BASELINE BIODIVERSITY REPORT
BOULDER OAKS PRESERVE

PREPARED FOR:

County of San Diego
Department of Parks and Recreation
5500 Overland Avenue, Suite 410
San Diego, CA 92123
Contact: Ms. Diane Buell

PREPARED BY:

ICF International
9775 Businesspark Avenue, Suite 200
San Diego, California 92131

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Acronyms and Abbreviations

°F	degrees Fahrenheit
AMSL	above mean sea level
Anabats	Anabat II bat detectors
ASMDs	area specific management directives
Cal-IPC	California Invasive Plant Council
CDFW	California Department of Fish and Wildlife
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
DPR	County of San Diego Department of Parks and Recreation
CRPR	California Rare Plant Ranking
EIR	Environmental Impact Report
ft	feet
GIS	geographic information system
GPS	Global Positioning System
ICF	ICF International
LDS	Latter Day Saints
mph	miles per hour
NVCS	National Vegetation Classification System
PAMA	pre-approved mitigation area
Preserve	Boulder Oaks Preserve
Quino	Quino checkerspot butterfly
RMP	Resource Management Plan
South County MSCP	Multiple Species Conservation Program South County Subarea Plan
SR-67	State Route 67
station	avian point count station
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VCM	Vegetation Classification Manual for Western San Diego County

Summary

The County of San Diego Department of Parks and Recreation (DPR) acquired the 747.8-acre Boulder Oaks North Preserve (referred to as Preserve hereafter) in 2012 to supplement the existing 1,268 acre Boulder Oaks South Preserve acquired in 2003 for inclusion in the Multiple Species Conservation Program Subarea Plan (South County MSCP) preserve system. DPR proposes to manage the Preserve in accordance with a Resource Management Plan (RMP), including Area-Specific Management Directives (ASMDs). The RMP will be prepared based upon the survey information contained within this report.

ICF International (ICF) conducted a baseline biological inventory study at the newly acquired northern section of Boulder Oaks Preserve (Preserve) that included the following: (1) vegetation surveys with habitat community mapping, rare plant, and California Invasive Plant Council (Cal-IPC) invasive plant species mapping components; (2) butterfly surveys (with a focus on Quino checkerspot and Hermes copper); (3) herpetofauna surveys including pitfall arrays; (4) ornithological surveys including diurnal point counts and nocturnal surveys; and (5) mammal surveys including small mammal trapping, camera stations for medium to large mammals, and bat surveys.

This report summarizes all survey methodologies and data collected during the 2013 survey period (March through August). This report provides recommendations for management of Multiple Species Conservation Program South County Subarea Plan (South County MSCP)-covered plant and animal species.

The Preserve includes approximately 747.8 acres and consists of the following 14 plant alliances, associations, or ground cover types: Chamise – Ramona Lilac Association, Eastwood Manzanita – Chamise Association, California Sagebrush – Black Sage Association, Chaparral Whitethorn Association, Ramona lilac Association, Scrub Oak – Chamise Association, Coast Live Oak –Poison Oak – Grass Association, Engelmann Oak – Coast Live Oak –Poison Oak – Grass Association, Arroyo Willow Association, Bulrush association, Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands, Open Water, Disturbed Habitat, and Developed Lands. The vegetation communities on site are dominated by chamise (*Adenostemma fasciculata*) and Ramona lilac-dominated chaparral associations.

The current survey effort documented 247 plant species. Of these species, ten plants are considered special status, three of which are covered by the South County MSCP. A total of 150 wildlife species were observed or detected in the Preserve during surveys, including, 29 invertebrates, four amphibians, 13 reptiles, 75 birds, and 29 mammals. Twenty (20) special-status wildlife species were detected during the surveys, seven (7) of which are covered by the MSCP.

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Chapter 1
Introduction

1.1 Purpose of the Project

Baseline biological resources surveys were conducted within the recently acquired northern parcel of the County of San Diego Department of Parks and Recreation (DPR) Boulder Oaks Preserve (Preserve) (Figures 1 and 2). The purpose of these surveys was to identify and map existing biological resources. This inventory includes the property previously owned by the Salvation Army and the Wildwood Ranch parcel. This information is being used in the development of a resource management plan (RMP). These area-specific management directives (ASMDs) will provide the management framework for monitoring and managing the Preserve's resources.

A biological survey of the original Boulder Oaks Preserve was conducted in 2007 by Jones and Stokes, Inc. (Jones and Stokes 2007). The vegetation community mapping for the original southern parcel was updated in 2013, but no other biological surveys were conducted on the original 1,268-acre preserve.

1.2 Multiple Species Conservation Program Context

The Preserve is located in the Metro-Lakeside-Jamul segment of the Multiple Species Conservation Program South County Subarea Plan (South County MSCP) (Figure 3). The Preserve is partially within a pre-approved mitigation area (PAMA). PAMA are areas within the MSCP with high conservation values and are important to the success of the regional preserve system. The Preserve is surrounded to the west and south by conserved lands (Figure 4). Un-conserved natural lands exist to the north and east of the Preserve. The City of Poway Iron Mountain Preserve exists to the east. California Department of Fish and Wildlife San Vicente Highlands exist to the southwest of the Preserve and the City of San Diego San Vicente Reservoir Cornerstone Lands are to the southeast.

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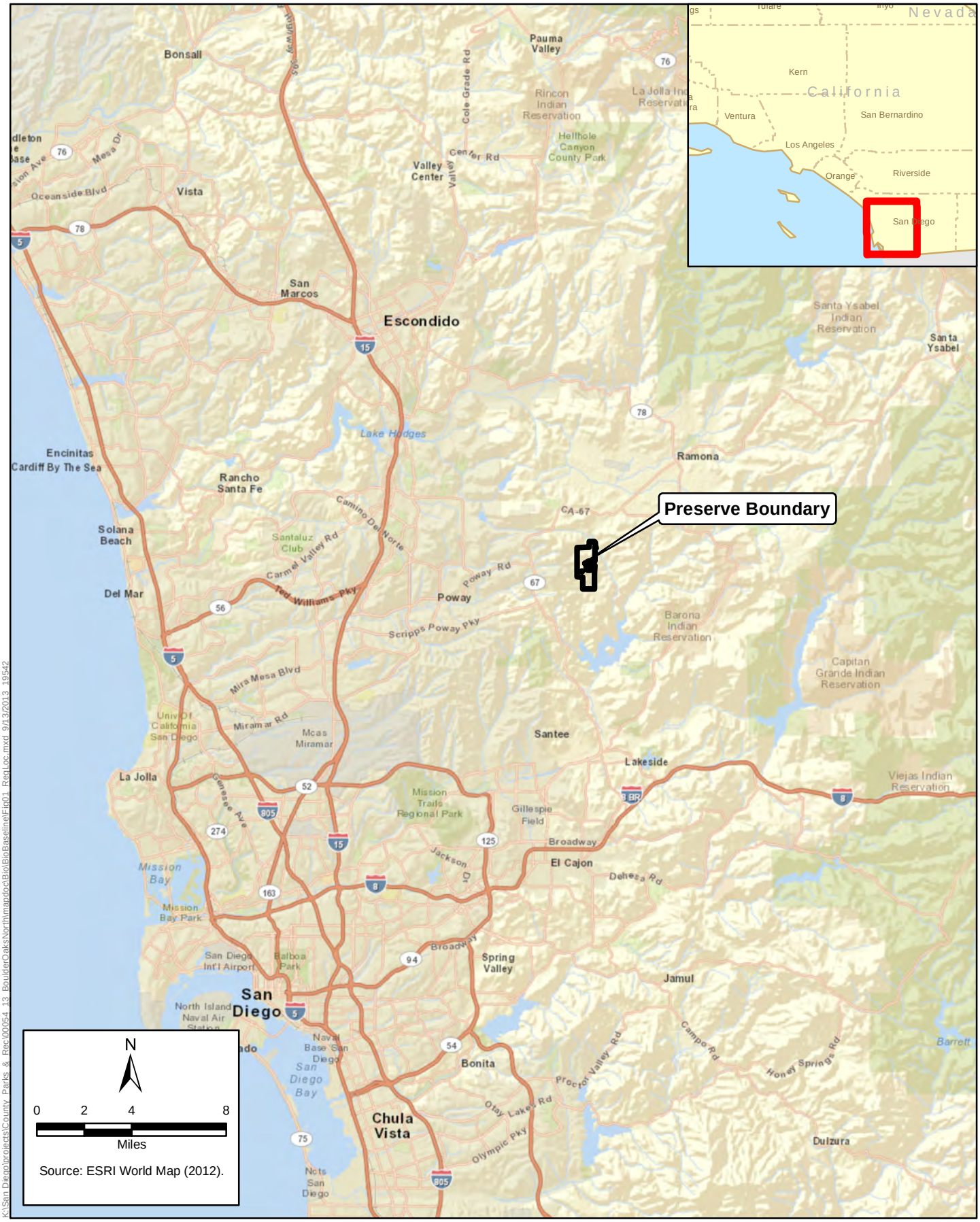

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Figure 1
Regional Location
Boulder Oaks Preserve

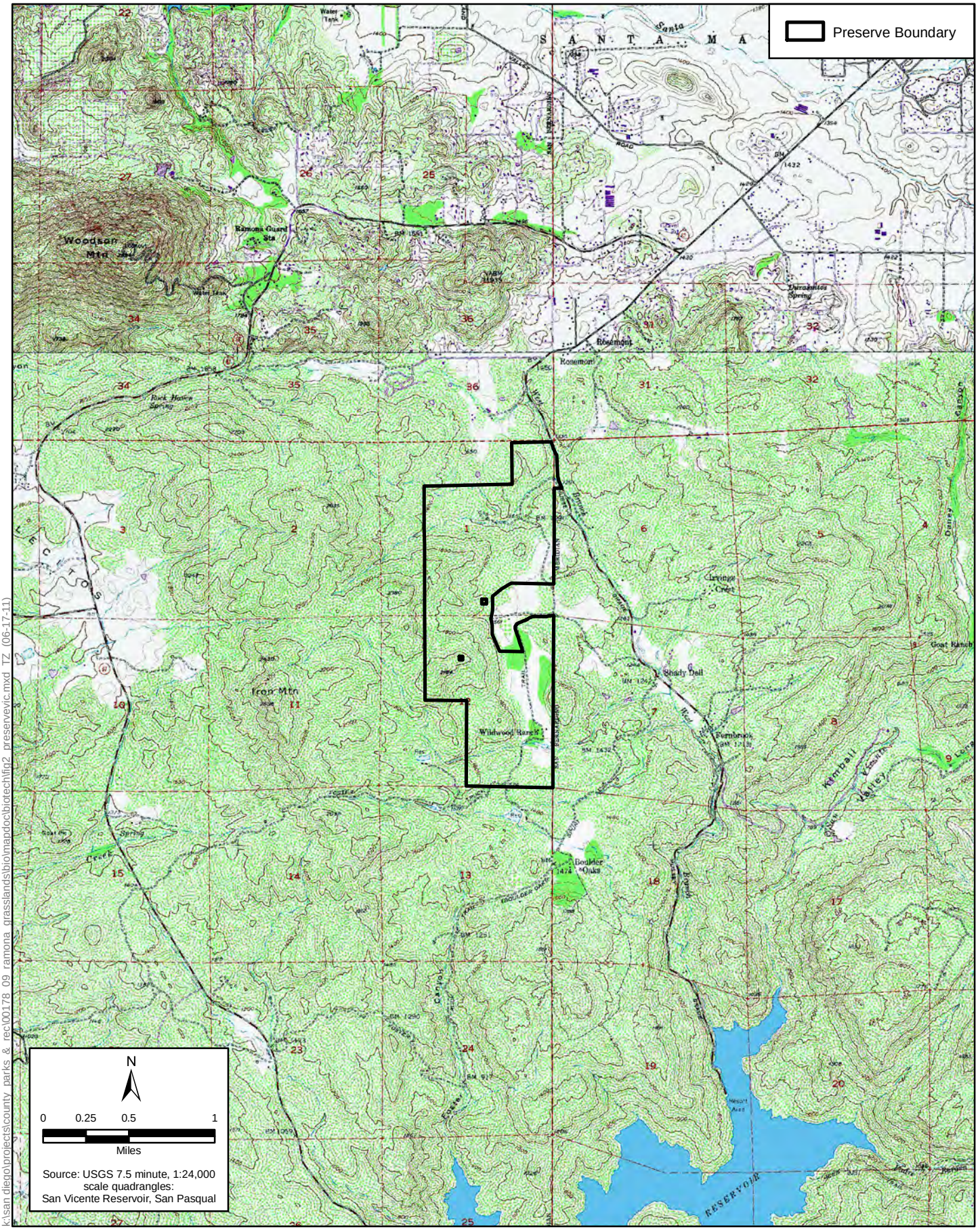

Figure 2
Preserve Vicinity Map
Boulder Oaks Preserve

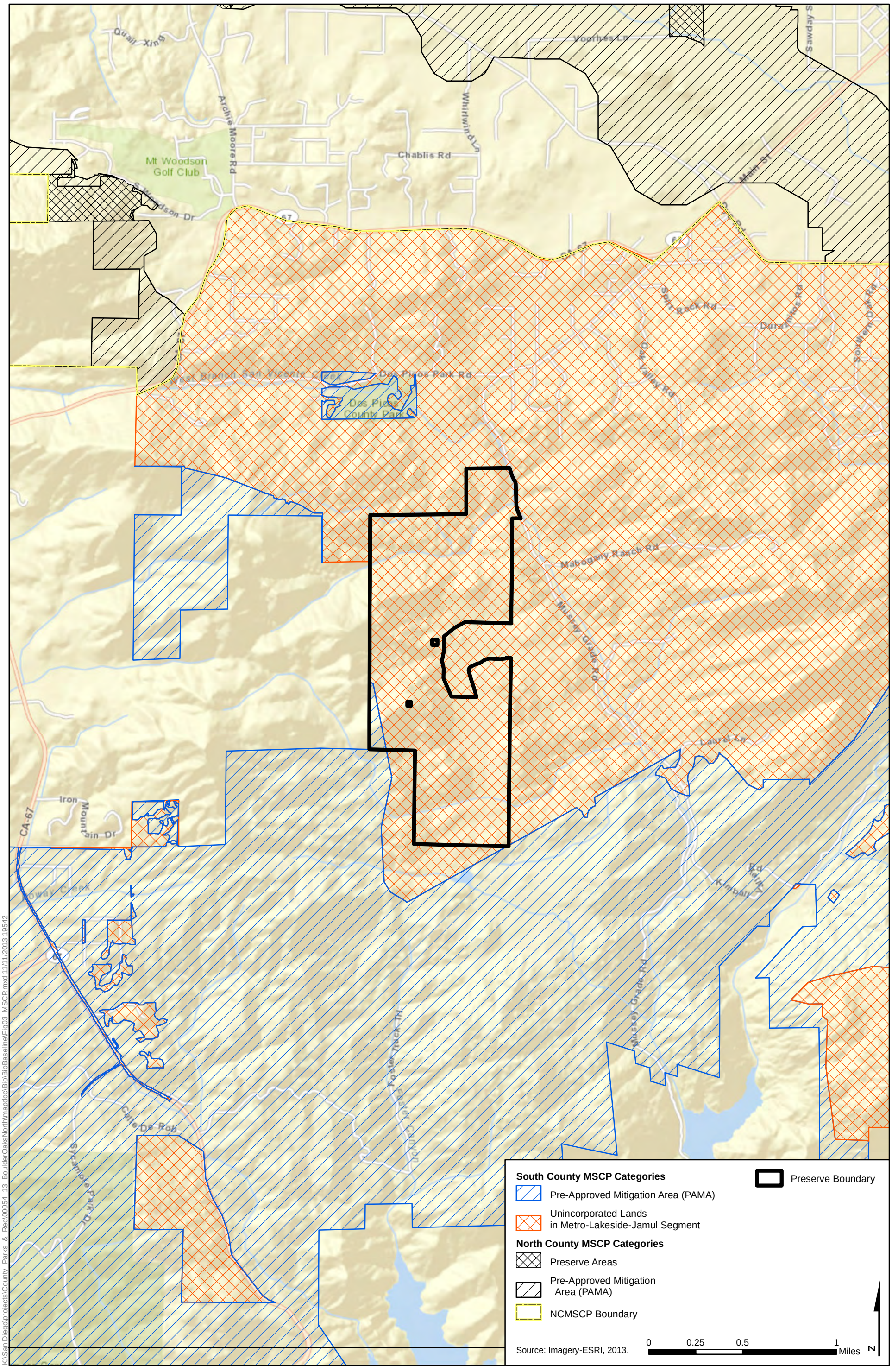

Figure 3
MSCP Designations and PAMA
Boulder Oaks Preserve

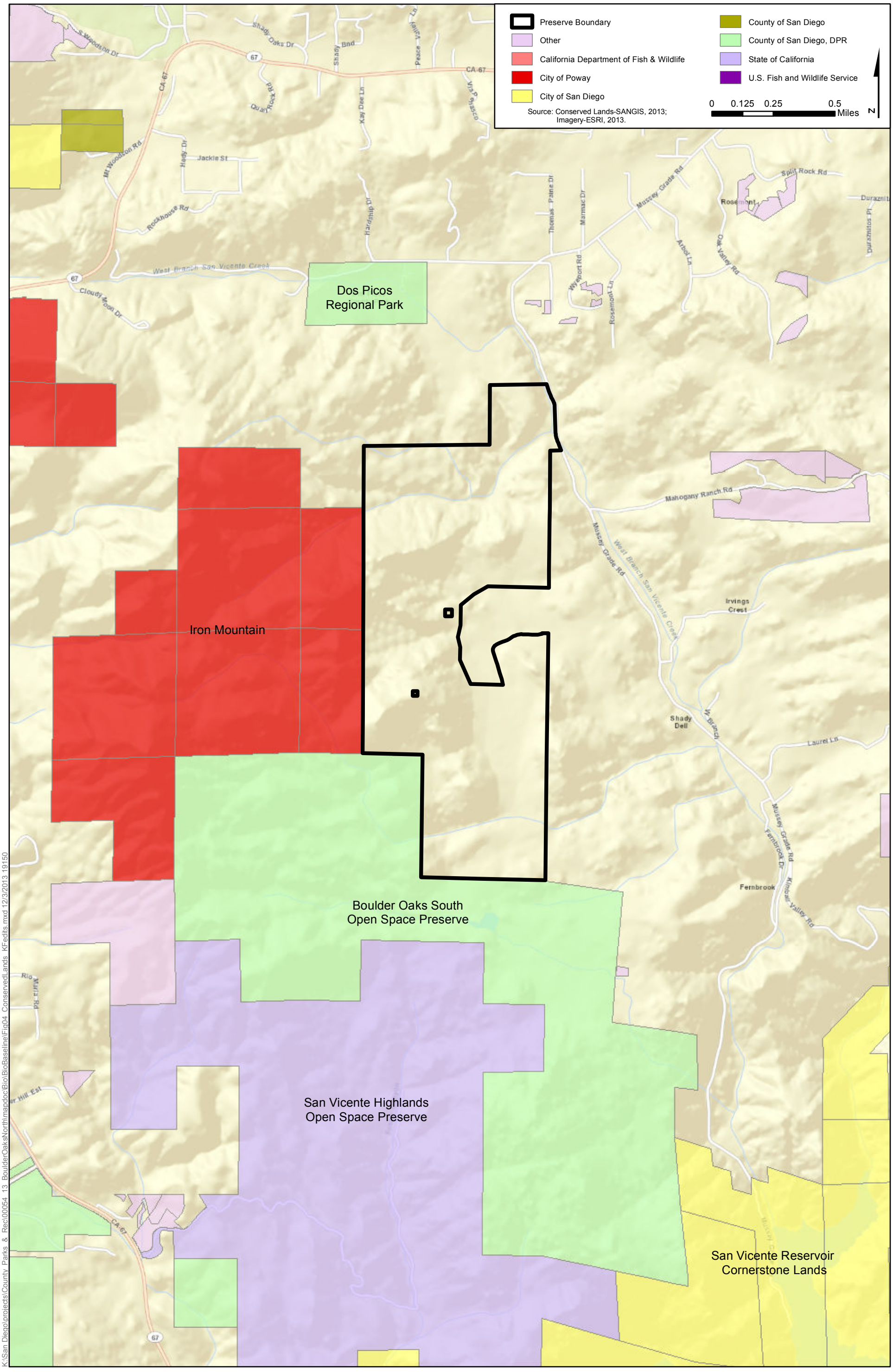

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Figure 4
Adjacent Conserved Lands
Boulder Oaks Preserve

Chapter 2
Study Area Description

2.1 Project Location

The Preserve is in central San Diego County, California, approximately 5 miles southwest of the center of the community of Ramona, and approximately 2 miles south of State Route 67 (SR-67) along Mussey Grade Road (Figures 1 and 2). Specifically, the Preserve is directly west of Mussey Grade Road and approximately 1 mile east of the peak of Iron Mountain. The Preserve can be found on USGS San Vicente Reservoir 7.5-minute Quadrangle in Township 14 South, Range 1 West, Sections 1 and 12 (Figure 2). The Preserve consists of Assessor's Parcel Numbers (APN) 278-231-05, 322-030-02, 322-030-10, 322-031-01, 322-031-02, 322-031-05, 322-060-01, 322-060-08, 322-060-09, 322-060-10, 322-061-03, 327-010-20, 327-010-42, 327-010-49, 327-011-29, and 327-011-30.

2.2 Geographical Setting

The Preserve is in the central foothills of San Diego County. The natural setting of the Preserve consists of steep mountain uplands with ridgelines separated by numerous canyons, ravines, and drainages. The western edge of the Preserve approaches the ridgeline that extends from Mt. Woodson to Iron Mountain. The top of Iron Mountain (2,696 feet) is roughly 0.9 mile west of the western edge of the Preserve. The valley of the west branch of San Vicente Creek lies along the Preserve's eastern boundary. The southeast portion of the Preserve includes relatively flat grasslands and woodlands. The northern and southwestern portions are composed of steep, boulder-strewn mountains (Figure 2). Elevations on the Preserve range from 2,184 feet (ft]) above mean sea level (AMSL) on the peak at the center west of the Preserve to approximately 1,300 ft AMSL at the northeastern corner along Mussey Grade Road.

2.3 Geology and Soils

The Preserve is situated atop the Southern California batholith, which consists of Cretaceous granitic rocks. These rocks form the majority element of this massive feature that underlies roughly two-fifths of San Diego County. In the project area, this exposed granitic bedrock comprises the Woodson Mountain Granodiorite Formation, consisting principally of granodiorite with minor granite and quartz diorite (tonalite) (Strand 1962). The soils map is presented in Figure 5. The majority of the hills within the site have been mapped as either Cieneba very rocky coarse sandy loam (CmrG) or Cieneba rocky coarse sandy loam (CmE2) (USDA 1973). The soils in the grasslands in the southeastern side of the site have been mapped as Arlington coarse sandy loam (AvC) and Visalia sandy loam (VaB and VaC). Other soil types mapped within the Preserve include Cieneba coarse sandy loam (ClD2), Fallbrook sandy loam (FaC), Fallbrook rocky sandy loam (FeE), Friant rocky fine sandy loam (FxE and FxG), Vista coarse sandy loam (VsC), and Vista rocky coarse sandy loam (VvD).

The **Arlington** soil series (AvC) is characterized as a coarse sandy loam with slopes from 2 to 9 percent. These soils are typically described as well drained alluvial fans and terraces with slopes

from nearly level to strongly sloping and are associated with growing grains, citrus and other truck crops. Naturalized vegetation found on this soil series is mainly annual grasses and forbs. These soils are mapped primarily in the southwestern portion of the Preserve.

The **Cieneba** soil series (ClD2, CmE2, CmrG) is characterized as coarse sandy, rocky coarse sandy, and very rocky coarse sandy loams with slopes from 5 to 75 percent. They are typically described as excessively drained shallow soils that are weathered in place from granite outcrops found in the adjacent uplands. These soils are mapped throughout the preserve, with the rocky coarse sandy and very rocky coarse sandy loam soils being the dominant of the three series. Coarse sandy loam is only found within the northwestern border of the Preserve.

The **Fallbrook** soil series (FaC, FeE) is characterized as sandy to rocky sandy loams with slopes from 5 to 30 percent. These soils are typically moderately deep and well drained, and are weathered in place from granodiorite. This soil is mapped in small scattered patches throughout northern border and middle of the Preserve.

The **Friant** soil series (FxE and FxG) is characterized as a rocky fine sandy loam with slopes from 9 to 70 percent. These soils are typically described as shallow, well drained soils that formed from weathered material consisting of fine grained metasedimentary rock. This soil is mapped in small scattered patches throughout southern and southeastern border of the Preserve.

The **Visalia** soil series (VaB, VaC) is characterized as sandy loam with slopes from 2 to 9 percent. These are moderately well-drained soils derived from granitic alluvium and are typically found in alluvial flood plains and fans. This soil is mapped in small scattered patches throughout western border of the Preserve. The **Vista** soil series (VsC, VvD,) is characterized as coarse sandy and rocky coarse sandy loams with slopes of 5 to 15 percent. These are well-drained, moderately deep to deep soils derived from granodiorite or quartz diorites. This soil is mapped in small scattered patches throughout western and southern border of the Preserve.

The **Vista** soil series (VaC, VvD) is characterized as coarse sandy and rocky coarse sandy loam with slopes of 5 to 15 percent. These are well drained, moderately deep to deep soils derived from granodirite or quartz diorites. This soil is mapped in small scattered patches throughout western and southern border of the Preserve.

2.4 Climate

A semi-permanent, Pacific high-pressure cell over the Pacific Ocean dominates San Diego County's climate. This cell drives the dominant onshore circulation, maintaining clear skies for much of the year. Summers in the Preserve area are typically warm and dry, while winters are mild with occasional rain (USDA 1973). The average temperatures range from approximately 53.3°Fahrenheit (°F) (low) to 94.4°F (high) in the summer and approximately 35.4°F (low) to 67.8°F (high) in the winter. In a normal year, precipitation averages 15 to 18 inches and falls mostly in the winter and spring (San Diego County Flood Control District 2007).

A predominant feature of the local climate is the sea-breeze/land-breeze cycle. During the daytime, particularly in the summer, onshore winds move inland with speeds of approximately seven to ten miles per hour (mph). Easterly land breezes of approximately two to four mph often occur at night. Surrounding rugged terrain, which induces turbulence into the airflow, modifies the influence of this cycle. In addition, this cycle is periodically affected by land airflow that dominates weather patterns.

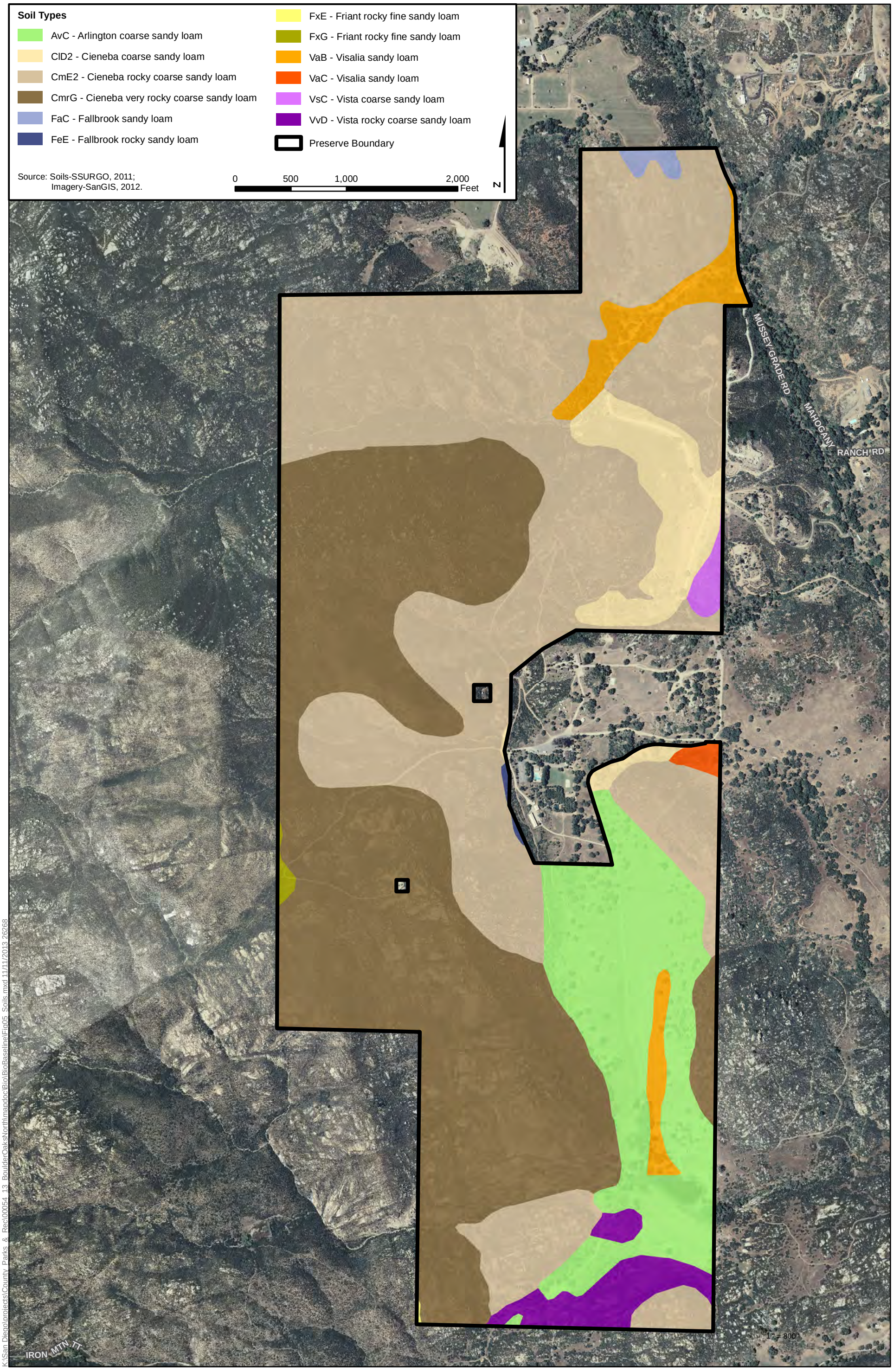

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Figure 5
Soils Map
Boulder Oaks Preserve

The most widely recognized of these are the Santa Ana conditions, during which strong, hot, dry easterly winds prevail for two- or three-day periods.

2.5 Hydrology

The Preserve is in the San Vicente Hydrologic Area of the San Diego River Watershed. Designated beneficial uses for the San Diego River and its tributaries include municipal and domestic supply, agricultural supply, industrial service supply, industrial process supply, contact and non-contact water recreation, warm freshwater habitat, cold freshwater habitat, wildlife habitat, and rare, threatened, or endangered species habitat.

Two unnamed drainages cross the site from west to east. These northern and southern drainages are shown as intermittent blue-line streams on the U.S. Geological Survey (USGS) 7.5-minute San Vicente Reservoir quadrangle map. The northern drainage drains the eastern side of an unnamed 2,635-ft peak and traverses the northern side of the site, with increasing cover of riparian trees, before emptying into western branch of San Vicente Creek at the northeastern corner of the Preserve. The southern drainage flows from the eastern face of Iron Mountain, crosses the Preserve for a short distance before reaching the pond at Wildwood Ranch, and then empties into the west branch of San Vicente Creek.

Other small drainages exist on site, including the central drainage, which flows from the eastern face of the unnamed 2,380-ft peak, which is immediately off-site to the east, and the northern side of the on-site 2,184-ft peak. The central drainage fans out immediately west of the Latter Day Saints (LDS) campground.

For context, drainages presented in this report are from the County's geographic information system (GIS) drainage layer, along with a few others observed on the site (Figure 6). However, those shown are illustrative only, and are not intended to define, for example, limits of waters of the U.S. or other specific features.

San Vicente Reservoir, approximately two miles south of the southern boundary of the northern section of Boulder Oaks Preserve, is a steep-sided, deep, man-made reservoir. When full, it has 1,069 surface acres, a maximum water depth of 190 feet, and 14 shoreline miles (City of San Diego Water Department 2004). The San Vicente Reservoir dam is under construction to raise the height of the dam, to increase the ponding capacity of the reservoir.

2.6 Fire History

The Preserve is dominated by chaparral vegetation, which is naturally maintained by infrequent fires. If the natural fire cycle is suppressed, the chaparral can become senescent, declining in both health and diversity. If the fire frequency is increased, vegetation could shift towards disturbed grassland habitats or disturbed shrub communities. The fire cycles within the area are affected by actions within and adjacent to the Preserve. Anthropogenic fires have altered the fire cycles throughout most of western San Diego County. The entire Preserve burned during an unnamed fire from 1913 and during the 2003 Cedar Fire (Figure 7). Northern sections of the Preserve have also burned in the 1958 Pearson Peak #2 fire and the 1972 Klondike fire. The mountain to the west of

the southern grassland burned during the 1995 Poway Fire. The 1984 Bowles fire reached the southern boundary of the Preserve (SanGIS 2008).

2.7 Trails and Roads

The Preserve is currently closed to the public. A gated-access road traverses the site from the northeast at Mussey grade road to the southern border (Figure 8). No current approved hiking or equestrian trails exist within the Preserve. A steep dirt road currently ascends the mountain on the west-central side of the Preserve. Several dirt trails extend from the north of the LDS camp.

Streams
Preserve Boundary

Source: Streams-NHD, 2000;
Imagery-SanGIS, 2012.

0 500 1,000 2,000 Feet

N

West Branch San Vicente Creek

MUSSEY GRADE RD

MAHOGANY RANCH RD

1 " = 800 '

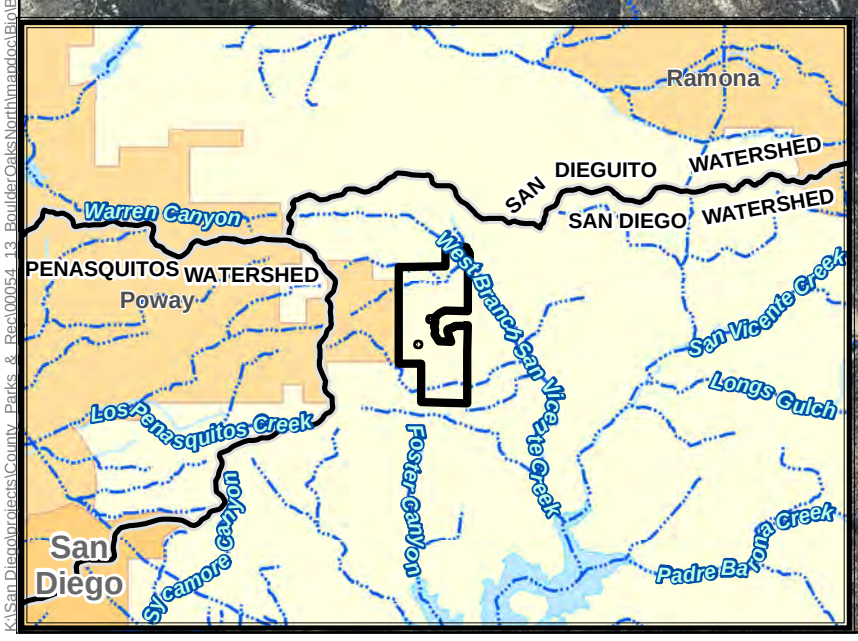

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Figure 6
Hydrology Map
Boulder Oaks Preserve

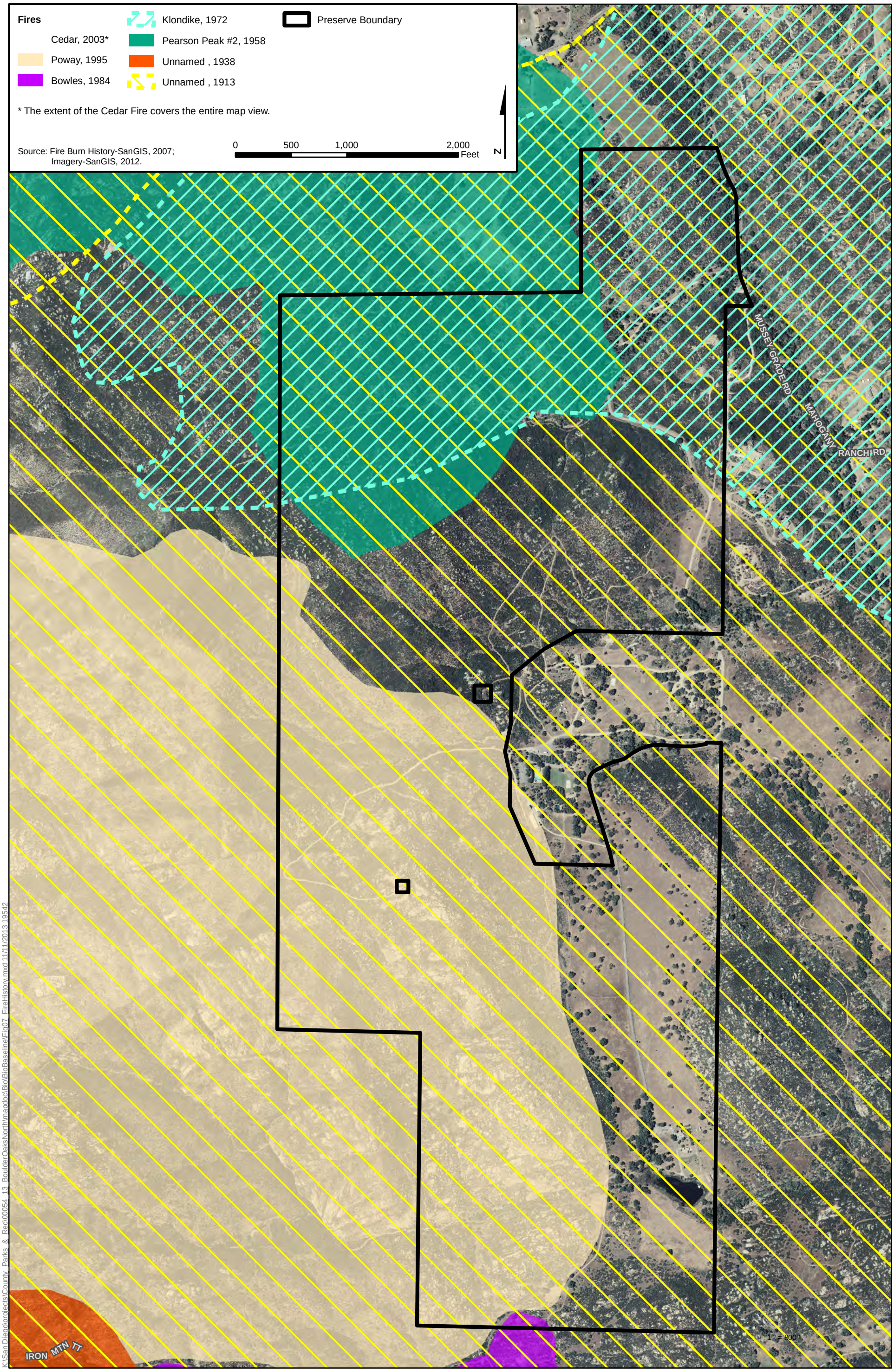

Figure 7
Fire History Map
Boulder Oaks Preserve

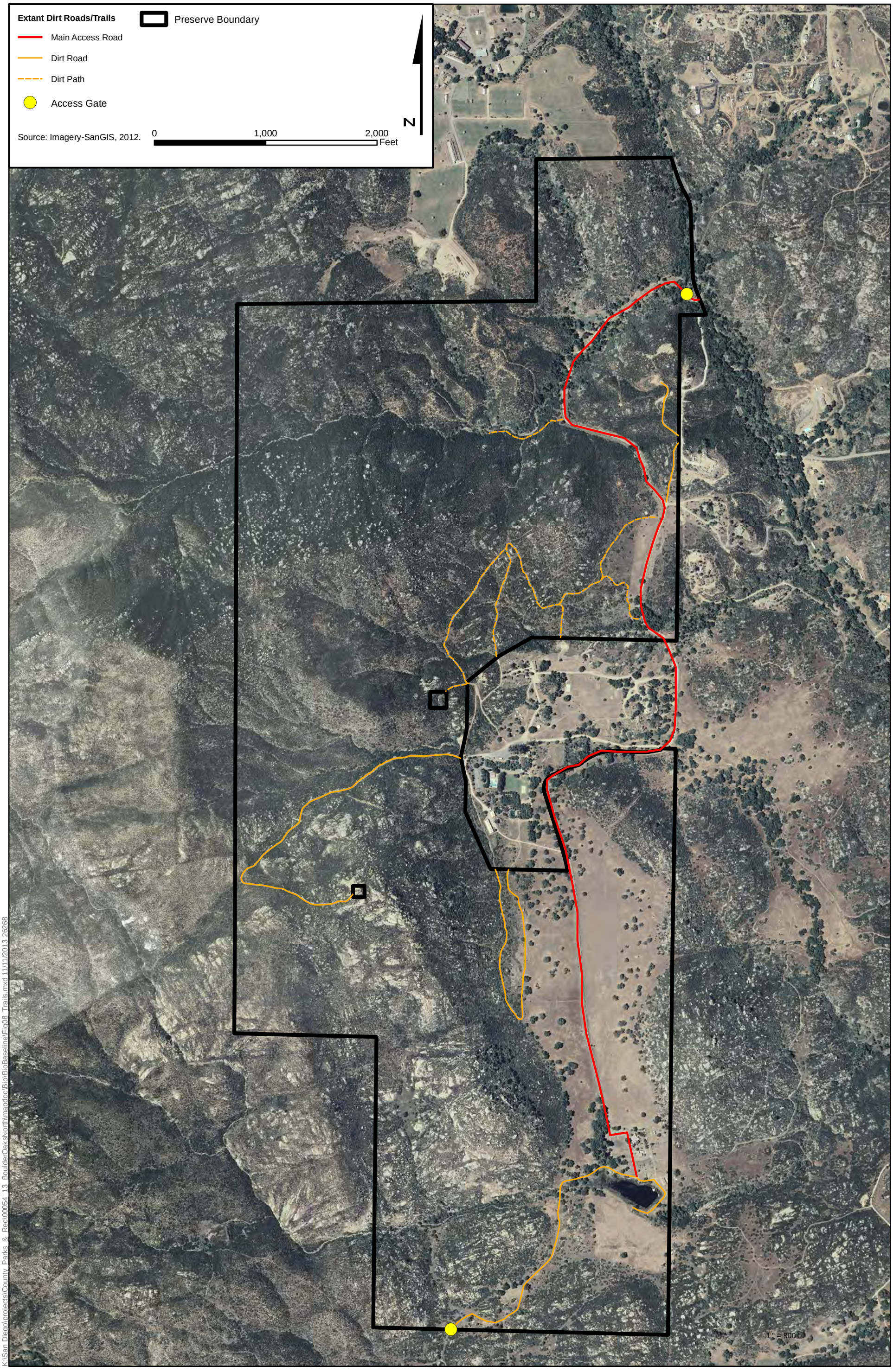

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Figure 8
Trails Map
Boulder Oaks Preserve

Chapter 3
Methods

ICF International (ICF) biologists conducted baseline biological surveys from March 13 through August 28, 2013 at the Preserve that included the following: (1) vegetation surveys with habitat community mapping, rare plant, and Cal-IPC invasive plant species mapping components; (2) butterfly surveys; (3) herpetofauna surveys including pitfall arrays; (4) ornithological surveys including diurnal point counts and nocturnal surveys; and (5) mammal surveys, including small mammal trapping, camera stations for medium to large mammals, and passive acoustical bat surveys.

The following sources are followed for taxonomy and nomenclature, including both scientific and standardized English names: Baldwin et al. (2012), and Rebman and Simpson (2006) for plants; Arnett (2000) for higher taxonomic categories of invertebrate animals; generally Opler and Wright (1999) or Hogue (1993) for invertebrate species; the Center for North American Herpetology (2013) for amphibians and reptiles; American Ornithologist's Union (1998 and supplements) for birds; and Baker et al. (2003) for mammals. The scientific binomial from the cited reference is included with the first mention of a species in the body of this report.

3.1 Vegetation Communities/Habitats

3.1.1 Vegetation Communities Mapping

Vegetation communities were mapped on a *one inch equals 200 feet* (1:2400)-scale aerial photograph of the Preserve in the field and later digitized into a GIS coverage using ArcGIS software. Vegetation communities were mapped within the Preserve boundaries and included a 100-foot buffer pursuant to County of San Diego guidelines (County of San Diego 2010). The methods and classification system used for this effort were consistent with the 2011 *Vegetation Classification Manual for Western San Diego County* (AECOM et al. 2011, herein referred to as VCM), which is based on *A Manual of California Vegetation* (Sawyer, Keeler-Wolf, Evens 2009) and the Holland (1986) (as modified by Oberbauer 2008) classification system.

The VCM is a hierarchical system that is consistent with the National Vegetation Classification System (NVCS). The highest levels of the NVCS are very broad, and therefore not part of the locally derived VCM, which focuses on the lowest levels—the alliances, associations and stands. *Alliances* are characterized by "the presence of diagnostic species within a range of cover values within a single plant stratum" and *associations* are a "subset of types within an alliance, which are further defined by additional diagnostic species that may be present in any stratum" (SANDAG 2011). The most basic unit in the VCM classification system is the *stand*, which is defined by species composition and relative cover, as well as structural integrity (e.g., vertical and horizontal structure resulting from local environmental conditions and site history). *Semi-natural stands* are equivalent to an alliance but dominated by nonnative species.

The vegetation types (e.g., Alliances and Associations) were determined by assessing the relative dominance of tree, shrub, and herbaceous species. These determinations were made with the use of a key, which was in the form of an interactive CD-ROM that was installed on a computer and used in

the field. In addition, to confirm the field identification, "membership rules" were reviewed as well as slope aspect, topographic position, and soil texture for each Alliance and Association. The boundaries of vegetation communities were then drawn onto a 1:2400-scale color aerial photograph and incorporated into a GIS data layer. To ensure consistency with previous mapping, the MSCP, and other planning or regulatory documents, the mapping on the Preserve was cross-walked to Holland classification system (1986), as modified by Oberbauer et al. (2008), pursuant to guidelines detailed in Appendix C of the VCM. Mapping of VCM and Holland are presented in the results.

All existing staging areas, roads, and trails were included on the map and depicted as either disturbed (dirt) or developed (paved). Man-made or unvegetated land covers not described in VCM are presented with their Holland code descriptions.

3.2 Plants

Prior to conducting rare plant surveys, ICF biologists performed a literature search of the available special-status species databases to determine if rare plants were previously detected or known to occur within the vicinity of the Preserve. Available data that was reviewed included the California Natural Diversity Database (CNDDB) (CDFW 2013), the California Native Plant Society (CNPS) Rare Plant Inventory (CNPS 2013), the U.S. Department of Agriculture (USDA) soil survey of the area (USDA 1973), the Baseline Biological Resources Evaluation Boulder Oaks Open Space Preserve (Jones and Stokes 2007), the Salvation Army Environmental Impact Report (EIR) Biological Report (Merkel & Associates, Inc. 2008) and USGS topographic maps to identify potential stream courses and other notable topographic features.

Surveys were conducted to categorize and map the plant communities within the Preserve, map special-status plants, map Cal-IPC invasive plant species, document all flora observed, and assess the potential occurrence of special-status plant species not detected during the surveys. ICF botanists traversed the Preserve via meandering transects in an effort to accurately categorize vegetation communities. Rare plant survey priority areas were determined once the literature search and the vegetation mapping were complete. For the purpose of this project, special-status plant species include all species listed or proposed for listing by the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW), any species listed as 1B through 4 on the California Rare Plant Ranking (CRPR), any species on the County list (Groups A, B, C, and D), and any species covered under the South County MSCP.

3.2.1 Floristic Surveys

Rare plant survey priority areas included unique features within the Preserve that have a high potential to support rare plant species. These features include the periphery of the oak woodland canopy and unique habitat features such as rock outcrops, clay lenses, and grassland openings between denser chaparral/scrub habitats. ICF botanists traversed the study area via meandering transects in an effort to identify the locations of any readily detectable special-status species. All plant species observed were noted, and plants that could not be identified in the field were identified later using taxonomic keys including Baldwin et al. (2012) (Appendix A). A discussion of sensitive-status plant species with potential to occur is presented as Appendix B. Nonnative invasive plant mapping was conducted on the Preserve. ICF botanists traversed the Preserve via meandering transects in an effort to detect any invasive plant species populations. Invasive plants incidentally

observed during other surveys were also recorded. Invasive plant species include those listed on the California Invasive Plant Council Invasive Plant Inventory (2013). Botanists mapped perennial highly invasive plant species, focusing on species that are both invasive and have potential to be controlled. Annual Mediterranean grasses are highly invasive but were not mapped, as these species cannot be practicably controlled on a large Preserve.

3.3 Wildlife

Surveys were conducted to document the wildlife species currently using the Preserve and to assess the potential occurrence of special-status wildlife species not detected during the surveys (Appendices C and D). The CNDDB was reviewed to create a list of wildlife with potential to occur on site (CDFW 2013; San Vicente Reservoir, San Pasqual, Ramona, El Cajon Mountain, Alpine, El Cajon, La Mesa, Poway, and Escondido quadrangles). Using a checklist of all species in the region with special status, species were added to the list of potentially occurring species based on professional knowledge and judgment, experience with prior projects in the area, review of previous studies conducted within the Preserve, ICF internal databases, and published and unpublished references. The potential for each of these species to occur on the Preserve or in the immediate vicinity was evaluated. In evaluating the potential for occurrence, a pool of references and resources was utilized for information on species distribution, habitat requirements, disturbance tolerance, threats and causes of declines, and other features of their conservation biology. Special-status wildlife species include all species listed or proposed for listing by the USFWS and CDFW, any species on the County list (Group I and II), and any species covered under the MSCP SAP.

3.3.1 Invertebrates

3.3.1.1 Butterflies

ICF biologists conducted a habitat assessment for the federally listed as endangered Quino checkerspot butterfly (*Euphydryas editha quino*; Quino) and general butterfly diversity surveys utilizing similar methods as outlined in the USFWS protocol for Quino surveys (USFWS 2002). Biologists used the field methods outlined in the protocol to increase the likelihood that Quino would be detected if it occurs within the Preserve. These methods are also effective for documenting springtime butterfly diversity.

Three surveys were conducted during suitable weather conditions for butterfly activity, within the flight season for Quino. The methods differed from the USFWS protocol on the number of surveys, which was limited to four, and also on the extent of the survey area, which was limited to habitat with the highest potential for detecting Quino, rather than 100% coverage of all non-excluded areas, with particular emphasis on areas that had openings in vegetation with flowering host plants.

ICF biologists conducted a habitat assessment for the Hermes copper butterfly (*Lycaena hermes*), a federal candidate species. Hermes copper butterflies use spiny redberry (*Rhamnus crocea*) as their larval host plant, and preferentially choose mature spiny redberry surrounded by nectaring resource California buckwheat (*Eriogonum fasciculatum*). No spiny redberry host plants were observed during habitat assessments so no flight season surveys were conducted. All butterfly species detected during the surveys were identified and counted. In addition, butterflies identified during other biological surveys are included in the wildlife species detected list in Appendix C.

3.3.1.2 Other Invertebrates

ICF biologists recorded a list of other invertebrate species observed during general surveys and recorded the family of species captured in the herpetological pitfall arrays. Observations are included in Appendix C.

3.3.2 Herpetofauna

ICF conducted surveys for herpetofauna (amphibians and reptiles) within the Preserve from April through July 2013. Terrestrial herpetological surveys were conducted using pitfall trap arrays as outlined in "Herpetological Monitoring Using a Pitfall Trapping Design in Southern California" (Stokes et al. 2001), with one variation. This design uses a standardized array of pitfall traps, funnel traps, and drift fencing to perform long-term research over a wide geographic area with replicates among site localities, habitats, and environments. The variation from the Stokes et al. design utilizes wire mesh box traps instead of some of the pitfall traps for capturing snakes.

The design recommended by Stokes et al. for sampling arrays utilizes a three-arm drift fence array with seven pitfall traps and three funnel traps. Our array design replaced the three pitfall traps at the ends of the arms with aboveground wire mesh box traps in order to increase the potential for catching snake species. Three feet of additional drift fencing were installed along the sides of the box traps and extended out towards the array from the corners of the box traps nearest the array. A flat wooden board was placed on top of the box trap to provide shade and encourage entry into the trap. With the exception of the use of box traps, this study's array design was consistent with that recommended by Stokes et al., and recommendations for array materials and trap construction were followed. As the site temperatures were not expected to be excessive during the trapping period, biologists constructed funnel traps with no pitfall trap retreat underneath, as described in the above-referenced protocol.

Array locations were selected based on access, vegetation community, soils, topography, and avoidance of known special-status resources (including cultural resources) (Table 1; Figure 9). Three sites were selected to construct arrays. The first array was on the northern side of the Preserve within Coast live oak woodland habitat with an understory of poison oak and nonnative grassland. The second array was installed within open chamise-Ramona lilac chaparral. The third array was on the southern side of the Preserve, within chamise-Ramona lilac chaparral.

All areas immediately surrounding the arrays were actively searched for herptiles during monitoring of each array. Additionally, active searches for herptiles were conducted during other wildlife surveys at the Preserve. Active searches included looking under rocks, shrubs, and logs and along the periphery of vegetated water features. All herptiles observed during active searches and other wildlife surveys were identified to species and recorded. Method of observation (arrays or active surveys) is presented for each species in the results section of this report.

Avian Point Count
Camera Station
Herpetological Array
Passive Anabat
Trapline
Active Anabat Survey Locations
Preserve Boundary

Source: Imagery-SanGIS, 2012.

0 1,000 2,000 Feet

N

A1 1
1
A2
N
B 4 2
3
C
4
D 3
5
E
2
F S
6
G
1
7
3

MUSSEY GRADE RD
MAHOGANY RANCH RD
IRON MTN TT

1" = 800'

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Figure 9
Biological Inventory Locations
Boulder Oaks Preserve

Table 1. Array Description

Array Number	Physical Description	Vegetation Community
1	Relatively flat land within coast live oak woodland with an understory of nonnative grassland, surrounded by hills vegetated with chamise-Ramona lilac chaparral.	Coast Live Oak–Poison Oak–Grass Association.
2	Open flat area of grasses and small shrubs adjacent to low sloping hills of chamise-Ramona lilac chaparral.	Chamise–Ramona Lilac Association.
3	Flat land within the edge of chamise-Ramona lilac chaparral, surrounded by sloping hills vegetated by chamise-Ramona lilac chaparral.	Chamise–Ramona Lilac Association.

3.3.2.1 Monitoring Arrays

Herpetofauna pitfall array traps were sampled on four consecutive days once a month beginning in April and continuing through July (Table 2). Typically, the traps were opened on a Monday afternoon, sampled Tuesday through Friday, and closed Friday. During the month of May, summer rain events caused the traps to remain closed an additional day from the planned schedule. During this month, the traps were opened on a Tuesday afternoon, sampled Wednesday through Saturday, and closed Saturday.

Array traps were checked during morning hours to ensure that animals were released before daytime temperatures reached levels that could result in mortality. All animals were identified to species and immediately released at the point of capture. Biologists did not handle animals other than to photograph and release them from traps. Because the trapping effort's purpose is to generate an inventory of species present within the Preserve and not to assess population sizes or dynamics, individuals were not marked, weighed, or otherwise measured. Data recorded included species and trap number.

Table 2. Dates and Personnel for the Pitfall Sampling on the Preserve in 2013

Date	Name of Biologists
April 9 through 12, 2013	D. Allen, C. Dunn, C. Rustin
May 14 through 18, 2013	W. Kohn, C. Rustin
June 4 through 7, 2013	C. Dunn, K. Fischer, W. Kohn, L. Willrick
July 16 through 19, 2013	D. Allen, W. Kohn

3.3.3 Birds

3.3.3.1 Diurnal Point Counts

Avian use of the Preserve was documented through the use of seven avian point count stations (stations) sampled once a month for four (4) months beginning in March and concluding in June (Table 3; Figure 9). Point counts provide a repeatable, quantitative sampling method for a broad spectrum of birds and were complementary to the general reconnaissance effort, strengthening the reference information developed on relative abundance of birds.

Table 3. Dates and Personnel for the Point Counts on the Preserve in 2013

Date	Name of Biologist
March 13, 2013	K. Fischer*, Erika Eidson
April 5, 2013	K. Fischer*, Lindsay Willrick
May 3, 2013	K. Fischer*, Dale Ritenour
June 7, 2013	K. Fischer*, Marisa Flores

*Lead biologist for the sampling effort

Point count methods followed recommendations provided in Ralph et al. (1995) for extensive (i.e., station-independent) surveys. See that source for detailed discussion of the basis for, and further details on, the methods presented here. A summary of methods, including additions beyond the recommendations, is provided below.

Stations were placed systematically to maximize sampling of the Preserve and to minimize coverage of outside areas. No particular features (e.g., plant community, slope, or aspect) were selected for or avoided, primarily due to the broad objectives of the study. Stations were generally located at or near existing roads to facilitate access. Prior to the first counts, all stations were mapped in the field, located using a global positioning system (GPS), marked for later identification, and photographed. The view from each point was photographed in the four cardinal compass directions.

Counts were conducted at each station once a month (April through July). The following recommendations, drawn directly from Ralph et al. (1995), were followed:

- Stations were located at least 250 meters (820 ft) apart to ensure independence (i.e., no or minimal overlapping of individual birds detected).
- Counts were conducted at each station for 10 minutes (stratified into periods of 3, 2, and 5 minutes) and started quickly upon reaching the point.
- All detected birds were counted except for any judged to have been counted at a previous station.
- Both seen and heard individuals were recorded as long as clearly identified.
- Birds were recorded within each time stratum as: (1) within a 50 meter (164 ft) radius from the station; (2) outside the 50 meter (164 ft) radius; or (3) flying over. This allows for rudimentary density estimates (without weighting for detectability).

- Individuals were counted at the location where first detected and at time of first detection, even when not identified, until they had moved or a new time period had begun.
- Adverse weather was avoided (e.g., dense fog, strong winds, extended rain).
- Stations were counted in the same order each time, starting at approximately the same time relative to sunrise, and finishing within 4 hours after sunrise. Note that counting stations in the same order each time is recommended as the preferred method where the primary purpose of the data is for comparison with future data sets at the same study area. For the current work, this is judged to be a higher priority than maximizing comparability with point counts investigating regional issues, which are best counted by randomizing the order of stations within sites and the order of sites within a day.

Additional point count methods not specified in Ralph et al. (1995) include:

- No attempts were made to attract birds, such as through use of taped vocalizations or "pishing" (imitating avian scold or alarm calls).
- Prior to the initial point counts, the observer practiced distance estimations by locating an object roughly 40 to 60 meters (131 to 197 ft) away, assigning it as beyond or closer than 50 meters (164 ft). This was done several times on several different days, in different directions, and on varied terrain, but always in open shrublands similar to that in which the stations were located.
- Birds noted only in flight were additionally recorded as either utilizing the landscape (e.g., actively foraging swallows and raptors, raptors using thermal updrafts) or not (e.g., birds commuting between distant habitat patches off site, such as cormorants over an upland site, or birds migrating high overhead).
- Birds were only counted when they had clearly fledged and moved away from a nest. Thus young raptors, which often spend several transitional days immediately adjacent to the nest, were not counted until they had been detected in a part of the tree or cliff where they were not expected to have reached by walking or climbing.
- When a flock was only heard, the number definitely heard was recorded, but when a flock was seen and individuals were not able to be precisely counted, a best estimate was used. Note that with or without this method, point count census assumes that, at each station, an observer has a good opportunity to see and hear birds and that the stations are comparable in this regard.
- All individual birds were counted during data analysis unless they could not be identified beyond "unidentified bird." Entries at the highest level of identification (e.g., "hummingbird sp., sparrow sp.") were used during calculations of number of birds observed at a point count. This same level of identification was also used to confirm that all genus types were accounted for in the species list. These birds were not included in the calculations of number of species observed during a point count if the genus was already represented during this sampling period.
- "Fly-by" (also called "fly-over") birds generally were not included in data analysis for total numbers of individuals or species. This is standard practice for point count analysis (Ralph et al. 1995). The rationale is that these birds are not using or influencing the Preserve. However, if the birds were observed foraging or hunting while in flight over the Preserve, the observations were included in the calculations. These birds were using the Preserve in the same way that a bird foraging from a perch makes use of the Preserve.

3.3.3.2 Nocturnal Surveys

Monthly nocturnal bird surveys were conducted for four months for nighttime birds at the Preserve (Table 4). Methods included walking trails throughout the Preserve, looking and listening for birds. A moderately powerful headlamp was used to aid identifications. Electronic playback of owl calls was intermittently used in an attempt to elicit responses from birds.

Table 4. Dates and Personnel for the Nocturnal Bird Surveys on the Preserve in 2013

Date	Name of Biologists
March 14, 2013	D. Allen, D. Ritenour
April 11, 2013	D. Allen
May 2, 2013	D. Allen
June 6, 2013	D. Allen

3.3.4 Mammals

The goal of the mammal surveys was to document which species are currently present on the Preserve or utilizing the Preserve for passage through to other areas of the County. Mammal species were documented through general surveys, small mammal trapping, camera stations, and bat sampling. The goal of the small mammal trapping was to document the small mammal species using different habitats on the Preserve. The camera stations documented the medium to large mammal species using the Preserve. Bat sampling was used to document the use of the Preserve by bat species.

3.3.4.1 Small Mammal Trapping

For the purposes of this project, small mammals include species in the following families: shrew, mole, squirrel, pocket gopher, pocket mouse, and rat and mouse. For this trapping effort, the small mammal sample areas were selected using vegetation mapping and aerial photography. Sample areas were selected based on three criteria: (1) sampling of different vegetation communities; (2) geographic distribution across the Preserve; and (3) sampling of unique features (e.g., wash or ecotone).

Small mammal trapping on the Preserve consisted of four (4) nights of trapping. A total of seven (7) sample areas were set with traps (traps A through G). A total of 160 traps were used. This number was based on logistical factors, such as distance and terrain between sample areas and estimated time to process small mammals captured. In total, the preserve trapping program produced 640 trap nights (i.e., number of traps multiplied by the number of nights).

The number of traps per sample area ranged from 10 to 30 sequentially numbered 12-inch Sherman live traps. All seven (7) sample areas utilized a meandering "sign" (e.g., scat, burrows, dusting baths) set transect. Traps were generally spaced between 3 meters (9 ft) and 6 meters (18 ft) apart, and were positioned where small rodent sign was apparent. If no rodent sign was apparent, traps were placed near the base of shrubs. The locations of traps were recorded using a recreational-grade GPS receiver (Garmin brand, WAAS enabled).

Traps were initially set and baited in the late afternoon on Monday, July 15, 2013. Traps were opened and baited before dusk and closed during the dawn trap check. Traps were systematically checked around dawn between 4:30 a.m. and 9:00 a.m. Table 5 summarizes the personnel, dates, and conditions for the trapping program. Table 6 summarizes the conditions associated with each sample area, including configuration (i.e., grid vs. transect), spacing, number of traps, trap sequence, trap night total, physical description, and associated vegetation communities. The location of each sample area is depicted on Figure 9.

Table 5. Personnel, Date, Time, and Conditions of the Small Mammal Trapping at the Preserve in 2013

Personnel	Night Number	Date Checked	Times Checked	Conditions
Phil Richards Cindy Dunn	1	July 16, 2013	5:05 to 7:45 a.m.	Partly cloudy; 57°-61°F; wind calm; no moon visible
Phil Richards Cindy Dunn	2	July 17, 2013	5:05 to 7:55 a.m.	Partly cloudy; 55°-57°F; wind calm; no moon visible
Phil Richards Cindy Dunn	3	July 18, 2013	4:45 to 7:45 a.m.	Clear; 57°-60°F; wind calm; no moon visible
Phil Richards Cindy Dunn	4	July 19, 2013	4:30 to 8:24 a.m.	Clear; 57°-67°F; wind calm; no moon visible

When animals were captured, each animal was transferred from the trap into a cloth bag. The animals were removed by their napes and identified to species. The sex and reproductive condition of each animal was recorded (i.e., testes scrotal, not scrotal; vagina perforate, not perforate). Any mites, ticks, or other parasites were noted. Digital photos were taken of some specimens (Appendix E). Once the data were recorded onto data sheets, each animal was released where captured. This whole process took several minutes for each capture. The released animals were observed until they moved to the safety of a burrow or clump of vegetation.

Table 6. Trapline Description

Sample Area	Configuration/ Spacing	Number of Traps	Trap Sequence	Trap Nights	Physical Description	Vegetation Communities
A1	Transect/ 3–7 meters	20	31–50	80	Trapline extends along the side of a south-facing slope; soils mostly loam; trapline is among mature shrubs with an understory consisting of a mix of bare ground and nonnative grasses.	Chamise–Ramona Lilac Association.
A2	Transect/ 3–10 meters	10	51–60	40	Trapline within an open woodland; relatively flat; low sloping hillsides on north and west sides of the woodland; generally east- to south-facing; soils mostly loam; portions of trapline under oak canopy with nonnative grasses and poison oak understory and the rest among mature shrubs with an understory of nonnative grasses.	Coast Live Oak–Poison Oak–Grass Association.
B	Transect/ 10–15 meters	30	61–90	120	Trapline extends along an old overgrown road, heading westward through a canyon, up the base of a north-facing slope moving across a drainage, then onto a south-facing slope; moderately sloped; soils mostly sandy loam; mix of mature shrubs and bare ground.	Ramona lilac Association, Arroyo Willow Association, and Chamise–Ramona Lilac Association.
C	Transect/ 5–10 meters	10	151–160	40	Trapline within open vegetation relatively flat; low sloping hillsides on north and west sides of the trapline; soils mostly sandy loam; mix of mature shrubs and bare ground.	Chamise–Ramona Lilac Association.
D	Transect/ 10–15 meters	30	91–120	120	Trapline located along the edges of an established road extending westward along a north-facing slope; relatively steep sloped; soils mostly sandy loam mix; dense mix of mature shrubs with understory consisting of bare ground.	Chamise–Ramona Lilac Association, Ramona Lilac Association, and Eastwood Manzanita–Chamise Association.
E	Transect/ 2–20 meters	20	121–140	80	Trapline within open, active cattle pen; relatively flat; soils mostly loam; mix of nonnative grasslands and bare ground.	Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands.
F	Transect/ 10–15 meters	10	141–150	40	Trapline within open woodland, then into dense bulrush along an open water pond; relatively flat; soils mostly sandy loamy mix; mix of mature trees and bulrush with an understory of herbaceous vegetation, debris, and bare ground.	Coast Live Oak–Poison Oak–Grass Association and Bulrush Association.

Sample Area	Configuration/ Spacing	Number of Traps	Trap Sequence	Trap Nights	Physical Description	Vegetation Communities
G	Transect/ 4–10 meters	30	1–30	120	Trapline extends along the base of a north-facing slope; soils mostly loam; sloped to gently sloped; trapline is among mature shrubs with an understory consisting of a mix of bare ground and nonnative grasses.	Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands and Chamise–Ramona Lilac Association.

3.3.4.2 Medium to Large Mammals

For the purposes of this project, medium and large mammals include all mammals in the lagomorph, procyonid, mustelid, felid, canid, and cervid families.

Camera Tracking Survey

Remote camera stations were used to help document the presence of medium and large mammals within the Preserve. These stations allow for the detection of species that are rarely encountered because of their nocturnal or crepuscular activity patterns. Within the Preserve, four (4) camera tracking stations were set up at locations that represented various vegetation communities on the Preserve and that were judged to have a high potential for movement of medium and large mammals (e.g., along game trails, dry creek beds, and existing trails) (Figure 9).

Each camera station consisted of one Moultrie infrared digital game camera. The cameras were programmed to record a series of three (3) images (spaced 10 seconds apart) every time the motion sensor was triggered. After the motion sensor was triggered, there was a five (5) minute delay before the next series of photos could be taken. Each image included an information tag that recorded the date, time, temperature, camera ID, and moon phase. Once in place, the cameras were periodically checked and all recorded images were downloaded to a portable hard drive. Digital images were interpreted and all animals were identified to the species level.

Table 7. Camera Sampling Location Description

Camera Station Number	Physical Description	Vegetation Community
1	Adjacent to the southern drainage in chaparral.	Chamise-Ramona lilac Association
2	At the west end of the pond in the southern side of the Preserve.	Coast Live Oak –Poison oak – Grass -Association
3	On the road on the hill in the center-west of the site.	Chamise-Ramona lilac Association
4	Adjacent to the northern drainage in chaparral.	Chamise-Ramona lilac Association

Mammal Track and Sign Survey

Track and sign surveys were conducted throughout the Preserve concurrently with other surveys. Dusty road and trail shoulders were carefully examined for tracks and sign (scat, scrapings, etc.) of medium and large mammals throughout the survey season. Surveys were primarily conducted during the day; however, strong flashlights were used during nighttime bird surveys to watch for nocturnal mammals. Daytime surveys involved hiking accessible roads and periodic inspections of hilltops, ridges, drainages, and game trails.

3.3.4.3 Bats

Two (2) types of bat surveys (passive and active) were conducted in this study, which consisted of a combination of techniques including acoustic surveys, visual surveys, and roost surveys.

Passive Surveys

Passive surveys using Anabat II bat detectors (Titley Electronics, New South Wales, Australia) were conducted within the Preserve. Anabat II bat detectors (Anabats) were utilized to detect and record bat echolocation signals (O'Farrell et al. 1999). These calls were analyzed and identified to the species level by a biologist experienced with bat vocalization identification. Passive Anabats are designed to automatically turn on and off at set times (i.e., sunset and sunrise) and automatically record bat echolocation signals to a compact flash card. Bat echolocation calls are then downloaded from the compact flash card to a computer and analyzed in the laboratory using specialized software designed for the Anabat system called "Analook" (version 3.3q). All recorded bat echolocation calls were identified to species, and an index of relative bat activity was generated by taking the number of bat call files recorded divided by the number of Anabat nights (number of Anabats times number of recording nights) multiplied by a factor of 10 to reduce use of fractional numbers. Mr. Drew Stokes of the San Diego Natural History Museum analyzed the bat calls.

Passive Anabats were used to survey for bats in the Preserve during two (2) week-long monitoring sessions in April and June 2013. During these monitoring sessions, one (1) Anabat unit was placed in the northern sampling location to monitor bats for three (3) consecutive nights and then the unit was moved to the southern sampling location for three (3) consecutive nights.

Active Surveys

Active foraging bat surveys were conducted in the Preserve using an Anabat bat detector, listening for audible bat echolocation calls in an attempt to document additional bat species foraging in the Preserve. Active surveys occurred during the passive survey monitoring sessions and were focused primarily along the northern riparian corridor and the pond in the southern area of the Preserve.

Active bat surveys were also conducted concurrently with nocturnal avian surveys (Table 4). The surveyor listened for audible bat echolocation calls and watched for bats in flight during the walking survey.

Two monitoring sessions were conducted during the 2013 survey effort: once during spring migration (April) and once during late spring (June). During these monitoring sessions, a single Anabat unit was placed in the Preserve to monitor bats for three (3) consecutive nights. Two (2) locations were sampled (Table 8; Figure 9).

Table 8. Passive Bat Sampling Location Description

Location	Name	Physical Description	Survey Dates
North	Oak Woodland	This sampling location was placed in coast live oak woodland in the northern drainage. The microphone was placed at an approximate 30-degree angle aimed just above the riparian canopy. This sampling location was selected for its ability to detect bats foraging along above the riparian corridor.	April 26 to 29, June 3 to 6, 2013
South	Pond	The detector was located adjacent to the pond and the grassland in the southern side of the site. This sampling location was selected for its ability to provide good foraging and drinking opportunities for bats.	April 29 to May 2, June 6 to 9, 2013

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Chapter 4
Results and Discussion

4.1 Vegetation Communities/Habitats

Fourteen (14) plant alliances, associations, or ground cover types were recorded within the Preserve (Table 9; Figures 10a-f). These vegetation community types are described below and organized as they are in the classification key by functional group (i.e., scrub and chaparral, woodland, riparian woodland, herbaceous wetlands, and grasslands). The VCM does not include unvegetated habitat (e.g., disturbed habitat, urban/developed, and non-vegetated channel); therefore, unvegetated habitat is described using the Oberbauer-modified Holland classification system (Oberbauer et al. 2008; Holland 1986).

Until the VCM was finalized in 2011, South County MSCP preserve lands were generally mapped using the Holland classification system. To ensure consistency with previous mapping efforts, the Property map data layer was cross-walked to the Holland system pursuant to the VCM (AECOM et al. 2011; Table 9; Figures 11a-f).

Table 9. Vegetation Communities and Land Cover Types within the Preserve

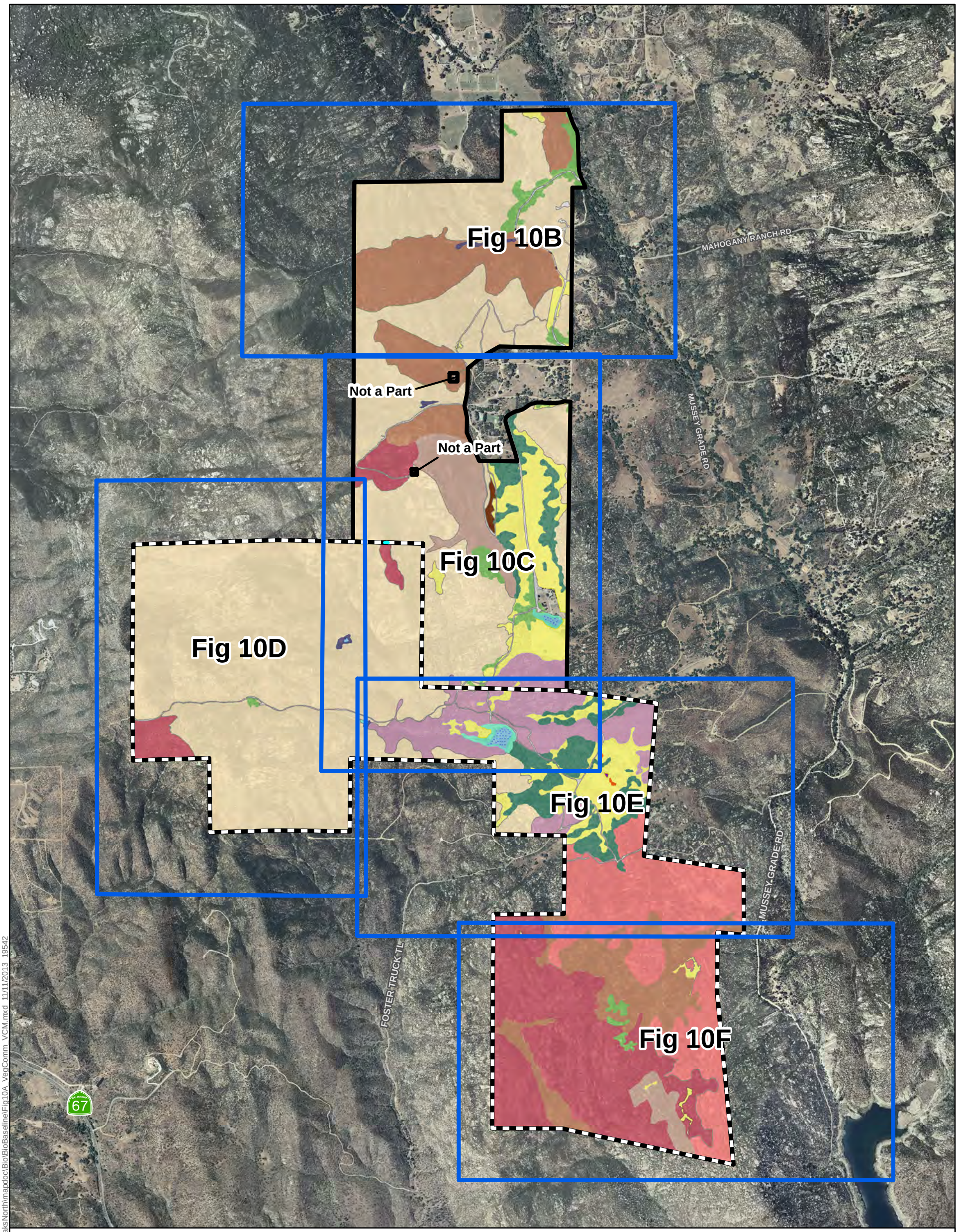
	Vegetation Community Type				
VCM Code	VCM Alliance/Association	VCM Common Name	Holland Code	Holland Classification	Acres
Scrub and Chaparral					
4.1.4	*Adenostoma fasciculatum – Ceanothus tomentosus* Association	Chamise – Ramona Lilac Association	37120	Southern Mixed Chaparral	390.45
4.4.1	*Arctostaphylos glandulosa – Adenostoma fasciculatum* Association	Manzanita – Chamise Association	37120	Southern Mixed Chaparral	16.93
4.8.1	*Artemisia californica – Salvia mellifera* Association	California Sagebrush – Black Sage Association	32500	Diegan Coastal Sage Scrub	2.26
4.16.1	*Ceanothus leucodermis* Association	Chaparral Whitethorn Association	37120	Southern Mixed Chaparral	48.15
4.18.1	*Ceanothus tomentosus* Association	Ramona lilac Association	37120	Southern Mixed Chaparral	132.98
4.38.1	*Quercus (berberidifolia, X acutidens) – Adenostoma fasciculatum* Association	Scrub Oak – Chamise Association	37900	Scrub Oak Chaparral	17.76
	Total Scrub and Chaparral				***608.54***

	Vegetation Community Type				
VCM Code	VCM Alliance/Association	VCM Common Name	Holland Code	Holland Classification	Acres
Woodland					
3.6.4	*Quercus agrifolia* – *Toxicodendron diversilobum* – Grass Association	Coast Live Oak – Poison Oak – Grass Association	71160	Coast Live Oak Woodland	13.08
3.7.2	*Quercus engelmannii* – *Quercus agrifolia* – *Toxicodendron diversilobum* – Grass Association	Engelmann Oak – Coast Live Oak – Poison Oak – Grass Association	71180	Engelmann Oak Woodland	21.68
	Total Woodland				***34.76***
Riparian Woodland					
3.10.1	*Salix lasiolepis* Association	Arroyo Willow Association	61310	Southern Arroyo Willow Riparian Forest	1.74
	Total Riparian Woodland				**1.74**
Herbaceous Wetland					
5.30.1	*Schoenoplectus americanus* Association	Bulrush association	52410	Coastal and Valley Freshwater Marsh	1.44
	Total Herbaceous Wetland				***1.44***
Grassland					
5.21	Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands	--	42200	Non-native grassland	71.79
	Total Grassland				***71.79***
Unvegetated[1]					
N/A	N/A	N/A	64100	Open Water	0.98
N/A	N/A	N/A	11300	Disturbed Habitat	11.48
N/A	N/A	N/A	12000	Urban/Developed	4.70
	Total Unvegetated				***17.16***
		TOTAL LAND COVER			**747.83**

[1] The Vegetation Classification Manual does not classify unvegetated habitats such as that found in the Oberbauer-modified Holland classification system: disturbed habitat, non-vegetated channel, and developed.

4.1.1.1 Chamise – Ramona Lilac Association (4.1.4)

Chamise – Ramona Lilac Association is a vegetation community dominated by two shrub species, chamise (*Adenostoma fasciculatum*) and Ramona lilac (*Ceanothus tomentosus*), with other co-dominant shrubs, such as laurel sumac (*Malosma laurina*), Manzanita (*Arctostaphylos* sp.), and sugar bush (*Rhus ovata*). This vegetation community is the dominant occurring community along most of the slopes of the Preserve.



Source: Vegetation-KBC, 2013; Imagery-SanGIS, 2013.

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Figure 10A
Vegetation Communities/Habitats (Vegetation Classification Manual)
Boulder Oaks Preserve

Mapped According to the Vegetation Classification Manual
Western San Diego County (SANDAG 2011)

- 3.6.4 Quercus agrifolia/Toxicodendron diversilobum/Grass Association
- 3.10.1 Salix lasiolepis Association
- 4.1.4 Adenostoma fasciculatum-Ceanothus tomentosus Association
- 4.18.1 Ceanothus tomentosus Association
- 5.21 Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands

Unvegetated Areas (Holland Classification)

- Disturbed Habitat (DH)
- Urban/Developed (DEV)

- Boulder Oaks North Preserve Boundary
- 100' Buffer of Preserve Boundaries

Source: Vegetation-KBC, 2013;
Imagery-SanGIS, 2012.

0 500 1,000 Feet

N

5.21
3.6.4
4.18.1
3.6.4
DH
3.6.4
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DEV
4.1.4
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4.1.4
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MAHOGANY RANCH RD

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Figure 10B
Vegetation Communities/Habitats (Vegetation Classification Manual)
Boulder Oaks Preserve

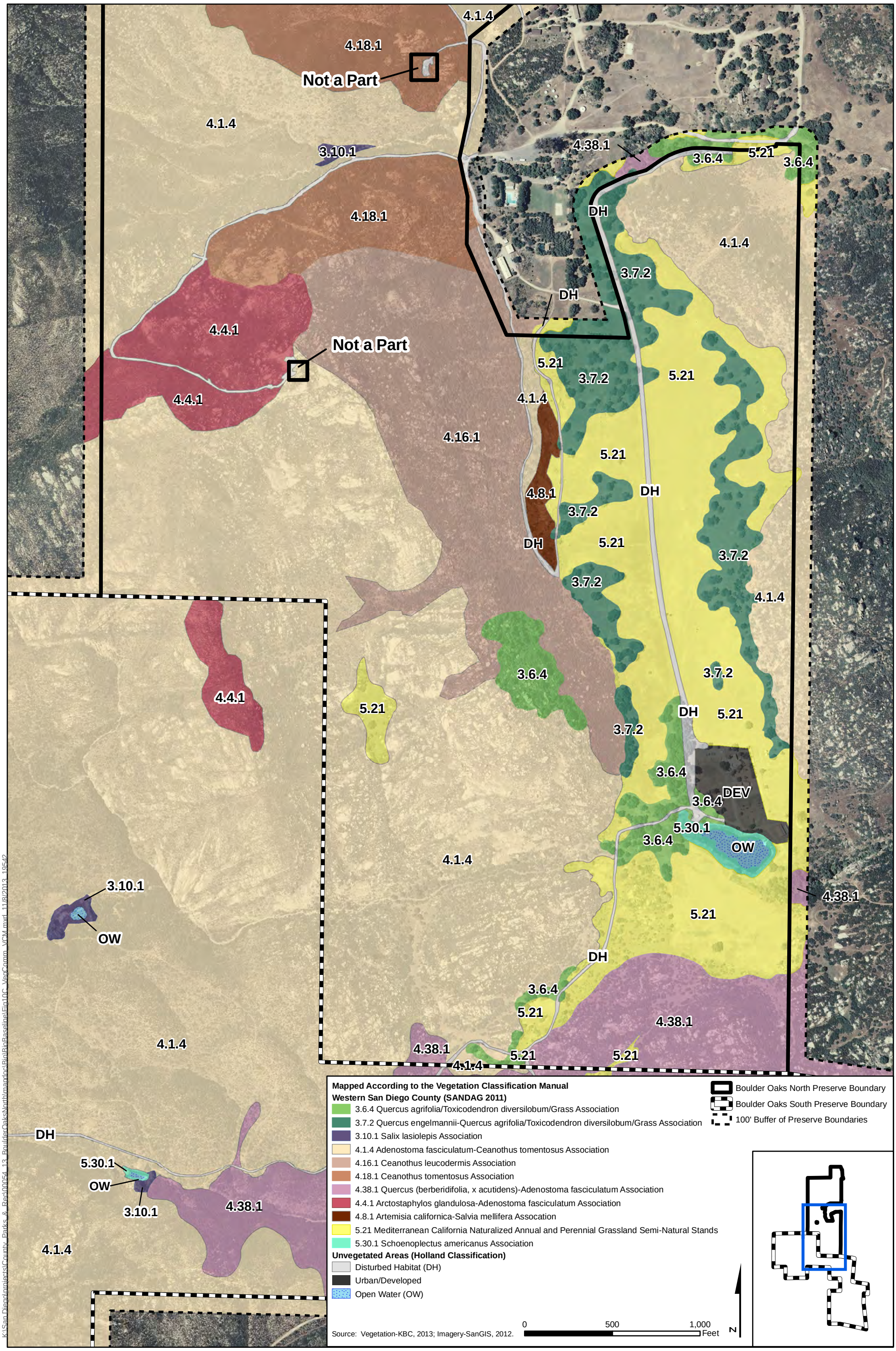

Figure 10C
Vegetation Communities (Vegetation Classification Manual)
Boulder Oaks Preserve

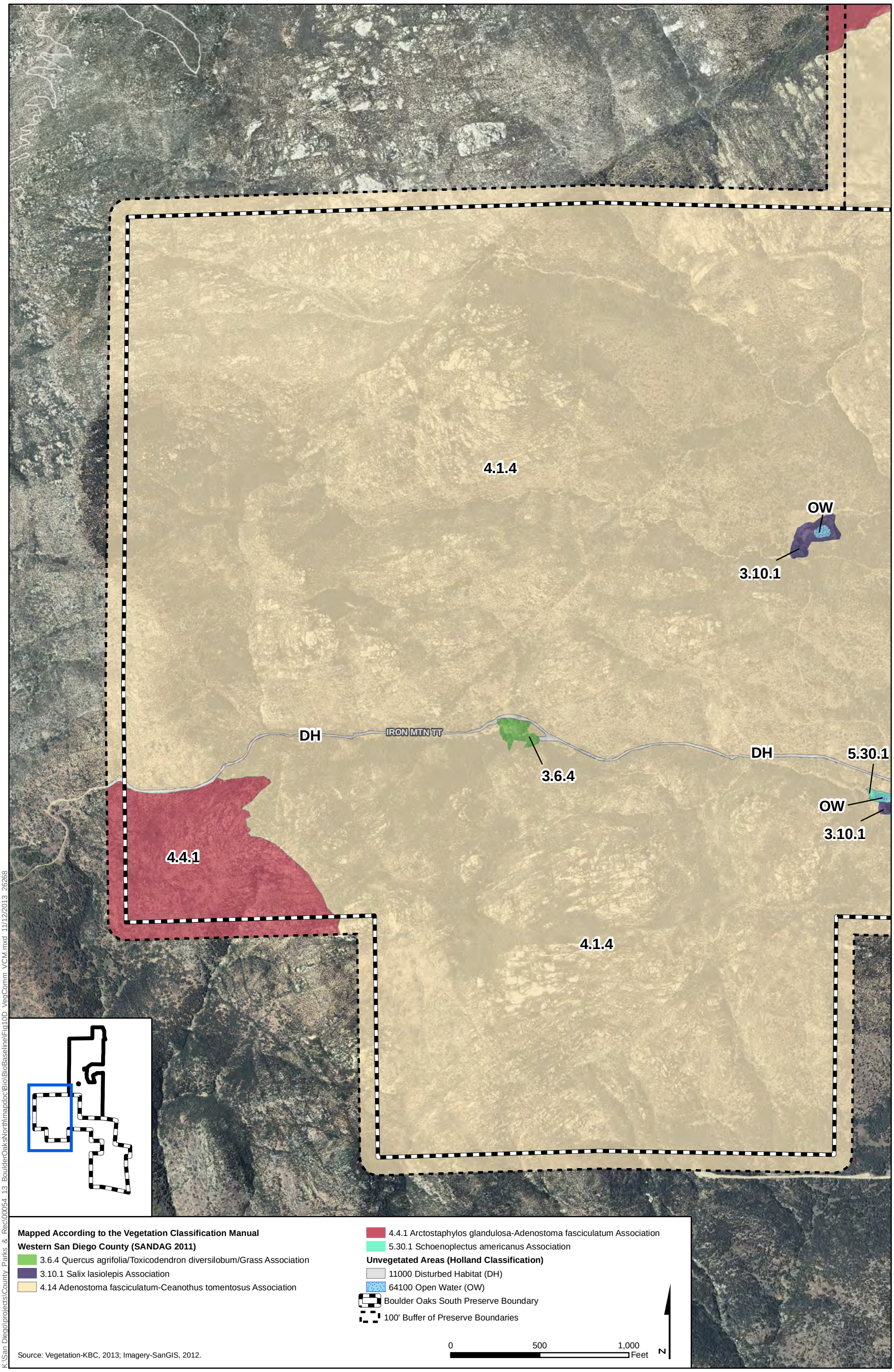

Figure 10D
Vegetation Communities (Vegetation Classification Manual)
Boulder Oaks Preserve

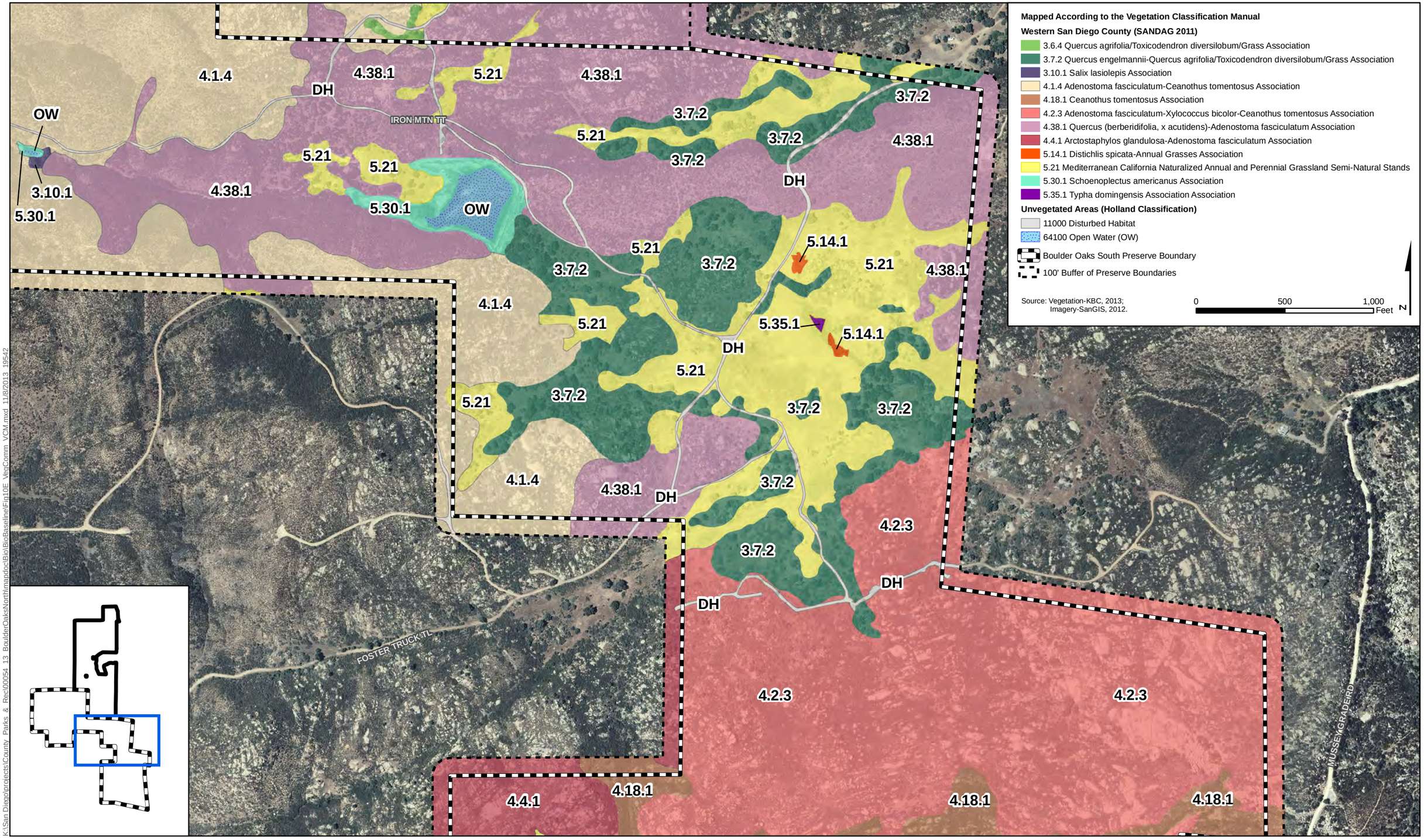

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Figure 10E
Vegetation Communities (Vegetation Classification Manual)
Boulder Oaks Preserve

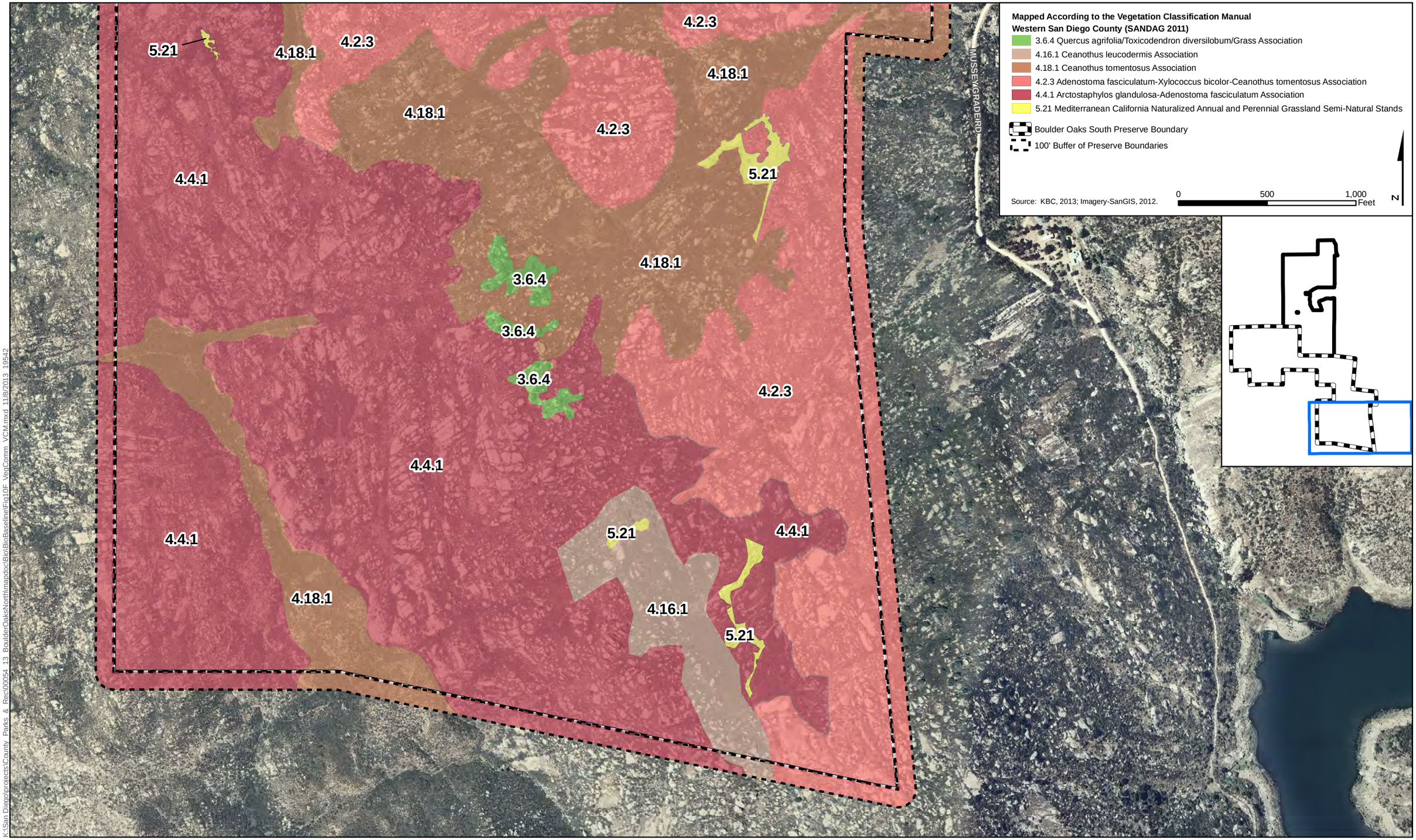

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Figure 10F
Vegetation Communities (Vegetation Classification Manual)
Boulder Oaks Preserve

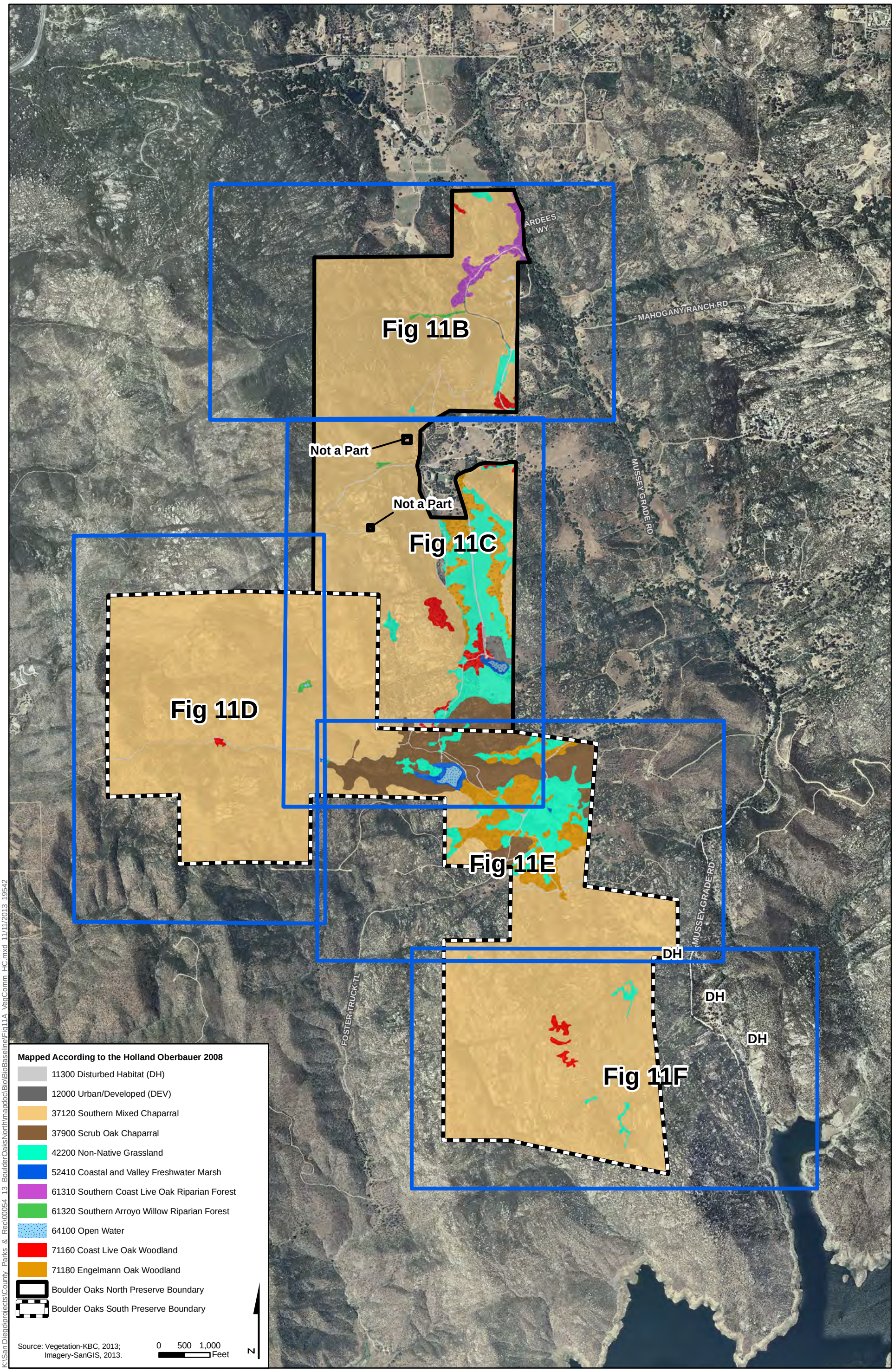

Figure 11A
Vegetation Communities/Habitats (Holland Code)
Boulder Oaks Preserve

Mapped According to the Holland Oberbauer 2008

- 11300 Disturbed Habitat (DH)
- 12000 Urban/Developed (DEV)
- 37120 Southern Mixed Chaparral
- 42200 Non-Native Grassland
- 61310 Southern Coast Live Oak Riparian Forest
- 61320 Southern Arroyo Willow Riparian Forest
- 71160 Coast Live Oak Woodland

100' Buffer of Preserve Boundaries

Boundary Oaks North Preserve Boundary

Source: Vegetation-KBC, 2013; Imagery-SanGIS, 2012.

0 500 1,000 Feet

N

42200
71160
61310
ARDEES WY
11300
61310
MUSSEY GRADE RD
11300
37120
61320
12000
MAHOGANY RANCH RD
11300
37120
42200
11300
11300
71160
11300
42200
42200

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Figure 11B
Vegetation Communities/Habitats (Holland Code)
Boulder Oaks Preserve

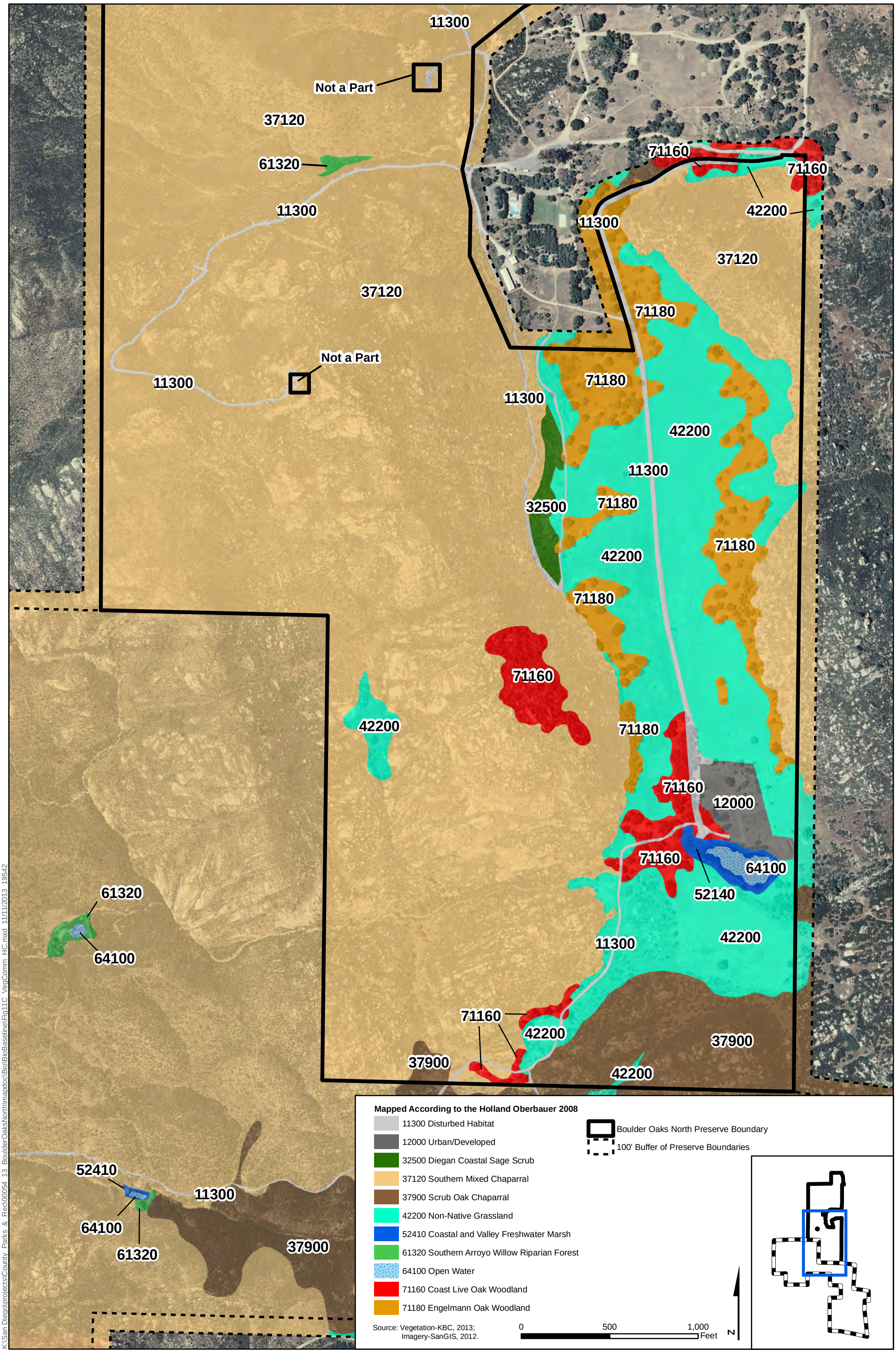

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Figure 11C
Vegetation Communities/Habitats (Holland Code)
Boulder Oaks Preserve

37120
64100
61320
11300
IRON MTN TT
71160
11300
64100
52410
61320
37120
37120

Mapped According to the Holland Oberbauer 2008
11300 Disturbed Habitat
37120 Southern Mixed Chaparral
37900 Scrub Oak Chaparral
52410 Coastal and Valley Freshwater Marsh
61320 Southern Arroyo Willow Riparian Forest
64100 Open Water
71160 Coast Live Oak Woodland

Boulder Oaks South Preserve Boundary
100' Buffer of Preserve Boundaries

0 500 1,000 Feet
N

Source: Vegetation-KBC, 2013; Imagery-SanGIS, 2012.

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ICF INTERNATIONAL

Figure 11D
Vegetation Communities/Habitats (Holland Code)
Boulder Oaks Preserve

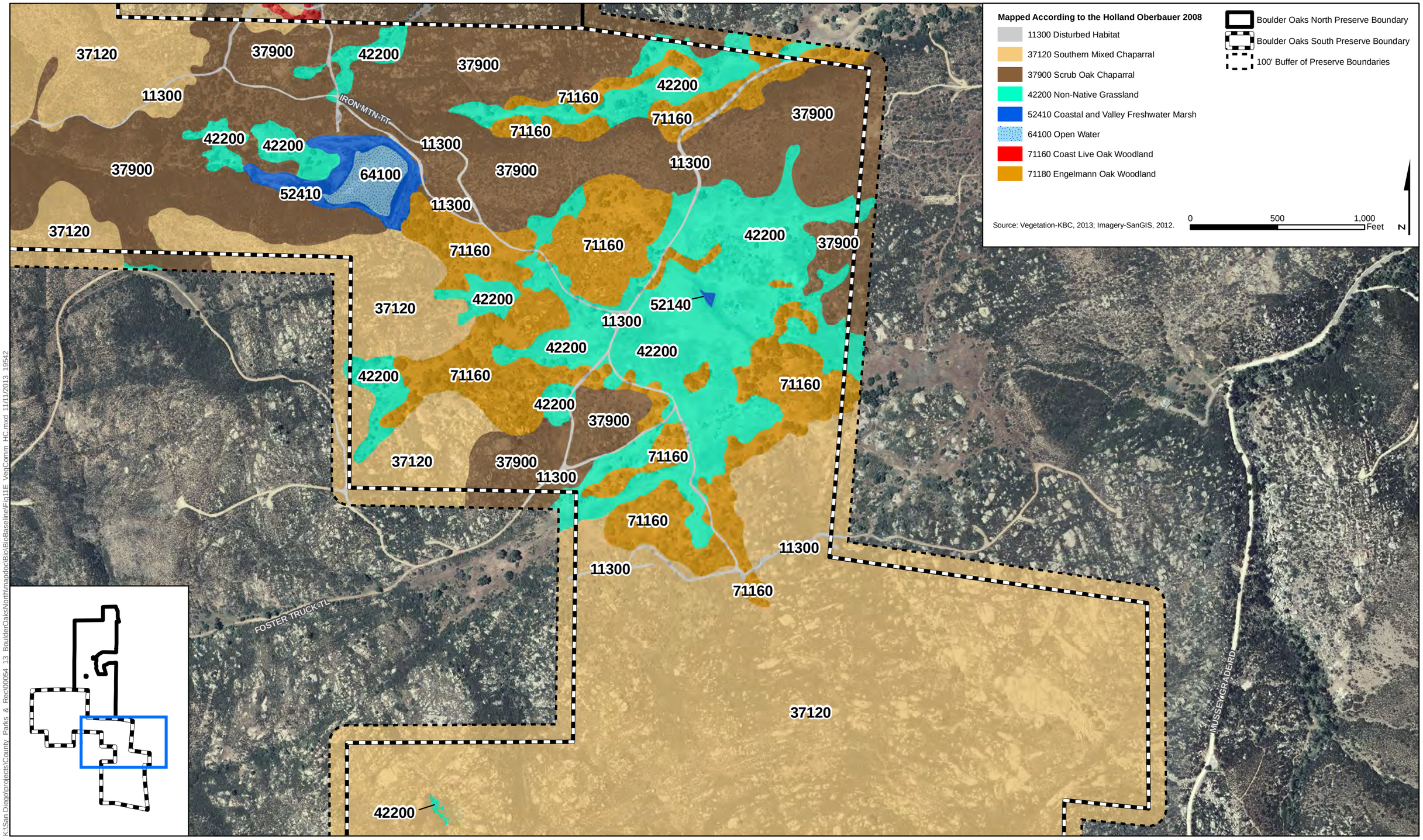

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Figure 11E
Vegetation Communities/Habitats (Holland Code)
Boulder Oaks Preserve

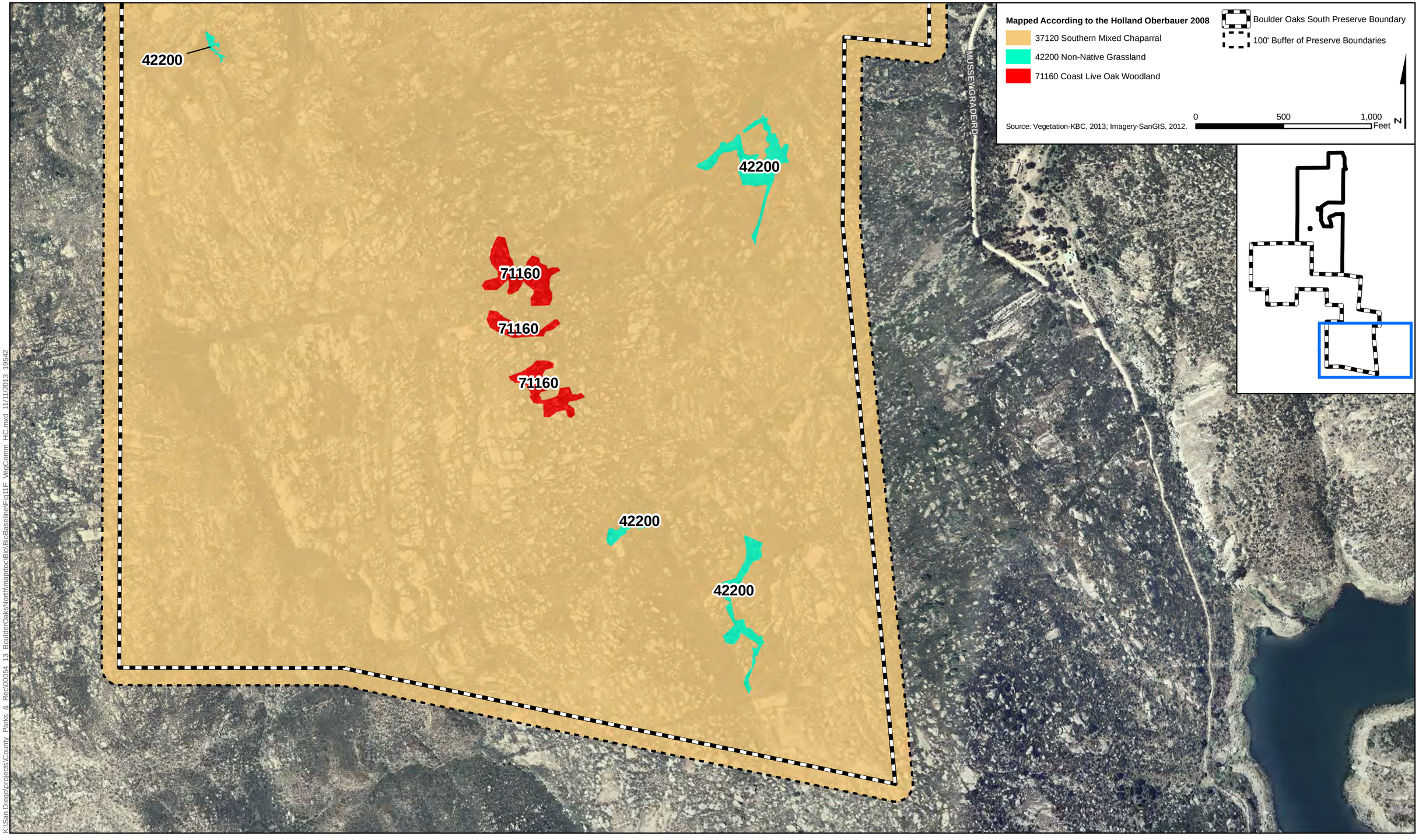

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Figure 11F
Vegetation Communities (Holland Code)
Boulder Oaks Preserve

4.1.1.2 Eastwood Manzanita – Chamise Association (4.4.1)

Eastwood Manzanita – Chamise Association is a vegetation community formed by co-dominant shrubs Eastwood Manzanita (*Arctostaphylos glandulosa*) and chamise with a continuous canopy. Other co-dominant species include scrub oak (*Quercus berberidifolia, Q. x acutidens*), Ramona lilac, chaparral whitethorn (*Ceanothus leucodermis*), mission manzanita (*Xylococcus bicolor*), toyon (*Heteromeles arbutifolia*), and sugar bush. The herb understory is often sparse, except after fires. Within the Preserve, it dominates north-facing slopes along the western side of the mountain in the central section of the site.

4.1.1.3 California Sagebrush – Black Sage Association (4.8.1)

California Sagebrush – Black Sage *Artemisia californica-Salvia mellifera* Association is a vegetation community in which two species, coastal sage and black sage, dominate in a relatively open canopy. Other co-dominant species include California buckwheat, bush monkey flower (*Mimulus aurantiacus*), and California Encelia (*Encelia californica*). Within the Preserve, this vegetation community occurs in a narrow strip just south of the LDS campground facility.

4.1.1.4 Chaparral Whitethorn Association (4.16.1)

Chaparral Whitethorn Association is a vegetation community dominated by one species, chaparral whitethorn, with low cover of other species, such as chamise (*Adenostoma fasciculatum*), mission Manzanita (*Xylococcus bicolor*), and white sage (*Salvia apiana*). Within the Preserve, this vegetation community occurs in one area southwest of the LDS campground.

4.1.1.5 Ramona Lilac Association (4.18.1)

Ramona Lilac Association is a vegetation community dominated by one species, Ramona lilac, with low cover of other species, such as San Diego mountain-mahogany (*Cercocarpus minutiflorus*), scrub oak, and toyon. Within the Preserve, this is the second-most common vegetation community, after the Adenostoma fasciculatum-Ceanothus tomentosus Association. This vegetation community occurs in areas of north-facing slopes throughout the northern half of the Preserve.

4.1.1.6 Scrub Oak – Chamise Association (4.38.1)

Scrub Oak – Chamise Association is a vegetation community comprising dense, evergreen perennial shrubs, dominated by scrub oak and chamise. There are few understory plants; typically, the understory consists of a substantial accumulation of leaf litter. Other species associated with this community include black sage, Ramona lilac, and San Diego mountain mahogany. This Association occurs on slopes at the far southern end of the Preserve.

4.1.1.7 Coast Live Oak –Poison Oak – Grass Association (3.6.4)

Coast Live Oak –Poison Oak – Grass Association is a vegetation community comprising a dense tree canopy dominated by coast live oak (*Quercus agrifolia*). The understory element of this community typically consists of a dense bramble of poison oak (*Toxicodendron diversilobum*) and various annual grasses. Within the Preserve, this habitat occurs along the road at the northern entrance to the preserve, at the northwest corner, a section to the northwest of the LDS camp ground facilities, and in areas at the southern end of the Preserve.

4.1.1.8 Engelmann Oak – Coast Live Oak –Poison Oak – Grass Association (3.7.2)

Engelmann Oak – Coast Live Oak –Poison Oak – Grass Association is a vegetation community dominated by Engelmann oak (*Quercus engelmannii*), with coast live oak co-dominating. The understory element of this community typically consists of a dense bramble of poison oak and various annual grasses. One the Preserve, this habitat is dominated by Engelmann oaks, with an understory of annual grasses. This community occurs at the margins of the grassland at the southern end of the Preserve and along the southeast margin of the LDS campground.

4.1.1.9 Arroyo Willow Association (3.10.1)

Arroyo Willow Association is a vegetation community comprised of arroyo willow (*Salix lasiolepis*) with co-dominant species such as red willow (*Salix laevigata*), black willow (*Salix gooddingii*), and mule-fat (*Baccharis salicifolia*). Within the Preserve, this vegetation community occurs along the northern and central drainages.

4.1.1.10 Bulrush Association (5.30.1)

Bulrush Association is a vegetation community dominated by one species of bulrush, Olney's bulrush (*Schoenoplectus americanus*), but it may have other bulrush species (*Schoenoplectus* and *Scirpus* sp.) and cattails (*Typha* sp.) occurring within the community. This community occurs at the southern end of the Preserve around the margin of the pond.

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

Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands is a vegetation community that occurs at the Group level, which is hierarchically above Association. This classification is used where there is no clear dominant nonnative species, but all are mixed together. Some species typically found in this Group are red brome (*Bromus madritensis*), red-stem filaree (*Erodium cicutarium*), and ripgut grass (*Bromus diandrus*). Within the Preserve, this vegetation community occurs along roads and spreads widely out in the valley to the south.

4.1.1.12 Open Water (64100)

Open water is an open source of water not under cover of any vegetation. This habitat occurs at the southern end of the Preserve and consists of the pond south of the Wildwood Ranch buildings.

4.1.1.13 Disturbed Habitat (11300)

Disturbed habitat within the Preserve consists of dirt roads and multi-use trails. These areas consist of mostly bare ground and occur throughout the Preserve.

4.1.1.14 Developed Lands (12000)

Developed land typically consists of existing paved roads, buildings, ornamental plantings, and other infrastructure. The only areas mapped as developed are the paved roads and the Wildwood Ranch buildings at the southern end of the Preserve.

4.2 Plants

The following section discusses special-status plant species observed within the Preserve. A special-status plant species is one listed by federal or state agencies as threatened or endangered; listed on CRPR list 1, 2, 3, or 4; or included on the County's Sensitive Plant list (Group A, B, C, or D Listed Plants).

A total of 247 plant species were recorded within the Preserve. Ten special-status plant species were detected on the Preserve in 2013, including Orcutt's brodiaea (*Brodiaea orcuttii*), Ramona horkelia (*Horkelia truncata*), Heart leaved pitcher sage (*Lepechinia cardiophylla*), Felt-leaved monardella (*Monardella hypoleuca* ssp*. lanata*), California adder's tongue (*Ophioglossum californicum*), Gander's ragwort (*Packera ganderi*), Golden-rayed pentacheata (*Pentachaeta aurea* ssp*. aurea*), Cooper's rein orchid (*Piperia cooperi*), Engelmann Oak, and Ashy Spike-moss (*Selaginella cinerascens*) (Figure 12).

4.2.1 Special-status Plant Species Observed

4.2.1.1 Orcutt's Brodiaea (*Brodiaea orcuttii*)

CRPR List 1B.1, San Diego County List A, South County MSCP Covered Species

Orcutt's brodiaea is a corm-based lily/onion relative with lavender flowers, generally occurring in vernally moist grasslands and the margins of vernal pools (Reiser 2001). Within the Preserve, two (2) individuals were observed: one (1) near herpetological pitfall array #2, several hundred feet west of the main road, and one (1) near the southeastern boundary of the Preserve.

4.2.1.2 Ramona Horkelia (*Horkelia truncata*)

CRPR List 1B.3, San Diego County List A

Ramona horkelia is a caudex-based perennial herb with white flowers, typically occurring with chamise dominated chaparral (Reiser 2001). Within the Preserve, this species is primarily located along and near trails in the western half of the study area, with a small population west of the pond at the southern end of the Preserve.

4.2.1.3 Heart-leaf Pitcher Sage (*Lepechinia cardiophylla*)

CRPR List 1B.2, San Diego County List A, South County MSCP Covered Species

Heart-leaf pitcher sage is a shrub with white- to lavender-tinged flowers, typically occurring in chaparral and cismontane woodland (Reiser 2001). One (1) population of three (3) individuals was observed along a dirt trail on the northern side of the mountain in the west-central area of the Preserve.

4.2.1.4 Felt-leaf Monardella (Monardella hypoleuca ssp. lanata)

CRPR List 1B.2, San Diego County List A, South County MSCP Covered Species

Felt-leaf monardella is a rhizome-based perennial herb in the mint family, with white flowers, typically occurring in the understory of chaparral (Reiser 2001). This species is distributed across the north-facing slopes of the mountain in the west-central area of the Preserve.

4.2.1.5 California Adder's Tongue (*Ophioglossum californicum*)

CRPR List 4.2, San Diego County List D

California adder's tongue is a spore-reproducing rhizome-based fern with sporophytes occurring on a spike. This species is closely associated with vernal pools, seeps, and vernally moist locales within open chaparral and grasslands (CNPS 2013). This species was found in openings in the west-central and southwestern areas of the Preserve.

4.2.1.6 Gander's Ragwort (*Packera ganderi*)

CRPR List 1B.2, San Diego County List A

Gander's ragwort is an annual herb with yellow flowers that typically grows in the understory of chaparral (Reiser 2001). Within the Preserve, two (2) individuals were observed along the dirt trail on the mountain in the west-central area of the Preserve.

4.2.1.7 Golden-rayed Pentachaeta (*Pentachaeta aurea* ssp. *aurea*)

CRPR List 4.2, San Diego County List D

Golden-rayed pentachaeta is an annual herb with yellow ray flowers and orange disk flowers that typically grows around grasslands and coastal sage scrub (Reiser 2001). Within the Preserve, one (1) population of roughly 150 individuals was observed on the hillside to the west of the pond.

4.2.1.8 Cooper's Rein Orchid (*Piperia cooperi*)

CRPR List 4.2, San Diego County List D

Cooper's rein orchid is a tuber-based perennial herb with greenish, semi-translucent flowers that typically grows in vernally moist areas of grasslands, chaparral, and montane woodland (Reiser 2001). Within the Preserve, three (3) individuals were observed along the trail west of the LDS campground parking area.

4.2.1.9 Engelmann Oak (Quercus engelmannii)

CRPR List 4.2, San Diego County List D

Engelmann oak is a tree that produces acorns from inconspicuous flowers. It is typically found growing in grasslands but it may also occur as a shrubby element within chaparral. This species is widely scattered throughout the Preserve and is not concentrated in one area.

Special-Status Plants

- Ashy spike-moss *(Selaginella cinerascens)*
- California adder's tongue *(Ophioglossum californicum)*
- Cooper's rein orchid *(Piperia cooperi)*
- Engelmann oak *(Quercus engellmannii)*
- Felt-leaf monardella *(Monardella hypoleuca ssp. lanata)*
- Gander's Ragwort *(Packera ganderi)*
- Golden-rayed pentacheata *(Pentacheata aurea ssp. aurea)*
- Heart-leaf pitcher sage *(Lepechinia cardiophylla)*
- Orcutt's brodiaea *(Brodiaea orcuttii)*
- Ramona horkelia *(Horkelia truncata)*
- Engelmann Oak
- Preserve Boundary

Source: Plants-ICF&KBC, 2013; Imagery-SanGIS, 2012.

0 500 1,000 2,000 Feet

N

MUSSEY GRADE RD

MAHOGANY

RANCH RD

IRON MTN TT

1 " = 800

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Figure 12
Special Status Plant Species
Boulder Oaks Preserve

4.2.1.10 Ashy Spike-moss (Selaginella cinerascens)

CRPR List 4.1, San Diego County List D

Ashy spike-moss is a creeping spike simple herb typically found in undisturbed chaparral and Diegan coastal sage scrub (Reiser 2001). This species is found on exposed rock outcrops and open soils in the southern half of the Preserve.

4.2.2 Special-status Plant Species with High Potential to Occur

4.2.2.1 Lakeside Ceanothus (*Ceanothus cyaneus*)

CRPR List 1B.2 San Diego County List A, MSCP Covered Species

Lakeside ceanothus is a shrub with purple to off-blue flowers that typically occurs in chaparral, often favoring dense stands of chamise chaparral. Populations of Lakeside ceanothus are found in the southern section of Boulder Oaks Preserve, but were outside of the study area for this inventory. Due to the presence of suitable habitat on site and the Preserve's proximity to extant populations, Lakeside ceanothus has a high potential to occur on site.

4.2.2.2 Delicate Clarkia (*Clarkia delicata*)

CRPR List 1B.2, San Diego County List A

Delicate clarkia is an annual herb with white to pink flowers that is typically found on the periphery of oak woodland habitats and within cismontane chaparral. Populations of delicate clarkia are known to occur immediately east of the Preserve along Mussey Creek. Due to the presence of suitable habitat on site and the Preserve's proximity to extant populations, delicate clarkia has a high potential to occur on site.

4.2.2.3 San Miguel Savory (*Clinopodium chandleri*)

CRPR List 1B.2, San Diego County List A, MSCP Covered Species

San Miguel savory is a shrub with white flowers, usually tinged purple, and typically occurs in chaparral. Populations of San Miguel savory are found in the understory of chaparral in the southern section of Boulder Oaks Preserve, but were outside of the study area for this inventory. Due to the presence of suitable habitat on site and the Preserve's proximity to extant populations, delicate clarkia has a high potential to occur on site.

4.2.2.4 Graceful Tarplant (*Holocarpha virgata* ssp. *elongata*)

CRPR List 4.2, San Diego County List D

Graceful tarplant is an annual herb that is typically found within annual and perennial grasslands but can occur within coastal sage scrub and chaparral (Reiser 2001; CNPS 2013). This species was found frequently in grasslands on the Ramona Grassland Preserve, approximately 3 miles from

Boulder Oaks Preserve. Due to the presence of suitable habitat on site and the Preserve's proximity to extant populations, graceful tarplant has a high potential to occur on site.

4.2.2.5 Robinson's pepper-grass (Lepidium virginicum var. robinsonii)

CRPR List 4.3, San Diego County List A

Robinson's pepper-grass is an annual herb that is typically found within dry exposed locales within openings in chaparral, sage scrub, or grassland communities (Reiser 2001; CNPS 2013). Due to the presence of suitable habitat on site and the Preserve's proximity to extant populations, Robinson's peppergrass has a high potential to occur on site.

4.2.2.6 Rush Chaparral-Star (Xanthisma [Machaeranthera] junceum)

CNPS List 4.3, San Diego County List D

Rush chaparral-star is a perennial herb associated with low-growing chamise chaparral and Diegan sage scrub communities (CNPS 2009). It prefers exposed locales with rocky substrates (Reiser 2001). It was observed in chaparral on the Ramona Grasslands Preserve. Due to the presence of suitable habitat on site and the Preserve's proximity to extant populations, rush chaparral-star has a high potential to occur on site.

4.2.3 Invasive Plant Species

The introduction of foreign invasive species into native habitats is becoming more common, and further expansion of human activities into areas away from urban and suburban centers will amplify this effect. Today, it is almost impossible to find any lowland areas in California that do not support a collection of plant species brought from elsewhere.

The general effect of invasive species is that they out-compete native species. This can occur directly through the taking up of space that was formerly occupied by native plants, but can also occur due to a variety of indirect, competitive effects of the presence of invasive species. Competition can be keen between invasive and native species for scarce water resources, soil nutrients, or even sunlight. Other species may use chemicals (i.e., allelopathy) to prevent germination of native plants. With a decrease in native plant diversity, there is an associated decrease in native animal diversity, particularly endemic invertebrates. Thus, it becomes important to control or eliminate nonnative invasive plant species from natural areas to maintain natural biodiversity and the support systems for native fauna.

Table 10 documents all nonnative plant species found during the surveys of the Preserve. During surveys of the Preserve, a total of 55 nonnative species were detected.

Based on their current extent (Figure 13), their highly invasive nature and the ability to reproduce quickly, their potential effects on the environment, and the ability for them to be practicably controlled, four species have been determined to be "target species," those for which a concerted effort should be made to monitor and control/eliminate them:

- Italian thistle (*Carduus pycnocephalus*)
- Veldt grass (*Ehrharta calycina*)

Preserve Boundary

Italian Thistle *(Carduus pycnocephalus)*

Pampas grass *(Cortaderia selloana)*

Salt Cedar *(Tamarix ramosissima)*

Fennel *(Foeniculum vulgare)*

Veldt Grass *(Ehrharta calycina)*

N

0 125250 500

Feet

Source: Plants-KBC, 2013;
Imagery-SanGIS, 2012.

MUSSEY GRADE RD

IRON MTN TT

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Figure 13
Invasive Plant Species
Boulder Oaks Preserve

- Fennel (*Foeniculum vulgare*)
- Salt cedar (*Tamarix ramosissima*)
- Pampas grass (*Cortaderia selloana*)

Italian thistle was observed scattered along roads and drainages at several locations on site, with an infestation totaling approximately1.18 acres (Figure 13). Fennel was observed along the southern drainage just west of the pond, totaling 0.001 acre. Veldt grass was mapped throughout the chaparral on the southwestern side of the Preserve, throughout an area of 33.9 acres onsite. Salt cedar was recorded as several scattered individuals in the northern and southern drainages, in an area of 0.013 acre. One pampas grass individual was observed on the southwestern side of the site, covering an area of less than 0.001 acre.

These target species are discussed further in Chapter 5. It should be noted that Table 10 details the presence of one additional Cal-IPC high-rated invasive plant (red brome), but this species is not targeted for removal/control because it is naturalized and unlikely to be controlled.

Table 10. Nonnative Invasive Plant Species Known to Occur in the Preserve

Scientific Name	Common Name	Cal-IPC Rating
Aira caryophyllea	Silver hair grass	N/A
Anagallis arvensis	Scarlet pimpernel	N/A
Anthemis cotula	Mayweed	N/A
Apium graveolens	Celery	N/A
Avena barbata	Slender wild oat	Moderate
Brassica nigra	Black mustard	Moderate
Briza maxima	Rattlesnake grass	Limited
Briza minor	Annual quaking grass	N/A
Bromus diandrus	Ripgut grass	Moderate
Bromus hordeaceus	Soft chess	Limited
Bromus madritensis ssp. *rubens*	Red brome	High
Carduus pycnocephalus	Italian thistle	Moderate
Centaurea melitensis	Tocalote	Moderate
Cerastium glomeratum	Sticky mouse-ear chickweed	N/A
Cortaderia jubata	Purple pampas grass	High
Cotula australis	Australian cotula	N/A
Cynodon dactylon	Bermuda grass	Moderate
Ehrharta calycina	Veldt grass	High
Erodium botrys	Long-beak stork's bill	N/A
Erodium cicutarium	Redstem filaree	Limited
Eucalyptus polyanthemos	Silver dollar gum	N/A
Eucalyptus globulus	Tasmanian blue-gum	Moderate
Festuca myuros	Rat-tail sixweeks grass	Moderate
Festuca perennis	Ryegrass	Moderate
Foeniculum vulgare	Fennel	High
Hedypnois cretica	Crete weed	N/A

Scientific Name	Common Name	Cal-IPC Rating
Helminthotheca echioides	Bristly ox-tongue	Limited
Hirschfeldia incana	Shortpod mustard	Moderate
Hordeum murinum	Smooth barley	Moderate
Hypochaeris glabra	Smooth cat's ear	Limited
Lactuca serriola	Prickly lettuce	N/A
Logfia gallica	Daggerleaf cottonrose	N/A
Lythrum hyssopifolia	Grass poly	Moderate
Malva parviflora	Cheeseweed	N/A
Marrubium vulgare	Horehound	Limited
Medicago polymorpha	California burclover	Limited
Nasturtium officinale	Water cress	N/A
Oleo europaea	Olive	Limited
Pennisetum setaceum	Crimson fountain grass	Moderate
Phoenix canariensis	Canary Island palm	Limited
Poa annua	Annual blue grass	N/A
Polypogon monspeliensis	Annual beard grass	Limited
Raphanus sativus	Radish	Limited
Reseda luteola	Dryer's rocket	N/A
Rumex crispus	Curly dock	Limited
Schismus barbatus	Common Mediterranean grass	Limited
Senecio vulgaris	Common groundsel	N/A
Silene gallica	Small-flower catchfly	N/A
Sonchus asper	Prickly sow thistle	N/A
Sonchus oleraceus	Common sow thistle	N/A
Stellaria media	Common chickweed	N/A
Tamarix ramosissima	Salt cedar (Tamarisk)	High
Vicia benghalensis	Purple vetch	N/A
Vicia villosa	Hairy vetch	N/A
Vinca major	Greater periwinkle	Moderate
Washingtonia robusta	Mexican fan palm	Moderate

4.3 Wildlife

In total, 150 wildlife species were detected during focused surveys, general surveys, pitfall trapping, avian point counts, camera sampling, and bat surveys. Twenty (20) of these species are considered special-status species by either the federal, state, or local governments.

4.3.1 Invertebrates

Twenty-nine (29) species of invertebrates including beetles, butterflies, skippers, and moths were identified during the 2013 surveys of the Preserve (Appendix C). Species were observed during focused butterfly diversity surveys, herpetological pitfall trapping, and other active surveys.

4.3.1.1 Butterflies

In total, sixteen (16) butterfly species were observed in 2013 on the Preserve (Table 11). None of these species are considered special-status species by either the federal, state, or local governments.

Quino was not observed on the Preserve during non-protocol surveys during the 2013 Quino flight season and is unlikely to occur on the Preserve. The Preserve contains isolated patches of potential Quino larval habitat; these patches contain Quino host plants dot-seed plantain *(Plantago erecta*) and/or purple owl's clover (*Castilleja exserta*), have other nectar plants, have some open ground or rocks for basking, and have nearby shrubs for shelter. Most of these patches were observed on south-facing slopes on the hills in the west-central and southwestern areas of the Preserve. These patches are isolated from other potential habitat by large expanses of chamise-Ramona lilac chaparral. These patches exist primarily on the southwest side of the Preserve and are isolated from any extant dirt roads or trails. Quino host plants were not observed outside of these isolated patches.

Although the Preserve does contain suitable habitat for Quino and there is a low potential for Quino to occur on site due to the presence of Quino's primary host plant, dwarf plantain (*Plantago erecta*), the Preserve is not expected to have high potential to support this species, as this site is isolated from other suitable habitat, no recent sightings have occurred in the vicinity despite focused surveys, and no Quino populations are known from anywhere in the local region. The closest recent sighting of Quino is approximately 6 miles southwest of the Preserve, south of Sycamore Canyon and Goodan Ranch Preserve (CDFW 2013) and this area did not support a continuing population of Quino.

Table 11. Butterfly Species Observed during 2013 Surveys

Scientific Name	Common Name	Survey Detection Type
Papilio rutulus	Western tiger swallowtail	Focused Survey
Papilio eurymedon	Pale swallowtail	Focused Survey
Pontia protodice	Checkered (common) white	Focused Survey
Anthocharis sara	Pacific orangetip	Focused Survey
Phoebis sp.	Sulfur	Focused Survey
Zerene eurydice	California dogface	Focused Survey
Callophrys affinis	Western green hairstreak	Focused Survey
Callophrys augustinus	Brown elfin	Focused Survey
Glaucopsyche lygdamus	Silvery blue	Focused Survey
Icaricia acmon	Acmon blue	Focused Survey
Vanessa atalanta	Red admiral	Focused Survey
Vanessa cardui	Painted lady	Focused Survey
Vanessa annabella	West coast lady	Focused Survey
Coenonympha tullia	Common ringlet	Focused Survey
Erynnis sp.	Duskywing	Focused Survey
Erynnis funeralis	Funereal duskywing	Focused Survey

4.3.1.2 Other Invertebrates

Thirteen (13) other invertebrate species were detected during the herpetological array sampling and/or observed during other fieldwork (Appendix C). These species were identified in the field or photographed to allow for identification by an entomologist; no invertebrate species were collected.

4.3.2 Herpetofauna

In total, four (4) amphibian species and 13 reptile species were captured in the sampling arrays and/or observed during active surveys (Appendix C). Four (4) of the 17 herptile species observed are considered special-status species by federal, state, or local agencies. These species' occurrences on the Preserve are discussed in more detail in Section 4.3.5.

4.3.2.1 Amphibians

During the 2013 sampling at the Preserve, four (4) amphibian species were observed (Table 12, Appendix C). No amphibians were captured in the sampling arrays. There is no potential for special-status amphibian species to occur on the Preserve.

Table 12. Amphibian Species Observed or Captured during 2013 Surveys

Scientific Name	Common Name	Survey Type
Anaxyrus boreas	Western toad	Active survey
Pseudacris cadaverina	California tree frog	Active survey
Pseudacris hypochondriaca	Baja California tree frog	Active survey
* *Lithobates catesbeiana*	Bullfrog	Active survey

Legend:
*=nonnative species

The most common native species identified was Baja California treefrog (*Pseudacris hypochondriaca*). Baja California treefrog adults and juveniles were detected throughout the river. Western toads (*Anaxyrus boreas*) were observed walking on the dirt roads near the pond at night in March 2013. One (1) common nonnative species, bullfrog (*Lithobates catesbeiana*), was also observed. Both adult and juvenile bullfrogs were detected throughout the drainages and within the freshwater pond on site. This species was abundant in high numbers and is a threat to native wildlife in the immediate vicinity.

4.3.2.2 Reptiles

During the 2013 sampling at the Preserve, 13 reptile species were observed (Table 13, Appendix C). One (1) species was captured only in the sampling arrays, while the remaining twelve (12) were captured in a sampling array and observed during active surveys. Eight (8) lizard species and five (5) snake species were detected, with four (4) species having special status. Special-status species observed consist of coast [San Diego] horned lizard (*Phrynosoma blainvillii*), coastal [western] whiptail (*Aspidoscelis tigris stejnegeri*), Coronado skink (*Plestiodon skiltonianus interparietalis*), and red diamond rattlesnake (*Crotalus ruber*). These species' occurrences on the Preserve are discussed in more detail in Section 4.3.5 and depicted on Figure 14.

Reptiles

- Coast horned lizard *(Phrynosoma blainvillii)*
- Coronado skink *(Plestiodon skiltonianus interparietalis)*
- Coastal western whiptail *(Aspidoscelis tigris stejnegeri)*
- Red diamond rattlesnake *(Crotalus ruber)*

Birds

- Great blue heron *(Ardea herodias*
- Turkey vulture *(Cathartes aura)*
- White-tailed kite *(Elanus leucurus)*
- Cooper's hawk *(Accipiter cooperi)*
- Red-shouldered hawk *(Buteo lineatus)*
- Barn owl *(Tyto alba)*
- Western bluebird *(Sialia mexicana)*
- Southern California rufous-crowned sparrow *(Aimophila ruficeps canescens)*

Mammals

- Small-footed myotis *(Myotis ciliolabrum)*
- Yuma myotis *(Myotis yumanensis)*
- Pocketed free-tailed bat *(Nyctinomops femorosaccus)*
- Western mastiff bat *(Eumops peratis)*
- San Diego desert woodrat *(Neotoma lepida intermedia)*
- Dulzura pocket mouse *(Chaetodipus californicus femoralis)*
- Southern mule deer *(Odocoileus hemionus fuliginata)*
- Mountain lion *(Puma concolor)*

Nests

- Red-tailed hawk *(Buteo jamaicensis)*
- Preserve Boundary

Source: Imagery-SanGIS, 2012.

0 500 1,000 2,000 Feet

N

MUSSEY GRADE RD

MAHOGANY RANCH

IRON MTN TT

1 " = 800

K:\San Diego\projects\County Parks & Rec\00054 13 BoulderOaksNorth\mapdoc\Bio\BioBaseline\Fig14 SSWildlife.mxd 11/11/2013 19542

Figure 14
Special Status Wildlife Species
Boulder Oaks Preserve

Based on the presence of potentially suitable habitat, two (2) additional reptile species have high potential to occur on the Preserve. As discussed in Section 4.3.6, special-status species with potential consist of orange-throated whiptail (*Aspidoscelis hyperythra beldingi*) and coastal rosy boa (*Charina trivirgata roseofusca*).

Table 13. Reptile Species Observed or Captured during 2013 Surveys

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status	Survey Type
Elgaria multicarinata	Southern alligator lizard			ARY # 1, 3; AS
Phrynosoma blainvillii	Coast horned lizard	CSC	SDC Group II, MSCP	ARY # 3; AS
Sceloporus occidentalis	Western fence lizard			ARY # 1, 3; AS
Sceloporus orcutti	Granite spiny lizard			ARY # 2, 3; AS
Uta stansburiana	Side-blotched lizard			ARY # 1, 2, 3; AS
Plestiodon gilberti rubricaudatus	Western red-tailed (Gilbert's) skink			ARY # 1, 2, 3; AS
Plestiodon skiltonianus interparietalis	Coronado skink	CSC	SDC Group II	ARY # 1, 3; AS
Aspidoscelis tigris stejnegeri	Coastal whiptail		SDC Group II	ARY # 2, 3; AS
Lampropeltis getula	Common kingsnake			ARY # 2
Coluber lateralis lateralis	California whipsnake			ARY # 1, 2, 3; AS
Pituophis catenifer	Gopher snake			ARY # 3; AS
Crotalus helleri	Southern Pacific rattlesnake			ARY # 1, 2; AS
Crotalus ruber	Red diamond rattlesnake	CSC	SDC Group II	ARY # 3; AS

Legend:

Special Status: CSC= California Species of Special Concern, SDC= County of San Diego Sensitive Animal, MSCP= Multiple Species Conservation Program Covered Species

Survey Type: AS= Active Survey, ARY= Sampling Array

4.3.3 Birds

Avian species richness (total species detected) was found to be moderate to high at the Preserve. In total, 75 bird species were detected, with 59 bird species detected during the point counts and 16 detected during other fieldwork (Table 14). These included year-round residents, breeding species that migrate to the Neotropics, and some species that are strictly migratory through the Preserve.

The Preserve's avifauna is a mixture of species that are associated with the habitat types found on site. These species include mallard (*Anas platyrhynchos*), ruddy duck (*Oxyura jamaicensis*), California quail (*Callipepla californica*), Cooper's hawk (*Accipiter cooperii*), red-tailed hawk (*Buteo*

jamaicensis), barn owl (*Tyto alba*), Anna's hummingbird (*Calypte anna*), Costa's hummingbird (*Calypte costae*), acorn woodpecker (*Melanerpes formicivorus*), Nuttall's woodpecker (*Picoides nuttallii*), pacific-slope flycatcher (*Empidonax difficilis*), ash-throated flycatcher (*Myiarchus cinerascens*), Cassin's kingbird (*Tyrannus vociferans*), western kingbird (*Tyrannus verticalis*), violet-green swallow (*Tachycineta thalassina*), bushtit (*Psaltriparus minimus*), white-breasted nuthatch (*Sitta carolinensis*), Bewick's wren (*Thryomanes bewickii*), house wren (*Troglodytes aedon*), blue-gray gnatcatcher (*Polioptila caerulea*), wrentit (*Chamaea* fasciata), western bluebird (*Sialia mexicana*), phainopepla (*Phainopepla nitens*), orange-crowned warbler (*Vermivora celata*), spotted towhee (*Pipilo maculates*), Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), California towhee (*Melozone crissalis*), song sparrow (*Melospiza melodia*), black-headed grosbeak (*Pheucticus melanocephalus*), red-winged blackbird (*Agelaius phoeniceus*), house finch (*Carpodacus mexicanus*), and lesser goldfinch (*Carduelis psaltria*). Further discussion of the use of the Preserve by special-status avian species is found in Section 4.3.6.

The Preserve has a good diversity of raptors, including eight (8) observed raptor species: turkey vulture (*Cathartes aura*), white-tailed kite (*Elanus leucurus*), Cooper's hawk, red-tailed hawk, red-shouldered hawk (*Buteo lineatus*), barn owl, western screech-owl (*Megascops kennicottii*), and great horned owl (*Bubo virginianus*). These birds are using the Preserve for foraging, and some species likely breed on site. The oak trees provide suitable habitat for all of the hawk and owl species. The rocky areas provide potentially suitable breeding habitat for the turkey vulture.

No federally or state-listed as endangered or threatened bird species were detected during the surveys. One (1) California fully protected species, white-tailed kite, was observed. This species was observed foraging near herpetological pitfall array #2, and a white-tailed kite was found dead on the ground near a pitfall array. It was unclear what caused the fatality. There were five (5) San Diego County Group I species and three (3) San Diego Group II species observed (Table 14, Figure 14). San Diego County Group I species include turkey vulture, white-tailed kite, Cooper's hawk, red-shouldered hawk, and Southern California rufous-crowned sparrow. San Diego County Group II species include great blue heron (*Ardea Herodias)*, barn owl, and western bluebird.

Four (4) nonnative or invasive species were detected during the surveys: rock pigeon (*Columba livia*), European starling (*Sturnus vulgaris*), brown-headed cowbird (*Molothrus aster*), and house sparrow (*Passer domesticus*). Three (3) rock pigeons were observed at point count Station 3 during a point count survey. House sparrows were observed during general surveys of the Preserve. Neither of these species poses a threat to the native avian species present on the Preserve. European starlings are breeding in the oak trees found on the Preserve. This species can out-compete cavity-nesting species such as western bluebirds. As native cavity-nesting species are still prevalent, presence of European starling does not appear to be significantly impacting the native avian populations. One (1) male brown-headed cowbird, an obligate brood parasite, was observed at point count Station 7 in May and June. At no time was a female or fledglings observed. If there is parasitism occurring on the Preserve, it is in low numbers.

4.3.3.1 Point Counts

As detailed in Section 3.3.3, 10-minute avian point counts were conducted at seven (7) stations (Figure 9) monthly from March through June 2013. ICF wildlife biologist Kylie Fischer conducted all of the counts.

The most regularly encountered and/or most numerous bird species, in decreasing number of observations, were wrentit (79 observations), lesser goldfinch (70 observations), Bewick's wren (62 observations), spotted towhee (56 observations), house finch (54 observations), California towhee (50 observations), mourning dove (45 observations), western scrub-jay (38 observations), bushtit (33 observations), and house wren (31). All other species had less than 30 observations during the course of the point counts.

Tables 15 and 16 provide quantitative summaries of the results for species and individuals. Station 6 shows the highest number of observations (195) and the highest diversity of species (36). Station 6 is immediately adjacent to the pond and has several different vegetation communities in the vicinity. Station 2 had the lowest number of observations (105) and Station 4 had the lowest species diversity (24). Stations 2 and 4 are surrounded by chaparral and do not have a wide variety of diversity in vegetation types in the nearby vicinity. There is more diversity near the other stations compared to Stations 2 and 4, so a lower diversity of species and less observations are expected at these two stations. Station 7 is also low in diversity (26 species) observations (110) and is also mostly surrounded by chaparral.

One (1) occurrence of an unknown woodpecker species was excluded from the calculation of total species. This occurrence was of an individual heard drumming in the distance, but no vocalizations were emitted to enable the observer to identify the species. As several woodpecker species were recorded at the Preserve, this species is most likely already recorded during the sampling. This individual was included in the number of observations, as it represented a unique bird during the sampling period. Three (3) occurrences of unknown hummingbird species were excluded from the calculation of total species. These sightings were of individuals passing by and giving no vocalizations to aid in identification. As common hummingbird species were recorded at the Preserve, the species was most likely already recorded during the sampling. These individuals were included in the number of observations, as they represented unique birds during the sampling period. One (1) occurrence of an unknown sparrow species was excluded from the calculation of total species. This occurrence was of a non-vocalizing individual that could be identified to type of bird based on shape but, due to lighting, identifying marks could not be seen and no vocalizations were emitted to enable the observer to identify the species. As several sparrow species were recorded at the Preserve, this species is most likely already recorded during the sampling. Four (4) observations of unknown species were excluded from the species data but were included as bird observations. The biologist was confident that these observations were not of birds that had already been documented during the point count.

Table 14. Avian Species Detected at the Preserve in 2013

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status	Survey Type	Breeding Status
Anas platyrhynchos	Mallard			PC	?
Oxyura jamaicensis	Ruddy duck			PC	?
Callipepla californica	California quail			PC	pr
Podilymbus podiceps	Pied-billed grebe			OS	?
Ardea herodias	Great blue heron		SDC Group II	OS	
Cathartes aura	Turkey vulture		SDC Group I	PC	?

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status	Survey Type	Breeding Status
Elanus leucurus	White-tailed kite	CFP	SDC Group I	OS	
Accipiter cooperii	Cooper's hawk		SDC Group I, MSCP	PC	pr
Buteo lineatus	Red-shouldered hawk		SDC Group I	OS	?
Buteo jamaicensis	Red-tailed hawk			PC	pr
Fulica americana	American coot			PC	?
Charadrius vociferus	Killdeer			PC	?
**Columba livia*	Rock pigeon			PC	pr
Zenaida macroura	Mourning dove			PC	pr
Geococcyx californianus	Greater roadrunner			PC	pr
Tyto alba	Barn owl		SDC Group II	N	CO
Megascops kennicottii	Western screech-owl			N	pr
Bubo virginianus	Great horned owl			PC, N	pr
Phalaenoptilus nuttallii	Common poorwill			N	pr
Aeronautes saxatalis	White-throated swift			OS	?
Calypte anna	Anna's hummingbird			PC	pr
Calypte costae	Costa's hummingbird			PC	CO
Melanerpes formicivorus	Acorn woodpecker			PC	pr
Picoides nuttallii	Nuttall's woodpecker			PC	pr
Colaptes auratus	Northern flicker			PC	pr
Contopus sordidulus	Western wood-pewee			OS	?
Empidonax difficilis	Pacific-slope flycatcher			OS	?
Sayornis nigricans	Black phoebe			PC	pr
Sayornis saya	Say's phoebe			OS	
Myiarchus cinerascens	Ash-throated flycatcher			PC	pr
Tyrannus vociferans	Cassin's kingbird			PC	pr
Tyrannus verticalis	Western kingbird			PC	pr
Vireo gilvus	Warbling vireo			OS	Migrant
Aphelocoma californica	Western scrub-jay			PC	CO
Corvus brachyrhynchos	American crow			PC	?
Corvus corax	Common raven			PC	CO
Tachycineta thalassina	Violet-green swallow			PC	CO
Stelgidopteryx serripennis	Northern rough-winged swallow			PC	?
Petrochelidon pyrrhonota	Cliff swallow			PC	?
Baeolophus inornatus	Oak titmouse			PC	CO
Psaltriparus minimus	Bushtit			PC	CO
Sitta carolinensis	White-breasted nuthatch			PC	pr

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status	Survey Type	Breeding Status
Salpinctes obsoletus	Rock wren			PC	?
Catherpes mexicanus	Canyon wren			PC	pr
Thryomanes bewickii	Bewick's wren			PC	pr
Troglodytes aedon	House wren			PC	CO
Polioptila caerulea	Blue-gray gnatcatcher			PC	CO
Regulus calendula	Ruby-crowned kinglet			PC	Migrant
Chamaea fasciata	Wrentit			PC	pr
Sialia mexicana	Western bluebird		SDC Group II, MSCP	PC	pr
Turdus migratorius	American robin			PC	?
Mimus polyglottos	Northern mockingbird			PC	pr
Toxostoma redivivum	California thrasher			OS	pr
**Sturnus vulgaris*	European starling			PC	CO
Phainopepla nitens	Phainopepla			PC	pr
Vermivora celata	Orange-crowned warbler			PC	pr
Dendroica coronata	Yellow-rumped warbler			PC	Migrant
Wilsonia pusilla	Wilson's warbler			PC	Migrant
Pipilo maculatus	Spotted towhee			PC	pr
Aimophila ruficeps canescens	Southern California rufous-crowned sparrow		SDC Group I, MSCP	PC	pr
Melozone crissalis	California towhee			PC	pr
Chondestes grammacus	Black-chinned sparrow			PC	pr
Spizella atrogularis	Lark sparrow			OS	?
Melospiza melodia	Song sparrow			PC	pr
Zonotrichia leucophrys	White-crowned sparrow			PC	Migrant
Zonotrichia atricapilla	Golden-crowned sparrow			OS	Migrant
Junco hyemalis	Dark-eyed junco			PC	?
Pheucticus melanocephalus	Black-headed grosbeak			PC	pr
Passerina caerulea	Blue grosbeak			PC	?
Agelaius phoeniceus	Red-winged blackbird			PC	CO
**Molothrus ater*	Brown-headed cowbird			PC	pr
Icterus bullockii	Bullock's oriole			PC	pr
Carpodacus mexicanus	House finch			PC	CO

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status	Survey Type	Breeding Status
Carduelis psaltria	Lesser goldfinch			PC	CO
**Passer domesticus*	House sparrow			OS	pr

*=Nonnative or Invasive species

Special Status: CFP= California Fully Protected Species, SDC Group= San Diego County Sensitive Animal, MSCP= South County Multiple Species Conservation Program Covered Species

Survey Type: PC = detected during point count, N = Nocturnal, OS = Observed during other fieldwork

Breeding Status: CO = Confirmed breeding, pr = Probable breeder, ? = Possible breeder. Rating is based on number of observations and period of observation (i.e., was the species identified throughout the breeding season or only during certain times of the year).

Table 15. Avian Point Counts: Totals for Individuals*

	Point Count Stations							Total # of Individuals	Mean # of Individuals
Month	1	2	3	4	5	6	7		
March	33	27	38	28	37	59	29	251	31.5
April	34	25	37	32	30	35	28	221	32.0
May	33	24	29	22	25	45	27	205	27.0
June	38	29	34	33	46	56	26	262	33.5
Total # of Individuals	138	105	138	115	138	195	110	939	
Mean # of Individuals	34.5	26.3	34.5	28.8	34.5	48.8	27.5		31.0

*See Section 3.3.3 regarding the exclusion of individuals recorded as "fly-bys.

Table 16. Avian Point Counts: Totals for Species*

	Point Count Stations							Total # of Species	Mean # of Species
Month	1	2	3	4	5	6	7		
March	16	15	15	13	15	18	9	37	17.3
April	17	13	19	13	16	13	15	34	17.5
May	17	10	12	13	15	18	11	41	17.1
June	20	14	17	13	16	17	11	44	19.0
Total # of Species	32	26	29	24	35	36	25		
Mean # of Species	17.5	13.0	15.8	13.0	15.5	16.5	11.5		14.8

* Birds not identified to species were excluded from the calculation. "Fly-by" species were included in the calculations.

4.3.3.2 Nocturnal Surveys

The nocturnal bird surveys documented four (4) nocturnal avian species: barn owl, great horned owl, western screech-owl, and common poorwill (*Phalaenoptilus nuttallii*). Barn owl, a special-status species, was detected once during the survey. A single barn owl was flushed from a palm tree

adjacent to the ranger station (Figure 14). The palm tree was dethatched prior to the second survey and the roost was removed. This barn owl was not observed or detected during subsequent nocturnal surveys. A great horned owl and two (2) western screech-owls were vocalizing in the oak woodland along the main road near the entrance off Mussey Grade Road, and a great horned owl was detected vocalizing in the southeastern portion of the Preserve. Several common poorwills were also vocalizing in the southern portion of the Preserve, and one (1) was flushed on the paved road in front of the ranger station.

4.3.4 Mammals

In total, 29 mammal species were detected during general surveys, mammal trapping, camera station sampling, and bat sampling (Appendix C). Of these, eight (8) species have special status with federal, state, or local governments.

4.3.4.1 Small Mammals

Six (6) small mammal species were captured during small mammal live trapping. The trapping effort yielded 89 captures (39 of which were recaptures) (Table 17). The small mammal species captured included Dulzura pocket mouse (*Chaetodipus californicus femoralis*), Deer mouse (*Peromyscus maniculatus*), California mouse (*Peromyscus californicus*), Northern Baja mouse (*Peromyscus fraterculus*), Dulzura kangaroo rat (*Dipodomys simulans*), and Big-eared woodrat (*Neotoma macrotis*). Five (5) additional species were detected during visual surveys or in a herpetological pitfall array (Table 18). One (1) species, Dulzura pocket mouse, has special status with state and local governments. These species' occurrences on the Preserve are discussed in more detail in Section 4.3.5 and depicted on Figure 14. As discussed in Section 4.3.6, one (1) sensitive small terrestrial mammal was determined to have a high potential to occur on the Preserve: Northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*). Stephen's kangaroo rat (*Dipodomys stephensi;* SKR) was not observed on Boulder Oaks in surveys in 2007 (Jones and Stokes 2007) and was not observed or expected during small mammal trapping in 2013. The grassland is potentially suitable habitat, but is isolated by several miles of chaparral and rural development from populations at Ramona Grasslands.

Table 17. Trapline Capture Summary

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status	Sample Area								Total
				A1	A2	B	C	D	E	F	G	
Chaetodipus californicus femoralis	Dulzura pocket Mouse	CSC	SDC Group II			1♂ 4♀(1)		4♂(2) 10♀(4) 1 ESC			6♂(3) 11♀(3)	11♂(5) 25♀(8) 1 ESC
Peromyscus maniculatus	Deer mouse								4♂(2) 8♀(4)			4♂(2) 8♀(4)
Peromyscus californicus	California mouse			1♀				2♂			2♂(1) 5♀(2)	4♂(1) 6♀(2)
Peromyscus fraterculus (=*Peromyscus eremicus*)	Northern Baja mouse					2♂(1) 3♀(2)					2♂(1)	4♂(2) 3♀(2)
Dipodomys simulans (=*Dipodomys agilis simulans*)	Dulzura kangaroo rat			4♀(3)		3♂(2) 6♀(3) 1 ESC					3♂(2) 2♀(1)	6♂(4) 12♀(7) 1 ESC
Neotoma macrotis (=Neotoma fuscipes)	Big-eared woodrat							1♀			3♀(2)	4♂(2)
Total				**5(3)**	**0**	**20(9)**	**0**	**18(6)**	**12(6)**	**0**	**34(15)**	**89(39)**

Legend:
♂ = male, ♀ = female, esc = escaped prior to determination of sex
(#) = number of animals recaptured
Special Status: CSC= California Species of Special Concern, SDC= County of San Diego Sensitive Animal

Table 18. Small Mammals Detected through Other Survey Methods

Scientific Name	Common Name	Vegetation Communities	Method of Detection
Spermophilus beecheyi nudipes	California ground squirrel	All communities	visual, sign
Peromyscus sp.	Deer mouse	Chaparral	captured in pitfall array
Neotoma lepida intermedia	San Diego desert woodrat	Chaparral	sign
Microtus californicus	California vole	Grassland	captured in pitfall array
Thomomys bottae	Botta's pocket gopher	All Communities	sign

4.3.4.2 Medium and Large Mammals

Each camera station was set from June 20, 2013 to August 28, 2013. Evaluation of all images captured at the four (4) camera stations resulted in the identification of eight (8) medium to large mammal species using the Preserve (Table 19). Movement of larger animals appeared to be concentrated along easily traveled routes with good visibility, such as trails and dry creek beds. Most sign of smaller animals was within natural communities with cover, especially chaparral. Two (2) of these species, mountain lion (*Puma concolor*) and southern mule deer (*Odocoileus hemionus fuliginata*), are special-status species. Further discussion of the use of the Preserve by special-status medium and large mammal species is found in Section 4.3.5. Three (3) additional medium and large mammal species, raccoon (*Procyon lotor*), domestic cattle (*Bos taurus*) and domestic horse (*Equus caballus*), were not captured on the remote cameras, but were observed or detected within the Preserve during other studies. Medium to large mammal species not detected but judged to have potential to occur on the Preserve based on habitat conditions and previous documented observations or conclusions include brush rabbit (*Sylvilagus bachmani*) and striped skunk (*Mephitis mephitis*) (Merkel & Associates, Inc. 2008; ICF Jones & Stokes 2008).

Table 19. Medium and Large Mammals Detected at Boulder Oaks Preserve in 2013

Scientific Name	Common Name	Local Government Special Status	Camera Stations	Vegetation Community
Sylvilagus audubonii	Desert cottontail	n/a	1 and 2	Chamise – Ramona Lilac Association, Coast Live Oak –Poison Oak – Grass Association
Canis latrans	Coyote	n/a	4	Ramona lilac Association
Urocyon cinereoargenteus	Common gray fox	n/a	1, 3, and 4	Chamise – Ramona Lilac Association, Ramona lilac Association, Arroyo Willow Association
Mustela frenata	Long-tailed weasel	n/a	1	Chamise – Ramona Lilac Association
Mephitis gracilis	Western spotted skunk	n/a	1 and 2	Chamise – Ramona Lilac Association Coast Live Oak –Poison Oak – Grass Association
Puma concolor	Mountain lion	SDC Group II, MSCP	4	Arroyo Willow Association
Odocoileus hemionus fuliginata	Southern mule deer	SDC Group II, MSCP	1, 3, and 4	Chamise – Ramona Lilac Association, Ramona lilac Association, Arroyo Willow Association
Procyon lotor	Northern raccoon	n/a	Tracks observed	Bulrush Association
**Bos taurus*	Domestic cattle	n/a	Visually observed	
**Equus caballus*	Domestic horse	n/a	Visually observed	

Legend:
*=non-native species
Special Status: SDC= County of San Diego Sensitive Animal, MSCP= South County Multiple Species Conservation Program Covered Species

4.3.4.3 Bats

Seven (7) bat species were detected during the bat surveys (Table 20). The bat species detected included small-footed myotis (*Myotis ciliolabrum*), Yuma myotis (*Myotis yumanensis*), canyon bat (*Parastrellus hesperus*), big brown bat (*Eptesicus fuscus*), Brazilian free-tailed bat (*Tadarida brasiliensis*), pocketed free-tailed bat (*Nyctinomops femorosaccus*), and western mastiff bat (*Eumops perotis*). A moderate number of bat species appear to occur within the Preserve. The Preserve's habitats are fairly diverse and contain features important to bats in the Southern California landscape, such as riparian vegetation, oak woodland, and scrub vegetation (Krutzsch 1948; Stokes et al. 2005). Further discussion of the use of the Preserve by special-status bat species is found in Section 4.3.5. Pocketed free-tail bat and western mastiff bat are California Species of Special Concern and County of San Diego Sensitive Group II and were observed at the north and south passive bat

recording locations. Small-footed myotis and Yuma myotis are County of San Diego Sensitive Group II and were observed at both sampling locations. These species' occurrences on the Preserve are discussed in more detail in Section 4.3.5 and depicted on Figure 14. Three (3) other species of bats, long-eared myotis (*Myotis evotis*), Big free-tailed bat (*Nyctinomops macrotis*), and pallid bat (*Antrozous pallidus*), have a high potential to occur on the Preserve and are discussed in Section 4.3.6.

Table 20. Bat Species Detected at the Preserve in 2013

Scientific Name	Common Name	Number of Anabat Recordings	Relative Frequency of Recordings (%)
Myotis ciliolabrum	Small-footed myotis†	23	2.38
Myotis yumanensis	Yuma myotis†	864	89.26
Parastrellus hesperus	Canyon bat	14	1.45
Eptesicus fuscus	Big brown bat	27	2.79
Tadarida brasiliensis	Brazilian free-tailed bat	22	2.27
Nyctinomops femorosaccus	Pocketed free-tailed bat*†	16	1.65
Eumops perotis	Western mastiff bat *†	2	0.21
	Total	**968**	

Legend:
* = California Species of Special Concern, † = County of San Diego Sensitive Animal Group II

4.3.5 Special-status Wildlife Species Observed

Twenty (20) special-status wildlife species were detected during the 2013 surveys at the Preserve (Figure 12). Four (4) special-status reptile species were detected: coast horned lizard, Coronado skink, coastal whiptail, and red diamond rattlesnake. Eight (8) special-status bird species were detected: great blue heron, turkey vulture, white-tailed kite, Cooper's hawk, red-shouldered hawk, barn owl, western bluebird, and Southern California rufous-crowned sparrow. Eight (8) special-status mammal species were detected: small-footed myotis, Yuma myotis, pocketed free-tailed bat, western mastiff bat, Dulzura pocket mouse, San Diego desert woodrat, mountain lion, and southern mule deer. See Figure 14 for locations of special-status species detected during surveys of the Preserve.

4.3.5.1 Herpetofauna

Coast Horned Lizard (*Phrynosoma blainvillii*)

California Species of Special Concern, San Diego County Group I

The coast horned lizard is a large lizard that historically was found in Kern, Los Angeles, Santa Barbara, and Ventura Counties southward to Baja California, Mexico. Horned lizards inhabit a variety of vegetation communities including coastal sage, annual grassland, chaparral, oak woodland, riparian woodland, and coniferous forest (Stebbins 2003). Loose, fine soils with a high sand content and an abundance of prey, and open areas with limited overstory typify suitable habitat for this species (Jennings and Hayes 1994). The coast horned lizard's insectivorous diet

consists mostly of native harvester ants (*Pogonmyrmex* sp.), which make up over 90% of its prey; however, it is an opportunistic feeder that will take other insects including termites, beetles, flies, wasps, and grasshoppers (Stebbins 2003; Jennings and Hayes 1994).

This species has disappeared from about 45% of its former range, and a number of factors have led to this decline, including habitat fragmentation and degradation, loss of native prey to exotic species, and extensive collection for the curio trade (Jennings and Hayes 1994). The specialized diet of harvester ants has made horned lizards especially vulnerable to extirpation since the introduction of Argentine ants (*Linepithema humile*). On the Preserve, this species was captured at Array #3 and was observed during surveys throughout the Preserve (Figure 14). This species has potential to occur throughout the scrub, chaparral, woodland, and grassland habitats.

Coronado Skink (*Plestiodon skiltonianus interparietalis*)

California Species of Special Concern, San Diego County Group II

The Coronado skink is a medium-sized secretive lizard that is typically found in the moister areas of coastal sage, chaparral, oak woodlands, pinyon-juniper, riparian woodlands, and pine forests (Jennings and Hayes 1994). Its prey includes small invertebrates found in leaf litter or dense vegetation at the edges of rocks and logs. The Coronado skink is found along the coastal plain and Peninsular Ranges west of the deserts from approximately San Gorgonio Pass in Riverside County south to San Quentin, Mexico (Jennings and Hayes 1994). The Coronado skink was detected on the Preserve in Arrays #1 and #3 and has potential to occur throughout the scrub, chaparral, woodland, and riparian habitats (Figure 14).

Coastal Whiptail (*Aspidoscelis tigris stejnegeri*)

San Diego County Group II

Coastal whiptail is a medium-sized slender lizard that is found in arid and semiarid desert to open woodlands where the vegetation is sparse so running is easy (Stebbins 2003). Its range includes coastal Southern California and western Baja California. The decline of coastal whiptails is likely due to loss of habitat to agriculture and urban development. On the Preserve, this species was captured at Arrays #2 and #3 and was observed during surveys throughout the Preserve (Figure 14). This species is presumed to occur throughout the scrub and chaparral habitats within the Preserve.

Red Diamond Rattlesnake (*Crotalus ruber*)

California Species of Special Concern, San Diego County Group II, South County MSCP Covered Species

The red diamond rattlesnake is a large, heavy-bodied rattlesnake that has a wide tolerance for varying environments and can be found in a variety of vegetation types, but is most commonly seen in areas with heavy brush and cacti, rocks, or boulders (Stebbins 2003). The known range extends from San Bernardino County along the coastal and desert slopes southward to Baja California. Adult red diamond rattlesnakes eat mostly squirrels and rabbits, but lizards, specifically the western whiptail, are a significant food source for juveniles (Jennings and Hayes 1994). Urban development and the trend towards planting orchards on steeper rocky hillsides have significantly decreased the amount of appropriate habitat for this species (Jennings and Hayes 1994). On the Preserve, this

species was captured at Array #3 and was observed during surveys throughout the Preserve (Figure 14). This species has potential to occur throughout the upland habitats that occur in the Preserve.

4.3.5.2 Birds

Great Blue Heron (*Ardea herodias*)

San Diego County Group II

The great blue heron is a large water bird that can be found in any type of wetland and is typically a colonial breeder that nests in trees near water (Unitt 2004); however, breeding by isolated pairs and in the absence of trees has been documented. Great blue herons will nest in bushes, on the ground, or in artificial structures (Butler 1992; Unitt 2004). This species is non-migratory in Southern California but is migratory in other parts of its range (Unitt 2004). Great blue herons forage diurnally in estuaries and beaches but are also commonly seen on dry land (Unitt 2004; K. Fischer Personal Observation). The observation in 2013 was of a lone individual in March foraging at the pond (Figure 14). This species is common within the County.

Turkey Vulture (*Cathartes aura*)

San Diego County Group I

Turkey vultures are often seen foraging over woodlands and nearby open country (Unitt 2004). They prefer dry, open country and ranch lands and often occur along roadsides where carrion is common. They nest in crevices among granite boulders (Unitt 2004). The turkey vultures' range has been retracting from the coast due to human disturbance, loss of foraging habitat, and pesticide contamination (Unitt 2004). Turkey vultures were observed foraging over the Preserve during 2013 surveys and at point count Station 7. There is no suitable breeding habitat for this species on the Preserve. This species is common in the undeveloped areas of San Diego County.

White-Tailed Kite (*Elanus caeruleus*)

California Fully Protected Species (nesting), San Diego County Group I

The white-tailed kite is found in lower elevations in open grasslands, agricultural areas, wetlands, and oak woodlands. Their primary source of food is the California vole (*Microtus californicus sanctidiegi*) (Unitt 2004). It typically forages in open, undisturbed habitats and nests in the top of dense oaks, willows, or other large trees (Unitt 2004). The white-tailed kite population is on the decline mostly due to urban sprawl; however, this species is still considered fairly widespread throughout the foothills of San Diego County (Unitt 2004). One (1) dead white-tailed kite was observed in the southern portion of the Preserve and one white-tailed kite (1) was observed foraging near herp pitfall array 2

Cooper's Hawk (Accipiter cooperii)

San Diego County Group I, MSCP Covered Species

The Cooper's hawk is a resident of riparian deciduous habitats and oak woodlands, but in recent times has become adapted to urban park environments (Unitt 2004). They hunt their primary source of food, passerines, in broken woodlands and forest margins, and they are also known to

take fish and mammals. The Cooper's hawk population declined due to hunting and loss of habitat; however, this species is making a comeback through its adaptation to the urban environment (Unitt 2004). This species is widespread throughout the County. Cooper's hawk was detected at point count Stations 1, 2, 4, 6, and 7 during 2013 surveys.

Red-shouldered Hawk (*Buteo lineatus*)

San Diego County Group I

The red-shouldered hawk was once an uncommon breeder of lowland riparian woodlands, but has been thriving in urban environments with large trees such as eucalyptus (Unitt 2004). On the west coast, this species is found in California and northern Baja California and is common throughout San Diego County. Red-shouldered hawk was observed on the Preserve.

Barn Owl (*Tyto alba*)

San Diego County Group II

The barn owl is the owl species that is most tolerant of urban development (Unitt 2004). It will nest in buildings, in nest boxes, at the base of the leaves in palm trees, and in cavities in native trees (Unitt 2004). Even though this species is tolerant of human development, dense housing communities do not provide suitable nesting habitat, and increased traffic has had a negative effect on the species (Unitt 2004). One (1) barn owl was detected in a palm tree near the ranger's station at the Preserve.

Western Bluebird (*Sialia mexicana*)

San Diego County Group II, MSCP Covered Species

The western bluebird is a stocky blue bird with a chestnut chest and is considered common in the foothills and mountains of San Diego County. This species can usually be found in montane coniferous and oak woodlands (Unitt 2004). It can also occur in areas with scattered trees, open forests, and scrubs, and during the winter it can be found in the desert. Western bluebirds breed in western North America from southern British Columbia south to central Mexico, east to western Montana, and west to Texas, but are absent from the Great Basin (Guinan et al. 2000). They can also winter outside their breeding range in central California and along the lower Colorado River (Guinan et al. 2000). Western bluebird numbers are declining due to loss of nesting cavities to logging, fire suppression, and competition with nonnative species such as European starling and house sparrow (*Passer domesticus*) (Unitt 2004). This species is still fairly common in San Diego County (Unitt 2004).

Western bluebirds were observed on the Preserve during the 2013 surveys. Individuals were detected in the oak woodland and grassland habitats in the central portion of the Preserve and at point count Stations 3, 5, and 6.

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

San Diego County Group I, MSCP Covered Species

The Southern California rufous-crowned sparrow is a resident species that is closely associated with coastal sage scrub, steep rocky hillsides, burned chaparral, and openings in mature chaparral (Unitt

2004). Preferring open habitat with approximately 50% shrub cover, this species seeks cover in shrubs, rocks, grass, and forb patches (Dudek 2000; Unitt 2004). The Southern California subspecies is restricted to semiarid coastal sage scrub and sparse chaparral from Santa Barbara south to the northwestern corner of Baja California (Dudek 2000). Southern California rufous-crowned sparrows are declining due to loss of appropriate habitat and their sensitivity to habitat fragmentation (Unitt 2004). Southern California rufous-crowned sparrows were detected at point count Stations 1, 2, 4, 5, and 7 during the 2013 surveys. This species is still found throughout San Diego County in large numbers (Unitt 2004).

4.3.5.3 Mammals

Small-footed Myotis (*Myotis ciliolabrum*)

San Diego County Group II

The small-footed myotis is found throughout most of western North America, from southwestern Canada south into Mexico (BCI 2008). There is little information on the habitat requirements of this species, but it has been documented under rock slabs, in crevices and mine tunnels, under loose tree bark, and in buildings (BCI 2008). This species hibernates in caves, typically in small groups. Reasons for decline are poorly understood, as there has been little research conducted on this species. Both suitable roosting and foraging habitat for the small-footed myotis occur on site and the species was detected during 2013 surveys at both sampling locations, indicating widespread use of the Preserve by this species.

Yuma Myotis (Myotis yumanensis)

San Diego County Group II

The Yuma myotis is found throughout much of the western U.S. and into Canada (BCI 2008). The species is always found near lakes, creeks, or ponds, where the species forages over the water. Typically, individuals skim low over the water and snatch up flying insects, but they can forage in other mesic areas. The species roosts by day usually in buildings or bridges but has been documented using mines or caves (BCI 2008). Yuma myotis is threatened by loss of riparian habitat and the decline in permanent water sources in the southwest. Yuma myotis was detected at both sampling locations during the 2013 sampling sessions.

Pocketed Free-tailed Bat (*Nyctinomops femorosaccus*)

California Species of Special Concern, San Diego County Group II

Pocketed free-tailed bats are rarely found in southwestern California. These bats live in arid desert areas and roost in crevices high on cliff faces in rugged canyons (BCI 2008). Nursery colonies are relatively small and usually include fewer than 100 individuals. This species primarily forages on large moths, especially over water. The regional status and species trends are unclear, but it is likely vulnerable to disturbance, especially at roosts, and perhaps also to threats to food supply from man-made toxins. The Preserve includes suitable roosting and foraging habitat. This species was detected in 2007 at Boulder Oak pond, approximately 0.5 mile south of the survey area. Pocketed free-tailed bats were detected at both sampling locations during the 2013 sampling sessions.

Western Mastiff Bat (*Eumops perotis*)

California Species of Special Concern, San Diego County Group II

Western mastiff bats are the largest native bats in the U.S. This subspecies occurs from the western foothills of the Sierra Nevada and the coastal ranges (south of San Francisco Bay) southward into Mexico (BCI 2008). In Southern California, they are found throughout the coastal lowlands up to drier mid-elevation mountains, but avoid the Mojave and Colorado deserts (Zeiner et al. 1990). Habitats include dry woodlands, shrublands, grasslands, and occasionally even developed areas. This big bat forages in flight, and most prey species are relatively small, low to the ground, and weak-flying. For roosting, western mastiff bats appear to favor rocky, rugged areas in lowlands where abundant suitable crevices are available for day roosts (BCI 2008). Roost sites may be in natural rock, tall buildings, or large trees, or elsewhere. The reasons for this species' decline are poorly understood but probably are related to disturbance, habitat loss, and perhaps widespread use of pesticides. The western mastiff bat was detected during nocturnal surveys foraging over the open grasslands in the central portion of the Preserve. Western mastiff bats were detected at both sampling locations during the 2013 sampling sessions.

Dulzura Pocket Mouse (Chaetodipus californicus femoralis)

California Species of Special Concern, San Diego County Group II

Dulzura pocket mouse is mainly active on the ground, but also climbs shrubs and small trees when feeding (CDFG 2005). This species can become torpid by day at any time of the year, and is inactive in cold, wet weather. It breeds in spring to early summer and occurs from sea level to approximately 2,408 meters (7,900 ft) AMSL (CDFG 2005). This species prefers dense chaparral and is less common in dry grassland and desert scrub. During the 2013 trapping program on the Preserve, 37 of the 89 animals captured were Dulzura pocket mice. Captures were associated with trapping locations B, D, and G (Figure 14).

San Diego Desert Woodrat (*Neotoma lepida intermedia*)

California Species of Special Concern, San Diego County Group II

San Diego desert woodrat requires large amounts of water, which it obtains from fleshy plants such as yucca species and prickly pear cactus (*Opuntia* sp.). It usually makes a stick house under one of these food plants, or may den among rocks (CDFG 2005). Materials used to build middens include cacti, sticks, bones, and a variety of debris. Middens provide insulation against excessive heat as well as protection from predators. This species breeds in late winter or spring, occurs from sea level to approximately 2,591 meters (8,500 ft) AMSL in deserts and coastal sage scrub, and prefers areas with rocky outcrops and plentiful succulents (CDFG 2005). During the 2013 surveys, the woodrat middens associated with this species were observed in boulder piles on south-facing slopes within open chaparral (Figure 14).

Mountain Lion (*Puma concolor*)

San Diego County Group II, South County MSCP Covered Species

Mountain lions prefer rocky areas, cliffs, and ledges that provide cover within open woodlands and chaparral (Dudek 2000). Riparian areas also provide protective habitat connections for movement

between fragmented habitats. This species is widespread in North and South America and occupies a broad variety of habitats from the northern limit of the Canadian forests to Patagonia in South America. Populations of this species require large areas to sustain themselves, requiring at least 850 square miles to remain stable (Dudek 2000). Habitat fragmentation, loss of large areas of undeveloped land, road kills, indiscriminate shootings, animal control measures, and loss of natural prey base have led to the decline of this species. The Preserve and the surrounding open space provide habitat for mountain lion to use for foraging and cover, and the tracks of this species were detected on the Preserve. This species was recorded on camera 1 (Figure 14).

Southern Mule Deer (Odocoileus hemionus fuliginata)

San Diego County Group II

Southern mule deer are common across the western U.S. in a variety of habitats from forest edges to mountains and foothills (Whitaker 1996). Southern mule deer prefer edge habitats, rarely travel or forage far from water, and are most active around dawn and dusk. Several southern mule deer were observed on the Preserve during 2013 surveys, and a few deer were photographed during camera sampling. Southern mule deer was visually observed and recorded at camera stations 1, 3, and 4 (Figure 14).

4.3.6 Special-status Wildlife Species with High Potential to Occur

4.3.6.1 Herpetofauna

Orange-throated Whiptail (Aspidoscelis hyperythra beldingi)

California Species of Special Concern, San Diego County Group II, MSCP Covered Species

The orange-throated whiptail is a medium-sized lizard that ranges from Southern California (specifically Corona del Mar in Orange County and Colton in San Bernardino County) southward to the tip of Baja California, Mexico. Historically, most populations of the orange-throated whiptail were found on floodplains or terraces along streams in brushy areas with loose soil and rocks (McGurty 1980). Habitat types they are known to use include chaparral, nonnative grassland, coastal sage scrub, juniper woodland, and oak woodland. California buckwheat is an important indicator of appropriate habitat for orange-throated whiptail (Dudek 2000). This plant species is a colonizer of disturbed, sandy soils and usually indicates open shrub spacing that is required for whiptail foraging and thermoregulatory behavior. Orange-throated whiptails appear to be dietary specialists, with most (greater than 85%) of their prey being termites (Dudek 2000). The decline of orange-throated whiptails is likely due to loss of habitat to agriculture and urban development. On the Preserve, there are several areas of appropriate habitat for this species. Although this species was not observed, it is presumed to occur within the Preserve.

Coastal Rosy Boa (Charina trivirgata roseofusca)

San Diego County Group II

Coastal rosy boas are heavy-bodied snakes that inhabit arid scrublands, semi-arid and rocky shrublands, rocky deserts, canyons, and other rocky areas (Stebbins 2003). This species eats

rodents, small birds, lizards, small snakes, and amphibians and kills its prey by constriction. Coastal rosy boas occur in southwestern California from the coastal slopes of the San Gabriel and San Bernardino Mountains and across the peninsular ranges into the desert in San Diego County (Stebbins 2003). Threats to this species include habitat degradation and fragmentation from urban development. Although this species was not observed during the 2013 surveys, it is presumed to occur within the rocky areas in the western areas of the Preserve.

4.3.6.2 Birds

Golden Eagle (Aquila chrysaetos)

State Fully Protected Species, San Diego County Group I, MSCP Covered Species

Golden eagles nest on cliff ledges or trees on steep slopes and forage in grasslands, sage scrub, or broken chaparral (Unitt 2004). Development of the grasslands they forage over has taken a toll on the numbers of this species present in San Diego County. A territory averages 36 square miles, so removal of foraging habitat will have significant impacts on this species (Unitt 2004). Historically, a golden eagle pair bred just outside of the Preserve to the northwest on an exposed cliff ledge (WRI 2001). If the pair returned and was using the nest, the Preserve would have high potential for foraging. No golden eagles were observed this season, but there is suitable foraging habitat at the Preserve.

4.3.6.3 Mammals

Pallid Bat (Antrozous pallidus)

State Species of Special Concern, San Diego County Group II, MSCP Covered Species

Pallid bats are widely distributed in the southwestern U.S. and northern Mexico (BCI 2008). They are locally common across most of California except in the far northwest and in higher portions of the Sierra Nevada. Habitats utilized include a wide variety of grasslands, shrublands, woodlands, and forests, including mixed conifer forest (Zeiner et al. 1990). They appear to be most common in open, dry, rocky lowlands, and they roost in caves, mines, rock crevices, buildings, and trees.

This is a colonial species that forages low over open ground, often picking up beetles and other species of prey off the ground (Zeiner et al. 1990). Flight is slow and maneuverable, and they are able to take a wide variety of prey, including large, hard-shelled insects (Zeiner et al. 1990). They have separate night and day roosts, hibernate in winter, and the sexes segregate in summer. The Preserve includes suitable roosting and foraging habitat. This species was detected in 2007 at Boulder Oak pond, approximately 0.5 mile south of the survey area.

Long-eared Myotis (*Myotis evotis*)

San Diego County Group II

Long-eared myotis is found in western North America from British Columbia south through California to Baja Mexico (BCI 2008). This species prefers coniferous forests in higher altitudes and will roost in caves, rock crevices, under tree bark, or in buildings (BCI 2008). Both suitable roosting and foraging habitat for the long-eared myotis occur on the Preserve. The long-eared myotis was not

detected during the 2013 acoustic surveys of the Preserve; however, this species was detected in low numbers in 2007 at Boulder Oak pond, approximately 0.5 mile south of the survey area.

Big Free-tailed Bat (*Nyctinomops macrotis*)

State Species of Special Concern, San Diego County Group II

Big free-tailed bats are typically found in desert and arid grasslands with rocky outcrops, canyons, or cliffs (BCI 2008). This species roosts on cliffs and occasionally in buildings. Isolated populations can be found throughout the southwestern U.S. into Mexico. The regional status and species trends are unclear, but it is likely vulnerable to disturbance, especially at roosts, and perhaps also to threats to food supply from man-made toxins. The big free-tailed bat has been detected in Ramona and there is high potential for it to forage over the Preserve. There is minimal roosting habitat.

Northwestern San Diego Pocket Mouse (*Chaetodipus fallax fallax*)

California Species of Special Concern, San Diego County Group II

The northwestern San Diego pocket mouse is typically found in coastal sage scrub, sage scrub/grassland ecotones, and chaparral (Dudek 2000). It inhabits open, sandy areas of both the Upper and Lower Sonoran areas of southwestern California and northern Baja California (Dudek 2000). This species is sensitive to habitat fragmentation and degradation, which has led to its decline. This species was not captured during the 2013 trapping program on the Preserve. Based on habitat present within the Preserve, this species does have potential to occur.

4.3.7 Invasive Wildlife Species

Native species are often at a disadvantage after exotic species or nonnative predators are introduced. Nonnative animal species have few natural predators or other ecological controls on their population sizes, and they thrive under conditions created by humans. These species may aggressively out-compete native species or otherwise harm sensitive species. When top predators are absent, intermediate predators multiply and increase predation on native bird species and their nests. Feral and domestic animals, particularly cats, can prey on small native wildlife species. Feral animals are not a current problem at the Preserve. With the increased use of the Preserve by hikers and their dogs and horseback riders, increased interactions between domestic animals and native animals are expected.

Seven (7) nonnative or invasive animal species were documented during the current survey effort, including bullfrog, rock pigeon, European starling, brown-headed cowbird, house sparrow, domestic cattle, and domestic horse.

The two (2) invasive species seen in large numbers were bullfrog and European starling. European starlings are breeding in the oak trees found on the Preserve. This species can out-compete cavity-nesting species, such as western bluebirds, but does not appear to be displacing bluebirds within the preserve. Bullfrogs are a direct threat to amphibians and small mammals utilizing the pond, but no sensitive animals vulnerable to bullfrogs are known to utilize the pond.

4.4 Wildlife Movement

Wildlife movement corridors are areas that connect suitable wildlife habitat areas in a region otherwise fragmented by rugged terrain, changes in vegetation, or human disturbance. Natural features such as canyon drainages, ridgelines, or areas with vegetative cover provide corridors for wildlife movement. Wildlife movement corridors are important because they provide access to mates, food, and water; allow the dispersal of individuals away from high population density areas; and facilitate the exchange of genetic traits between populations.

Portions of the Preserve are identified within the Metro-Lakeside-Jamul section of the South County MSCP as a core habitat area (Figure 3). The Preserve provides open space habitat for wildlife and connects to many other areas of large open space, including park lands owned by the City of Poway's Iron Mountain preservation area, California Department of Fish and Wildlife San Vicente Highlands Preserve, the San Vicente conservation bank, and undeveloped lands around San Vicente Reservoir. These large core areas support the persistence and dispersal of medium and large mammals, including coyote, bobcat, mountain lion, and mule deer. Mountain lions are a widely ranging species that utilize large territories, and sign of mountain lion feeding on deer was observed on the Preserve. As a core area, the Preserve provides large amounts of refuge habitat for this species and is connected to open space to the north, east, south, and west, allowing for movement and dispersal.

Chapter 5
Conclusions and South County MSCP Management and Monitoring Recommendations

The Preserve is in the Metro-Lakeside-Jamul Segment of the South County MSCP planning area and does not contain any designated USFWS Critical Habitat. Due to the importance of the Preserve within the South County MSCP, ongoing monitoring and adaptive management should be implemented to assess the status and trends of biological resources within the Preserve. The overall South County MSCP goal is to maintain and enhance biological diversity in the region and conserve viable populations of sensitive species and their habitats, preventing extirpation or extinction. The South County MSCP includes general biological monitoring intended to evaluate whether the preserve system is meeting conservation targets for covered plant and animal species and their habitats, identify threats to covered species and their habitats, and help identify management needs.

In this chapter, we will present specific management recommendations for the habitat types documented within the Preserve and the various taxonomic groups assessed during this survey effort. These recommendations are based on the results of the baseline biological diversity surveys and the management and monitoring guidelines and conservation goals provided in the MSCP Framework Management Plan (FMP) (County of San Diego 2008). The FMP includes plan-wide stewardship and management guidelines; habitat- and species-specific management guidelines; and monitoring guidelines, as well as specific conservation goals for each of the three planning segments identified in the MSCP SAP. The Preserve is located within the Metro-Jamul-Lakeside subarea. Specific biological resources management concerns for the subarea include human development adjacent to sensitive habitats or linkages, off-road vehicle activity, dumping, or other adverse human disturbances; habitat restoration; and invasion of non-native plants and animals. As detailed previously, the current survey effort documented 13 vegetation associations/alliances and 340 species within the Preserve. Specifically, the surveys detected 247 plant species and 150 wildlife species. Of these species, ten (10) plants are considered special status and three (3) of these are covered by the South County MSCP; 20 special-status wildlife species were detected during the surveys, eight (8) of which are covered by the South County MSCP.

5.1 Vegetation Communities/Habitats

As previously discussed, the Preserve contains 14 vegetation associations/alliances, including uncommon Engelmann oak woodlands (Engelmann oak-coast live oak/poison oak/grass association). Upland communities at the Preserve are dominated by chaparral, including chamise-Ramona lilac Association, Whitethorn Association, and Ramona lilac Association. The Preserve also supports grasslands, which, though heavily grazed, have the potential to support foraging raptors. In order to assess the overall biological integrity of the Preserve, it is recommended that the County maintain an updated vegetation community map. The map should be used as a tool for adaptive management within the Preserve. Updates should occur once every five (5) years or within the first growing season following an unforeseen disturbance (i.e., fire, rock fall, flood, or man-made disturbance). The purpose of the ongoing mapping effort should be to document changes in the vegetation communities within the Preserve that could affect quality and usage by wildlife.

Vegetation monitoring for habitat value should also focus on identifying adverse changes and their effects on the vegetation over time. This includes dramatic changes, such as fire, and slower but equally important effects, such as invasion by nonnative species or slow decline of existing native species.

5.2 Plants

During baseline surveys in 2013, three (3) South County MSCP covered plant species were detected, including Orcutt's brodiaea (*Brodiaea orcuttii*), heart-leaf pitcher sage (*Lepechinia cardiophylla*), and felt-leaf monardella (*Monardella hypoleuca* ssp*. lanata*). Management recommendations for these species are detailed below. The South County MSCP describes that there are critical populations of Orcutt's brodiaea north of San Vicente Reservoir and of felt-leaf monardella on Iron Peak. Populations of these two (2) species on Boulder Oaks Preserve are related to those described critical populations.

5.2.1 Management Directives for South County MSCP Covered Plant Species

5.2.1.1 Orcutt's Brodiaea (*Brodiaea orcuttii*)

Site Location

Two (2) individuals were observed within the Preserve: one near herpetological pitfall array #2, several hundred feet west of the main road, and one near the southeastern boundary of the Preserve.

Vegetation Community

Grassland and chaparral.

South County MSCP Monitoring Conditions

This species is considered a second-priority monitoring species under the South County MSCP. Recommend focused surveys every two years. A large population has been observed at the southern section of Boulder Oaks Preserve (Figure 12; not surveyed in 2013) and there is the potential for more populations to be discovered on northern section Boulder Oaks through more intense surveys or through ongoing monitoring.

5.2.1.2 Heart-leaf Pitcher Sage (*Lepechinia cardiophylla*)

Site Location

One population of three (3) individuals was observed along a dirt trail on the northern side of the mountain in the west-central area of the Preserve.

Vegetation Community

Ramona-lilac chaparral.

South County MSCP Monitoring Conditions

This species is considered a third-priority monitoring species under the South County MSCP. Recommend photo point monitoring every five (5) years. DPR will conduct rare plant surveys every five (5) years, with particular attention paid to detecting covered species, such as heart-leaf pitcher sage.

5.2.1.3 Felt-leaf Monardella (*Monardella hypoleuca* ssp. *lanata*)

Site Location

This species is distributed across the north-facing slopes of the mountain in the west-central area of the Preserve.

Vegetation Community

Eastwood manzanita-chamise chaparral and Ramona-lilac chaparral.

South County MSCP Monitoring Conditions

This species is considered a third-priority monitoring species under the South County MSCP. Recommend photo point monitoring every five (5) years.

5.3 Wildlife

As documented previously, six (6) South County MSCP wildlife species were detected during baseline surveys at the Preserve in 2013. Covered wildlife species detected included coast horned lizard, Cooper's hawk, western bluebird, Southern California rufous-crowned sparrow, southern mule deer, and mountain lion. Management and monitoring recommendation for each of these species covered are detailed below.

5.3.1 Management Directives for South County MSCP Covered Wildlife Species

5.3.1.1 Coast Horned Lizard (*Phrynosoma blainvillii*)

Site Location

Observed at scattered locations in chaparral, in openings in grasslands, and on roads throughout the Preserve.

Vegetation Community

Grassland and Ramona-lilac chaparral.

South County MSCP Monitoring Conditions

This species has a low priority for management and monitoring. Nonnative argentine ant populations, which contribute to the threat of extirpation of coast horned lizard, benefit from

artificial year-round water sources (e.g., irrigation, urban runoff). Argentine ants compete with and often displace native ants from suitable habitats. Due diligence should be conducted to prevent infestation, including inspecting any plants being brought into the Preserve for the presence of Argentine ants and avoiding unneeded irrigation or leaking pipes.

5.3.1.2 Cooper's Hawk (*Accipiter cooperii*)

Site Location

Observed foraging throughout the Preserve.

Vegetation Community

Grassland and chaparral.

South County MSCP Monitoring Conditions

This species has a low priority for management and monitoring. The preservation of woodland vegetation communities will provide adequate nesting and foraging habitat. While no Cooper's hawk nests were detected in 2013, any Cooper's hawk nest should be avoided by at least 300 ft. Habitat-based management and monitoring will be conducted by monitoring the distribution and acreage of woodland habitat in the preserve over time. This will be conducted by vegetation mapping every five years. Monitoring of the post-fire recovery of woodland habitat will be conducted after wildfires. If woodlands are lost to disease or beetles, or natural post-fire recovery of woodlands does not occur, adaptive management should be conducted, which may include the planting of oaks or sycamores.

5.3.1.3 Western Bluebird (*Sialia mexicana*)

Site Location

Observed throughout the woodlands on the northeast and southeast of the Preserve.

Vegetation Community

Engelmann oak woodland and coast live oak woodland (Engelmann oak-coast live oak/poison oak/grass and coast live oak/poison oak/grass associations).

South County MSCP Monitoring Conditions

This species has a low priority for management and monitoring. Habitat-based management will be conducted. The preservation of oak woodland vegetation communities will provide adequate nesting and foraging habitat. Habitat-based management and monitoring will be conducted by monitoring the distribution and acreage of woodland habitat in the preserve over time. This will be conducted by vegetation mapping every five years. Monitoring of the post-fire recovery of woodland habitat will be conducted after wildfires. If woodlands are lost to disease or beetles, or natural post-fire recovery of woodlands does not occur, adaptive management should be conducted, which may include the planting of oaks or sycamores.

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

Site Location

Widespread in chaparral on the Preserve.

Vegetation Community

Chaparral (chamise-Ramona lilac, Ramona lilac, and chaparral whitethorn associations).

South County MSCP Monitoring Conditions

This species has a low priority for management and monitoring. Habitat-based management will be conducted. The preservation of chaparral will provide adequate nesting and foraging habitat. Habitat-based management and monitoring will be conducted by monitoring the distribution and acreage of woodland habitat in the preserve over time. This will be conducted by vegetation mapping every five (5) years. Monitoring of the post-fire recovery of woodland habitat will be conducted after wildfires. If woodlands are lost to disease or beetles, or natural post-fire recovery of woodlands does not occur, adaptive management should be conducted, which may include the planting of oaks or sycamores.

5.3.1.5 Southern mule deer (*Odocoileus hemionus fuliginata*)

Site Location

Widespread throughout the Preserve.

Vegetation Community

Chaparral, woodlands, and grasslands.

South County MSCP Monitoring Conditions

This species has a low priority for management and monitoring. Habitat-based management will be conducted. The preservation of undeveloped vegetation will provide adequate foraging habitat. Monitoring efforts should focus on status monitoring. Status monitoring should involve general assessments of habitat characteristics, such as threats, or changes in habitat quality as a check on their condition. Vegetation mapping will be conducted on the Preserve every five (5) years and will monitor for the loss of foraging habitat, particularly as a result of development or too-frequent wildfire regime.

Habitat-based monitoring variable should include:

1. Status of foraging habitat (type conversion by wildfire)
2. Evidence of human disturbance (road collisions)
3. Evidence of human persecution (e.g., illegal hunting)

5.3.1.6 Mountain Lion (*Puma concolor*)

Site Location

Widespread throughout the Preserve.

Vegetation Community

Chaparral, woodlands, and grasslands.

South County MSCP Monitoring Conditions

This species has a low priority for management and monitoring. Core areas, such as the Preserve, provide large blocks of unfragmented natural habitat to support this species.

Habitat-based management will be conducted. The preservation of undeveloped vegetation will provide adequate foraging habitat. Monitoring efforts should focus on status monitoring. Status monitoring should involve general assessments of habitat characteristics, such as threats, or changes in habitat quality as a check on their condition. For the mountain lion, monitoring should additionally focus on corridor quality assessment and wildlife corridor monitoring. Additionally, habitat-based monitoring variable should include:

1. Status of prey populations (e.g., mule deer, rabbit, rodents, coyotes, snakes)
2. Evidence of human disturbance (e.g., road collisions, residential encroachment)
3. Evidence of human persecution (e.g., illegal hunting)

5.4 Invasive Nonnative Species Control

Invasive nonnative plant species control is primarily monitored and implemented at the vegetation community level. As discussed in Section 5, specific management and monitoring measures are required within conserved core habitats. A detailed Vegetation Management Plan is being prepared for the Preserve and will address nonnative species control.

5.4.1 Invasive Plants

Table 11 in Chapter 4.3.7 detailed the Cal-IPC plants that were observed on the Preserve during the current survey effort. Most of the plants are not currently occupying the Preserve in a manner that would be detrimental to the conserved habitats on site. The invasive nonnative plant species locations that have the potential to affect core conserved habitats were presented in Figure 13. Target invasive plants identified for control at the Preserve include:

- Italian thistle
- Fennel
- Veldt grass
- Tamarisk
- Pampas grass

The Vegetation Management Plan for this Preserve will detail removal and control methods for the five (5) target species.

When invasive nonnative plant control is implemented within a preserve, the FRMP requires that the following measures be followed.

- Priority for removal should be based on a species' biology, the immediate need of a specific area, and where removal could increase habitat available for covered species.
- Avoid removal activities during the reproductive seasons of sensitive species and reduce impacts to sensitive species or native habitats.
- Use an integrated pest management approach, i.e., use the least biologically intrusive control methods, at the most appropriate period of the growth cycle to achieve the desired goals.
- Consider both mechanical and chemical methods of control. Only herbicides compatible with biological goals should be used. Only licensed pest control advisers are permitted to make specific pest control recommendations.
- Properly dispose of all exotic plant materials that are removed from preserve lands (e.g., in off-site facilities).
- Revegetate exotic weed removal areas with species appropriate to biological goals, as appropriate.
- Identify where active revegetation (as opposed to passive recruitment) will be necessary in the RMP.

5.4.2 Invasive Wildlife

Bullfrogs are the primary invasive wildlife species that need to be monitored and controlled at the Preserve. It is recommended that a trapping program be implemented to reduce or eliminate the presence of this species on site.

5.4.2.1 Bullfrog Trapping Program

The removal and control of bullfrogs at the Preserve would improve the functions and services of the pond for a variety of non-sensitive native species. Removal methods can include dip netting and removal of adult bullfrogs. In addition, surveys can be conducted for bullfrog egg masses and, if found, they can be removed.

5.5 Restoration Opportunities

The Preserve is generally composed of high quality habitat that provides essential habitat for special-status species that are covered under the South County MSCP.

The goal of habitat restoration is to reestablish or enhance the biological functions and values of habitat that has been degraded by either human or natural causes. Restoration methods range from active revegetation, which recreates habitat, to passive management. For Preserve lands, restoration is typically not required; however, in some cases, if resources are available, active restoration may assist the recovery of an area that has been disturbed and is showing difficulty in recovering. The need for restoration activities will be determined based on the results of habitat monitoring and

trail maintenance activities. Any proposed restoration activity should utilize current, accepted techniques and avoid or minimize impacts to sensitive species or native habitats. Additionally, revegetation activities should use only local, native plant seed or container stock plants that have been propagated from plant material from the San Diego watershed.

Restoration opportunities could include passive or active revegetation of redundant roads or trails. These opportunities will be detailed in the public access plan for Boulder Oaks (in press). Active removal of target invasive plant species will be proposed in the Vegetation Management Plan for the Preserve.

5.6 Fire Management

Fire management guidelines will be addressed in the Boulder Oaks Preserve Vegetation Management Plan. The Preserve has burned frequently in the last 100 years. Efforts should be made to reduce anthropogenic ignition sources, including restricting tobacco smoking and campfires on the Preserve, and preventing vehicles from parking over grass or other vegetation. The County should conduct post-fire monitoring at a minimum within the first three (3) years following significant fires; the first two (2) growing seasons after the fire is preferable. Elements to monitor include sensitive plant populations, existing or potential erosion threats (to life, property, or natural resources), and animal movement. More details regarding post-fire monitoring will be provided in the fire management section of the Vegetation Management Plan being developed for the Preserve.

5.7 Wildlife Linkages and Corridors

The primary function of wildlife corridors is to provide migration routes between core biological areas. In some cases, wildlife corridors may also serve as habitat for various life history requirements (e.g., foraging, reproduction, growth). Target species for corridor use include large mammals, such as coyotes and southern mule deer. Corridor use by mammals will be monitored as described below.

A program to monitor corridor use by mammals is established within the existing South County MSCP area (Conservation Biology Institute 2003). As the Preserve is part of a larger area of conserved open space, there are no defined habitat linkages present on site. There are preferred wildlife movement areas, including roads, trails, and streambeds that can be monitored by track identification, scat identification, and video observation to determine use by target mammal species. Camera locations 1 through 4 were placed at these sorts of movement corridors.

5.8 Additional Management Recommendations

5.8.1 Public Access

Public access is not currently allowed in the Preserve. Passive recreational activities (e.g., hiking, bird watching, equestrian use) are being considered and will be discussed in the Public Access Plan that will be prepared for the Preserve. In general, passive activities only pose a significant threat to

biological resources when the level of recreational use becomes too intense in areas where sensitive species or resources are located.

5.8.2 Fencing

Fencing plays an important role in the use of the landscape by humans, domestic animals, and wildlife. Fencing can control human access, particularly by off-highway vehicles. Fencing can direct wildlife to road undercrossings and prevent road kills. However, fencing can also have an impact on cultural resources, restrict normal wildlife movement, restrict access to food and water, and guide wildlife onto roads. Currently, fencing is located around the grassland at the southeastern side of the site which is being used for cattle grazing and along the southern border of the site, and at other scattered locations along the eastern side. Fencing recommendations will be provided in the vegetation management plan. Fencing may be recommended within the Engelmann oak woodlands to exclude cattle to allow for recruitment of Engelmann Oak seedlings.

5.8.3 Trails and Access Roads

Ensure passive recreational use of the Preserve is consistent with the protection and enhancement of biological resources. Passive recreational facilities should be managed to promote the maintenance of habitat value surrounding these facilities and reduce impacts to the conserved resources.

5.8.4 Signage and Education

Signs educate, provide direction, and promote the sensitive use and enjoyment of natural areas, but they can also inadvertently invite vandalism and other destructive behavior. Signs that explain the rules of the Preserve (e.g., firearms use, protection of archaeological resources) are most effective at staging areas and trail heads. Educational signs along the multi-use trails should be posted at appropriate locations.

Signage does not currently exist in the Preserve as the Preserve is currently not open to the public. Signage recommendations will be included in the Public Access Plan that will be prepared for the Preserve.

5.8.5 Litter/Trash Removal

Management of the Preserve should include implementation of a litter and trash removal program. The purpose of this program would be to ensure that contaminants do not negatively affect the conserved resources within the Preserve.

5.8.6 Illegal Off-road Activity

Off-road activities can result in a significant detrimental effect on the conserved resources within the Preserve by reducing air quality, causing soil erosion and sedimentation into local waters, creating noise pollution, and causing habitat degradation. Disturbance from off-road vehicles can also disrupt breeding activities. For these reasons, off-road vehicle use is not compatible in Preserve areas. The fences and gates within the Preserve should be maintained to prevent illegal access.

5.8.7 Emergency and Safety Issues

Safety measures will be implemented within the Preserve as needed. These measures may include installing safety signs and identifying emergency evacuation procedures, such as vehicular access and helicopter landing areas. The Preserve is not open at night, so safety lighting is not necessary.

Chapter 6
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Appendix A

Vascular Plant Species Detected

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Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status
LYCOPHYTES			
Selaginellaceae - Spike-moss family			
Selaginella bigelovii	Bushy spike-moss		
Selaginella cinerascens	Ashy spike-moss	CRPR 4.1	SDC Group D
FERNS			
Dryopteridaceae - Wood Fern family			
Dryopteris arguta	Coastal woodfern		
Polystichum californicum	California swordfern		
Ophioglossaceae - Adder's-tongue family			
Ophioglossum californicum	California adder's-tongue	CRPR 4.2	SDC Group D
Polypodiaceae - Polypody family			
Polypodium californicum	California polypody		
Pteridaceae - Brake family			
Aspidotis californica	California lace fern		
Cheilanthes clevelandii	Cleveland's lip fern		
Cheilanthes newberryi	Newberry's lip fern		
Pellaea andromedifolia	Coffee fern		
Pellaea mucronata var. mucronata	Bird's foot cliff brake		
Pentagramma triangularis ssp. triangularis	Goldback fern		
MAGNOLIIDS			
Saururaceae - Lizard's-tail family			
Anemopsis californica	Yerba mansa		
EUDICOTS			
Adoxaceae - Muskroot family			
Sambucus nigra ssp. caerulea	Blue elderberry		
Anacardiaceae - Sumac Or Cashew family			
Malosma laurina	Laurel sumac		
Rhus aromatica	Skunk bush		
Rhus ovata	Sugar bush		
Toxicodendron diversilobum	Western poison oak		
Apiaceae - Carrot family			
Apiastrum angustifolium	Mock parsley		
* *Apium graveolens*	Celery		
Daucus pusillus	American wild carrot		
* *Foeniculum vulgare*	Fennel		

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status
Lomatium dasycarpum ssp. dasycarpum	Woollyfruit desertparsley		
Sanicula bipinnatifida	Purple sanicle		
Tauschia arguta	Southern umbrellawort		
Apocynaceae - Dogbane family			
* *Vinca major*	Greater periwinkle		
Asteraceae - Sunflower family			
Acourtia microcephala	Sacapellote		
Ambrosia psilostachya	Western ragweed		
* *Anthemis cotula*	Mayweed		
Artemisia californica	California sagebrush		
Artemisia douglasiana	Mugwort		
Baccharis pilularis	Coyote brush		
Baccharis salicifolia ssp. salicifolia	Mule fat		
* *Carduus pycnocephalus ssp. pycnocephalus*	Italian thistle		
* *Centaurea melitensis*	Tocalote		
Chaenactis artemisiifolia	White pincushion		
Cirsium occidentale var. californicum	California thistle		
Corethrogyne filaginifolia	Common sand aster		
* *Cotula australis*	Australian cotula		
Deinandra fasciculata	Clustered tarweed		
Encelia californica	California brittlebush		
Erigeron foliosus	Leafy fleabane		
Eriophyllum confertiflorum var. confertiflorum	Golden-yarrow		
Gutierrezia sarothrae	Matchweed		
Hazardia squarrosa var. grindelioides	Sawtooth bristleweed		
* *Hedypnois cretica*	Crete weed		
Helianthus annuus	Common sunflower		
* *Helminthotheca echioides*	Bristly ox-tongue		
Heterotheca grandiflora	Telegraph weed		
* *Hypochaeris glabra*	Smooth cat's-ear		
Isocoma menziesii	Coastal goldenbush		
* *Lactuca serriola*	Prickly lettuce		
* *Logfia gallica*	Daggerleaf cottonrose		
Packera ganderi	Gander's ragwort	SR, CRPR 1B.2	SDC Group A
Pentachaeta aurea ssp. aurea	Golden-Rayed pentachaeta	CRPR 4.2	SDC Group D
Porophyllum gracile	Odora, slender poreleaf		
Pseudognaphalium beneolens	Fragrant everlansting		
Pseudognaphalium biolettii	Two-color rabbit-tobacco		

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status
Pseudognaphalium californicum	Ladies' tobacco		
Pseudognaphalium stramineum	Cottonbatting plant		
* *Senecio vulgaris*	Common groundsel		
* *Sonchus asper ssp. asper*	Prickly sow thistle		
* *Sonchus oleraceus*	Common sow thistle		
Stylocline gnaphaloides	Everlasting neststraw		
Uropappus lindleyi	Silver Puffs		
Boraginaceae - Borage family			
Amsinckia intermedia	Common fiddleneck		
Cryptantha intermedia	Clearwater cryptantha		
Cryptantha muricata var. jonesii	Jones' cryptantha		
Eriodictyon crassifolium var. crassifolium	Thick-leaved yerba santa		
Eucrypta chrysanthemifolia var. chrysanthemifolia	Spotted hideseed		
Nemophila menziesii	Baby blue eyes		
Nemophila menziesii var. integrifolia	Baby blue eyes		
Pectocarya linearis ssp. ferocula	Narrow-toothed pectocarya		
Pectocarya penicillata	Northern pectocarya		
Phacelia cicutaria var. hispida	Caterpillar phacelia		
Phacelia parryi	Parry's phacelia		
Plagiobothrys tenellus	Pacific popcornflower		
Brassicaceae - Mustard family			
* *Brassica nigra*	Black mustard		
Cardamine californica	Milk maids, tooth wort		
Caulanthus heterophyllus	San Diego wild cabbage		
* *Hirschfeldia incana*	Shortpod mustard		
* *Nasturtium officinale*	Water cress		
* *Raphanus sativus*	Radish		
Thysanocarpus curvipes	Sand fringepod		
Cactaceae - Cactus family			
Opuntia littoralis	Coastal prickly-pear		
Caprifoliaceae - Honeysuckle family			
Lonicera subspicata var. denudata	Santa Barbara honeysuckle		
Caryophyllaceae - Pink family			
* *Cerastium glomeratum*	Sticky mouse-ear chickweed		
* *Silene gallica*	Small-flower catchfly		
* *Stellaria media*	Common chickweed		
Cistaceae - Rock-rose family			
Helianthemum scoparium	Peak rush-rose		

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status
Convolvulaceae - Morning-glory family			
Calystegia macrostegia	Island false bindweed		
Cuscuta californica	Chaparral dodder		
Crassulaceae - Stonecrop family			
Crassula connata	Pygmy-weed		
Dudleya edulis	Fingertips		
Dudleya pulverulenta	Chalk dudleya		
Cucurbitaceae - Gourd family			
Marah macrocarpa	Wild cucumber		
Ericaceae - Heath family			
Arctostaphylos glandulosa ssp. glandulosa	Eastwood's manzanita		
Arctostaphylos glauca	Bigberry manzanita		
Xylococcus bicolor	Mission manzanita		
Euphorbiaceae - Spurge family			
Chamaesyce polycarpa	Smallseed sandmat		
Croton setigerus	Turkey-mullein		
Fabaceae - Legume family			
Acmispon glaber var. glaber	Common deerweed		
Acmispon strigosus	Strigose bird's-foot trefoil		
Lathyrus vestitus var. alefeldii	San Diego Sweet Pea		
Lupinus bicolor	Miniature lupine		
Lupinus hirsutissimus	Stinging lupine		
Lupinus sparsiflorus	Coulter's lupine		
Lupinus truncatus	Collared annual lupine		
* *Medicago polymorpha*	California burclover		
Trifolium depauperatum var. amplectens	Pale sack clover		
Trifolium willdenovii	Tomcat clover		
* *Vicia benghalensis*	Purple vetch		
* *Vicia villosa*	Hairy vetch		
Fagaceae - Oak family			
Quercus ×acutidens	Torrey's scrub oak		
Quercus agrifolia var. agrifolia	Coast live oak		
Quercus berberidifolia	Scrub oak		
Quercus engelmannii	Engelmann oak	CRPR 4.2	SDC Group D
Quercus wislizeni var. frutescens	Interior live oak		
Gentianaceae - Gentian family			
Zeltnera venusta	California centaury		

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status
Geraniaceae - Geranium family			
* *Erodium botrys*	Longbeak stork's bill		
* *Erodium cicutarium*	Redstem filaree		
Geranium carolinianum	Carolina geranium		
Grossulariaceae - Gooseberry family			
Ribes indecorum	White-flowering currant		
Lamiaceae - Mint family			
Lepechinia cardiophylla	Heart-leaved pitcher sage	CRPR 1B.2	SDC Group A, MSCP
* *Marrubium vulgare*	Horehound		
Monardella hypoleuca ssp. lanata	Felt-leaved monardella	CRPR 1B.2	
Salvia apiana	White sage		
Salvia clevelandii	Fragrant sage		
Salvia columbariae	Chia		
Salvia mellifera	Black sage		
Scutellaria tuberosa	Danny's skullcap		
Stachys ajugoides	Bugle hedgenettle		
Lythraceae - Loosestrife family			
* *Lythrum hyssopifolia*	Grass Poly		
Malvaceae - Mallow family			
Malacothamnus densiflorus	Yellowstem bush-mallow		
* *Malva parviflora*	Cheeseweed		
Sidalcea malviflora ssp. malviflora	Dwarf checkerbloom		
Montiaceae - Miner's Lettuce family			
Claytonia parviflora	Streambank springbeauty		
Claytonia perfoliata ssp. perfoliata	Miner's lettuce		
Myrsinaceae - Myrsine family			
* *Anagallis arvensis*	Scarlet pimpernel		
Myrtaceae - Myrtle family			
* *Eucalyptus globulus*	Blue gum		
* *Eucalyptus polyanthemos*	Silver dollar gum, red box		
Nyctaginaceae - Four O'clock family			
Mirabilis laevis	Wishbone-bush		
Oleaceae - Olive family			
* *Olea europaea*	Olive		
Onagraceae - Evening Primrose family			
Camissoniopsis micrantha	Miniature suncup		
Clarkia purpurea ssp. purpurea	Winecup clarkia		
Epilobium canum	California fuchsia		

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status
Orobanchaceae - Broom-rape family			
Castilleja exserta	Purple owl's-clover		
Cordylanthus rigidus ssp. setigerus	Stiffbranch bird's-beak		
Pedicularis densiflora	Warrior's plume		
Paeoniaceae - Peony family			
Paeonia californica	California peony		
Papaveraceae - Poppy family			
Dendromecon rigida	Bush poppy		
Eschscholzia californica	California poppy		
Phrymaceae - Lopseed family			
Mimulus aurantiacus var. parviflorus	Coast monkey flower		
Mimulus guttatus	Seep monkeyflower		
Mimulus pilosus	Downy Monkey Flower		
Plantaginaceae - Plantain family			
Antirrhinum nuttallianum ssp. nuttallianum	Nuttall's Snapdragon		
Keckiella cordifolia	Heartleaf keckiella		
Nuttallanthus texanus	Blue toadflax		
Penstemon spectabilis var. spectabilis	Showy Penstemon		
Plantago erecta	Dotseed plantain		
Platanaceae - Plane Tree, Sycamore family			
Platanus racemosa	Western sycamore		
Polemoniaceae - Phlox family			
Eriastrum sapphirinum	Sapphire woollystar		
Navarretia hamata	Hooked pincushionplant		
Polygonaceae - Buckwheat family			
Chorizanthe fimbriata var. fimbriata	Fringed spineflower		
Chorizanthe procumbens	Prostrate spineflower		
Eriogonum fasciculatum var. foliolosum	Leafy California buckwheat		
Rumex californicus	Toothed willow dock		
* *Rumex crispus*	Curly dock		
Primulaceae - Primrose family			
Dodecatheon clevelandii	Padre's shooting star		
Ranunculaceae - Buttercup family			
Clematis pauciflora	Southern California clematis		
Delphinium cardinale	Cardinal or scarlet larkspur		
Delphinium parryi ssp. parryi	Parry's larkspur		
Thalictrum fendleri var. polycarpum	Fendler's meadow-rue		

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status
Resedaceae - Mignonette family			
* *Reseda luteola*	Dyer's rocket		
Rhamnaceae - Buckthorn family			
Ceanothus leucodermis	Chaparral whitethorn		
Ceanothus oliganthus var. oliganthus	Hairy Ceanothus		
Ceanothus tomentosus	Ramona lilac		
Rhamnus ilicifolia	Hollyleaf redberry		
Rosaceae - Rose family			
Adenostoma fasciculatum var. fasciculatum	Chamise		
Cercocarpus minutiflorus	San Diego mountain mahogany		
Drymocallis glandulosa	Sticky cinquefoil		
Heteromeles arbutifolia	Toyon		
Horkelia truncata	Ramona horkelia	CRPR 1B.3	SDC Group A
Prunus ilicifolia ssp. ilicifolia	Islay, holly-leafed cherry		
Rosa californica	California rose		
Rubus ursinus	California blackberry		
Rubiaceae - Madder family			
Galium angustifolium ssp. angustifolium	Narrowleaf bedstraw		
Galium nuttallii ssp. nuttallii	Climbing bedstraw		
Rutaceae - Rue family			
Cneoridium dumosum	Bushrue		
Salicaceae - Willow family			
Salix laevigata	Red willow		
Saxifragaceae - Saxifrage family			
Jepsonia parryi	Parry's jepsonia		
Lithophragma affine	San francisco woodland-star		
Scrophulariaceae - Figwort family			
Scrophularia californica	California figwort		
Solanaceae - Nightshade family			
Solanum parishii	Parish's nightshade		
Styracaceae - Storax family			
Styrax redivivus	Drug snowbell		
Tamaricaceae - Tamarisk family			
* *Tamarix ramosissima*	Saltcedar		
Violaceae - Violet family			
Viola pedunculata	Johnny-jump-up		
Viscaceae - Mistletoe family			
Phoradendron serotinum ssp. macrophyllum	Big-leaf mistletoe		

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status
Vitaceae - Grape family			
Vitis girdiana	Desert wild grape		
MONOCOTS			
Agavaceae - Century Plant family			
Chlorogalum parviflorum	Smallflower soap plant		
Hesperoyucca whipplei	Chaparral yucca		
Yucca schidigera	Mojave yucca		
Alliaceae - Onion or Garlic family			
Allium haematochiton	Redskin onion		
Arecaceae - Palm family			
* *Phoenix canariensis*	Canary Island palm		
* *Washingtonia robusta*	Mexican fan palm		
Cyperaceae - Sedge family			
Carex praegracilis	Black creeper		
Carex triquetra	Trigonous sedge		
Cyperus eragrostis	Tall flatsedge		
Eleocharis montevidensis	Sand spikerush		
Schoenoplectus californicus	Southern bulrush		
Iridaceae - Iris family			
Sisyrinchium bellum	Western blue-eyed-grass		
Juncaceae - Rush family			
Juncus bufonius var. bufonius	Toad rush		
Juncus dubius	Mariposa rush		
Liliaceae - Lily family			
Calochortus splendens	Splendid mariposa lily		
Calochortus weedii	Weed's mariposa lily		
Melanthiaceae - False-Hellebore family			
Toxicoscordion fremontii	Fremont's deathcamas		
Orchidaceae - Orchid family			
Piperia cooperi	Chaparral rein orchid	CRPR 4.2	SDC Group D
Poaceae - Grass family			
* *Aira caryophyllea*	Silver hair grass		
* *Avena barbata*	Slender wild oat		
Bothriochloa barbinodis	Cane bluestem		
* *Briza maxima*	Rattlesnake grass		
* *Briza minor*	Annual quaking grass		
* *Bromus diandrus*	Ripgut grass		

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status
* *Bromus hordeaceus*	Soft chess		
* *Bromus madritensis ssp. rubens*	Red brome		
* *Cortaderia jubata*	Purple pampas grass		
* *Cynodon dactylon*	Bermuda grass		
* *Ehrharta calycina*	Perennial veldt grass		
Elymus condensatus	Giant wild-rye		
Elymus glaucus ssp. glaucus	Blue wildrye		
* *Festuca myuros*	Rattail sixweeks grass		
* *Festuca perennis*	Rye grass		
* *Hordeum murinum ssp. glaucum*	Smooth barley		
Melica imperfecta	Little California melica		
Muhlenbergia rigens	Deer grass		
* *Pennisetum setaceum*	Crimson fountain grass		
* *Poa annua*	Annual blue grass		
* *Polypogon monspeliensis*	Annual beard grass		
* *Schismus barbatus*	Common mediterranean grass		
Stipa cernua	Nodding needle grass		
Stipa coronata	Crested needle grass		
Stipa pulchra	Purple needle grass		
Themidaceae - Brodiaea family			
Bloomeria crocea var. crocea	Common goldenstar		
Brodiaea orcuttii	Orcutt's brodiaea	CRPR 1B.1	SDC Group A, MSCP
Dichelostemma capitatum ssp. capitatum	Blue dicks		
Muilla maritima	Common muilla		
Typhaceae - Cattail family			
Typha latifolia	Broad-leaved cattail		

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status

Legend

*= Non-native or invasive species

Special Status:

Federal:
FE = Endangered
FT = Threatened

State:
SE = Endangered
ST =Threatened
SR = Rare

CRPR – California Rare Plant Rank
1A. Presumed extinct in California
1B. Rare or Endangered in California and elsewhere
2. Rare or Endangered in California, more common elsewhere
3. Plants for which we need more information - Review list
4. Plants of limited distribution - Watch list

Threat Ranks
.1 - Seriously endangered in California
.2 – Fairly endangered in California
.3 – Not very endangered in California

San Diego County Group (SDC Group)
A – Rare, threatened or endangered in California and elsewhere
B – Rare, threatened or endangered in California but more common elsewhere
C – Maybe quite rare, but more information is needed to determine their status
D – Limited distribution and are uncommon but not presently rare or endangered

MSCP = Multiple Species Conservation Program Covered Species

Appendix B

Potentially Occurring Sensitive Species: Plants

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Appendix B. Sensitive Plant Species with Potential to Occur

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
San Diego thornmint (*Acanthomintha ilicifolia*)	FT/CE CRPR List 1B.1 SD County Group A	Grassy openings in chaparral and coastal sage scrub, valley and foothill grassland, vernal pools. Prefers friable or broken clay soils. 10-960m. Blooming period: April-June	No	Low	Appropriate microhabitat for this species within the preserve is of marginal quality.
California adolphia (*Adolphia californica*)	CRPR List 2B.1 SD County Group B	Chaparral, coastal scrub, valley and foothill grassland. 45-740m Blooming period: Dec-May	No	Low	This species is typically found in the coastal plain. Study area is above the typical elevation range of the species.
Singlewhorl burrobush (*Ambrosia monogyra*)	CRPR List 2B.2	Chaparral and Sonoran desert scrub in sandy soil 10-500m Blooming period: Aug-Nov	No	None	Species occurs outside the elevation range of the study area.
San Diego ambrosia (*Ambrosia pumila*)	FE CRPR List 1B.1 SD County Group A	Chaparral, coastal sage scrub, valley and foothill grassland, vernal pools, often in disturbed areas. Can occur in creek beds, seasonally dry drainages, and floodplains. 20-415m Blooming period: Apr-Oct	No	Low	Study area is at the edge of the range of this species and habitat onsite is of marginal quality.
Del Mar Manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*)	FE CRPR List 1B.1 SD County Group A	Low growing chaparral with eroding sandstone as substrate. 0-365m Blooming period: Dec-Jun	No	None	Species occurs outside the elevation range of the study area.
San Diego sagewort (*Artemisia palmeri*)	CRPR List 4.2 SD County Group D	Chaparral, coastal scrub, riparian habitats in sandy soil 15-915m Blooming period: Feb-Sept	No	Moderate	Habitat requirements are present in the study area and are of good quality.
Dean's milkvetch (*Astragalus deanei*)	CRPR List 1B.1 SD County Group A	Open shrubby slopes. Associated with coastal sage scrub, chaparral, and sandy washes. 75-695m Blooming period: Feb-May	No	Moderate	Habitat requirements are present in the study area and are of good quality.
San Diego milk-vetch (*Astragalus oocarpus*)	CRPR List 1B.2 SD County Group A	Openings in chaparral and oak woodland. 600-1500m (1968-4921ft). Blooming period: May-Aug	No	Moderate	Habitat requirements are present in the study area and are of good quality.
Coulter's saltbush (*Atriplex coulteri*)	CRPR List 1B.2 SD County Group A	Coastal habitats and valley foothill grassland in alkaline or clay soils 3-460m Blooming period: Mar-Oct	No	Low	Required habitat is not present in the study area.
Parish brittlescale (*Atriplex parishii*)	CRPR List 1B.1 SD County Group A	Chenopod scrub, playas, vernal pools. 25-1900m Blooming period: Jun-Oct	No	Low	Required habitat is not present in the study area.
Encinitas baccharis (*Baccharis vanessae*)	FT/CE CRPR List 1B.1 SD County Group A	Generally coastally influenced chaparral and, cismontane woodland. 60-720m Blooming period: Aug-Nov	No	Moderate	Habitat requirements are present in the study area and are of good quality. This species has been observed on the flank of Mt. Woodson.

Appendix B. Sensitive Plant Species with Potential to Occur *Continued*

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
San Diego goldenstar *(Bloomeria clevelandii)*	CRPR List 1B.1 SD County Group A MSCP	Openings in chaparral or coastal scrub;, grasslands and vernal pools in clay soils. 50-465m Blooming period: Apr-May	No	Moderate	Suitable microhabitats present on-site. Observed in chaparral to the south of the study area.
Thread-leaved brodiaea (*Brodiaea filifolia*)	FT/CE CRPR List 1B.1 SD County Group A MSCP	Openings in cismontane woodlands, chaparral, and coastal scrub, playas, grasslands, and vernal pools, often in clay soils 25-1120m Blooming period: Mar-Jun	No	Low	Some habitat requirements are present in the study area and are of moderate quality, soil conditions where this specie s is usually found is not present in the survey area.
Orcutt's brodiaea (*Brodiaea orcuttii*)	CRPR List 1B.1 SD County Group A MSCP	Moist grasslands, near streams and the periphery of vernal pools. 0-1600m (0-5249ft). Blooming period: May-July	**Yes**	Present	This species was found during surveys.
Round-leaved filaree (*California macrophylla*)	CRPR List 1B.1 SD County Group B	Cismontane woodland, valley and foothill grassland in clay soils. 15-1200m Blooming period: Mar-May	No	Low	Appropriate microhabitat for this species within the preserve is of marginal quality.
Lakeside ceanothus (*Ceanothus cyaneus*)	CRPR List 1B.2 SD County Group A	Closed-cone coniferous forest, dense chaparral. 235-755m Blooming period: Apr-Jun	No	High	Habitat requirements are present in the study area and are of good quality. Present on the southern section of the Boulder Oaks Preserve.
Wart-stemmed ceanothus (*Ceanothus verrucosus*)	CRPR List 2B.2 SD County Group B	Chaparral. 1-380m Blooming period: Dec-May	No	None	Coastal species: Species occurs outside the elevation range of the study area.
Southern tarplant (*Centromadia parryi* ssp *australis*)	CRPR List 1B.1 SD County Group A	Marshes and swamps, valley and foothill grassland(mesic), vernal pools 0-425m Blooming period: May-Nov	No	Moderate	Appropriate soils and habitats present within the study area. Large population present at Ramona Grasslands Preserve.
Smooth tarplant (*Centromadia pungens* ssp. *laevis*)	CRPR List 1B.1 SD County Group A	Chenopod scrub, meadows and seeps, playas, riparian woodland, valley and foothill grassland 0-640m Blooming period: Apr-Sept	No	Low	Some habitat requirements are present in the study area and are of low to moderate quality.
Southern mountain misery (*Chamabaetia australis*)	CRPR List 4.2 SD County Group D	Chaparral, cismontane woodland, coastal scrub, riparian woodland, valley & foothill grassland, in gabbroic or meta-volcanic substrate, 120-1,005 m. Blooming period: Nov-May	No	Moderate	Required habitat is present in the study area but limited amount of appropriate soils. Present on the southern section of the Boulder Oaks Preserve.
Peninsular spineflower (*Chorizanthe leptotheca*)	CRPR List 4.2 SD County Group D	Chaparral, coastal scrub, and montane coniferous forests in alluvial fans and granitic soil. 300-1900m (984-6234ft). Blooming period: May-Aug	No	Moderate	Some habitat is present in the study area but not the soils this species is typically found with. SDNHM voucher records from just west of the Preserve.

Appendix B. Sensitive Plant Species with Potential to Occur *Continued*

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
Long spined-spine flower (*Chorizanthe polygonoides* var. *longispina*)	CRPR List 1B.2 SD County Group A	Clay lenses, largely devoid of shrubs. Occasionally seen on the periphery of vernal pool habitat and the periphery of montane meadows near vernal seeps. Below 1400m (4593ft). Blooming period: Apr-Jul	No	Low	Appropriate microhabitat for this species within the preserve is of marginal quality.
Delicate clarkia (*Clarkia delicata*)	CRPR List 1B.2 SD County Group A	Oak woodlands and chaparral often in gabbro soils. 235-1000m (770-3280ft). Blooming period: Apr-Jun	No	High	CNDDB records from oak woodland along Mussey Creek. Suitable habitat present with the Preserve.
San Miguel savory (*Clinopodium chandleri*)	CRPR List 1B.2 SD County Group A MSCP	Chaparral, cismontane woodland, coastal scrub, riparian woodland, and grasslands in rocky, gabbro, or metavolcanic soils 120-1075m Blooming period: Mar-Jul	No	High	Observed in the understory of chaparral on the southern section of the Boulder Oaks Preserve.
Summer holly (*Comarostaphylis diversifolia* var. *diversifolia*)	CRPR List 1B.2 SD County Group A	Southern mixed chaparral, usually on mesic north-facing slopes. Almost the entire population occurs west of Interstate 15. 100-550m (328-1804ft). Blooming period: Apr-Jun	No	Low	Although soils and habitat are appropriate for this species, this is at the edge of the species range.
Variegated dudleya (*Dudleya variegata*)	CRPR List 1B.2 SD County Group A MSCP	Openings in chaparral, cismontane woodland, and coastal sage scrub, isolated rocky substrates in open grasslands, and vernal pools 3-580m Blooming period: Apr-Jun	No	Moderate	Habitat requirements are present, but typical soils found with this species are of marginal quality in the study area.
Palmer's goldenbush (*Ericameria palmeri* var. *palmeri*)	CRPR List 1B.1 SD County Group B MSCP	Coastal drainages, in mesic chaparral sites, or rarely in coastal sage scrub. Below 600m (1969ft). Blooming period: Jul-Nov	No	Low	Habitat requirements are marginally found in the study area.
Vanishing wild buckwheat (*Eriogonum evanidum*)	CRPR List 1B.1	Chaparral, cismontane woodland, lower montane coniferous forests, and pinyon/juniper woodland in sandy or gravelly soils. 1100-2225m Blooming period: Jul-Oct	No	Moderate	Some habitat requirements are present in the study area and are of good quality
San Diego button-celery (*Eryngium aristulatum var. parishii*)	FE/CE CRPR List 1B.1 SD County Group A	Vernal Pools, coastal sage scrub, valley and foothill grassland in mesic soils 20-620m Blooming period: Apr-Jun	No	None	Required vernal pools are not present in the study area.
San Diego barrel cactus (*Ferocactus viridescens*)	CRPR List 2B.1 SD County Group B MSCP	Chaparral, coastal scrub, grasslands and vernal pools in sandy to rocky areas. 10–150m (33-492ft). Blooming period: May-Jun	No	Low	Coastal species. Above and outside of the normal range of this species.
Mission canyon bluecup (*Githopsis diffusa ssp. filicaulis*)	CRPR List 3.1 SD County Group C	Isolated, open areas in chaparral in mesic and disturbed areas 450-700m Blooming period: Apr-Jun	No	Low	Required soils are not present in the study area.

Appendix B. Sensitive Plant Species with Potential to Occur *Continued*

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
Palmer's grappling hook (*Harpagonella palmeri*)	CRPR List 4.2 SD County Group D	Chaparral, coastal scrub, grasslands in clay soils 197-8924m (60 to 2720ft). Blooming period: Mar-May	No	Moderate	Appropriate microhabitat present.
Tecate cypress (*Hesperocyparis forbesii*)	CRPR List 1B.1 SD County Group A	Coniferous forests and chaparral in clay, gabbro, or meta-volcanic soils 80-1500m	No	None	Required soils are not present in the study area.
Graceful tarplant (*Holocarpha virgata ssp. elongata*)	CRPR List 4.3 SD County Group D	Chaparral, coastal sage and grasslands	No	High	Found in high frequency in grasslands in the vicinity (Ramona). Suitable habitat present on the Preserve.
Ramona horkelia (*Horkelia truncata*)	CRPR List 1B.3 SD County Group A	Open chamise chaparral between 400-1300m (1312-4265ft). Blooming period: May-Jun	**Yes**	Present	This species was found during surveys.
Decumbent goldenbush (*Isocoma menziesii* var. *decumbens*)	CRPR 1B.2 SD County Group A	Chaparral, coastal scrub often in sandy disturbed areas 10-135m Blooming period: Apr-Nov	No	None	Coastal species: Species occurs outside the elevation range of the study area.
San Diego marsh-elder (*Iva hayesiana*)	CRPR List 2B.2 SD County Group B	Marshes and swamps, playas, creeks or intermittent streambeds 10-500m Blooming period: Apr-Oct	No	Low	Required habitat is not present in the study area.
Heart-leaf pitcher sage (*Lepechinia cardiophylla*)	CRPR List 1B.2 SD County Group A MSCP	Closed-cone coniferous forest, chaparral, cismontane woodland 520-1370m Blooming period: Apr-Jul	**Yes**	Present	This species was found during surveys.
Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*)	CRPR List 4.3 SD County Group A	Openings in chaparral and sage scrub, generally well away from the coast in Southern California in the foothill elevations. Below 885m. Blooming period: Jan-Jul	No	High	Habitat requirements are present in the study area and are of good quality.
Felt-leaf monardella (*Monardella hypoleuca* var. *lanata*)	CRPR List 1B.2 SD County Group A MSCP	Chamise chaparral understory. 300-1000m (984-3280 ft). Blooming period: Jun-Aug	**Yes**	Present	This species was found during surveys.
Willowy monardella (*Monardella viminea*)	FE/CE CRPR List 1B.1 SD County Group A MSCP	Chaparral, coastal scrub, riparian forest, riparian scrub, riparian woodland, alluvial ephemeral washes, usually at sandy locales in seasonally dry washes 50-225m Blooming period: Jun-Aug	No	Moderate	Drainages within the site are isolated from nearest populations at Sycamore Canyon. Drainages onsite are marginally suitable.
Little mousetail (*Myosurus minimus ssp. apus*)	CRPR List 3.1 SD County Group C	Vernal pools 20-640m Blooming period: Mar-Jun	No	None	Required vernal pool habitat is not present in the study area.
Spreading navarretia (*Navarretia fossalis*)	FT CRPR List 1B.1 SD County Group A MSCP	Chenopod scrub, marshes and swamps, vernal pools 30-655m Blooming period: Apr-Jun	No	None	Required vernal pool habitat is not present in the study area.

Appendix B. Sensitive Plant Species with Potential to Occur *Continued*

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
Dehesa beargrass (*Nolina interrata*)	CE CRPR List 1B.1 SD County Group A MSCP	Open southern mixed chaparral and chamise chaparral in gabbro, meta-volcanic, or serpentine soils. 200-700m (656-2296ft). Blooming period: Jun-Jul	No	None	Required soils are not present in the study area. Outside of the species known geographic range.
California adder's-tongue (*Ophioglossum californicum*)	CRPR List 4.2 SD County Group D	Chaparral, valley & foothill grassland, vernal pool margins, 60-300 m.	**Yes**	Present	This species was found during surveys.
Gander's ragwort (*Packera ganderi*)	CR CRPR List 1B.2 SD County Group A	Openings in chaparral on metavolcanic, mafic or gabbro soils. 400-1200m Blooming period: Apr-Jun	**Yes**	Present	This species was found during surveys.
Golden-rayed pentacheata (Pentacheata aurea ssp. *aurea)*	CRPR List 4.2 SD County Group D	Chaparral, cismontane woodland, coastal scrub, coniferous forest, riparian woodland, grasslands 80-1850m Blooming period: Mar-Jul	**Yes**	Present	This species was found during surveys.
Cooper's rein orchid (*Piperia cooperi*)	CRPR List 4.2 SD County Group D	Chaparral, cismontane woodland, grasslands 15-1585m Blooming period: Mar-Jun	**Yes**	Present	This species was found during surveys.
San Diego mesa mint (*Pogogyne abramsii*)	FE/CE CRPR List 1B.1 SD County Group A MSCP	Clay pan vernal pools in central San Diego County 90-200m Blooming period: Mar-Jul	No	None	Required habitat is not present in the study area.
Nuttall's scrub oak (*Quercus dumosa*)	CRPR List 1B.1 SD County Group A	Coastal chaparral with a generally open canopy cover 15-400m Blooming period: Feb-Aug	No	Low	This species typically occurs within the coastal plain.
Engelmann oak (*Quercus engelmannii*)	CRPR List 4.2 SD County Group D	Oak woodland, southern mixed chaparral, and savannah grasslands of the interior valleys and slopes. Below 1300m (4265ft). Blooming period: Mar-Jun	**Yes**	Present	This species was found during surveys.
Moreno currant (*Ribes canthariforme*)	CRPR List 1B.3 SD County Group A	Chamise chaparral and riparian scrub. 500-1200m (1640-3937ft). Blooming period: Feb-Apr	No	Low	While habitat requirements are present in the study area and are of good quality, the study area is outside of the known range of the species.
Ashy spike-moss (*Selaginella cinerascens*)	CRPR List 4.1 SD County Group D	Chaparral and coastal scrub 20-640m	**Yes**	Present	This species was found during surveys.
Rayless ragwort (*Senecio aphanactis*)	CRPR List 2B.2 SD County Group B	Coastal sage scrub, chaparral, cismontane woodland, alkaline flats 15-800m Blooming period: Jan-Apr	No	Low	Extraordinarily scarce throughout range.
Hammitt's clay-cress (*Sibaropsis hammittii*)	CRPR List 1B.2 SD County Group A	Chaparral, valley and foothill grassland in clay soils 720-1065m Blooming period: Mar-Apr	No	None	Required soils are not present in the study area. This species has a restricted distribution.

Appendix B. Sensitive Plant Species with Potential to Occur *Continued*

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
Blue streamwort (*Stemodia durantifolia*)	CRPR List 2B.1 SD County Group B	Sonoran desert scrub, riparian woodland, often in mesic sandy soils 180-300m Blooming period: Jan-Dec	No	Moderate	Habitat requirements are found in the drainages within the study area.
Parry's tetracoccus (*Tetracoccus dioicus*)	CRPR List 1B.2 SD County Group A MSCP	Chamise chaparral and coastal scrub. Below 1000m (3280ft). Blooming period: Apr-May	No	Moderate	Habitat requirements are present in the study area and are of good quality. This species is uncommon in the vicinity.
Rush chaparral-star (*Xanthisma junceum*)	CNPS List 4 SDC Group D	Low growing chamise chaparral and Diegan sage scrub communities. Blooming period: July - January	No	High	Suitable habitat present on the Preserve. Found in chaparral on Ramona Grasslands Preserve.

Appendix B. Sensitive Plant Species with Potential to Occur *Continued*

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale

Legend:

Status:

Federal
FE - Listed as endangered under the federal Endangered Species Act.
FT - Listed as threatened under the federal Endangered Species Act.
FC – Candidate for listing under the federal Endangered Species Act.

State
SE - Listed as endangered under the California Endangered Species Act.
ST – Listed as threatened under California Endangered Species Act.
SR – Listed as rare under California Endangered Species Act.

CA Rare Plant Rank (CRPR) – Formerly known as CNPS List
1A. Presumed extirpated in California, and either rare or extinct elsewhere
1B. Rare, Threatened, or Endangered in California and elsewhere
2A. Presumed extripated in California, more common elsewhere
2B. Rare, Threatened,or Endangered in California, more common elsewhere
3. Plants for which we more information is needed - Review list
4. Plants of limited distribution - Watch list
Threat Ranks
.1 - Seriously endangered in California
.2 – Fairly endangered in California
.3 – Not very endangered in California

San Diego County Group
Plants
A – Rare, threatened or endangered in California and elsewhere
B – Rare, threatened or endangered in California but more common elsewhere
C – Maybe quite rare, but more information is needed to determine their status
D – Limited distribution and are uncommon but not presently rare or endangered
Animals
Group 1 - includes those that have a very high level of sensitivity, either because they are listed as threatened or endangered or because they have very specific natural history requirement that must be met.
Group 2 - includes those species that are becoming less common, but are not yet so rare that extirpation or extinction is imminent without immediate action.
MSCP – Covered Species under the MSCP South County Subarea Plan

References:
Special Status plant information from CDFW 2013. Nomenclature and plant descriptions from: CNPS Online Inventory, Calflora.org, Baldwin 2012, Lightner 2011, Reiser 2001, Roberts 1989. Range information from CNDDB 2013, CNPS 2013, and SDNHM Plant Atlas Project 2013.

Special Status animal information from CDFW 2013. Nomenclature and invertebrate descriptions from USFWS 2008. Nomenclature and vertebrate descriptions from AOU 1998 and supplements, Collins and Taggart 2012, Baker et.al. 2003, Wilson and Cole 2005, Unitt 2004.

Appendix C

Wildlife Species Detected

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Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status
INVERTEBRATES			
Arachnids			
Pseudouroctonus angelenus	Los Angeles Scorpion		
Pardosa sp.	Wolf Spider		
**Latrodectus geometricus*	Brown Widow		
Branchiopods			
**Armadillidium vulgare*	Common Pillbug		
Insects			
Trimerotropis pallidipennis	Pallid-winged Grasshopper		
Ceuthophilus hesperus	San Diego Camel Cricket		
Gryllus sp.	Field Cricket		
Stenopelmatus fuscus	Dark Jerusalem Cricket		
Phloeodes diabolicus	Diabolical Ironclad Beetle		
Eleodes armatus	Armored Darkling Beetle		
**Linepithema humile*	Argentine Ant		
Dasymutilla coccinea	Red Velvet-Ant		
Pepsis / Hemipepsis sp.	Tarantula Hawk Wasp		
Moths, Skippers and Butterflies			
Papilio rutulus	Western Tiger Swallowtail		
Papilio eurymedon	Pale Swallowtail		
Pontia protodice	Checkered White		
Anthocharis sara	Pacific Orangetip		
Zerene eurydice	California Dogface		
Phoebis sp.	Sulphur		
Callophrys affinis	Western Green Hairstreak		
Callophrys agustinus	Brown Elfin		
Glaucopsyche lygdamus	Silvery Blue		
Icaricia acmon	Acmon Blue		
Vanessa atalanta	Red Admiral		
Vanessa cardui	Painted Lady		

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status
Vanessa annabella	West Coast Lady		
Coenonympha tullia	Common Ringlet		
Erynnis sp.	Duskywing		
Erynnis funeralis	Funereal Duskywing		
VERTEBRATES			
Amphibians			
Anaxyrus boreas	Western Toad		
Pseudacris cadaverina	California Treefrog		
Pseudacris hypochondriaca	Baja California treefrog		
**Lithobates catesbeiana*	Bullfrog		
Reptiles			
Elgaria multicarinata	Southern Alligator Lizard		
Phrynosoma blainvillii	Coast Horned Lizard	CSC	SDC Group II, MSCP
Sceloporus occidentalis	Western Fence Lizard		
Sceloporus orcutti	Granite Spiny Lizard		
Uta stansburiana	Side-blotched Lizard		
Plestiodon gilberti rubricaudatis	Western Red-tailed Skink		
Plestiodon skiltonianus interparietalis	Coronado Skink	CSC	SD County Group II
Aspidoscelis tigris multiscutatus	Coastal Western Whiptail		SD County Group II
Lampropeltis getula	Common Kingsnake		
Coluber lateralis lateralis	California Whipsnake		
Pituophis catenifer	Gopher Snake		
Crotalus helleri	Southern Pacific Rattlesnake		
Crotalus ruber	Red Diamond Rattlesnake	CSC	SDC Group II
Birds			
Anas platyrhynchos	Mallard		
Oxyura jamaicensis	Ruddy Duck		
Callipepla californica	California Quail		
Podilymbus podiceps	Pied-billed Grebe		
Ardea herodias	Great Blue Heron		SDC Group II
Cathartes aura	Turkey Vulture		SDC Group I
Elanus leucurus	White-tailed Kite	FPS	SD County Group I

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status
Accipiter cooperii	Cooper's Hawk		SDC Group I, MSCP
Buteo lineatus	Red-shouldered Hawk		SDC Group I
Buteo jamaicensis	Red-tailed Hawk		
Fulica americana	American Coot		
Charadrius vociferus	Killdeer		
**Columba livia*	Rock Pigeon		
Zenaida macroura	Mourning Dove		
Geococcyx californianus	Greater Roadrunner		
Tyto alba	Barn Owl		SDC Group II
Megascops kennicottii	Western Screech-Owl		
Bubo virginianus	Great Horned Owl		
Phalaenoptilus nuttallii	Common Poorwill		
Aeronautes saxatalis	White-throated Swift		
Calypte anna	Anna's Hummingbird		
Calypte costae	Costa's Hummingbird		
Melanerpes formicivorus	Acorn Woodpecker		
Picoides nuttallii	Nuttall's Woodpecker		
Colaptes auratus	Northern Flicker		
Contopus sordidulus	Western Wood-Pewee		
Empidonax difficilis	Pacific-slope Flycatcher		
Sayornis nigricans	Black Phoebe		
Sayornis saya	Say's Phoebe		
Myiarchus cinerascens	Ash-throated Flycatcher		
Tyrannus vociferans	Cassin's Kingbird		
Tyrannus verticalis	Western Kingbird		
Vireo gilvus	Warbling Vireo		
Aphelocoma californica	Western Scrub-Jay		
Corvus brachyrhynchos	American Crow		
Corvus corax	Common Raven		
Tachycineta thalassina	Violet-green Swallow		
Stelgidopteryx serripennis	Northern Rough-winged Swallow		

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status
Petrochelidon pyrrhonota	Cliff Swallow		
Baeolophus inornatus	Oak Titmouse		
Psaltriparus minimus	Bushtit		
Sitta carolinensis	White-breasted Nuthatch		
Salpinctes obsoletus	Rock Wren		
Catherpes mexicanus	Canyon Wren		
Thryomanes bewickii	Bewick's Wren		
Troglodytes aedon	House Wren		
Polioptila caerulea	Blue-gray Gnatcatcher		
Regulus calendula	Ruby-crowned Kinglet		
Chamaea fasciata	Wrentit		
Sialia mexicana	Western Bluebird		SDC Group II, MSCP
Turdus migratorius	American Robin		
Mimus polyglottos	Northern Mockingbird		
Toxostoma redivivum	California Thrasher		
**Sturnus vulgaris*	European Starling		
Phainopepla nitens	Phainopepla		
Vermivora celata	Orange-crowned Warbler		
Dendroica coronata	Yellow-rumped Warbler		
Wilsonia pusilla	Wilson's Warbler		
Pipilo maculatus	Spotted Towhee		
Aimophila ruficeps canescens	Southern California Rufous-crowned Sparrow		SDC Group I, MSCP
Melozone crissalis	California Towhee		
Spizella atrogularis	Black-chinned Sparrow		
Chondestes grammacus	Lark Sparrow		
Melospiza melodia	Song Sparrow		
Zonotrichia leucophrys	White-crowned Sparrow		
Zonotrichia atricapilla	Golden-crowned Sparrow		
Junco hyemalis	Dark-eyed Junco		
Pheucticus melanocephalus	Black-headed Grosbeak		
Passerina caerulea	Blue Grosbeak		

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status
Agelaius phoeniceus	Red-winged Blackbird		
**Molothrus ater*	Brown-headed Cowbird		
Icterus bullockii	Bullock's Oriole		
Carpodacus mexicanus	House Finch		
Carduelis psaltria	Lesser Goldfinch		
**Passer domesticus*	House Sparrow		
Mammals			
Myotis ciliolabrum	Small-footed Myotis		SDC Group II
Myotis yumanensis	Yuma Myotis		SDC Group II
Parastrellus hesperus	Canyon Bat		
Eptesicus fuscus	Big Brown Bat		
Tadarida brasiliensis	Brazilian Free-tailed Bat		
Nyctinomops femorosaccus	Pocketed Free-tailed Bat	CSC	SDC Group II
Eumops perotis	Western Mastiff Bat	CSC	SDC Group II
Sylvilagus audubonii	Desert Cottontail		
Spermophilus beecheyi	California Ground Squirrel		
Thomomys bottae	Botta's Pocket Gopher		
Chaetodipus californicus femoralis	Dulzura Pocket Mouse	CSC	SDC Group II
Dipodomys simulans	Dulzura Kangaroo Rat		
Peromyscus sp.	Mouse		
Peromyscus californicus	California Mouse		
Peromyscus fraterculus	Northern Baja Mouse		
Peromyscus maniculatus	Deer Mouse		
Neotoma macrotis	Big-eared Woodrat		
Neotoma lepida intermedia	San Diego Desert Woodrat	CSC	SDC Group II
Microtus californicus	California Vole		
Canis latrans	Coyote		
Urocyon cinereoargenteus	Common Gray Fox		
Procyon lotor	Northern Raccoon		
Mustela frenata	Long-tailed Weasel		
Spilogale gracilis	Western Spotted Skunk		

Scientific Name	Common Name	Federal and State Special Status	Local Government Special Status
Puma concolor	Mountain Lion		SDC Group II, MSCP
Lynx rufus	Bobcat		
**Equus caballus*	Domestic Horse		
Odocoileus hemionus	Southern Mule Deer		SDC Group II, MSCP
**Bos taurus*	Domestic Cattle		

Legend

*= Non-native or invasive species

Special Status:

Federal:
FE = Endangered
FT = Threatened

State:
SE = Endangered
ST =Threatened
CSC = California Species of Special Concern
FPS = California Fully Protected Species

County:
SDC Group I - includes animal species that have a very high level of sensitivity, either because they are listed as threatened or endangered or because they have very specific natural history requirements that must be met.

SDC Group II - includes animal species that are becoming less common, but are not yet so rare that extirpation or extinction is imminent without immediate action. These species tend to be prolific within their suitable habitat types.

MSCP = Multiple Species Conservation Program Covered Species

Appendix D

Potentially Occurring Sensitive Species: Wildlife

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Special-Status Wildlife Species Potential to Occur

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Detected within the Preserve? (Historical and/or current observations)	Potential to Occur	Rationale
INVERTEBRATES					
San Diego Fairy Shrimp (*Branchinecta sandiegoensis*)	FE SDC Group I MSCP	Vernal pools. All known localities are below 701m (2,300 ft) and are within 64km (40 miles) of the Pacific Ocean.	No	None	No suitable habitat (vernal pools or road ruts) observed on the Preserve.
Riverside Fairy Shrimp (*Streptocephalus woottoni*)	FE SDC Group I MSCP	Vernal pools. It occurs from Los Angeles County to Baja California. In San Diego County, all populations are within 15 kilometers of the coast.	No	None	No suitable habitat (vernal pools or ephemeral basins) observed on the Preserve.
Quino checkerspot butterfly (*Euphydryas editha quino*)	FE SDC Group I	Inhabits openings on clay soils within or in the vicinity of shrublands, grasslands, meadows, vernal pools, and lake margins. Closely tied to its larval host plant, dwarf plantain *(Plantago erecta)* or owl's clover (*Castilleja exserta* ssp*. exserta).*	No	Low	Small patches of suitable habitat on site are isolated by large expanses of dense chaparral. No records of Quino checkerspot butterflies occurring near the Preserve.
AMPHIBIANS					
Arroyo Toad (*Bufo californicus*)	FE CSC SDC Group I MSCP	Exposed shallow pools with a sand or gravel base are used for breeding. Breeding pools must occur in the vicinity (ca. 10-100 m) of a braided sandy channel with shorelines or central bars made of stable, sandy terraces.	No	None	While this species is present in the vicinity near San Vicente Reservoir, no suitable breeding habitat occurs on the Preserve.
Western Spadefoot (*Spea (=Scaphiopus) hammondii*)	CSC SDC Group II	Temporary rainpools with water temperatures between 9°C and < 30°C that last at least 3 weeks.	No	Low	Marginal breeding habitat occurs on the Preserve.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Detected within the Preserve? (Historical and/or current observations)	Potential to Occur	Rationale
REPTILES					
Southwestern Pond Turtle *(Emys (=Clemmys) marmorata pallid*)	CSC SDC Group I MSCP	Requires slack- or slow-water aquatic habitat as well as aerial and aquatic basking sites. Also requires an upland oviposition site on an unshaded slope with clay soils, in the vicinity of the aquatic site.	No	Medium	Suitable freshwater pond habitat occurs on the Preserve. Not observed during surveys.
Silvery Legless Lizard (*Anniella pulchra pulchra*)	CSC SDC Group II	Occurs in sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks. Leaf litter under trees and bushes in sunny areas often indicate suitable habitat.	No	Medium	Suitable habitat occurs on the Preserve.
Coast (San Diego) Horned Lizard (*Phrynosoma blainvillii*)	CSC SDC Group II MSCP	Grasslands, brushlands, woodlands, and open coniferous forest with sandy or loose soil; requires abundant ant colonies for foraging.	Yes	Present	Adult coast horned lizard captured in southern herp array. Observed during walking surveys.
Coronado Skink (*Plestiodon skiltonianus interparietalis*)	CSC SDC Group II	Forest, open woodland and grassy areas. Usually found under leaf litter, logs or rocks.	Yes	Present	Observed during general surveys of the Preserve. Individuals were captured in herp array.
Orange-throatws Whiptail (*Aspidoscelis hyperythra beldingi*)	CSC SDC Group II MSCP	The habitat characteristics are poorly understood, however historically it was found in floodplains or terraces along streams. Closely tied to coastal sage scrub plants and some chaparral plants.	No	High	Suitable habitat occurs on the Preserve.
Coastal Whiptail (*Aspidoscelis tigris stejnegeri*)	SDC Group II	Found in open brushland in semiarid habitats.	Yes	Present	Observed during general surveys of the Preserve. Individuals were captured in herp array.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Detected within the Preserve? (Historical and/or current observations)	Potential to Occur	Rationale
Coastal Rosy Boa (*Charina trivirgata roseofusca*)	SDC Group II	Inhabits rocky areas in coastal sage scrub, chaparral, and desert environments.	No	High	Suitable habitat occurs on the Preserve.
Coast Patch-nosed Snake (*Salvadora hexalepis virgultea*)	CSC SDC Group II	Inhabits semi-arid brushy areas and chaparral in canyons, rocky hillsides, and plains.	No	Medium	Suitable habitat occurs on the Preserve
Two-striped Garter Snake (*Thamnophis hammondii*)	CSC SDC Group I	Inhabits perennial and intermittent streams with rocky beds and bordered by willow thickets or other dense vegetation.	No	Low	Marginal suitable habitat occurs on the Preserve.
Red Diamond Rattlesnake (*Crotalus ruber*)	CSC SDC Group II	Occurs from sea level to 914m (3000ft) in chaparral, woodland, and arid desert habitats with rocky areas and dense vegetation.	Yes	Present	One adult captured in herp array #3.
San Diego Ringneck Snake (*Diadophis punctatus similis*)	SDC Group II	Prefers moist habitats, including wet meadows, rocky hillsides, gardens, farmland, grassland, chaparral, mixed coniferous forests and woodlands.	No	Medium	Suitable habitat occurs on the Preserve.
BIRDS					
Least Bittern (*Ixobrychus exilis*)	CSC SDC Group II	Dense freshwater marshes with tules and cattails.	No	None	Freshwater pond on the Preserve is too disturbed by maintenance activities to support this species.
Green Heron (*Butorides virescens*)	SDC Group II	Common in wetland thickets throughout much of North America. Generally a solitarily nester but are known to sometimes nest socially in loose colonies. Usually forages for fish by wading at water's edge or in very shallow water.	No	Low	Freshwater pond on the Preserve is too disturbed by maintenance activities to support this species.
Great Blue Heron (*Areda herodias*)	SDC Group II	Forages in wetlands and occasionally grasslands. Communal nester on trees near water.	Yes	Nesting - None Foraging - Present	Observed foraging at the pond.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Detected within the Preserve? (Historical and/or current observations)	Potential to Occur	Rationale
White-faced Ibis (*Plegadis chihi*)	SDC Group I MSCP	Forages in marshes, swamps, ponds and rivers, mostly in freshwater habitats. Nests in emergent vegetation or low trees and shrubs over shallow water; sometimes on ground on small islands.	No	None	Freshwater pond on the Preserve is too disturbed by maintenance activities to support this species.
Turkey Vulture (*Cathartes aura*)	SDC Group I	Forage over woodland and nearby open country. Nest in crevices among granite boulders.	Yes	Present	Observed foraging on the Preserve.
White-tailed Kite (*Elanus leucurus*)	FPS (nesting) SDC Group I	Open grasslands, agricultural areas, wetlands, and oak woodlands. Their primary source of food is the California vole. It typically forages in open undisturbed habitats and nests in the top of a dense oak, willow or other large tree.	Yes	Present	One dead white-tailed kite found in southern portion of the Preserve. One white-tailed kite was observed foraging near pitfall array #2.
Northern Harrier (*Circus cyaneus*)	CSC (nesting) SDC Group I MSCP	Grasslands and marshes. Nests are on the ground and typically concealed within a marsh or other dense vegetation.	No	Breeding - Low Foraging– Medium	This species may forage over the Preserve. Most of the grasslands are too disturbed to support breeding.
Sharp-shinned Hawk (*Accipiter striatus*)	SDC Group I	Found in San Diego County during the winter in a variety of habitats.	No	Breeding - None Migration/Wintering – Medium	This species has been documented in the vicinity and may move through the Preserve in migration.
Cooper's Hawk (*Accipiter cooperii*)	SDC Group I MSCP	Oak groves and mature stands of riparian woodland. This species has adapted well to development and is abundant in urban canyons with eucalyptus trees.	Yes	Present	Observed on the Preserve during avian and general surveys.
Red-shouldered Hawk (*Buteo lineatus*)	SDC Group I	Lowland riparian woodland. This species has adapted well to development and is abundant in areas with eucalyptus trees.	Yes	Present	Observed on the Preserve during avian surveys.
Ferruginous Hawk (*Buteo regalis*)	SDC Group I	Open grasslands	No	Nesting - None Foraging - Medium	May utilize the grasslands for foraging during the winter.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Detected within the Preserve? (Historical and/or current observations)	Potential to Occur	Rationale
Golden Eagle (*Aquila chrysaetos*)	FPS SDC Group I MSCP	Nest on cliff ledges or trees on steep slopes. Forage in grasslands, sage scrub or broken chaparral.	No	Nesting - None Foraging - Medium	No suitable nesting habitat occurs on the preserve. The Preserve supports suitable foraging habitat, but grasslands support limited prey.
Merlin (*Falco columbarius*)	SDC Group II	Will forage over a variety of habitats; however, species does not breed in California.	No	Breeding - None Migration/Wintering – Medium	This species has been documented in the vicinity and may move through the Preserve in migration.
Peregrine Falcon (*Falco peregrinus*)	SE SDC Group I MSCP (S)	Will forage over a variety of habitats however only breed near water, typically with the nest placed on a cliff ledge.	No	Breeding - None Migration/Wintering - Medium	This species has been documented in the vicinity and may move through the Preserve in migration.
Prairie Falcon (*Falco mexicanus*)	SDC Group I	Nest on cliffs or bluffs and forage in open desert or grasslands. In San Diego County, nest at least 23 miles from the coast (Unitt 2004).	No	Nesting - None Foraging - Medium	No suitable nesting habitat occurs on the preserve. The Preserve supports suitable foraging habitat.
Barn Owl (*Tyto alba*)	SDC Group II	Nest in buildings, nest boxes, at the base of the leaves in palm trees, and in cavities in native trees.	Yes	Present	One adult barn owl observed in palm tree at the ranger station.
Burrowing Owl (*Athene cunicularia*)	CSC SDC Group I MSCP	Prairies, grasslands, lowland scrub, agricultural lands, coastal dunes, desert floors, and some artificial, open areas. They require large open expanses of sparsely vegetated areas on gently rolling or level terrain with an abundance of active small mammal burrows. They use rodent or other burrows for roosting and nesting cover and also known to use pipes, culverts, and nest boxes where burrows are scarce.	No	Low	Not observed during surveys. The nearest known Burrowing owls to the Preserve are at Ramona Grasslands. (Unitt 2004).
Long-eared Owl (*Asio otus*)	CSC SDC Group I	Rare residents of oak woodlands and broad riparian forests. Ideal nesting habitat has a closed canopy and open lands adjacent for foraging.	No	Low	Known to historically occur in the vicinity (Unitt 2004); however, during surveys of the woodlands on the Preserve, this species was not detected.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Detected within the Preserve? (Historical and/or current observations)	Potential to Occur	Rationale
Southwestern Willow Flycatcher (*Empidonax trailii extimus*)	FE SE SDC Group I MSCP	Breeds in riparian woodlands along rivers, streams, or other wetlands. They usually nest within close proximity of water or very saturated soil.	No	None	No suitable breeding habitat occurs on the Preserve.
Loggerhead Shrike (*Lanius ludovicianus*)	CSC SDC Group I	Found near grassland, open sage scrub and chaparral, and desert scrub. They nest in dense vegetation adjacent to their open foraging habitats.	Yes	Breeding - Medium Foraging - Present	There is suitable foraging and breeding habitat on the Preserve. The species should have been detected if present during the 2013 surveys.
Least Bell's Vireo (*Vireo bellii pusillus*)	FE SE SDC Group I MSCP	Riparian thickets either near water or in dry portions of river bottoms; nests along margins of bushes and forages low to the ground; may also be found using mesquite and arrow weed in desert canyons.	No	None	No suitable breeding habitat occurs on the Preserve.
California Horned Lark (*Eremophila alpestris actia*)	SDC Group II	Grasslands, recently disturbed habitat where seeds and insects are easy to find.	No	Medium	Foraging habitat occurs on the Preserve.
San Diego Cactus Wren (*Campylorhynchus brunneicapillus sandiegensis*)	CSC SDC Group I MSCP	Cactus thickets.	No	None	No cactus thickets occur on the Preserve.
Coastal California Gnatcatcher (*Polioptila californica californica*)	FT CSC SDC Group I MSCP	Prefer open scrubby habitats such as coastal sage scrub and some forms of chaparral.	No	Low	Very little appropriate habitat occurs within the Preserve, and that habitat is isolated by large expanses of dense chaparral.
Western Bluebird (*Sialia mexicana*)	SDC Group II MSCP	Foothills and mountains in meadows near groves of oaks and pines. This species is a cavity nester.	Yes	Present	Observed in grassland in the middle of the Preserve.
Yellow Warbler (*Dendroica petechia brewsteri*)	CSC SDC Group II	Mature riparian woodlands.	No	None	No mature riparian occurs on the Preserve.
Yellow-breasted Chat (*Ictera virens*)	CSC SDC Group I	Dense riparian woodland.	No	None	No mature riparian occurs on the Preserve.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Detected within the Preserve? (Historical and/or current observations)	Potential to Occur	Rationale
Southern California Rufous-crowned Sparrow (*Aimophila ruficeps canescens*)	SDC Group I MSCP	Fairly common, widespread and generally fairly conspicuous resident of rocky grassland and patchy shrub habitats, often including areas with disturbance from fire, trash, soil compaction and non-native vegetation.	Yes	Present	Observed during general surveys.
Bell's Sage Sparrow (*Amphispiza belli belli*)	SDC Group I	Open chaparral and sage scrubs.	No	Low	Marginal suitable habitat occurs on the Preserve.
Grasshopper Sparrow (*Ammodramus savannarum*)	CSC SDC Group I	Structurally diverse grassland usually with native grasses.	No	Low	Marginal suitable habitat occurs on the Preserve.
Tricolored Blackbird (*Agelaius tricolor*)	CSC (nesting colony) SDC Group I MSCP	Breeds near fresh water, preferably in emergent wetland with tall, dense cattails or tules, but also in thickets of willow, blackberry, wild rose, tall herbs. Feeds in grassland and cropland habitats.	No	Low	Marginal suitable habitat occurs on the Preserve.
MAMMALS					
Mexican Long-tongued Bat (*Choeronycteris mexicana*)	CSC SDC Group II	Likes desert canyons, arid mountain ranges. Roosts by day in caves, mines or buildings. Records indicate only a summer resident in San Diego County (CDFG 2005). Feeds on nectar and pollen from agaves and cactus blossoms.	No	Low	The Preserve lacks abundant required food sources to support this species.
Small-footed Myotis (*Myotis ciliolabrum*)	SDC Group II	Not much information available, but has been spotted under rock slabs and in crevices, mine tunnels, under loose tree bark, and in buildings.	Yes	Present	Vocalizations recorded on Anabat detectors at the northern and southern (oaks and riparian) locations during 2013 surveys.
Long-eared Myotis (*Myotis evotis*)	SDC Group II	Brush, woodland and forest habitats from sea level to 9000 ft. Lives in coniferous forests in mountain areas, roosts in small colonies in caves, buildings and under tree bark.	No	High	Low number of vocalizations recorded at Boulder Oaks pond, approximately 0.5 miles south of survey area in July 2007. Preserve supports suitable foraging habitat

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Detected within the Preserve? (Historical and/or current observations)	Potential to Occur	Rationale
Yuma Myotis (*Myotis yumanensis*)	SDC Group II	Always found near lakes, creeks or ponds. Roosts by day under building sidings or shingles. Nursery colonies choose caves, mines, buildings or under bridges.	Yes	Present	Vocalizations recorded on Anabat detectors at the northern and southern (oaks and riparian) locations during 2013 surveys.
Western Red Bat (*Lasiurus blossevillii*)	CSC SDC Group II	Usually among dense foliage, in forests and wooded areas, making long migrations from the northern latitudes to warmer climes for winter, sometimes hibernates in tree hollows or woodpecker holes.	No	Low	The Preserve lacks dense riparian and wooded areas. Species may migrate through the Preserve.
Western Yellow Bat (*Lasiurus xanthinus*)	CSC	Rare visitor to San Diego County. Found in wooded areas and desert scrub. Roosts in foliage, particularly in palm trees.	No	Low	The Preserve lack dense riparian areas and no thatched palm trees.
Pallid Bat (*Antrozous pallidus*)	CSC SDC Group II	Throughout So. Cal. from coast to mixed conifer forest; grasslands, shrublands, woodlands, & forest; most common in open, dry habitats w/ rocky areas for roosting; yearlong resident in most of range. Roosts in rock crevices, caves, mine shafts, under bridges, in buildings and tree hollows.	No	High	Low number of vocalizations recorded at Boulder Oaks pond, approximately 0.5 miles south of survey area in July 2007. Preserve supports suitable foraging habitat
Pocketed Free-tailed Bat (*Nyctinomops (=Tadarida) femorosaccus*)	CSC SDC Group II	Lives in deserts and sage scrub, roosts in rocky crevices.	Yes	Present	Vocalizations recorded on Anabat detectors at the northern and southern (oaks and riparian) locations during 2013 surveys.
Big Free-tailed Bat (*Nyctinomops (=Tadarida) macrotis*)	CSC SDC Group II	Inhabits arid, rocky areas; roosts in crevices in cliffs. Has been recorded in urban locations in San Diego County (CDFG 2005. Species is rare in California (CDFG 2005).	No	Roosting habitat- Low Foraging habitat- High	Marginal suitable habitat occurs on the Preserve. Appropriate foraging habitat present.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Detected within the Preserve? (Historical and/or current observations)	Potential to Occur	Rationale
Western Mastiff Bat (*Eumops perotis californicus*)	CSC SDC Group II	Primarily a cliff-dwelling species for breeding. Found foraging in a variety of habitats, from dry desert washes, flood plains, chaparral, oak woodland, open ponderosa pine forest, grassland, montane meadows, and agricultural areas.	Yes	Present	Vocalizations recorded on Anabat detectors at the northern and southern (oaks and riparian) locations during 2013 surveys.
San Diego Black-tailed Jackrabbit (*Lepus californicus bennettii*)	CSC SDC Group II	Mostly found on the coastal side of our local mountains in open habitats, usually avoiding dense stands of chaparral or woodlands.	No	Low	Marginal suitable habitat occurs on the Preserve.
Dulzura Pocket Mouse (*Chaetodipus californicus femoralis*)	CSC SDC Group II	Coastal and montane regions in grassland, sage scrub, and chaparral slopes.	Yes	Present	Suitable habitat occurs on site, but this species was not caught during trapping surveys.
Northwestern San Diego Pocket Mouse (*Chaetodipus fallax fallax*)	CSC SDC Group II	Coastal sage scrub, sage scrub/grassland ecotones, and chaparral communities.	No	High	Suitable habitat occurs on site, but this species was not caught during trapping surveys.
Stephens' Kangaroo Rat (*Dipodomys stephensi*)	FE ST SDC Group I	Occurs in flat or gently rolling, often degraded, annual grassland.	No	Low	Potentially suitable habitat occurs on site, but this site is isolated from other grassland areas. This species was not caught during small-mammal trapping surveys.
Ramona Grasshopper Mouse (*Onychomys torridus ramona*)	CSC SDC Group II	Grasslands and sparse coastal sage scrub habitats.	No	Low	Some suitable habitat exists; however, it is disturbed. The survey area is located within the range of the species.
San Diego Desert Woodrat (*Neotoma lepida intermedia*)	CSC SDC Group II	Variety of shrub and desert habitats primarily associated with rock outcroppings, boulders, cacti, or areas of dense undergrowth.	Yes	Present	Nests of this species observed within boulders onsite.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Detected within the Preserve? (Historical and/or current observations)	Potential to Occur	Rationale
Ringtail (*Bassariscus astutus*)	SDC Group II	Usually not found more than 1 km (0.6 mi) from permanent water. Suitable habitat consists of a mixture of forest and shrubland in close association with rocky areas or riparian habitats. Forages on ground, among rocks, in trees; usually near water.	No	Medium	Some suitable habitat occurs within the Preserve.
American badger (*Taxidea taxus*)	CSC SDC Group II MSCP	Inhabit a diversity of habitats with principal requirements of sufficient food, friable soils, and relatively open, uncultivated ground. Grasslands, savannas, and mountain meadows near timberline are preferred.	No	Low	Marginal suitable habitat occurs on the Preserve. Isolated from other grasslands. No tracks or burrows were observed during the surveys.
Mountain Lion (*Puma (=Felis) concolor*)	SDC Group II MSCP	Rocky areas, cliffs, and ledges that provide cover within open woodlands and chaparral, as well as riparian areas.	Yes	Present	Tracks and sign of Mt. lion observed on the Preserve. One individual was photographed by remote camera.
Southern Mule Deer (*Odocoileus hemionus fuliginata*)	SDC Group II MSCP	Oak woodlands, open scrub and young chaparral, low-elevation pine forests, riparian areas, and along the margins of meadows and grasslands.	Yes	Present	Several individuals were observed on the Preserve.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Detected within the Preserve? (Historical and/or current observations)	Potential to Occur	Rationale

LEGEND:

STATUS:

Federal

FE - listed as endangered under the federal Endangered Species Act.

FT - listed as threatened under the federal Endangered Species Act.

State

SE - listed as endangered under the California Endangered Species Act.

FPS – fully protected species in California.

CSC - species of special concern in California.

San Diego County Group (SDC Group)

I = includes animal species that have a very high level of sensitivity, either because they are listed as threatened or endangered or because they have very specific natural history requirements that must be met.

II = includes animal species that are becoming less common, but are not yet so rare that extirpation or extinction is imminent without immediate action. These species tend to be prolific within their suitable habitat types.

Multiple Species Conservation Program Covered Species (MSCP)

References

Special Status information from CDFW 2013. Nomenclature and invertebrate descriptions from Hogan 2005, and USFWS 1997. Nomenclature and vertebrate descriptions from AOU 1998 and supplements, CDFG 2005, Collins and Taggart 2013, Stephenson and Calcarone 1999, Baker *et al.* 2003, and Unitt 2004.

Appendix E

Photo Book

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Photo 1. Northern portion of Boulder Oaks North looking north.

Photo 2. Northwestern portion of Boulder Oaks North looking west.

Photo 3. Southwestern portion of Boulder Oaks North and surrounding habitats looking south.

Photo 4. Southern portion of Boulder Oaks North and surrounding habitats looking east.

Photo 5. Ashy spike-moss growing on rock outcrop.

Photo 6. California adder's-tongue.

Photo 7. Gander's ragwort.

Photo 8. Golden-rayed pentachaeta growing with ashy spike-moss.

Photo 9. Engelmann oak.

Photo 10. Heart-leaved pitcher sage.

Photo 11. Ramona horkelia.

Photo 12. Chaparral rein orchid.

Photo 13. Orcutt's brodiaea.

Photo 14. Invertebrates captured in Herpetological pit fall trap.

Photo 15. Coast horned lizard captured in herpetological array #3.

Photo 16. Coronado skink captured in herpetological array #3.

Photo 17. Juvenile western red-tailed (Gilbert's) skink captured in herpetological array #3.

Photo 18. California whipsnake captured in array #2.

Photo 19. Southern Pacific rattlesnake captured in array #2.

Photo 20. Red diamond rattlesnake captured in array #3.

Photo 21. Greater roadrunner photographed by remote camera #1.

Photo 22. Desert cottontail photographed by remote camera #1.

Photo 23. California ground squirrel photographed by remote camera #1.

Photo 24. Big eared woodrat.

Photo 25. San Diego desert woodrat midden under rock outcrop.

Photo 26. Coyote photographed by remote camera #4.

Photo 27. Common gray fox photographed by remote camera #1.

Photo 28. Long-tailed Weasel photographed by remote camera #1.

Photo 29. Bobcat photographed by remote camera #1.

Photo 30. Southern mule deer photographed by remote camera #3.