRP. Suitable coastal sage scrub exists within the TRVRP.
sea dahlia (<i>Leptosyne maritima</i>)	--/-- CRPR 2B.2 County List B	Perennial herb. Occurs on coastal bluffs within coastal sage scrub. Flowering period: February – June. Elevation: below 66 feet (20 meters).	Present. This species was observed during 2018 HELIX TRVRP surveys. This species was mapped in Diegan coastal sage scrub on Spooner’s Mesa and Monument Mesa (Figure 10). A total of 842 individuals were mapped within the TRVRP.
California box-thorn (<i>Lycium californicum</i>)	--/-- CRPR 4.2 County List D	Perennial shrub. Occurs on coastal bluffs and coastal-sage scrub. Flowering period: March through August (December). Elevation: below 492 feet (150 meters).	High. This genus was observed during 2018 HELIX TRVRP surveys on steep north-facing slopes, but specimens lacked diagnostic features, and they were not identifiable to species level. This species was previously documented in the TRVRP as being associated with <i>Euphorbia misera</i> (County of San Diego 2007).

Appendix C (cont.)
Special Status Plant Species Observed or With Potential to Occur

Species	Status ¹	Habit, Ecology and Life History	Potential to Occur ²
small-flowered microseris (<i>Microseris douglasii</i> ssp. <i>platycarpa</i>)	--/-- CRPR 4.2 County List D	Annual herb. Occurs on clay soils in cismontane woodland, coastal scrub, native grassland, and vernal pools. Flowering period: March – May. Elevation: below 3,609 feet (1,100 meters).	Not Expected. Suitable soils do not occur within the TRVRP. No historical observations recorded within the TRVRP.
little mousetail (<i>Myosurus minimus</i> ssp. <i>apus</i>)	--/-- CRPR 3.1 County List C	Annual herb. Occurs in alkaline vernal pools in native grassland. Flowering period: March – June.	Not Expected. Suitable vernal pool habitat was not observed within the TRVRP during the 2018 HELIX TRVRP surveys.
mud nama (<i>Nama stenocarpa</i>)	--/-- CRPR 2B.2 County List B	Annual herb. Occurs in intermittently wet areas, streambanks, and muddy lake edges. Flowering period: March - October. Elevation: below 2,657 feet (810 meters).	Low. Not observed during 2018 HELIX TRVRP surveys and no historical observations recorded within or near the TRVRP. Suitable wet areas exist within the TRVRP.
spreading navarretia (<i>Navarretia fossalis</i>)	FT/-- CRPR 1B.1 County List A MSCP Covered	Annual herb. Occurs in vernal pools, chenopod scrub, marshes, swamps, and playas. Flowering period: April – June. Elevation: 98 – 4,265 feet (30–1,300 meters).	High. Suitable wetland habitat occurs within the TRVRP. One historical observation recorded within the TRVRP.
coast woolly-heads (<i>Nemacaulis denudata</i> var. <i>denudata</i>)	--/-- CRPR 1B.2 County List A	Annual herb. Occurs in dunes and coastal strand. Flowering period: March - August. Elevation: below 328 feet (100 meters).	Low. Not observed during 2018 HELIX TRVRP surveys. 2015 CNPS observation recorded west of the TRVRP. The TRVRP is inland from typical habitat.
slender cottonheads (<i>Nemacaulis denudata</i> var. <i>gracilis</i>)	--/-- CRPR 2B.2 County List B	Annual herb. Occurs on dunes within coastal strand and creosote bush scrub communities. Flowering period: January – May. Elevation: 33 – 1,640 feet (10 – 500 meters).	Not Expected. Suitable habitat does not occur within the TRVRP. No historical observations recorded within the TRVRP.
California adder's-tongue (<i>Ophioglossum californicum</i>)	--/-- CRPR 4.2 County List D	Rhizomatous fern. Occurs in grassy, open areas where it is generally associated with short grasses and other herbs. Although often found near vernal pools, can also occur in relatively dry, stony areas. Elevation: 197-1,476 feet (60 - 450 meters).	Low. Not observed during 2018 HELIX TRVRP surveys and no historical observations recorded on or near the TRVRP.
California Orcutt grass (<i>Orcuttia californica</i>)	FE/SE CRPR 1B.1 County List A MSCP Covered	Annual grass. Grows in vernal pools in valley grassland and wetland communities. Flowering period: April – August. Elevation: 197 – 2,165 feet (700 meters).	Not Expected. Suitable habitat does not occur within the TRVRP. No historical observations recorded within the TRVRP.

Appendix C (cont.)
Special Status Plant Species Observed or With Potential to Occur

Species	Status ¹	Habit, Ecology and Life History	Potential to Occur ²
Baja California birdbush (<i>Ornithostaphylos oppositifolia</i>)	--/SE CRPR 2B.1 County List B	Shrub. Occurs in chaparral hills south of Tijuana River Valley. Flowering period: January - April. Elevation: 328 – 2,625 feet (100 – 800 meters).	Present. This species was observed during 2018 HELIX TRVRP surveys. A patch of this species was mapped in Diegan coastal sage scrub/ southern maritime chaparral along the southern edge of Monument Mesa (Figure 10). A total of 9 individuals were mapped within the TRVRP.
short-lobed broomrape (<i>Orobanche parishii</i> ssp. <i>brachyloba</i>)	--/-- CRPR 4.2 County List D	Parasitic perennial herb. Occurs in coastal strand and coastal sage scrub on sandy soil, generally on <i>Isocoma menziesii</i> . Flowering period: May - August. Elevation: below 984 feet (300 meters).	Low. No historical observations recorded within the TRVRP. <i>Isocoma menziesii</i> present within the TRVRP.
Brand's star phacelia (<i>Phacelia stellaris</i>)	--/-- CRPR 1B.1 County List A	Annual herb. Occurs in open areas and on dunes within coastal strand and coastal sage scrub communities. Flowering period: March – May. Elevation: below 1,312 feet (400 meters).	High. Historical observations recorded within the TRVRP. Suitable coastal sage scrub habitat present within the TRVRP.
Torrey pine (<i>Pinus torreyana</i> ssp. <i>torreyana</i>)	--/-- CRPR 1B.2 County List A MSCP Covered	Tree. Subspecies occurs naturally in only one location: along the coast near Del Mar. Occurs on ocean bluffs and sandstone. Elevation: below 656 feet (200 meters).	Present. This subspecies was observed during 2018 HELIX TRVRP surveys. Torrey pine within the TRVRP was planted, as the TRVRP is outside of this subspecies' natural range. Torrey pine trees observed at two locations in the TRVRP are not naturally occurring (Figure 10). One individual was mapped on developed land in the northeastern portion of the TRVRP. Ten trees are present at Butterfly Gardens.
Otay Mesa mint (<i>Pogogyne nudiuscula</i>)	FE/SE CRPR 1B.1 County List A MSCP Covered	Annual herb. Grows in coastal mesa vernal pools within chaparral, coastal sage scrub, and wetland communities. Flowering period: March – June. Elevation: 328 – 820 feet (100 – 250 meters).	Not Expected. Suitable habitat does not occur within the TRVRP. No historical observations recorded within the TRVRP.
Nuttall's scrub oak (<i>Quercus dumosa</i>)	--/-- CRPR 1B.1 County List A	Shrub. Generally found on sandy or clay loam soils in open coastal chaparral or monotypic communities on north-facing slopes. Flowering period: March - May. Elevation: below 656 feet (200 meters).	Present. This species was observed during 2018 HELIX TRVRP surveys. This species was mapped in few locations in the southern portion of the TRVRP (Figure 10). A total of 4 individuals were mapped within the TRVRP.
Santa Catalina Island currant (<i>Ribes viburnifolium</i>)	--/-- CRPR 1B.2 County List A	Shrub. Occurs in openings within chaparral. Flowering period: February – April. Elevation: 98 – 1,968 feet (30 – 600 meters).	High. Historical observations recorded within the TRVRP. Suitable chaparral habitat not observed within the TRVRP.

Appendix C (cont.)
Special Status Plant Species Observed or With Potential to Occur

Species	Status ¹	Habit, Ecology and Life History	Potential to Occur ²
small-leaved rose (<i>Rosa minutifolia</i>)	--/SE CRPR 2B.1 County List B MSCP Covered	Shrub. Occurs in chaparral, in mesas, hillsides, and arroyos near the coast. Flowering period: February – April. Elevation: approximately 525 feet (160 meters).	Presumed Absent. Conspicuous plant not observed during 2018 HELIX TRVRP surveys. Nearest recorded observation approximately 2.4 miles northeast of the TRVRP.
ashy spike-moss (<i>Selaginella cinerascens</i>)	--/-- CRPR 4.1 County List D	Rhizomatous fern. Occurs in chaparral and coastal sage scrub. Elevation: below 1,804 feet (550 meters).	Present. This species was observed during 2018 HELIX TRVRP surveys. Because of the growth form of ashy spike-moss, the number of individuals was not estimated, but is likely in excess of thousands.
chaparral ragwort (<i>Senecio aphanactis</i>)	--/-- CRPR 2B.2 County List B	Annual herb. Occurs on alkali flats and dry, open, rocky areas within foothill woodland, northern coastal scrub, and coastal sage scrub communities. Flowering period: February – May. Elevation: 33 – 1,804 feet (10 – 550 meters).	High. Historical observations recorded within the TRVRP. Suitable open, coastal sage scrub habitat occurs within the TRVRP.
purple stemodia (<i>Stemodia durantifolia</i>)	--/-- CRPR 2B.1 County List B	Perennial herb. Grows on wet sand or rocks and drying streambeds within riparian habitats. Flowering period: year-round. Elevation: 1,312 feet (400 meters).	Low. Not observed during 2018 HELIX TRVRP surveys and no historical observations recorded on or near the site. Suitable riparian habitat occurs within the TRVRP.
San Diego County needle grass (<i>Stipa diegoensis</i>)	--/-- CRPR 4.2 County List D	Perennial bunchgrass. Occurs in chaparral – sage scrub ecotone, usually in fine, silty loam soil. Flowering period: February – June. Elevation: below 7,480 feet (2,280 meters).	Low. Not observed during 2018 HELIX TRVRP surveys and no historical observations recorded within the TRVRP.
Laguna Mountains jewelflower (<i>Streptanthus bernardinus</i>)	--/-- CRPR 4.3 County List D	Perennial herb. Occurs on montane peak tops in lower montane coniferous forest. While typically in mesic situations, it can occupy drier embankments in granitic gravels and sand. Flowering period: June - August. Elevation: 3,937-8,202 feet (1,200 – 2,500 meters).	Not expected. Suitable habitat does not occur on site and site outside of known elevation range. No historical observations recorded on site.
estuary seablite (<i>Suaeda esteroa</i>)	--/-- CRPR 1B.2 County List A	Perennial herb. Occurs in coastal salt marshes. Flowering period: May – October. Elevation: below 16 feet (5 meters).	High. This species was observed immediately west of the Preserve during 2018 HELIX surveys.
woolly seablite (<i>Suaeda taxifolia</i>)	--/-- CRPR 4.2 County List D	Shrub. Occurs in the margins of coastal salt marshes, coastal dunes, and coastal bluff scrub. Flowering period: all year. Elevation: below 49 feet (15 meters).	High. Recent historical observations recorded in the west side of site along the Tijuana River.

Appendix C (cont.) Special Status Plant Species Observed or With Potential to Occur

Species	Status ¹	Habit, Ecology and Life History	Potential to Occur ²
Parry's tetracoccus (<i>Tetracoccus dioicus</i>)	--/-- CRPR 1B.2 County List A MSCP Covered	Shrub. Occurs on gabbro soils in low growing chamise chaparral and sage scrub. Usually, conditions are quite xeric with only limited annual growth. Flowering period: April - May. Elevation: below 3,281 feet (1,000 meters).	Presumed absent. Not observed during 2018 HELIX TRVRP surveys. Nearest recorded observation approximately 3.0 miles northeast of the site.
California screw moss (<i>Tortula californica</i>)	--/-- CRPR 1B.2	Moss. Occurs in damp areas within wetland habitats.	High. Abundant suitable damp, wetland habitat within the TRVRP.

¹ F = Federal; S = State of California; E = Endangered; T = Threatened; CE = Candidate Endangered; R = Rare

CRPR = California Native Plant Society Rare Plant Rank: 1A – presumed extirpated in California and either rare or extinct elsewhere; 1B – rare, threatened, or endangered in California and elsewhere; 2A – presumed extirpated in California, but more common elsewhere; 2B – rare, threatened, or endangered in California, but more common elsewhere; 3 – more information needed; 4 – watch list for species of limited distribution. Extension codes: .1 – seriously endangered; .2 – moderately endangered; .3 – not very endangered.

County of San Diego Sensitivity Status: Plant species are divided into Groups A through D on the County Rare Plant List. **Groups A and B** Plants include those that have a very high level of sensitivity, either because they are listed as threatened or endangered or because they have very specific natural history requirements that must be met. **Groups C and D** Plants include those species that are becoming less common but are not yet so rare that extirpation or extinction is imminent without immediate action. These species tend to be prolific within their suitable habitat types.

MSCP Covered Species: Covered Species under City MSCP Subarea Plan; NE = Narrow Endemic Species under City MSCP Subarea Plan.

² Potential to Occur is assessed as follows. **None:** Species is either sessile (i.e. plants) or so limited to a particular habitat that it cannot disperse on its own, and habitat suitable for its establishment and survival does not occur in the project site; **Not Expected:** Species moves freely and might disperse through or across the project site, but suitable habitat for residence or breeding does not occur in the project site; **Low:** Suitable habitat is present in the project site but no sign of the species was observed during surveys, however the species cannot be excluded with certainty; **High:** Suitable habitat occurs in the project site and the species has been recorded recently on or near the study area, but was not observed during project surveys; **Present:** The species was observed during biological surveys for the project and is assumed to occupy the project site; **Presumed Absent:** Species would be visible all year and would have been observed if present.

Appendix D

Special Status Wildlife Species
Potential to Occur

Appendix D
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Invertebrates			
San Diego fairy shrimp (<i>Branchinecta sandiegonensis</i>)	FE/-- County Group 1 MSCP NE MSCP Covered	Restricted to vernal pools and other ephemeral basin in southern California from coastal Orange County to San Diego County. Found in seasonally astatic pools which occur in tectonic swales or earth slump basins and other areas of shallow, standing water often in patches of grassland and agriculture interspersed in coastal sage scrub and chaparral.	High. Vernal pools were not documented during biological surveys, but ephemeral ponds were reported to be present along dirt roads on Spooner's Mesa (County 2007). Additionally, fairy shrimp of the genus <i>Branchinecta</i> were within ephemeral ponds present along dirt trails in the southwestern portion of the Park, north of Monument Road, in 2019 (Figure 13a). Potential habitat to support the species may occur Monument Mesa and Spooner's Mesa, and along in road ruts or basins that hold ponding water. No documented occurrences of the species are reported in the TRVRP.
Western tidal-flat tiger beetle (<i>Cicindela gabbii</i>)	--/-- County Group 2	Occurs on mudflats and dry saline flats of estuaries along southern California coast.	None. Suitable estuarine habitat is not present within the TRVRP.
Sandy beach tiger beetle (<i>Cicindela hirticollis gravida</i>)	--/-- County Group 2	Found in moist sand near the ocean, such as swales behind dunes or upper beaches above average high tide, along the immediate coast of California from Marin County to San Diego County.	None. Suitable sandy coastal habitat is not present within the TRVRP.
Western beach tiger beetle (<i>Cicindela latesignata latesignata</i>)	--/-- County Group 2	Inhabits mudflats and beaches in coastal San Diego County.	None. Suitable habitat beach habitat not present within the TRVRP.
Senile tiger beetle (<i>Cicindela senilis frosti</i>)	--/-- County Group 2	Inhabits salty mud shores and flats, and wetlands from Central California coast south to salt marshes of San Diego. In Riverside, found in an inland salt marsh surrounded by development, with one individual found at the muddy shore of Lake Elsinore. Inhabits dark-colored mud in the lower zone and dried salt pans in the upper zone.	Low. Suitable habitat limited to shores of ponds within the TRVRP. The nearest recorded occurrence for this species is from 1992 to the west in Border Field State Park.
Globose dune beetle (<i>Coelus globosus</i>)	--/-- County Group 1	Occurs in low beach foredunes and coastal strand. Live and feed on dead vegetation that accumulates in sand under plants. Cannot survive under dune grass (<i>Ammophila arenaria</i>).	None. Suitable sandy coastal habitat not present within the TRVRP. The nearest recorded occurrence for this species is from 1992 along the coast west of the TRVRP with the species reported in low numbers.

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Invertebrates (cont.)			
Monarch (<i>Danaus plexippus</i>)	--/-- County Group 2	The population west of the Rocky Mountains migrates to, and overwinters, along the coast of central and southern California. Inhabits a wide variety of open habitats including fields, meadows, marshes, and roadsides and roosting on wind-protected tree groves (such as eucalyptus [<i>Eucalyptus</i> spp.], Monterey pine [<i>Pinus radiata</i>], cypress [<i>Hesperocyparis</i> sp.]), with nectar and water sources nearby. Breeds in areas that have a suitable abundance of their host plant, milkweed (<i>Asclepias</i> sp.).	Present. Two individuals were observed in April during the butterfly surveys in the northwestern portion of the TRVRP within the Butterfly Gardens (Figure 12).
Quino checkerspot butterfly (<i>Euphydryas editha quino</i>)	FE/-- County Group 1 MSCP NE	Occurs in California from western Riverside County southwards to southern San Diego County. Inhabits open and sparsely vegetated areas that contain larval host plant species (principally dot-seed plantain [<i>Plantago erecta</i>], woolly plantain [<i>Plantago patagonia</i>] but also Coulter's snapdragon [<i>Antirrhinum coulterianum</i>], and rigid bird's beak [<i>Cordylanthus rigidus</i>]) and nectar sources. Often found on rounded hilltops, ridgelines, and occasionally rocky outcrops. Occurs within a wide range of open-canopied habitats including vernal pools, sage scrub, chaparral, grassland, and open oak and juniper woodland communities.	Present. One individual was incidentally observed on Spooner's Mesa on April 15, 2019 during monitoring of an adjacent habitat enhancement area (Figure 13e).
Wandering (saltmarsh) skipper (<i>Panoquina errans</i>)	--/-- County Group 1 MSCP Covered	Occurs along coastal southern California. Inhabits salt marshes that contain its larval host plant salt grass (<i>Distichlis spicata</i>). May be observed on ocean bluffs, salt marshes, or open areas along the ocean.	Low. Salt grass is present within the TRVRP, but suitable salt marsh habitat is absent. Historical occurrences of this species from 1982 are located immediately west of the TRVRP within Border Field State Park. No recent occurrences occur in the TRVRP.

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Invertebrates (cont.)			
Riverside fairy shrimp (<i>Streptocephalus woottoni</i>)	FE/-- County Group 1 MSCP NE MSCP Covered	In California, occurs from Los Angeles County south to coastal San Diego County, and east to western Riverside County. Found in deep seasonal vernal pools, ephemeral ponds, stock ponds, and other human modified depressions at least 30 centimeters deep. Associated with grasslands, which may be interspersed through chaparral or coastal sage scrub vegetation.	High. Vernal pools were not documented during biological surveys, but ephemeral ponds were reported to be present along dirt roads on Spooner's Mesa (County 2007). Potential habitat to support the species may occur Monument Mesa and Spooner's Mesa, and along in road ruts or basins that hold ponding water. No documented occurrences of the species are reported in the TRVRP.
Mimic tryonia (<i>Tryonia imitator</i>)	--/-- County Group 2	Very small water snail occurring along coastal California from Sonoma County to San Diego County. Inhabits brackish waters of coastal lagoons, creeks, sloughs, and marshes.	Low. An historical occurrence of the species from 1912 is mapped northwestern portion of the TRVRP but description is generalized to Tijuana River. Found during 2006 to the northwest during sampling of ponds in the Tijuana River. Typically associated with more saline environments that occur to the west.
Amphibians			
Western spadefoot toad (<i>Spea hammondi</i>)	--/SSC County Group 2	Occurs from northern California southward to San Diego County, and to the west of the Sierra Nevada at elevations below 4,500 feet. Terrestrial species requiring temporary pools for breeding. Suitable upland habitats include coastal sage scrub, chaparral, and grasslands. Most common in grasslands with vernal pools or mixed grassland-coastal sage scrub areas. Breeds in temporary pools formed by heavy rains, but also found in riparian habitats with suitable water resources. Breeding pools must lack exotic predators such fish, bullfrogs, and crayfish for the species to successfully reproduce. Estivates in burrows within upland habitats adjacent to potential breeding sites.	Present. Western spadefoot tadpoles were observed within an ephemeral pond present along a dirt trail in the southwestern portion of the Park in February 2019 (Figure 13a). Additional previous occurrences of the species are reported within the TRVRP and surrounding region. At least 2 individuals were captured between 1997 and 1999 in pit-fall traps within Border Field State Park, which lies immediately west of the park. Tadpoles were reportedly observed in 2007 in a depression present within a dirt road on Spooner's Mesa (County 2007).

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Reptiles			
San Diegan legless lizard (<i>Anniella stebbinsi</i>)	--/SSC County Group 2	Occurs in sparsely vegetated areas with moist warm, loose soil with plant cover; moisture is essential. Common in several habitats but especially in beach dunes, coastal scrub, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks. Found primarily in areas with sandy or loose organic soils or where there is plenty of leaf litter. Sometimes found in suburban gardens in southern California.	High. Suitable sandy habitats and moist soils occur in the TRVRP. Reported occurrences of these are present in the park and further west in Border Field State Park. One adult was reportedly observed in May and July 2004 in the southwestern portion of the TRVRP, north of Monument Road and south of Tijuana River.
California glossy snake (<i>Arizona elegans occidentalis</i>)	--/SSC	Occurs along the coastal regions from San Francisco south to San Diego County; though it is absent along the central coast of California. Inhabits arid scrub, rocky washes, grasslands, and chaparral. Prefers open areas and areas with soils loose enough for easy burrowing.	High. Suitable habitat occurs within the TRVRP and the species reportedly observed at an undisclosed location in 2007 (County 2007). However, was not found during surveys conducted at the Border Field State Park in 1999. Historical records of the species from the 1930s and 1940s are present in the surrounding area, including Border Field State Park.
Belding's orange-throated whiptail (<i>Aspidoscelis hyperythra beldingi</i>)	--/WL County Group 2 MSCP Covered	Found within the southwestern portion of California in southern San Bernardino, western Riverside, Orange, and San Diego Counties on the western slopes of the Peninsular ranges below 3,500 feet. Suitable habitat includes coastal sage scrub, chaparral, juniper woodland, oak woodland, and grasslands along with alluvial fan scrub and riparian areas. Occurrence of the species correlated with the presence perennial plants (such as California buckwheat, California sagebrush, black sage, or chaparral) to provide a food base for its major food source, termites.	Present. Detected in several locations throughout the park and captured during the reptile trapping surveys. Twenty-two (22) individuals were captured between Traps 2, 3, and 4 (Appendix H; Figure 8). Outside of the reptile trapping locations, observed in the central portion of the TRVRP, west of Hollister Street, at the Butterfly Gardens (Figure 12).
Baja California coachwhip (<i>Coluber fuliginosus</i>)	--/SSC	Occurs from extreme southern San Diego County at elevations below 7,700 feet. Habitat generalist found in open terrain but more common in grasslands, scrublands, and coastal sand dunes in California. Diet consists of a wide variety of prey including rodents, lizards, snakes, turtles, insects, bird and lizard eggs, and carrion.	Present. A single individual was captured in August during the drift fence with funnel trapping surveys at Trap 4 in the northwestern portion of the park south of Sunset Avenue (Figures 8 and 12).

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Reptiles (cont.)			
Red diamond rattlesnake (<i>Crotalus ruber</i>)	--/SSC County Group 2	Occurs in the southwestern portion of California from San Bernardino County southward to San Diego County at elevations below 5,000 feet. Has a wide tolerance for varying environments including the desert, dense foothill chaparral, warm inland mesas and valleys, and cool coastal zones. Most commonly found near heavy brush with large rocky microhabitats. Chamise and red shank chaparral associations may offer better structural habitat for refuges and food resources.	Low. Suitable habitat occurs in the TRVRP, particularly within scrub habitats located in south at Spooner's Mesa and Monument Mesa (Figures 9a and 9b). However, no reported occurrences are present in the TRVRP.
San Diego ring-necked snake (<i>Diadophis punctatus similis</i>)	--/-- County Group 2	Found mainly in San Diego County along the coast to the west of the mountain and desert regions, and in extreme southwestern Riverside County. Prefers moist habitats and often found near intermittent streams. Suitable habitat includes wet meadows, rocky hillsides, farmland, grassland, chaparral, mixed coniferous forests, and woodlands. Secretive with individuals usually found under the cover of rocks, wood, boards and other surface debris, but occasionally seen moving on the surface on cloudy days, dusk, or at night.	Low. Suitable moist soils and appropriate habitat occurs in the TRVRP and the species was reportedly captured in pitfall traps (unknown date) on Spooner's Mesa. However, there no other recent documented occurrences in the TRVRP or adjacent area.
Blainville's horned lizard (<i>Phrynosoma blainvillii</i>)	--/SSC County Group 2 MSCP Covered	Occurs from southern California to northern Baja California. In California, the species predominately occurs from Kern County south to San Diego County west of the desert at elevations below 8,000 feet. Inhabits a wide variety of vegetation types including sagebrush scrub, chaparral, grasslands, forests, and woodlands but is restricted to areas with suitable sandy, loose soils with open areas for basking. Diet primarily composed of native harvester ants (<i>Pogonmyrmex</i> sp.) and are generally excluded from areas invaded by Argentine ants (<i>Linepithema humile</i>).	Present. A single individual was captured in August during the drift fence with funnel trapping surveys at Trap 4 in the northwestern portion of the TRVRP south of Sunset Avenue (Figure 12).

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Reptiles (cont.)			
Coronado skink (<i>Plestiodon skiltonianus interparietalis</i>)	--/WL County Group 2	Occurs from in coastal and inland portions of southern San Diego County, though the can occur up into Riverside County where it intergrades with Skilton's skink (<i>Plestiodon skiltonianus skiltonianus</i>). Suitable habitats include grassland, woodlands, pine forests, and chaparral, especially in open sunny areas such as clearings and edges of creeks or rivers. Prefers rocky areas near streams with lots of vegetation but can also be found in areas away from water. Occasionally seen foraging in leaf litter but more commonly found underneath surface objects, such as bark or rocks, where it lives in extensive burrows.	High. Suitable habitat is present in TRVRP and multiple reported occurrences occur in the TRVRP and surrounding area. Most recently, one juvenile was reportedly observed on July 16, 2004 along the Tijuana River, 0.2 miles southwest of the Sunset Avenue and Hollister Street intersection.
Two-striped garter snake (<i>Thamnophis hammondi</i>)	--/SSC County Group 1	Found in California from Monterey County south along the coast to San Diego County and into northern Baja California at elevations below 7,000 feet. Commonly inhabits perennial and intermittent streams with rocky beds bordered by riparian habitats dominated by willows and other dense vegetation. The species has also been found in stock ponds and other artificially created aquatic habitats if bordered by dense vegetation and potential prey, such as amphibians and fish, are present.	High. Suitable aquatic and riparian habitat present in the TRVRP. Additionally, one adult was reportedly observed on July 22, 2004 along the Tijuana River, 0.2 miles southwest of the Sunset Avenue and Hollister Street intersection.
Birds			
Cooper's Hawk (<i>Accipiter cooperii</i>)	--/WL County Group 1 MSCP Covered	In California, the species breeds from Siskiyou County south to San Diego County and east to the Owens Valley at elevations below 9,000 feet. Inhabits forests, riparian areas, and more recently suburban and urban areas nesting within dense woodlands and forests and isolated trees in open areas.	Present. Detected at multiple locations in the TRVRP during multiple survey efforts, including the avian point count surveys. Heard calling, observed flying overhead, and perched on telephone poles and trees in the northwestern, northeastern, southeastern, and southwestern portions of the TRVRP, including Spooner's Mesa (Figure 12).

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Birds (cont.)			
Sharp-shinned Hawk (<i>Accipiter striatus</i>)	--/WL County Group 1	Primarily winters and migrates throughout California with breeding records in the northern and central portions of the State, but the species breeding range in California is poorly known. Breeds within most closed-canopy woodlands and forests, including riparian habitats, from sea level to near alpine elevations, generally nesting in trees near openings. Wintering habitat similar to breeding habitat but more expansive to include suburban and agricultural areas.	Present. Incidentally observed flying in the southeastern portion of the TRVRP, north of Monument Road, in April during the first small mammal trapping session and avian point count survey (Figure 12). Presumed to be a wintering visitor as no later observations occurred, and no breeding records occur in the area.
Tricolored Blackbird (<i>Agelaius tricolor</i>)	BCC/SCE, SSC County Group 1 MSCP Covered	Highly colonial, nomadic species occurring as a year-round resident of California from Sonoma County to San Diego. Common locally in the Central Valley and sporadically throughout the State. Breeds in dense colonies. Breeding habitat typically characterized by emergent freshwater marsh dominated by tall, dense cattails (<i>Typha</i> spp.) and bulrush (<i>Schoenoplectus</i> spp.), though the species also utilizes willows (<i>Salix</i> spp.), blackberries (<i>Rubus</i> spp.), thistles (<i>Cirsium</i> and <i>Centaurea</i> spp.), nettles (<i>Urtica</i> sp.), and agricultural crops. Forages in grasslands and cropland habitats adjacent to breeding areas.	Not Expected. Limited suitable marsh habitat occurs in TRVRP. Historically breed at Dairy Mart Pond in the 1970's; however, numbers declined in the mid 1990's and the species has been extirpated from the area. Not observed during survey conducted in 2007 and 2018.
Southern California Rufous-crowned Sparrow (<i>Aimophila ruficeps canescens</i>)	--/WL County Group 1 MSCP Covered	Restricted to southwestern California occurring from Santa Barbara County southwards to San Diego County at elevations below 5,000 feet. Generally found on moderate to steep slopes vegetated with grassland, coastal sage scrub, and chaparral. Prefer areas with California sagebrush but area also generally absent from areas with dense stands of coastal sage scrub or chaparral. May occur on steep grassy slopes without shrubs if rock outcrops are present.	High. Suitable habitat is present in TRVRP at Spooner's Mesa and Monument Mesa (Figure 9a and 9b). Reportedly observed in 2004 within the TRVRP at an undisclosed location (County 2007). Several reported occurrences of the species occur in the southern portion of the TRVRP and surrounding area.

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Birds (cont.)			
Golden Eagle (<i>Aquila chrysaetos</i>)	BCC/WL, FP County Group 1 MSCP Covered	Uncommon permanent resident and migrant throughout California, except the center of the Central Valley. More common in southern California than in northern regions. Inhabits a variety of habitats, nesting in cliffs or trees and rugged terrain and foraging over plains, grasslands, or low and open shrublands including chaparral and coastal sage scrub. Typically absent from heavily forested areas or on the immediate coast and are almost never detected in urbanized environments.	Low. Species not observed during 2004 or 2018 surveys (County 2007). Scattered sightings of individuals reported to eBird, with photo documentation, confirming species presence in area. TRVRP is situated within a heavily urbanized environment lacking suitable remote habitat and cliffs suitable for nesting. If present, likely only occurs as a migrant or foraging visitor, but would not breed in area.
Great Blue Heron (<i>Ardea herodias</i>)	--/-- County Group 2	Year-round resident of California occurring throughout most of the State in saline and freshwater wetlands and shallow estuaries. Nests as single pairs and in small colonies with nests located on the ground, in trees and bushes, and on artificial structures that are usually adjacent to water and secluded from human disturbance. Found in a wide variety of habitats foraging in various wetland habitats, water bodies, and occasionally uplands.	Present. A single great blue heron was observed at Dairy Mart Pond during the November avian point count survey (Figure 12). Observed wading within the freshwater marsh habitat at the edge of the pond and foraging for food.
Burrowing Owl (<i>Athene cunicularia</i>)	BCC/SSC County Group 1 MSCP NE MSCP Covered	Found from central California east to the Mojave Desert and south to coastal San Diego County. Primarily a grassland species that prefers areas with level to gentle topography and well-drained soils. Species can also occupy agricultural areas, vacant lots, and pastures. Requires underground burrows for nesting and roosting that are typically dug by other species such as California ground squirrel (<i>Spermophilus beecheyi</i>). Species will also utilize natural rock cavities, debris piles, culverts, and pipes for nesting and roosting.	High. Suitable open habitat occurs in the TRVRP. There are historical records of the species to the northwest of the park, west of the Imperial Beach Naval Station. There are multiple eBird sightings in the area, with one from December 2011 located west Sunset Avenue. Most likely occurs as a wintering visitor or migrant based on the lack of reported breeding occurrences in the vicinity.
Canada Goose (<i>Branta canadensis</i>)	--/-- County Group 2 MSCP Covered	Winters in southern California occurring in mixed fresh and brackish water habitats with low grass or succulent leaves. Typically roosts on open water of lakes or ponds. Feeds mainly on cultivated grains, wild grasses, and forbs, but also feeds on aquatic plants. Often seen in flocks.	High. Open fields and agricultural lands within the TRVRP and immediate vicinity provide suitable foraging habitat for wintering Canada geese. There are multiple eBird sightings within the TRVRP and surrounding area.

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Birds (cont.)			
Red-shouldered Hawk (<i>Buteo lineatus</i>)	--/-- County Group 1	In California, the species occurs to the west of Sierra Nevada occupying mature oak and riparian woodlands, eucalyptus groves, and suburban areas near forested areas. Nests in trees, both native and non-native, often located near a water source such as stream or pond.	Present. Detected during multiple survey efforts including the avian point count surveys. Individuals were heard calling within riparian habitat along the Tijuana River and flying overhead in the northwestern, northeastern, and southwestern portions of the park (Figure 12).
Ferruginous Hawk (<i>Buteo regalis</i>)	BCC/WL County Group 1 MSCP Covered	Found only as wintering individual in California; uncommon in San Diego County. Typically occupies flat and rolling terrain in grasslands, shrub habitats, and deserts.	Low. Suitable wintering habitat for the species is present in the TRVRP but there are no reported occurrences of the species in the region. Recent eBird sighting with photo documentation occurs to the northwest, west of the Imperial Beach Naval Station.
Green Heron (<i>Butorides virescens</i>)	--/-- County Group 2	In California, the species is a year-round found generally west of the Sierra Nevada and within the southern deserts. Found in a wide variety of wetland habitats such as swamps, marshes, riparian habitat along creeks and streams, lake edges, and man-made ditches, canals, and ponds preferring thick vegetation and avoiding open areas.	Present. A single individual was detected during the June point county survey at Dairy Mart Pond in the northeastern portion of the TRVRP (Figure 12).
Costa's Hummingbird (<i>Calypte costae</i>)	BCC/--	Found in deserts and xeric habitats west of the Continental Divide and south of the Great Basin from southern Utah, western and southern Arizona, to southern California and further into Baja California and Mexico. Occurs year-round in southern California breeding along the coast in sage scrub and chaparral habitats from Santa Barbara County south to San Diego County, and east to desert regions of Inyo County south to Imperial County. Breeding habitats include Sonoran desert scrub, Mojave desert scrub, coastal sage scrub, and chaparral.	Present Detected during the avian point count in April. A single individual was present at point count 9 in the southeastern portion of the TRVRP at Monument Mesa (Figure 12).

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Birds (cont.)			
Coastal Cactus Wren (<i>Campylorhynchus brunneicapillus sandiegensis</i>)	BCC/SSC County Group 1 MSCP NE MSCP Covered	One of seven subspecies occurring in southern California from southern Orange County south to San Diego County. Occupies native scrub vegetation with thickets of mature cacti consisting of cholla (<i>Cylindropuntia</i> spp.) or prickly-pear cactus (<i>Opuntia littoralis</i>). Cacti must be tall enough to support and protect the bird's nest (typically 3 feet or more in height). Surrounding vegetation usually consists of coastal sage scrub habitat with shrubs normally below the level of nest placement.	Not expected. Though cactus is present in the TRVRP, patches of mature cacti required by the species for nesting are absent. No recorded located in the TRVRP. Closest documented location is to over 1-mile east of the park, east of the I-5/I-805 transportation corridor.
Turkey Vulture (<i>Cathartes aura</i>)	--/-- County Group 1	In California, the species occurs as a year-round resident along the coastal regions but breeds throughout the entire state. Preferred habitat includes farmland and forests but is also found at pastures and agricultural areas in the west and has an increased presence in urban areas during the winter. Nests in partly forested to forested areas isolated from humans on rock outcrops, fallen trees, and abandoned buildings. Roosts communally preferring stands of large trees or hilly areas, usually away from human disturbance. Opportunistic feeders of domestic and wild carrion, primarily mammals but also non-mammals, foraging and locating food through both sight and smell.	Present. Observed flying over the TRVRP during multiple survey efforts including the avian point count surveys. Detected in the northeastern, southeastern, and southern portions of the park including Monument Mesa and Spooner's Mesa (Figure 12).
Western Snowy Plover (<i>Charadrius alexandrinus nivosus</i>)	FT,BCC/SSC County Group 1 MSCP Covered	Breeds primarily on coastal beaches from southern Washington to southern Baja California. Nesting habitat includes sand spits, dune-backed beaches, beaches at creek and river mouths, and salt pans at lagoons and estuaries. Usually prefer sand, silt or dry mud with even surface, avoiding rocky or broken ground. Exhibits high breeding site fidelity. In winter, found on many of the beaches used for nesting, as well as others where they do not nest. Also occur in man-made salt ponds and on estuarine sand and mud flats.	Not Expected. The TRVRP as it is situated inland from the coast lacking suitable breeding habitat. No reported occurrences located in the TRVRP. Nearest documented location is to the northeast in the Tijuana Slough National Wildlife Preserve.

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Birds (cont.)			
Mountain Plover (<i>Charadrius montanus</i>)	BCC/SSC County Group 2 MSCP Covered	Winters visitor in central and southern California, primarily in Central and Imperial Valley. Strongly associated with short-grass habitats such as fallow, grazed, or burned area. Rare in San Diego County.	Not expected. Species is considered rare in San Diego County with two or fewer records of the species within the last decade (California Birds Record Committee). There are reported eBird sightings of the species to the northwest in the Tijuana Slough National Wildlife Refuge with photo documentation within the last few years; however, these would represent vagrant individuals. The species is not anticipated to inhabit the TRVRP.
Northern Harrier (<i>Circus cyaneus</i>)	--/SSC County Group 1 MSCP Covered	Occurs as a year-round resident in California. Inhabits open areas including wetlands, marshes, marshy meadows, grasslands, riparian woodlands, desert scrub, and pastures and agricultural areas. Breeding populations in southern California from Ventura County to San Diego County are highly fragmented with many local populations extirpated mostly likely as a result of habitat loss and degradation. Nests on the ground in wetlands and uplands within patches of dense, often tall, vegetation in undisturbed areas.	Present. Detected during multiple survey efforts, including the avian point count surveys. Observed foraging and flying overhead in the northwestern, northeastern, and southwestern portions of the TRVRP, as well as Monument Mesa and Spooner's Mesa (Figure 12). Additionally, a nest was detected in the southwestern portion of the park to the north of Monument Road during rare plant surveys confirming the species positive breeding status within the TRVRP.
White-tailed Kite (<i>Elanus leucurus</i>)	--/FP County Group 1	Year-long resident of California residing along the coasts and valleys west of the Sierra Nevada foothills and southeast deserts, though the species has also been documented breeding in arid regions east of the Sierra Nevada and within Imperial County. Inhabits low elevation grasslands, wetlands, oak woodlands, open woodlands, and is associated with agricultural areas. Breeds in riparian areas adjacent to open spaces nesting isolate trees or relatively large stands.	Present. Observed in January, April, and June during baseline surveys including the avian point surveys. Family group of 3 individuals observed in the northeastern portion of the TRVRP to the east of the baseball fields at the terminus of Sunset Avenue (Figure 12). Additionally, single kite was observed flying over Dairy Mart Pond (Figure 12).

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Birds (cont.)			
Southwestern Willow Flycatcher (<i>Empidonax traillii extimus</i>)	FE/SE County Group 1 MSCP NE MSCP Covered	Breeds in southern California, Arizona, New Mexico, southwestern Colorado, and extreme southern portions of Nevada and Utah. Riparian obligates that breed in relatively dense riparian habitats along rivers, streams, or other wetlands where surface water is present, or soils are very saturated. Breeding habitat can consist of monotypic stands of willows (<i>Salix</i> spp.), a mixture of native broadleaf trees and shrubs, monotypic stands of exotics such as tamarisk (<i>Tamarix</i> spp.) or Russian olive (<i>Elaeagnus angustifolia</i>), or mixture of native broadleaf trees and shrubs with exotics. Restricted in San Diego County to two modest colonies at San Luis Rey River and Santa Margarita River, with a few scattered pairs.	Low. Suitable riparian habitat is present, and Tijuana River is a perennial water source; however, the species is not expected to occur. Migrating willow flycatchers have been detected in the TRVRP over the years, but no breeding pairs were documented. Not detected during focused surveys conducted in 2007 (County 2007).
California Horned Lark (<i>Eremophila alpestris actia</i>)	--/WL County Group 2	One of 21 recognized subspecies occurring in the coastal ranges of California from San Joaquin Valley to northern Baja California. Inhabits a wide variety of open habitats with low, sparse vegetation where trees and large shrubs are generally absent. Suitable habitats include grasslands along the coast, deserts within the inland regions, shrub habitat at higher elevations, and agricultural areas.	Present. Detected during the avian point count surveys in April. Single individual heard signing in southeastern portion of the TRVRP at Monument Mesa (Figure 12). Individual was not identified to the subspecies level but is presumed to be subspecies because of high likelihood to occur.
Merlin (<i>Falco columbarius</i>)	--/WL County Group 2	Uncommon winter migrant in California occurring from September to May at elevations below 5,000 feet. Often found in open woodland, grasslands, cultivated fields, marshes, estuaries and sea coasts and are rarely found in heavily wooded areas or over open deserts .	High. Suitable wintering habitat for the species is found within the TRVRP. Several recent sightings of the species, with accompanying photo documentation, have been reported to eBird within the TRVRP and surrounding area.

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Birds (cont.)			
American Peregrine Falcon (<i>Falco peregrinus anatum</i>)	BCC/FP County Group 1 MSCP NE MSCP Covered	In California, the species breeds and winters throughout the State, except for desert areas. Very uncommon breeding resident and uncommon as a migrant. Active nesting sites of this species within California are known from along the coast north of Santa Barbara, in the Sierra Nevada, and other mountains of northern California. Few nest sites are known anecdotally for southern California mostly at coastal estuaries and inland oases. Inhabits a large variety of open habitats including marshes, grasslands, coastlines, and woodlands. Typically nest on cliff faces in remote rugged sites where adequate food is available nearby, but the species can also be found in urbanized areas nesting on man-made structures.	Low. Suitable foraging habitat present and species was reported soaring over the park in 2004 (County 2007). However, not expected to nest in the TRVRP as slopes in the southern portion, while steep, are not near vertical cliffs with suitable rocky ledges where falcons would construct nests. Additionally, the species nesting locations within San Diego County are fairly well documented with no nests recorded in the Area (Unitt 2004). If present, likely only occurs as a migrant or foraging visitor, but would not breed in area.
Prairie Falcon (<i>Falco mexicanus</i>)	BCC/WL County Group 1	In California, the species is an uncommon permanent resident and migrant that ranges from southeastern deserts northwest along the inner coastal mountains and Sierra Nevada but is absent from northern coastal fog belt. Primary habitats include grasslands, savannahs, alpine meadows, some agricultural fields during the winter season, and desert scrub areas where suitable cliffs or bluffs are present for nest sites. Requires sheltered cliff ledges for cover and nesting which may range in height from low rock outcrops of thirty feet to cliffs up to and higher than 400 feet.	Low. Suitable foraging habitat present within the TRVRP, but suitable nesting habitat is absent. Steep slopes within the TRVRP are not near vertical cliffs with rocky ledges suitable for nest placement. Documented breeding distribution in San Diego is concentrated in inland areas at least 23 miles from the coast (Unitt 2004). Recent reported eBird sightings for the species occur in the park and surrounding area, all during the wintering months. Expected to occur as a migrant or wintering individual. If present, likely only occurs as a migrant or foraging visitor, but would not breed in area.

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Birds (cont.)			
Yellow-breasted Chat (<i>Icteria virens</i>)	--/SSC County Group 1	Occurs throughout North America from Canada south to Baja California and Mexico. Breeds from southern British Columbia south to Baja California and winters in southern Baja California and south Texas south to Mexico and Panama. In California, the species occurs as a migrant and summer resident breeding from the coastal regions in northern California, east of the Cascades, and throughout the central and southern portions of the State. Breeds in early successional riparian habitats with well-developed shrub layer and an open canopy nesting on the borders of streams, creeks, rivers, and marshes.	Present. Detected within the TRVRP in the spring and summer months during multiple survey efforts including the avian count surveys in multiple locations. The species was found within riparian habitat long Tijuana River and associated floodplain in areas north of Monument Road (Figure 12).
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	BCC/SSC County Group 1	In California, found year-round throughout the foothills and lowlands with winter migrants found coastally north of Mendocino County. Inhabits a variety of habitats seen foraging over open ground within areas of short vegetation, pastures with fence rows, old orchards, mowed roadsides, cemeteries, golf courses, riparian areas, open woodland, agricultural fields, desert washes, desert scrub, grassland, broken chaparral and beach with scattered shrubs. Individuals forage by perching to search for prey (such as large insects, small mammals, amphibians, reptiles, and fish) and using impaling as a means of handling prey.	High. Several historical and recent occurrences of the species are reported in the TRVRP and surrounding region, including photo documentation of recent sightings in eBird confirming species presence.
California Gull (<i>Larus californicus</i>)	--/WL County Group 2	In California, the species winters along coastal regions with breeding populations localized at Mono Lake and southern San Francisco Bay. Breeding colonies nearly always occur on islands in natural lakes, rivers, or reservoirs. In the winter, the species is found along coastal California at beaches, rocky coasts, mudflats, coastal estuaries, and deltas of rivers and streams.	High. Suitable wintering habitat is present within the TRVRP for loafing and foraging habitat for the species. Multiple occurrences of the species are reported within the TRVRP and surrounding region, particularly along the coast. The park is outside of the species documented breeding distribution.

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Birds (cont.)			
Gadwall (<i>Mareca strepera</i>)	--/-- County Group 2	Winters and breeds within California occupying interior valleys, wetlands, ponds, and streams. Nests in short, dense herbaceous habitats adjacent to suitable shallow-water feeding areas, such as islands surrounded by open water.	Present. Five gadwalls were observed during the avian point count surveys in the April and June surveys at Dairy Mart Pond and along the Tijuana River just south of Dairy Mart Pond (Figure 12).
Osprey (<i>Pandion haliaetus</i>)	--/WL County Group 1	Within California, breeding populations reside in the Cascade and Sierra mountain ranges, though small numbers of the species also breed within San Diego County. Although widely seen on the coast, these birds are rare transients in the interior portions of southern California. Restricted to large water bodies such as rivers, lakes, and reservoirs supporting fish with suitable nesting habitat such as rocky pinnacles or large trees and snags. Build their large nests, often in dead tops of older trees and man-made structures.	Low. Suitable habitat for the species occurs within the TRVRP. Multiple occurrences reported in the TRVRP and surrounding area. However, not expected to nest in the TRVRP as none were observed during surveys and no known nests occur in the area (Unitt 2004).
Belding's Savannah Sparrow (<i>Passerculus sandwichensis beldingi</i>)	--/SE County Group 1 MSCP NE MSCP Covered	Year-round resident of coastal salt marshes within southern California from Santa Barbara County south to San Diego County. Particularly associated with salt marsh habitat dominated by dense pickleweed (<i>Salicornia</i> sp.) within which most nests are found.	Not Expected. Breeds west of the TRVRP within suitable coastal salt marsh habitat found at Brown Field State Park and Tijuana Slough National Wildlife Refuge. In 2001, a total of 289 pairs were estimated, of which 147 pairs were located south of the Tijuana River mouth. No documented occurrences occur in the TRVRP and the park lacks suitable coastal salt marsh habitat for the species.
Large-billed Savannah Sparrow (<i>Passerculus sandwichensis rostratus</i>)	--/SSC County Group 2 MSCP Covered	A non-breeding visitor of southern California occurring in small pockets along the coast from San Luis Obispo County south to San Diego County, and east at the Salton Sea. Wintering habitat almost entirely restricted to shorelines occurring at beaches and salt marshes and can be numerous along constructed seawalls and rocky shoreline outcroppings. At Salton Sea, found in low halophytic scrub, dominated by iodine bush (<i>Allenrolfea occidentalis</i>) and saltbush (<i>Atriplex</i> spp.), and in introduced stands of young tamarisk (<i>Tamarix ramossissima</i>).	Low. The TRVRP is situated inland lacking suitable shoreline habitat typically associated with wintering individuals. No documented occurrences of the species are reported in the TRVRP. There are a few eBird sightings, with accompanying photo documentation, to the west in Border Field State Park.

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Birds (cont.)			
American White Pelican (<i>Pelecanus erythrorhynchos</i>)	--/SSC County Group 2	Mainly an overwintering visitor to California along the Pacific Coast and lowlands of central California, although also winters at the Salton Sea in Imperial County. In California, the species breeds at lakes and marshes in the Klamath Basin, Modoc Plateau, and Great Basin desert in the northeastern portion of the state. Breeds in colonies on isolated islands of freshwater lakes and overwinters at marine estuaries and inland lakes where suitable habitat for feeding, loafing, and roosting is present.	Present. Observed flying over the TRVRP during the avian point count surveys in November. A group of 10 individuals were observed flying in the distance to the northwest of Dairy Mart Pond (Figures 8 and 12). A group of 11 were observed flying to the south of Dairy Mart Pond. Has potential to utilize the TRVRP for loafing and foraging opportunities during the winter but is not expected to breed in the park.
California Brown Pelican (<i>Pelecanus occidentalis californicus</i>)	FD/SD,FP County Group 2 MSCP Covered	Found in estuarine, marine subtidal, and marine pelagic waters along the California coast. Rare to uncommon on Salton Sea from July to September. Nests on undisturbed islands adjacent to good marine fishing areas. Rests on water or inaccessible rocks offshore or on the mainland, but also uses mudflats, sandy beaches, wharfs, and jetties.	Low. Suitable loafing and foraging habitat is present in the TRVRP, particularly at larger recreation ponds such as Dairy Mart Pond. However, suitable breeding habitat is absent. There are scattered eBird sightings in the TRVRP, but most are concentrated to the west along the coast in Border Field State Park and the Tijuana Slough National Wildlife Refuge.
Double-crested Cormorant (<i>Phalacrocorax auritus</i>)	--/WL County Group 2	Year-round resident along the entire coast also occupying fresh and saltwater estuaries, and inland lakes. Occurs east of the coast within the Central Valley, lower Colorado River, and Salton Sea. Habitat requirements include suitable places for feeding, resting, loafing, and nighttime roosts. Diet mostly consists of fish but may include other aquatic animals, and at times terrestrial animals based on opportunity. Breeds in colonies at TRVRPs safe from predators and adjacent to feeding areas such as rocky or sandy islands, bridges, docks, nesting towers, trees, emergent marsh vegetation, and on the ground.	Present. Observed flying over and utilizing aquatic habitat within the TRVRP during the avian point count surveys (Figure 12). A total of 10 individuals were observed during the avian point counts. A single individual was observed flying overhead in the northwestern portion of the park. Numerous individuals were observed loafing and foraging at the Dairy Mart Pond, but no nesting cormorants were observed during surveys.

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Birds (cont.)			
White-faced Ibis (<i>Plegadis chihi</i>)	--/WL MSCP Covered County Group 1	Uncommon summer resident in sections of southern California and a rare visitor in the Central Valley. Local wintering visitor along coast. Prefers to feed in fresh emergent wetlands, shallow lacustrine waters, muddy ground of wet meadows, and irrigated or flooded pastures and croplands. Nests in dense, fresh emergent wetland. In San Diego County, two nesting colonies documented at Guajome Lake and at a pond along the San Luis Rey located near Keys Canyon (southwest of the I-15 and SR-76 intersection).	Low. Not expected to breed in the TRVRP as no known nesting colonies occur in the region. There are numerous eBird sightings of the species, some with accompanying photo documentation, within the TRVRP and surrounding area during the winter.
Coastal California Gnatcatcher (<i>Polioptila californica californica</i>)	FT/SSC County Group 1 MSCP Covered	Year-round resident of California occurring from Ventura County south to San Diego County, and east to the western portions of San Bernardino and Riverside Counties. Typically occur in arid, open sage scrub habitats on gently slopes hillsides to relatively flat areas at elevations below 3,000 feet. The composition of sage scrub in which gnatcatchers are found varies; however, California sagebrush is at least present as dominant or co-dominant species. The species is mostly absent from areas dominated by black sage, white sage, or lemonadeberry, though the species may occur more regularly in inland regions dominated by black sage.	Present. Detected within the southern portion of the TRVRP during multiple survey efforts, including the avian point count surveys. The species was detected at multiple locations within Spooner's Mesa and Monument Mesa (Figure 12). A single individual was detected in the southwestern portion of the TRVRP north of Monument Road and west of Hollister Street (Figure 12).
Vermilion Flycatcher (<i>Pyrocephalus rubinus</i>)	--/SSC County Group 1	Scare breeding records occur in southern California with a few individuals wintering regularly along the California coast from Ventura County south to San Diego County. Suitable habitat includes arid scrub, farmlands, parks, golf courses, desert, savanna, cultivated lands, and riparian woodland, usually near water. Wintering individuals can be found in open and semi-open areas with hedges, scattered trees and bushes, and often near water. The species is known to both breed and winter at selected sites within San Diego County.	High. Reported wintering and breeding records occur in the TRVRP at the baseball fields south of Sunset Avenue. Multiple sightings of the species have been reported to eBird, with accompanying photo documentation, confirming the species presence.

**Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur**

Species	Status ¹	Habitat Associations	Potential to Occur ²
Birds (cont.)			
Light-footed Ridgway's Rail (<i>Rallus obsoletus levipes</i>)	FE/SE, FP County Group 1 MSCP NE MSCP Covered	One of six recognized subspecies occurring as a resident in coastal salt marshes and lagoons from Santa Barbara County south to Baja California. The species is found primarily in tall, dense cordgrass (<i>Spartina foliosa</i>) and occasionally pickleweed (<i>Salicornia pacifica</i>) in the low marsh zone. Also found in freshwater marshes in winter.	High. Two pairs were reportedly detected in the northeast portion of the TRVRP in 2007 (County 2007). Several reported occurrences of the species are present in the TRVRP at Dairy Mart Pond and along the Tijuana River in the northern portion of the park, though dates are not associated with these sightings. The species breeds to the west within Border Field State Park and further northwest Tijuana Slough National Wildlife Preserve which supports the second of the largest population in California (Zemba et al. 2017).
Black Skimmer (<i>Rynchops niger</i>)	BCC/SSC County Group 1	Year-round resident in southern California breeding in localized areas along coast from San Francisco Bay south to south San Diego County, and in the interior at the Salton Sea. Nests in mixed species colonies on open sandy areas, or gravel and shell bars, with sparse vegetation. In winter, roosts communally on urban beaches or on mud flats in estuaries. In San Diego County, primarily observed in Mission Bay in winter and at the salt works in south San Diego Bay during summer.	Not expected. The TRVRP is situated inland lacking suitable beach habitats and sandy, open areas associated with the species. Individuals may fly over, or be observed foraging at Dairy Mart Pond, as eBird sightings of the species are present in the TRVRP.
Yellow Warbler (<i>Setophaga petechia</i>)	BCC/SSC County Group 2	Common to locally abundant species breeding throughout California at elevations below 8,500 feet, excluding most of the Mojave Desert, and all of the Colorado Desert. Breeds in riparian areas dominated by willows (<i>Salix</i> spp.) and cottonwoods (<i>Populus</i> spp.), near rivers, streams, lakes, and wet meadows. Also breeds in montane shrub and conifer forests in higher elevation areas.	Present. Detected during several efforts, including the avian point surveys, in the spring and summer months. Found throughout the TRVRP, primarily within riparian habitat along the Tijuana River (Figure 12).

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Birds (cont.)			
Western Bluebird (<i>Sialia mexicana</i>)	--/-- County Group 2 MSCP Covered	Common year-round resident throughout California, but absent from the higher mountains and eastern deserts. Breeds in open woodlands, riparian habitats, grasslands, and farmlands. Nests and roosts in cavities of trees and snags, often in holes previously created by woodpeckers, and nest boxes. Winters in a wider variety of habitats.	Present. Detected in April during the first small mammal trapping session in the northwestern portion of the TRVRP at Dairy Mart Pond (Figure 12).
Elegant Tern (<i>Sterna elegans</i>)	--/WL County Group 1 MSCP Covered	Migrates along the coastal regions of California, with three known breeding colonies located in the extreme southwestern portion of the State: Los Angeles harbor (Los Angeles County), Bolsa Chica Ecological Reserve (Orange County), and San Diego Bay (San Diego County). Nests on generally low, flat, and sandy areas with little vegetation. Found in bays, harbors, estuaries, and inshore coastal waters. Rarely found inland.	None. The TRVRP is situated inland lacking suitable coastal and nesting habitats where the species is most commonly found. Reported eBird sightings of the species in TRVRP most likely represent migrating individuals.
California Least Tern (<i>Sternula antillarum browni</i>)	FE/SE, FP County Group 1 MSCP NE MSCP Covered	Occurs locally along California coastal regions breeding in colonies from San Francisco Bay south to San Diego County. Wintering areas in unknown areas of South America. Nests on relatively bare or sparsely vegetated beaches and mudflats near water. Forage in the bays and estuaries near their colonies, on the ocean near shore, and at inland lakes in the coastal lowland.	None. The TRVRP is situated inland lacking suitable coastal and nesting habitats where the species is most commonly found. Closest known breeding colony occurs to the northwest in the Tijuana Slough National Wildlife Refuge and Border Field State Park at the mouth of the Tijuana River. Reported eBird sightings of the species in the TRVRP most likely represent migrating and foraging individuals.
Barn Owl (<i>Tyto alba</i>)	--/-- County Group 2	Common, yearlong resident of California found in open habitats such as grassland, chaparral, riparian, and wetlands avoiding dense forests and open desert habitats. Also found in urban and suburban areas. Nest in sheltered areas of cliffs or man-made structures, on ledges, in crevices, culverts, nest boxes, and in cavities in trees. Roosts in dense vegetation, cliffs, and buildings and other man-made structures.	Present. Detected during the evening avian point counts in April, June, and November as single individuals and groups of two. Observed foraging within uplands and perched on telephone poles and wires within the southwestern and northeastern portions of TRVRP including Spooner's Mesa, south of Dairy Mart Pond, and north of baseball fields (Figure 12).

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Birds (cont.)			
Least Bell's Vireo (<i>Vireo bellii pusillus</i>)	FE/SE County Group 1 MSCP NE MSCP Covered	Breeds within California and northern Baja California, wintering in southern Baja California. In California, breeds along the coast and western edge of the Mojave Desert from Santa Barbara County south to San Diego County, and east to Inyo County, San Bernardino, and Riverside Counties. Breeding habitat consists of early to mid-successional riparian habitat, often where flowing water is present, but also found in dry watercourses within the desert. A structurally diverse canopy and dense shrub cover is required for nesting and foraging. Dominant species within breeding habitat includes cottonwood and willows with mule fat, oaks, and sycamore, and mesquite (<i>Prosopis glandulosa</i>) and arrowweed (<i>Pluchea sericea</i>) within desert habitats. The species can be tolerant of the presence of non-native species such as tamarisk.	Present. Detected during the spring and summer months during multiple survey efforts including the avian count surveys in multiple. The species occurs within riparian habitat long Tijuana River and associated floodplain in areas north of Monument Road (Figure 12).
Mammals			
Pallid bat (<i>Antrozous pallidus</i>)	--/SSC County Group 2	Locally common found at low elevations in California. Associated with arid and open habitats including grasslands, shrublands, woodlands, and forests, often with open water nearby. Prefers rocky outcrops, cliffs, and crevices with access to open habitats for foraging. Day roosts in caves, crevices, mines, and occasionally hollow trees and buildings. Appears to be intolerant of most human disturbances, being mostly absent from urban and suburban areas.	Low. Not observed during focused bat surveys and there are no recorded occurrences of the species in the TRVRP. Historical CNDDDB observations to the north are from the 1940s. The surrounding area is highly developed with dense residential neighborhoods to the north, south, and east.

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Mammals (cont.)			
Northwestern San Diego pocket mouse (<i>Chaetodipus fallax fallax</i>)	--/SSC County Group 2	Occurs throughout southwestern California from western Riverside County to northern Baja California at elevations below 6,000 feet. Inhabits coastal sage scrub, grasslands, and chaparral communities, and generally exhibits a strong microhabitat affinity for moderately gravelly and rocky substrates. Forage for seeds from California sagebrush, California buckwheat, lemonade berry, and grasses under shrub and tree canopies, or around rock crevices.	High. Suitable habitat for the species occurs in the TRVRP and surrounding region. The species was reported captured in low numbers in 2002 within the Imperial Beach Naval Station located northwest of the TRVRP. Multiple occurrences of San Diego pocket mouse (<i>Chaetodipus fallax</i>) are reported within the TRVRP, especially in the southern portion of the park on Monument Mesa and Spooner's Mesa.
Mexican long-tongued bat (<i>Choeronycteris mexicana</i>)	--/SSC County Group 2	Found in southern California from Ventura County south to San Diego County. Occurs in arid habitats below 7,900 feet such grasslands, scrub, mixed forest, and canyons in mountain ranges rising from the desert. Primarily found in urban and suburban areas in San Diego County. Roosts in in caves and mines, and man-made structures such as garages, office buildings, under porches, and warehouses.	Low. Not observed during focused bat surveys and there are no recorded occurrences of the species in the TRVRP. One historical CNDDDB observation to the north is from the 1980's.
Townsend's big-eared bat (<i>Corynorhinus townsendii pallescens</i>)	--/SSC County Group 2	Occurs throughout California but distribution is strongly correlated with the availability of caves and cave-like roosting habitat. Found in a variety of habitats with presence of caves or cave-like structures (such as buildings). In San Diego County, presumed absent from coastal areas being found more commonly in historic mining districts and boulder-strewn regions (i.e., Escondido, Lakeside, Dulzura, Jacumba, etc.).	Not Expected. Not observed during focused bat surveys and there are no recorded occurrences of the species in the TRVRP. The park is situated near the coast which the species is presumed to be absent.
Western mastiff bat (<i>Eumops perotis californicus</i>)	--/SSC County Group 2	In California, the species occurs from Monterey County to San Diego County from the coast eastward to the Colorado Desert. Found in open, semi-arid to arid habitats including coastal and desert scrub, grasslands, woodlands, and palm oases. Prefers to roost in high situations above the ground on vertical cliffs, rock quarries, outcrops of fractured boulders, and occasionally tall buildings.	Present. Detected during the passive bat surveys in May and July with calls recorded at Monument Mesa, Spooner's Mesa, and along the Tijuana River south of Dairy Mart Pond (Figure 12).

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Mammals (cont.)			
Mountain lion (<i>Felis concolor</i>)	--/-- County Group 2 MSCP Covered	Uncommon permanent resident found throughout California in nearly all habitats, except xeric regions of Mojave and Colorado deserts. Requires extensive riparian vegetation and brushy habitats with interspersed irregular terrain, rocky outcrops, and tree or brush edges. Main prey is mule deer.	None. Species was not detected during biological surveys and is presumed to be absent from the TRVRP. No wildlife corridors that would facilitate movement and connect the species to adjacent open spaces areas are present. The TRVRP is geographically isolated being surrounded by dense urban and residential development to the north and east, the Pacific Coast to the west, and international border fence and dense development to the south. Additionally, mule deer was not detected in the park.
Western red bat (<i>Lasiurus blossevillii</i>)	--/SSC County Group 2	In California, the species is locally common occurring from Shasta County south to San Diego County and west of the Sierra Nevada/Cascade Range and deserts. Mainly occurs in riparian woodlands populated by willows, cottonwoods, sycamores, and oak trees but can be found in non-native vegetation such as tamarisk, eucalyptus, and orchards. Primarily roosts in trees preferring heavily shaded areas which are open underneath.	Present. Detected during the passive bat surveys with calls being recorded at Duck Ponds, Dairy Mart Pond, and south of Dairy Mart Pond along the Tijuana River (Figure 12).
San Diego black-tailed jackrabbit (<i>Lepus californicus bennettii</i>)	--/SSC County Group 2	Occurs along the coastal regions of southern California south to northern Baja California. Found in arid regions preferring grasslands, agricultural fields, and sparse scrub. Typically absent from areas with high-grass or dense brush, such as closed-canopy chaparral, primarily occupying short-grass and open scrub habitats.	Present. Observed six separate locations in the southern portion of the TRVRP on Spooner's Mesa and Monument Mesa (Figure 12).
Small-footed myotis (<i>Myotis ciliolabrum</i>)	--/-- County Group 2	Found throughout California occurring in desert, chaparral, riparian areas, and forests. Presence of riparian areas and waters appears to be important in distribution. Strongly associated with chaparral and montane habitats in San Diego County. Roosts solitarily or in small numbers in rocky crevices, caves, mines, snags, buildings, and bridges.	Not Expected. This species was not observed during focused bat surveys and there are no reported occurrences of the species in the area. Species tends to favor chaparral habitat which is generally absent from the TRVRP.

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Mammals (cont.)			
Yuma myotis (<i>Myotis yumanensis</i>)	--/-- County Group 2	Widespread in California but uncommon in the Mojave and Colorado Deserts, except in the mountain ranges bordering Colorado River Valley. Found in a variety of habitats including juniper and riparian woodlands, riparian forests, and desert regions where bodies of water (i.e., rivers, streams, ponds, lakes, etc.) are present. Closely associated with water which it uses for foraging and sources of drinking water. Roosts in caves, attics, buildings, mines, underneath bridges, and other similar structures.	Present. Species detected during the passive bat surveys with calls recorded at Spooner's Mesa, Duck Ponds, Dairy Mart Pond, and along the Tijuana River south of Dairy Mart Pond (Figure 12).
San Diego desert woodrat (<i>Neotoma lepida intermedia</i>)	--/SSC County Group 2	Occurs along the coastal regions of California being found as far north as San Luis Obispo County, south to San Diego County, and in the western portions of San Bernardino and Riverside Counties. Inhabits a variety of shrub and desert habitats such as coastal sagebrush scrub, chaparral, pinyon-juniper woodland, and Joshua tree woodland among others. Often associated with rock outcroppings, boulders, cacti patches, and areas with dense understories. Construct dens used for shelter, food storage, and nesting around rock outcroppings and cacti using various materials such as twigs, sticks, and other debris.	Present. The species captured during the small mammal trapping efforts in April and June, and during the reptile trapping efforts in April. A total of three individuals were captured, with one recapture, all within Array 1 located at Monument Mesa in the southeastern portion of the TRVRP (Figures 8 and 12). Two individuals were captured in reptile Trap 2 located on Spooner's Mesa, and one individual was captured in reptile Trap 3 located on Monument Mesa, both located south of Monument Road (Figures 8 and 12).
Pocketed free-tailed bat (<i>Nyctinomops femorosaccus</i>)	--/SSC County Group 2	Rare in California occurring from Los Angeles County eastwards to San Bernardino County, and southwards to San Diego County. Closely associated with their preferred roosting habitats consisting of vertical cliffs, quarries, and rocky outcrops. Sometimes roosts under tiled roofs and observed utilizing bat boxes. Habitat generalists foraging in grasslands, shrublands, riparian areas, oak woodlands, forests, meadows, and ponds favoring larger water bodies for drinking.	Present. Detected during the passive bat surveys with calls of the recorded at Spooner's Mesa in the southeastern portion of the TRVRP (Figure 12).

Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur

Species	Status ¹	Habitat Associations	Potential to Occur ²
Mammals (cont.)			
Big free-tailed bat (<i>Nyctinomops macrotis</i>)	--/SSC County Group 2	Rare in California with species found in urban areas of San Diego County. Closely associated with their preferred roosting habitats consisting of vertical cliffs, quarries, and rocky outcrops. Also roosts in buildings and occasionally holes in trees. Associated with coastal and desert scrub, forests, riparian zones, and montane woodlands. Probably does not breed in California.	Not Expected. Not observed during focused bat surveys and there are no recorded occurrences of the species in the TRVRP or surrounding area. Rare vagrant in San Diego with no breeding colonies documented (Tremor 2017).
Mule deer (<i>Odocoileus hemionus</i>)	--/-- County Group 2 MSCP Covered	Found throughout California with the species lacking from only completely urbanized areas and the desert floor. Distribution determined by vegetation type, water availability, and quality and quantity of foraging habitat. Inhabits a wide array of habitats from grasslands, meadows, coastal sage scrub, chaparral, riparian and montane forests. Crepuscular activity and movements are along routes that provide the greatest amount of protective cover.	None. Species was not detected during biological surveys and is presumed to be absent from the TRVRP. No wildlife corridors that would facilitate movement and connect the species to adjacent open spaces areas are present. The TRVRP is geographically isolated being surrounded by dense urban and residential development to the north and east, the Pacific Coast to the west, and international border fence and dense development to the south.
Southern grasshopper mouse (<i>Onychomys torridus</i>)	--/SSC County Group 2	Occurs from the San Joaquin Valley south to San Diego County. Typically found in open habitats associated with gentle terrain including grasslands and coastal sage scrub. Also found in alluvial fans and desert scrub in desert regions. Prefers habitats with friable soils with scattered shrubs and mixed grasses.	Low. This species was not captured during focused small mammal surveys, although suitable soils and habitats are present in the TRVRP. No documented occurrences are present in the area.

**Appendix D (cont.)
Special Status Animal Species Observed or With Potential to Occur**

Species	Status ¹	Habitat Associations	Potential to Occur ²
Mammals (cont.)			
Pacific pocket mouse (<i>Perognathus longimembris pacificus</i>)	FE/SSC County Group 1	Historically occurred in coastal southern California from Los Angeles County south to San Diego County. Current distribution is within 1 mile of the coast with three known populations still present: Dana Point Headlands (Orange County, San Mateo Creek (northern San Diego County), and Camp Pendleton (southern San Diego County). Occurs on fine-grained, sandy or gravelly substrates in coastal strand, coastal dunes, river alluvium, and coastal sage scrub growing on marine terraces.	None. Not observed during focused small mammal surveys. While the species historically occurred in the Tijuana River Valley, it is now believed to be extirpated based on lack of positive findings during survey efforts in the mid-1990's (Tremor 2017),

¹ F = Federal; S = State of California; E = Endangered; T = Threatened; CE = Candidate Endangered; R = Rare; BCC = Federal Bird of Conservation Concern; SSC = State Species of Special Concern; FP = State Fully Protected; WL = Watch List

County of San Diego Sensitivity Status: Animals are divided into Groups 1 and 2 on the Sensitive Animal List. **Group 1** Animals include those that have a very high level of sensitivity, either because they are listed as threatened or endangered or because they have very specific natural history requirements that must be met. **Group 2** Animals include those species that are becoming less common but are not yet so rare that extirpation or extinction is imminent without immediate action. These species tend to be prolific within their suitable habitat types.

MSCP Covered Species: Covered Species under City of San Diego MSCP Subarea Plan; NE = Narrow Endemic Species under City MSCP Subarea Plan.

² Potential to Occur is assessed as follows. **None:** Species is so limited to a particular habitat that it cannot disperse on its own, and habitat suitable for its establishment and survival does not occur in the project TRVRP; **Not Expected:** Species moves freely and might disperse through or across the project TRVRP, but suitable habitat for residence or breeding does not occur in the study area; **Low:** Suitable habitat is present in the project TRVRP but no sign of the species was observed during surveys, however the species cannot be excluded with certainty; **High:** Suitable habitat occurs in the study area and the species has been recorded recently on or near the study area, but was not observed during project surveys; **Present:** The species was observed during biological surveys for the project and is assumed to occupy the project TRVRP.

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Appendix E

Explanation of Status Codes for Plant and Animal Species

Appendix E
Explanation of Status Codes for Plant and Animal Species

FEDERAL, STATE, AND LOCAL CODES

U.S. FISH AND WILDLIFE SERVICE (USFWS)

- FE Federally listed endangered
- FT Federally listed threatened
- BCC Birds of Conservation Concern (discussed in more detail below)
- BGEPA Bald and Golden Eagle Protection Act (discussed in more detail below)

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE (CDFW)

- SE State listed endangered
- ST State listed threatened
- SSC State species of special concern
- WL Watch List

Fully Protected Fully Protected species refer to all vertebrate and invertebrate taxa of concern to the Natural Diversity Data Base regardless of legal or protection status. These species may not be taken or possessed without a permit from the Fish and Game Commission and/or CDFW.

COUNTY OF SAN DIEGO (COUNTY)

Plant sensitivity

- List A Plants rare, threatened, or endangered in California or elsewhere
- List B Plants rare, threatened, or endangered in California but more common elsewhere
- List C Plants that may be quite rare, but more information is needed to determine rarity status
- List D Plants of limited distribution and are uncommon, but not presently rare or endangered

Animal sensitivity

- Group 1 Animals that have a very high level of sensitivity, either because they are listed as threatened or endangered or because they have very specific natural history requirements that must be met
- Group 2 Animals that are becoming less common but are not yet so rare that extirpation or extinction is imminent without immediate action. These species tend to be prolific within their suitable habitat types.

CITY OF SAN DIEGO (CITY)

Multiple Species Conservation Program (MSCP) Covered

Multiple Species Conservation Program covered species for which the City has take authorization within the MSCP area.

Appendix E (cont.)

Explanation of Status Codes for Plant and Animal Species

MSCP Narrow Endemic (NE)

Narrow endemic species are native species that have “restricted geographic distributions, soil affinities, and/or habitats.” The MSCP participants’ subarea plans have specific conservation measures to ensure impacts to narrow endemics are avoided to the maximum extent practicable.

OTHER CODES AND ABBREVIATIONS

USFWS BALD AND GOLDEN EAGLE PROTECTION ACT (BGEPA)

In 1782, Continental Congress adopted the bald eagle as a national symbol. During the next one and a half centuries, the bald eagle was heavily hunted by sportsmen, taxidermists, fisherman, and farmers. To prevent the species from becoming extinct, Congress passed the Bald Eagle Protection Act in 1940. The Act was extremely comprehensive, prohibiting the take, possession, sale, purchase, barter, or offer to sell, purchase, or barter, export or import of the bald eagle “at any time or in any manner.”

In 1962, Congress amended the Eagle Act to cover golden eagles, a move that was partially an attempt to strengthen protection of bald eagles, since the latter were often killed by people mistaking them for golden eagles. The golden eagle, however, is accorded somewhat lighter protection under the Act than the bald eagle. Another 1962 amendment authorizes the Secretary of the Interior to grant permits to Native Americans for traditional religious use of eagles and eagle parts and feathers.

USFWS BIRDS OF CONSERVATION CONCERN (BCC)

This report from 2002 aims to identify accurately the migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent USFWS’ highest conservation priorities and draw attention to species in need of conservation action. USFWS hopes that by focusing attention on these highest priority species, the report will promote greater study and protection of the habitats and ecological communities upon which these species depend, thereby ensuring the future of healthy avian populations and communities. The report is available online at <http://migratorybirds.fws.gov/reports/bcc2002.pdf>.

Appendix E (cont.)
Explanation of Status Codes for Plant and Animal Species

CALIFORNIA NATIVE PLANT SOCIETY (CNPS) CALIFORNIA RARE PLANT RANKING (CRPR)

Lists

- 1A = Presumed extinct.
- 1B = Rare, threatened, or endangered in California and elsewhere. Eligible for state listing.
- 2 = Rare, threatened, or endangered in California but more common elsewhere. Eligible for state listing.
- 3 = Distribution, endangerment, ecology, and/or taxonomic information needed. Some eligible for state listing.
- 4 = A watch list for species of limited distribution. Needs monitoring for changes in population status. Few (if any) eligible for state listing.

List/Threat Code Extensions

- .1 – Seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat)
- .2 – Fairly endangered in California (20 to 80 percent occurrences threatened)
- .3 – Not very endangered in California (less than 20 percent of occurrences threatened, or no current threats known)

A “CA Endemic” entry corresponds to those taxa that only occur in California.

All List 1A (presumed extinct in California) and some List 3 (need more information; a review list) plants lacking threat information receive no extension. Threat Code guidelines represent only a starting point in threat level assessment. Other factors, such as habitat vulnerability and specificity, distribution, and condition of occurrences, are considered in setting the Threat Code.

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Appendix F

Butterfly Survey Results

Appendix F Butterfly Survey Results

Species†		Survey Location								Total Individuals	Species Richness
Common Name	Scientific Name	Northwest	Southwest	Southeast	Monument Mesa	Spooner's Mesa	CIAP ¹	Baseball Fields & Dairy Mart	Other		
Family Hesperidae (Skippers)											
Funereal Duskywing	<i>Erynnis funeralis</i>	1	0	0	1	2	0	0	1	5	X
Umber Skipper	<i>Poanes melane</i>	0	1	0	0	0	0	0	0	1	X
unidentified skipper	--	0	0	0	0	0	0	0	1	1	-
Family Lycaenidae (Gossamer-wing Butterflies)											
Western Pygmy-Blue	<i>Brephidium exila</i>	1	10	11	0	0	0	2	3	27	X
Bernardino Square-spotted Blue	<i>Euphilotes battoides bernardino</i>	0	0	3	4	6	0	0	0	13	X
Marine Blue	<i>Leptotes marina</i>	0	0	0	2	0	0	0	0	2	X
Acmon Blue	<i>Plebejus acmon</i>	0	0	0	4	4	0	0	0	8	X
Gray Hairstreak	<i>Strymon melinus</i>	2	0	0	2	0	0	0	0	4	X
Unidentified blue	---	0	1	1	3	4	0	0	0	9	-
Family Nymphalidae (Brush-footed Butterflies)											
Common Ringlet	<i>Coenonympha tullia</i>	0	0	0	1	0	0	0	0	1	X
Monarch	<i>Danaus plexippus</i> [†]	2	0	0	0	0	0	0	0	2	X
Lorquin's Admiral	<i>Limenitis lorquini</i>	3	2	1	0	0	0	2	0	8	X
Mourning Cloak	<i>Nymphalis antiopa</i>	0	0	1	0	0	1	1	0	3	X
Satyr Comma	<i>Polygonia satyrus</i>	0	0	1	0	0	0	0	0	1	X
West Coast Lady	<i>Vanessa annabella</i>	0	0	0	0	0	1	0	1	2	X
Red Admiral	<i>Vanessa atalanta</i>	0	2	0	0	0	0	1	0	3	X
Unidentified lady	<i>Vanessa</i> sp.	0	1	1	1	0	3	0	1	7	-
Family Papilionidae (Parnassians and Swallowtails)											
Pale Swallowtail	<i>Papilio eurymedon</i>	0	0	0	0	0	0	1	0	1	X
Western Tiger Swallowtail	<i>Papilio rutulus</i>	4	12	0	0	0	1	8	0	25	X
Anise Swallowtail	<i>Papilio zelicaon</i>	0	0	0	1	1	0	0	0	2	X

**Appendix (cont.)
Butterfly Survey Results**

Species†		Survey Location								Total Individuals	Species Richness
Common Name	Scientific Name	Northwest	Southwest	Southeast	Monument Mesa	Spooner's Mesa	CIAP ¹	Baseball Fields & Dairy Mart	Other		
Family Pieridae (Whites and Sulphurs)											
Pacific Sara Orangetip	<i>Anthocharis sara sara</i>	1	5	6	2	0	0	2	0	16	X
Dainty Sulphur	<i>Nathalis iole</i>	0	0	0	0	0	0	0	1	1	X
Cabbage White	<i>Pieris rapae</i>	0	4	4	0	0	0	4	1	13	X
Checkered White	<i>Pontia protodice</i>	0	2	0	0	0	0	0	0	2	X
Unidentified sulphur	---	1	0	0	0	0	0	0	0	1	-
Family Riodinidae (Metalmarks)											
Behr's Metalmark	<i>Apodemia mormo virgulti</i>	0	0	0	31	11	0	0	0	42	X
TOTAL		15	40	29	52	28	6	21	9	200	22

¹ Coastal Impact Assistance Program (CIAP). This area is located in the northeastern portion of the TRVRP to the northwest of Dairy Mart Pond. The area is currently being enhanced through funding provided by a CIAP grant.

† Special Status Species

Appendix G

Amphibian Survey Results

Appendix G Amphibian Survey Results

Species		Survey Location												TOTAL
Common Name	Scientific Name	1		2		3		4		5		6		
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
Session 1 - April 24, 2018														
Western toad	<i>Anaxyrus boreas</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
American bullfrog	<i>Lithobates catesbeianus</i>	-	X	-	-	-	-	-	-	-	-	-	X	X
California treefrog	<i>Pseudacris cadaverina</i>	-	X	-	-	-	-	-	-	-	-	-	-	X
Baja California treefrog	<i>Pseudacris hypochondriaca hypochondriaca</i>	-	X	-	X	-	X	-	X	-	-	-	-	X
Red-eared slider	<i>Trachemys scripta elegans</i>	X	-	-	-	-	-	-	-	-	-	-	-	X
Session 1 Species Richness		1	3	0	1	0	1	0	1	0	0	0	1	4
Session 2 - June 7, 2018														
Western toad	<i>Anaxyrus boreas</i>	-	-	-	-	-	-	-	-	-	-	-	X	X
American bullfrog	<i>Lithobates catesbeianus</i>	X	X	-	-	-	-	-	-	-	-	X	X	X
California treefrog	<i>Pseudacris cadaverina</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
Baja California treefrog	<i>Pseudacris hypochondriaca hypochondriaca</i>	-	X	-	X	-	X	-	X	-	-	-	-	X
Red-eared slider	<i>Trachemys scripta elegans</i>	X	-	-	-	X	-	-	-	-	-	-	-	X
Session 2 Species Richness		2	2	0	1	1	1	0	1	0	0	1	2	4
Session 3 - August 8, 2018														
Western toad	<i>Anaxyrus boreas</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
American bullfrog	<i>Lithobates catesbeianus</i>	-	X	-	-	-	-	-	-	-	-	X	X	X
California treefrog	<i>Pseudacris cadaverina</i>	-	X	-	-	-	-	-	-	-	-	-	-	X
Baja California treefrog	<i>Pseudacris hypochondriaca hypochondriaca</i>	-	X	-	-	-	X	-	-	-	-	-	X	X
Red-eared slider	<i>Trachemys scripta elegans</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
Session 3 Species Richness		0	3	0	0	0	1	0	0	0	0	1	2	3
Total Detections														
Western toad	<i>Anaxyrus boreas</i>	-	-	-	-	-	-	-	-	-	-	-	X	X
American bullfrog	<i>Lithobates catesbeianus</i>	X	X	-	-	-	-	-	-	-	-	X	X	X
California treefrog	<i>Pseudacris cadaverina</i>	-	X	-	-	-	-	-	-	-	-	-	-	X
Baja California treefrog	<i>Pseudacris hypochondriaca hypochondriaca</i>	-	X	-	X	-	X	-	X	-	-	-	X	X
Red-eared slider	<i>Trachemys scripta elegans</i>	X	-	-	-	X	-	-	-	-	-	-	-	X
Total Species Richness		2	3	0	1	1	1	0	1	0	0	1	3	5

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Appendix H

Reptile Drift-Fence Funnel Trap Survey Results

Appendix H Reptile Drift-Fence Funnel Trap Survey Results

Species†		Trapping Location																									
Common Name	Scientific Name	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	Total	
Session 1		April 17, 2018						April 18, 2018						April 19, 2018						April 20, 2018						Total	
Belding's orange-throated whiptail	<i>Aspidoscelis hyperythra beldingi</i> †	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Baja California coachwhip	<i>Coluber fuliginosus</i> †	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Common Ground-Dove	<i>Columbina passerina</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Darkling beetle	<i>Eleodes</i> sp.	-	-	1	-	1	-	-	-	1	-	2	-	-	-	-	-	2	-	-	-	-	-	-	-	-	7
San Diego desert woodrat	<i>Neotoma lepida intermedia</i> †	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	3
Tarantula hawk	<i>Pepsis grossa</i>	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Brush mouse	<i>Peromyscus boylii</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1*	-	-	-	-	-	-	-	-	1
California mouse	<i>Peromyscus californicus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Deer mouse	<i>Peromyscus maniculatus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Blainville's horned lizard	<i>Phrynosoma blainvillii</i> †	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Western harvest mouse	<i>Reithrodontomys megalotis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
Great Basin fence lizard	<i>Sceloporus occidentalis longipies</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Ornate shrew	<i>Sorex ornatus</i>	-	-	-	-	-	-	1*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Jerusalem cricket	<i>Stenopelmatus</i> sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Brush rabbit	<i>Sylvilagus bachmani</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Botta's pocket gopher	<i>Thomomys bottae</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Western side-blotched lizard	<i>Uta stansburiana elegans</i>	-	-	-	2	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	4
Daily Totals		0	0	2	2	1	0	0	2	1	2	2	0	0	0	0	1	3	0	1	1	1	1	0	0	20	
Session 2		June 12, 2018						June 13, 2018						June 14, 2018						June 15, 2018						Total	
Belding's orange-throated whiptail	<i>Aspidoscelis hyperythra beldingi</i> †	-	3	1	2	-	-	-	4	2	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	13
Baja California coachwhip	<i>Coluber fuliginosus</i> †	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Darkling beetle	<i>Eleodes</i> sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	1	1	-	1	1	-	-	6
Common Ground-Dove	<i>Columbina passerina</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
San Diego desert woodrat	<i>Neotoma lepida intermedia</i> †	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Tarantula hawk	<i>Pepsis grossa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Brush mouse	<i>Peromyscus boylii</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0

**Appendix H (cont.)
Drift Fence Tunnel Trap Survey Results**

Species†		Trapping Location																								
Common Name	Scientific Name	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	Total
Session 2 (continued)		June 12, 2018						June 13, 2018						June 14, 2018						June 15, 2018						Total
California mouse	<i>Peromyscus californicus</i>	-	-	-	-	-	-	-	-	-	-	-	1*	-	-	-	-	-	-	-	-	-	-	-	-	1
Deer mouse	<i>Peromyscus maniculatus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Blainville's horned lizard	<i>Phrynosoma blainvillii</i> †	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Western harvest mouse	<i>Reithrodontomys megalotis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Great Basin fence lizard	<i>Sceloporus occidentalis longipies</i>	-	-	-	-	-	1	-	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	4
Ornate shrew	<i>Sorex ornatus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Jerusalem cricket	<i>Stenopelmatus</i> sp.	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Brush rabbit	<i>Sylvilagus bachmani</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Botta's pocket gopher	<i>Thomomys bottae</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
Western side-blotched lizard	<i>Uta stansburiana elegans</i>	-	-	-	2	-	-	-	-	-	-	1	-	-	-	-	1	-	1	-	-	-	-	-	1	6
Daily Totals		0	3	1	4	0	1	0	6	2	1	1	1	0	2	2	0	1	1	1	1	0	2	1	2	33
Session 3		August 14, 2018						August 15, 2018						August 16, 2018						August 17, 2018						Total
Belding's orange-throated whiptail	<i>Aspidoscelis hyperythra beldingi</i> †	-	1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	8
Baja California coachwhip	<i>Coluber fuliginosus</i> †	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Common Ground-Dove	<i>Columbina passerina</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Darkling beetle	<i>Eleodes</i> sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
San Diego desert woodrat	<i>Neotoma lepida intermedia</i> †	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Tarantula hawk	<i>Pepsis grossa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Brush mouse	<i>Peromyscus boylii</i>	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
California mouse	<i>Peromyscus californicus</i>	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Deer mouse	<i>Peromyscus maniculatus</i>	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	2
Blainville's horned lizard	<i>Phrynosoma blainvillii</i> †	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Western harvest mouse	<i>Reithrodontomys megalotis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Great Basin fence lizard	<i>Sceloporus occidentalis longipies</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Ornate shrew	<i>Sorex ornatus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Jerusalem cricket	<i>Stenopelmatus</i> sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0

**Appendix H (cont.)
Drift Fence Tunnel Trap Survey Results**

Species†		Trapping Location																								
Common Name	Scientific Name	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	Total
Session 3 (continued)		August 14, 2018						August 15, 2018						August 16, 2018						August 17, 2018						Total
Brush rabbit	<i>Sylvilagus bachmani</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Botta's pocket gopher	<i>Thomomys bottae</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Western side-blotched lizard	<i>Uta stansburiana elegans</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Daily Totals		0	1	2	2	0	0	0	0	0	4	0	1	0	0	0	2	0	0	0	0	0	4	0	0	16
TOTAL CAPTURES																								69		

* Mortality
† Special Status Species

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Appendix I

Avian Point Count Survey Results

Appendix I Avian Point Count Survey Results

Species†	Point Count Location																				TOTAL
	1		2		3		4		5		6		7		8		9		10		
	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	
Session 1 – April 26, 2018																					
American Coot	0	0	0	0	0	0	1	0	0	0	5	1	0	0	0	0	0	0	0	0	7
American Crow	0	0	0	0	2	0	2	0	1	0	0	0	0	0	0	0	1	0	0	0	6
Anna's Hummingbird	1	0	0	0	0	0	2	0	3	0	0	0	3	0	1	0	1	0	0	0	11
Ash-throated Flycatcher	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
Barn Owl†	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	4
Bewick's Wren	1	0	2	0	0	0	0	0	1	0	0	0	0	0	1	0	2	0	0	0	7
Black Phoebe	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Black-headed Grosbeak	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	1	0	4
Black-throated Gray Warbler	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Blue Grosbeak	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	4
Brown-headed Cowbird	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Bushtit	0	0	6	0	0	0	0	0	0	0	5	0	0	0	2	0	0	0	0	0	13
California Thrasher	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
California Towhee	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3
Cinnamon Teal	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	4
Cliff Swallow	40	0	0	0	0	0	4	0	0	0	0	0	3	0	0	0	0	0	0	0	47
Common Gallinule	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Common Raven	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Common Yellowthroat	0	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	4
Costa's Hummingbird	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Double-crested Cormorant†	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Downy Woodpecker	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Eurasian Collared-Dove	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
Gadwall†	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	4
Horned Lark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1

**Appendix I (cont.)
Avian Point Count Survey Results**

Species	Point Count Location																				TOTAL
	1		2		3		4		5		6		7		8		9		10		
	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	
Session 1 – April 26, 2018 (continued)																					
House Finch	0	0	1	0	2	0	1	0	2	0	5	0	0	0	1	0	2	0	1	0	15
House Wren	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
Hutton's vireo	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Least Bell's Vireo†	1	0	2	0	1	0	0	0	2	0	1	0	0	0	2	0	0	0	1	0	10
Lesser Goldfinch	0	0	3	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	0	0	7
Mallard	1	0	0	1	1	0	0	0	0	0	11	0	8	0	1	0	0	0	0	0	23
Marsh Wren	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
Mourning Dove	0	0	1	0	6	0	0	0	1	0	0	0	1	0	1	0	0	0	1	0	11
Nashville Warbler	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Northern Harrier†	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3
Northern Rough-winged Swallow	11	0	0	0	0	0	13	0	0	0	23	0	31	0	16	0	0	0	0	0	94
Nuttall's Woodpecker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2
Orange-crowned Warbler	3	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	3	0	0	0	8
Pacific-slope Flycatcher	1	0	0	0	0	0	0	1	0	0	1	0	2	0	1	0	0	0	0	0	6
Pied-billed Grebe	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
Red-shouldered Hawk†	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Ruddy Duck	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	6
Snowy Egret	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Song Sparrow	2	0	1	0	2	0	1	0	2	0	2	0	3	0	3	0	0	0	0	0	16
Spotted Towhee	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Tree Swallow	0	0	0	0	1	0	0	0	0	0	9	0	6	0	0	0	0	0	0	0	16
Unidentified Gull	0	0	2	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
Unidentified Hummingbird	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Unidentified Kingbird	0	0	0	0	4	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	7

**Appendix I (cont.)
Avian Point Count Survey Results**

Species	Point Count Location																				TOTAL
	1		2		3		4		5		6		7		8		9		10		
	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	
Session 1 – April 26, 2018 (continued)																					
Unidentified Passerine	0	0	0	0	0	0	0	0	9	0	0	0	1	0	0	0	2	0	0	0	12
Unidentified Swallow	0	0	0	0	4	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	19
Unidentified Tern	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Unidentified Woodpecker	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
Western Gull	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	9
Wilson's Warbler	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3
Wrentit	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	6
Yellow Warbler†	2	0	3	0	3	0	3	0	3	0	2	0	1	0	3	0	0	0	0	0	20
Yellow-breasted Chat†	0	0	3	1	3	0	2	0	1	0	2	1	3	0	3	0	0	1	1	0	21
Yellow-rumped Warbler	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4
TOTAL	77	1	32	2	43	0	37	1	45	2	90	2	77	0	39	0	23	1	9	1	482
Session 2 – June 27 (pm) and June 28 (am), 2018																					
Allen's Hummingbird	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2
American Coot	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	5
American Crow	1	0	2	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	1	0	8
American Kestrel	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	2
Anna's Hummingbird	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	4
Barn Owl†	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Bewick's Wren	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	0	5
Black Phoebe	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3
Black-headed Grosbeak	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Blue Grosbeak	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	2
Brown-headed Cowbird	0	0	10	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	13
Bushtit	22	0	5	0	0	0	0	0	3	0	11	0	0	0	3	0	0	0	0	0	44

**Appendix I (cont.)
Avian Point Count Survey Results**

Species	Point Count Location																				TOTAL
	1		2		3		4		5		6		7		8		9		10		
	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	
Session 2 – June 27 (pm) and June 28 (am), 2018 (continued)																					
California Towhee	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	4
Cliff Swallow	55	0	0	0	8	0	0	0	17	0	48	0	0	0	62	0	0	0	1	0	191
Coastal California Gnatcatcher†	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	3
Common Poorwill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Common Yellowthroat	0	0	1	0	0	0	3	0	0	0	1	0	1	0	1	0	0	0	0	0	7
Cooper's Hawk†	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Double-crested Cormorant†	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Downy Woodpecker	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
Gadwall†	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Great Horned Owl	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	3
Green Heron†	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
House Finch	2	0	1	0	1	0	7	0	5	0	0	0	13	0	0	0	1	0	7	0	37
Hutton's vireo	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3
Least Bell's Vireo†	2	0	2	0	1	0	0	0	2	0	1	0	2	0	1	0	0	0	0	0	11
Lesser Goldfinch	0	0	0	0	1	0	1	0	0	0	0	0	3	0	0	0	0	0	0	0	5
Mallard	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	11
Mourning Dove	0	0	3	0	1	0	1	0	3	0	0	0	0	0	1	0	1	0	0	0	10
Northern Rough-winged Swallow	0	0	0	0	0	0	33	0	5	0	0	0	8	0	0	0	0	0	2	0	48
Nuttall's Woodpecker	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	4
Orange-crowned Warbler	2	0	1	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	6
Pacific-slope Flycatcher	1	0	1	0	1	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	6
Pied-billed Grebe	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Red-tailed Hawk	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Red-winged Blackbird	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3

**Appendix I (cont.)
Avian Point Count Survey Results**

Species	Point Count Location																				TOTAL
	1		2		3		4		5		6		7		8		9		10		
	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	
Session 2 – June 27 (pm) and June 28 (am), 2018 (continued)																					
Ruddy Duck	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	8
Snowy Egret	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	3
Song Sparrow	1	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	4
Tree Swallow	0	0	2	0	0	0	0	0	0	0	1	0	17	0	0	0	0	0	0	0	20
Unidentified Gull	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Unidentified Swallow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Unidentified Woodpecker	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Western Gull	0	0	2	0	0	0	0	0	3	0	11	0	0	0	0	0	0	0	2	0	18
White-tailed Kite†	0	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	4
White-throated Swift	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Wrentit	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	5
Yellow Warbler†	2	0	3	0	1	0	1	0	1	0	4	0	1	0	2	0	0	0	0	0	15
Yellow-breasted Chat†	1	0	3	0	3	0	2	1	2	0	2	0	3	1	2	0	1	0	0	0	21
TOTAL	95	0	41	1	26	0	54	1	50	0	114	0	59	2	77	0	13	2	20	1	556
Session 3 – November 14 (pm) and November 15 (am), 2018																					
American Crow	2	0	0	0	5	0	1	0	6	0	0	0	0	0	0	0	0	0	0	0	14
American Coot	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	11
American Kestrel	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	4
American White Pelican†	0	0	0	0	0	0	0	0	10	0	0	0	11	0	0	0	0	0	0	0	21
Anna's Hummingbird	1	0	1	0	2	0	0	0	1	0	0	0	0	0	0	0	3	0	0	0	8
Bewick's Wren	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
Black Phoebe	2	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	4
Black-crowned Night-Heron	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4
Blue Gray gnatcatcher	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
Bushtit	0	0	8	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	14

**Appendix I (cont.)
Avian Point Count Survey Results**

Species	Point Count Location																				TOTAL
	1		2		3		4		5		6		7		8		9		10		
	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	
Session 3 – November 14 (pm) and November 15 (am), 2018 (continued)																					
California Thrasher	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	2
California Towhee	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	4
Cassin's Kingbird	3	0	0	0	8	0	2	0	0	0	0	0	1	0	1	0	0	0	0	0	15
Cinnamon Teal	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4
Common Yellowthroat	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	3
Cooper's Hawk†	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
Double-crested Cormorant†	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	7
Eared Grebe	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
European Starling	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
Eurasian Collared-Dove	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3
Great Blue Heron	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Great Egret	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	4
Great Horned Owl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
House Finch	6	0	4	0	6	0	4	0	13	0	0	0	3	0	1	0	2	0	4	0	43
House Wren	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Hutton's Vireo	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Killdeer	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	3
Lesser Goldfinch	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2
Lincoln's Sparrow	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Mallard	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	6
Mourning Dove	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
Northern Shoveler	0	0	0	0	0	0	0	0	0	0	44	0	0	0	0	0	0	0	0	0	44
Northern Harrier†	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2
Nuttall's Woodpecker	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Orange-crowned Warbler	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1

**Appendix I (cont.)
Avian Point Count Survey Results**

Species	Point Count Location																				TOTAL
	1		2		3		4		5		6		7		8		9		10		
	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	
Session 3 – November 14 (pm) and November 15 (am), 2018 (continued)																					
Pied-billed Grebe	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
Red-shoulder Hawk†	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Red-tailed Hawk	1	0	0	0	4	0	0	0	0	0	0	0	1	0	5	0	0	0	0	0	11
Red-winged Blackbird	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Ring-billed Gull	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Ruby-crowned Kinglet	0	0	2	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	5
Ruddy Duck	0	0	0	0	0	0	0	0	0	0	28	0	0	0	0	0	0	0	0	0	28
Snowy Egret	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
Song Sparrow	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	4
Tree Swallow	0	0	0	0	0	0	0	0	0	0	6	0	34	0	0	0	0	0	0	0	40
Turkey Vulture†	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
Unidentified Passerine	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Western Gull	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	5
White-crowned Sparrow	0	0	0	0	18	1	0	0	9	0	0	0	0	0	0	0	0	0	0	0	28
White-throated Swift	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	3
Wrentit	1	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	6
Yellow-rumped Warbler	2	0	3	0	0	0	2	0	1	0	0	0	1	0	4	0	5	0	0	0	18
TOTAL	20	0	23	0	59	1	16	0	51	2	132	2	59	0	22	0	17	1	6	0	410

† Special Status Species

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Appendix J

Small Mammal Trapping Results

Appendix J Small Mammal Trapping Results

Species		Session 1 (April 2018)			Session 2 (June 2018)			Total		
Common Name	Scientific Name†	T1	T2	Total	T1	T2	Total	T1	T2	Total
Array 1 - Monument Mesa										
California pocket mouse	<i>Chaetodipus californicus</i>	10	12	22	6	6	12	16	18	34
	recap	4	2	6	3	4	7	7	6	13
	Total	14	14	28	9	10	19	23	24	47
San Diego desert woodrat	<i>Neotoma lepida intermedia</i> †	1	0	1	1	1	2	2	1	3
	recap	0	0	0	0	1	1	0	1	1
	Total	1	0	1	1	2	3	2	2	4
California deer mouse	<i>Peromyscus californicus</i>	21	19	40	12	15	27	33	34	67
	recap	4	3	7	9	8	17	13	11	24
	Total	25	22	47	21	23	44	46	45	91
Western harvest mouse	<i>Reithrodontomys megalotis</i>	0	0	0	1	0	1	1	0	1
	recap	0	0	0	0	0	0	0	0	0
	Total	0	0	0	1	0	1	1	0	1
	TOTAL	40	36	76	32	35	67	72	71	143
Array 2 - Southwest										
California pocket mouse	<i>Chaetodipus californicus</i>	0	2	2	0	0	0	0	2	2
	recap	0	0	0	0	0	0	0	0	0
	Total	0	2	2	0	0	0	0	2	2
Brush deer mouse	<i>Peromyscus boylii</i>	4	7	11	1	0	1	5	7	12
	recap	2	0	2	0	0	0	2	0	2
	Total	6	7	13	1	0	1	7	7	14
California deer mouse	<i>Peromyscus californicus</i>	13	15	28	0	0	0	13	15	28
	recap	0	3	3	0	0	0	0	3	3
	Total	13	18	31	0	0	0	13	18	31
North American deer mouse	<i>Peromyscus maniculatus</i>	0	0	0	2	1	3	2	1	3
	recap	0	0	0	0	0	0	0	0	0
	Total	0	0	0	2	1	3	2	1	3
Western harvest mouse	<i>Reithrodontomys megalotis</i>	3	3	6	3	5	8	6	8	14
	recap	2	2	4	0	0	0	2	2	4
	Total	5	5	10	3	5	8	8	10	18
Desert cottontail	<i>Sylvilagus audubonii</i>	0	0	0	1	0	1	1	0	1
	recap	0	0	0	0	0	0	0	0	0
	Total	0	0	0	1	0	1	1	0	1
California ground squirrel	<i>Otospermophilus beecheyi</i>	0	0	0	0	1	1	0	1	1
	recap	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	1	1	0	1	1
	TOTAL	24	32	56	7	7	14	31	39	70

Appendix J (cont.) Small Mammal Trapping Results

Species		Session 1 (April 2018)			Session 2 (June 2018)			Total		
Common Name	Scientific Name†	T1	T2	Total	T1	T2	Total	T1	T2	Total
Array 3 - Northwest										
California pocket mouse	<i>Chaetodipus californicus</i>	1	7	8	3	6	9	4	13	17
	recap	0	3	3	1	8	9	1	11	12
	Total	1	10	11	4	14	18	5	24	29
Brush deer mouse	<i>Peromyscus boylii</i>	2	0	2	2	3	5	4	3	7
	recap	0	0	0	0	2	2	0	2	2
	Total	2	0	2	2	5	7	4	5	9
California deer mouse	<i>Peromyscus californicus</i>	1	1	2	0	0	0	1	1	2
	recap	1	0	1	0	0	0	1	0	1
	Total	2	1	3	0	0	0	2	1	3
North American deer mouse	<i>Peromyscus maniculatus</i>	0	0	0	6	5	11	6	5	11
	recap	0	0	0	1	5	6	1	5	6
	Total	0	0	0	7	10	17	7	10	17
Western harvest mouse	<i>Reithrodontomys megalotis</i>	0	0	0	2	0	2	2	0	2
	recap	0	0	0	1	0	1	1	0	1
	Total	0	0	0	3	0	3	3	0	3
Botta's pocket gopher	<i>Thomomys bottae</i>	1	0	1	0	0	0	1	0	1
	recap	0	0	0	0	0	0	0	0	0
	Total	1	0	1	0	0	0	1	0	1
	TOTAL	6	11	17	16	29	45	22	40	62
Array 4.1 - Baseball Fields and Dairy Mart										
California pocket mouse	<i>Chaetodipus californicus</i>	1	4	5	0	0	0	1	4	5
	recap	0	0	0	0	0	0	0	0	0
	Total	1	4	5	0	0	0	1	4	5
Brush deer mouse	<i>Peromyscus boylii</i>	3	2	5	0	0	0	3	2	5
	recap	1	2	3	0	0	0	1	2	3
	Total	4	4	8	0	0	0	4	4	8
California deer mouse	<i>Peromyscus californicus</i>	0	2	2	0	0	0	0	2	2
	recap	0	2	2	0	0	0	0	2	2
	Total	0	4	4	0	0	0	0	4	4
Western harvest mouse	<i>Reithrodontomys megalotis</i>	1	4	5	0	0	0	1	4	5
	recap	1	0	1	0	0	0	1	0	1
	Total	2	4	6	0	0	0	2	4	6
	TOTAL	7	16	23	0	0	0	7	16	23
Array 4.2 - Spooners Mesa										
California pocket mouse	<i>Chaetodipus californicus</i>	0	0	0	7	5	12	7	5	12
	recap	0	0	0	3	2	5	3	2	5
	Total	0	0	0	10	7	17	10	7	17

Appendix J (cont.) Small Mammal Trapping Results

Species		Session 1 (April 2018)			Session 2 (June 2018)			Total		
Common Name	Scientific Name†	T1	T2	Total	T1	T2	Total	T1	T2	Total
Array 4.2 - Spooners Mesa (continued)										
California deer mouse	<i>Peromyscus californicus</i>	0	0	0	2	4	6	2	4	6
	recap	0	0	0	0	1	1	0	1	1
	Total	0	0	0	2	5	7	2	5	7
North American deer mouse	<i>Peromyscus maniculatus</i>	0	0	0	13	10	23	13	10	23
	recap	0	0	0	4	3	7	4	3	7
	Total	0	0	0	17	13	30	17	13	30
	TOTAL	0	0	0	29	25	54	29	25	54
TOTAL										
California pocket mouse	<i>Chaetodipus californicus</i>	12	25	37	16	17	33	28	42	70
	recap	4	5	9	7	14	21	11	19	30
	Total	16	30	46	23	31	54	39	61	100
San Diego desert woodrat	<i>Neotoma lepida intermedia</i> †	1	0	1	1	1	2	2	1	3
	recap	0	0	0	0	1	1	0	1	1
	Total	1	0	1	1	2	3	2	2	4
Brush deer mouse	<i>Peromyscus boylii</i>	9	9	18	3	3	6	12	12	24
	recap	3	2	5	0	2	2	3	4	7
	Total	12	11	23	3	5	8	15	16	31
California deer mouse	<i>Peromyscus californicus</i>	35	37	72	14	19	33	49	56	105
	recap	5	8	13	9	9	18	14	17	31
	Total	40	45	85	23	28	51	63	73	136
North American deer mouse	<i>Peromyscus maniculatus</i>	0	0	0	21	16	37	21	16	37
	recap	0	0	0	5	8	13	5	8	13
	Total	0	0	0	26	24	50	26	24	50
California ground squirrel	<i>Otospermophilus beecheyi</i>	0	0	0	0	1	1	0	1	1
	recap	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	1	1	0	1	1
Western harvest mouse	<i>Reithrodontomys megalotis</i>	4	7	11	6	5	11	10	12	22
	recap	3	2	5	1	0	1	4	2	6
	Total	7	9	16	7	5	12	14	14	28
Desert cottontail	<i>Sylvilagus audubonii</i>	0	0	0	1	0	1	1	0	1
	recap	0	0	0	0	0	0	0	0	0
	Total	0	0	0	1	0	1	1	0	1
Botta's pocket gopher	<i>Thomomys bottae</i>	1	0	1	0	0	0	1	0	1
	recap	0	0	0	0	0	0	0	0	0
	Total	1	0	1	0	0	0	1	0	1
	TOTAL	77	95	172	84	96	180	161	191	352

† Special Status Species

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Appendix K

Wildlife Camera Survey Results

Appendix K Wildlife Camera Survey Results

Species		Number of Detections						
Common Name	Scientific Name	Camera Station						Total
		1	2	3	4	5	6	
Session 1 – March 7-21, 2018								
Mallard	<i>Anas platyrhynchos</i>	--	--	--	--	--	--	0
Great Horned Owl	<i>Bubo virginianus</i>	--	--	1	--	--	--	1
Anna's Hummingbird	<i>Calypte anna</i>	--	--	--	--	--	--	0
Coyote	<i>Canis latrans</i>	3	5	11	12	3	5	39
Unidentified Thrush	<i>Catharus sp.</i>	--	--	--	--	--	--	0
Opossum	<i>Didelphis virginiana</i>	--	--	1	2	--	--	3
Greater Roadrunner	<i>Geococcyx californianus</i>	--	--	--	--	--	--	0
House Finch	<i>Haemorhous mexicanus</i>	--	--	--	--	--	--	0
Bobcat	<i>Lynx rufus</i>	--	--	2	2	--	--	4
Song Sparrow	<i>Melospiza melodia</i>	--	--	--	--	--	--	0
California Towhee	<i>Melospiza crissalis</i>	--	--	--	--	--	--	0
Unidentified Woodrat	<i>Neotoma sp.</i>	--	--	--	2	1	--	3
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	--	--	--	--	2	--	2
Western Tiger Swallowtail	<i>Papilio rutulus</i>	--	--	--	--	--	--	0
Raccoon	<i>Procyon lotor</i>	--	--	4	1	19	--	24
Bushtit	<i>Psaltriparus minimus</i>	--	--	--	--	--	--	0
Black Phoebe	<i>Sayornis nigricans</i>	--	--	--	--	--	--	0
Great Basin Fence Lizard	<i>Sceloporus occidentalis longipies</i>	--	--	2	--	--	--	2
California Ground Squirrel	<i>Spermophilus beecheyi</i>	--	--	7	--	--	--	7
Lesser Goldfinch	<i>Spinus psaltria</i>	--	--	--	--	--	--	0
Desert Cottontail	<i>Sylvilagus audubonii</i>	--	--	2	39	7	--	48
Brush Rabbit	<i>Sylvilagus bachmani</i>	--	--	--	--	--	--	0
Unidentified Moth	<i>unidentified</i>	--	--	--	--	--	--	0
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	--	--	--	1	--	--	1
Session 1 Total		3	5	30	59	32	5	134
Session 2 – May 7 - 22, 2018								
Mallard	<i>Anas platyrhynchos</i>	--	--	1	--	--	--	1
Great Horned Owl	<i>Bubo virginianus</i>	--	--	--	--	--	--	0
Anna's Hummingbird	<i>Calypte anna</i>	--	--	2	--	--	--	2
Coyote	<i>Canis latrans</i>	1	--	13	24	5	18	61
Unidentified Thrush	<i>Catharus sp.</i>	--	--	1	--	--	--	1
Opossum	<i>Didelphis virginiana</i>	2	--	7	--	2	--	11
Greater Roadrunner	<i>Geococcyx californianus</i>	1	--	--	2	--	--	3
House Finch	<i>Haemorhous mexicanus</i>	--	--	--	1	--	--	1
Bobcat	<i>Lynx rufus</i>	1	--	1	4	--	2	8
Song Sparrow	<i>Melospiza melodia</i>	--	--	19	--	1	--	20
California Towhee	<i>Melospiza crissalis</i>	--	--	1	--	--	--	1

**Appendix K (cont.)
Wildlife Camera Survey Results**

Species		Number of Detections						
Common Name	Scientific Name	Camera Station						Total
		1	2	3	4	5	6	
Session 2 – May 7 - 22, 2018 (continued)								
Unidentified Woodrat	<i>Neotoma sp.</i>	--	--	1	--	1	--	2
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	--	--	--	--	--	--	0
Western Tiger Swallowtail	<i>Papilio rutulus</i>	2	--	--	--	--	--	2
Raccoon	<i>Procyon lotor</i>	2	--	3	--	2	--	7
Bushtit	<i>Psaltriparus minimus</i>	--	--	1	--	--	--	1
Black Phoebe	<i>Sayornis nigricans</i>	--	--	--	--	--	--	0
Great Basin Fence Lizard	<i>Sceloporus occidentalis longipies</i>	--	--	1	--	--	--	1
California Ground Squirrel	<i>Spermophilus beecheyi</i>	--	--	9	--	--	--	9
Lesser Goldfinch	<i>Spinus psaltria</i>	--	--	--	1	--	--	1
Desert Cottontail	<i>Sylvilagus audubonii</i>	--	--	1	17	16	--	34
Brush Rabbit	<i>Sylvilagus bachmani</i>	--	--	--	--	1	--	1
Unidentified Moth	<i>unidentified</i>	--	--	--	--	1	--	1
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	--	--	--	--	--	--	0
Session 2 Total		9	0	61	49	29	20	168
Session 3 – July 3 - 17, 2018								
Mallard	<i>Anas platyrhynchos</i>	--	--	--	--	--	--	0
Great Horned Owl	<i>Bubo virginianus</i>	--	--	--	--	--	--	0
Anna's Hummingbird	<i>Calypte anna</i>	--	--	--	--	--	--	0
Coyote	<i>Canis latrans</i>	4	1	31	1	3	1	41
Unidentified Thrush	<i>Catharus sp.</i>	--	--	--	--	--	--	0
Opossum	<i>Didelphis virginiana</i>	--	--	--	--	--	--	0
Greater Roadrunner	<i>Geococcyx californianus</i>	--	--	--	--	--	--	0
House Finch	<i>Haemorhous mexicanus</i>	--	--	--	3	2	--	5
Bobcat	<i>Lynx rufus</i>	4	--	10	--	--	--	14
Song Sparrow	<i>Melospiza melodia</i>	--	1	--	--	5	--	6
California Towhee	<i>Melospiza crissalis</i>	--	--	--	--	--	--	0
Unidentified Woodrat	<i>Neotoma sp.</i>	--	--	--	--	--	--	0
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	--	--	--	--	--	--	0
Western Tiger Swallowtail	<i>Papilio rutulus</i>	--	--	--	--	--	--	0
Raccoon	<i>Procyon lotor</i>	1	1	2	--	2	--	6
Bushtit	<i>Psaltriparus minimus</i>	--	--	--	--	--	--	0
Black Phoebe	<i>Sayornis nigricans</i>	--	--	3	--	--	--	3
Great Basin Fence Lizard	<i>Sceloporus occidentalis longipies</i>	--	--	1	--	1	--	2
California Ground Squirrel	<i>Spermophilus beecheyi</i>	--	--	26	--	3	--	29
Lesser Goldfinch	<i>Spinus psaltria</i>	--	--	--	--	--	--	0
Desert Cottontail	<i>Sylvilagus audubonii</i>	4	--	--	--	25	--	29
Brush Rabbit	<i>Sylvilagus bachmani</i>	--	--	--	--	--	--	0

**Appendix K (cont.)
Wildlife Camera Survey Results**

Species		Number of Detections						
Common Name	Scientific Name	Camera Station						Total
		1	2	3	4	5	6	
Session 3 – July 3 - 17, 2018 (continued)								
Unidentified Moth	<i>unidentified</i>	--	--	--	--	--	--	0
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	--	--	--	--	--	--	0
Session 3 Total		13	3	73	4	41	1	135
Total Detections								
Mallard	<i>Anas platyrhynchos</i>	--	--	1	--	--	--	1
Great Horned Owl	<i>Bubo virginianus</i>	--	--	1	--	--	--	1
Anna's Hummingbird	<i>Calypte anna</i>	--	--	2	--	--	--	2
Coyote	<i>Canis latrans</i>	8	6	55	37	11	24	141
Unidentified Thrush	<i>Catharus sp.</i>	--	--	1	--	--	--	1
Opossum	<i>Didelphis virginiana</i>	2	--	8	2	4	--	16
Greater Roadrunner	<i>Geococcyx californianus</i>	1	--	--	2	--	--	3
House Finch	<i>Haemorhous mexicanus</i>	--	--	--	4	--	--	4
Bobcat	<i>Lynx rufus</i>	5	--	13	6	--	2	26
Song Sparrow	<i>Melospiza melodia</i>	--	1	19	--	6	--	26
California Towhee	<i>Melospiza crissalis</i>	--	--	1	--	--	--	1
Unidentified Woodrat	<i>Neotoma sp.</i>	--	--	1	2	2	--	5
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	--	--	--	--	2	--	2
Western Tiger Swallowtail	<i>Papilio rutulus</i>	2	--	--	--	--	--	2
Raccoon	<i>Procyon lotor</i>	3	1	9	1	23	--	37
Bushtit	<i>Psaltriparus minimus</i>	--	--	1	--	--	--	1
Black Phoebe	<i>Sayornis nigricans</i>	--	--	3	--	--	--	3
Great Basin Fence Lizard	<i>Sceloporus occidentalis longipies</i>	--	--	4	--	1	--	5
California Ground Squirrel	<i>Spermophilus beecheyi</i>	--	--	42	--	3	--	45
Lesser Goldfinch	<i>Spinus psaltria</i>	--	--	--	1	--	--	1
Desert Cottontail	<i>Sylvilagus audubonii</i>	4	--	3	56	48	--	111
Brush Rabbit	<i>Sylvilagus bachmani</i>	--	--	--	--	1	--	1
Unidentified Moth	<i>unidentified</i>	--	--	--	--	1	--	1
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	--	--	--	1	--	--	1
TOTAL		25	8	164	112	102	26	437

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Appendix L

Representative Photographs



Photo 1: Habitat Mapping. Overview of the southwest portion of the TRVRP. Vegetation communities include Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands, Mule Fat Association, Garland Daisy Semi-Natural Stands, California Buckwheat Association, and Goldenbush Provisional Alliance.



Photo 2. Habitat Mapping: Habitat mapped as Goldenbush provisional alliance in the southwest portion of the TRVRP.

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Photo 3. Special Status Plant Species: Singlewhorl burrobrush (*Ambrosia monogyra*) observed in the southwest portion of the TRVRP in Smuggler's Gulch.



Photo 4. Special Status Plant Species: San Diego barrel cactus (*Ferocactus viridescens*) observed in the southwest portion of the TRVRP on Spooner's Mesa.

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Photo 5. Butterflies: western pygmy blue (*Brephidium exila*)

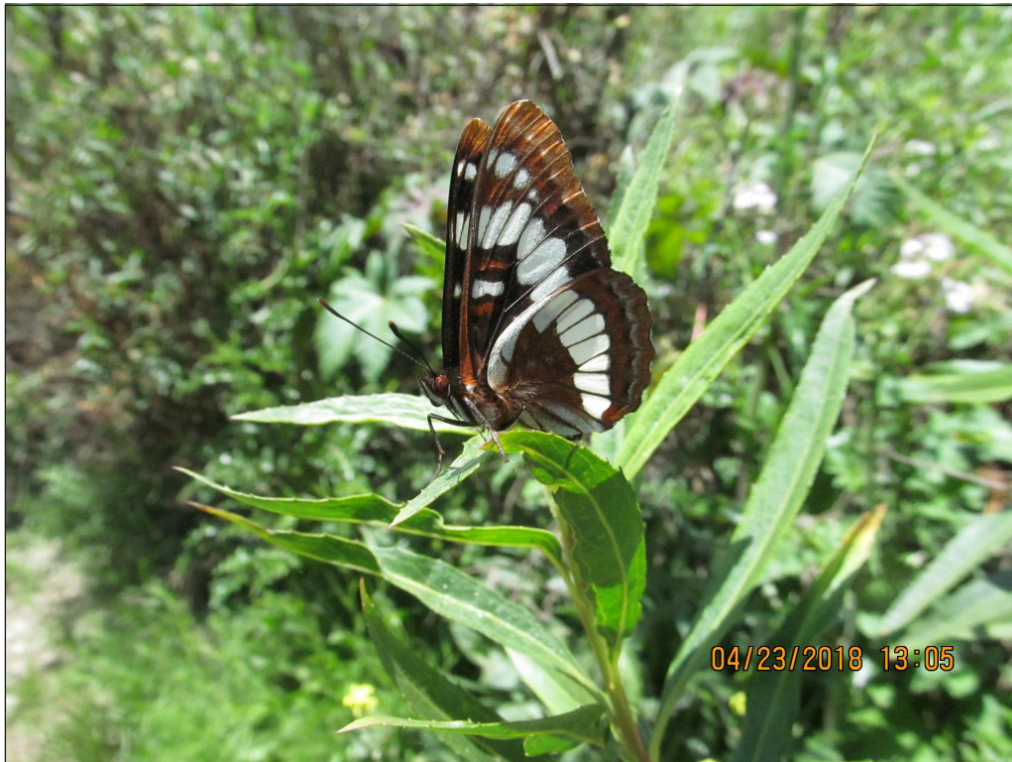


Photo 6. Butterflies: Lorquin's admiral (*Limenitis lorquini*)

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Photo 7: Amphibians: Survey areas included the Duck Ponds adjacent to the Tijuana River corridor in the northwest at amphibian survey location 1.



Photo 8: American bullfrog (*Lithobates catesbeianus*) in the Duck Ponds adjacent to the Tijuana River corridor in the northwest at amphibian survey location 1.

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Photo 9. Reptiles: Drift-fence funnel trap installation in the northwest at trapping location 4.



Photo 10. Reptiles: Baja California coachwhip (*Coluber fuliginosus*) captured in the northwest at trapping location 4.

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Photo 11: Bats: Surveys included abandoned buildings in the southwest portion of the park, south of the Tijuana River.



Photo 12: Bats: Surveys included abandoned buildings in the northwest portion of the park at the Brown Fill property.

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Photo 13: Small mammals: California pocket mouse (*Chaetodipus californicus*) with mark for recapture captured in Array 1 in the southeast portion of the TRVRP during the second trapping session in June 2018.



Photo 14: Small mammals: Brush deermouse (*Peromyscus boylii*) captured in Array 2A in the western portion of the TRVRP captured during the first trapping session in April 2018.

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Photo 15. Greater Roadrunner carrying a prey item (unknown lizard species) captured at Camera 1 in May 2018 in the central portion of the TRVRP south of Butterfly Gardens along the Tijuana River.



Photo 16. Coyote captured at Camera 2 in March 2018 in the northwestern portion of the TRVRP, west of Saturn Boulevard, and north of Tijuana River.

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Photo 17. Nursing female coyote captured at Camera 3 in May in the southwestern portion of the TRVRP, north of Monument Road, and south of Tijuana River.



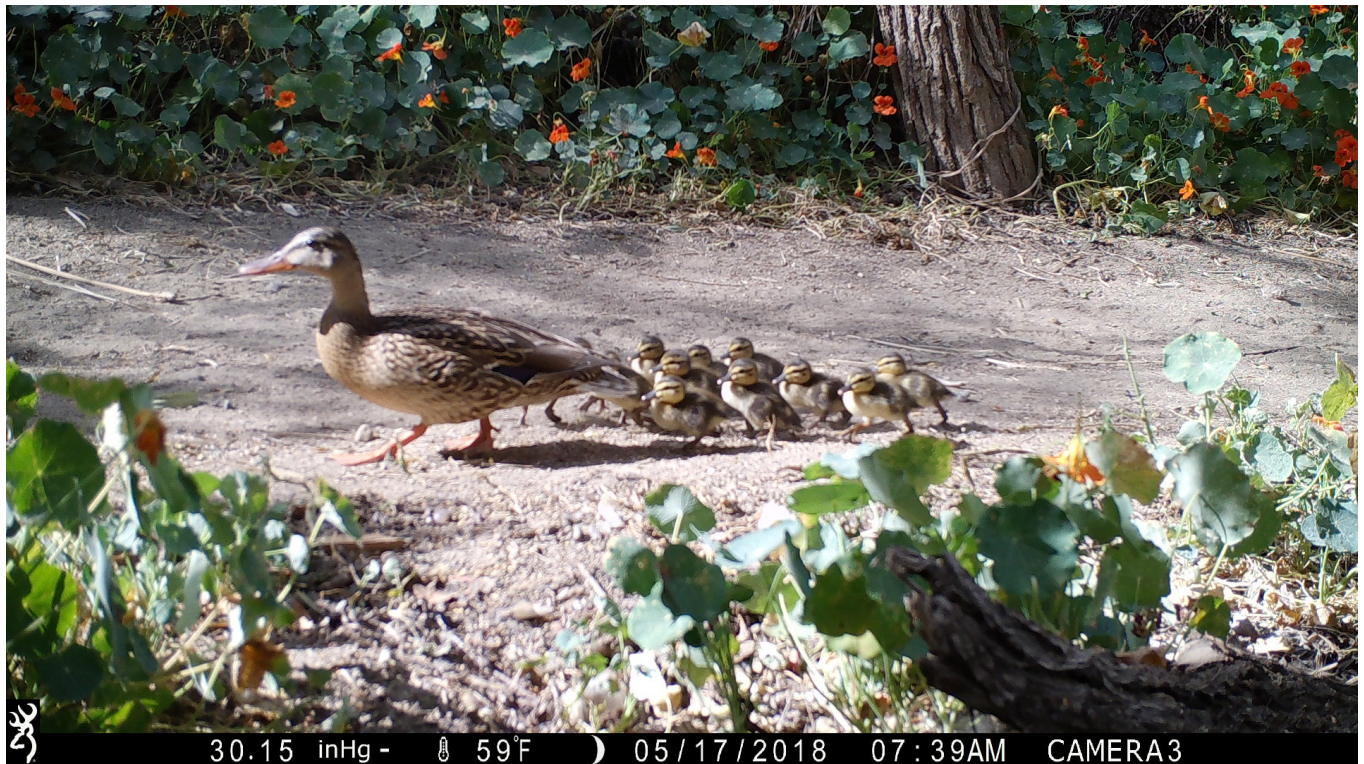
Photo 18. Three coyote pups captured at Camera 3 in May in the southwestern portion of the TRVRP, north of Monument Road, and south of Tijuana River.

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30.24 inHg ↓ 80°F 03/19/2018 11:25AM CAMERA3

Photo 19. Bobcat captured at Camera 3 in March in the southwestern portion of the TRVRP, north of Monument Road, and south of Tijuana River.



30.15 inHg - 59°F 05/17/2018 07:39AM CAMERA3

Photo 20. Adult mallard with ducklings captured at Camera 3 in May in the southwestern portion of the TRVRP, north of Monument Road, and south of Tijuana River.

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Photo 21. Nursing female coyote captured at Camera 4 in May in the southeastern portion of the TRVRP, east of Hollister Street, and south of Tijuana River.



Photo 22. Black-crowned Night-Heron at Camera 5 in March in the southeastern portion of the TRVRP, south of Dairy Mart Pond, and north of Tijuana River.

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30.12 inHg - 18°F 03/08/2018 05:54AM CAMERA5

Photo 23. Raccoon captured at Camera 5 in March in the southeastern portion of the TRVRP, south of Dairy Mart Pond, and north of Tijuana River.



30.15 inHg - 71°F 05/16/2018 07:06PM CAMERA6

Photo 24. Two coyotes captured at Camera 6 in May in the southeastern portion of the TRVRP, north of Monument Road, and south of Tijuana River.

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