BASELINE BIODIVERSITY REPORT
FOR THE
DICTIONARY HILL PRESERVE
COUNTY OF SAN DIEGO
DEPARTMENT OF PARKS AND RECREATION

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EXECUTIVE SUMMARY

In 2017, the County of San Diego (County) Department of Parks and Recreation acquired Dictionary Hill Preserve (hereafter referred to as the Preserve) totaling approximately 175 acres. The Preserve is located within the County's Multiple Species Conservation Plan (MSCP) South County Subarea Plan boundaries and consists primarily of Diegan coastal sage scrub, disturbed habitat, and non-native grassland. The majority of the habitat is considered moderate to high quality, although some areas are considered low quality and have been impacted by human activities (e.g., unauthorized trails). The Resource Management Plan developed for this Preserve will integrate survey information contained within this report.

The following biological inventory surveys were conducted within the Preserve from spring 2018 through fall 2019: vegetation community mapping; rare plant surveys; invasive/non-native plant mapping; butterfly surveys; herpetological drift fence surveys; diurnal and nocturnal avian surveys; small mammal trapping; passive and active acoustical bat surveys; and medium and large mammal remote camera surveys.

Vegetation on the Preserve consists of nine vegetation alliances, associations, or semi-natural stands, including grassland, scrub, and woodland habitats, as well as two land cover types, as described by Oberbauer et al. (2008). A total of 183 plant species were recorded within the Preserve during field surveys, including 62 non-native species and 8 special-status plant species. Three of the detected special-status plant species are also covered by the MSCP Subarea Plan. A total of 101 wildlife species were observed or detected within the Preserve during surveys, including 13 butterflies, 8 reptiles, 52 birds, and 21 mammals. Of these, a total of 12 special-status wildlife species were observed or detected within the Preserve. Four of the detected special-status wildlife species are also covered by the MSCP Subarea Plan.

Based on the surveys conducted in 2018–2020and the presence of multiple special-status species within the Preserve, management recommendations have been included to protect, preserve, and sustain populations of special-status species within the Preserve. General management recommendations to protect special-status plant and wildlife species include monitoring and removing invasive non-native plant species, maintaining fences or barriers to prevent unauthorized public access, and surveying and monitoring for specific species, including federally listed butterfly and bird species. Additional measures to reduce human-caused edge effects (such as introduction of invasive/exotic species and domestic pets; increase in trash/littering; and/or habitat destruction, especially through human-induced fires) may be necessary.

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1.0 INTRODUCTION

1.1 PURPOSE OF THE REPORT

The purpose of this report is to document the results of the baseline biological surveys conducted from spring 2018 to fall 2019 within the Dictionary Hill Preserve (Preserve) for the County of San Diego (County) Department of Parks and Recreation (DPR) (**Figures 1** and **2**). The purpose of these surveys was to identify and map biological resources that exist on the Preserve. This information will be used to create a Resource Management Plan for the Preserve, which will include management directives that will provide the framework for managing and monitoring the resources on the Preserve.

1.2 MULTIPLE SPECIES CONSERVATION PROGRAM CONTEXT

The Preserve is located within the San Diego County Multiple Species Conservation Program (MSCP) Plan boundary (**Figure 3**). Specifically, the Preserve is located within the planning boundaries of the County's MSCP Subarea Plan, which implements the MSCP Plan in the southwestern portion of the County. The Preserve is located within the unincorporated lands in the Metro-Lakeside-Jamul Segment of the MSCP Subarea Plan, which encompasses 172,952 acres. Lands in the Metro-Lakeside-Jamul Segment provide future opportunities for both development and conservation, and require conservation of approximately 33,200 additional acres in an appropriate configuration to achieve the biological goals for this area. Though the Preserve is situated north of the Sweetwater Reservoir/San Miguel Mountain/Sweetwater River biological core resource area, it provides habitat for many species covered by the MSCP Subarea Plan, including variegated dudleya (*Dudleya variegata*), a narrow endemic. Additionally, the Preserve was known to historically support abundant populations of Quino checkerspot butterfly (Quino; *Euphydryas editha quino*), which is also a narrow endemic, though it is unknown if this species is still extant on the Preserve. The Preserve was acquired by DPR in 2017.

SOURCE: SanGIS

Figure 1
Regional Location

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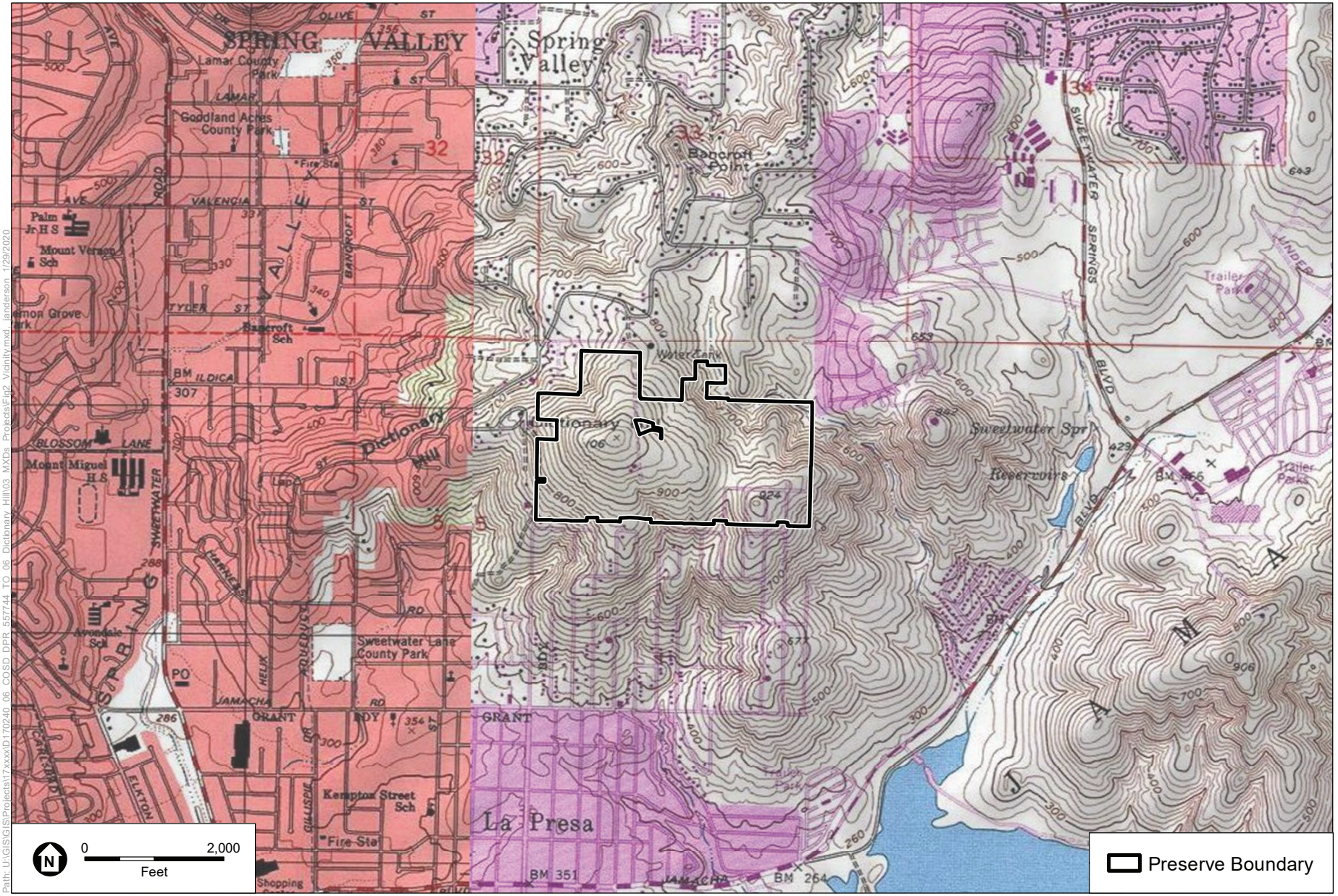

SOURCE: USGS 7.5' Topo Quad Jamul Mountains 1975, 1978; National City 1975, 1978

Figure 2
Vicinity Map

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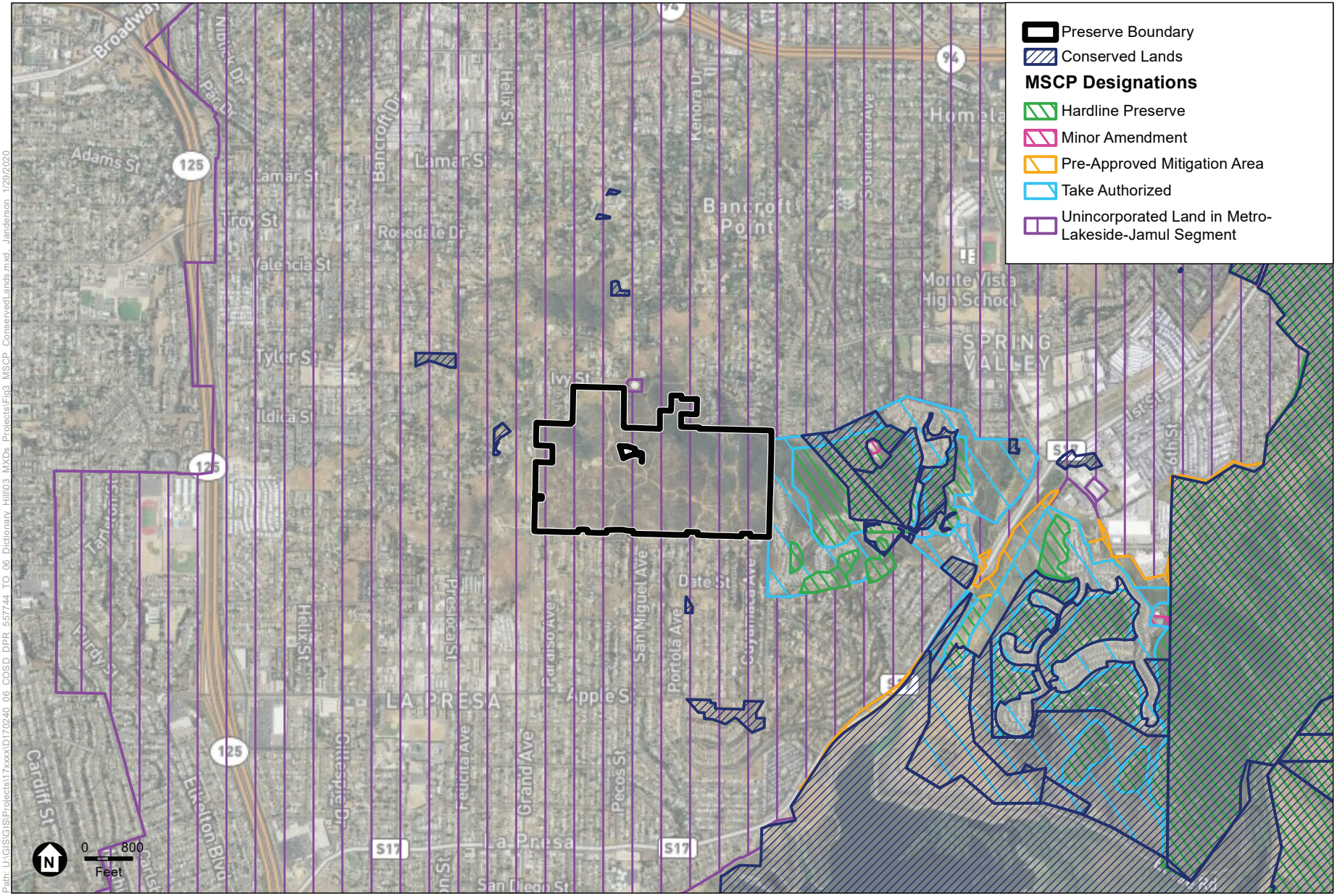

SOURCE: SanGIS 2019

Figure 3
MSCP Designations and Conserved Lands

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2.0 STUDY AREA DESCRIPTION

2.1 PRESERVE LOCATION

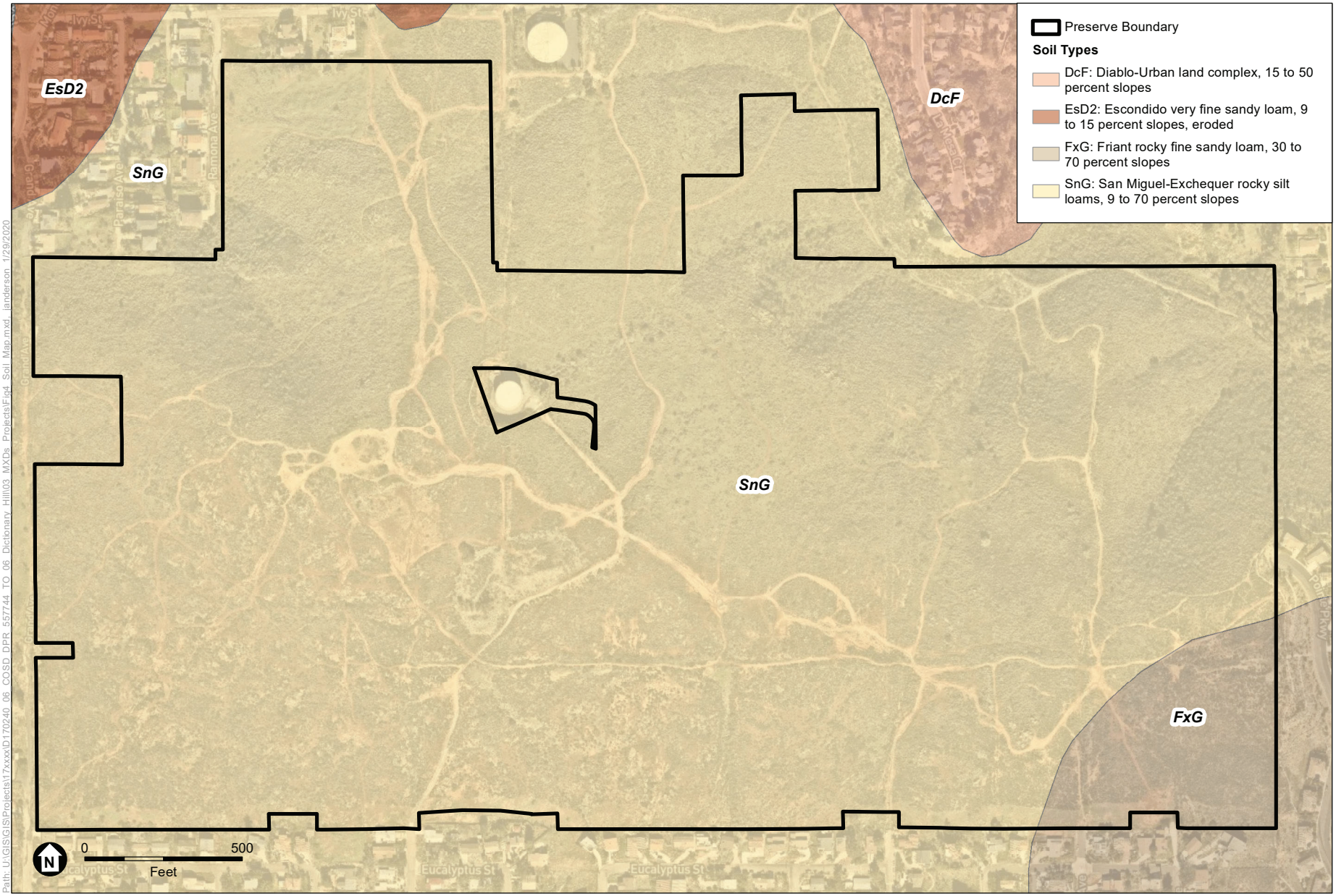
The Preserve is located in the community of Spring Valley in the west-central portion of unincorporated San Diego County, east of State Route 125 and south of State Route 94 (Figure 1). The Preserve is mapped within Section 4, Township 17 South, Range 1 West, of the U.S. Geological Survey (USGS) 7.5-minute topographic map, Jamul Mountains quadrangle (Figure 2). The Preserve is a combination of 97 parcels, encompassing 175 acres. A complete list of Assessor's Parcel Numbers within the Preserve is included in **Appendix A**. The Preserve can currently be accessed from 13 locations around its perimeter, including Buena Vista Avenue, South Barcelona Street, and Grand Avenue in Spring Valley.

2.2 GEOGRAPHICAL SETTING

The Preserve is located in the Peninsular Range Geomorphic Province, and consists of undeveloped open space along the slopes of a mountain named Dictionary Hill. Elevations within the Preserve range from 578 feet to 1,065 feet above mean sea level, with the highest elevation occurring at the peak of the mountain in the central western portion of the Preserve. Bancroft Creek runs through the northeast corner of the Preserve, and eventually discharges into the Sweetwater River that feeds the Sweetwater Reservoir, located 0.7 miles south of the Preserve. Residential development generally surrounds the Preserve in all directions, with large expanses of open space occurring to the southeast, including Jamacha Valley, San Miguel Mountain, and the Jamul Mountains.

2.3 GEOLOGY AND SOILS

The Preserve contains two soil types belonging to two soil series: San Miguel-Exchequer and Friant (**Figure 4**). These two soils mapped for the Preserve consist of residuum derived from weathered metavolcanics and metasedimentary rock (USDA 2019a). Metavolcanic rock and metasedimentary rock is known to support rare and/or sensitive plant species (AECOM 2018a). Descriptions of each soil series and the attendant soil types were derived from U.S. Department of Agricultural Natural Resources Conservation Service, and are described in further detail below.



SOURCE: NRCS; SanGIS 2019

Figure 4
Soils Map

ESA

2.3.1 San Miguel-Exchequer Series

The San Miguel-Exchequer series consists of a mix of 45 percent San Miguel soils, 35 percent Exchequer soils, and 20 percent minor components. This series is described as a rocky silt loam with 9 to 70 percent slopes (SnG). This well-drained series is located on steep slopes and is sourced from residuum derived from metavolcanic rock. The San Miguel and Exchequer components of this series differ slightly in certain characteristics. San Miguel soils are typically 8 to 18 inches deep to unweathered bedrock, with a very high runoff class and a low water-holding capacity (about 3.5 inches). Exchequer soils are typically 10 to 14 inches deep to bedrock, with a high runoff class and a very low water-holding capacity (about 1.5 inches) (USDA 2019b). Based on a K Factor of 0.55, this series is considered to be highly susceptible to erosion (USDA 2019b; MSU 2002). This series makes up roughly 95 percent of the Preserve.

2.3.2 Friant Series

The Friant series consists of shallow and very shallow, well-drained fine sandy loams that formed in material weathered from fine-grained metasedimentary rock. This series is located on mountainous uplands and has slopes of 9 to 70 percent (FxG). Friant soils are typically dark-brown and brown, fine sandy loam soil 12 inches deep to hard metasedimentary rock. Rock outcrops can cover 2 to 10 percent of the surface in some areas. The available water-holding capacity is 0.5 to 1.5 inches with runoff medium to rapid and erosion hazard moderate to high. Based on a K factor of 0.22, this series is considered to be highly susceptible to erosion (USDA 2019c; MSU 2002). This soil type makes up roughly 5 percent of the Preserve, and is present in the lower elevation southeastern portion.

2.4 CLIMATE

The climate of the Preserve is considered Mediterranean, with hot, dry summers and cool, wet winters (George 2019). The closest consistent weather station to the Preserve is located in El Cajon, approximately 6.4 miles north of the Preserve (Western Regional Climate Center 2019). Average annual precipitation in El Cajon is 12.4 inches of rain, with the greatest amount, 2.75 inches, falling in January (**Table 1**). The summer months, from June through September, are generally dry and receive 0.32 inches of rain on average. August is typically the hottest and driest month, with an average of 0.02 inches of rainfall and an average maximum temperature of 88.9 degrees Fahrenheit. Given the Preserve's distance and higher elevation than the El Cajon weather station, temperature and precipitation values may vary slightly. Due to its location in Southern California, the Preserve is subject to Santa Ana winds, which are hot, dry winds that blow from the Great Basin desert typically from September to May. These winds can increase and enhance fire danger (Fovell 2007).

Table 1. Temperature and Precipitation Data for El Cajon (Gillespie) Weather Station (042706)

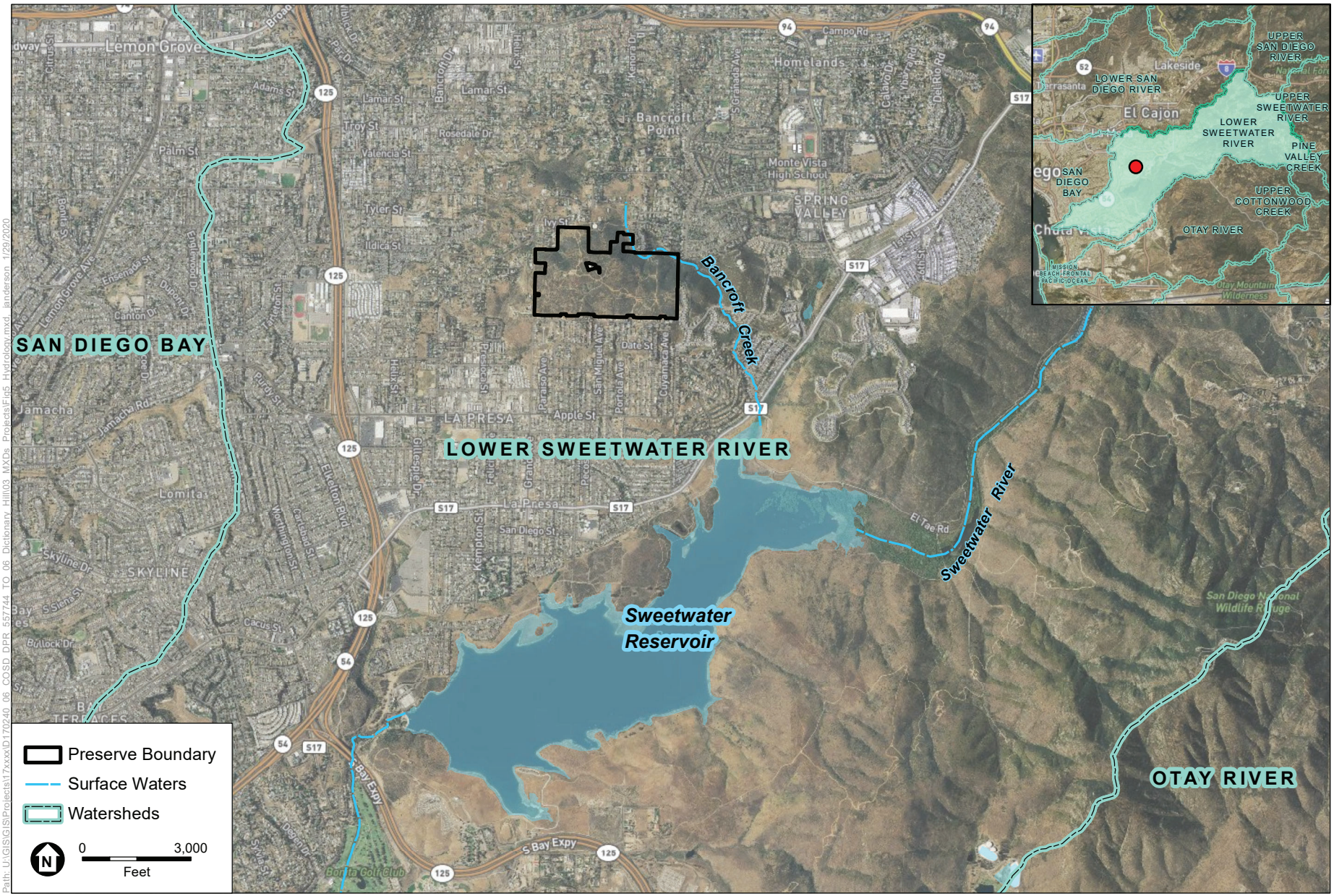
Period of Record: November 1, 1979 through June 9, 2016													
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
Average Maximum Temperature (°F)	69.8	69.7	71.2	75.3	77.4	81.7	87.4	88.9	87.7	81.3	74.7	69.3	**77.9**
Average Minimum Temperature (°F)	42.3	44.1	47.2	50.4	55.3	58.5	62.7	64.2	61.4	54.8	46.2	41.3	**52.4**
Average Total Precipitation (inches)	2.37	2.75	2.30	0.84	0.17	0.07	0.09	0.02	0.14	0.63	1.33	1.70	**12.40**

SOURCE: WRCC 2019.

While California is prone to natural drought periods, California recently experienced an acute drought period lasting about five and a half years, from December of 2011 through April 2017. By the winter of 2013–2014, California had experienced three below-normal rainfall seasons, causing lower groundwater levels and abnormally dry vegetation that raised wildfire risk. Although a heavy rain event occurred toward the beginning of 2016, drought conditions resumed by February of 2016 and continued until April of the following year (NOAA 2019). As of September 2019, San Diego County is still considered abnormally dry (NDMC 2019).

2.5 HYDROLOGY

The Preserve is located within the Sweetwater watershed or Hydrologic Unit (County of San Diego 2014) (**Figure 5**). Within the Sweetwater watershed are three subbasins: the Upper, Middle, and Lower Sweetwater subbasins. The Sweetwater watershed also contains four major waterbodies: Sweetwater River, Sweetwater Reservoir, Loveland Reservoir, and San Diego Bay. The western portion of the Preserve is located within the Lower Sweetwater subbasin and the eastern portion falls within the Middle Sweetwater subbasin. Drainage on the eastern portion of the Preserve eventually flows into Bancroft Creek, which discharges into the Sweetwater Reservoir. Drainage on the western portion of the Preserve eventually flows into the lower portion of the Sweetwater River and into San Diego Bay. A segment of Bancroft Creek and associated riparian vegetation are present in the northeast corner of the Preserve.



SOURCE: SanGIS 2019

Figure 5
Hydrology Map

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2.6 FIRE HISTORY

Based on historical fire data from the California Department of Forestry and Fire Protection and SanGIS (CalFIRE 2019; SanGIS 2019), the Preserve has been affected by one wildfire (**Table 2** and **Figure 6**) according to records beginning in 1878. The most recent fire to burn the Preserve was the Assist #11 Fire of July 1981, which burned approximately 43 percent of the Preserve. The Preserve is located within an area of high wildland fire potential (County of San Diego 2019).

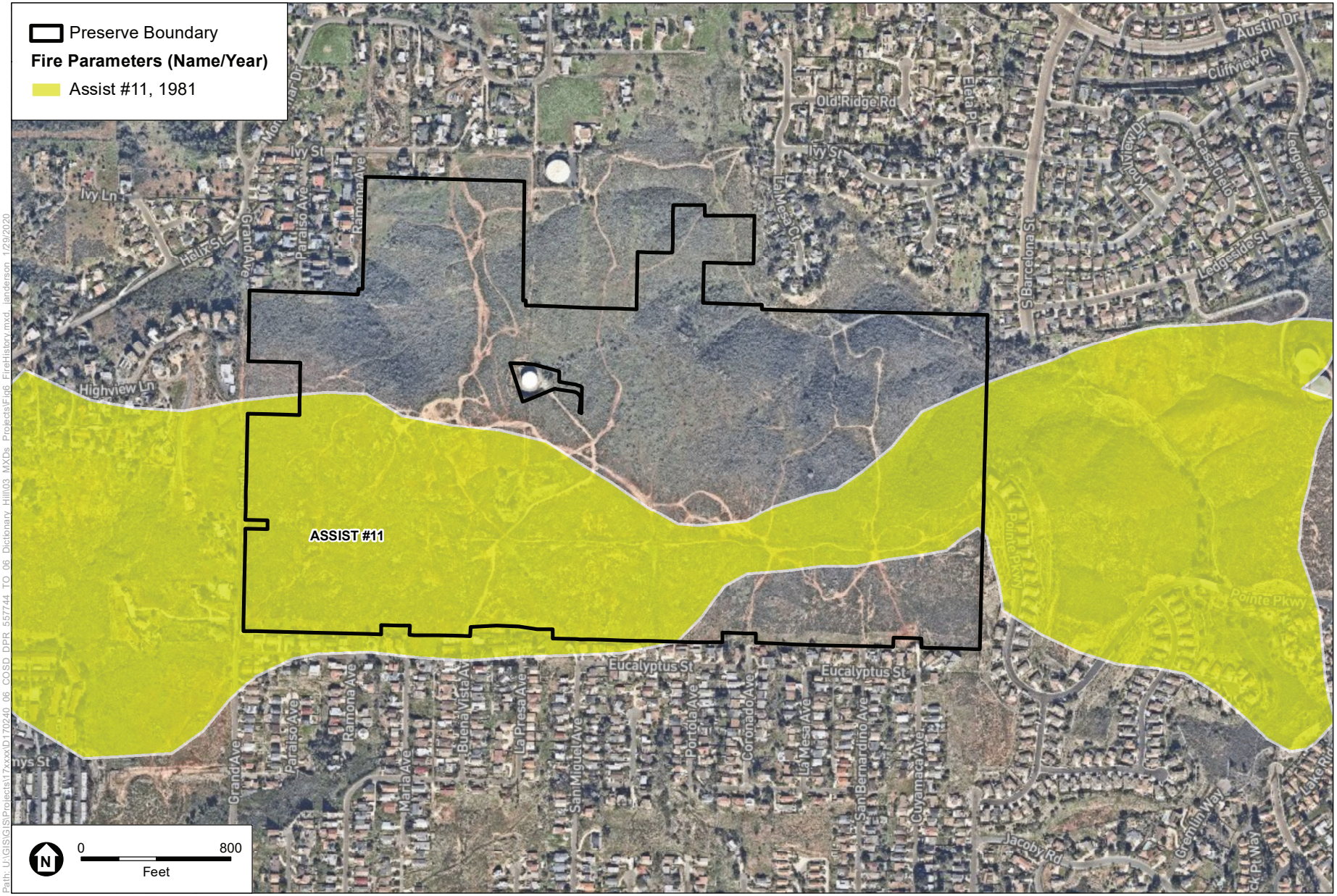
Table 2. Preserve Fire Interval Data

Fire Year	Fire Name	Interval (years)	Acreage Burned on Preserve	Percent of Preserve Burned
1981	Assist #11	–	75.64	43.02

SOURCE: SanGIS 2019; CalFIRE 2019.

2.7 TRAILS

The Preserve has been subjected to long periods of disturbance from the numerous dirt trails created by off-road vehicles and unauthorized use. Unauthorized dirt trails account for approximately 12.99 acres within the Preserve (AECOM 2018a). These trails generally access the top of Dictionary Hill and provide views of the surrounding city along the way. Trails typically exceed ten feet in width and are characterized by steep slopes that often exceed 20 percent. Narrow foot trails meander through the network and access rocky viewpoints. In recent years, the trails have experienced heavy erosion from rainfall, creating deep drainage trenches. Rainfall and limited maintenance have led to vegetation overgrowth along sections of narrow foot trails. The Preserve can currently be accessed from 13 locations around its perimeter with parking located on residential streets. Since being under DPR ownership, access has been limited with gates and rock barriers (AECOM 2018a).



SOURCE: SanGIS 2019; CalFire 2019

Figure 6
Fire History Map

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3.0 METHODS

Baseline biological surveys were conducted on the Preserve between April 2018 and February 2020. **Table 3** lists the survey dates, personnel who conducted the surveys, and the type of survey conducted. Botanical surveys included vegetation mapping, rare plant surveys, and invasive non-native plant species mapping. Wildlife surveys included a butterfly survey, herpetological drift fence surveys, diurnal and nocturnal avian surveys, small mammal trapping, passive and active acoustical bat surveys, and medium and large mammal remote camera surveys.

Table 3. Survey Type, Dates, Number, Personnel, and Survey Conditions

Survey Date	Survey Number	Personnel	Conditions[1]
Botanical Surveys: Vegetation Mapping			
April 13, 2018	1	AECOM	NA
Botanical Surveys: Rare Plant Surveys			
April 10, 2018, and May 2, 2018	1	AECOM	NA
Botanical Surveys: Invasive Non-Native Plant Species Mapping			
April 2 through April 3, 2019	1	Cailin Lyons, Adrienne Lee	Start: 68°F, wind 0 mph, 20% CC, visibility: good End: 78°F, wind 12 mph, 0% CC, visibility: good
Butterfly Survey			
April 11, 2019	1	Barbra Calantas, Alanna Sullivan	Start: 69°F, wind 0 mph, 0% CC, visibility: good End: 68°F, wind: 3 mph 50% CC, visibility: good
Butterfly Survey: Quino Checkerspot Host Plant Mapping			
February 12 and 13, 2020	1	Adrienne Lee, Ian Maunsell*, Seth Reimers*	Start: 47°F, wind 1 mph, 0% CC, visibility: good End: 69°F, wind: 8 mph 0% CC, visibility: good
Herpetofauna Drift Fence Surveys			
April 5 through April 7, 2019	1	Kris Alberts*, Ryan Quilley,* Andy Steyers*	NA
May 13 through May 17, 2019	2	Kris Alberts*	NA
June 10 through June 14, 2019	3	Seth Reimers*	NA
July 8 through July 12, 2019	4	Andy Steyers,* Haley Double*	NA
Avian Nocturnal and Diurnal Surveys			
February 20, 2019	1	Jaclyn Catino-Davenport, Adrienne Lee	Start: 45°F, wind: 0 mph, 0% CC, visibility: good End: 73°F, wind: 3 mph 0% CC, visibility: good
April 9, 2019	2	Jaclyn Catino-Davenport, Adrienne Lee	Start: 50°F, wind: 0 mph, 0% CC, visibility: good End: 64°F, wind: 5 mph 0% CC, visibility: good
July 16, 2019	3	Jaclyn Catino-Davenport, Lisa Maier	Start: 63°F, wind: 0 mph, 100% CC, visibility: poor End: 62°F, wind: 3 mph 80% CC, visibility: fair

Survey Date	Survey Number	Personnel	Conditions[1]
September 27, 2019	4	Jaclyn Catino-Davenport, Lisa Maier	Start: 66°F, wind: 2 mph, 100% CC, visibility: fair, misting End: 69°F, wind: 5 mph 90% CC, visibility: good
Small Mammal Trapping			
November 5 through November 9, 2018	1	Kelly Rios, Seth Reimers*	Temp: 60°F, wind: 1–2 mph, 80% CC Temp: 63°F, wind: 1–2 mph, 95% CC Temp: 64°F, wind: 1–2 mph, 90% CC Temp: 54°F, wind: 1–2 mph, 0% CC
May 27 through May 31, 2019	2	Kelly Rios, Seth Reimers,* Desiree Johnson*	Temp: 60°F, wind: 1–2 mph, 80% CC Temp: 63°F, wind: 1–2 mph, 95% CC Temp: 64°F, wind: 1–2 mph, 90% CC Temp: 54°F, wind: 1–2 mph, 0% CC
Bats – Passive Surveys			
April 18 through April 25, 2019	1	Julie Stout, Karla Flores	NA
June 25 through July 2, 2019	2	Julie Stout, Lisa Maier	NA
Bats – Active Surveys			
April 18, 2019	1	Julie Stout, Karla Flores	Start: 65°F, wind: 0 mph, 0% CC End: 80°F, wind: 5 mph 10% CC
June 25, 2019	2	Julie Stout, Lisa Maier	Start: 60°F, wind: 0 mph, 90% CC End: 65°F, wind: 5 mph 100% CC
Wildlife Cameras			
December 7, 2018 through January 7, 2019	1	Paige Anderson	NA
March 27, 2019 through May 1, 2019	2	Paige Anderson	NA
June 7, 2019 through July 16, 2019	3	Paige Anderson	NA
August 27 through September 27, 2019	4	Adrienne Lee	NA

[1]NA = not applicable due to the survey spanning multiple days and multiple weather conditions

°F = degrees Fahrenheit; mph = miles per hour; CC = cloud cover

* = Blackhawk Environmental personnel

A review of state and federal databases for existing biological resource information for the Preserve was conducted to provide baseline information regarding special-status biological resources potentially occurring on the Preserve and in the surrounding area. Sources reviewed and used include the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants of California (CNPS 2019a); California Natural Diversity Database (CNDDB) (CDFW 2019a); County of San Diego SanBIOS Database (SanBIOS) (County of San Diego 2019); and the U.S. Fish and Wildlife Service (USFWS) Environmental Conservation Online System (ECOS) (USFWS 2019). For all four databases, a search of a 1-mile radius around the Preserve was conducted to determine if there were nearby known occurrences of special-status species (CDFW 2019a). Additionally, a biological survey report that followed County rare plant survey protocols for a development project previously proposed on the site was examined (REC Consultants 2007),

and a plant list compiled by interested citizens with botanical experience in the community that incorporated the REC Consultants data was examined (Dillane and Merzbacher 2017).

For purposes of this Baseline Biodiversity Report, species are considered special-status species if they meet at least one of the following criteria:

Listed or proposed for listing (including candidate species[1]) under the federal Endangered Species Act (FESA) or California Endangered Species Act (CESA).

California Department of Fish and Wildlife (CDFW) Species of Special Concern (CDFW 2019b).

CDFW fully protected species (CDFW 2019b).

CDFW watch list species (CDFW 2019b).

Listed by CNPS as California Rare Plant Ranks (CRPRs) 1A (presumed extinct in California and rare/extinct elsewhere), 1B (rare, threatened, and endangered in California and elsewhere), 2A (presumed extinct in California, but more common elsewhere), 2B (rare, threatened, or endangered in California, but more common elsewhere), 3 (review list: plants about which more information is needed), and 4 (watch list: plants of limited distribution) (CNPS 2019b).

Species considered sensitive by the County (County of San Diego 2006; County of San Diego 2010).

Any species covered by the MSCP Subarea Plan, including narrow endemics (County of San Diego 1997).

3.1 VEGETATION COMMUNITIES/HABITAT

3.1.1 Vegetation Communities Mapping

Vegetation communities and land cover were delineated in the field by AECOM on April 13, 2018. Mapping of the Preserve included a 100-foot buffer pursuant to County guidelines (County of San Diego 2010). Vegetation classification during field mapping was based on the Vegetation Classification Manual for Western San Diego County (VCM) (Sproul et al. 2011) and then cross-walked to the Holland (1986) classification system modified by Oberbauer (Oberbauer et al. 2008).

[1] Candidate species are those petitioned species that are actively being considered for listing under the FESA, as well as those species for which the USFWS has initiated a FESA status review, as announced in the *Federal Register*. Proposed species are those candidate species that were found to warrant listing and have been officially proposed for listing in the *Federal Register*. Under the CESA, candidate species are those species currently petitioned for state-listing status.

Acreage calculations were generated using ArcGIS. Vegetation classifications described in Section 4.1 of this report follow the VCM.

3.2 PLANTS

3.2.1 Special-Status/Rare Plant Surveys

AECOM botanists conducted comprehensive sensitive/rare plant surveys on the Preserve on April 10 and May 2, 2018. Rare plant surveys were conducted in accordance with the County Guidelines Report Format and Content Requirements for Biological Resources (County of San Diego 2010); Guidelines for Conducting and Reporting Botanical Inventories of Federally Listed, Proposed, and Candidate Plants (USFWS 1996); Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities (CDFG 2009; CDFG 2018); and CNPS Botanical Survey Guidelines (CNPS 2001).

All accessible areas with a potential to support rare plant species were surveyed on foot. Surveys were floristic in nature; therefore, all plant species detected were identified to subspecies or variety to determine sensitivity status and were recorded to inventory plant species on the Preserve. For each rare plant species detected, attributes of relative abundance, general distribution, and global positioning system (GPS) coordinates were recorded within the Preserve. Latin and common names follow the Checklist of Vascular Plans of San Diego County (Rebman and Simpson 2014).

The vegetation, elevation, soil types and rock formations, disturbance, status, and distribution within the vicinity of the Preserve were considered when evaluating the Preserve for potential for special-status plant species to occur. The Preserve is located in an area of San Diego County known to support a number of sensitive plant species. Metavolcanic and metasedimentary soils occur over the majority of the Preserve, and these soils are known to support sensitive plants.

3.2.2 Invasive Non-Native Plant Species Mapping

Non-native plant species are defined by California Invasive Plant Council (Cal-IPC) as species that were introduced to California after European contact and as a direct or indirect result of human activity. Invasive non-native plants are also not native, but once introduced, can establish, quickly reproduce and spread, and cause harm to the environment, economy, and/or human health. Once invasive non-native plant species spread into wildland ecosystems, they can hybridize with native plant species, displace native plant and wildlife species, alter biological communities, and/or alter ecosystem processes (Cal-IPC n.d.). Invasive non-native plant surveys were conducted by ESA biologists on April 2 and 3, 2019. Special attention was given to the 29 invasive non-native plant species identified as priorities for near-term management and monitoring by the San Diego

Environmental Mitigation Program Working Group in their Management Priorities for Invasive Non-Native Plants (Conservation Biology Institute 2012). When encountered, these species' locations were mapped with GPS sub-meter accuracy and estimates of population size were recorded using the ArcGIS Collector (Collector app) mobile application. Species of greatest concern include those rated by the California Invasive Plant Council (Cal-IPC) in the Invasive Plant Inventory Database (Cal-IPC 2019), existing on the Federal Invasive and Noxious Plant List (USDA Natural Resources Conservation Service 2014), or occurring on the California Noxious Weeds List (California Department of Food and Agriculture 2019). Species that were considered the most invasive or were represented in a few locations were of greatest priority for mapping individual locations. No Management Level 1 or 2 species were identified on the Preserve (presence of these species would have required ESA to contact the County Project Manager within 7 days of detection to allow the County to treat these species promptly).

3.3 WILDLIFE

3.3.1 Invertebrates

A general butterfly survey was conducted on April 11, 2019, to document the diversity of butterfly species within the Preserve. Additionally, due to historical populations of Quino (federally endangered; MSCP narrow endemic) on-site and within 1 mile of the Preserve (USFWS 2019; County of San Diego 2019), the survey was performed during the flight season for Quino. The survey was conducted by ESA biologists slowly walking meandering transects across the Preserve during the warmest and sunniest period of the day, from late morning to mid-afternoon, when butterfly activity was at its peak, following the Checklist Method (Royer et al. 1998). Areas with flowering plants or potential butterfly nectar sources were checked, and existing trails were walked as they provided easy access through vegetation and butterflies often rest on bare ground. Binoculars were used to aid in butterfly identification. A habitat assessment for special-status butterfly species was conducted concurrently with the general butterfly survey. Any incidental observations of butterflies that were made during other biological surveys were recorded. Survey date, time, personnel, and weather are shown in Table 3. Photographs from the survey can be found in **Appendix F**.

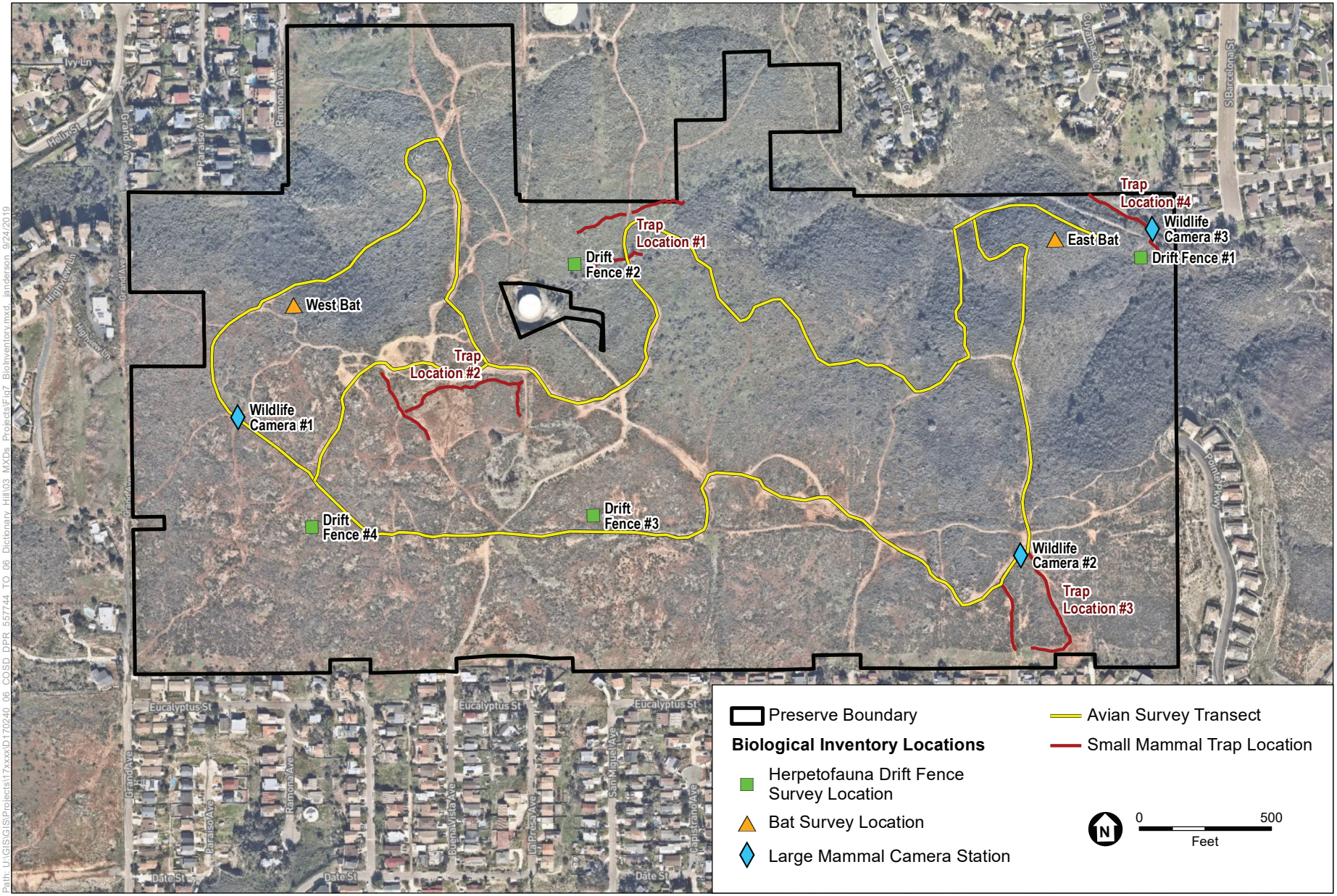
Due to the high potential for Quino to occur on-site, host plant mapping was conducted on February 12 and 13, 2020 for the Preserve following the 2016 USFWS Quino Checkerspot Survey Protocol (USFWS 2016). The entire Preserve was surveyed for known host plants, such as dot-seed plantain (*Plantago erecta*). All locations of host plants were mapped with a GPS unit and populations were estimated to categorize density of host plant patches and recorded using the ArcGIS Collector (Collector app) mobile application.

3.3.2 Herpetofauna

General herpetological surveys were conducted to document the presence of amphibian and reptile species within the Preserve. Herpetological surveys were conducted using drift fences with a box funnel trap at each end of the fence (hereafter referred to as drift fence surveys). Biologists conducted a habitat assessment for herpetofauna by reviewing aerial data and vegetation community mapping and by walking the site to determine suitable locations for drift fences based on soil substrate, topography, and vegetative cover. The biologists assessed the Preserve for the various herpetofaunal species that might occur, and strategically placed drift fences in representative areas for the various vegetation communities that occur within the Preserve to fully capture the diversity of the herpetofauna on-site.

Four drift fences with box funnel traps were installed on the Preserve on April 5, 2019 (**Figure 7**). Each drift fence was 50 feet long and 1 foot tall (composed of thick, dark-green shade cloth), trenched about 2 inches into the ground and staked in place with one box funnel trap (12 by 8 by 18 inches) at each end. Each box funnel trap had two 28-inch-long drift fence "wings" protruding off the front of each trap to increase the size of the funnel. Box funnel traps capture any species that enter them, including small mammals; therefore, each box funnel trap contained a piece of PVC pipe (generally 1 to 2 inches in diameter by 3 to 4 inches long) to provide shelter for captured herpetofauna, and pieces of cotton and a small amount of food to provide shelter and food for small mammals. Each box funnel trap was covered with a 2-foot by 2-foot piece of plywood to protect captured animals from the heat of the sun.

Drift fences were monitored for approximately 4 days per month for 4 months (April through July 2019; see Table 3 for specific survey dates). Traps were opened on the first day and checked every morning for four consecutive mornings. When box funnel traps were "opened" on the first day of a trapping session, they were placed at the ends of the drift fence to capture any animals that encountered the fence and followed it into the box funnel traps. All species captured (including small mammal species) were identified to species (if possible) and released unharmed. Any incidental observations of amphibians and reptiles that were made while walking between drift fences and during other biological surveys were also recorded. Drift fences and funnel traps were removed upon survey completion on July 12, 2019. Representative photographs of amphibian and reptile species were taken when possible (Appendix F).



SOURCE: ESRI; ESA 2019

Figure 7
Biological Inventory Locations

ESA

3.3.3 Birds

ESA conducted nocturnal and diurnal avian surveys throughout the Preserve to document avian species that nest, winter, or migrate through the Preserve. The surveys were conducted by two biologists walking meandering transects through all habitat types within the Preserve (Figure 7). ESA conducted a total of four 8-hour meandering transect surveys within the Preserve. These four surveys were spaced throughout the year (February, April, July, and September 2019) to capture data from each season, including spring and early fall migration periods (Table 3).

Nocturnal avian surveys consisted of calling and listening for nocturnal birds in the pre-dawn hours before starting the diurnal surveys. The biologists arrived on the Preserve 2 hours before sunrise and surveyed the Preserve by walking dirt trails and listening and looking for various nocturnal species. The biologists periodically stopped and played a vocal recording (via Android phone or similar playback device) of nocturnal species with potential to occur, including common poorwill (*Phalaenoptilus nuttallii*), western screech owl (*Megascops kennicottii*), barn owl (*Tyto alba*), short-eared owl (*Asio flammeus*), and great horned owl (*Bubo virginianus*). The recording was played at three locations throughout the Preserve, where potentially suitable habitat existed for the various nocturnal species. If a nocturnal species was already heard on the Preserve prior to playback, the vocal recording for the species was not played.

Once the sun rose, vocal playback for nocturnal species ceased and the biologists recorded diurnal avian species detected either visually or aurally. Diurnal surveys consisted of walking meandering transects along the dirt trails within the Preserve and recording all avian species detected, without playing any vocal recordings. Additionally, the biologists surveyed any canyons, ridges, or areas with good vantage points.

For both nocturnal and diurnal avian surveys, the biologists recorded the avian species, number of individuals, and the GPS location for any special-status avian species detected. Weather conditions, such as temperature, wind, cloud cover, and visibility, were recorded during each survey. Incidental observations of avian species that were made during other biological surveys were also recorded.

3.3.4 Mammals

Small Mammals

Small mammal trapping was conducted in November 2018 and May 2019 to document the diversity of small mammal species within the Preserve. Prior to the start of trapping, biologists

conducted a habitat assessment for small mammals by reviewing aerial data and vegetation community mapping and by walking the site.

Surveys were conducted according to the standard live-trapping protocols established by CDFW. Each trapping session (fall and spring/summer) consisted of a total of four nights. Nine-inch collapsible Sherman traps with modified trap doors were strategically set in four distinct areas that had potential to capture a representative sampling of small mammals within the Preserve based on vegetation communities and habitat conditions, such as terrain and soil type. Traps were placed in locations to minimize exposure to direct sunlight, and in locations where small mammals might frequent (such as along rock ledges, in front of woodrat nests, rock outcrops, runs, and burrow entrances). If ants were detected within or adjacent to traps, the traps were adjusted slightly to a location that was free of ants. The specific locations where traps were set are depicted in Figure 7.

Each trapping area consisted of at least one meandering transect that contained 30 traps (spaced 5 to 7 meters apart), for a total of 120 traps set to sample the small mammal species at the Preserve. Traps were opened and baited with a commercial bird seed mix containing sunflower seeds and millet in the late afternoon hours, and were checked early the following morning before direct sunlight could cause temperatures to rise in the traps and result in possible mortality. When a small mammal was captured in a trap, it was identified to species and then released. All traps were closed in the morning to prevent any wildlife from entering the traps during the heat of the day.

In addition to the above-mentioned trapping, small mammals were captured during drift fence surveys for herpetofauna species. Any small mammal species captured during drift fence surveys were identified to species and released. Representative photographs of small mammal species were taken when possible; they are included in Appendix F.

Bats

ESA conducted a daytime roosting habitat assessment, emergence surveys and active acoustic monitoring, and passive acoustic surveys. The methodology of each survey type is described below.

Roosting Habitat Assessment

A daytime habitat assessment survey was conducted on April 18, 2019, to assess the presence and value of roosting habitat at appropriate geological formations and habitats such as rocky outcroppings, caves, and snags, if present on-site. The assessment was conducted prior to and coinciding with the setup of passive acoustic equipment. During the habitat assessment, two biologists walked throughout the Preserve, focusing on searching rocky areas for crevices or caves,

searching for trees with cavities or sloughing bark, and searching for the presence of riparian or open water habitats, which are of high foraging value to certain bats. If potential roost sites were identified during the habitat assessment survey, roost sites were visually inspected for guano, staining, and other signs of bat presence.

Emergence Surveys and Active Acoustic Monitoring

Emergence surveys and active acoustic monitoring were conducted over two nights, including one night in spring (April 18, 2019) and one night in summer (June 25, 2019) to capture the bat migration period and summer maternity season. Emergence surveys and active acoustic monitoring were conducted by a biologist using a high-beam flashlight and handheld Echo Meter Touch acoustic detector. Surveys and monitoring were conducted approximately 30 minutes before sunset to an hour after sunset in key habitats identified during the daytime habitat assessment. Monitoring was conducted on foot from existing roads and trails where possible. During the surveys, biologists noted bat behavior and any observations of bat emerging from roost sites (if present).

Passive Acoustic Surveys

Two Wildlife Acoustics Inc. SM4 bat echolocation detectors were passively deployed in spring (April 18 through 25, 2019) to capture migratory and year-round resident species, and in summer (June 25 through July 2, 2019) to document species during the summer/maternity season. The locations of the two detectors were selected to maximize the diversity of bat species detected by geographically separating the detectors and placing them near different habitat areas, and to maximize accessibility by using existing trails while limiting the potential for vandalism by distancing the detectors from direct trail access (Figure 7). These locations were used for both spring and summer surveys. The detectors had SMM-U2 microphones mounted approximately 10 to 12 feet above ground level. Both detectors were placed within California Sage Brush–Coast Monkey Flower Association habitat. One detector was placed near the top of a northwest facing hill in the western portion of the Preserve, and the second detector was placed in the northeastern portion of the Preserve near a rocky outcrop in the vicinity of riparian habitat along Bancroft Creek (Figure 7). Representative photographs were taken of both detectors and are shown in Appendix F.

The detectors were programmed to turn on and off 30 minutes before and after solar sunrise, and default settings were modified to trigger recording at 5 kilohertz. Bat calls were automatically recorded by the units during the monitoring period, and, at the end of each passive survey period, the bat detector equipment was removed.

The recorded bat calls were processed using Sonobat Version 4.4.1, using the region and subregion classifiers for southwest California [version: c20190609]. Manual vetting of automatically identified calls consisted of manually reviewing subsets of calls for each species. Manual vetting consisted of reviewing individual calls and comparing them to a reference library of bat calls. Where initial manual review indicated misclassifications of call groups (e.g., groupings by minimum frequency, species, season, or time of night), these groups were manually reviewed and identified to most likely species. Many bat species have overlapping call repertoires; therefore, not all bat calls can be conclusively identified to a species. Identifications for inconclusive calls were deferred to the most likely species based on a combination of automatic species identification, survey-specific trends noted during manual call review, and species expected to occur based on known seasonal and geographic distribution. Relative activity indexes were then calculated for each species based on the number of call files recorded per species per night multiplied by 10.

Medium to Large Mammals

Remote wildlife cameras were used to document the diversity of medium and large mammals that occur or move through the Preserve. Three Bushnell 20MP Trophy Cam Low Glow Trail Camera HD Aggressor cameras were set in areas where multiple trails intersected and were likely being utilized by wildlife (i.e., signs of scat and/or tracks present) (Figure 7). All cameras were positioned approximately 2 to 3 feet off the ground to best record medium- to large-sized wildlife.

The cameras were set to have "low sensitivity" to movement such that anything from a small bird to large mule deer would likely trigger the cameras to start taking photographs but vegetation moving in the wind would not. Most medium- to large-sized objects that moved within the camera's field of view would trigger the camera to take photos. Once triggered, the wildlife cameras were set to take a series of three photographs, 1 second apart. The cameras were set to continue to take a series of three photographs until movement in front of the camera was not detected as a result of the animal leaving the field of view (i.e., no time would elapse between triggers). To prevent vandalism and theft, each camera was locked inside specialized security boxes and the words "wildlife movement study" were written on the boxes. Two of the wildlife cameras were bolted to a 4-foot-tall steel pole that had been dug into the ground. The third wildlife camera was drilled into a eucalyptus tree. The cameras were oriented away from the sun (to the extent practical) and were positioned to take photos of wildlife walking along a trail, headed either toward or away from the wildlife camera. Representative photographs were taken of all three wildlife cameras locations (Appendix F).

All three wildlife cameras were turned on and left to record for four survey periods from December 7, 2018, through January 7, 2019; from March 27 through May 1; from June 7 through July 16; and from August 27 through September 27, 2019 (Table 3). At the end of each survey

period, the cameras were removed and checked to confirm that each camera worked for the entire month. The photographs were then reviewed and categorized based on the species detected. All photographs displaying human activity and/or dogs were separated out and organized by camera number in order to make general assumptions regarding amount of human traffic in certain areas of the Preserve compared to others. It was noted that the second wildlife camera and its associated steel post were stolen during the final survey period in fall 2019, and thus no photographs were collected at that location during that survey period. It was also noted that the first wildlife camera collected pictures for only half of the final survey period in fall 2019 before the memory card became full due to excessive pictures of moving vegetation triggering the camera. The remaining two cameras were removed on September 27, 2019.

4.0 RESULTS AND DISCUSSION

4.1 VEGETATION COMMUNITIES/HABITAT

Vegetation community classification was based on two separate systems: the VCM (Sproul et al. 2011) and the Holland (1986) (as modified by Oberbauer et al. 2008) classification system. Field mapping was conducted in spring 2018 according to the VCM and then cross-walked to the Holland/Oberbauer classification system. Acreages of the vegetation communities on the Preserve are listed in **Table 4,** *Vegetation Communities/Land Cover Type Acreages for Dictionary Hill Preserve* (AECOM 2018b). Vegetation communities according to the VCM and Holland/Oberbauer classification system are shown in **Figures 8a** and **8b**, respectively.

The predominant vegetation community within the Preserve is the *Artemisia californica* (California Sage Brush) Association. It composes more than half of the combined acreages of the Preserve with more than 92 acres. Other vegetation communities include: *Malosma laurina–Acmispon glaber* (Laurel Sumac–Coastal Deerweed) Association; *Acmispon glaber* (Coastal Deerweed) Association; *Artemisia californica–Diplacus puniceus* (*Mimulus aurantiacus*) (California Sage Brush–Coastal Monkey Flower) Association; *Salvia munzii* Special Stands (Munz's Sage Special Stands) Association; *Baccharis sarothroides* (Broom Baccharis) Association; *Salix gooddingii* (Goodding's Black Willow) Association; Eucalyptus Semi-Natural Stands; Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands; disturbed land covers; and developed land covers.

Table 4. Vegetation Communities/Land Cover Type Acreages for Dictionary Hill Preserve

San Diego Vegetation Classification Manual		Holland/Oberbauer	Preserve Acreage[1]	100-ft Buffer Acreage[1]
Alliance Level	***Association Level***	***Herbaceous***		
Mediterranean California naturalized annual and perennial grassland semi-natural stands	5.21 Mediterranean California naturalized annual and perennial grassland semi-natural stands	42200 Non-Native Grassland	4.67	2.90
		Scrub		
***Malosma laurina* Alliance**	4.35.1 *Malosma laurina – Acmispon glaber (Lotus scoparius)* Association; Laurel Sumac–Coastal Deerweed Association[2]	32000 Coastal Scrub	1.94	-
***Acmispon glaber* Alliance**	4.32.1 *Acmispon glaber (Lotus scoparius)* Association; Coastal Deerweed Association[2]	32500 Diegan Coastal Sage Scrub	0.79	-
***Artemisia californica* Alliance**	4.6.1 *Artemisia californica* Association; California Sage Brush Association		92.74	9.02
***Artemisia californica* Alliance**	4.6.2 *Artemisia californica – Diplacus puniceus* (*Mimulus aurantiacus*) Association; California Sage Brush–Coast Monkey Flower Association[2]		43.96	6.16
***Artemisia californica* Alliance**	SM *Salvia munzii* Special Stands; Munz's Sage Special Stands[3]		16.57	0.67
***Baccharis sarothroides* Provisional Alliance**	4.12.1 *Baccharis sarothroides* Association; Broom Baccharis Association	32500 Diegan Coastal Sage Scrub: Baccharis Dominated	0.21	-
		Woodland		
***Salix goodingii* Alliance**	3.8.1 *Salix gooddingii* Association; Goodding's Black Willow Association	62500 Southern Riparian Woodland	0.71	-
Eucalyptus Semi-Natural Stands	3.2 Eucalyptus Semi-Natural Stands	79100 Eucalyptus Woodland	0.96	1.51
		Other		
Disturbed	Other – Disturbed	10000 Disturbed	12.98	1.83
Developed	Other – Developed	12000 Urban/Developed	0.35	13.29
Total			**175.89**	**35.38**

[1] Vegetation acreage may not sum due to rounding.

[2] The scientific names for two species in the Vegetation Classification Manual and the Holland/Oberbauer vegetation classification have been updated according to the Jepson Manual of Flowering Plants available on line at http://ucjeps.berkeley.edu/eflora/ and the Checklist of the Vascular Plants of San Diego County, 5th edition by J.P. Rebman and M. G. Simpson 2014 from the San Diego Natural History Museum. *Lotus scoparius* is now *Acmispon glaber* and *Mimulus aurantiacus* is now *Diplacus puniceus*.

[3] *Salvia munzii* forms nearly pure stands on parts of Dictionary Hill. This is a vegetation community that is more common in Baja California, Mexico, but is unique to Dictionary Hill and parts of San Miguel and Otay Mountains and a few other locations. While it is not listed in the VCM, it deserves recognition on the Preserve.

SOURCE: AECOM 2018b.

The following vegetation communities and land cover type descriptions for the Preserve follow those designated in the VCM.

4.1.1 Herbaceous

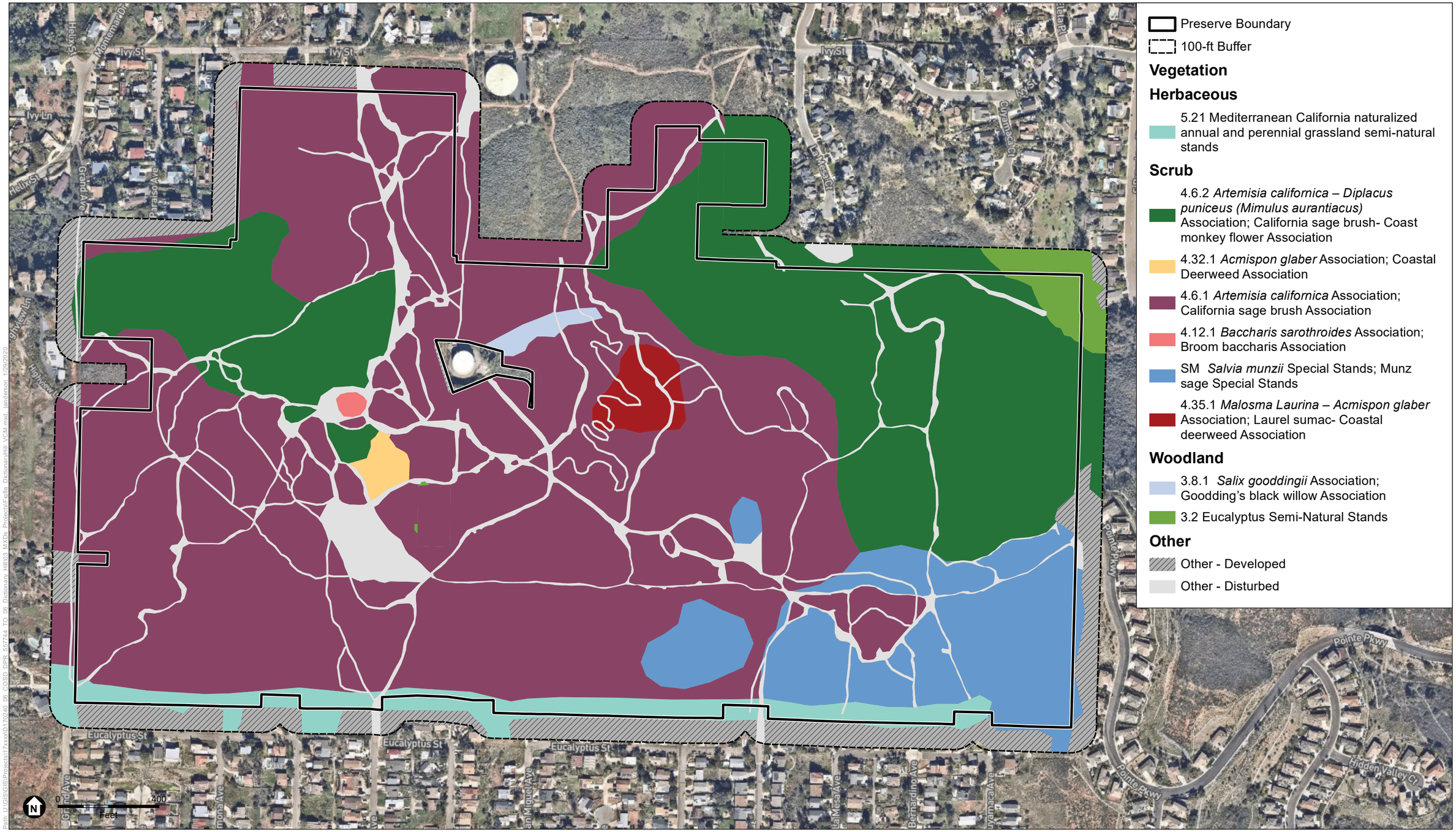
Mediterranean California naturalized annual and perennial grassland semi-natural stands (5.21)

Mediterranean California naturalized annual and perennial grassland semi-natural stands consists of dominant non-native grasses and forbs that have replaced native types through repeated soil disturbance and introduction of non-native plant species (Sproul et al. 2011). This vegetation community type occurs on approximately 4.67 acres of the Preserve and 2.90 acres within the 100-foot buffer. It is generally located along the southern boundary of the Preserve, adjacent to private residential properties. These areas are dominated by weedy invasive non-native species, including crimson fountaingrass (*Pennisetum setaceum*), crown daisy (*Glebionis coronaria*), short-pod mustard (*Hirschfeldia incana*), tocalote (*Centaurea melitensis*), tree tobacco (*Nicotiana glauca*), and Peruvian pepper tree (*Schinus molle*).

4.1.2 Scrub

Laurel Sumac–Coastal Deerweed Association (4.35.1)

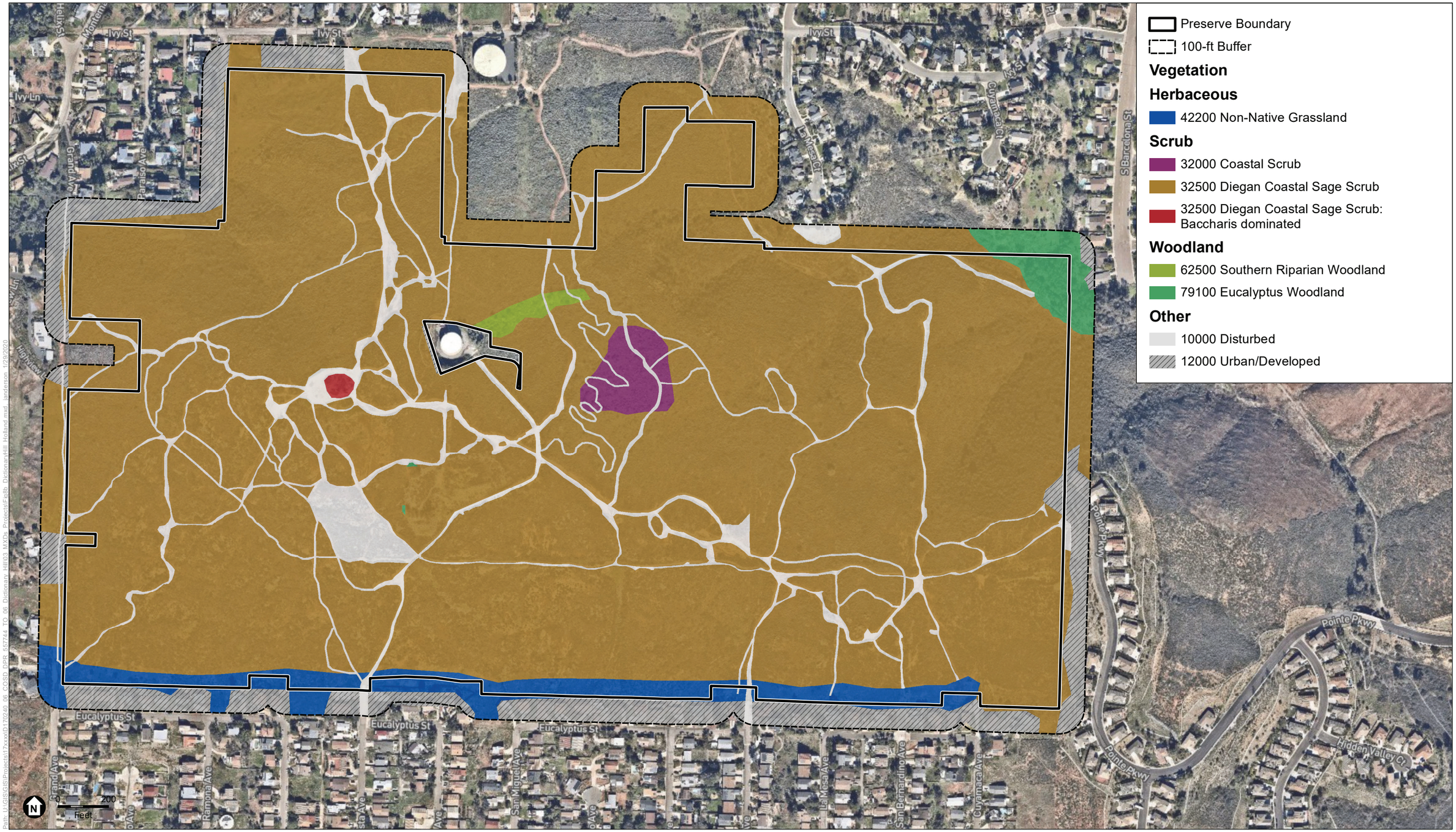
Laurel Sumac–Coastal Deerweed Association (*Malosma laurina/Acmispon glaber* [=*Lotus scoparius*] association) is composed of codominant open stands of laurel sumac and coastal deerweed, subdominant shrubs, and high herbaceous cover. This association is a transitional vegetation community, often occurring as post-fire regeneration (Sproul et al. 2011). This vegetation community occurs in the north-central portion of the Preserve, where it covers approximately 1.94 acres. The dominant shrubs within this community include laurel sumac, coastal deerweed, and California sage brush (*Artemisia californica*). Herbaceous plants occurring in openings of this association include non-native redstem stork's bill (*Erodium cicutarium*), red brome (*Bromus madritensis* ssp. *rubens*), rattail fescue (*Festuca myuros*), and Italian rye grass (*Festuca perennis*). This habitat is listed as Tier II in the MSCP Subarea Plan (1998).



SOURCE: ESRI; SanGIS 2019; AECOM 2018

Figure 8a
Vegetation Communities/Habitats
(VCM Classification)

ESA



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SOURCE: ESRI; SanGIS 2019; AECOM 2018

Figure 8b
Vegetation Communities/Habitats
(Holland/Oberbauer Classification)

ESA

Coastal Deerweed Association (4.32.1)

Coastal Deerweed Association (*Acmispon glaber* [=*Lotus scoparius*] association) consists of dominant coastal deerweed open shrub canopy, often occurring with subdominant shrubs. This association is considered early transitional, resulting from natural post-fire regeneration (Sproul et al. 2011). This vegetation community occurs in the west-central portion of the Preserve where it covers approximately 0.79 acres. The dominant shrubs within this community include coastal deerweed and California buckwheat (*Eriogonum fasciculatum*). Herbaceous plants occurring in the openings of this association include non-native redstem stork's bill, longbeak stork's bill (*Erodium botrys*), and short-pod mustard. This habitat is listed as Tier II in the MSCP Subarea Plan (1998).

California Sage Brush Association (4.6.1)

California Sage Brush Association (*Artemisia californica* association) is dominated by California sage brush, but often has a relatively open cover and a high diversity of subdominant shrubs. This association can occur both as a mature stable vegetation community or as an early transitional stage for other shrub communities in response to disturbance such as fire (Sproul et al. 2011). This vegetation community occurs from the western boundary to the east-central side of the Preserve, where it covers approximately 92.74 acres within the Preserve and an additional 9.02 acres within the 100-foot buffer. The dominant shrubs within this community include California sage brush and California buckwheat. Herbaceous plants occurring in the openings of this association include native plants: caterpillar phacelia (*Phacelia cicutaria*), dot-seed plantain, small-flowered soap plant (*Chlorogalum parviflorum*), and mesa spike-moss (*Selaginella cinerascens*); and non-native plants: short-pod mustard, red brome, and tocalote. This habitat is listed as Tier II in the MSCP Subarea Plan (1998).

California Sage Brush/Coast Monkey Flower Association (4.6.2)

California Sage Brush/Coast Monkey Flower Association (*Artemisia californica/Diplacus puniceus* [=*Mimulus aurantiacus*] association) is composed of codominant open stands of California sage brush and coast monkey flower, subdominant shrubs, and well-developed herbaceous cover (Sproul et al. 2011). This vegetation community occurs in the northwestern and northeastern portions of the Preserve, where it covers approximately 43.96 acres within the Preserve and an additional 6.16 acres within the 100-foot buffer. The dominant shrubs within this community include California sage brush, coast monkey flower, and California buckwheat. Herbaceous plants occurring in the openings of this association include native fascicled tarplant (*Deinandra fasciculata*), and non-native short-pod mustard, tocalote, red brome, and ripgut brome (*Bromus diandrus*). This habitat is listed as Tier II in the MSCP Subarea Plan (1998).

Special Stands: Munz's Sage Special Stands (SM)

Munz's Sage Special Stands (*Salvia munzii* Special Stands) is a vegetation community that is composed of nearly pure stands of Munz's sage. It is not listed in the VCM, as this community is more common in Baja California, Mexico, but it is unique to the Dictionary Hill Preserve and a few other locations in California, including parts of San Miguel and Otay Mountains. This vegetation community occurs in the southeastern portion of the Preserve, where it covers approximately 16.57 acres within the Preserve and an additional 0.67 acres within the 100-foot buffer. Munz's sage is the dominant shrub within this community and subdominant shrubs include California sage brush and California buckwheat. Herbaceous plants occurring in the openings of this association include native California poppy (*Eschscholzia californica*) and blue dicks (*Dichelostemma capitatum*); and non-native short-pod mustard and red brome. This habitat is listed as Tier II in the MSCP Subarea Plan (1998).

Broom Baccharis Association (4.12.1)

Broom Baccharis Association (*Baccharis sarothroides* association) is comprised by an open shrub canopy of broom baccharis, subdominant shrubs, and a diverse herbaceous cover (Sproul et al. 2011). This vegetation community occurs in the west-central portion of the Preserve, where it covers approximately 0.21 acres. Broom baccharis is the dominant shrub and California buckwheat is the subdominant shrub within this community. Herbaceous plants occurring in the openings of this association include native dot-seed plantain and goldentop (*Lamarckia aurea*); and non-native short-pod mustard,. This habitat is listed as Tier II in the MSCP Subarea Plan (1998).

4.1.3 Woodland

Goodding's Black Willow Association (3.8.1)

Goodding's Black Willow Association (*Salix gooddingii* association) is dominated by Goodding's black willow in an open to closed tree canopy with other riparian tree species, subdominant shrubs, and wetland-affiliated herbaceous plants (Sproul et al. 2011). This vegetation community occurs in the north-central portion of the Preserve, where it covers approximately 0.71 acres. At the time of the invasive non-native plant surveys in 2019, the Goodding's black willows in this community appeared dead with the exception of one re-sprout. Additional tree species included invasive non-native Peruvian pepper tree. Herbaceous plants occurring in the openings of this association included native laurel sumac; and invasive non-native pampas grass (*Cortaderia selloana*), milk thistle (*Silybum marianum*), and iceplant (*Carpobrotus edulis*). This habitat is listed as Tier I in the MSCP Subarea Plan (1998).

Eucalyptus Semi-Natural Stands (3.2)

Eucalyptus (*globulus/camaldulensis*) Semi-Natural Stands are composed of eucalyptus tree species that form self-perpetuating stands (Sproul et al. 2011). This vegetation community occurs in the northeastern corner of the Preserve, where it covers approximately 0.96 acres within the Preserve and 1.51 acres within the 100-foot buffer. The canopy is composed of eucalyptus trees, and the herbaceous understory consists of non-native grasses (*Bromus* sp. and *Avena* sp.), short-pod mustard, curly dock (*Rumex crispus*), and invasive non-native milk thistle. This habitat is listed as Tier IV in the MSCP Subarea Plan (1998).

4.1.4 Other

Disturbed Habitat (11300)

Land designated as disturbed habitat is not addressed by the VCM; therefore, this description follows Oberbauer et al. (2008). Disturbed habitat consists of areas that have been physically disturbed and are no longer recognizable as a native vegetation community but continue to retain a soil substrate. Vegetation is nearly exclusively composed of non-native species, including ornamentals or ruderal exotic species (Oberbauer et al. 2008). Approximately 12.98 acres within the Preserve and 1.83 acres within the 100-foot buffer were mapped as disturbed habitat. The disturbed habitat within the Preserve consists primarily of access roads, unauthorized trails, and areas disturbed by unauthorized off-highway vehicles and/or erosion. These areas generally consist of bare ground but contain scattered non-native plant species, including short-pod mustard and tocalote.

Urban/Developed (12000)

Land designated as urban/developed is not addressed by the VCM; therefore, this description follows Oberbauer et al. (2008). Urban/developed land consists of areas that no longer support native vegetation due to physical alteration. This may include the construction of structures, hardscaping, pavement, and/or landscaping (Oberbauer et al. 2008). Urban/developed land approximately 0.35 acres within the Preserve and 13.29 acres within the 100-foot buffer was mapped as developed habitat. Urban/developed land consists of residential development in the buffer and a small portion of a manufactured slope occurring within the Preserve boundary.

4.2 PLANTS

A total of 183 species of plants were observed on the Preserve during the 2018 and 2019 baseline surveys. Of these 183 species, 62 species are non-native species and 11 of those species are target

invasive non-native species. Eight special-status rare plants, including San Diego sunflower (*Bahiopsis laciniata*), San Diego goldenstar (*Bloomeria clevelandii*), western dichondra (*Dichondra occidentalis*), variegated dudleya, San Diego barrel cactus (*Ferocactus viridescens*), southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*), Munz's sage (*Salvia munzii*), and mesa spike-moss (*Selaginella cinerascens*), were documented on the Preserve during 2018 special-status/rare plant surveys and are discussed below and shown in **Figure 9**. Three additional special-status rare plant species, Palmer's grappling hook (*Harpagonella palmeri*), California adder's tongue fern (*Ophioglossum californicum*), and decumbent goldenbush (*Isocoma menziesii* var. *decumbens*) have been reported previously on the Preserve. These species were not observed during 2018 surveys but are considered to have a high potential to occur given the previous records and suitable habitat on-site. A list of plant species observed on the Preserve is included in **Appendix B**.

4.2.1 Special-Status Plant Species Observed

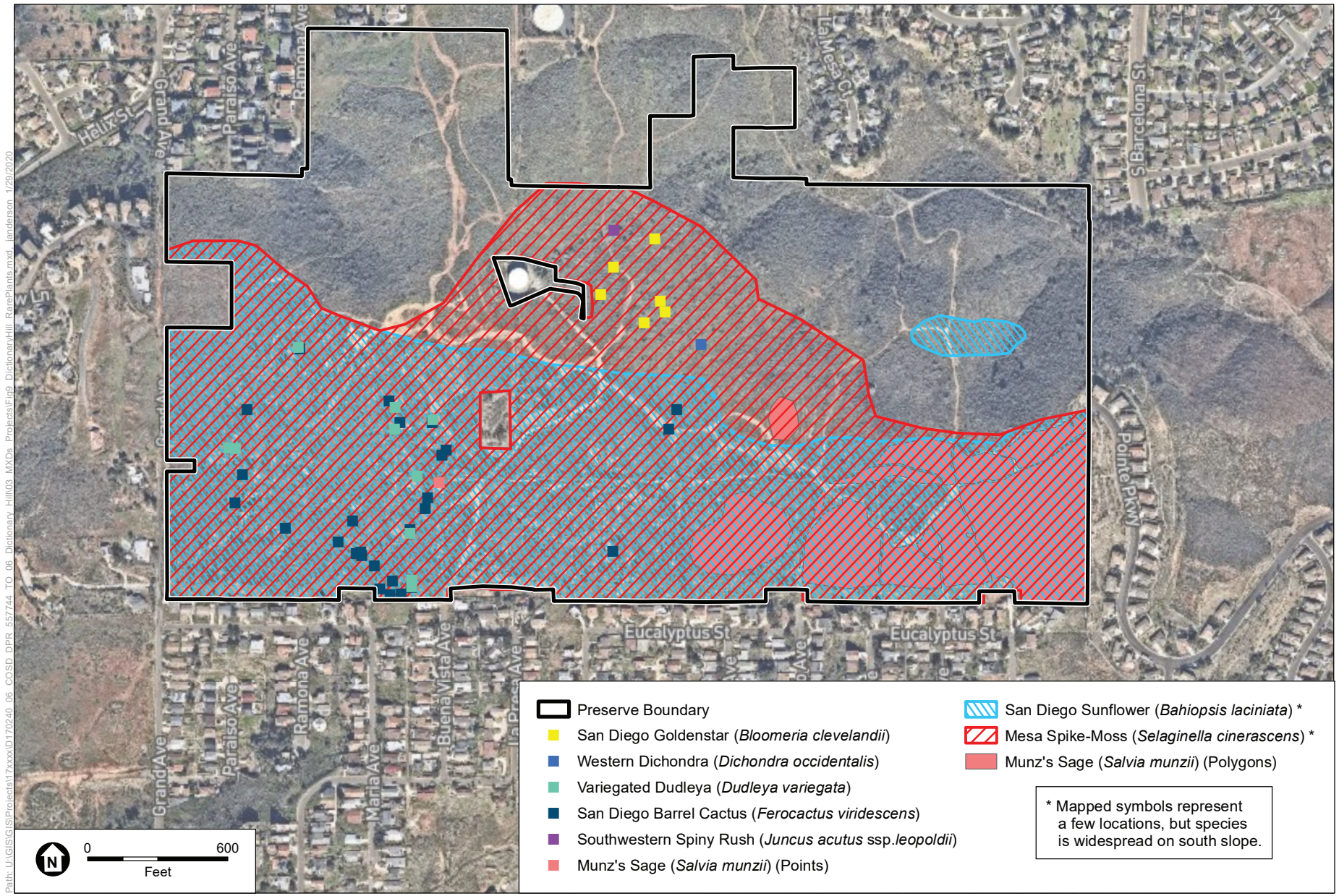
San Diego Sunflower (*Bahiopsis laciniata*)
CRPR 4.3, County List D

San Diego sunflower is a perennial shrub with bright-yellow flowers and narrow, lance-shaped green leaves. It ranges from coastal Southern California to northern Baja California, Mexico, but is commonly used for revegetation of road and development projects, so its distribution has expanded. It typically grows in southwestern San Diego County along dry mesas, canyons, and mountain slopes as part of chaparral and coastal sage scrub vegetation communities, where it forms a major component of the vegetation.

Within the Preserve, San Diego sunflower grows with California sage brush and California buckwheat and is widespread on south-facing slopes.

San Diego Goldenstar (*Bloomeria clevelandii*)
CRPR 1B.1, County List A, MSCP Covered

San Diego goldenstar is a perennial geophytic bulb with green-veined, bright yellow, star-shaped flowers and two to eight narrow, slender leaves that dry before flowering. It is native to San Diego County, California, and nearby adjacent Baja California, Mexico, where it can be found within scrub and coastal grassland communities with loam or clay loam soils.



SOURCE: ESRI; SanGIS 2019; AECOM 2018

Figure 9
Special-Status Plant Species

ESA

San Diego goldenstar was found in one area of the Preserve, on the north-facing slope east and southeast of the large water tank inholding (Figure 9). It grows in good numbers in the midst of clay loamy soil and rocky areas with openings, but also in areas slightly shaded by nearby laurel sumac. This area of the Preserve roughly corresponds to the area mapped as *Malosma laurina – Acmispon glaber* association (Laurel Sumac–Coastal Deerweed Association). During the 2018 survey, this species was observed as sparsely occurring and not in dense groups of flowering plants that one might expect if the rainfall season had greater precipitation.

Western Dichondra (*Dichondra occidentalis*)
CRPR 4.2, County List D

Western dichondra is an herbaceous perennial plant that grows from stolons and extends stem runners below the soil surface outward from the center of the plant. The round, nickel-sized green leaves that sit on the soil surface are characteristic of the plant. It generally grows relatively close to the coast from San Luis Obispo County to northern Baja California, Mexico, with the greatest concentration of observations from San Diego County. It grows along slopes in sandy or loamy soils and among gravel and small rocks in coastal sage scrub and chaparral habitats. The flowers are inconspicuous beneath the leaves of the plant.

This species was found in one location east of the center of the Preserve (Figure 9). During a higher rainfall season, REC Consultants (2007) also found it in scattered locations on the southeastern portion of the Preserve in the midst of the Munz's sage (*Salvia munzii*), but the species was not observed in these locations during the 2018 survey. Because it is an herbaceous perennial, it may not display aboveground growth during years with low rainfall totals, as exhibited in 2018.

Variegated Dudleya (*Dudleya variegata*)
CRPR 1B.2, County List A, MSCP Covered, MSCP Narrow Endemic

Variegated dudleya is an herbaceous perennial succulent plant that grows from a subterranean corm-like stem. The leaves are summer deciduous as the plants produce small, bright yellow, star-shaped flowers. It ranges from San Diego County down to Baja California, Mexico, where it can be found in several habitat types, including chaparral and vernal pools. In the San Diego region, the plants seem to prefer growing on rock slabs and between rocks, producing flowers against a rock background or moss-covered soil crust with few other flowering plants.

Dictionary Hill has historically been one of the best locations to consistently find variegated dudleya in flower each spring in San Diego County. Within the Preserve, it is often found in areas with San Diego barrel cactus (*Ferocactus viridescens*). The species was found in a number of clusters on the Preserve, ranging from a few plants to significant populations on rocky slab areas

scattered over the southwestern slope (Figure 9). While it was widespread in a relatively large number of locations during the 2018 survey, it could be even more numerous within the mapped locations following a wet rainfall season.

San Diego Barrel Cactus (*Ferocactus viridescens*)
CRPR 2B.1, County List B, MSCP Covered

San Diego barrel cactus is a spherical or nearly cylindrical cactus that is usually wider than tall, and less than 30 centimeters in height. It often grows in clusters but can be found alone as well. The body of the plant is bright green with several ribs covered in strong, yellow or orange-red, curved spines. The flowers bloom in yellow to greenish flowers with red or pink scales. It is restricted to portions of the coast that support sea bluffs, sandy or rocky mesas, and south-facing slopes from Southern California to northern Baja California, Mexico, with the greatest concentration of observations from San Diego County.

This species was common on the rock slabs on the southwestern portion of the Preserve, growing in clusters with plants that are generally less than a foot in diameter (Figure 9).

Southwestern Spiny Rush (*Juncus acutus* ssp. *leopoldii*)
CRPR 4.2, County List D

Southwestern spiny rush is a moderately-sized, perennial, rhizomatous plant that consists of a large clump of sharp, pointed rush stems radiating from a central growth point. It can be found from the central and south coast of California to the southern Channel Islands, and it extends to Baja California, Mexico, Arizona, and South America. In California, it is typically found within habitats that support high levels of moisture, such as seeps, meadows, salt marshes, and coastal dunes.

Within the Preserve, it was found in the drainage area downslope from the large water tank inholding (Figure 9).

Munz's Sage (*Salvia munzii*)
CRPR 2B.2, County List B

Munz's sage is a medium-sized aromatic shrub with gray-green leaves and blue flowers. Its scent and color distinguish it from black sage (*Salvia mellifera*) and Cleveland sage (*Salvia clevelandii*). It ranges from the southern part of the Peninsular Range in California down into Baja California, Mexico. In San Diego County, it typically grows on south-facing slopes, especially on metavolcanic soils, within chaparral or coastal sage scrub habitats. In some locations, it grows nearly as a monoculture.

The species was found growing with an extensive cover on the southeastern portion of the Preserve, with patches scattered in a few other locations (Figure 9).

Mesa Spike-Moss (*Selaginella cinerascens*)
CRPR 4.1, County List D

Mesa spike-moss is a perennial herb that grows in a thin mat on the surface of the soil. It can appear dry and dead for much of the year, but following a rain it will turn green and start growing within a very short period of time. It occurs from Orange County into northwestern Baja California, Mexico, on coastal mesas that support vernal pools, chaparral, or coastal sage scrub, but has suffered tremendous decline due to development and disturbance of these coastal mesas. It is typically found on soil crusts (where the soil surface has a hardened crust as a result of a combination of lichens, algae, fungi, and cyanobacteria) that lack any sort of disturbance. This species is an indicator of low soil disturbance and how pristine a site may be.

Soil crusts are quite common in the Preserve, particularly on the south-facing slopes and more level areas. Mesa spike-moss grows in many of these natural open areas with soil crusts. As a result, mesa spike-moss is widespread on the Preserve and was mapped with a general boundary (Figure 9).

4.2.2 Special-Status Plant Species with High Potential to Occur

In addition to the special-status plant species documented during the field surveys, three special-status plant species have a high potential to occur on the Preserve: Palmer's grappling hook (*Harpagonella palmeri*), decumbent goldenbush (*Isocoma menziesii* var. *decumbens*), and California adder's tongue (*Ophioglossum californicum*). The evaluation of their potential for occurrence was based on the elevation, soils, and vegetation communities present on the Preserve; known past occurrences within the Preserve; and the range and distribution of species within the vicinity of the Preserve. Life history, habitat occurring on the Preserve, rationale for potential to occur, and sensitivity status for these species are detailed below.

A table of all special-status plant species evaluated for a potential to occur on the Preserve is included in **Appendix C**.

Palmer's Grappling Hook (*Harpagonella palmeri*)
CRPR 4.2, County List D

Palmer's grappling hook is a small annual with stems lined with occasional small, pointed leaves and spiny, white flowers with hooked bristles. It is native to the desert and coastal regions of California, Arizona, and Baja California, Mexico, where it can be found within chaparral and coastal scrub communities. It grows within openings of vegetation on sandy and gravelly soil, particularly on south-facing slopes. The highest concentration of collections has been from southwestern San Diego County.

The species was previously documented on the Preserve by Reiser (2001) and Dillane and Merzbacher (2017). It was not reported by REC Consultants (2007), which performed surveys during a more favorable rainfall year. It is likely that it would be found on south-facing slopes in areas near the rock slabs and openings in the vegetation.

Decumbent Goldenbush (*Isocoma menziesii* var. *decumbens*)
CRPR 1B.2, County List A

Decumbent goldenbush is a shrub with grey-green leafy stems that branch mostly from the base, ending in loose to tight clusters of heads with tubular yellow disk flowers. It ranges from Los Angeles to San Diego Counties southward into Baja California, Mexico, but the highest conservation of observations is in western San Diego County. It can be found in sandy, often-disturbed areas within chaparral and coastal scrub habitats.

The species was previously documented on the Preserve by Dillane and Merzbacher (2017). It was not reported by REC Consultants (2007). It is likely that it would be found in the coastal scrub habitats, particularly in disturbed areas, within the Preserve.

California Adder's Tongue (*Ophioglossum californicum*)
CRPR 4.2, County List D

California adder's tongue is a fern that appears as a single yellow-green leaf protruding out of the soil that is smaller than a nickel coin. It also produces a slender fruiting frond that has the appearance of the tongue of a snake with tiny slots on the side to release spores. It is an herbaceous perennial with a root rhizome that persists during wet and dry seasons. Its range extends from scattered locations in the foothills of the Sierra Nevada to coastal Monterey, Santa Barbara, Orange County, and San Diego County within grassy pastures, vernal pool edges, or chaparral communities. The highest concentrations of observations are from southwestern San Diego County. It has also been collected on Colonet Mesa in northern Baja California, Mexico, and in the Sierra de la Laguna Mountains near the southern tip of the Baja California Peninsula. Finding and identifying California adder's tongue is difficult and partially based on chance observation as it is very ephemeral and dries and disappears very quickly.

The species was previously documented on the Preserve by Dillane and Merzbacher (2017) without a location identified. It was not observed by REC Consultants (2007). It is likely that it would be found in vernally moist areas of the Preserve within the coastal scrub or grassland habitats.

4.2.3 Invasive Non-Native Plants

A total of 62 non-native plant species[2] were detected on the Preserve during botanical surveys in spring 2018 and 2019. **Table 5** lists the 11 target invasive non-native plant species that were mapped within the Preserve, along with their associated Management Priority Level (Conservation Biology Institute 2012) and Cal-IPC Inventory Ranking (Cal-IPC 2019). Target invasive non-native plant species were selected based on their invasive potential, prevalence throughout the Preserve, and ability for management. These target invasive non-native plant species locations are shown on **Figure 10**. Additional non-native plants are present throughout the Preserve, particularly along dirt roads and trails and around grassy areas.

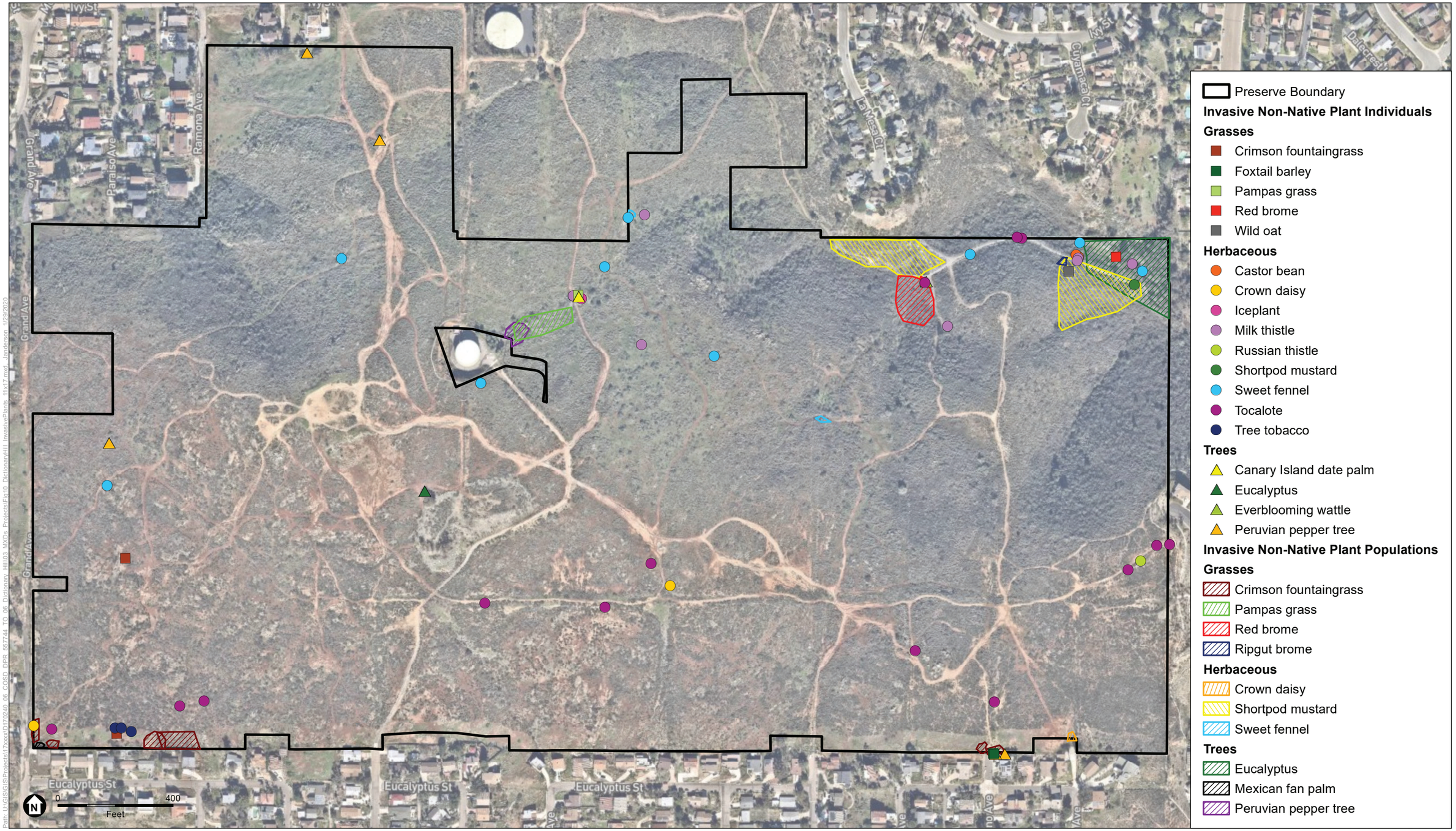
Pampas Grass (*Cortaderia selloana*)

Pampas grass is an invasive perennial grass species that has spread along the coast of California, in the Coast Ranges, Central Valley, western Transverse Ranges, and Mojave Desert due to ornamental planting and as an erosion control species. It produces large plumes containing up to 100,000 seeds that are widely dispersed by wind. It can be found within dunes, bluffs, coastal shrublands, marshes, inland riparian areas, and disturbed areas, where it can quickly colonize bare ground (Cal-IPC 2019). Within the Preserve, this species was detected in the drainage area downslope from the large water tank inholding (Figure 10).

Sweet Fennel (*Foeniculum vulgare*)

Sweet fennel is an invasive perennial species that has a high ability to spread. It has established dense local populations throughout California, such as in the Marine Corps Base Camp Pendleton, where it has drastically altered the composition and structure of the landscape and prevented the recovery of native vegetation from disturbance. It is an upright, branching species that produces aromatic yellow-green leaves and small yellow flowers in compound umbels. This species can be found within grasslands, coastal scrub, riparian, and wetland communities (Cal-IPC 2019). It was detected in multiple locations throughout the Preserve (Figure 10) with populations ranging from approximately 1 individual to 30 individuals.

[2] Non-native plant species includes invasive plants species.



SOURCE: ESRI; SanGIS 2019; ESA 2019

Figure 10
Invasive Non-Native Plant Species

ESA

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Table 5. Invasive Non-Native Plant Species with High Priority for Removal on the Preserve[1]

Common Name	Scientific Name	CBI Management Priority for Invasive Non-native Plants[2]	Cal-IPC Rating[3]
Pampas Grass	*Cortaderia selloana*	Management Level 3	High
Sweet Fennel	*Foeniculum vulgare*	Management Level 4	High
Milk Thistle	*Silybum marianum*	Management Level 4	Limited
Crown Daisy	*Glebionis coronaria*	Management Level 5	Moderate
Iceplant	*Carpobrotus edulis*	NA	High
Crimson Fountaingrass	*Pennisetum setaceum*	NA	Moderate
Tree Tobacco	*Nicotiana glauca*	NA	Moderate
Mexican Fan Palm	*Washingtonia robusta*	NA	Moderate
Canary Island Date Palm	*Phoenix canariensis*	NA	Limited
Castor Bean	*Ricinus communis*	NA	Limited
Peruvian Pepper Tree	*Schinus molle*	NA	Limited

[1] Species are included in this table due to their potential for being invasive and the feasibility of removal from the Preserve since they currently remain in low enough numbers for removal and eradication.

[2] **Source**: San Diego Environmental Mitigation Program Working Group in their Management Priorities for Invasive Nonnative Plants. Conservation Biology Institute (CBI) 2012.
Management Levels for San Diego County's Natural Community Conservation Programs (NCCP):
Level 3 – Containment: Eradication with coordinated programs by management unit or watershed.
Level 4 – Directed Management: Control within reserve or sub-management unit to benefit NCCP resources.
Level 5 – Directed Suppression: Suppression, typically to allow recovery of disturbed site, improve re-vegetation success, or benefit NCCP resources.

[3] **Source**: Cal-IPC Invasive Plant Inventory Database, 2019. Overall rating listed for southwest region, factoring impact, invasiveness, distribution, and documentation level.
Cal-IPC Inventory Categories:
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 statewide 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.

Milk Thistle (*Silybum marianum*)

Milk thistle is a large, prickly thistle that can grow in dense, impenetrable stands that outcompete native species. This species is widely spread throughout California, often in overgrazed pastures, along fence lines, and in other disturbed areas (Cal-IPC 2019). It produces large leaves with milk-white veins and purple flowerheads. It was detected in multiple locations with the northern portion of the Preserve, primarily within the drainage area downslope from the large water tank inholding and within the understory of the eucalyptus semi-natural stand (Figure 10).

Crown Daisy (*Glebionis coronaria*)

Crown daisy is an escaped ornamental plant that can be found along the central and south coast of California. Seedlings may grow up to 5 feet tall and can form dense stands that crowd out native

vegetation. It commonly invades riparian areas, coastal dunes, prairies, scrub, and disturbed areas (Cal-IPC 2019). This species was detected in multiple locations within the Preserve, with the largest stand in the southeast corner of the Preserve, primarily within disturbed areas, such as along dirt roads (Figure 10).

Iceplant (*Carpobrotus edulis*)

Iceplant is an invasive succulent shrub found throughout coastal California and the Channel Islands due to ornamental planting. This species propagates by seed and vegetatively, where even small stem fragments can regenerate into a new plant. It can grow into dense mats within coastal scrub, grasslands, chaparral, bluffs, dunes, and beaches, where it increases soil organic matter over time, allowing new non-native species to invade (Cal-IPC 2019). Within the Preserve, a small mat of iceplant was detected in the drainage area downslope from the large water tank inholding (Figure 10).

Crimson Fountaingrass (*Pennisetum setaceum*)

Crimson fountaingrass is a coarse-tufted perennial grass species that grows primarily along the Southern California coast. Crimson fountaingrass is well adapted to fire and can increase in density following a burn (Cal-IPC 2019). It is commonly found within chaparral, grassland, and coastal dune and scrub habitats. This species was detected predominantly along the southern border of the Preserve, where it is likely spreading from adjacent residential properties, but it was also detected higher up the slope on the western side of the Preserve, downslope of a population of variegated dudleya (Figure 10).

Tree Tobacco (*Nicotiana glauca*)

Tree tobacco is a short-lived shrub or tree that can grow up to 20 feet tall. It was introduced to California approximately 100 years ago and can be found in disturbed areas, in vacant lots, along roadsides and streamsides, and in other riparian areas (Cal-IPC 2019). Three individuals were detected along the southwestern boundary of the Preserve within the Mediterranean California naturalized annual and perennial grassland semi-natural stands and the developed habitat (Figure 10). This species occurs near crimson fountaingrass.

Mexican Fan Palm (*Washingtonia robusta*)

Mexican fan palm is a single-trunked palm tree found in the San Francisco Bay area, in southern Sacramento Valley, and along the Southern California coast. It was introduced as a common landscape ornamental that escaped and became invasive in riparian areas, orchards, and landscaped

areas. It can create monospecific stands in riparian areas where the dead fronds can become a fire hazard (Cal-IPC 2019). Three individuals were detected in the southwestern corner of the Preserve adjacent to residential development (Figure 10).

Canary Island Date Palm (*Phoenix canariensis*)

Canary Island date palm is an escaped landscape ornamental palm tree found in Southern California. It invades riparian areas, orchards, and landscaped areas. This species can grow to 25 meters tall in clusters that form a dense canopy, excluding light from reaching beneath them, resulting in the loss of native plants (Cal-IPC 2019). One individual was detected in the drainage area downslope from the large water tank inholding (Figure 10).

Castor Bean (*Ricinus communis*)

Castor bean is an herbaceous plant or semi-woody large shrub or a small tree that has escaped cultivation and invaded central and southern California. It produces seeds that contain ricin, an extremely toxic chemical that can kill an adult who consumes only four to eight seeds. Handling foliage and seeds can cause severe dermatitis. It is commonly found in disturbed habitats. Two individuals were found in the northeast corner of the Preserve within the California sage brush/coast monkey flower vegetation community (Figure 10).

Peruvian Pepper Tree (*Schinus molle*)

Peruvian pepper tree is an evergreen shrub or tree that often occurs in upland habitats. Peruvian pepper trees reproduce by seed and sometimes vegetatively from root sprouts. Peruvian pepper trees flower between June and August. Individuals are dioecious and can be prolific, producing fruits that get eaten and dispersed by wildlife, and root shoots that can result in dense monotypic growth within the tree canopy (Cal-IPC 2019). Peruvian pepper trees were recorded in the drainage area downslope from the large water tank inholding as well as on the southern edge of the Preserve (Figure 10).

4.3 WILDLIFE

A total of 101 wildlife species were detected and/or observed during surveys conducted in 2019–2020: 19 invertebrates, 8 reptiles, 52 birds, and 21 mammals. A total of 12 special-status wildlife species were observed or detected, and are shown on **Figure 11**. A comprehensive list of wildlife species observed or detected on the Preserve is included in **Appendix D**.

4.3.1 Invertebrates

A number of invertebrates were observed within the Preserve and were identified to genus when feasible. These included armored darkling beetle (*Eleodes armatus*), European honey bee (*Apis mellifera*), tarantula hawk wask (*Pepsis* sp.), ants (Family *Formicidae*), velvet ants (Family *Mutillidae*), flies (Order *Diptera*), and dragonflies (Order *Odonata*).

4.3.1.1 Butterflies

Thirteen species of butterflies were detected during the butterfly survey and Quino host plant mapping on the Preserve, including desert orangetip (*Anthocharis cethura*), Behr's metalmark (*Apodemia virgulti*), California ringlet (*Coenonympha tullia*), western tailed-blue (*Cupido amyntula*), funereal duskywing (*Erynnis funeralis*), silvery blue (*Glaucopsyche lygdamus*), common buckeye (*Junonia coenia*), marine blue (*Leptotes marina*), anise swallowtail (*Papilio zelicaon*), cabbage white (*Pieris rapae*), checkered white (*Pontia protodice*), red admiral (*Vanessa atalanta*), and painted lady (*Vanessa cardui*). No special-status butterfly species were detected; however, potential habitat for Quino was present and Quino host plant was mapped within the Preserve, and is discussed in further detail in Section 4.3.6.

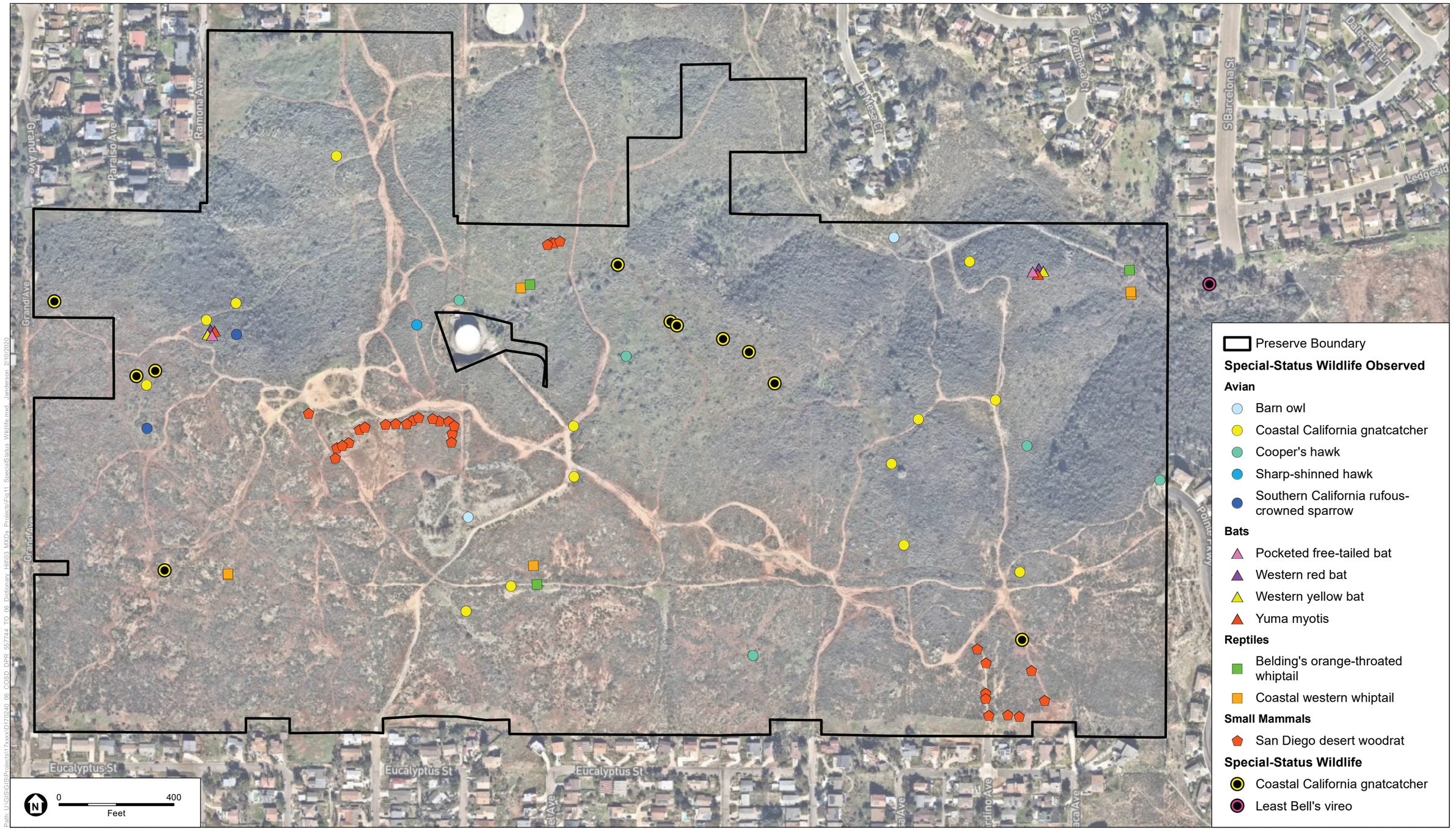
4.3.2 Herpetofauna

4.3.2.1 Amphibians

No amphibian species were documented during herpetofauna drift fence surveys. Amphibians require a water source to lay their eggs and allow their larvae to develop before metamorphosis to adults. There are no permanent sources of water within the Preserve, and no vernal pools or temporarily ponded areas were documented within the Preserve. Should any common amphibian species be present on the Preserve, the ongoing drought in addition to the lack of permanent water sources may have limited the amount of aboveground activity and reduced the potential for successful breeding.

4.3.2.2 Reptiles

A total of eight reptile species were detected within the Preserve. Six species were detected during drift fence surveys, including three lizard species and three snake species, with a total 15 reptile captures (**Table 6**). Two additional species (one lizard and one snake species) were detected during incidental observations. Two special-status reptile species, Belding's orange-throated whiptail (*Aspidoscelis hyperythra beldingi*) and coastal western whiptail (*Aspidoscelis tigris stejnegeri*), were detected during drift fence surveys or incidentally within the Preserve; these are discussed in detail in Section 4.3.5.



SOURCE: ESRI; SanGIS 2019; ESA 2019

Figure 11
Special-Status Wildlife Species

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Table 6. Reptile Drift Fence Captures

Common Name	Scientific Name	Status[1]	Array (Number of Captures)																Total Number of Captures
			Week 1 (April 5–9, 2019)				Week 2 (May 13–17, 2019)				Week 3 (June 10–14, 2019)				Week 4 (July 8–12, 2019)				
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Lizards																			
Belding's Orange-Throated Whiptail	*Aspidoscelis hyperythra beldingi*	WL, MSCP, Group 2	-	-	-	-	-	-	-	-	-	-	-	-	*	*	*	-	**0**
Coastal Western Whiptail	*Aspidoscelis tigris stejnegeri*	SSC, Group 2	-	-	-	-	1	-	1	1	1	-	-	1	-	-	-	-	**5**
Southern Alligator Lizard	*Elgaria multicarinata*	None	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	**3**
Western Fence Lizard	*Sceloporus occidentalis*	None	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	**1**
Snakes																			
California Striped Racer	*Coluber lateralis lateralis*	None	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1	-	**3**
Southern Pacific Rattlesnake	*Crotalus oreganus helleri*	None	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	**0**
California Kingsnake	*Lampropeltis californiae*	None	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	**2**
Gopher Snake	*Pituophis catenifer*	None	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	**1**
Total Number of Captures			**2**	**0**	**1**	**1**	**1**	**1**	**3**	**2**	**2**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**15**

[1] SSC: CDFW Species of Special Concern
WL: CDFW Watch List
MSCP: Covered under the MSCP Subarea Plan
Group 2: Animals declining but not in immediate threat of extinction or extirpation (County)
* Individual(s) were observed incidentally along trails near this herpetological array

The lizard species captured during drift fence surveys within the Preserve include coastal western whiptail, southern alligator lizard (*Elgaria multicarinata*), and western fence lizard (*Sceloporus occidentalis*) (Table 6). Multiple Belding's orange-throated whiptail individuals were detected incidentally during the third round of drift fence surveys along trails near funnel traps. While no lizard species were captured in Trap 2, multiple individuals were observed incidentally in the vicinity of Trap 2; therefore, all detected lizard species are considered to be distributed throughout the Preserve.

Snake species accounted for 40 percent of the drift fence captures. Snake species captured during drift fence surveys within the Preserve include California striped racer (*Coluber lateralis lateralis*), gopher snake (*Pituophis catenifer*), and California kingsnake (*Lampropeltis californiae*) (Table 6). A southern Pacific rattlesnake (*Crotalus oreganus helleri*) was detected incidentally during the third round of drift fence surveys along an access road near Trap 2. All detected snake species were distributed throughout the Preserve based on trap location. Representative photographs of reptile species caught during drift fence surveys are located in Appendix F.

4.3.3 Birds

A total of 52 bird species were observed within the Preserve during avian surveys in February, April, July, and September 2019, and incidentally during other surveys (**Table 7**). Of these, a total of five special-status bird species were observed during avian surveys: barn owl (*Tyto alba*), coastal California gnatcatcher (*Polioptila californica californica*), Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), and Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*). These species are discussed in further detail in Section 4.3.5. The full list of all avian species detected is located in Appendix D.

The most common species observed in terms of numbers of individuals recorded were California towhee (*Melozone crissalis*), mourning dove (*Zenaida macroura*), lesser goldfinch (*Spinus psaltria*), Anna's hummingbird (*Calypte anna*), California quail (*Callipepla californica*), wrentit (*Chamaea fasciata*), and white-crowned sparrow (*Zonotrichia leucophrys*). The following birds were observed during nocturnal surveys: common poorwill (*Phalaenoptilus nuttallii*), barn owl (*Tyto alba*), and great-horned owl (*Bubo virginianus*).

Common resident species on the Preserve include wrentit, California towhee, California quail, spotted towhee (*Pipilo maculatus*), Anna's hummingbird, and Bewick's wren (*Thryomanes bewickii*). These species were observed during each survey and are presumed to nest within the Preserve. Other resident species that were common on the Preserve but are presumed to use the Preserve only for foraging are red-tailed hawk (*Buteo jamaicensis*) and common raven (*Corvus corax*).

Table 7. Avian Survey Results

Common Name by Family	Scientific Name	Winter (2/19/19)	Spring (4/9/19)	Summer (7/16/19)	Fall (9/27/19)	Incidental Observations	Status[1]
Odontophoridae							
California Quail	*Callipepla californica*	1	8	15	5	X	
Columbidae							
Rock Pigeon	*Columba livia*	-	1[a]	-	6	-	
Mourning Dove	*Zenaida macroura*	12	6	12	20	X	
Cuculidae							
Greater Roadrunner	*Geococcyx californianus*	-	1	-	-	-	
Caprimulgidae							
Common Poorwill	*Phalaenoptilus nuttallii*	X	X	X	-	-	
Trochilidae							
Anna's Hummingbird	*Calypte anna*	11	14	4	4	X	
Costa's Hummingbird	*Calypte costae*	1	-	-	-	-	
Allen's Hummingbird	*Selasphorus sasin*	-	5	-	-	-	
Rufous/Allen's Hummingbird	*Selsphorus rufus/sasin*	-	-	1	-	-	
Hummingbird sp.		1	-	-	1	-	
Accipitridae							
Sharp-Shinned Hawk	*Accipiter striatus*	-	1	-	-	-	WL, Group 1
Cooper's Hawk	*Accipiter cooperii*	1	1	-	3	-	WL, MSCP, Group 1
Red-Tailed Hawk	*Buteo jamaicensis*	1	-	-	-	X	
Tytonidae							
Barn Owl	*Tyto alba*	-	-	X	X	-	Group 2
Strigidae							
Great Horned Owl	*Bubo virginianus*	1	-	-	-	-	
Picidae							
Acorn Woodpecker	*Melanerpes formicivorus*	-	-	-	-	X	
Nuttall's Woodpecker	*Dryobates nuttallii*	1	-	1	1	-	
Northern Flicker	*Colaptes auratus*	3	-	-	-	-	
Falconidae							
American Kestrel	*Falco sparverius*	3	-	-	-	-	
Tyrannidae							
Pacific-Slope Flycatcher	*Empidonax difficilis*	-	-	1	2	-	
Black Phoebe	*Sayornis nigricans*	-	-	1	1	-	

Common Name by Family	Scientific Name	Winter (2/19/19)	Spring (4/9/19)	Summer (7/16/19)	Fall (9/27/19)	Incidental Observations	Status[1]
Say's Phoebe	*Sayornis saya*	2	-	-	3	-	
Ash-Throated Flycatcher	*Myiarchus cinerascens*	-	-	-	-	X	
Cassin's Kingbird	*Tyrannus vociferans*	7	-	1	-	-	
Corvidae							
California Scrub-Jay	*Aphelocoma californica*	-	1	-	-	-	
American Crow	*Corvus brachyrhynchos*	1[a]	-	1	2	-	
Common Raven	*Corvus corax*	1[a]	1[a]	1	3	X	
Aegithalidae							
Bushtit	*Psaltriparus minimus*	-	-	-	10	X	
Sylviidae							
Wrentit	*Chamaea fasciata*	6	10	8	5	X	
Polioptilidae							
Blue-Gray Gnatcatcher	*Polioptila caerulea*	-	-	-	1	-	
Coastal California Gnatcatcher	*Polioptila californica californica*	3	2	3	6	-	FT, SSC, MSCP, Group 1
Troglodytidae							
Bewick's Wren	*Thryomanes bewickii*	5	3	3	4	-	
House Wren	*Troglodytes aedon*	2	-	2	1	-	
Rock Wren	*Salpinctes obsoletus*	2	-	-	-		
Mimidae							
California Thrasher	*Toxostoma redivivum*	5	2	2	4	X	
Northern Mockingbird	*Mimus polyglottos*	-	-	1	1	-	
Turdidae							
American Robin	*Turdus migratorius*	1[a]	-	-	-	-	
Fringillidae							
House Finch	*Haemorhous mexicanus*	8	5	1	-	X	
Lesser Goldfinch	*Spinus psaltria*	12	9	8	3	X	
Passerellidae							
White-Crowned Sparrow	*Zonotrichia leucophrys*	11	14	-	6	X	
Golden-Crowned Sparrow	*Zonotrichia atricapilla*	1	1	-	-	-	
Song Sparrow	*Melospiza melodia*	3	3	-	-	X	
Lincoln's Sparrow	*Melospiza lincolnii*	-	1	-	-	-	
California Towhee	*Melozone crissalis*	13	23	10	7	X	
Southern California Rufous-Crowned Sparrow	*Aimophila ruficeps canescens*	2	1	-	-	-	WL, MSCP,

Common Name by Family	Scientific Name	Winter (2/19/19)	Spring (4/9/19)	Summer (7/16/19)	Fall (9/27/19)	Incidental Observations	Status[1]
							Group 1
Spotted Towhee	*Pipilo maculatus*	4	4	4	4	X	
Icteridae							
Western Meadowlark	*Sturnella neglecta*	1	-	-	-	-	
Hooded Oriole	*Icterus cucullatus*	-	-	3	-	-	
Bullock's Oriole	*Icterus bullockii*	-	1	-	-	-	
Parulidae							
Common Yellowthroat	*Geothlypis trichas*	1	1	-	-	-	
Yellow-Rumped Warbler	*Setophaga coronata*	9	1	-	1	-	
Black-Throated Gray Warbler	*Setophaga nigrescens*	-	2	-	-	-	
Number of Species Observed/Detected		**33**	**28**	**23**	**25**	**16**	

[1] FT: Federally Threatened
SSC: CDFW Species of Special Concern
WL: CDFW Watch List
MSCP: Covered under the MSCP Subarea Plan
Group 1: Animals of high sensitivity (listed or specific natural history requirements) (County)
Group 2: Animals declining but not in immediate threat of extinction or extirpation (County)

X – species heard, but number of individuals was undetermined

[a] Flyovers

In addition to the resident species, some winter resident species were present within the Preserve. These species are winter residents in coastal sage scrub and chaparral habitat within San Diego County and were detected only during the winter or early springtime, before they migrated north. This includes species such as American robin (*Turdus migratorius*), yellow-rumped warbler (*Setophaga coronata*), golden-crowned sparrow (*Zonotrichia atricapilla*), and white-crowned sparrow (Table 7). Few non-resident migratory species were detected within the Preserve, but those few include black-throated gray warbler (*Setophaga nigrescens*) and sharp-shinned hawk. These individual migratory species moved through the Preserve, but no large pulses of migratory birds were detected. Generally, the habitat within the Preserve appears to represent quality breeding and wintering habitat for species, with no major migratory corridors or areas of dense stands of vegetation where migratory birds would rest or stop during migration (i.e., there are no areas of riparian vegetation or wetland areas).

Table 7 lists the bird species found during the four avian surveys in 2019, as well as incidental avian observations from other focused survey efforts. The numbers in Table 7 indicate the approximate number of individuals per species that were heard or observed during each survey. Avian diversity was highest in the winter (February), and lowest in the summer (July).

4.3.4 Mammals

4.3.4.1 Small Mammals

Seven small mammal species, all rodents, were trapped on the Preserve during the small mammal surveys. This included the special-status species San Diego desert woodrat (*Neotoma lepida intermedia*), which is discussed in further detail in Section 4.3.5. The most common species trapped was the California mouse (*Peromyscus californicus*). Representative photographs of small mammal species found on the Preserve are located in Appendix F.

Table 8, provides a summary of the total number of individuals captured in each trapline during the fall and summer trapping sessions. For four consecutive nights of trapping during fall 2018 and another four consecutive nights during spring 2019, 150 traps were used, for a total of 1,200 "trap nights"—defined as one trap set for one night. There were 160 small mammal captures across those 1,200 trap nights for an approximate 13.3 percent trap night success rate.

Table 8. Small Mammal Trapping Results

Common Name	Scientific Name	Status[1]	Fall 2018 (11/5/18–11/9/18) Sampling Location				Summer 2019 (5/27/19–5/31/19) Sampling Location				Total
			1	2	3	4	1	2	3	4	
California pocket mouse	*Chaetodipus californicus*	None	2	2	4	1	-	8	1	-	**18**
San Diego desert woodrat	*Neotoma lepida intermedia*	SSC, Group 2	4	8	8	-	-	10	1	-	**31**
Big-eared woodrat	*Neotoma macrotis*	None	-	-	-	-	2	-	-	4	**6**
Brush mouse	*Peromyscus boylii*	None	-	-	-	-	1	6	2	-	**9**
California mouse	*Peromyscus californicus*	None	19	14	15	7	5	11	13	3	**87**
Deer mouse	*Peromyscus maniculatus*	None	-	-	-	-	1	-	2	2	**5**
Western harvest mouse[2]	*Reithrodontomys megalotis*	None	-	-	-	3	-	-	-	1	**4**
Total Number of Individuals Captured			**25**	**24**	**27**	**11**	**9**	**35**	**19**	**10**	**160**

[1] SSC: CDFW Wildlife Species of Special Concern
Group 2: Animals declining but not in immediate threat of extinction or extirpation (County)
[2] Western harvest mouse was also captured during the herpetological drift fence surveys at the drift fence #2 location on July 8, 2019, in close proximity to small mammal trap #1.

4.3.4.2 Bats

Ten bat species were detected within the Preserve during passive and active acoustic surveys in 2019, including big brown bat (*Eptesicus fuscus*), western red bat (*Lasiurus blossevillii*), hoary bat (*Lasiurus cinereus*), western yellow bat (*Lasiurus xanthinus*), California myotis (*Myotis californicus*), western small-footed myotis (*Myotis ciliolabrum*), Yuma myotis (*Myotis yumanensis*), pocketed free-tailed bat (*Nyctinomops femorosaccus*), canyon bat (*Parastrellus hesperus*), and Mexican free-tailed bat (*Tadarida brasiliensis*). Three of these species are CDFW Species of Special Concern: western red bat, western yellow bat, and pocketed free-tailed bat. **Table 9** lists the status, preferred roosting habitat, and detection method for each bat species that was detected during the 2019 spring and summer bat surveys.

Table 9. Summary of Bat Species Detected During 2019 Surveys

Common Name	Scientific Name	Status[1]	Roosting Habitat[2]	Detection Method
Big brown bat	*Eptesicus fuscus*	None	Multiple	Acoustic
Western red bat	*Lasiurus blossevillii*	SSC Group 2	Tree	Acoustic, Visual
Hoary bat	*Lasiurus cinereus*	None	Tree	Acoustic
Western yellow bat	*Lasiurus xanthinus*	SSC	Tree	Acoustic
California myotis	*Myotis californicus*	None	Multiple	Acoustic
Western small-footed myotis	*Myotis ciliolabrum*	None	Multiple	Acoustic
Yuma myotis	*Myotis yumanensis*	Group 2	Multiple	Acoustic
Pocketed free-tailed bat	*Nyctinomops femorosaccus*	SSC Group 2	Cliff	Acoustic
Canyon bat	*Parastrellus hesperus*	None	Cliff[3]	Acoustic, Visual
Mexican free-tailed bat	*Tadarida brasiliensis*	None	Multiple	Acoustic

[1] SSC: CDFW Species of Special Concern
Group 2: Animals declining but not in immediate threat of extinction or extirpation (County)
[2] Source: Western Bat Working Group (WBWG). 2019. Species Matrix. Accessed at http://wbwg.org/matrices/species-matrix/ in September 2019
[3] Roosts primarily in rock crevices

Roosting Habitat Assessment

Overall, roosting habitat within the Preserve is limited and of relatively low abundance compared to other developed and undeveloped lands in the region. The Preserve does not contain cliffs, large rock faces, snags, culverts, bridges, abandoned buildings, or mines. Small rocky outcrops occur throughout the Preserve and may provide roosting habitat for canyon bats; however, these features are generally low to the ground and lack the vertical drop and predator protection preferred by other cliff and multiple roosting habitat species such as the big free-tailed bat (*Nyctinomops*

macrotis). The foliage and sloughing bark of mature eucalyptus trees along Bancroft Creek in the northeastern corner of the Preserve may provide roosting habitat for tree-roosting species and multiple-roosting-habitat species such as the California myotis and western red bat.

Emergence Surveys and Active Acoustic Monitoring

Two species of bats were detected during active acoustic monitoring within the Preserve: a canyon bat was detected within the eucalyptus stand in the northeastern portion during the spring survey and a California myotis was detected within the eucalyptus stand in the northeastern corner of the Preserve during the summer survey (**Table 10**). No potential concentrated roost sites or focused emergence points (e.g., tree cavities) were identified during the roosting habitat assessment; therefore, the emergence surveys were focused on the eucalyptus woodland area and rock outcrops in the vicinity of Bancroft Creek. No bats were directly observed emerging from these areas; however, directly observing the emergence of solitary roosting bats or small roosting colonies in these areas would be unlikely, even if roosting bats were present.

Table 10. Results of Emergence Surveys and Active Acoustic Monitoring during Spring and Summer 2019

Date	Surveyors	Results[1]
Spring		
4/18/19	Julie Stout, Karla Flores	Canyon bat observed foraging in the vicinity of Bancroft Creek.
Summer		
6/25/19	Julie Stout, Lisa Maier	California myotis detected early in the evening flying on-site from the east along the riparian/eucalyptus area of Bancroft Creek.

Passive Acoustic Surveys

Nine bat species were detected during the spring passive acoustic survey and all ten bat species were detected during the summer passive acoustic survey. **Table 11** presents the relative activity index for each bat species during the spring and summer passive acoustic surveys. The relative activity index provides a basis for relative comparison of activity for each bat species, but does not directly correlate with the abundance of individuals. A higher activity index could be the result of a single bat foraging in the survey area for an extended period of time or multiple bats briefly passing through the survey area. Representative photographs of passive bat survey detectors are located in Appendix F.

Table 11. Results of Passive Acoustic Bat Surveys during Spring and Summer 2019

Common Name	Scientific Name	Status[1]	Relative Nightly Activity Index[2]		
			Spring (April)	Summer (July)	Average Activity Index[3]
Big brown bat	*Eptesicus fuscus*	None	300.71	25.83	163.27
Western red bat	*Lasiurus blossevillii*	SSC Group 2	108.57	248.33	178.45
Hoary bat	*Lasiurus cinereus*	None	37.86	6.67	22.26
Western yellow bat	*Lasiurus xanthinus*	SSC	0.71	0.83	0.77
California myotis	*Myotis californicus*	None	12.14	29.17	20.65
Western small-footed myotis	*Myotis ciliolabrum*	None	0.00	1.67	0.83
Yuma myotis	*Myotis yumanensis*	Group 2	22.14	28.33	25.24
Pocketed free-tailed bat	*Nyctinomops femorosaccus*	SSC Group 2	70.00	18.33	44.17
Canyon bat	*Parastrellus hesperus*	None	62.14	100.83	81.49
Mexican free-tailed bat	*Tadarida brasiliensis*	None	733.57	178.33	455.95

[1] SSC: CDFW Species of Special Concern
Group 2: Animals declining but not in immediate threat of extinction or extirpation (County)
[2] Number of bat passes per detector per night multiplied by 10
[3] Average of seasonal measures of relative activity for each bat species detected

For migratory species such as the hoary bat and Mexican free-tailed bat (a species that occurs as both a migrant and year-round resident in Southern California), trends of increased activity in the spring, as compared to summer, may be the result of migratory activity. Trends of increased activity in the spring for year-round resident species such as the big brown bat and pocketed free-tailed bat may be the result of local dispersals or seasonal movements between winter and summer roost sites or may indicate reduced summer foraging distances tied to maternity roost locations or different foraging patterns tied to seasonal insect distribution or abundance. For species with increased summer activity, such as the western red bat and canyon bat, these activity trends may be associated with local seasonal movement patterns and changes in seasonal foraging activity. Increased activity during summer could also indicate that maternal roosts occur in the vicinity.

4.3.4.3 Medium and Large Mammals

Wildlife Cameras

Several mammal and bird species were detected at the three wildlife camera locations. Species detected at the wildlife cameras in approximate order of abundance based on the total number of instances a camera was triggered by each species were coyote (*Canis latrans*), Audubon's cottontail (*Sylvilagus audubonii*), various bird species (American crow [*Corvus brachyrhynchos*], common raven [*Corvus corax*], greater roadrunner [*Geococcyx californianus*], and mourning dove

[*Zenaida macroura*]), raccoon (*Procyon lotor*), and bobcat (*Lynx rufus*). No special-status wildlife species were detected at any of the three camera locations. Representative photographs of the wildlife cameras and their views are located in Appendix F.

Table 12 details the number of instances a wildlife species triggered a wildlife camera per species. It is important to note that, while the number of instances triggered per species per camera is useful to show the locations where various wildlife species were detected, the number of instances are not meant to provide an index or estimate of relative abundance. For example, species such as the Audubon's cottontail are very active and if they are foraging in front of a wildlife camera, the camera will continue to take photos of the same cottontail, until the cottontail exits the camera's field of view. It is likely that, for several of the species, the cameras detected many of the same individuals moving around the Preserve.

Table 12. Wildlife Species Detected at Wildlife Camera Stations

Wildlife Camera Station ID	Number of Instances a Camera Was Triggered			
	Winter (12/7/18–1/7/19)	Spring (3/27/19–4/27/19)	Summer (6/7/19–7/7/19)	Fall (8/27/19–9/27/19)
Audubon's Cottontail				
1	35	4	-	-[a]
2	-	-	-	*
3	1	3	62	20
Total	**36**	**7**	**62**	**20**
Bird Species				
1	1	-	19	9[a]
2	-	2	2	*
3	-	4	1	1
Total	**1**	**6**	**22**	**10**
Bobcat				
1	-	-	-	-[a]
2	-	-	-	*
3	-	1	-	2
Total	**0**	**1**	**0**	**2**
Coyote				
1	44	2	19	11[a]
2	62	30	11	*
3	216	53	89	90
Total	**322**	**85**	**119**	**101**
Raccoon				
1	-	-	-	-[a]
2	-	-	-	*
3	2	-	-	1
Total	**2**	**0**	**0**	**1**
Total Photos (All Species)	**361**	**99**	**203**	**134**

* Wildlife camera 2 was stolen during the fall survey period and no pictures were recovered.

[a] Wildlife camera 1 collected pictures for only half of the final survey period in fall 2019 before the memory card became full due to excessive pictures of moving vegetation triggering the camera.

In addition to the wildlife species captured on wildlife cameras, multiple photographs of hikers, mountain bikers, domestic dogs, and illegal dirt-bikers were captured on the wildlife cameras located within the Preserve.

4.3.5 Special-Status Wildlife Observed

Twelve special-status wildlife species were observed or detected within the Preserve during surveys in 2018–2019 (**Figure 11**). Of these species, four species are also covered under the MSCP Subarea Plan. No special-status invertebrate species, including butterflies, were detected. Special-status wildlife species detected included two reptile species, five bird species, and five mammal species. Life history, range description, and occurrence of these species within the Preserve are discussed in further detail in the following sections.

4.3.5.1 Herpetofauna

Belding's Orange-Throated Whiptail (*Aspidoscelis hyperythra beldingi*)
CDFW Watch List, County Group 2, MSCP Covered Species

Belding's orange-throated whiptail is a slim-bodied lizard with a long slender tail. The back is unspotted with dark brown, black, and white-ish yellow stripes and the throat is orange, turning brighter orange during breeding season. In California, Belding's orange-throated whiptail ranges from the Santa Ana River in Orange County, and near Colton in San Bernardino County, west of the Peninsular Ranges, into the Baja Peninsula (Zeiner et al. 1988). This subspecies inhabits semi-arid brushy areas typically with loose soil and rocks, including washes, streamsides, rocky hillsides, and coastal chaparral (Zeiner et al. 1988). Their diet consists of a variety of small invertebrates, especially spiders, scorpions, centipedes, and termites. This species is considered special-status primarily due to loss of suitable coastal sage scrub habitat. Development of floodplains and stream terraces has also greatly contributed to this species' decline, as well as habitat fragmentation.

Belding's orange-throated whiptail was detected in the open scrub habitat on-site during surveys in 2019. It was not captured in any of the drift fence locations but was seen incidentally along trails near array 1, 2, and 3 (Figure 11). This species likely inhabits most of the open scrub habitat throughout the Preserve.

Coastal Western Whiptail (*Aspidoscelis tigris stejnegeri*)
CDFW Species of Special Concern, County Group 2

Coastal western whiptail is a slim-bodied lizard with a long slender tail. The back and sides are grey, tan, or brown, marked with sharply defined dark spots or mottling. This subspecies is found in coastal Southern California, predominantly west of the Peninsular Ranges and south of the Transverse Ranges, and north into Ventura County, extending south into Baja California, Mexico. It inhabits a variety of ecosystems such as chaparral, woodland, and riparian areas, primarily hot and dry open areas with sparse foliage. This species is considered special-status primarily due to habitat fragmentation and destruction (Zeiner et al. 1988).

Coastal western whiptail was detected in the open scrub habitat on-site during surveys in 2019. It was the most commonly captured lizard species (Figure 11). There were a total of five captures of coastal western whiptail during drift fence surveys at arrays 1, 3, and 4. While it was not captured at array 2, one individual was observed incidentally along a trail near array 2. Given the broad range of locations where this species was captured, it likely inhabits most of the open chaparral and scrub habitat throughout the Preserve.

4.3.5.2 Birds

Barn Owl (*Tyto alba*)
County Group 2

Barn owls reside in much of the continental United States, including California. They are found in many open habitats, including grassland, chaparral, riparian, and developed or urban habitats. This species will roost in barns, caves, dense trees, or other structures and hunt for small mammals on the wing or from a perch. Prey species include mice, voles, gophers, and squirrels as well as other small birds. Barn owls in California retain their home range throughout the year and are not migratory (Zeiner et al. 1990a). Barn owls are threatened by the conversion of agricultural land to urban and suburban development and the loss of suitable nesting sites such as large, hollow trees and old buildings. They can also be impacted by rodenticides as rodents make up the majority of their diet.

One barn owl was detected during the summer nocturnal avian survey at the playback point adjacent to the eucalyptus trees in the northeast portion of the Preserve (Figure 11). There was a barn owl box adjacent to the Preserve in a private backyard but it did not appear to be occupied this year. No nesting behavior was observed during baseline biological surveys. A second barn owl was observed foraging within the Preserve during the fall nocturnal avian survey (Figure 11).

Given the suitable foraging habitat and observation of a foraging individual, it is highly likely this species is found year-round on the Preserve.

Coastal California Gnatcatcher (*Polioptila californica californica*)
Federally Threatened, CDFW Species of Special Concern, County Group 1, MSCP Covered Species

The coastal California gnatcatcher ranges from coastal Southern California, specifically in the six southernmost California counties located within the coastal plain (San Bernardino, Ventura, Los Angeles, Orange, San Diego, and Riverside) to Baja California, Mexico. It can be found year-round within coastal sage scrub habitats dominated by California sage brush and flat-topped buckwheat, mainly on cismontane slopes below 1,500 feet in elevation (Atwood 1990). Coastal California gnatcatchers prey on insects and spiders from the foliage of shrubs within their territory. When nesting, this species typically avoids slopes that are greater than 25 percent and covered with dense, tall vegetation. Coastal California gnatcatcher pairs will attempt several nests each year (average of four) with each nest placed in a different location inside their breeding territory, but most nest attempts are unsuccessful due to depredation by a variety of species (Grishaver et al. 1998; Atwood and Bontrager 2001). Clutch size ranges from one to five eggs, with three or four eggs most common. Coastal California gnatcatchers will remain paired through the nonbreeding season and will generally expand their home range when not breeding. Coastal California gnatcatcher populations have declined due to widespread destruction of its coastal scrub habitat (Atwood 1990).

Within the Preserve, coastal California gnatcatchers were detected during all the diurnal avian surveys. The birds were typically detected by vocalizations only and were rarely seen for long periods of time; therefore, individuals' sexes were unable to be identified (Figure 11). However, nesting behavior was observed during baseline biological surveys. The majority of the Preserve is dominated by California sage brush or another coastal sage shrub alliance (see Section 4.1), providing suitable habitat for coastal California gnatcatchers. Based on avian surveys and other incidental observations, up to four territories are established on the Preserve.

Cooper's Hawk (*Accipiter cooperii*)
CDFW Watch List, County Group 1, MSCP Covered Species

Cooper's hawks inhabit live oak, riparian deciduous, or other forest habitats near water. This species is a year-round resident of much of western and eastern United States and is migratory in its range throughout the central United States south to Mexico (Zeiner et al. 1990a). This species is a resident of California, and most of its breeding occurs in the southern Sierra Nevada foothills, the New York Mountains, Owens Valley, and throughout Southern California. This species nests

and forages near open water or in riparian vegetation. Cooper's hawks primarily hunt small birds, although they will consume small mammals, reptiles, and amphibians (Zeiner et al. 1990a). This species has been impacted due to continued use of pesticides, but population numbers have rebounded in recent years (NatureServe 2019). Loss of suitable riparian habitat may also be impacting this species, but they are known to occupy more urbanized habitats as well (NatureServe 2019).

Cooper's hawk was detected during the winter, spring, and fall diurnal avian surveys. During the winter and spring surveys, only one individual Cooper's hawk was detected. At least three individual Cooper's hawks were detected during the fall survey. The individual during the winter survey was observed flying low over the vegetation, actively hunting within the Preserve (Figure 11). The individual observed during the spring survey was seen perched in a shrub high up on the Preserve, most likely actively scanning for prey items. Two individuals, one juvenile and one adult, were observed foraging within the Preserve during the fall survey (Figure 11). The third individual, age unknown, was seen circling over the Preserve with the other two individuals during the fall survey (Figure 11). Given the time of year, it is difficult to determine if this bird was a migrant or a wintering/resident. The entire Preserve provides suitable foraging habitat and the two woodland habitats on-site provide suitable trees for nesting and roosting; however, these trees lack the height and density that is typically preferred by this species.

Sharp-Shinned Hawk (*Accipiter striatus*)
CDFW Watch List, County Group 1

The sharp-shinned hawk breeds throughout the boreal forests of Canada and Alaska, and across both deciduous and evergreen forests within much of the United States. It can be found within drier regions of the western United States at higher altitudes in montane evergreen forests, extending south into higher elevation areas of Mexico. In winter, they are present coast to coast throughout the southern United States and northern Mexico (Evans and Rosenfield 1985, American Ornithologists' Union 1998). Within Southern California, sharp-shinned hawks are regular winter residents feeding on songbird populations that winter in the same areas. In California, this species typically nests in coniferous forests, often within riparian areas or on north-facing slopes near water or in proximity to open areas (Zeiner et al. 1990a). Sharp-shinned hawks primarily hunt songbirds, although they will consume small mammals as well. Sharp-shinned hawks continue to be seen in Southern California in small but consistent numbers in winter, but habitat destruction, logging and development of forested areas, pesticide contamination, and shooting are the primary threats to sharp-shinned hawk populations.

A single sharp-shinned hawk was observed during the spring diurnal avian survey. This individual was observed circling up over the Preserve and then dive-bombing out of view into the Preserve

to pursue a prey item (Figure 11). The entire Preserve provides suitable habitat for foraging for this migratory or wintering species; however, due to the lack of thick, tall tree strands, it is unlikely this species would roost on-site.

Southern California Rufous-Crowned Sparrow *(Aimophila ruficeps canescens)*
CDFW Watch List, County Group 1, MSCP Covered Species

Southern California rufous-crowned sparrow is a resident species in San Diego County and primarily inhabits coastal sage scrub or mixed chaparral habitats (Zeiner et al. 1990a), preferably along steep grassy or rocky hillsides. This species is secretive and frequently hides in shrub patches or near rocky outcrops, where it can forage on the ground for insects, spiders, seeds, and other vegetation. Southern California rufous-crowned sparrow is not migratory as it maintains year-round territories, but territory size may increase during the post-breeding season (Zeiner et al. 1990a). Like many other species that inhabit coastal scrub habitats, this species is threatened primarily by habitat loss and fragmentation of coastal scrub habitats. Brown-headed cowbird (*Molothrus ater*) parasitism has also been recorded for this sparrow (Zeiner et al. 1990a).

Southern California rufous-crowned sparrows were detected during both the winter and spring diurnal avian surveys. They were mainly heard in the western portion of the Preserve (Figure 11). This species was heard within the more open sage scrub habitats along the steep hillsides. This species likely breeds within the Preserve based on observed avian behavior and calling.

4.3.5.3 Mammals

San Diego Desert Woodrat (*Neotoma lepida intermedia*)
CDFW Species of Special Concern, County Group 2

The San Diego desert woodrat occurs in coastal California from San Luis Obispo south through the Transverse and Peninsular Ranges into Baja California, Mexico. This species is found in a variety of shrub and desert habitats and nest primarily against rock outcroppings, boulders, cacti, or areas of dense undergrowth (Brylski 2005; Zeiner et al. 1990b; Bleich 1973; Bleich and Schwartz 1975; Cameron and Rainey 1972; Thompson 1982). Their nests, or middens, typically include several entrances and changers for nesting and food. Desert woodrats are primarily herbivorous, including flower buds, leaves, seeds, berries, and young shoots (Meserve 1974; Cameron and Rainey 1972). This species is impacted by edge effects, primarily related to increased predation from cats or other mesopredators.

San Diego desert woodrats were captured 31 times during the fall 2018 and summer 2019 small mammal trapping within the Preserve, specifically in traps 1, 2, and 3 (Figure 11). This species likely inhabits most of the open scrub habitat throughout the Preserve.

Pocketed Free-Tailed Bat (*Nyctinomops femorosaccus*)
CDFW Species of Special Concern, County Group 2

The pocketed free-tailed bat, while it can be found in Riverside, San Diego, and Imperial Counties is rare in California and more common in Mexico (Harris 2000). This species inhabits pinyon-juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oasis (Harris 2000). The pocketed free-tailed bat prefers rock crevices in cliffs as roosting sites and rocky desert areas with high cliffs or rock outcrops (Harris 2000). The status of this species in California is poorly known, but it appears rare (Harris 2000).

The pocketed free-tailed bat was detected foraging and traversing the Preserve during both spring and summer passive acoustic surveys within the Preserve, but this species' relative nightly activity index was higher during the spring survey. Small rocky outcrops occur throughout the Preserve; however, these features are generally low to the ground and lack the vertical drop and predator protection preferred for roosting by this species.

Western Red Bat (*Lasiurus blossevillii*)
CDFW Species of Special Concern, County Group 2

The western red bat is locally common in some areas of California, occurring from Shasta County to the Mexican border, west of the Sierra Nevada/Cascade crest and deserts (Zeiner et al. 1990b). The winter range includes western lowlands and coastal regions south of San Francisco Bay. They are not found in desert areas. This species roosts primarily in forests and woodlands from sea level up through mixed conifer forests and are often in edge habitats adjacent to streams, fields, or urban areas (Zeiner et al. 1990b). Western red bats forage over a wide variety of habitats, including grasslands, shrublands, open woodlands, and croplands where they feed on a variety of insects (Zeiner et al. 1990b). Most individuals likely make relatively short migrations between summer and winter ranges in California (Zeiner et al. 1990b).

The western red bat was detected foraging and traversing the Preserve during both spring and summer passive acoustic surveys within the Preserve, but this species' relative nightly activity index was higher during the summer survey. The foliage of eucalyptus trees along Bancroft Creek may provide roosting habitat for this species.

Western Yellow Bat (*Lasiurus xanthinus*)
CDFW Species of Special Concern

The western yellow bat is uncommon in California, known only in Los Angeles and San Bernardino Counties south to the Mexican border, where it occurs year-round. It inhabits valley foothill riparian, desert riparian, desert washes, and palm oasis habitats below 2,000 feet in elevation (Harris 2008). This species roosts primarily in trees, including under palm trees, and forages for insects over water and among trees.

The western yellow bat was detected traversing the Preserve during both spring and summer surveys within the Preserve. Dead fronds of palm trees along Bancroft Creek may provide marginal-quality roosting habitat for this species; however, the species is more likely to roost off-site in nearby residential areas where taller palm trees provide higher-quality roosting habitat.

Yuma Myotis (*Myotis yumanensis*)
County Group 2

Yuma myotis is common and widespread throughout California in many habitat types, particularly open forests and woodlands with sources of water to forage over (Zeiner et al. 1990b). It ranges from sea level to 11,000 feet in elevation, but is generally found below 8,000 feet. This species roosts in buildings, mines, caves, or crevices, but has also been seen roosting in abandoned swallow nests and under bridges (Zeiner et al. 1990b). Yuma myotis forages over water sources such as ponds, streams, and stock tanks, where they feed on a variety of small flying insects. It probably makes local or short migrations to suitable hibernacula, where it hibernates during the winter (Zeiner et al. 1990b).

Yuma myotis was detected foraging and traversing the Preserve during both spring and summer surveys within the Preserve. Rock crevices and sloughing bark or cavities of eucalyptus trees on-site may provide low-quality roosting habitat for this species; however, the species is more likely to roost off-site in nearby bridges, culverts, and buildings.

4.3.6 Special-Status Wildlife Species with High Potential to Occur

In addition to the special-status wildlife species documented during the field surveys, 10 special-status wildlife species have a high potential to occur on the Preserve. The evaluation of their potential for occurrence was based on the elevation, soils, and vegetation communities present on the Preserve; known past occurrences within the Preserve; and the range and distribution of species within the vicinity of the Preserve. The sensitivity status, life history, habitat preferences, and

rationale for occurrence potential of each species are detailed below. A table of all special-status wildlife species evaluated for a potential to occur on the Preserve is included in **Appendix E**.

Crotch Bumble Bee (*Bombus crotchii*)
State Endangered Candidate Species

The crotch bumble bee occurs primarily in California, including the Mediterranean region, Pacific coast, western desert, Great Valley, and adjacent foothills through most of southwestern California (Williams et al. 2014). It was historically common in the Central Valley of California but now appears to be absent from most of it, especially in the center of its historic range (Hatfield et al. 2014; Richardson 2014). Within its current range in California, this species inhabits open grassland and scrub habitats that support potential nectar sources such as plants within the Fabaceae, Apocynaceae, Asteraceae, Lamiaceae, and Boraginaceae families (Richardson 2017; Williams et al. 2014; Thorp et al. 1983). Like most other species of bumble bee, the crotch bumble bee nests underground (Williams et al. 2014). The flight season for queens in this species runs from late February to late October, peaking in early April, with a second pulse in July. The flight season for workers and males runs from late March through September, peaking in early July (Thorp et al. 1983). This species has been impacted by extensive agricultural intensification in the Central Valley and habitat loss and fragmentation from rapid urbanization in the southern part of its range.

Much of the Preserve supports suitable nectar sources such as plant species in the *Phacelia* and *Salvia* genera, and two CNDDB occurrences were previously documented in 1957 and 1979 within the 1-mile-radius search around the Preserve (CDFW 2019a). The crotch bumble bee has a high potential to occur within the Preserve due to the presence of suitable food sources and past observations.

Quino Checkerspot Butterfly (*Euphydryas editha quino*)
Federally Endangered, MSCP Narrow Endemic Species, County Group 1

Historically, Quino inhabited the coastal slopes of Southern California, specifically in the five southernmost California counties (Los Angeles, Orange, Riverside, San Diego, and San Bernardino) to northern Baja California, Mexico. Currently, the butterfly is known to occur in high inland elevations of San Diego County. It can occupy a variety of habitat types, including grasslands, coastal sage scrub, chamise chaparral, juniper woodland, and semi-desert scrub, as long as larval host plants, such as native species of plantain, are present. Larvae feed upon the leaves of native plantain plant species and adults feed on plant nectar. The flight season for Quino runs from late February through May, peaking in March and April, when mating typically occurs. This species is threatened by habitat fragmentation and degradation caused by urban development, increased fire frequencies, pesticide spraying, unauthorized trash dumping, displacement of larval

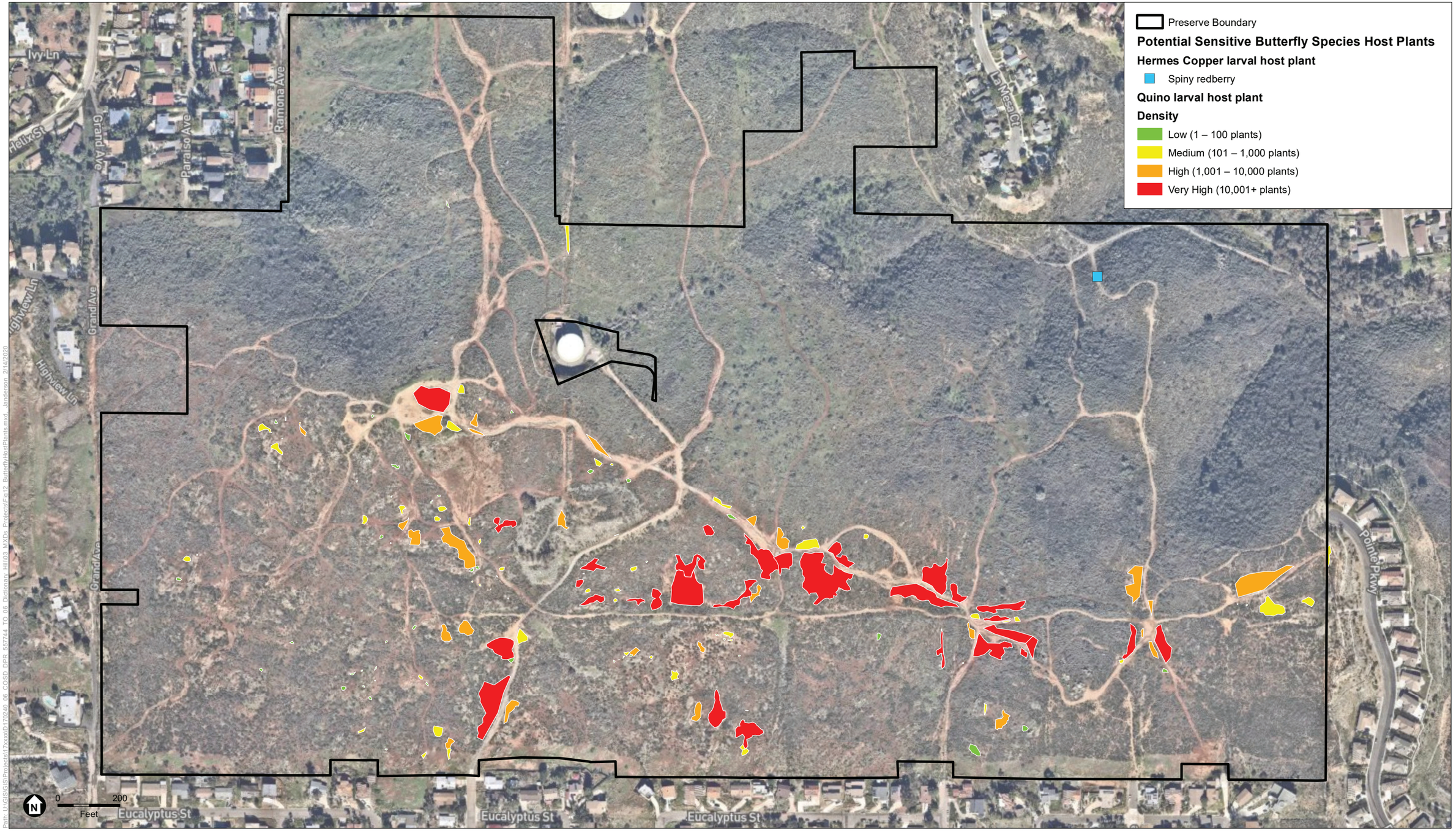
host plants and adult nectar sources by non-native and invasive non-native plant species, impacts from off-road vehicles, and over-collection.

Quino has a high potential to occur within the Preserve due to the presence of larval host plants, suitable adult nectar sources, and nearby known populations. Quino have been historically documented within the Preserve from 1947–1981 (County of San Diego 2019). While the entire area within the Preserve is potentially suitable habitat for Quino, Quino larval host plant populations were detected predominantly in the southern half of the Preserve. Dot-seed plantain, a Quino larval host plant, occurs in patches throughout the southern half of the Preserve, ranging in densities of tens to millions (**Figure 12**). Specific areas that Quino tend to prefer, including semi-open scrub, open hilltops, and open dirt trails, were also present. Potential nectar sources for adult Quino, including ground-pink (*Linanthus dianthiflorus*), deerweed, blue dicks, and other species, were scattered throughout the Preserve.

Quino is a species with metapopulation dynamics where there are patches of suitable habitat that are unoccupied during certain years, but in other years are occupied. The species undergoes drastic population fluctuations from year to year, and is highly dependent on rainfall. Quino may be absent from suitable habitat patches in one year, but in subsequent years reoccupy habitat. Drought conditions within San Diego County prior to the 2018/2019 rainy season have been detrimental to populations of Quino around the county and may be a factor contributing to the lack of Quino detections within the Preserve. Although Quino was not observed during the single survey performed on April 11, 2019, this does not preclude this species from being present on the Preserve. Additional protocol-level surveys would be needed to confirm presence or absence of this species due to the historic population and presence of suitable habitat with host and nectar plants.

Coast Horned Lizard (*Phrynosoma blainvillii*)
CDFW Species of Special Concern, County Group 2, MSCP Covered Species

The coast horned lizard is a flat-bodied lizard with a wide oval-shaped body and a large crown of horns or spines on its head. They are historically found in California along the Pacific Coast, from the San Francisco Bay Area down to Baja California, Mexico, west of the deserts and the Sierra Nevada, and inland as far north as Shasta Reservoir. Currently, the range has been severely fragmented due to land alteration, and populations seem to be restricted to localized areas that support loose soils and have a high sand content (Jennings and Hayes 1994). This species relies on open areas of sandy soil and low vegetation and can inhabit a variety of habitats, including grasslands, coniferous forests, woodlands, and chaparral (Stebbins 2003). They are commonly found in lowlands along sandy washes with scattered shrubs, along dirt roads, and near native ant hills.



SOURCE: ESRI; SanGIS 2019; ESA 2020

Figure 12
Potential Sensitive Butterfly Species Host Plants

ESA

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Three CNDDB occurrences for this species were previously documented in 1967, 1996, and 2003 within the 1-mile-radius search around the Preserve (CDFW 2019a). This species has potential to inhabit most of the open scrub habitats where they coincide with sandy or friable soils on the Preserve. Their food source, harvester ants, were also present on-site.

Red Diamond Rattlesnake (*Crotalus ruber*)
CDFW Species of Special Concern, County Group 2

The red diamond rattlesnake is found in southwestern California from the Morongo Valley west to the coast and south along the peninsular ranges to mid Baja California, Mexico. This heavy-bodied species inhabits arid scrub, coastal chaparral, oak and pine woodlands, rocky grasslands, and cultivated areas (Zeiner et al. 1998). It can also be found on the desert slopes of the mountains east toward Anza Borrego Desert. This species preys predominantly on small mammals, including ground squirrels, wood rats, mice, and rabbits, but has been known to eat lizards and birds as well.

One CNDDB occurrence of this species was previously documented in 1996 within the 1-mile-radius search around the Preserve (CDFW 2019a). Suitable habitat occurs throughout most of the Preserve for this species, especially in rocky areas with thick vegetative cover.

San Diego Ringneck Snake (*Diadophis punctatus similis*)
County Group 2

The San Diego ringneck snake is found mainly in San Diego County along the coast and into the Peninsular Range, and in southwestern Riverside County. This secretive snake is usually found under the cover of rocks, wood, bark, and other surface debris in preferable moist habitats, including wet meadows, rocky hillsides, grassland, chaparral, and woodlands. This species preys predominantly on small salamanders, tadpoles, small frogs, small snakes, lizards, worms, and insects.

Four SanBIOS occurrences of this species were previously documented in 1930, 1947, and 1950 within the 1-mile-radius search around the Preserve (County of San Diego 2019). Suitable habitat occurs within the grassland and rocky hillsides of the Preserve.

Bell's Sage Sparrow (*Artemisiospiza belli belli*)
CDFW Watch List, County Group 1

The Bell's sage sparrow can be found from the coastal ranges of California and across the Sacramento Valley to the west slope of the Sierra Nevadas, where it inhabits large, unfragmented blocks of coastal sage scrub, southern mixed chaparral habitats. This species is generally non-

migratory, but San Joaquin Valley and northern Mohave Desert populations do migrate, and some populations move up-slope and down-slope with season changes (Johnson and Marten 1992). Bell's sage sparrows forage primarily on insects, spiders, and seeds.

One CNDDB occurrence was previously documented in 2003 within the 1-mile-radius search around the Preserve (CDFW 2019a). Suitable habitat occurs throughout most of the Preserve, within the non-native grassland and various scrub habitats.

California Horned Lark (*Eremophila alpestris actia*)
CDFW Watch List, County Group 2

The California horned lark is a common resident in a variety of open habitats, usually where trees and large shrubs are absent. They can be found from grasslands along the coast and deserts near sea level to alpine dwarf-shrub habitat above the treeline. During the winter, this species typically flocks in desert lowlands, with many migrating from outside the state (Garrett and Dunn 1981). California horned larks forage primarily on insects, snails, and spiders during the breeding season, and supplement with plant matter such as grass and forb seeds during the other seasons.

One CNDDB occurrence was previously documented in 1996 within the 1-mile-radius search around the Preserve (CDFW 2019a). Suitable habitat occurs along the southern border of the Preserve within the non-native grassland habitat, as well as within areas of bare ground within the disturbed habitat and various scrub habitats.

Least Bell's Vireo (*Vireo bellii pusillus*)
Federally Endangered, State Endangered, MSCP Narrow Endemic Species, County Group 1, MSCP Covered Species

The least Bell's vireo was historically abundance in the riparian woodlands of California's Central Valley and low-elevation riparian streams in Southern California down into northern Baja California, Mexico. Due to habitat loss and brood parasitism by brown-headed cowbirds (*Molothrus ater*), least Bell's vireo populations occupy a small fraction of its former range. They are a highly territorial, migratory songbird that nest and forage almost exclusively in riparian woodlands. Breeding territories are established by mid- to late-March, and nesting habitat typically consists of well-developed, dense overstories and understories of aquatic and herbaceous cover. Least Bell's vireos forage primarily on insects.

While this species was not heard during any of the focused avian surveys, one individual was heard vocalizing on June 25, 2019, just off-site adjacent to the eucalyptus stands in the northeastern corner of the Preserve. Marginal suitable habitat occurs within the eucalyptus woodland along

Bancroft Creek due to the limited amount of riparian shrub vegetation at the preferred height of less than 6 feet typically utilized for nesting.

San Diego Pocket Mouse (*Chaetodipus fallax*)
CDFW Species of Special Concern, County Group 2

The San Diego pocket mouse ranges from parts of Riverside and San Bernardino Counties into San Diego County, where it inhabits sandy herbaceous areas, usually in association with rocks or coarse gravel (Grinnell 1933; Miller and Stebbins 1964). It occurs in arid coastal and desert border areas that support coastal scrub, chamise-redshank chaparral, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent shrub, pinyon-juniper, and annual grassland habitats in San Diego County. San Diego pocket mouse forages primarily on seeds of forbs, grasses, and shrubs, but has been documented to eat some insects as well.

Three SanBIOS occurrences were previously documented in 1942 and 2004 within the 1-mile-radius search around the Preserve (County of San Diego 2019). Suitable habitat occurs throughout most of the Preserve, within the non-native grassland and various scrub habitats, particularly around rocky outcrops.

San Diego Black-Tailed Jackrabbit (*Lepus californicus bennettii*)
CDFW Species of Special Concern, County Group 2

The San Diego black-tailed jackrabbit ranges from Los Padres National Forest southward and west of the Peninsular Ranges into northwestern Baja California, Mexico. This species inhabits open grasslands, agricultural fields, and sparse coastal scrub where they occur primarily in arid regions with short grass. In Southern California, black-tailed jackrabbits are known to breed throughout the year, but number of leverets (young rabbits) produced varies depending on environmental conditions. They are strictly herbivorous, primarily feeding on a wide variety of grasses, but they will also feed on forbs and shrubs during fall and winter.

Two CNDDB occurrences were previously documented in 1996 and 2003 within the 1-mile-radius search around the Preserve (CDFW 2019a). Suitable habitat occurs throughout most of the Preserve, within the non-native grassland and various scrub habitats.

4.3.7 Invasive Wildlife Species

No invasive invertebrates, herpetofauna, or mammal wildlife species were detected on the Preserve; however, rock pigeons (*Columba livia*) were observed flying over the Preserve during the spring and fall diurnal avian surveys.

4.4 WILDLIFE MOVEMENT

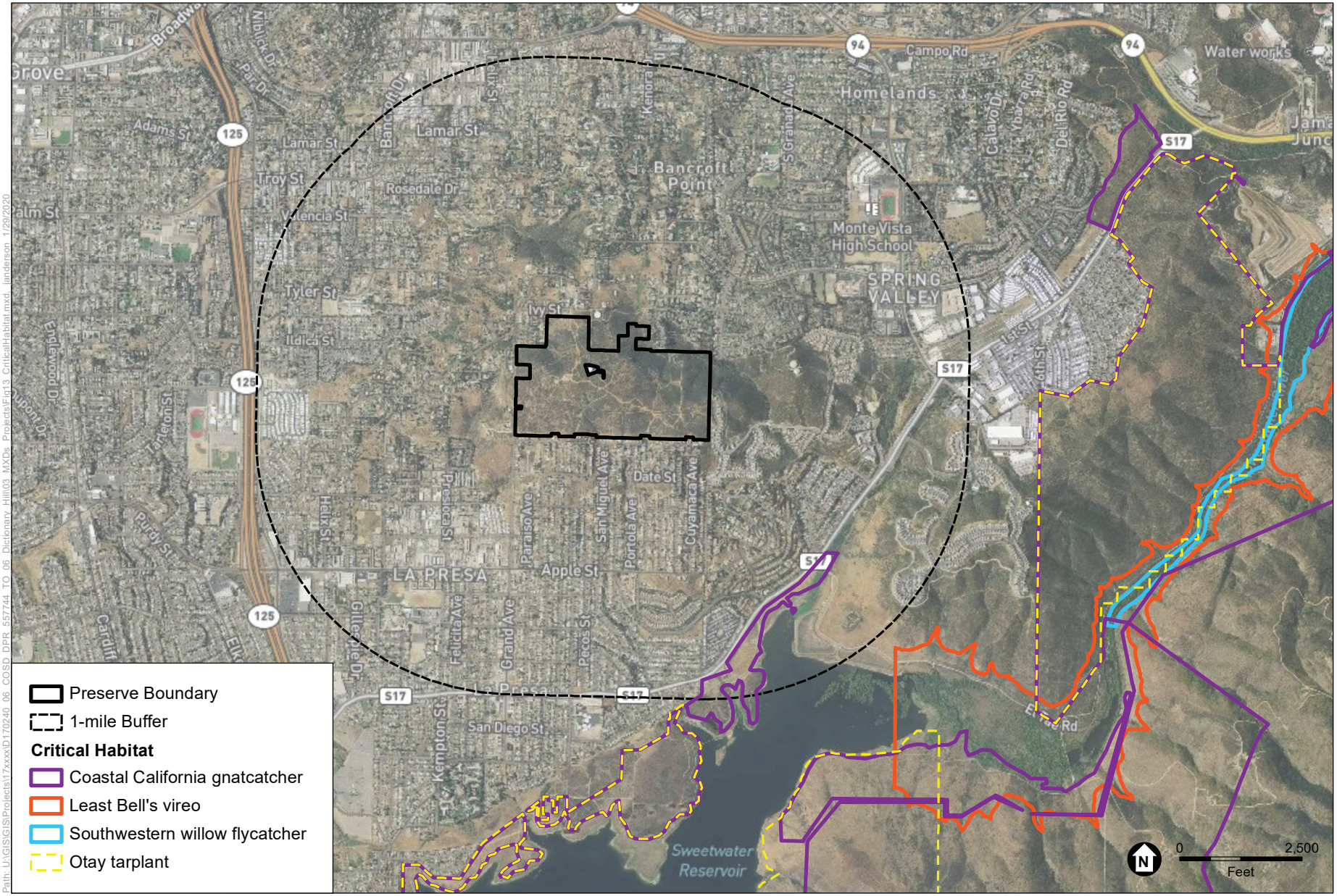
The Preserve is located north/northwest of the Sweetwater Reservoir/San Miguel Mountain/Sweetwater River core resource area identified by the MSCP Subarea Plan, and provides an important 'stepping stone' for landscape connectivity in south San Diego County. Stepping stones work to connect areas of habitat in fragmented landscapes and play a key role for wildlife in urban areas, particularly for long-distance movements (Saura et al. 2014). While located in an area with dense residential development, the Preserve provides valuable habitat block within a network of urban canyons, in proximity to large expanses of open space associated with the Sweetwater Rive and Reservoir, and well as San Miguel Mountain. Additionally, the Preserve is a historically important area for Quino, and provides large expanses of coastal sage scrub habitat valuable for MSCP-covered species such as coastal California gnatcatcher and southern California rufous-crowned sparrow.

As indicated by the presence of numerous species detected during surveys, the Preserve is part of the home range of many species, which may use it at different times of the year depending on available resources. In general, wildlife species are likely to use the Preserve for local movements related to home range activities (foraging for food or water, defending territories, searching for mates, breeding areas, or cover). Large mammals such as bobcats and coyotes were also observed moving through the Preserve. These large mammals require fresh water, which is not available year-round within the Preserve; therefore, it is anticipated that the Preserve also provides temporary forage and cover as they travel to off-site areas. The nearest regional corridor and source of permanent water is presumed to be present to the south at the Sweetwater River and Sweetwater Reservoir, which is separated from the Preserve by a residential road and Jamacha Boulevard. Limitations to terrestrial movement exist in this area due to fencing, roads, and a lack of culverts and crossings. However, given the presence of large mammal species within the Preserve, it is possible that the Preserve provides a stepping stone for wildlife between the urban canyon system to this area.

The Preserve is also a part of the broader Pacific Flyway, a major north-south migration route for birds that travel between North and South America. Various avian species pass through the Preserve during migration and/or may use the Preserve as migratory stop-over habitat. While there is limited riparian and woodland vegetation or topographical configurations within the Preserve that would concentrate or funnel avian species during migration, they likely move through on-site habitat in small groups, or fly over it at night. Based on the avian surveys conducted during 2019, no major pulses of avian species were detected within the Preserve; however, surveys were infrequent and may have missed large pulses of birds. Additionally, bat species are likely to move through the Preserve while in transit to permanent sources of water to the south.

4.5 CRITICAL HABITAT

There is no USFWS-designated critical habitat within the Preserve. USFWS-designated critical habitat near the Preserve include coastal California gnatcatcher approximately 0.6 miles southeast, least Bell's vireo approximately 1.4 miles southeast, Otay tarplant (*Deinandra conjugens*) approximately 1.1 miles south of the Preserve, and southwestern willow flycatcher (*Empidonax traillii extimus*) approximately 1.7 miles southeast of the Preserve (**Figure 13**). While the Preserve does not contain USFWS-designated critical habitat for coastal California gnatcatcher, up to four individuals/territories were detected on-site.



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SOURCE: SanGIS 2019; USFWS 2019

Figure 13
Critical Habitat

ESA

5.0 CONCLUSIONS AND MANAGEMENT RECOMMENDATIONS

Surveys conducted in 2018 and 2019 documented nine vegetation group level classifications, alliances, associations, or semi-natural stands as described in the VCM (Sproul et al. 2011), as well as two land cover types as described by Oberbauer et al. (2008). 183 plant species and 101 wildlife species were observed or detected within the Preserve during surveys, including 13 butterflies, 8 reptiles, 52 birds, and 21 mammals. Also detected or observed within the Preserve were 8 special-status plant species and 12 special-status species wildlife species, 7 of which are covered under the MSCP Subarea Plan.

This section provides resource-specific conclusions and management recommendations for the vegetation communities, plants, and wildlife species detected during the 2018 and 2019 field surveys. These recommendations are based on the results of the baseline biological diversity surveys and management and monitoring guidelines associated with the MSCP Subarea Plan.

5.1 VEGETATION COMMUNITIES/HABITAT

5.1.1 Management

Vegetation on the Preserve consists of nine vegetation alliances, associations, or semi-natural stands, including grassland, scrub, and woodland habitats, as well as two land cover types as described by Oberbauer et al. (2008). The Preserve is part of the South Metro-Lakeside-Jamul segment. The Framework Management Plan conservation goals for this segment relevant to the Preserve include conserving a network of canyons, ridges, river valleys, and slopes for wildlife habitat and allowing movement.

The Preserve encompasses the area known as Dictionary Hill. Surrounding land consists of urban residential properties but becomes more rural and somewhat remote further to the southeast. The upland habitats of the Preserve, notably coastal sage scrub, are relatively undisturbed and will most likely not require extensive management. However, control of non-native and invasive non-native plant species within these upland areas should be considered an ongoing management goal. Implementation of an Early Detection Rapid Response (EDRR) program to facilitate early detection and management of invasive non-native plant species occurrences before becoming significant management issues is recommended. Management for coastal scrub includes fire management and non-native and invasive non-native plant species control. Fire management recommendations are discussed in Section 5.6, and invasive non-native plant species treatment recommendations are discussed in Section 5.4. Additionally, unauthorized dirt trails run throughout the Preserve. Once official trails are established based on the future Dictionary Hill

Preserve Public Access Plan, all trails should be monitored to reduce edge effects encroaching on vegetation communities.

Semi-natural grasslands will most likely not require extensive management; however, control of invasive non-native plant species within this habitat should be considered an ongoing management goal. Management for semi-natural grasslands includes fire management and invasive non-native plant species control. Fire management recommendations are discussed in Section 5.6, and invasive non-native plant species treatment recommendations are discussed in Section 5.4.

Riparian habitat is located downslope from a water tower in the north central region of the Preserve. This habitat will most likely not require extensive management. However, multiple high-priority invasive non-native plant species occur in this habitat as well; therefore, control of invasive non-native plant species should be considered an ongoing management goal. Invasive non-native plant species treatment recommendations are discussed in Section 5.4.

It is recommended the County conduct ongoing habitat monitoring every 10 years, or following a change in conditions (e.g., fire, drought) within the Preserve in accordance with the County's Targeted Monitoring Plan (TMP; ESA and ICF 2019), to maintain an up-to-date inventory of the distribution and species composition, as well as other basic characteristics of the vegetation communities on-site. Ongoing monitoring within the Preserve will identify any adverse changes in vegetation community distribution and habitat quality, such as changes from fire, invasion by non-native plants, or decline of existing species, and monitoring will indicate whether modifications to current management actions are needed. Any re-mapping will be done using the VCM.

5.2 PLANTS

5.2.1 Management

The 2018 and 2019 baseline inventory surveys identified eight special-status plant species. Of these species, three are covered under the MSCP Subarea Plan: San Diego goldenstar, variegated dudleya, and San Diego barrel cactus. Species-specific measures for management and monitoring of these special-status species are based on Table 3-5 of the MSCP Plan (1997), and detailed below in Section 5.2.2. All special-status plant species detected within the Preserve, as well as other special-status plant species with the potential to occur on-site, are generally threatened by development, non-native and invasive non-native plant species, and human activity. Suppressed fire regimes or fire regimes that are too active may also compromise special-status plant species that require natural fire regimes to thrive. Future rare plant surveys are recommended for all special-status plant species detected and those that have a high potential to occur within the

Preserve. Surveys should be conducted at appropriate times to monitor the known populations of special-status plant species and to maximize the future detection of special-status plant species. Additional management recommendations for special-status plant species include:

Invasive non-native plant control and/or removal (Section 5.4.1)

Exclusion of rocky outcrops or other areas known to be suitable habitat for special-status plant species from future trail planning

Strategic placement of fencing or barriers to deter unauthorized access

Installation of signage around perimeter of Preserve to inform public of penalties for unauthorized collection

5.2.2 MSCP Table 3-5 Species-Specific Conditions

San Diego Goldenstar (*Bloomeria clevelandii*)

San Diego goldenstar was found in one area of the Preserve, on the north-facing slope east and southeast of the large water tank inholding within the area mapped as Laurel Sumac–Coastal Deerweed Association. Per the County's MSCP Plan, the species-specific conditions for this species include monitoring of transplanted populations and specific measures to protect against detrimental edge effects to this species (County of San Diego 1998).

A baseline survey is recommended to determine the number and extent of this species within the Preserve during ideal climatic conditions (average or above-average rainfall) to maximize detection. Should the population size be estimated at greater than 100 individuals, monitoring on 2-year intervals is recommended consistent with the Management and Monitoring Strategic Plan for Conserved Lands in Western San Diego County (SANDAG 2017) to collect quantitative population information and assess threats. Data collected should be consistent with SDMMP rare plant monitoring protocols and forms. Invasive non-native plants should also be monitored and controlled for in this area, as needed.

Variegated Dudleya (*Dudleya variegata*)

Variegated dudleya was found in a number of clusters on the Preserve, ranging from a few plants to significant populations on rocky slab areas scattered over the southwestern slope within the area mapped as California Sage Brush Association. Per the MSCP, the species-specific conditions for variegated dudleya include species-specific monitoring and specific measures to protect against detrimental edge effects to this species, including effects caused by recreational activities (County of San Diego 1998).

It is recommended, when the Preserve is added to the TMP, that species-specific monitoring be conducted annually in accordance with the TMP (ESA and ICF 2019). This includes conducting a baseline population survey and habitat assessment within known occurrences of variegated dudleya on the Preserve to determine the number of individuals and population extent, and annual monitoring to collect quantitative population information and assess threats. Data collected should be consistent with SDMMP rare plant monitoring protocols and forms. The collected information will be used to identify appropriate management actions, which may include invasive non-native plant species control and installing barriers or fencing to deter public access to these sensitive areas and protect against detrimental edge effects.

San Diego Barrel Cactus (*Ferocactus viridescens*)

San Diego barrel cactus was found growing in clusters on the rocky slab areas on the southwestern portion of the Preserve within the area mapped as California Sage Brush Association. Per the MSCP, the species-specific conditions for San Diego barrel cactus include measures to protect this species from edge effects and unauthorized collections, as well as appropriate fire management/control practices to protect against a too-frequent fire cycle (County of San Diego 1998).

San Diego barrel cactus is a slow-growing perennial plant; therefore, the population is expected to change little over time. Species-specific habitat maintenance is not considered necessary to maintain this species' population. However, maintenance of the coastal sage scrub habitat for California gnatcatcher and Southern California rufous-crowned sparrow through vegetation management practices, such as selective thinning and invasive non-native plant species control, as described in Section 5.3.2 below, is expected to maintain this species' habitat. Access control measures such as fencing, signage, and gates, as described in Section 5.8.2, are also recommended to reduce disturbance from unauthorized access and collections.

5.3 WILDLIFE

5.3.1 Management

The surveys in 2019 identified 12 special-status wildlife species. Of these species, four are covered under the MSCP: Belding's orange-throated whiptail, coastal California gnatcatcher, Cooper's hawk, and Southern California rufous-crowned sparrow. Species-specific measures for management and monitoring of these special-status wildlife species are based on Table 3-5 of the MSCP Plan (County of San Diego 1998) and detailed below in Section 5.3.2.

Though not detected within the Preserve, there is also a high potential for Quino to occur based on historic populations and the presence of suitable habitat with larval host plants and multiple adult nectar sources. Though this species is not currently covered by the MSCP Subarea Plan, focused protocol-level Quino surveys following USFWS protocols are recommended to inform management decisions on the Preserve. If possible, Quino surveys should be conducted during a high or above-average rainfall year, as the species tends to have a stronger flight season during wet years and thus is easier to detect. If this species is present within the Preserve, human activity such as trails should incorporate adequate buffers from occupied areas and host plant patches, where the annuals (and butterfly larvae) are sensitive to trampling and crushing. Additionally, habitat enhancement activities should include planting (or augmenting through weed removal, seeding, or planting of container plants) appropriate host plant species in areas that have invasive non-native vegetation removal or areas slated for restoration, particularly on the hilltop.

Additional management recommendations for all special-status wildlife species detected and with a high potential to occur within the Preserve include:

Invasive non-native plant control and/or removal

Habitat monitoring every 10 years, or following a change in conditions (e.g., fire, drought)

Management and reduction of human-caused edge effects (such as introduction of invasive/exotic species and domestic pets, increase in trash/pollution, and/or habitat destruction—especially through human-induced fires)

Vegetation maintenance activities that involve tree trimming, removal of exotic trees, and vegetation thinning/clearance should implement avian and/or bat mitigation measures to avoid potential impacts to nesting birds and roosting bats, as needed

Exclusion of rocky outcrops or other areas known to be suitable habitat for special-status wildlife species from future trail planning

Signage, fencing, and strategic placement of barriers to deter unauthorized access to special-status wildlife species and sensitive habitats

5.3.2 MSCP Table 3-5 Species-Specific Conditions

Belding's Orange-Throated Whiptail (*Aspidoscelis hyperythra beldingi*)

Belding's orange-throated whiptail was detected in the open scrub habitat on-site during surveys in 2019. Per the MSCP, species-specific conditions for this species include measures to address edge effects (County of San Diego 1998). Potential edge effects that could affect this species

include incidental mortality on unauthorized trails, mortality due to stray animals or pets, and increased incidence with non-native species. Coordination with adjacent homeowners to control pets, removal or control of invasive non-native plants, exclusion of rocky outcrops or other areas known to be suitable habitat, and strategic placement of fencing or barriers to deter unauthorized access are recommended.

Coastal California Gnatcatcher (*Polioptila californica californica*)

Up to four established territories were detected in the California sage brush or other coastal sage shrub alliance during surveys in 2019. Per the MSCP, the species-specific conditions for coastal California gnatcatcher include management directives to reduce edge effects and minimize disturbance during the nesting period, fire protection measures to reduce the potential for habitat degradation due to unplanned fires, and management measures to maintain or improve habitat quality, including vegetation structure (County of San Diego 1998). A Vegetation Management Plan is being prepared that will address vegetation management practices, including fire protection measures and vegetation management. Maintenance of open coastal sage scrub habitat through vegetation management practices such as selective thinning and invasive non-native plant species control is recommended to maintain suitable foraging and nesting habitat for this species. Additionally, access control measures such as fencing, signage, and gates, as described in Section 5.8.2, are recommended to reduce disturbance from unauthorized access and impacts to occupied habitat from unauthorized vehicles.

Cooper's Hawk (*Accipiter cooperii*)

A Cooper's hawk was observed actively hunting within the Preserve during the winter avian survey and during the spring avian survey. At least three individual Cooper's hawks were detected during the fall survey. Per the MSCP, the species-specific conditions for this species include 300-foot impact avoidance areas around active nests and minimization of disturbance in oak woodlands and oak riparian forests (County of San Diego 1998). Oak woodland and oak riparian forest habitat are not present within the Preserve and it is unlikely that a Cooper's hawk would nest within the two woodland habitats on the Preserve because these vegetation communities lack the height and density that is typically preferred by this species. However, pepper trees on the Otay Municipal Water District property in the north-central part of the Preserve could potentially provide roosting habitat for Cooper's hawk. If an active nest is found within the Preserve, a 300-foot impact avoidance area must be established. Additionally, vegetation management practices described in the Vegetation Management Plan will maintain or improve the quality of the coastal sage scrub habitat on-site so that foraging habitat for this species is maintained.

Southern California Rufous-Crowned Sparrow *(Aimophila ruficeps canescens)*

Southern California rufous-crowned sparrows were detected during both the winter and spring diurnal avian surveys along the steep hillsides in the western portion of the Preserve. Per the MSCP Subarea Plan, the species-specific conditions for Southern California rufous-crowned sparrows include maintenance of dynamic processes, such as fire, to perpetuate some open phases of coastal sage scrub with herbaceous components (County of San Diego 1998). A Vegetation Management Plan is being prepared which will address vegetation management practices, including the need for prescribed fire. Due to the proximity of the Preserve to residential development, fire may not be appropriate within the Preserve; however, selective thinning and invasive non-native plant species control are recommended as surrogates for fire to maintain openings within the coastal sage scrub communities.

5.4 INVASIVE NON-NATIVE SPECIES REMOVAL AND CONTROL

Invasive non-native species can outcompete native species for limited resources such as water, food, and space. Invasive non-native plant species often have adaptations that allow them to germinate and grow faster than native species, thereby outcompeting native species. Removal of invasive non-native plant species is recommended to enhance habitat quality. A detailed Vegetation Management Plan is being prepared for the Preserve and will address invasive non-native plant species control.

5.4.1 Plants

Sixty-two non-native plant species were observed within the Preserve in 2018 and 2019. Of these sixty-two, eleven species have been identified as invasive non-native plants targeted for removal (**Table 13**). Species designated as high priority are recommended for immediate removal and moderate species should be removed after high-priority species are under control or when in close proximity to occupied habitat for special-status species. A Vegetation Management Plan is being prepared for the Preserve; the Plan includes specific information regarding methods for removing each of the 11 targeted invasive non-native species.

Table 13. Priorities for Removal or Management of Invasive Non-Native Plant Species[1]

Common Name	Scientific Name	CBI Management Priority for Invasive Non-native Plants[2]	Cal-IPC Rating[3]	Removal Priority
Pampas Grass	*Cortaderia selloana*	Management Level 3	High	High
Sweet Fennel	*Foeniculum vulgare*	Management Level 4	High	High
Iceplant	*Carpobrotus edulis*	NA	High	High
Crimson Fountaingrass	*Pennisetum setaceum*	NA	Moderate	High
Mexican Fan Palm	*Washingtonia robusta*	NA	Moderate	High
Canary Island Date Palm	*Phoenix canariensis*	NA	Limited	Moderate
Castor Bean	*Ricinus communis*	NA	Limited	Moderate
Crown Daisy	*Glebionis coronaria*	Management Level 5	Moderate	Moderate
Tree Tobacco	*Nicotiana glauca*	NA	Moderate	Moderate
Milk Thistle	*Silybum marianum*	Management Level 4	Limited	Moderate
Peruvian pepper tree	*Schinus molle*	NA	Limited	Moderate

[1] Species are included in this table due to their potential for being invasive and the feasibility of removal from the Preserve since they currently remain in low enough numbers for removal and eradication.

[2] **SOURCE**: San Diego Environmental Mitigation Program Working Group in their Management Priorities for Invasive Nonnative Plants (CBI 2012).
Management Levels for San Diego County's Natural Community Conservation Programs (NCCPs):
Level 3 – Containment: Eradication with coordinated programs by management unit or watershed.
Level 4 – Directed Management: Control within reserve or sub-management unit to benefit NCCP resources.
Level 5 – Directed Suppression: Suppression, typically to allow recovery of disturbed site, improve re-vegetation success, or benefit NCCP resources.

[3] **SOURCE**: Cal-IPC Invasive Plant Inventory Database, (Cal-IPC 2019a). Overall rating listed for southwest region, factoring impact, invasiveness, distribution, and documentation level.
Cal-IPC Inventory Categories:
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 statewide 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.

Species prioritized for removal are those generally found within the Goodding's black willow riparian area, those near special-status plant species (e.g., crimson fountaingrass), and those in the vicinity of other high-priority invasive non-native plant species (e.g., tree tobacco). Recommended removal methodologies include manual removal, mechanical removal, herbicides, and cut and daub. However, the appropriate removal methodology should ultimately be determined with consideration of many variables, including time of year, severity of infestation, presence of special-status plant species, the degree of intermixing of invasive non-native plant species with sensitive native habitats, access, and proximity to surface water.

Additional non-native plant species, including brome grasses, short-pod mustard, tocalote, rattail fescue, Italian rye grass, wild oat, London rocket (*Sisymbrium irio*), and Russian thistle (*Salsola*

tragus), are not prioritized for removal but should be included as species to monitor and control as components of general habitat management. These species are generally widespread throughout the Preserve and management for these species would most likely not be cost-effective or successful.

5.4.2 Wildlife

One rock pigeon was observed flying over the Preserve during the spring diurnal survey. Six additional white rock pigeons were observed flying over and along the southern boundary of the Preserve during the fall diurnal survey. These six white rock pigeons appear to be homing pigeons that return to a roost site/home just south of the Preserve. This species is expected to use the Preserve for foraging, but given the low numbers, they are unlikely to displace any native avian species. There is also potential for invasive non-native Argentine ants to occur on-site and become established. Argentine ants often displace native ants, an important food source for the coast horned lizard, which has a high potential to occur within the Preserve. Measures to reduce the risk and extent of invasion include restricting litter and food waste, inspecting planting stock if active restoration occurs on-site, and educating nearby residents about Argentine ants. Argentine ants are generally associated with a water source; therefore, it is recommended that monitoring for this invasive wildlife species be conducted within the riparian habitat and other mesic portions of the Preserve, as well as the Preserve boundaries that abut residential properties.

Domestic dogs were detected within the Preserve based on photographs from the wildlife cameras, and it is likely that stray dogs and cats wander through the Preserve, based on the proximity to residential homes. Dogs do not kill nearly as many native species as pet cats do; however, they can stress native species and have the potential to kill. Cats kill native wildlife, particularly bird and lizard species. It is recommended that pets must be leashed at all times within the Preserve.

5.5 RESTORATION OPPORTUNITIES

The Preserve is primarily composed of high-quality native vegetation within upland areas but has an extensive unauthorized trail network running throughout the Preserve. Restoration opportunities could include invasive non-native plant species control and passive restoration of unauthorized trails and naturalized annual and perennial grasslands. The targeted species for invasive non-native plant control are identified and prioritized in Table 13. The quantity of plants that are considered high priority for removal is relatively low, and complete control is feasible. However, these high-priority species, including pampas grass, sweet fennel, iceplant, crimson fountaingrass, Mexican fan palm, Canary Island date palm, and castor bean, will likely continue to invade the Preserve, and thus continued invasive non-native plant species management may be required. Areas dominated by crown daisy and non-native grasses could be targeted for restoration

in priority areas focused on special-status species management rather than invasive non-native plant removal and control.

In addition to invasive non-native plant species control, active restoration or enhancement of suitable Quino habitat is recommended, should this species be determined to be present on the Preserve. This could be achieved through seeding or planting additional larval host plant species for Quino in close proximity within appropriate habitat, particularly on hilltops.

5.6 FIRE MANAGEMENT

The Preserve is dominated by upland scrub vegetation communities. Upland areas are susceptible to burns, particularly as the vegetation ages and drought conditions continue. The most recent wildfire burned over 40 percent of the Preserve in 1981. The primary concern for impacts is from increased presence of non-native and invasive non-native plant species.

A Vegetation Management Plan is being prepared for the Preserve and will include a short-term tactical fire suppression plan and a long-term strategic plan for vegetation management. These plans will consider strategic fire prevention activities, fire suppression with regard to fire effects on habitat, and post-fire monitoring and rehabilitation. Fuel management recommendations will include prescriptions specific to high-value vegetation resources present on the Preserve, such as coastal sage scrub components, based on a combination of prevention practices. Management recommendations that would complement fuel reduction practices will also be identified, including delineating and maintaining fuel modification zones, providing emergency fire access, promoting data sharing, preventing illegal access and trespass, increasing public education to reduce potential for ignition, and suppressing wildfires.

5.7 WILDLIFE LINKAGES AND CORRIDORS

The Preserve provides a valuable stepping stone for wildlife species within an urbanized setting. Given the Preserve's location in an urban canyon system, wildlife species likely use the Preserve primarily for local movements related to home range activities. However, the Preserve may also provide important forage and cover for longer range movements, as evidenced by the presence of medium and large mammals, such as bobcat and coyote. Though some constraints related to connectivity with the Sweetwater Reservoir/San Miguel Mountain/Sweetwater River core resource area exist due to roads, fencing, and development, it is presumed that wildlife traveling from this area can access the Preserve.

Conservation and management of habitat within the Preserve would allow wildlife to continue to use the Preserve. Additionally, the recommendations in Sections 5.1 through 5.6 will also ensure that habitat on the Preserve is viable for local and regional movement.

5.8 ADDITIONAL MANAGEMENT RECOMMENDATIONS

5.8.1 Public Access

The Preserve is currently open to the public for passive recreational activities such as hiking, horseback riding, and mountain biking; however, a Public Access Plan has not been prepared previously. Type of trail users, access to trails and features, and trail alignment to reduce unauthorized trail usage will be considered and discussed in the Public Access Plan that will be prepared for the Preserve.

5.8.2 Fencing and Gates

Currently, the Preserve is fenced at some locations but is accessible by foot from all sides. Fencing and gate recommendations to limit access to authorized roads and trails will be provided in the Public Access Plan. Exclusion fencing is also recommended to be installed as needed as part of ongoing management to prevent unauthorized trespass into sensitive biological areas such as the rocky outcrops and potential Quino habitat. Additional fencing or gates may be used to block unauthorized access from residential neighborhoods.

5.8.3 Trails and Access Roads

Hikers and mountain bikers were observed throughout the Preserve during surveys; however, an official trail system is not currently in place but will be analyzed and recommended within the upcoming Public Access Plan. Many of the current dirt trails are highly eroded and would likely need maintenance if incorporated into the future official trail alignment. Unauthorized trails should be blocked off with natural elements, such as boulders or plantings, or fenced off with signage to prohibit foot traffic and to allow passive habitat restoration to take place.

The Preserve is currently not accessible to any public vehicles; however, there is a dirt road that connects from Buena Vista Avenue that is likely used as a dirt access road for the Otay Municipal Water District property within the Preserve. This access road is currently gated and locked to prevent trespassing.

5.8.4 Signage and Education

Signage, such as boundary signs and use regulations, currently exists at the Preserve's access points. Additional signage recommendations, such as public, interpretive signs, prohibiting unauthorized trail usage, and prohibiting littering and dumping signs, will be included in the Public Access Plan that will be prepared for the Preserve. Additionally, signage should warn people of the risk of rattlesnakes, enforce leash laws, and prohibit people from collecting any native plant or wildlife species within the Preserve.

5.8.5 Litter/Trash Removal

During surveys, some litter and trash, such as glass bottles, were detected within the Preserve. Two illegal dumping areas were also located during surveys, one along the western edge of the Preserve and one in the southeastern corner of the Preserve adjacent to residential properties. Management of the Preserve should include continued implementation of a litter and trash removal program and additional signage prohibiting littering and dumping should be installed if the problem persists.

5.8.6 Illegal Off-Road Activity

Off-road activity, in the form of motorbikers and a truck, was observed on the Preserve from wildlife camera photos. Off-road activity can result in a significant detrimental effect on the conserved resources within the Preserve by reducing air quality, causing soil erosion, and causing habitat degradation. Fencing and gate installation recommendations will be included in the Public Access Plan that will be prepared for the Preserve, which will prevent illegal access to the Preserve and reduce illegal off-road activity.

5.8.7 Emergency and Safety Issues

The Preserve is not open at night; however, after-hours access by the public was observed from wildlife camera photos. This is a potential safety issue and could result in increased trash and littering, as well as fire. It is recommended that additional signage posting the hours public access is allowed and safety rules of the Preserve be installed at all access points. Additional safety measures should be implemented within the Preserve as needed.

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APPENDIX A

ASSESSOR'S PARCEL NUMBERS FOR THE PRESERVE

Assessor's Parcel Numbers within the Preserve

57904612	57904101	57903114	57902113
57904611	57903911	57903112	57902112
57904608	57903807	57903111	57902111
57904606	57903711	57903110	57902110
57904602	57903609	57903109	57902109
57904515	57903606	57903108	57902108
57904505	57903517	57903107	57902107
57904503	57903508	57903106	57902106
57904502	57903507	57903105	57902105
57904501	57903506	57903103	57901818
57904408	57903426	57903102	57901806
57904402	57903424	57903101	57901805
57904401	57903422	57902604	57901804
57904305	57903421	57902603	57901802
57904301	57903414	57902602	57901801
57904216	57903413	57902503	57901702
57904208	57903412	57902404	57901603
57904207	57903411	57902403	57901602
57904202	57903410	57902402	57901601
57904201	57903409	57902306	57901311
57904109	57903304	57902305	57903118
57904107	57903203	57902304	57903116
57904103	57903202	57902303	57902203
57904102	57903201	57902302	

APPENDIX B

PLANTS SPECIES DETECTED ON THE PRESERVE

Plant Species Detected on the Preserve

LYCOPHYTES

Scientific Name	Common Name	Status (Federal/State/CRPR/Local)
Selaginellaceae	**Spike-Moss Family**	
Selaginella bigelovii	Bigelow's spike moss	None/None/None/None
Selaginella cinerascens	mesa spike-moss	None/None/4.1/List D

FERNS

Scientific Name	Common Name	Status (Federal/State/CRPR/Local)
Pteridaceae	**Maidenhair Fern Family**	
Adiantum jordanii	California maidenhair	None/None/None/None
Pellaea andromedifolia var. *andromedifolia*	coffee cliffbrake	None/None/None/None
Pellaea mucronata var. *mucronatas*	birdfoot cliffbrake	None/None/None/None
Pentagramma triangularis subsp. *triangularis*	California goldback fern	None/None/None/None

EUDICOTS

Scientific Name	Common Name	Status (Federal/State/CRPR/Local)
Adoxaceae	**Muskroot Family**	
Sambucus nigra ssp. *caerulea*	blue elderberry	None/None/None/None
Aizoaceae	**Fig-Marigold Family**	
* *Carpobrotus edulis*	iceplant	None/None/None/None
Anacardiaceae	**Sumac Family**	
Malosma laurina	laurel sumac	None/None/None/None
* *Schinus molle*	Peruvian pepper tree	None/None/None/None
Apiaceae	**Carrot Family**	
Apiastrum angustifolium	mock celery	None/None/None/None
* *Apium graveolens*	wild celery	None/None/None/None
Daucus pusillus	American wild carrot	None/None/None/None
* *Foeniculum vulgare*	sweet fennel	None/None/None/None
Sanicula bipinnatifida	purple sanicle	None/None/None/None
Sanicula crassicaulis	Pacific sanicle	None/None/None/None

EUDICOTS

	Scientific Name	Common Name	Status (Federal/State/CRPR/Local)
	Apocynaceae	**Dogbane Family**	
*	*Nerium oleander*	oleander	None/None/None/None
	Asteraceae	**Aster Family**	
	Acourtia microcephala	sacapellote	None/None/None/None
	Ambrosia psilostachya	western ragweed	None/None/None/None
	Artemisia californica	California sage brush	None/None/None/None
	Baccharis salicifolia	mule fat	None/None/None/None
	Baccharis sarothroides	desertbroom	None/None/None/None
	Bahiopsis laciniata	San Diego sunflower	None/None/4.3/List D
	Brickellia californica	California brickellbush	None/None/None/None
*	*Carduus pycnocephalus*	Italian thistle	None/None/None/None
*	*Centaurea melitensis*	tocalote/ Maltese star-thistle	None/None/None/None
	Chaenactis artemisiifolia	white pincushion	None/None/None/None
	Chaenactis glabriuscula var. *glabriuscula*	yellow pincushion	None/None/None/None
	Corethrogyne filaginifolia var. *filaginifolia*	common sandaster	None/None/None/None
*	*Cotula australis*	Australian waterbuttons	None/None/None/None
	Deinandra fasciculata	fascicled tarplant	None/None/None/None
*	*Erigeron bonariensis*	flax-leaf fleabane	None/None/None/None
	Erigeron canadensis	horseweed	None/None/None/None
	Eriophyllum confertiflorum var. *confertiflorum*	golden-yarrow	None/None/None/None
*	*Glebionis coronaria*	crown daisy	None/None/None/None
	Gutierrezia sarothrae	broom snakeweed	None/None/None/None
	Hazardia squarrosa var. *grindelioides*	sawtooth goldenbush	None/None/None/None
	Hedypnois cretica	Cretanweed	None/None/None/None
*	*Helminthotheca echioides*	bristly ox-tongue	None/None/None/None
	Heterotheca grandiflora	telegraphweed	None/None/None/None
*	*Hypochaeris glabra*	smooth cat's ear	None/None/None/None
	Isocoma menziesii var. *menziesii*	spreading goldenbush	None/None/None/None
*	*Lactuca serriola*	prickly lettuce	None/None/None/None

EUDICOTS

	Scientific Name	Common Name	Status (Federal/State/CRPR/Local)
	Lasthenia gracilis	needle goldfields	None/None/None/None
	Logfia filaginoides	California cottonrose	None/None/None/None
*	*Logfia gallica*	narrowleaf cottonrose	None/None/None/None
*	*Matricaria discoidea*	pineapple weed	None/None/None/None
	Osmadenia tenella	false rosinweed	None/None/None/None
	Pseudognaphalium biolettii	two-color rabbit-tobacco	None/None/None/None
	Pseudognaphalium californicum	ladies' tobacco	None/None/None/None
*	*Pseudognaphalium luteoalbum*	Jersey cudweed	None/None/None/None
*	*Silybum marianum*	milk thistle	None/None/None/None
*	*Sonchus asper* subsp. *asper*	spiny sowthistle	None/None/None/None
	Stephanomeria virgata ssp. *pleurocarpa*	rod wirelettuce	None/None/None/None
	Stylocline gnaphalioides	mountain neststraw	None/None/None/None
	Boraginaceae	**Borage Family**	
	Amsinckia menziesii	Menzies' fiddleneck	None/None/None/None
	Cryptantha muricata var. *jonesii*	pointed cryptantha	None/None/None/None
	Eucrypta chrysanthemifolia var. *chrysanthemifolia*	common eucrypta	None/None/None/None
	Pectocarya linearis ssp. *ferocula*	sagebrush combseed	None/None/None/None
	Phacelia cicutaria var. *hispida*	caterpillar phacelia	None/None/None/None
	Pholistoma racemosum	San Diego fiesta flower	None/None/None/None
	Plagiobothrys collinus var. *californicus*	California popcornflower	None/None/None/None
	Plagiobothrys collinus var. *fulvescens*	rough popcornflower	None/None/None/None
	Brassicaceae	**Mustard Family**	
	Athysanus pusillus	common sandweed	None/None/None/None
*	*Brassica nigra*	black mustard	None/None/None/None
*	*Hirschfeldia incana*	short-pod mustard	None/None/None/None
	Lepidium nitidum	shining pepperweed	None/None/None/None
*	*Raphanus sativus*	cultivated radish	None/None/None/None
*	*Sinapis arvensis*	charlock mustard	None/None/None/None
*	*Sisymbrium irio*	London rocket	None/None/None/None

EUDICOTS

	Scientific Name	Common Name	Status (Federal/State/CRPR/Local)
Cactaceae		**Cactus Family**	
	Cylindropuntia prolifera	coastal cholla	None/None/None/None
	Ferocactus viridescens var. *viridescens*	San Diego barrel cactus	None/None/2B.1/MSCP, List B
	Opuntia littoralis	coastal prickly pear	None/None/None/None
Caprifoliaceae		**Honeysuckle Family**	
	Lonicera subspicata var. *denudata*	Johnston's honeysuckle	None/None/None/None
Caryophyllaceae		**Pink Family**	
*	*Cerastium glomeratum*	mouse-ear chickweed	None/None/None/None
*	*Stellaria pallida*	lesser chickweed	None/None/None/None
Chenopodiaceae		**Goosefoot Family**	
	Chenopodium californicum	California goosefoot	None/None/None/None
*	*Chenopodium murale*	nettle-leaved goosefoot	None/None/None/None
*	*Salsola tragus*	prickly Russian thistle	None/None/None/None
Convolvulaceae		**Morning-Glory Family**	
	Calystegia macrostegia subsp. *arida*	San Diego morning glory	None/None/None/None
	Cuscuta californica var. *californica*	California dodder	None/None/None/None
	Dichondra occidentalis	western dichondra	None/None/4.2/List D
Crassulaceae		**Stonecrop Family**	
	Crassula connata	sand pygmyweed	None/None/None/None
	Dudleya pulverulenta	chalk dudleya	None/None/None/None
	Dudleya variegata	variegated dudleya	None/None/1B.2/MSCP, NE, List A
Cucurbitaceae		**Gourd Family**	
	Marah macrocarpa	wild cucumber	None/None/None/None
Ericaceae		**Heath Family**	
	Xylococcus bicolor	mission manzanita	None/None/None/None
Euphorbiaceae		**Spurge Family**	
*	*Euphorbia peplus*	petty spurge	None/None/None/None
*	*Ricinus communis*	castor bean	None/None/None/None

EUDICOTS

	Scientific Name	Common Name	Status (Federal/State/CRPR/Local)
	Fabaceae	**Legume Family**	
*	*Acacia retinodes*	everblooming wattle	None/None/None/None
	Acmispon americanus var. *americanus*	Spanish lotus	None/None/None/None
	Acmispon glaber var. *glaber*	Coastal deerweed	None/None/None/None
	Acmispon strigosus	strigose lotus	None/None/None/None
	Astragalus trichopodus var. lonchus	Santa Barbara milkvetch	None/None/None/None
	Lathyrus vestitus var. *alefeldii*	San Diego sweet pea	None/None/None/None
*	*Medicago polymorpha*	bur clover	None/None/None/None
*	*Melilotus indicus*	sourclover	None/None/None/None
*	*Robinia neomexicana*	New Mexico locust	None/None/None/None
	Fagaceae	**Oak Family**	
	Quercus x acutidens	Torrey's scrub oak	None/None/None/None
	Gentianaceae	**Gentian Family**	
	Zeltnera spp.	charming centaury	None/None/None/None
	Geraniaceae	**Geranium Family**	
*	*Erodium botrys*	longbeak stork's bill	None/None/None/None
*	*Erodium cicutarium*	redstem stork's bill	None/None/None/None
	Lamiaceae	**Mint Family**	
*	*Marrubium vulgare*	horehound	None/None/None/None
	Salvia apiana	white sage	None/None/None/None
	Salvia columbariae	chia sage	None/None/None/None
	Salvia mellifera	black sage	None/None/None/None
	Salvia munzii	Munz's sage	None/None/2B.2/List B
	Malvaceae	**Mallow Family**	
	Malacothamnus fasciculatus	chaparrel bushmallow	None/None/None/None
	Malvella leprosa	Alkali mallow	None/None/None/None
	Sidalcea sparsifolia	southern checkerbloom	None/None/None/None
	Sphaeralcea ambigua	desert globemallow	None/None/None/None
	Montiaceae	**Miner's Lettuce Family**	
	Claytonia perfoliata subsp. *perfoliata*	miner's lettuce	None/None/None/None
	Myrsinaceae	**Myrsine Family**	
*	*Lysimachia arvensis*	scarlet pimpernel	None/None/None/None

EUDICOTS

Scientific Name	Common Name	Status (Federal/State/CRPR/Local)
Myrtaceae	**Myrtle Family**	
* *Eucalyptus camaldulensis*	red gum	None/None/None/None
* *Eucalyptus sp.*	gum tree	None/None/None/None
Nyctaginaceae	**Four O'Clock Family**	
Mirabilis laevis var. *crassifolia*	coastal wishbone bush	None/None/None/None
Oleaceae	**Olive Family**	
* *Olea europaea*	olive	None/None/None/None
Onagraceae	**Evening Primrose Family**	
Clarkia purpurea var. *quadrivulnera*	four-spot clarkia	None/None/None/None
Orobanchaceae	**Broom-rape Family**	
Castilleja exserta var. *exserta*	purple owl's-clover	None/None/None/None
Oxalidaceae	**Oxalis Family**	
* *Oxalis pes-caprae*	Bermuda buttercup	None/None/None/None
Paeoniaceae	**Peony Family**	
Paeonia californica	California peony	None/None/None/None
Papaveraceae	**Poppy Family**	
Eschscholzia californica	California poppy	None/None/None/None
Phrymaceae	**Lopseed Family**	
Diplacus x australis	San Diego monkeyflower	None/None/None/None
Diplacus puniceus	coast monkeyflower	None/None/None/None
Plantaginaceae	**Plantain Family**	
Antirrhinum nuttallianum ssp. *subsessile*	big-gland Nuttall's snapdragon	None/None/None/None
Keckiella antirrhinoides	yellow bush penstemon	None/None/None/None
Plantago erecta	dot-seed plantain	None/None/None/None
Polemoniaceae	**Phlox Family**	
Gilia angelensis	angel gilia	None/None/None/None
Linanthus dianthiflorus	ground-pink	None/None/None/None
Navarretia hamata	hooked navarretia	None/None/None/None
Polygonaceae	**Buckwheat Family**	
Chorizanthe spp.	spineflower	None/None/None/None
Eriogonum fasciculatum var. *fasciculatum*	California buckwheat	None/None/None/None
Pterostegia drymarioides	California thread-stem	None/None/None/None
* *Rumex crispus*	curly dock	None/None/None/None

EUDICOTS

Scientific Name	Common Name	Status (Federal/State/CRPR/Local)
Ranunculaceae	**Buttercup Family**	
Clematis pauciflora	ropevine	None/None/None/None
Thalictrum fendleri var. *polycarpum*	smooth-leaf meadow rue	None/None/None/None
Rhamnaceae	**Buckthorn Family**	
Rhamnus crocea	spiny redberry	None/None/None/None
Rosaceae	**Rose Family**	
Adenostoma fasciculatum var. *fasciculatum*	chamise	None/None/None/None
Heteromeles arbutifolia	toyon	None/None/None/None
Rubiaceae	**Madder Family**	
Galium angustifolium ssp. angustifolium	narrow-leaf bedstraw	None/None/None/None
Galium aparine	goose grass	None/None/None/None
Salicaceae	**Willow Family**	
Salix gooddingii	Gooding's black willow	None/None/None/None
Salix laevigata	red willow	None/None/None/None
Salix lasiolepis	arroyo willow	None/None/None/None
Scrophulariaceae	**Figwort Family**	
Scrophularia californica	California figwort	None/None/None/None
Solanaceae	**Nightshade Family**	
* *Nicotiana glauca*	tree tobacco	None/None/None/None
Solanum americanum	small-flowered nightshade	None/None/None/None
Solanum xanti	chaparral nightshade	None/None/None/None
Violaceae	**Violet Family**	
Viola pedunculata	johnny-jump-up	None/None/None/None

MONOCOTYLEDONS

Scientific Name	Common Name	Status (Federal/State/CRPR/Local)
Agavaceae	**Agave Family**	
Chlorogalum parviflorum	small-flowered soap plant	None/None/None/None
Hesperoyucca whipplei	chaparral yucca	None/None/None/None
Arecaceae	**Palm Family**	
* *Butia capitata*	jelly palm	None/None/None/None
* *Phoenix canariensis*	Canary Island date palm	None/None/None/None

MONOCOTYLEDONS

Scientific Name	Common Name	Status (Federal/State/CRPR/Local)
* *Washingtonia robusta*	Mexican fan palm	None/None/None/None
Asparagaceae	**Asparagas Family**	
* *Asparagus asparagoides*	smilax	None/None/None/None
Asphodelaceae	**Aloe Family**	
* *Aloe maculata*	zebra aloe	None/None/None/None
Iridaceae	**Iris Family**	
Sisyrinchium bellum	blue-eyed-grass	None/None/None/None
Juncaceae	**Rush Family**	
Juncus acutus ssp. leopoldii	southwestern spiny rush	None/None/4.2/List D
Liliaceae	**Lily Family**	
Calochortus splendens	lilac mariposa lily	None/None/None/None
Poaceae	**Grass Family**	
* *Avena fatua*	wild oat	None/None/None/None
Brachypodium distachyon	false-brome	None/None/None/None
Bromus carinatus var. *carinatus*	California brome	None/None/None/None
* *Bromus diandrus*	ripgut brome	None/None/None/None
* *Bromus hordeaceus*	soft chess	None/None/None/None
* *Bromus madritensis ssp. rubens*	red brome	None/None/None/None
* *Cortaderia selloana*	pampas grass	None/None/None/None
* *Cynodon dactylon*	Bermuda grass	None/None/None/None
* *Digitaria* ssp.	crabgrass	None/None/None/None
* *Festuca myuros*	rattail fescue	None/None/None/None
Festuca octoflora	tufted fescue	None/None/None/None
* *Festuca perennis*	Italian rye grass	None/None/None/None
* *Hordeum murinum*	glaucous foxtail barley	None/None/None/None
* *Lamarckia aurea*	goldentop	None/None/None/None
Melica imperfecta	coast range melic	None/None/None/None
Melinus repens	natal grass	None/None/None/None
Muhlenbergia microsperma	littleseed muhly	None/None/None/None
* *Pennisetum setaceum*	crimson fountaingrass	None/None/None/None
* *Polypogon monspeliensis*	annual beard grass	None/None/None/None
* *Schismus barbatus*	Mediterranean schismus	None/None/None/None

MONOCOTYLEDONS

Scientific Name	Common Name	Status (Federal/State/CRPR/Local)
Stipa lepida	small-flowered needlegrass	None/None/None/None
Stipa pulchra	purple needlegrass	None/None/None/None
Themidaceae	**Brodiaea Family**	
Bloomeria clevelandii	San Diego goldenstar	None/None/1B.1/MSCP, List A
Dichelostemma capitatum subsp. *capitatum*	blue dicks	None/None/None/None

CRPR 1B.1 = *Plants rare, threatened, or endangered in California and elsewhere; seriously threatened in California.*
CRPR 1B.2 = *Plants rare, threatened, or endangered in California and elsewhere; moderately threatened in California.*
CRPR 2B.1 = *Plants rare, threatened, or endangered in California but more common elsewhere; seriously threatened in California.*
CRPR 2B.2 = *Plants rare, threatened, or endangered in California but more common elsewhere; moderately threatened in California.*
CRPR 4.2 = *Watch List: Plants of limited distribution; moderately threatened in California.*
CRPR 4.3 = *Watch List: Plants of limited distribution; not very threatened in California.*
MSCP = *MSCP Covered Species*
NE = *MSCP Narrow Endemic Species*
County List A = *Plants rare, threatened, or endangered in California and elsewhere.*
County List B = *Plants rare, threatened, or endangered in California, but more common elsewhere.*
County List D = *Plants of limited distribution and are uncommon, but not presently rare or endangered.*

APPENDIX C

SPECIAL-STATUS PLANT SPECIES EVALUATED FOR POTENTIAL TO OCCUR ON THE PRESERVE

Special-Status Plant Species Evaluated for Potential to Occur on the Preserve

Scientific Name	Common Name	Flowering Period	Federal	State	Local (CRPR/MSCP/ Other)	Preferred Habitat	Distribution	Potential to Occur
ANGIOSPERMS (DICOTYLEDONS)								
Asteraceae	**Sunflower Family**							
Ambrosia pumila	San Diego ambrosia	Apr–Oct	FE	None	1B.1, MSCP, NE, County List A	Lowland areas near major floodplains and valley bottoms. Alluvial soils near stream bottoms and open valleys. 20–415 meters.	Riverside, San Diego, and Baja California.	Not Expected This species is not expected to occur due to limited alluvial deposits and lowland areas within the Preserve. This species has been reported within one mile of the Preserve (CDFW 2019).
Bahiopsis laciniata	San Diego sunflower	Feb–Aug	None	None	4.3, County List D	Coastal scrub and chaparral slopes. 90–750 meters.	Ventura, Los Angeles, Orange, Riverside, San Diego, Baja California, and western Sonora.	Present This species was detected on south-facing slopes within the Preserve during 2018 rare plant surveys (AECOM 2018).
Deinandra conjugens	Otay tarplant	(Apr) May–Jun	FT	SE	1B.1, MSCP, NE, County List A	Rolling grassy hillsides with deep, developed soils that contain some clay. 25–300 meters.	San Diego and Baja California.	Not Expected This species is not expected to occur due to lack of suitable soils. Deeper soils in grassland are limited on the Preserve due to base rock formation. This species has been reported within one mile of the Preserve (CDFW 2019).
Ericameria palmeri var. *palmeri*	Palmer's goldenbush	(Jul) Sep–Nov	None	None	1B.1, MSCP, NE, County List B	Grows on alluvial deposits and adjacent uplands. 30–600 meters.	San Diego and Baja California.	Not Expected Not expected to occur due to small size of potential habitat though this species has been recorded within one mile of the Preserve (CDFW 2019).

Scientific Name	Common Name	Flowering Period	Federal	State	Local (CRPR/MSCP/ Other)	Preferred Habitat	Distribution	Potential to Occur
Grindelia hallii	San Diego gumplant	May–Oct	None	None	1B.2, County List A	Chaparral, lower montane coniferous forests, meadows and seeps, and valley and foothill grasslands. 185–1745 meters.	San Diego.	Moderate The Preserve supports suitable grassland habitat for this species. Though the 2018 surveys were conducted during an appropriate time of year to detect this species, below-average rainfall may have precluded flowering of this annual at the time surveys were conducted. This species has been reported within one mile of the Preserve (CDFW 2019).
Isocoma menziesii var. *decumbens*	decumbent goldenbush	Apr–Nov	None	None	1B.2, County List A	Chaparral and coastal scrub; sandy, often in disturbed areas. 10–135 meters.	Los Angeles, Orange, San Clemente Island, Santa Catalina Island, San Diego, San Nicolas Island, Ventura, and Baja California.	High Reported by Dillane and Merzbacher (2017) with unknown location.
Iva hayesiana	San Diego marsh-elder	Apr–Oct	None	None	2B.2, County List B	Lowland areas near drainages where moisture persists in the soil. Narrow drainages with riparian and wetland habitats. 10–500 meters.	San Diego and Baja California.	Moderate Though the size of potential habitat is small, it has been found within a mile of the site and it could occur in some isolated side canyons. This species has been reported within one mile of the Preserve (CDFW 2019).
Boraginaceae	**Borage Family**							
Harpagonella palmeri	Palmer's grapping hook	Mar–May	None	None	4.2, County List D	Loamy and clay soils in openings. 20–955 meters.	Los Angeles, Orange, Riverside, Santa Catalina Island, San Diego, Arizona, Baja	High Reported by Dillane and Merzbacher (2017) with unknown location. Reported as occurring on Dictionary Hill by Reiser (2001).

Scientific Name	Common Name	Flowering Period	Federal	State	Local (CRPR/MSCP/ Other)	Preferred Habitat	Distribution	Potential to Occur
							California, and Sonora.	
Cactaceae	**Cactus Family**							
Ferocactus viridescens	San Diego barrel cactus	May–Jun	None	None	2B.1, MSCP, County List B	Sandy to rocky areas. 10–150 meters.	San Diego and Baja California.	Present This species was detected in the rocky slab areas on the southwestern slope of the Preserve during 2018 rare plant surveys (AECOM 2018).
Convolvulaceae	**Morning Glory Family**							
Dichondra occidentalis	western dichondra	Mar–Jun	None	None	4.2, County List D	Among rocks, shrubs, in coastal scrub, chaparral, oak woodland. < 520 meters.	Santa Barbara, Ventura, Los Angeles, Orange, San Diego, and Baja California.	Present This species was detected east of the center of the Preserve during 2018 rare plant surveys (AECOM 2018).
Crassulaceae	**Stonecrop Family**							
Dudleya variagata	variegated dudleya	Apr–Jun	None	None	1B.2, MSCP NE, County List A	Dry hillsides, mesas. < 300 meters.	San Diego, and northern Baja California.	Present This species was detected in multiple areas around rocky slabs on the southwestern slope of the Preserve during 2018 rare plant surveys (AECOM 2018).
Fabaceae	**Legume Family**							
Astragalus deanei	Dean's milk-vetch	Feb–May	None	None	1B.1, County List A	Coastal sage scrub and riparian along Sweetwater, Otay, and Tijuana Rivers and tributaries. 75–695 meters.	San Diego.	Moderate The Preserve supports suitable coastal sage scrub and drainages for this species. Though the 2018 surveys were conducted during an appropriate time of year to

Scientific Name	Common Name	Flowering Period	Federal	State	Local (CRPR/MSCP/ Other)	Preferred Habitat	Distribution	Potential to Occur
								detect this species, below-average rainfall may have precluded this perennial herb from flowering at the time surveys were conducted. Additionally, this species has been reported within one mile of the Preserve (CDFW 2019).
Lamiaceae	**Mint Family**							
Acanthomintha ilicifolia	San Diego thornmint	Apr–Jun	FT	SE	1B.1, MSCP, NE, County List A	Heavy friable clay soils in the midst of chaparral, coastal sage scrub, and grasslands. 10–960 meters.	San Diego and Baja California.	Not Expected Historically found within a mile of the site; however, the metavolcanic rock on the Preserve does not include enough clay soils to support this species. This species has been reported within one mile of the Preserve (CDFW 2019).
Salvia munzii	Munz's sage	Jan–May	None	None	2B.2, County List B	Coastal sage scrub, lower chaparral. < 800 meters.	Orange, Riverside, San Diego, and northern Baja California.	Present This species was detected throughout the southeastern portion of the Preserve during 2018 rare plant surveys (AECOM 2018).
Ophioglossaceae	**Adder's-tongue Family**							
Ophioglossum californicum	California adder's-tongue	(Dec) Jan–Jun	None	None	4.2, County List D	Sandy soil surfaces in openings in shrub areas. 6–525 meters.	Amador, Butte, Merced, Monterey, Mariposa, Orange, San Bernardino, San Diego, Stanislaus, Tuolumne, and Baja California.	High Reported by Dillane and Merzbacher (2017) with unknown location. The next closest population is in Proctor Valley 5 miles to the southeast.

Scientific Name	Common Name	Flowering Period	Federal	State	Local (CRPR/MSCP/ Other)	Preferred Habitat	Distribution	Potential to Occur
Rhamnaceae	**Buckthorn Family**							
Adolphia californica	California adolphia	Dec–May	None	None	2B.1, County List B	Clay and loamy soils particularly on south slopes along the edge of grasslands where the grassy areas are adjacent to coastal sage scrub habitat. Clay and loamy soils in grasslands and edges of coastal sage scrub. 10–740 meters.	San Diego, Arizona, and Baja California.	Not expected. Plant is very easily identified any time of the year. Lack of suitable habitat limits potential though it has been reported within one mile of the Preserve (CDFW 2019).
ANGIOSPERMS (MONOCOTYLEDONS)								
Juncaeae	**Rush Family**							
Juncus acutus ssp. *leopoldii*	southwestern spiny rush	May–Jun	None	None	4.2, County List D	Moist saline places, salt marshes, alkaline seeps. < 300 meters.	San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, Riverside, San Diego, Imperial, Arizona, Baja California, South America, and Africa.	Present This species was detected in the drainage area downslope from the large water tank inholding within the Preserve during 2018 rare plant surveys (AECOM 2018).
Themidaceae	**Brodiaeae Family**							
Bloomeria clevelandii	San Diego goldenstar	May	None	None	1B.1, MSCP, County List A	Coastal scrub and mesa grassland. < 100 meters.	Riverside, San Diego, and northern Baja California.	Present This species was detected on the north-facing slope east and southeast of the large water tank inholding area within the Preserve during 2018 rare plant surveys (AECOM 2018).

Scientific Name	Common Name	Flowering Period	Federal	State	Local (CRPR/MSCP/ Other)	Preferred Habitat	Distribution	Potential to Occur
LYCOPHYTES								
Selaginellaceae	**Spike-Moss Family**							
Selaginella cinerascens	mesa spike-moss	NA	None	None	4.1, County List D	Sunny spots or under shrubs, often "red clay." < 550 meters.	Los Angeles, Orange, Riverside, San Diego, and Baja California.	Present This species was detected throughout the Preserve in natural open areas with soil crusts during 2018 rare plant surveys (AECOM 2018).

Key to Species Listing Status Codes

FE	*Federally Endangered*	*SE*	*State Listed as Endangered*
FT	*Federally Threatened*	*ST*	*State Listed as Threatened*

California Rare Plant Rank (CRPR)

CRPR 1B.1	*Plants rare, threatened, or endangered in California and elsewhere; seriously threatened in California.*
CRPR 1B.2	*Plants rare, threatened, or endangered in California and elsewhere; moderately threatened in California.*
CRPR 2B.1	*Plants rare, threatened, or endangered in California but more common elsewhere; seriously threatened in California.*
CRPR 2B.2	*Plants rare, threatened, or endangered in California but more common elsewhere; moderately threatened in California.*
MSCP	*MSCP Covered Species*
NE	*MSCP Narrow Endemic Species: Rare, narrow endemic animal species known from San Diego County within the MSCP Subarea*
County List A	*Plants rare, threatened, or endangered in California and elsewhere.*
County List B	*Plants rare, threatened, or endangered in California, but more common elsewhere.*
County List D	*Plants of limited distribution and are uncommon, but not presently rare or endangered.*

Occurrence Potential Definitions

High Potential: The project area and/or immediate vicinity provide high quality or ideal habitat (i.e., soils, vegetation assemblage, and topography) for a particular species and/or there are known occurrences in the general vicinity of the project area.

Moderate Potential: The project area and/or immediate vicinity provides moderately suitable habitat for a particular species. For example, proper soils may be present, but the desired vegetation assemblage or density is less than ideal; or soils and vegetation are suitable, but the site is outside of the known elevation range of the species.

Low Potential: The project area and/or immediate vicinity provides low quality habitat for a particular species, such as improper soils, disturbed or otherwise degraded habitat, improper assemblage of desired vegetation, and/or the site is outside of the known elevation range of the species.

Not Expected: The project area and/or immediate vicinity does not provide suitable habitat necessary to support the species and/or the site is located outside of the known geographic range of the species. Within suitable habitat, focused protocol surveys and/or botanical surveys conducted during optimal timing (e.g. flowering period) and climatic conditions (e.g. average to above-average hydrologic year) would preclude the presence of the species.

APPENDIX D

WILDLIFE SPECIES DETECTED ON THE PRESERVE

Wildlife Species Detected on the Preserve

INVERTEBRATES

Scientific Name	Common Name	Status (Federal/State/Local)
Insecta (Order Coleoptera)	**Beetles**	
Eleodes armatus	armored darkling beetle	None/None/None
Insecta (Order Diptera)	**Flies**	
Order Diptera	flies	None/None/None
Insecta (Order Hymenoptera)	**Ants, Bees, and Wasps**	
* *Apis mellifera*	European honey bee	None/None/None
Pepsis sp.	tarantula hawk wasp	None/None/None
Family Formicidae	ants	None/None/None
Family Mutillidae	velvet ant	None/None/None
Insecta (Order Lepidoptera)	**Butterflies and Moths**	
Anthocharis cethura	desert orangetip butterfly	None/None/None
Apodemia virgulti	Behr's metalmark butterfly	None/None/None
Coenonympha tullia	California ringlet butterfly	None/None/None
Cupido amyntula	western tailed-blue butterfly	None/None/None
Erynnis funeralis	funereal duskywing butterfly	None/None/None
Glaucopsyche lygdamus	silvery blue butterfly	None/None/None
Junonia coenia	common buckeye butterfly	None/None/None
Leptotes marina	marine blue butterfly	None/None/None
Papilio zelicaon	anise swallowtail butterfly	None/None/None
Pieris rapae	cabbage white butterfly	None/None/None
Pontia protodice	checkered white butterfly	None/None/None
Vanessa atalanta	red admiral butterfly	None/None/None
Vanessa cardui	painted lady butterfly	None/None/None
Insecta (Order Odonata)	**Dragonflies and Damselflies**	
Order Odonata	dragonflies	None/None/None

REPTILES

Scientific Name	Common Name	Status (Federal/State/Local)
LACERTILIA	**LIZARDS**	
Anguidae	**Alligator Lizards**	
Elgaria multicarinatus	southern alligator lizard	None/None/None
Phrynosomatidae	**Zebratail, Earless, Horned, Spiny, Fringe-Toed Lizards**	
Sceloporus occidentalis	western fence lizard	None/None/None
Teiidae	**Whiptail Lizards**	
Aspidoscelis hyperythra beldingi	Belding's orange-throated whiptail	None/WL/MSCP, Group 2
Aspidoscelis tigris stejnegeri	San Diegan tiger whiptail	None/SSC/Group 2
Serpentes	**Snakes**	
Colubridae	**Colubrid Snakes**	
Coluber lateralis lateralis	California striped racer	None/None/None
Lampropeltis getula californiae	California kingsnake	None/None/None
Pituophis catenifer	gopher snake	None/None/None
Viperidae	**Vipers**	
Crotalus oreganus helleri	southern Pacific rattlesnake	None/None/None

BIRDS

Scientific Name	Common Name	Status (Federal/State/Local)
GALLIFORMES		
Odontophoridae	**Quails**	
Callipepla californica	California quail	None/None/None
COLUMBIFORMES		
Columbidae	**Pigeons and Doves**	
* *Columba livia*	rock pigeon	None/None/None
Zenaida macroura	mourning dove	None/None/None
CAPRIMULGIFORMES		
Caprimulgidae	**Goatsuckers**	
Phalaenoptilus nuttallii	common poorwill	None/None/None

BIRDS

Scientific Name	Common Name	Status (Federal/State/Local)
CUCULIFORMES		
Cuculidae	**Cuckoos and Roadrunners**	
Geococcyx californianus	greater roadrunner	None/None/None
APODIFORMES		
Trochilidae	**Hummingbirds**	
Calypte anna	Anna's hummingbird	None/None/None
Calypte costae	Costa's hummingbird	None/None/None
Selasphorus rufus	rufous hummingbird	None/None/None
Selasphorus sasin	Allen's hummingbird	None/None/None
ACCIPITRIFORMES		
Accipitridae	**Hawks**	
Accipiter cooperii	Cooper's hawk	None/WL/MSCP, Group 1
Accipiter striatus	sharp-shinned hawk	None/WL/Group 1
Buteo jamaicensis	red-tailed hawk	None/None/None
STRIGIFORMES		
Tytonidae	**Barn Owls**	
Tyto alba	barn owl	None/None/Group 2
Strigidae	**True Owls**	
Bubo virginianus	great horned owl	None/None/None
PICIFORMES		
Picidae	**Woodpeckers**	
Colaptes auratus	northern flicker	None/None/None
Melanerpes formicivorus	acorn woodpecker	None/None/None
Picoides nuttallii	Nuttall's woodpecker	None/None/None
FALCONIFORMES		
Falconidae	**Falcons**	
Falco sparverius	American kestrel	None/None/None

BIRDS

Scientific Name	Common Name	Status (Federal/State/Local)
PASSERIFORMES		
Tyrannidae	**Tyrant Flycatchers**	
Empidonax difficilis	Pacific-slope flycatcher	None/None/None
Myiarchus cinerascens	ash-throated flycatcher	None/None/None
Sayornis nigricans	black phoebe	None/None/None
Sayornis saya	Say's phoebe	None/None/None
Tyrannus vociferans	Cassin's kingbird	None/None/None
Vireonidae	**Vireos**	
Vireo bellii pusillus	least Bell's vireo	FE/SE/MSCP, NE, Group 1
Corvidae	**Jays and Crows**	
Aphelocoma californica	California scrub-jay	None/None/None
Corvus brachyrhynchos	American crow	None/None/None
Corvus corax	common raven	None/None/None
Aegithalidae	**Bushtits**	
Psaltriparus minimus	bushtit	None/None/None
Troglodytidae	**Wrens**	
Salpinctes obsoletus	rock wren	None/None/None
Thryomanes bewickii	Bewick's wren	None/None/None
Troglodytes aedon	house wren	None/None/None
Polioptilidae	**Gnatcatchers**	
Polioptila caerulea	blue-gray gnatcatcher	None/None/None
Polioptila californica californica	coastal California gnatcatcher	FT/SSC/MSCP, Group 1
Paradoxornithidae	**Wrentits**	
Chamaea fasciata	wrentit	None/None/None
Turdidae	**Thrushes**	
Turdus migratorius	American robin	None/None/None
Mimidae	**Thrashers**	
Mimus polyglottos	northern mockingbird	None/None/None
Toxostoma redivivum	California thrasher	None/None/None
Fringillidae	**Finches**	
Haemorhous mexicanus	house finch	None/None/None
Spinus psaltria	lesser goldfinch	None/None/None

BIRDS

Scientific Name	Common Name	Status (Federal/State/Local)
Passerellidae	**New World Sparrows**	
Aimophila ruficeps canescens	southern California rufous-crowned sparrow	None/WL/MSCP, Group 1
Melospiza lincolnii	Lincoln's sparrow	None/None/None
Melospiza melodia	song sparrow	None/None/None
Melozone crissalis	California towhee	None/None/None
Pipilo maculatus	spotted towhee	None/None/None
Zonotrichia atricoplilla	golden-crowned sparrow	None/None/None
Zonotrichia leucophrys	white-crowned sparrow	None/None/None
Icteridae	**Blackbirds**	
Icterus bullockii	Bullock's oriole	None/None/None
Icterus cucullatus	hooded oriole	None/None/None
Sturnella neglecta	western meadowlark	None/None/None
Parulidae	**Wood Warblers**	
Geothlypis trichas	common yellowthroat	None/None/None
Setophaga coronata	yellow-rumped warbler	None/None/None
Setophaga nigrescens	black-throated gray warbler	None/None/None

MAMMALS

Scientific Name	Common Name	Status (Federal/State/Local)
Canidae	**Canines**	
Canis latrans	coyote	None/None/None
Felidae	**Cats**	
Lynx rufus	bobcat	None/None/None
Heteromyidae	**Pocket Mice and Kangaroo Rats**	
Chaetodipus californicus	California pocket mouse	None/None/None
Leporidae	**Hares and Rabbits**	
Sylvilagus audubonii sanctidiegi	Audubon's cottontail	None/None/None
Molossidae	**Free-Tailed Bats**	
Nyctinomops femorosaccus	pocketed free-tailed bat	None/SSC/Group 2
Tadarida brasiliensis	Mexican free-tailed bat	None/None/None

MAMMALS

Scientific Name	Common Name	Status (Federal/State/Local)
Muridae	**Mice, Rats, and Voles**	
Neotoma lepida intermedia	San Diego desert woodrat	None/SSC/Group 2
Neotoma macrotis	big-eared woodrat	None/None/None
Peromyscus boylii	brush mouse	None/None/None
Peromyscus californicus	California mouse	None/None/None
Peromyscus maniculatus	deer mouse	None/None/None
Reithrodontomys megalotis	western harvest mouse	None/None/None
Procyonidae	**Ringtails and Raccoons**	
Procyon lotor	northern raccoon	None/None/None
Vespertilionidae	**Evening Bats**	
Eptesicus fuscus	big brown bat	None/None/None
Lasiurus blossevillii	western red bat	None/SSC/Group 2
Lasiurus cinereus	hoary bat	None/None/None
Lasiurus xanthinus	western yellow bat	None/SSC/None
Myotis californicus	California myotis	None/None/None
Myotis ciliolabrum	western small-footed myotis	None/None/None
Myotis yumanensis	Yuma myotis	None/None/Group 2
Parastrellus hesperus	canyon bat	None/None/None

[1] FE: Federally Endangered
FT: Federally Threatened
SE: State Endangered
WL: California Department of Fish and Wildlife Watch List
SSC: California Department of Fish and Wildlife Species of Special Concern
MSCP: Covered under the South County MSCP Subarea Plan
NE: MSCP Narrow Endemic Species
Group 1: Animals of high sensitivity (listed or specific natural history requirements) (County)
Group 2: Animals declining but not in immediate threat of extinction or extirpation (County)

APPENDIX E

SPECIAL-STATUS WILDLIFE SPECIES EVALUATED FOR POTENTIAL TO OCCUR ON THE PRESERVE

Special-Status Wildlife Species Evaluated for Potential to Occur on the Preserve

Scientific Name	Common Name	Federal	State	Local	Preferred Habitat	Potential for Occurrence in the Study Area
INVERTEBRATES						
Insecta/Coleoptera	**Beetles**					
Cicindela gabbii	Gabb's tidal-flat tiger beetle	None	None	County Group 2	Salty coastal habitats including salt marshes, tidal flats, and beaches.	Not Expected This species is not expected to occur within the Preserve due to lack of suitable salt marsh, tidal flat, or beach habitat. This species has been reported within one mile of the Preserve (CDFW, 2019).
Cicindela latesignata latesignata	western beach tiger beetle	None	None	County Group 2	Coastal habitats, primarily beaches.	Not Expected This species is not expected to occur within the Preserve due to lack of suitable coastal or beach habitat. This species has been reported within one mile of the Preserve (CDFW, 2019).
Insecta/Hymenoptera	**Wasps, Bees, and Ants**					
Bombus crotchii	crotch bumble bee	None	SCE	None	Open grassland and scrub habitats that support potential nectar sources such as plants within the Fabaceae, Apocynaceae, Asteraceae, Lamiaceae, and Boraginaceae families.	High This species has high potential to occur within the Preserve due to the presence of suitable grassland and scrub habitats with potential nectar sources. This species has been reported within one mile of the Preserve (CDFW, 2019).
Insecta/Lepidoptera	**Butterflies and Moths**					
Callophrys thornei	Thorne's hairstreak	None	None	MSCP, NE, County Group 1	Chaparral habitats within the vicinity of Otay Mountain. Requires the host plant: Tecate cypress (*Cupressus forbesii*).	Not Expected This species is not expected to occur within the Preserve due to lack of the species' host plant, Tecate cypress. This species has been reported within one mile of the Preserve (CDFW, 2019).

Scientific Name	Common Name	Federal	State	Local	Preferred Habitat	Potential for Occurrence in the Study Area
Danaus plexippus	monarch butterfly	None	None	County Group 2	Wintering sites in California are associated with wind-protected groves of large trees (primarily eucalyptus or pine [Pinus spp.]) with nectar and water sources nearby that are generally near the coast.	Low This species has low potential to occur on-site within the eucalyptus woodland, as the stands on-site are relatively small in size and isolated in nature. This species has been reported within one mile of the Preserve (County of San Diego 2019).
Euphydryas editha quino	quino checkerspot butterfly	FE	None	NE, County Group 1	Chaparral and coastal scrub with sunny clearings. Require high densities of larval host plants, such as *Plantago erecta*, *P. insularis*, and *Castilleja exserta*.	High This species has high potential to occur within the Preserve due to the presence of suitable open coastal scrub containing species' preferred host plant, *Plantago erecta*, as well as nectar sources. Additionally, the Preserve is known to have historically supported large populations of this species on-site and within one mile of the Preserve (USFWS 2019, County of San Diego 2019).
REPTILES						
Anniellidae	**Legless Lizard Family**					
Anniella stebbinsi [=Anniella pulchra]	southern California legless lizard	None	SSC	County Group 2	Occurs in sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks.	Moderate This species has a moderate potential to occur within the Preserve. While the Preserve lacks the vegetation assemblages generally associated with this species, Bancroft Creek may provide suitable habitat areas of moist, loose soil with plant cover. This species has been reported within one mile of the Preserve (County of San Diego 2019; CDFW 2019).

Scientific Name	Common Name	Federal	State	Local	Preferred Habitat	Potential for Occurrence in the Study Area
Phrynosomatidae	**Iguanid Lizard Family**					
Phrynosoma blainvillii	**coast horned lizard**	None	SSC	MSCP, County Group 2	Prefers sandy riparian and sage scrub habitats but also occurs in valley-foothill hardwood, conifer, pine-cypress, juniper and annual grassland habitats below 6,000 feet, open country, especially sandy areas, washes, flood plains, and windblown deposits.	High This species has high potential to occur within the Preserve due to the presence of suitable coastal scrub and grassland habitat with suitable sandy loam soils. This species has been reported within one mile of the Preserve (County of San Diego 2019; CDFW 2019).
Teiidae	**Whiptail and Racerunner Family**					
Aspidoscelis hyperythra beldingi	Belding's orange-throated whiptail	None	WL	MSCP, County Group 2	Semi-arid brushy areas typically with loose soil and rocks, including washes, streamsides, rocky hillsides, and coastal chaparral.	Present This species was detected incidentally during wildlife surveys in 2019 in the open scrub habitat within the Preserve.
Aspidoscelis tigris stejnegeri	coastal western whiptail	None	SSC	County Group 2	Found in a variety of ecosystems, primarily hot and dry areas with sparse foliage, including chaparral, woodland, and riparian areas.	Present This species was detected incidentally during wildlife surveys in 2019 in the open scrub habitat within the Preserve.
Colubridae	**Colubrid Snakes**					
Diadophis punctatus similis	San Diego ringneck snake	None	None	County Group 2	Prefers moist habitats, including wet meadows, rocky hillsides, gardens, farmland, grassland, chaparral, mixed coniferous forests, woodlands.	High This species has high potential to occur within the Preserve due to the presence of suitable grassland and rocky hillsides. This species has been reported within one mile of the Preserve (County of San Diego 2019).

Scientific Name	Common Name	Federal	State	Local	Preferred Habitat	Potential for Occurrence in the Study Area
Thamnophis hammondii	two-striped garter snake	None	SSC	County Group 1	Coastal California near water sources (e.g. pools, creeks, cattle tanks) with permanent fresh water, and near streams with rocky beds and riparian growth. Associated vegetation includes oak woodland, willow, coastal sage scrub, scrub oak, sparse pine, chaparral, and brushland.	Moderate This species has a moderate potential to occur within the Preserve. While the Preserve lacks permanent water sources, Bancroft Creek may provide suitable stream and riparian habitat particularly during the wet season. This species has been reported within one mile of the Preserve (County of San Diego 2019).
Viperidae	**Vipers**					
Crotalus ruber	red-diamond rattlesnake	None	SSC	County Group 2	Chaparral, woodland, grassland, sage scrub, and desert. In rocky areas and dense vegetation.	High This species has a high potential to occur within the Preserve due to the presence of suitable grassland, sage scrub, and woodland habitat. This species has been reported within one mile of the Preserve (County of San Diego 2019; CDFW 2019).
BIRDS						
Phalacrocoracidae	**Cormorants and Anhingas**					
Phalacrocorax auritus	double-crested cormorant	None	WL	County Group 2	Colonial waterbirds that seek aquatic bodies large enough to support their fish diet, but can nest in clusters or trees near smaller lagoons or ponds.	Not Expected This species is not expected to occur within the Preserve due to lack of suitable aquatic habitat such as ponds or lagoons. This species has been reported within one mile of the Preserve (CDFW, 2019).
Accipitridae	**Hawks**					
Accipiter cooperii	Cooper's hawk	None	WL	MSCP, County Group 1	Inhabits live oak, riparian deciduous, or other forest habitats near water. Nests and forages near open water or in riparian vegetation.	Present This species was detected actively hunting within the Preserve during diurnal avian surveys but is unlikely to roost or nest within the Preserve.

Scientific Name	Common Name	Federal	State	Local	Preferred Habitat	Potential for Occurrence in the Study Area
Accipiter striatus	sharp-shinned hawk	None	WL	County Group 1	Nests in coniferous forests, often within riparian areas or on north-facing slopes near water or in proximity to open areas.	Present This species was detected actively hunting within the Preserve during diurnal avian surveys but is unlikely to roost or nest within the Preserve.
Tytonidae	**Barn Owls**					
Tyto alba	barn owl	None	None	County Group 2	Can be found in open habitats across most of the United States, including grasslands, deserts, marshes, agricultural fields, etc. They nest in tree cavities, caves, and in buildings.	Present This species was detected in the eucalyptus stand in the northeast corner of the Preserve during nocturnal avian surveys.
Vireonidae	**Vireos**					
Vireo bellii pusillus	least Bell's vireo	FE	SE	MSCP, NE, County Group 1	Highly territorial, migratory songbird that nest and forage almost exclusively in riparian woodlands.	High This species has a high potential to occur within the Preserve due to the presence of suitable riparian woodland habitat. This species has been reported within one mile of the Preserve (USFWS 2019; CDFW 2019).
Alaudidae	**Larks**					
Eremophila alpestris actia	California horned lark	None	WL	County Group 2	Found from grasslands along the coast and deserts near sea level to alpine dwarf-shrub habitat above the treeline. During the winter, this species typically flocks in desert lowlands.	High This species has a high potential to occur within the Preserve due to the presence of grassland and open coastal sage scrub, with suitable areas of bare ground for nesting. This species has been reported within one mile of the Preserve (CDFW 2019).
Polioptilidae	**Gnatcatchers**					
Polioptila californica californica	coastal California gnatcatcher	FT	SSC	MSCP, County Group 1	Found year-round in coastal sage scrub habitats dominated by California sagebrush and flat-topped buckwheat, mainly on cismontane slopes below 1,500 feet in elevation.	Present This species was detected during diurnal avian surveys, with up to four individuals/territories established within the Preserve.

Scientific Name	Common Name	Federal	State	Local	Preferred Habitat	Potential for Occurrence in the Study Area
Troglodytidae	**Wrens**					
Campylorhynchus brunneicapillus sandiegensis	coastal cactus wren	None	SSC	MSCP, NE, County Group 1	Nest almost exclusively in prickly pear (*Opuntia littoralis* and *O. oricola*) and coastal cholla (*O. prolifera)* within coastal sage scrub.	Low This species has low potential to occur within the Preserve. Though the Preserve supports suitable coastal sage scrub with [*Opuntia* sp.] for nesting, the cactus patches onsite are patchily distributed and limited in size. This species has been reported within one mile of the Preserve (County of San Diego 2019, CDFW 2019).
Passerellidae	**New World Sparrows**					
Aimophila ruficeps canescens	rufous-crowned sparrow	None	WL	MSCP, County Group 1	Inhabits coastal sage scrub or mixed chaparral habitats, preferably along steep grassy or rocky hillsides.	Present This species was detected within open sage scrub habitats along the steep hillsides in the western portion of the Preserve during diurnal avian surveys.
Artemisiospiza belli belli	Bell's sage sparrow	None	WL	County Group 1	Inhabits large, unfragmented blocks of coastal sage scrub, southern mixed chaparral habitats	High This species has high potential to occur within the Preserve due to large, unfragmented blocks of coastal sage scrub. This species has been reported within one mile of the Preserve (CDFW 2019).
Icteriidae	**Yellow-Breasted Chat**					
Icteria virens	yellow-breasted chat	None	SSC	County Group 1	Breeds in areas of dense shrubbery, including abandoned farm fields, clear-cuts, power-line corridors, fence-rows, forest edges and openings, swamps, and edges of streams, ponds, and rivers.	Low This species has a low potential to occur within the Preserve, during migration. The Preserve lacks suitable breeding habitat, which includes dense riparian habitat. This species has been reported within one mile of the Preserve (CDFW, 2019).
Icteridae	**Blackbird Family**					
Agelaius tricolor	Tricolored blackbird	None	SSC	MSCP, County Group 1	Highly colonial species. Requires open water, protected nesting substrate, and foraging area with insect prey within a few kilometers of the colony.	Not Expected This species is not expected to occur within the Preserve due to lack of suitable open water habitat and suitable nesting vegetation such as cattails and bulrush. This species has been reported within one mile of the Preserve (CDFW, 2019).

Scientific Name	Common Name	Federal	State	Local	Preferred Habitat	Potential for Occurrence in the Study Area
Parulidae	**Wood Warblers**					
Setophaga petechia	yellow warbler	None	SSC	None	Riparian woodlands, montane chaparral, open ponderosa pine and mixed coniferous habitat with significant brush.	Moderate This species has a moderate potential to occur within the Preserve. The Preserve has limited breeding habitat, but does contain eucalyptus woodland in the northeastern corner. This species has been reported within one mile of the Preserve (CDFW, 2019).
MAMMALS						
Heteromyidae	**Pocket Mice and Kangaroo Rat Family**					
Chaetodipus fallax	**San Diego pocket mouse**	None	SSC	County Group 2	Coastal scrub, sagebrush, chaparral, grasslands, pinyon-juniper, and desert wash and scrub. Found in sandy, herbaceous areas with nearby shrubs for cover. Burrows are typically dug within gravelly or sandy soil.	High This species has a high potential to occur within the Preserve as suitable habitat occurs throughout most of the Preserve, within the annual and perennial grassland and various scrub habitats, particularly around rocky outcrops. (County of San Diego 2019).
Muridae	**Mice, Rats, and Voles**					
Neotoma lepida intermedia	**San Diego desert woodrat**	None	SSC	County Group 2	Found in a variety of shrub and desert habitats and nest primarily against rock outcroppings, boulders, cacti, or areas of dense undergrowth.	Present This species was detected during small mammal trapping surveys in 2019.
Molossidae	**Free-tailed Bats**					
Nyctinomops femorosaccus	pocketed free-tailed bat	None	SSC	County Group 2	Inhabits pinyon-juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oasis.	Present This species was detected during spring and summer 2019 passive acoustic bat surveys within the Preserve.

Scientific Name	Common Name	Federal	State	Local	Preferred Habitat	Potential for Occurrence in the Study Area
Nyctinomops macrotis	big free-tailed bat	None	SSC	County Group 2	Low-lying arid areas in Southern California. Need high cliffs or rocky outcrops for roosting sites. Feeds principally on large moths.	Not Expected This species is not expected to occur due to lack of suitable high cliffs for roosting. This species has been reported within one mile of the Preserve (County of San Diego, 2019; CDFW 2019).
Phyllostomidae	**Leaf-Nosed Bats**					
Choeronycteris mexicana	Mexican long-tongued bat	None	SSC	County Group 2	Occasionally found in San Diego County, which is on the northern limit of their range; feeds on nectar and pollen of night-blooming succulents; roosts in relatively well-lit caves and within buildings.	Low This species has a low potential to occur due to lack of suitable roosting habitat (e.g. caves and buildings) and limited suitable foraging habitat (e.g. night-blooming succulents). This species has been reported within one mile of the Preserve (County of San Diego 2019).
Vespertilionidae	**Evening Bats**					
Lasiurus blossevillii	western red bat	None	SSC	County Group 2	Roosts primarily in forests and woodlands from sea level up through mixed conifer forests and are often in edge habitats adjacent to streams, fields, or urban areas.	Present This species was detected during spring and summer 2019 passive acoustic bat surveys within the Preserve.
Lasiurus xanthinus	western yellow bat	None	SSC	None	Roosts primarily in trees, including under palm trees, and forages for insects over water and among trees.	Present This species was detected during spring and summer 2019 passive acoustic bat surveys within the Preserve.
Myotis yumanensis	Yuma myotis	None	None	County Group 2	Roosts in buildings, mines, caves, or crevices, but has also been seen roosting in abandoned swallow nests and under bridges.	Present This species was detected during spring and summer 2019 passive acoustic bat surveys within the Preserve.
Leporidae	**Hares and Rabbits**					
Lepus californicus bennettii	San Diego black-tailed jackrabbit	None	SSC	County Group 2	Inhabits open grasslands, agricultural fields, and sparse coastal scrub where they occur primarily in arid regions with short grass.	High This species has a high potential to occur due to the suitable habitat such as annual and perennial grassland and scrub habitats within the Preserve. (CDFW 2019)

Scientific Name	Common Name	Federal	State	Local	Preferred Habitat	Potential for Occurrence in the Study Area
Mustelidae	**Weasels, Skunks, and Otters Family**					
Taxidea taxus	American badger	None	SSC	MSCP, County Group 2	Drier, open stages of shrubland, forest, and herbaceous habitats with friable soils.	Low This species has a low potential to occur within the Preserve. This species is sparsely populated within the County and is generally associated with large, unfragmented expanses of primarily grassland habitat. Though the Preserve supports suitable shrubland and grassland habitats and has connectivity to off-site areas of open space, the Preserve is bounded by residential development to the north and south and only supports a small amount (4.8 acres) of grassland habitat.

Key to Species Listing Status Codes

FE	*Federally Endangered*	SE	*State Listed as Endangered*
FT	*Federally Threatened*	ST	*State Listed as Threatened*
SSC	*CDFW Species of Special Concern*	SCE	*State Candidate for Endangered*
WL	*CDFW Watch List Species*		
MSCP	*MSCP Covered Species*		
NE	*MSCP Narrow Endemic Species: : Rare, narrow endemic animal species known from San Diego County within the MSCP Subarea*		
County Group 1	*Animals of high sensitivity (listed or specific natural history requirements).*		
County Group 2	*Animals declining but not in immediate threat of extinction or extirpation.*		

Occurrence Potential Definitions

High Potential: The project area and/or immediate vicinity provide high quality or ideal habitat (i.e., soils, vegetation assemblage, and topography) for a particular species and/or there are known occurrences in the general vicinity of the project area.

Moderate Potential: The project area and/or immediate vicinity provides moderately suitable habitat for a particular species. For example, proper soils may be present, but the desired vegetation assemblage or density is less than ideal; or soils and vegetation are suitable, but the site is outside of the known elevation range of the species.

Low Potential: The project area and/or immediate vicinity provides low quality habitat for a particular species, such as improper soils, disturbed or otherwise degraded habitat, improper assemblage of desired vegetation, and/or the site is outside of the known elevation range of the species.

Not Expected: The project area and/or immediate vicinity does not provide suitable habitat necessary to support the species and/or the site is located outside of the known geographic range of the species. Within suitable habitat, focused protocol surveys and/or botanical surveys conducted during optimal timing (e.g. flowering period) and climatic conditions (e.g. average to above-average hydrologic year) would preclude the presence of the species.

APPENDIX F

REPRESENTATIVE PHOTOGRAPHS FROM SURVEYS

Representative Vegetation Photographs

Variegated dudleya (*Dudleya variegata*) blooming on a rocky slab in the Preserve.

Blooming San Diego barrel cactus (*Ferocactus viridescens*).

Butterflies Survey Photographs

Hundreds of California plantain, a Quino checkerspot butterfly larval host plant.

Open scrub habitat with Quino nectar sources, such as deerweed and blue dicks.

Herpetofauna Drift Fence Representative Photographs

Coastal western whiptail (*Aspidoscelis tigris stejnegeri*) caught during week 2 of trapping in drift fence 4.

California kingsnake (*Lampropeltis californiae*) caught during week 2 of trapping in drift fence 3.

Small Mammal Trapping Representative Photographs

San Diego desert woodrat (*Neotoma lepida intermedia*) caught during the fall 2018 trapping season.

California pocket mouse (*Chaetodipus californicus*) caught during the fall 2018 trapping season.

California mouse (*Peromyscus californicus*) caught during the fall 2018 trapping season.

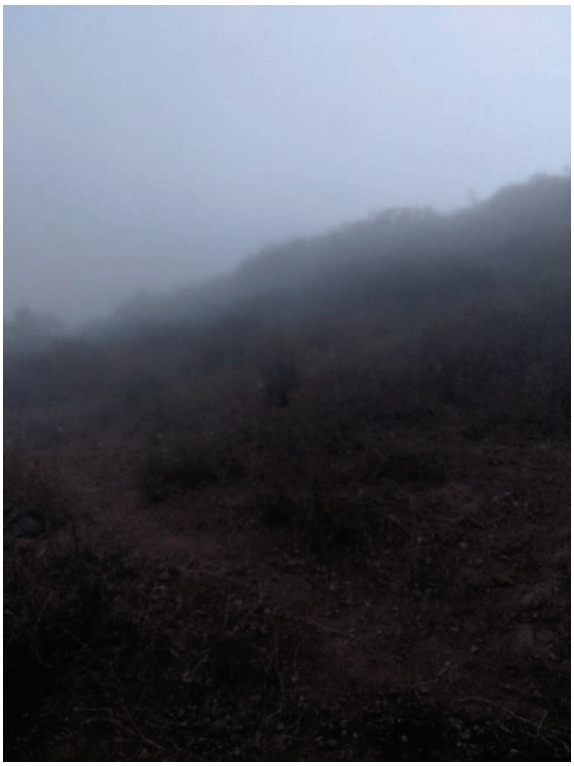
Bat Passive Survey Detector Photographs

Eastern passive bat detector location.

Western passive bat detector location.

Wildlife Camera Locations and Representative Views

Wildlife Camera 1 mounted on steel post.



Wildlife Camera 1 representative view.

Wildlife Camera 2 mounted on steel post.

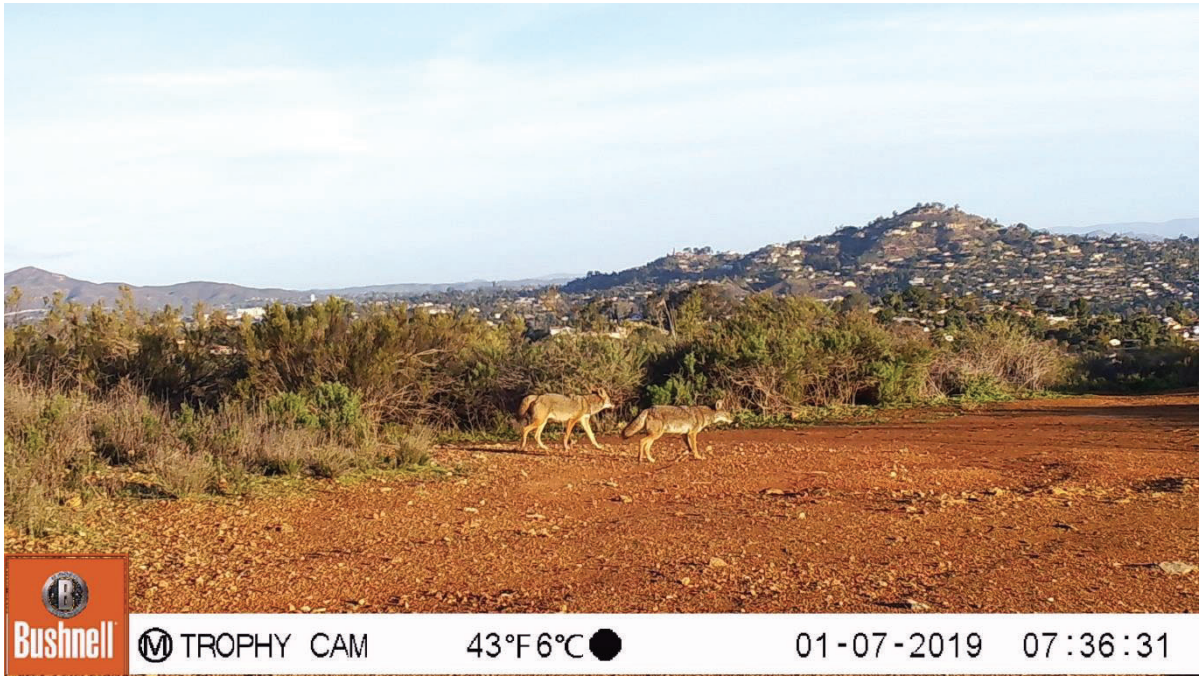
Wildlife Camera 2 representative view.

Wildlife Camera 3 mounted to a eucalyptus tree.

Wildlife Camera 3 representative view.

Medium to Large Mammal Wildlife Camera Representative Photographs

Coyote detected on 12/14/18 at Wildlife Camera 1.



Two coyotes detected on 1/7/19 at Wildlife Camera 2.

Coyote detected on 12/21/18 at Wildlife Camera 3.

Four Audubon's cottontail detected on 3/31/19 at Wildlife Camera 1.

Three coyotes detected on 4/5/19 at Wildlife Camera 3.

Raccoon detected on 8/31/19 at Wildlife Camera 3.

Bobcat detected on 9/3/19 at Wildlife Camera 3.

Anna's hummingbird detected on 9/15/19 at Wildlife Camera 3.