

**BASELINE BIOLOGICAL RESOURCES
EVALUATION**

FOR THE

OAK OASIS OPEN SPACE PRESERVE

Prepared for:

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Executive Summary

ICF Jones & Stokes conducted a baseline biodiversity study of the County of San Diego's Oakoasis Preserve (Preserve) to provide the Department of Parks and Recreation with biological data to develop a Resource Management Plan (RMP) including Area Specific Management Directives (ASMDs). To provide a baseline evaluation of biological resources, the following studies were conducted by ICF Jones & Stokes: (1) vegetation community mapping; (2) rare plant surveys; (3) pitfall trap arrays to sample amphibians, reptiles, and small mammals; (4) avian point counts; (5) nocturnal bird surveys; (6) acoustic sampling and roost surveys for bats; (7) small mammal trapping; (8) a track and sign survey for medium-to-large mammals; and (9) a camera station survey for medium-to-large mammals.

This report summarizes all survey methodologies and data collected during the 2008 survey period (February through October). This report also includes recommendations for adaptive management, including management and monitoring of vegetation communities and sensitive plants and habitats, control of invasive non-native plants, and management and monitoring of sensitive wildlife species, including species covered by the South County Multiple Species Conservation Program (MSCP).

The Preserve includes approximately 405.0 acres¹ of native oak woodlands, southern mixed chaparral and non-native grassland habitats as well as disturbed areas all of which are within the MSCP. The undeveloped portion of the Preserve is mapped as Pre-approved Mitigation Area (PAMA) and is considered Preserve within the MSCP.

The current surveys documented six land cover types and 243 species that were detected throughout the Preserve. Our surveys detected 115 plant species, 63 bird species, 29 mammal species (12 bats, nine small mammals, and eight medium and large bodied mammals), 14 herptiles (two amphibians and 12 reptiles), and 22 invertebrate species. In addition, two additional reptile species were observed by Park Rangers in 2008. This list includes 26 sensitive species (23 wildlife and three plants), of which six are MSCP-covered species (five wildlife and one plant).

¹ The assessor's parcel data list the Preserve to be 397.9 acres; however, calculations generated from the GIS data show the Preserve as 405.0. Therefore, this report references the property as 405.0 acres.

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Chapter 1

Introduction

Baseline biological resources surveys were conducted within the County of San Diego's Oakoasis Preserve (Preserve). The purpose of these surveys was to identify and map existing resources and to provide the Department of Parks and Recreation with information as the basis for development of a Resource Management Plan (RMP) including Area Specific Management Directives (ASMDs). These ASMDs will provide the management framework for monitoring and managing the Preserve resources.

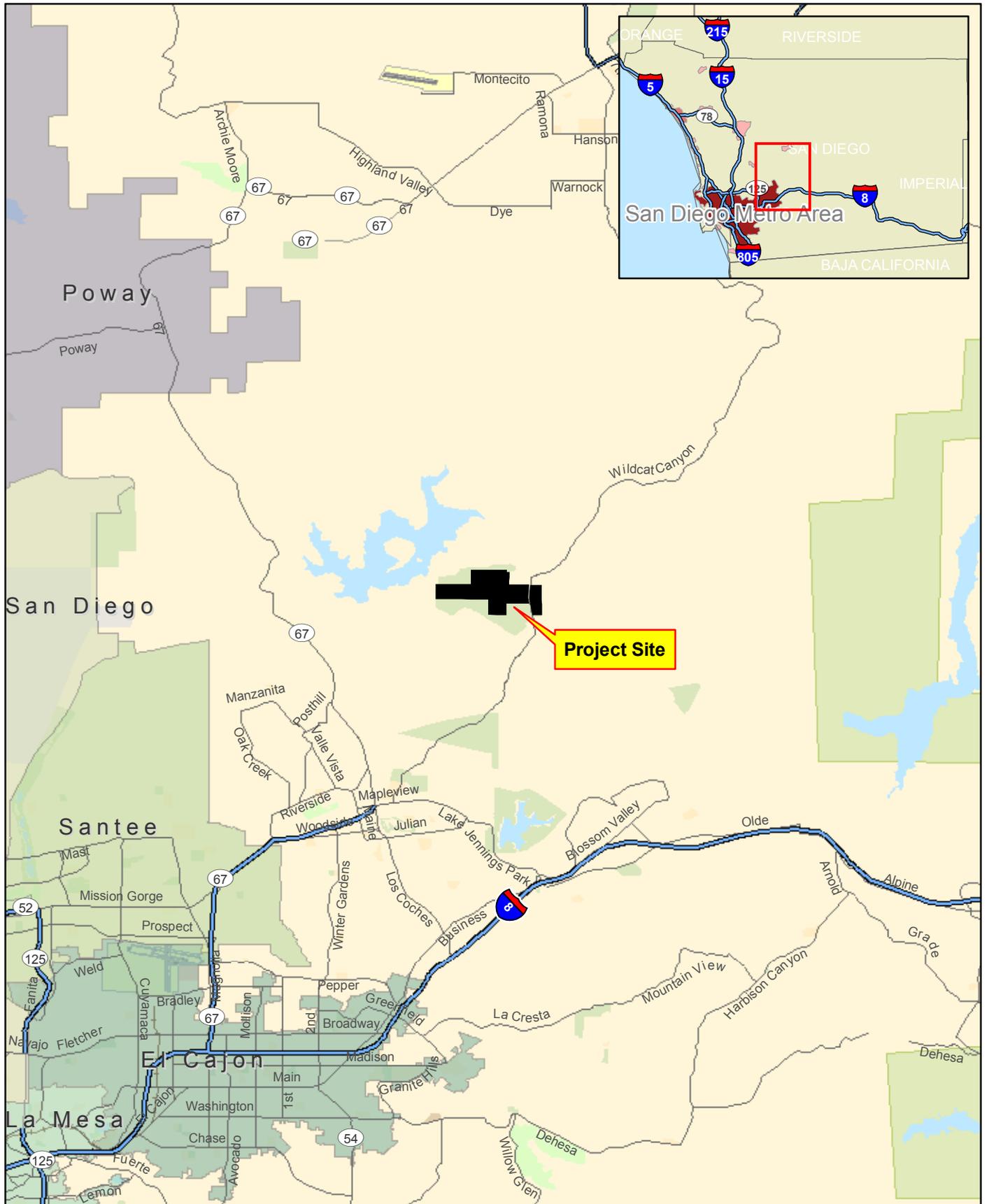
The Preserve is located approximately 3.0 miles north of Lakeside and 2.5 miles south of the Barona Indian Reservation. The 405.0-acre¹ Preserve is located in the upper San Diego River watershed, less than one mile east of the San Vicente Reservoir (Figures 1 and 2). The Preserve is bisected by Wildcat Canyon Road; El Capitan Preserve is located east of the Preserve and a mix of rural residential/open space occurs to the south, west and north. Elevations within the Preserve range from approximately 304.8 meters (m) (1,000 feet (ft)) above mean sea level (AMSL) in the western most portion of the Preserve to nearly 487.7 m (1,600 ft) AMSL along the ridge tops.

To provide a baseline evaluation of biological resources, the following studies were conducted by ICF Jones & Stokes: (1) vegetation community mapping; (2) rare plant surveys; (3) pitfall trap arrays to sample amphibians, reptiles, and small mammals; (4) avian point counts; (5) nocturnal bird surveys; (6) acoustic sampling and roost surveys for bats; (7) small mammal trapping; (8) a track and sign survey for medium-to-large mammals; and (9) a camera station survey for medium-to-large mammals.

In addition to methods and results for all the work conducted, this report provides brief recommendations and options to preserve and enhance the biological resources present on the Preserve.

¹ The assessor's parcel data list the Preserve to be 397.9 acres; however, calculations generated from the GIS data show the Preserve as 405.0. Therefore, this report references the property as 405.0 acres.

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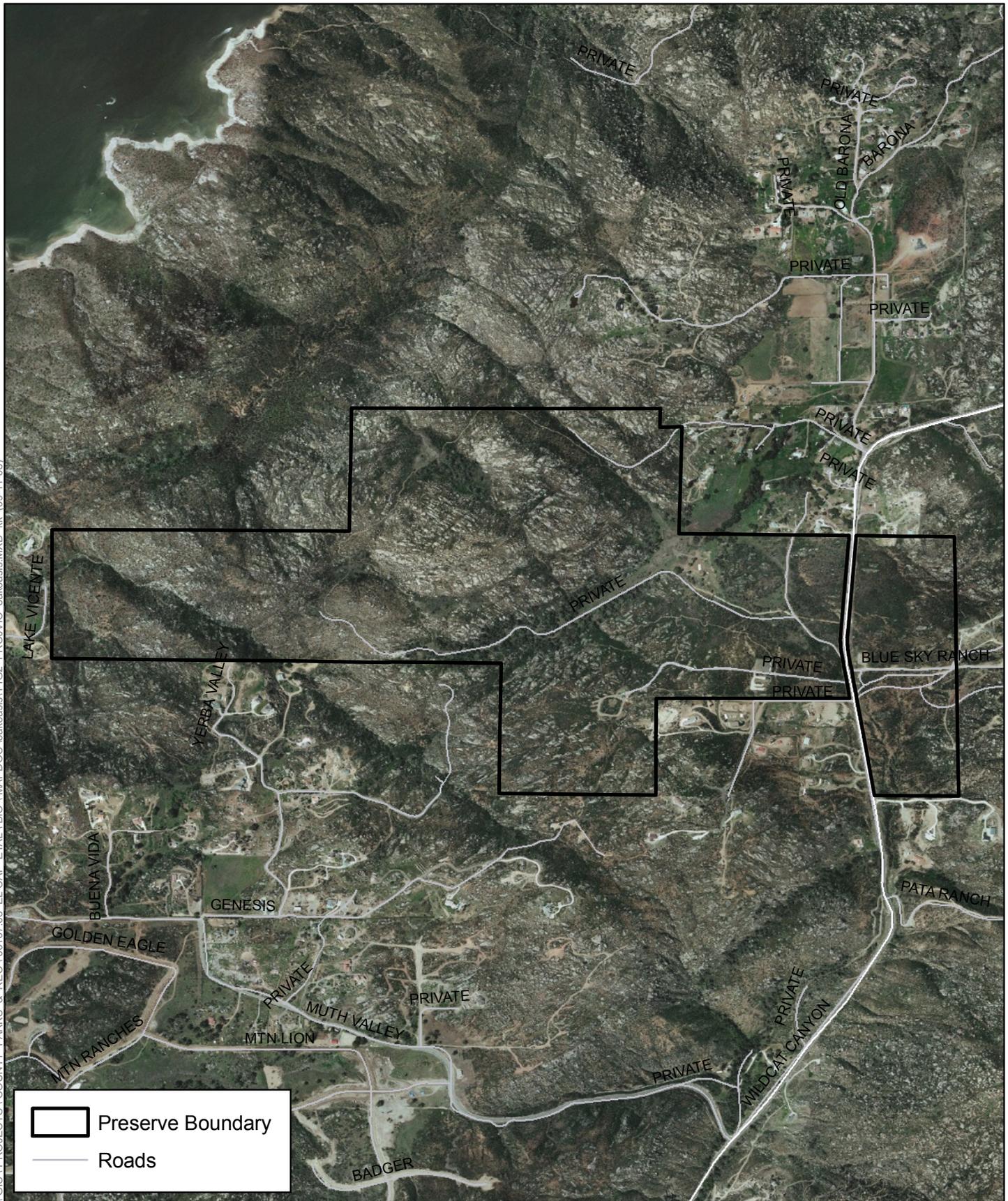


SOURCE: ESRI Streetmap USA (2006)



Figure 1
 Regional Location
 Oakoasis Preserve

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SOURCE: ESRI Imagery

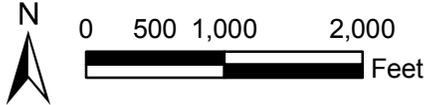


Figure 2
Project Vicinity
Oakoasis Preserve

2.1 Physical and Climatic Conditions

2.1.1 Geography

The natural setting within the Preserve is characterized by steep coastal foothills separated by a canyon and drainages. The Preserve is situated southeast of San Vicente Reservoir. Wildcat Canyon Road bisects the eastern portion of the property. Three blue-line streams occur within the Preserve. Elevation within the Preserve ranges between approximately 304.8 m (1,000 ft) AMSL at a low point along the western portion of the Preserve and approximately 487.7 m (1,600 ft) AMSL east of Wildcat Canyon Road. The closest source of fresh water is San Vicente Reservoir.

2.1.2 Soils

Within the Preserve, several general soil associations are represented: the Arlington series, Cieneba series, Visalia series, and Vista series (Figure 3).

The *Arlington* soil series is characterized as moderately well drained moderately deep coarse sandy loams and is usually found on alluvial fans with slopes ranging from 2 to 9 percent. It is found at elevations ranging from 122–335 m (400–1,100 ft). The surface layer is brown in color and coarse sandy loam in texture. The subsoil is yellowish-brown, brown, and light yellowish-brown in color and slightly acidic. The substratum extends to a depth of 122 centimeters (cm) (48 inches (in)) and is weakly cemented, slightly acidic coarse sandy loam. The specific soil type found in the Preserve is Arlington coarse sandy loam (2 to 9 percent slopes). Vegetation communities occurring on this soil type within the Preserve include non-native grassland, coast live oak woodland, and southern mixed chaparral.

The *Cieneba* soil series is characterized as excessively drained very shallow to shallow, coarse sandy loams and is usually found on slopes ranging from 5 to 75 percent. It is found on uplands at elevations ranging from 61–914 m (200–3,000

ft). It is usually 25.4 to 50.8 cm (10 to 20 in) thick and medium acidic. The topsoil ranges from brown to dark brown in color and coarse sandy loam to sandy loam in texture. The layer below this consists of weathered granodiorite. Runoff is high to very high and the erosion hazard is very high. Boulders and rock outcrops are present. Specific soil types found in the Preserve consist of Cieneba rocky coarse sandy loam (9 to 30 percent, eroded), Cieneba very rocky coarse sandy loam (30 to 75 percent), and Cieneba-Fallbrook rocky sandy loams (9 to 30 percent slopes, eroded). This soil complex is about 55 percent Cieneba coarse sandy loam and 40 percent Fallbrook sandy loam (USDA 1973). Within the Preserve these soil types support southern mixed chaparral.

The *Visalia* soil series is characterized by moderately well drained, very deep sandy loams and is usually found on slopes ranging from 0 to 15 percent. It is found on alluvial fans and floodplains at elevations ranging from 122 – 610 m (400-2,000 ft). The surface layer is usually 30.5 cm (12 in) thick and slightly acidic. The topsoil is dark grayish-brown in color and sandy loam in texture. The subsoil is dark grayish-brown, slightly acidic, sandy loam and loam and is more than 152.4 cm (60 in) thick. Runoff is very slow to medium and the erosion hazard is slight to moderate. The gravelly sandy loam consists of approximately 15 percent gravel. The specific soil type found within the Preserve is Visalia sandy loam (0 to 2 percent slopes) and Visalia sandy loam (2 to 5 percent slopes). Within the Preserve these soil types support southern coast live oak riparian forest, non-native grassland, and southern mixed chaparral.

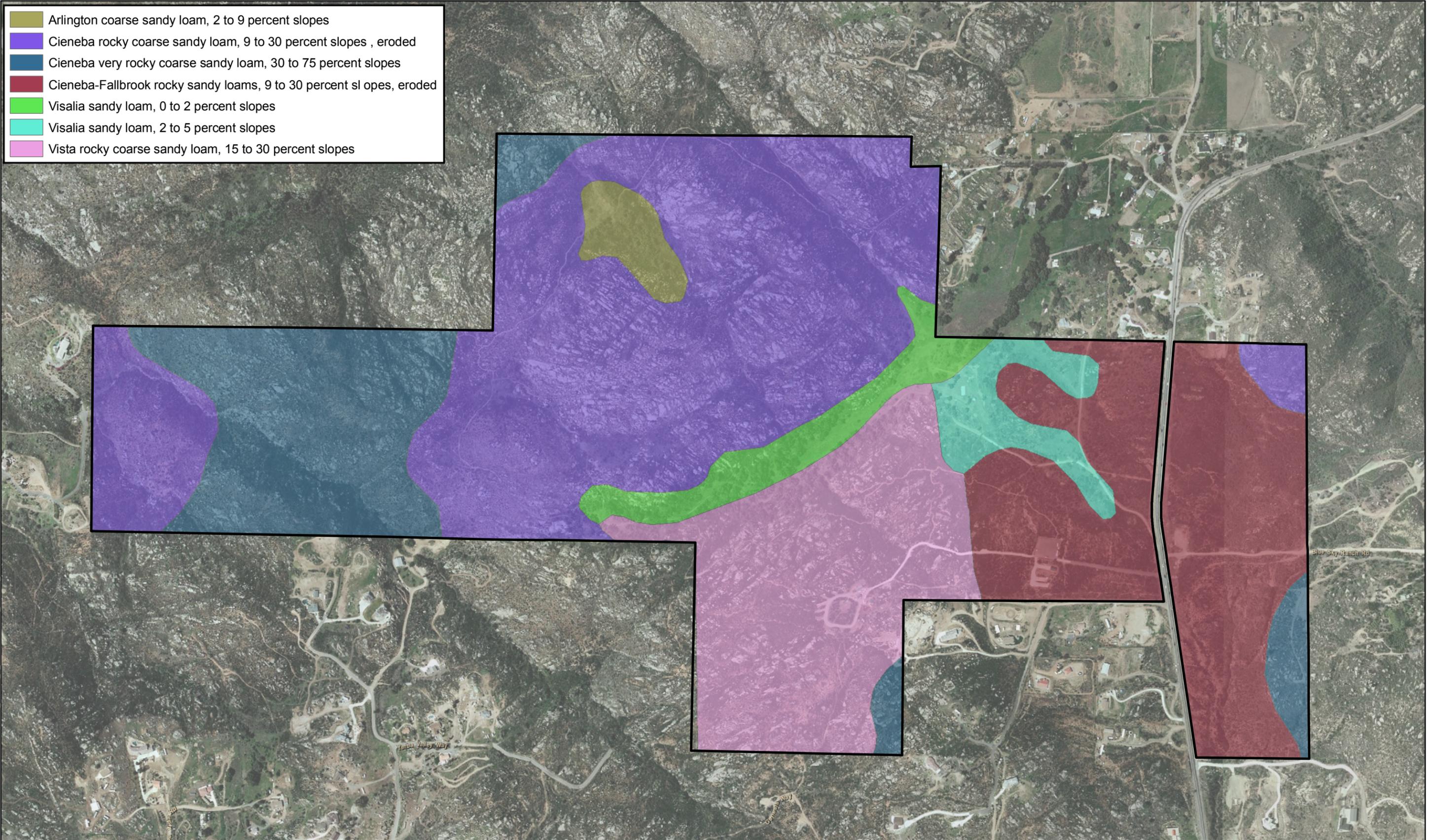
The *Vista* soil series is characterized by well drained, moderately deep and deep coarse sandy loams and is usually found on slopes ranging from 5 to 65 percent. It is found on uplands at elevations ranging from 91– 62 m (300–2,500 ft). The surface layer is usually 48.3 cm (19 in) thick and neutral and slightly acidic. The topsoil is dark grayish-brown and dark brown in color and consists of sandy loam in texture. The subsoil is dark brown and yellowish-brown in color, slightly acidic, coarse sandy loam and is about 40.6 cm (16 in) thick. Below this layer the soil consists of strongly weathered granitic rock. Runoff is slow to medium and the erosion hazard is slight to moderate. The specific soil type found in the Preserve is Vista rocky coarse sandy loam (15 to 30 percent slopes). This soil type supports southern mixed chaparral within the Preserve.

2.1.3 Climate

A semi-permanent, Pacific high-pressure cell, located over the Pacific Ocean, dominates San Diego County's climate. This cell drives the dominant on-shore circulation, maintaining clear skies for much of the year. Summers in the Preserve are typically warm and dry, while winters are mild with occasional rain (USDA 1973).

The Western Regional Climate Center, a collaborative project of the National Oceanic and Atmospheric Agency and the Desert Research Institute, maintains a climatic station in El Cajon – the closest such station to the Preserve. Data collected at the station indicate that the area experiences a normal mean

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- Arlington coarse sandy loam, 2 to 9 percent slopes
- Cieneba rocky coarse sandy loam, 9 to 30 percent slopes , eroded
- Cieneba very rocky coarse sandy loam, 30 to 75 percent slopes
- Cieneba-Fallbrook rocky sandy loams, 9 to 30 percent slopes, eroded
- Visalia sandy loam, 0 to 2 percent slopes
- Visalia sandy loam, 2 to 5 percent slopes
- Vista rocky coarse sandy loam, 15 to 30 percent slopes

SOURCE: ESRI Imagery



Figure 3
Soils Map
Oakoasis Preserve

temperature of approximately 65 degrees Fahrenheit (°F), with a mean maximum temperature of 77.8°F and a mean minimum of 52.4°F. The El Cajon area tends to experience more sunshine than the coastal regions of southern California due to its inland location. In a normal year, precipitation on the Preserve averages 15-18 in 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, on-shore 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. 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.

2.1.4 Fire Cycles

The Preserve is dominated by southern mixed chaparral and oak woodland habitats, which are 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 opportunistic pioneering shrub communities. The fire cycles within the area are affected by actions within and adjacent to the Preserve property. Surrounding development and brush management actions associated with urban development have altered the fire cycles throughout most of western San Diego County. According to the County of San Diego fire burn data, the entire Preserve burned in the 2003 Cedar Fire; the Preserve has not burned in any other recent fires (SanGIS 2008) (Figure 4).

2.1.5 Hydrology

The Preserve is situated within 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 (California Regional Water Quality Control Board San Diego Region 2003).

Three unnamed seasonal blue-line streams occur within the Preserve (Figure 4). Two are tributaries to San Vicente Reservoir and one is a tributary to the San Diego River.

2.1.6 Trails

The Preserve contains approximately 4.9 miles of trails (Figure 5). These trails include dirt roads and single track footpaths that navigate users through a large portion of the Preserve. Associated with the trail system are recreational camping facilities located along the south eastern portion of the Preserve.

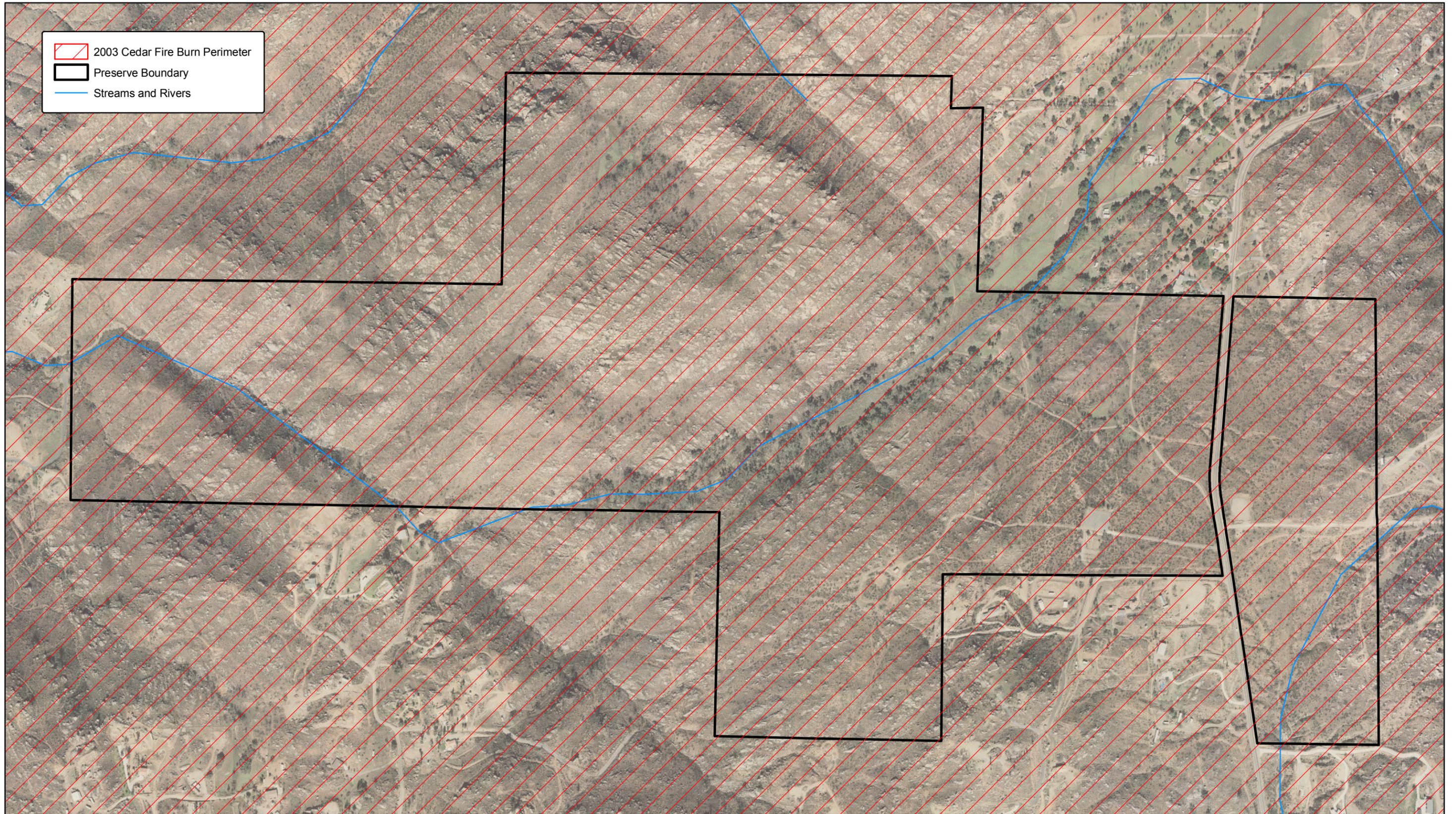
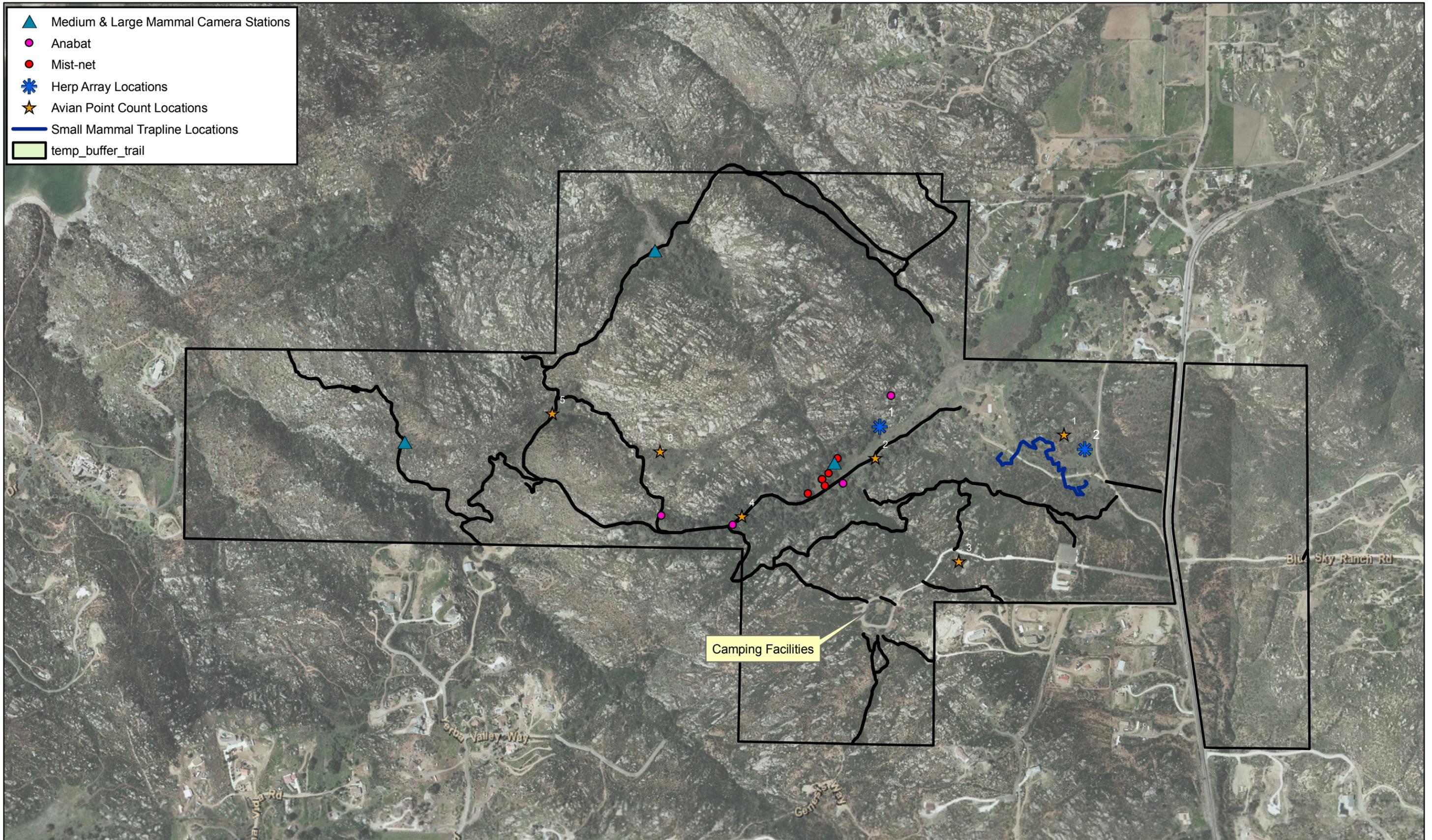


Figure 4
Watershed & Fire History Map
Oakoasis Preserve



SOURCE: ESRI Imagery



Figure 5
Trail & Biological Inventory Locations
Oakoasis Preserve

Place names in this report follow both specific names and standards used for mapping by the U.S. Geological Survey (e.g., “Fosters Canyon” rather than Foster’s Canyon). The following sources are followed for taxonomy and nomenclature, including both scientific and standardized English names: 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; Collins and Taggart (2002) for amphibians and reptiles; American Ornithologist’s Union (1998 and supplements) for birds; and Baker et al. (2003) for mammals. Where this information differs from MSCP names, we provide the MSCP information parenthetically. For clarity and to differentiate standardized, sourced, English names for species from descriptions (e.g., Yellow Warbler and not any other warbler that is yellow), we follow most published sources of standardized names by capitalizing them; we also include the scientific binomial from the cited reference with the first mention of a species in the body of this report.

3.1 Vegetation

Prior to conducting surveys for the project, searches of available literature and databases were conducted to determine special-status species previously detected or with potential to occur at the Preserve as well as the physical characteristics of the site and surrounding areas. Available data that were reviewed included the California Natural Diversity Database (CDFG 2008), the U.S. Department of Agriculture (USDA) soil survey of the area (USDA 1973), and U.S. Geologic Survey (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, and document all flora observed within the Preserve (Table 1). During each rare plant survey, ICF Jones & Stokes botanists traversed the study area by meandering transects in an effort to accurately categorize vegetation communities and to identify the locations of any special-status species readily detectable. During these surveys, all plants species detected were recorded (Appendix A)

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 geographic information system (GIS) coverage using ArcGIS software. Mapping included the entire 405.0-acre Preserve; vegetation communities were categorized using standard County classifications (Holland 1986 as modified by Oberbauer 2005). All plant species observed were noted, and plants that could not be identified in the field were identified later using taxonomic keys including Beauchamp (1986) and Hickman (1993), or verified with herbarium specimens at the San Diego Natural History Museum.

Table 1. Vegetation Mapping and Floristic Inventory Surveys at the Preserve in 2008

Survey Personnel	Date
Klutz, Korey	03/03/2008
Klutz, Korey	03/05/2008
Klutz, Korey	03/10/2008
Klutz, Korey	04/23/2008
Borcher, Andrew	04/20/2008
Klutz, Korey and Cain, Ian	05/28/2008

Locations of special-status plant populations were mapped using either sub-meter accurate global positioning system (GPS) or recreational grade GPS receivers (accurate from 1 to 5 m (3 to 16 ft)). Groups of individuals were mapped as single points with attribute data including total individuals observed.

3.2 Invertebrates

3.2.1 Quino Checkerspot Butterfly

A habitat assessment was conducted on March 5th, 2008 to determine if focused protocol surveys for the federally endangered Quino Checkerspot Butterfly (*Euphydryas editha quino*, Quino) would be appropriate within the Preserve. Upon completion of the habitat assessment it was determined that due to the absence of Dwarf Plantain (*Plantago erecta*), Quino’s primary host, and the dense nature of the tree and shrub canopies that it would be unlikely that the Preserve would support the Quino Checkerspot Butterfly; therefore, protocol surveys were not performed.

3.2.2 Other Invertebrates

No focused studies were performed to inventory invertebrates within the Preserve. However, all invertebrates encountered during other active surveys or captured in the pitfall traps associated with the herpetological surveys were identified and recorded in the wildlife table (Appendix B). All unidentifiable invertebrates were photographed, and those photographs were provided to a local entomologist for identification.

3.3 Herpetofauna

ICF Jones & Stokes conducted surveys for herpetofauna (amphibians and reptiles) within the Preserve from March through July 2008. Terrestrial herpetological surveys were conducted using pitfall trap arrays as outlined in the USGS's "Herpetological Monitoring Using a Pitfall Trapping Design in Southern California" (Stokes et al. 2001). 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 optimal design for drift fencing includes a three-arm array with seven pitfall traps and three funnel traps. This study's array design was consistent with this optimal design, and recommendations for array materials and trap construction were followed. As the site temperatures were not excessive during the trapping period, biologists constructed funnel traps with no pitfall trap retreat underneath, as described in the USGS protocol.

Two sites were selected for the array construction based on access, vegetation community, soils, and topography. One array was constructed under coast live oak woodland situated between a meadow and chaparral, and the other array was constructed in a non-native grassland/chaparral interface (Figure 5). Locations were mapped using GPS technologies.

All areas immediately surrounding the arrays were actively searched for herptiles during the array monitoring. Active searching included looking under shrubs and logs. All herptiles captured or observed during active searches and other wildlife surveys, were recorded and are included in the wildlife tables in Appendix B.

3.3.1 Monitoring Arrays

Array traps were sampled on four consecutive days once a month beginning in March and continuing through July. The traps were opened on a Monday afternoon, sampled Tuesday through Friday, and closed Friday.

Array traps were checked during early 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 was to generate an inventory of species present within the Preserve (i.e., not to assess population sizes or dynamics), individuals were not marked, weighed, or otherwise measured.

Data were recorded on paper and entered into an Excel spreadsheet. Recorded information included species and trap number.

3.4 Birds

3.4.1 Diurnal Point Count Survey

Avian use of the study area was formally documented through the use of six point count stations sampled once a month for six months beginning in April and concluding in September (Figure 5). Point counts provide a repeatable, quantitative sampling method for a broad spectrum of birds that is complementary to the general reconnaissance effort, strengthening the reference information developed on relative abundance of birds.

With sufficient sample size and accuracy, data generated can be evaluated against many hypotheses, even at some later time. At larger time and/or spatial scales the data produced on species richness and turnover can contribute to information on connectivity and response to disturbances. The data set may increase in value over time through its function as reference data contributing to investigation and calibration of both local and larger scale changes.

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 bases for, and further details on, the methods presented here. A summary of methods, including additions beyond the recommendations, is provided below.

Stations were placed non-randomly to maximize sampling of the study area 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 trails to facilitate access. Prior to the first counts, all stations were mapped in the field, located using GPS, marked for later identification, and photographed. The view-shed from each point was also photographed in the four cardinal compass directions.

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

- Stations were located at least 250 m (820 ft) apart to ensure independence (i.e., no or minimal overlapping of individual birds detected).

- Counts were conducted at each station for ten 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 m (164 ft) radius from the station, (2) outside the 50 m (164 ft) radius, or (3) flying over. This will allow rudimentary density estimates (without waiting for detectability).
- Individuals were counted at the location where first detected and time of first detection, even when not identified until they have moved or a new time period has 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 four 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 was 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 used beyond those provided 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 m (131 to 197 ft) away, assigning it as beyond or closer than 50 m (164 ft). This was done several times on several different days, in different directions, and on varied terrain, but always in open shrub lands similar to that in which the stations were located.
- Birds noted only in flight are additionally recorded as either utilizing the landscape (e.g., actively foraging swallows and raptors, and 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 their nest. Thus young raptors, which often spend several transitional days immediately adjacent to the nest, would not be counted until at least located in a part of the tree or cliff they were not expected to have reached by walking or climbing.

- Vocalization type was typically used to categorize birds that were heard only with regard to whether or not they were assumed to be flying over or perched. Thus flight calls for a particular species were used to categorize a bird as in flight, making it important to separate calls accurately by type for species heard only.
- When a flock was only heard, only the number definitely heard was recorded, but when a flock was seen and individuals could not be precisely counted, a best estimate was used. Note that with or without this method, point count censusing assumes that at each station an observer has a good opportunity to see and hear birds and (for comparison among stations) that stations are comparable in this regard.
- No individual birds were ‘discarded’ (not counted) due to lack of identification, unless they are at the level of simply, “unidentified bird” (e.g., an unrecognized call). Instead they should be retained at the highest level of identification supported (e.g., “hummingbird sp.”). Variability among surveyors in such treatment can substantially affect estimates of abundance for some groups, or for overall avian abundance.

Numerous issues that may substantially affect how data are recorded or later interpreted from avian point counts are typically not addressed in published work on suggested methods, in published results, or both. To aid future comparability while also allowing current point counts to provide censusing of a broad spectrum of bird species and behaviors, the following additional discussion of methods is provided.

Birds recorded but not identified to the level of species are counted in the totals and other statistics for individuals but not the totals or statistics for species, except where they clearly represented species otherwise unrecorded. Thus, “raptor sp.” would not add to the overall species total if raptors were also recorded to the species level. However, individual “raptor sp.” would (1) be counted in the total species number for the particular counts on which they occurred, when no other raptors were recorded as identified to species on that count and (2) add to the total abundance of birds in any relevant totals.

“Fly-by” (also called “fly-over”) birds were not generally added to the totals calculated for numbers of individuals or species. This is standard practice for point count analysis (Ralph et al. 1995). The rationale is that such birds are neither making any use of nor influencing the study area. However, totals here do include small numbers of birds judged to be foraging or hunting while in flight over the study area, as they are anticipated to be making use of the study area in the same way that a bird foraging from a perch at the same distance from the observer is making use of the study area. For the current work, most observations of swifts, swallows, and raptors (including Turkey Vultures) are included.

The point counts were designed as ‘2-interval’ counts (referring to distance, not time), using the terminology of Bibby et al. (2000; pp. 101-102). A radius of 50 m (164 ft) was set, and all birds recorded were categorized as inside or outside of

the resulting circle. This allows a calculation of density with an adjustment for detectability, but one must guess in applying the detectability adjustment, as this format does not allow testing of how detectability for a given species attenuates across distance (e.g., half normal to a fixed limit). Because the sample size is limited and fragmentation and disturbance make generalizations about distribution across the site tenuous, no density-based estimates of total abundance are provided for any species based on the current results.

3.4.2 Nocturnal Bird Survey

Nocturnal bird surveys were conducted for nighttime birds at the Preserve. Methods include a combination of walking and slowly driving roads, looking and listening for birds. A moderately powerful headlamp was used to aid identifications.

3.5 Small Mammal Trapping

On March 3 and 5, 2008, ICF Jones & Stokes' biologists Phillip Richards and Korey Klutz assessed the physical conditions, vegetative community distribution, vegetative cover, and accessibility for planning the trapping program for small mammals within the Preserve. For the purposes of this project, "small mammals" include species in the shrew, squirrel, pocket gopher, heteromyid, mouse, rat, and vole families.

Due to budgetary and logistical constraints the design of the trapping program for the Preserve needed to consider the sampling of three other County Parks/Preserves during the same field effort (Stelzer and El Monte County Parks, and El Capitan Preserve). The locations of the trapline and the number of traps planned during the sampling program were primarily based on the following variables: access constraints (e.g., roads and trails), drive time to and from Preserve and the habitat diversity within the Preserve. Specifically, the trapping plan was designed to assess the small mammal diversity within representative habitats found within the four Parks/Preserves.

The trapline at the Preserve was set for four nights for a total of 200 trap nights and was initially set and baited during the afternoon of July 14, 2008. Traps were systematically checked in the early morning between 0430 and 0845 from July 15 through July 18, 2008 (Table 2). The trapline was located along the eastern side of the Preserve and consisted of 50 traps (Figure 5, Table 3).

Specific trapline locations were selected based on three criteria: 1) sampling of different vegetative communities, 2) geographic distribution across the Park/Preserve complex, 3) and sampling of unique features (e.g., washes). Sequentially numbered 12-inch Sherman live traps were set at dusk, approximately 5 to 10 m (16 to 33 ft) apart. Traps were sign set and placed where potential small rodent captures were judged to be most probable. Where rodent sign was not apparent, traps were placed near the base of shrubs. The

location of each trap was recorded using a recreational grade GPS receiver (Garmin brand, WAAS enabled). Mixed birdseed was used as bait, and a few seeds were trailed out from the mouth of the trap, usually toward a game trail, burrow, or open area. All traps were checked and closed at dawn.

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. 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 2. Personnel, Date, Time, and Conditions of the Small Mammal Trapping Program at the Preserve in 2008

Trapline	Personnel	Date Checked	Time Checked	Conditions
4	Phillip Richards	7/15/08	0741	Partly Cloudy; 70°F; Wind 0-1; No Moon Visible; Moderate-High Humidity
	Cindy Dunn	7/16/08	0800	Clear; 71°F; Wind 0-3; No Moon Visible; Moderate-High Humidity
	Phillip Richards	7/17/08	0720	Clear; 69°F; Wind 0-1; No Moon Visible; Moderate-High Humidity
	James Hickman	7/18/08	0615	Cloudy; 64°F; Wind 0-2; No Moon Visible; Moderate-High Humidity

Table 3. Trapline Description

Trapline	Trap Nights	Number of Traps	Trap Sequence	Physical Description	Vegetative Community
4	4	50	151 - 200	Area consists of short rolling hills, one small drainage, and a small flat drainage basin; some sand along drainage but mostly loam with scattered rocky outcrops; mix of dense shrubs, scattered oak trees, and few open areas dominated by short herbaceous plants	Southern mixed chaparral and coast live oak woodland

3.6 Medium and Large Mammals

For the purposes of this project, “medium and large mammals” include all mammals in the hare, rabbit, beaver, canid, procyonid, mustelid, skunk, cat, and cervid families.

3.6.1 Camera Tracking Stations

Remote camera stations were used to help document the presence of medium and large mammals within the Preserve. These stations often allow for the detection of species that are rarely encountered because of their nocturnal or crepuscular activity patterns. Within the Preserve, three camera tracking stations were set up at locations that were judged to have a high potential for movement of medium and large mammals (e.g., along game trails, abandoned roadways, and hiking trails; Figure 5).

Each station consisted of one Moultrie infrared digital game camera. These cameras were programmed to record an image every time the motion sensor was triggered. Each image includes an information tag that records 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. This method allowed the cameras to record continuously throughout the study period (June 5 – September 4, 2008). The digital images were then interpreted and all animals were identified to the species level.

3.6.2 Mammal Track and Sign Survey

Throughout the survey season, sections of existing trails and roads were carefully examined for tracks and sign (scat, scrapings, etc.) of medium and large mammals. These surveys were primarily conducted during the day; however periodic nighttime surveys were also performed. Daytime surveys involved hiking accessible roads, trail reaches and periodic inspections of hilltops, ridges, drainages, and game trails. Nighttime surveys involved a combination of driving, hiking and listening within the Preserve, and when feasible handheld lights were used to identify any wildlife, or wildlife sign observed during the survey. Finally, mammal tracks and sign were also carefully evaluated when detected during other fieldwork.

3.7 Bats

Two types of bat surveys were conducted in this study: passive and active, which consisted of a combination of techniques including acoustic surveys, mist-netting, and roost surveys.

3.7.1 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) are utilized to detect and record bat echolocation signals (O'Farrell et al. 1999). These calls are then analyzed and most can be 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). An attempt was made to identify all recorded bat echolocation calls and an index of relative bat activity was generated by taking the number of batcall 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.

Passive Anabats were used to survey for bats in the Preserve during three monitoring sessions: spring, summer, and fall 2008. During the three monitoring sessions, a total of two passive Anabat units were placed in the Preserve to monitor bats for three consecutive nights.

3.7.2 Active Surveys

One active foraging bat survey was conducted using an Anabat bat detector, listening for audible bat echolocation calls, and using mist-nets in an attempt to document additional bat species foraging in the Preserve. The survey was conducted near a group of oaks located at the southwest edge of the Preserve on July 30, 2008 (Figure 5).

4.1 Vegetation

Vegetation communities present within the Preserve consist of southern coast live oak riparian forest, open coast live oak woodland, southern mixed chaparral, non-native grassland, disturbed habitat and developed lands (Figure 6, Table 4). A description of the vegetation communities and the dominant plant species detected during the survey are found below. A complete list of plant species observed within the Preserve is provided as Appendix A.

Table 4. Vegetation Communities and Land Cover Types within the Preserve

Vegetation/Land Cover Type	Acreage*
Southern Coast Live Oak Riparian Forest	16.9
Coast Live Oak Woodland	2.6
Southern Mixed Chaparral	361
Nonnative Grassland	7.1
Disturbed Habitat	4.0
Developed (Includes Roads, Park Ranger House and Camping Facilities).	13.4
Total	405.0

4.1.1 Southern Coast Live Oak Riparian Forest (61310)

Southern coast live oak riparian forest is a dense evergreen sclerophyllous riparian forest dominated by Coast Live Oak (*Quercus agrifolia*). According to Holland (1986), it is richer in herbs and poorer in understory shrubs than other riparian communities. It typically occurs in bottom lands and outer floodplains along larger streams, on fine-grained, rich alluvium. Southern coast live oak riparian forest occurs along several stream courses within the Preserve.

4.1.2 Open Coast Live Oak Woodland (71161)

Open coast live oak woodland is typically dominated by Coast Live Oak trees that reach 9 to 24 m (30 to 80 ft) in height. The shrub layer within this habitat is usually poorly developed while the herb layer is continuous and typically dominated by nonnative grasses. This community typically occurs on north-facing slopes and shaded ravines in southern California (Holland 1986). Coast Live Oak was the dominant plant species in areas mapped as open coast live oak woodland.

4.1.3 Southern Mixed Chaparral (37120)

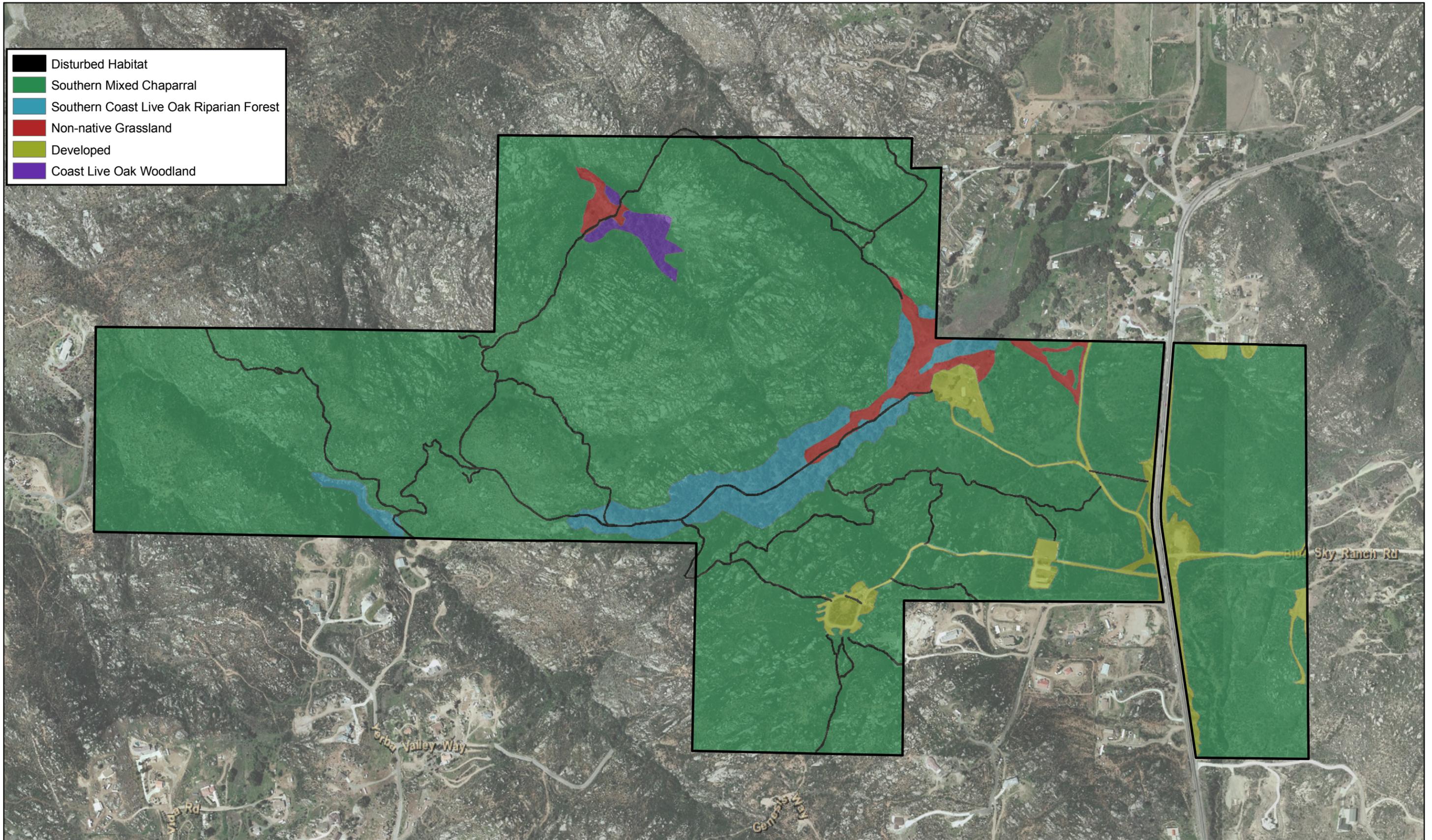
Southern mixed chaparral is generally composed of broad-leaved sclerophyll shrubs that form dense vegetation with little or no understory. The majority of the Preserve supports this vegetation community. Dominant plant species observed within this habitat within the Preserve include Chamise (*Adenostoma fasciculatum*), Laurel Sumac (*Malosma laurina*), Mission Manzanita (*Xylococcus bicolor*), and Scrub Oak (*Quercus berberidifolia*). Other species present include Lakeside Ceanothus (*Ceanothus cyaneus*), Chaparral Whitethorn (*Ceanothus leucodermis*), Holly Leaf Redberry (*Rhamnus ilicifolia*), Sugar Bush (*Rhus ovata*), Our Lord's Candle (*Yucca whipplei*), Thicketleaf Yerba Santa (*Eriodictyon crassifolium*), Blue Elderberry (*Sambucus mexicana*), Wild Cucumber (*Marah macrocarpus*), and Manzanita (*Arctostaphylos* sp.).

4.1.4 Nonnative Grassland (42200)

Nonnative grassland is characterized by a dense to sparse cover of annual grasses reaching up to 1 m (3 ft), which may include numerous native wildflowers, particularly in years of high rainfall. These annuals germinate with the onset of the rainy season and set seeds in the late spring or summer. This community is usually found on fine-textured soils that proceed from moist or waterlogged in the winter to very dry during the summer and fall (Holland 1986). Nonnative grasslands, in many circumstances, have replaced native grasslands as a result of disturbance (directly manmade [e.g., mechanical disturbance, grazing] or natural [i.e. altered fire cycles]). Within the Preserve nonnative grassland is found adjacent to the southern coast live oak riparian forest and within the vicinity of the coast live oak woodland.

4.1.5 Disturbed Habitat (11300)

Disturbed habitats within the Preserve consist of trails used for recreational purposes including hiking, and horseback riding. This land cover type has a low ecological value due to the lack of natural habitat elements.



SOURCE: ESRI Imagery



Figure 6
Vegetation Communities
Oakoasis Preserve

4.1.6 Developed Land (12000)

Developed lands within the Preserve consist of existing roads, a parking lot, camping facilities and a ranger house. This land cover type has a low ecological value due to the lack of natural habitat elements.

4.1.7 Special-Status Plant Species

The following section discusses special-status plant species observed or considered to have a high potential to occur within the Preserve. A special-status plant species is one listed by federal or state agencies as threatened or endangered; considered to be of special status by one or more special interest groups, such as the California Native Plant Society (e.g., CNPS List 1, 2, 3, and 4 Plant Species); or is included on the County's Sensitive Plant list (Group A, B, C, or D Listed Plants).

Special-status plant species detected within the Preserve include Delicate Clarkia (also known as Campo Clarkia) (*Clarkia delicata*), Palmer's Sagebrush (also known as San Diego sagewort) (*Artemisia palmeri*), and Lakeside Ceanothus (*Ceanothus cyaneus*; Figure 7).

Special-Status Plant Species Observed

Delicate Clarkia (also known as Campo Clarkia) (*Clarkia delicata*)

CNPS List 1B, San Diego County Group A

Delicate Clarkia is an annual wildflower that is typically found on the periphery of oak woodland habitats and within cismontane chaparral. Two different Delicate Clarkia populations are located within the center portion of the Preserve (Figure 7).

Lakeside Ceanothus (*Ceanothus cyaneus*)

CNPS List 1B, MSCP Covered Species, San Diego County Group A

Lakeside Ceanothus is known from an extremely small range (southern Ramona to the foothills of Lakeside). Typically, this *Ceanothus* occurs in dense, almost impenetrable chaparral with a mix of Chamise and other shrubs such as Manzanita. Lakeside Ceanothus found on the Preserve is within the rocky chaparral located within the northern portion of the Preserve (see Figure 7). This species is a common component of the chaparral in the northern portion of the Preserve.

Palmer's Sagebrush (also known as San Diego sagewort) (*Artemisia palmeri*)

CNPS List 4, San Diego County Group D

Palmer's Sagebrush is typically found along creeks and drainages near the coast and within inland chaparral. Within the Preserve this species is widely scattered within the southern mixed chaparral and woodland habitats (Figure 7).

Special-Status Plant Species not Observed but with a High Potential to Occur

Orcutt's Brodiaea (*Brodiaea orcuttii*)

CNPS List 1B, MSCP Covered Species, San Diego County Group A

Orcutt's Brodiaea is a perennial herb from a corm that prefers vernal moist grasslands, mima mound topography and the periphery of vernal pools. Within the Preserve the non-native grasslands could potentially support this MSCP-covered plant species.

4.1.8 Invasive Plant Species

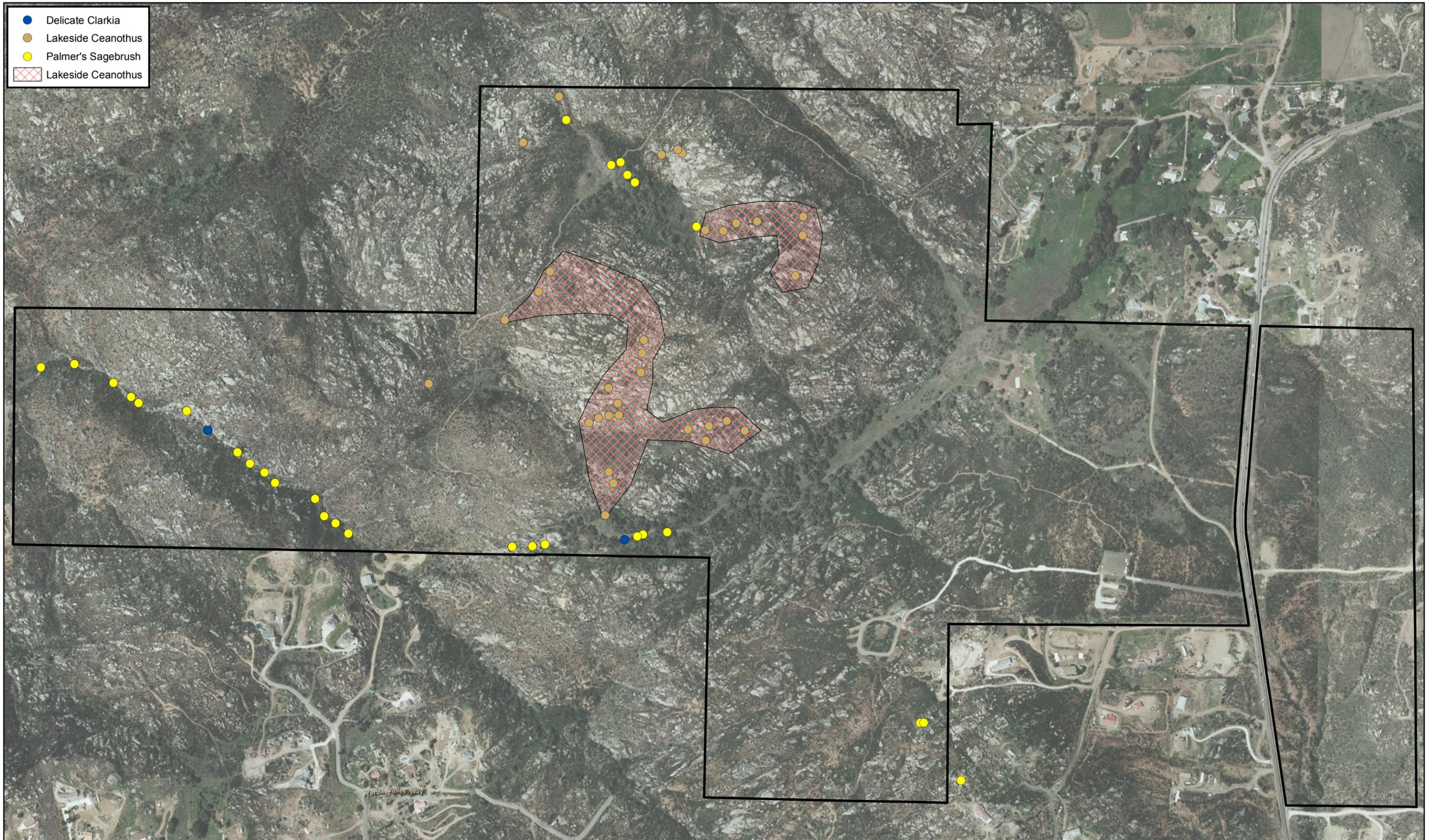
The Preserve is dominated by native and naturalized plant species. Invasive plant species are not abundant within the Preserve.

4.2 Invertebrates

All invertebrates identified on the Preserve below the level of family are included in Appendix B. No special-status invertebrate species are reported for the Preserve by the CNNDDB (CDFG 2008).

4.2.1 Butterflies

Butterfly species observed on the Preserve include Sara's Orangetip (*Anthocaris sara*), Behr's Metalmark (*Apodemia mormo virgulti*), Brown Elfin (*Callophrys augustinus*), Orange Sulfur (*Colias eurytheme*), Funereal Duskywing (*Erynnis funeralis*), Pale Swallowtail (*Papilio eurymedon*), Common White (*Pontia protodice*), and Painted Lady (*Vanessa cardui*). No Quino Checkerspot Butterfly or any other special-status butterfly surveys were performed on the Preserve. Although Quino checkerspot's primary host plant, Dwarf Plantain, occurs in small patches within the Preserve, this species is likely absent due to the high density of the surrounding shrub and tree communities.



SOURCE: ESRI Imagery



Figure 7
Special Status Plant Species
Oakoasis Preserve

4.2.2 Other Invertebrates

Twelve other invertebrate species were captured in the pitfall traps associated with the herpetological array or observed during other fieldwork (Appendix B). These species were identified in the field, or photographed and provided to a local entomologist to identify. No invertebrate species were collected.

4.2.3 Special-Status Invertebrate Species

Special-Status Invertebrate Species Observed

No special-status butterfly species or other invertebrate species were detected during any surveys.

Special-Status Invertebrate Species not Observed but with a High Potential to Occur

No special-status invertebrate species have high potential to occur at the Preserve.

4.3 Amphibians

Two amphibian species, including Pacific Chorus Frog (*Pseudacris regilla*) and Western Toad (*Bufo boreas*), were captured in the pitfall traps during the 2008 sampling at the Preserve (Appendix B). Western Toad tadpoles were observed in several ponded areas within the meadow south of Array 1 (Figure 5). Pacific Chorus Frog tadpoles were observed in the stream in the western portion of the Preserve.

Other amphibians with potential to occur are limited to California Chorus Frog (*Pseudacris cadaverina*), Western Spadefoot (*Spea hammondi*), Arboreal Salamander (*Aneides lugubris*), Garden Slender Salamander (*Batrachoseps major major*), and Common Ensatina (*Ensatina eschscholtzi*).

4.3.1 Special-Status Amphibian Species

Special-Status Amphibian Species Observed

No sensitive amphibian species were detected during the 2008 surveys.

Special-Status Amphibian Species not Observed but with a High Potential to Occur

Western Spadefoot (*Spea* [= *Scaphiopus*] *hammondi*)

State Species of Special Concern, San Diego County Group II

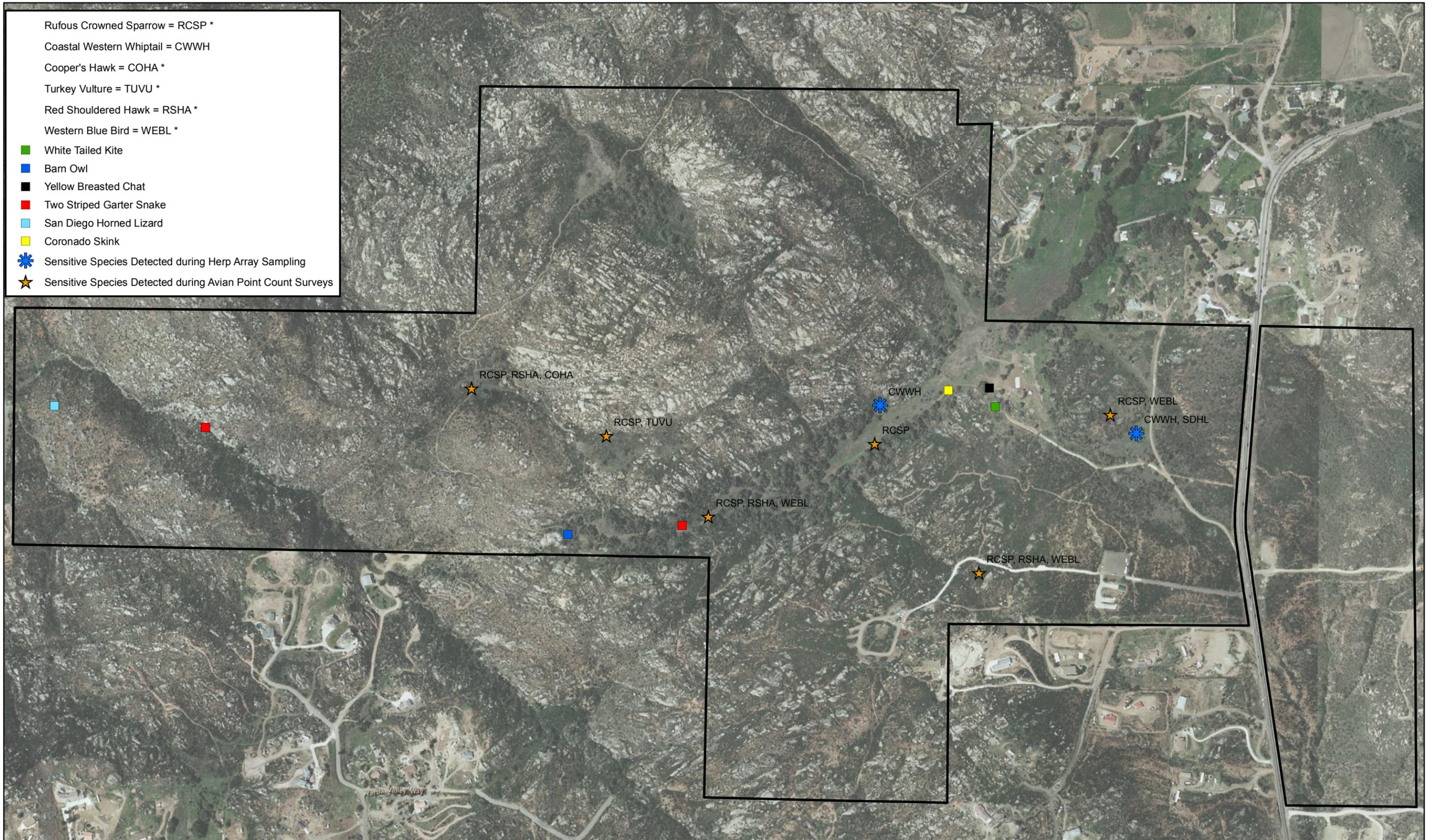
The Western Spadefoot range covers the central portion of northern California, the Great Valley, and Coast Ranges from San Francisco to Baja California (Lemm 2006). Although they spend the great majority of their life outside water, they require temporary rain pools with water temperatures between 48° and 86° F (9° and 30° C) lasting upwards of three weeks. These pools must also lack predators of eggs and tadpoles such as introduced fishes, bullfrogs, and crayfishes (Jennings and Hayes 1994). Vernal pools are sometimes occupied, but in all cases the species must have access to soils suitable for digging to allow estivation during the dry season. Tolerance of disturbance is high where conditions are otherwise suitable, and the species is sometimes found in pools resulting from landscape modification by man, even adjacent to roads. This species is known to occur in the area and has high potential to occur in pooled areas along the stream courses within the Preserve.

4.4 Reptiles

During the 2008 sampling at the Preserve, twelve reptile species were detected (Table 5, Appendix B). Eight reptile species were captured by the pitfall arrays: Southern Alligator Lizard (*Elgaria multicarinata*), San Diego Horned Lizard (*Phrynosoma coronatum blainvilli*), Western Fence Lizard (*Sceloporus occidentalis*), Granite Spiny Lizard (*Sceloporus orcutti*), Side-blotched Lizard (*Uta stansburiana*), Gilbert's Skink (*Eumeces gilberti*), and Coastal Western Whiptail (*Cnemidophorus tigris stejnegeri*). Five additional reptile species observed or detected but not captured in the arrays include Coronado Skink (*Eumeces skiltonianus interparietalis*), Granite Night Lizard (*Xantusia henshawi*), Striped Racer (*Masticophis lateralis*), Two-striped Garter Snake (*Thamnophis hammondi*), and Western Rattlesnake (*Crotalus oreganus*).

Two additional species, Western Blind Snake (*Leptotyphlops humilis*), and Night Snake (*Hypsiglena torquata*), were observed by Park Ranger P. Hayden within the Preserve in April 2008 (Pers. Com., P. Hayden April 25, 2008).

Based on the presence of potentially suitable habitat, several additional reptile species may also occur on the Preserve. Sensitive species include California Legless Lizard (*Anniella pulchra*), Orange-throated Whiptail (*Cnemidophorus hyperythrus beldingi*), Coastal Rosy Boa (*Lichanura trivirgata roseofusca*), San Diego Ringneck Snake (*Diadophis punctatus similis*), Coast Patch-nosed Snake (*Salvadora hexalepis vigultea*), and Red Diamond Rattlesnake (*Crotalus ruber ruber*). Other potential species include Western Banded Gecko (*Coleonyx variegatus*), Western Racer (*Coluber mormon*), Common Kingsnake



SOURCE: ESRI Imagery

* = Acronyms used for sensitive species detected at herpetological array location and at avian point count location.



Figure 8
Special Status Wildlife Species
Oakoasis Preserve

(*Lampropeltis getula*), Coachwhip (*Masticophis flagellum*), Striped Racer (*Masticophis lateralis*), Gopher Snake (*Pituophis catenifer*), Longnose Snake (*Rhinocheilus lecontei*), Western Blackhead Snake (*Tantilla planiceps*), Speckled Rattlesnake (*Crotalus mitchellii*), and Lyre Snake (*Trimorphodon biscutatus*).

Table 5. Reptile Species Observed or Captured at the Preserve in 2008

Scientific Name	Common Name	Special Status
<i>Elgaria multicarinata</i>	Southern Alligator Lizard	
<i>Phrynosoma coronatum blainvillii</i>	San Diego Horned Lizard	CSC, MSCP, CSDS Group II
<i>Sceloporus occidentalis</i>	Western Fence Lizard	
<i>Sceloporus orcutti</i>	Granite Spiny Lizard	
<i>Uta stansburiana</i>	Side-blotched Lizard	
<i>Eumeces gilberti</i>	Gilbert's Skink	
<i>Eumeces skiltonianus interparietalis</i>	Coronado Skink	CSC, CSDS Group II
<i>Cnemidophorus tigris stejnegeri</i>	Coastal Western Whiptail	CSDS Group II
<i>Xantusia henshawi</i>	Granite Night Lizard	
<i>Masticophis lateralis</i>	Striped Racer	
<i>Thamnophis hammondi</i>	Two-striped Garter Snake	CSC, CSDS Group I
<i>Crotalus oreganus [Crotalus viridis]</i>	Western Rattlesnake	

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

4.4.1 Special-Status Reptile Species

Four sensitive species were detected and include San Diego Horned Lizard, Coronado Skink, Coastal Western Whiptail, and Two-striped Garter Snake (Figure 8).

Special-Status Reptile Species Observed

San Diego Horned Lizard (*Phrynosoma coronatum blainvillii*)

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

The San Diego 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, an abundance of prey and open areas with limited overstory typify suitable habitat for this species (Jennings and Hayes 1994). The San Diego Horned Lizard's insectivorous diet consists mostly of native Harvester Ants (*Pogonomyrmex* sp.) which make up over 90% of their prey items, but 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*). This species was captured in Array 2 in July (Figure 8).

Coronado Skink (*Eumeces skiltonianus interparietalis*)

State 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, pinon-juniper, riparian woodlands and pine forests (Jennings and Hayes 1994). Their 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 Geronio Pass in Riverside County south to San Quentin, Mexico (Jennings and Hayes 1994). Coronado Skink was observed during surveys of the Preserve.

Coastal Western Whiptail (*Cnemidophorus tigris multiscutatus*)

San Diego County Group II

Coastal Western 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 Western Whiptails is likely due to loss of habitat to agriculture and urban development. This species was captured numerous times throughout the trapping program in Arrays 1 and 2.

Two-striped Garter Snake (*Thamnophis hammondi*)

State Species of Special Concern, San Diego County Group I

Two-striped Garter Snake occurs west of the deserts and Central Valley from Salinas, Monterey County, south into Baja California, and at elevations from sea level up to about 2,438 m (8,000 ft) in the San Jacinto Mountains (Jennings and

Hayes 1994). It is often in water and rarely found far from it, though it is also known to inhabit intermittent streams having rocky beds bordered by willow thickets or other dense vegetation (Jennings and Hayes 1994). They will also inhabit large riverbeds such as those of the Santa Ana and Santa Clara rivers if riparian vegetation is available, and even occur in artificial impoundments if both aquatic vegetation and suitable prey items (small amphibians and fish) are present (Jennings and Hayes 1994). Declines are attributable directly to loss of riparian habitats. This species was observed during surveys of the Preserve.

Special-Status Reptile Species not Observed but with a High Potential to Occur

Orange-throated Whiptail (*Cnemidophorus hyperythrus beldingi*)

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

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, non-native grassland, coastal sage scrub, juniper woodland, and oak woodland. California Buckwheat is an important indicator of appropriate habitat for Orange-throated Whiptails (Dudek 2000). This plant species is a colonizer of disturbed, sandy soils and usually indicates open shrub spacing that is required for foraging and thermoregulatory behavior. Orange-throated Whiptails appear to be dietary specialists with most (> 85%) of its prey being comprised of termites (Dudek 2000). The decline of Orange-throated Whiptails is likely due to loss of habitat to agriculture and urban development. This species has high potential to occur in chaparral on 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. This species has high potential to occur in rocky areas on the Preserve.

San Diego Ringneck Snake (*Diadophis punctatus similis*)

San Diego County Group II

The San Diego Ringneck Snake is a small, thin snake that prefers moist habitats, including wet meadows, rocky hillsides, gardens, farmland, grassland, chaparral, mixed coniferous forests, and woodlands (Stebbins 2003). It is secretive in its behavior, usually found under the cover of rocks, wood, bark, boards, and other surface debris. Ringneck snakes eat small salamanders, tadpoles, small frogs, small snakes, lizards, worms, slugs, and insects. This species' range includes San Diego County along the coast and into the Peninsular range, southwestern San Bernardino County, and barely south into northern Baja California (Stebbins 2003). Threats to this species include habitat degradation and fragmentation from urban development. This species has high potential to occur in mesic areas throughout the Preserve.

Coast Patch-nosed Snake (*Salvadora hexalepis virgutea*)

State Species of Special Concern, San Diego County Group II

The Coast Patch-nosed Snake is a medium-sized, slender snake that is a habitat generalist that makes use of whatever vegetative cover is available and thrives in most environments. It is also a generalist in its diet, opportunistically feeding on anything it can overpower including small mammals, lizards, and the eggs of lizards and snakes. The species ranges from Creston in San Luis Obispo County southward into Baja California (Stebbins 2003). This species' decline is likely due to conversion of habitat to development, agriculture or non-native plant species. This species has high potential to occur throughout the Preserve due to presence of suitable habitat.

Red Diamond Rattlesnake (*Crotalus ruber ruber*)

State Species of Special Concern, San Diego County Group II

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 it is most commonly seen in areas with heavy brush and cactus, 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 the steeper rocky hillsides have significantly decreased the amount of appropriate habitat for this species (Jennings and Hayes 1994). This species has high potential to occur in the areas with boulders on the Preserve.

4.5 Birds

Avian species richness (total species detected) was found to be moderate at the Preserve. In total, 63 bird species were detected with 55 species detected during the point counts and 8 detected during other fieldwork. These included year-round residents, winter-only species, breeding species that migrate to the Neotropics, and species that are strictly migratory through the Preserve, neither breeding nor wintering there.

The Preserve's avifauna is a mixture of species that are closely associated with the riparian habitat and the surrounding chaparral that is recovering from the 2003 Cedar Fire. These species include California Quail (*Callipepla californica*), Black-chinned Hummingbird (*Archilochus alexandri*), Costa's Hummingbird (*Calypte costae*), Anna's Hummingbird (*Calypte anna*), Acorn Woodpecker (*Melanerpes formicivorus*), Nuttall's Woodpecker (*Picoides nuttallii*), Ash-throated Flycatcher (*Myiarchus cinerascens*), Pacific Slope Flycatcher (*Empidonax difficilis*), Oak Titmouse (*Baeolophus inornatus*), White-breasted Nuthatch (*Sitta carolinensis*), Canyon Wren (*Catherpes mexicanus*), Bewick's Wren (*Thryomanes bewickii*), House Wren (*Troglodytes aedon*), Spotted Towhee (*Pipilo maculatus*), California Towhee (*Pipilo crissalis*), Southern California Rufous-crowned Sparrow (*Aimophila ruficeps canescens*), Song Sparrow (*Melospiza melodia*), Lazuli Bunting (*Passerina amoena*), House Finch (*Carpodacus mexicanus*), and Lesser Goldfinch (*Carduelis psaltria*).

The Preserve has a good diversity of raptors (birds of prey), including seven raptor species observed: Turkey Vulture (*Cathartes aura*), White-tailed Kite (*Elanus leucurus*), Cooper's Hawk (*Accipiter cooperii*), Red-shouldered Hawk (*Buteo lineatus*), Red-tailed Hawk (*Buteo jamaicensis*), Barn Owl (*Tyto alba*), and Great Horned Owl (*Bubo virginianus*). These birds are using the Preserve for foraging and some species have potential to breed on site; however, no active raptor nests were observed.

The Preserve supports a small patch of willows but the riparian vegetation is best described as oak riparian forest with an open understory. There is no reasonable potential for Southwestern Willow Flycatcher (*Empidonax traillii extimus*) to occur at the Preserve beyond rare and brief visits, due to lack of suitable habitat. It is likely that other subspecies of Willow Flycatcher pass through the Preserve in spring and fall, though they were not recorded during the current work. There is moderate potential for Least Bell's Vireo (*Vireo bellii pusillus*) to occur at the Preserve but once again this would be in a rare or brief visit.

Two non-native or invasive bird species were detected during the surveys – European Starling (*Sturnus vulgaris*) and Brown-headed Cowbird (*Molothrus ater*). Brown-headed Cowbird, an obligate brood parasite was apparently present only as a migrant and wanderer on the Preserve. Nineteen sightings of individuals, mainly males, were recorded on or over the Preserve. No juveniles were detected indicating that this species may not parasitize nests on the Preserve. There was only one sighting of a European Starling and this bird was

flying high overhead. This species does not currently pose a threat to the native avian species on the Preserve.

4.5.1 Point Count Results

As detailed in Section 3.4, ten-minute avian point counts were conducted at six stations monthly from April through September 2008 (Figure 5). ICF Jones & Stokes' Wildlife Biologist Kylie Fischer conducted all of the counts.

A total of 63 bird species were detected during surveys of the Preserve - 55 bird species during the point counts and 8 during other fieldwork (Table 6). The most numerous bird species were Mourning Dove, Anna's Hummingbird, American Crow, Western Scrub-jay, Bewick's Wren, House Wren, Wrentit, Spotted Towhee, California Towhee, Southern California Rufous-crowned Sparrow, Song Sparrow, House Finch, and Lesser Goldfinch. Species identified in Table 6 as confirmed breeders and probable breeders were regularly detected during the point counts.

Table 6. Avian Species Detected at the Preserve in 2008

Scientific Name	Common Name	Observed or Detected	Special Status	Breeding Status
<i>Anas platyrhynchos</i>	Mallard	O		
<i>Callipepla californica</i>	California Quail	X		pr
<i>Ardea alba</i>	Great Egret	XFB		
<i>Cathartes aura</i>	Turkey Vulture	X	CSDS Group I	
<i>Elanus leucurus</i>	White-tailed Kite	O	CFP, CSDS Group I	
<i>Accipiter cooperii</i>	Cooper's Hawk	O	MSCP, CSDS Group I	
<i>Buteo lineatus</i>	Red-shouldered Hawk	X	CSDS Group I	pr
<i>Buteo jamaicensis</i>	Red-tailed Hawk	X		pr
<i>Charadrius vociferus</i>	Killdeer	X		
<i>Zenaidura macroura</i>	Mourning Dove	X		pr
<i>Geococcyx californianus</i>	Greater Roadrunner	X		?
<i>Tyto alba</i>	Barn Owl	O	CSDS Group II	?
<i>Bubo virginianus</i>	Great Horned Owl	O		pr
<i>Phalaenoptilus nuttallii</i>	Common Poorwill	O		pr
<i>Archilochus alexandri</i>	Black-chinned Hummingbird	X		pr
<i>Calypte anna</i>	Anna's Hummingbird	X		pr
<i>Calypte costae</i>	Costa's Hummingbird	X		pr

Scientific Name	Common Name	Observed or Detected	Special Status	Breeding Status
<i>Melanerpes formicivorus</i>	Acorn Woodpecker	X		pr
<i>Picoides nuttallii</i>	Nuttall's Woodpecker	X		pr
<i>Colaptes auratus</i>	Northern Flicker	O		
<i>Contopus sordidulus</i>	Western Wood-Pewee	X		
<i>Empidonax difficilis</i>	Pacific-slope Flycatcher	X		?
<i>Sayornis nigricans</i>	Black Phoebe	X		CO
<i>Myiarchus cinerascens</i>	Ash-throated Flycatcher	X		pr
<i>Tyrannus sp.</i>	? Kingbird	X		
<i>Aphelocoma californica</i>	Western Scrub-Jay	X		pr
<i>Corvus brachyrhynchos</i>	American Crow	X		CO
<i>Corvus corax</i>	Common Raven	X		CO (PC)
<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	X		
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	X		
<i>Baeolophus inornatus</i>	Oak Titmouse	X		pr
<i>Psaltriparus minimus</i>	Bushtit	X		CO
<i>Sitta carolinensis</i>	White-breasted Nuthatch	X		CO
<i>Salpinctes obsoletus</i>	Rock Wren	X		pr
<i>Catherpes mexicanus</i>	Canyon Wren	X		pr
<i>Thryomanes bewickii</i>	Bewick's Wren	X		pr
<i>Troglodytes aedon</i>	House Wren	X		CO
<i>Polioptila caerulea</i>	Blue-gray Gnatcatcher	X		pr
<i>Sialia mexicana</i>	Western Bluebird	X	MSCP, CSDS Group II	CO
<i>Catharus ustulatus</i>	Swainson's Thrush	X		
<i>Chamaea fasciata</i>	Wrentit	X		pr
<i>Mimus polyglottos</i>	Northern Mockingbird	X		
<i>Toxostoma redivivum</i>	California Thrasher	X		pr
* <i>Sturnus vulgaris</i>	European Starling	X		CO
<i>Phainopepla nitens</i>	Phainopepla	X		pr
<i>Vermivora celata</i>	Orange-crowned Warbler	X		pr
<i>Dendroica coronata</i>	Yellow-rumped Warbler	X		
<i>Dendroica nigrescens</i>	Black-throated Gray Warbler	X		
<i>Geothlypis trichas</i>	Common Yellowthroat	X		pr

Scientific Name	Common Name	Observed or Detected	Special Status	Breeding Status
<i>Wilsonia pusilla</i>	Wilson's Warbler	X		
<i>Icteria virens</i>	Yellow-breasted Chat	O	CSC, CSDS Group I	?
<i>Pipilo maculatus</i>	Spotted Towhee	X		pr
<i>Pipilo crissalis</i>	California Towhee	X		pr
<i>Aimophila ruficeps canescens</i>	Southern California Rufous-crowned Sparrow (=California Rufous-crowned Sparrow)	X	MSCP, CSDS Group I	pr
<i>Spizella atrogularis</i>	Black-chinned Sparrow	X		pr
<i>Melospiza melodia</i>	Song Sparrow	X		CO
<i>Zonotrichia atricapilla</i>	Golden-crowned Sparrow	X		
<i>Pheucticus melanocephalus</i>	Black-headed Grosbeak	X		
<i>Passerina amoena</i>	Lazuli Bunting	X		pr
* <i>Molothrus ater</i>	Brown-headed Cowbird	X		?
<i>Icterus cucullatus</i>	Hooded Oriole	X		
<i>Carpodacus mexicanus</i>	House Finch	X		CO
<i>Carduelis psaltria</i>	Lesser Goldfinch	X		CO

Legend

*=Non-native or invasive species

Observed or Detected: X = detected during point count, O = Observed during other fieldwork, FB = overhead or fly-by only

Special Status: FE= Federally Endangered, FT=Federally Threatened, SE= State Endangered, CSC= California Species of Special Concern, CFP= California Fully Protected, MSCP= Multiple Species Conservation Program Covered Species, CSDS=County of San Diego Sensitive Animal

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)

Tables 7 and 8 provide quantitative summaries of the results for species and individuals. Abundance varies significantly ranging from 99 observations at station 5 to 191 at Station 3. The greatest number of species were detected at station 2 (36 species) and the lowest number was at station 6 (26 species). Included in the species calculations is one sighting of an unknown kingbird. This bird was seen in flight and the lighting and circumstances did not allow the observer to see any identifying characteristics beyond type of bird. Two

observations of unknown sparrow species were excluded from the calculation of total species.

Table 7. Avian Point Counts — Totals for Individuals*

Month	Point Count Stations						Total # of Individuals	Mean # of Individuals
	1	2	3	4	5	6		
April	22	36	21	23	23	18	143	23.8
May	29	14	33	23	16	14	129	21.5
June	18	35	27	21	24	26	151	25.2
July	39	18	31	20	11	13	132	22.0
August	28	14	36	17	8	21	124	20.7
September	17	22	43	22	17	20	141	23.5
Total # of Individuals	153	139	191	126	99	112	820	
<i>Mean # of Individuals</i>	<i>25.5</i>	<i>23.2</i>	<i>31.8</i>	<i>21.0</i>	<i>16.5</i>	<i>18.7</i>		22.8

* See Section 3.4.1 regarding the exclusion of individuals recorded as “fly-bys”.

Table 8. Avian Point Counts—Totals for Species*

Month	Point Count Stations						Total # of Species	Mean # of Species
	1	2	3	4	5	6		
April	14	19	17	12	15	13	38	18.3
May	15	10	18	15	10	12	36	16.6
June	14	18	15	14	12	14	39	18.0
July	14	12	13	11	9	11	30	14.3
August	13	13	14	10	6	12	26	13.4
September	12	11	13	14	10	10	26	13.7
Total # of Species	32	36	33	30	27	26		
<i>Mean # of Species</i>	<i>13.7</i>	<i>13.8</i>	<i>15.0</i>	<i>12.7</i>	<i>10.3</i>	<i>12.0</i>		15.7

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

4.5.2 Nocturnal Survey Results

The nocturnal bird surveys documented three nocturnal species using the Preserve – Barn Owl, Great Horned Owl and Common Poorwill (*Phalaenoptilus nuttallii*). A Barn Owl was detected during a nocturnal survey in August and they have been detected during other occasions at the Preserve (P. Heyden, personal communication). A Great Horned Owl pair was detected regularly during the nocturnal surveys and most likely breed on the Preserve. Common Poorwills were regularly detected during nocturnal surveys. The Preserve supports high potential for two additional nocturnal species: Western Screech-owl (*Megascops kennicottii*) and Lesser Nighthawk (*Chordeiles acutipennis*). These species could be present in small numbers, though were not detected during the surveys. Western Screech-owl was present on site historically but has not returned since the Cedar Fire (P. Heyden, personal communication).

4.5.3 Special-Status Bird Species

Seven special-status species were detected during the point counts – Turkey Vulture, White-tailed Kite, Red-shouldered Hawk, Barn Owl, Western Bluebird (*Sialia mexicana*), Yellow-breasted Chat (*Icteria virens*) and Southern California Rufous-crowned Sparrow. See Figure 8 for locations of special-status birds detected during surveys of the Preserve.

Special-Status Bird Species Observed

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, ranch lands and often occur along roadsides where carrion is common. They nest in crevices among granite boulders (Unitt 2004). The Turkey Vulture's 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. This species is still common in the undeveloped areas of east San Diego County thus the sighting at the Preserve is not regionally significant.

White-Tailed Kite (*Elanus caeruleus*)

State 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 a dense oak, willow or other large tree (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). A White-tailed Kite was observed near the Ranger Residence in May. There is suitable foraging and nesting habitat within the boundaries of the Preserve but breeding was not confirmed. The sighting at the Preserve is not regionally significant as this species is still widespread

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). A transitory juvenile Cooper's Hawk was observed on the Preserve in July. There is suitable foraging and breeding habitat on the Preserve; however, breeding was not confirmed on the Preserve. The sighting at the Preserve is not regionally significant as this species is still widespread.

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 gum (*Eucalyptus sp.*) (Unitt 2004). On the west coast, this species is found in California and northern Baja California and is common throughout San Diego County (Unitt 2004). A Red-shouldered Hawk was detected in the riparian forest in June and September and most likely breeds somewhere in this riparian corridor. The sighting at the Preserve is not regionally significant as this species is still widespread.

Barn Owl (*Tyto alba*)

San Diego County Group II

The Barn Owl is the owl species that is most tolerant to urban development (Unitt 2004). It will nest in buildings, nest boxes, at the base of the leaves in palm trees, and in cavities in native trees. Even though this species is tolerant of human development, dense housing communities do not provide suitable nesting habitat and loss of birds to increased traffic has a negative effect on the species (Unitt 2004). A Barn Owl was not detected at the Preserve until August but there is potential for this species to breed in the southern coast live oak riparian forest. This sighting is not regionally significant as this species is still widespread.

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, scrubs and during the winter in the desert. Western Bluebirds breed in western North America from southern British Columbia south to central Mexico, east to western Montana and west Texas, but are absent from the Great Basin (Guinan et al. 2000). It can also winter outside its 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 non-native species such as European Starling and House Sparrow (*Passer domesticus*) (Unitt 2004). A Western Bluebird pair was confirmed successfully breeding at point count station 3. As this species is still fairly common in San Diego County (Unitt 2004), the individuals detected do not represent a regionally significant population.

Yellow-breasted Chat (*Icteria virens*)

State Species of Special Concern, San Diego County Group I

The Yellow-breasted Chat is a medium sized insectivorous migratory passerine that is typically found in dense stands of riparian woodland that also have a well-developed understory. Chats are usually detected on their breeding grounds from April to late September near the edge of a stream, swampy ground or small pond. The loss of riparian habitat to development, agriculture and channeling of water has led to this species' decline. Some also mention that the decline may have been due to parasitism by the Brown-headed Cowbird (Gaines 1974, Unitt 2004). Numbers of Yellow-breasted Chats in San Diego County have been on the rise since the mid 1980's (Unitt 2004). Two Yellow-breasted Chats were observed in the southern coast live oak riparian forest adjacent to the Ranger Residence. It is unclear if they were breeding on site but they were present in June during the breeding season. This sighting is not regionally significant as this species is still widespread

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). Rufous-crowned Sparrows are declining due to loss of appropriate habitat and are sensitive to habitat fragmentation (Unitt 2004). Southern California Rufous-Crowned Sparrows were detected throughout the recovering shrub communities within the Preserve. As this species is still found throughout San Diego County in large numbers (Unitt 2004), the individuals detected do not represent a regionally significant population.

Special-Status Bird Species not Observed but with a High Potential to Occur

Northern Harrier (*Circus cyaneus*)

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

The Northern Harrier is associated with open grassland and marshes. This species typically forages in open, undisturbed habitat and nests on the ground in areas of dense low-growing vegetation to help conceal the nest. Nesting harriers are now considered rare and the known breeding population in San Diego County is estimated at 25 to 75 pairs (Unitt 2004). As with other ground nesting grassland birds, the northern harrier population is on the decline due to urban sprawl (Unitt 2004). Northern Harriers have been documented foraging at the nearby Stelzer County Park (IFC J&S 2008). This nearby sighting and the presence of foraging habitat at the Preserve lead to high potential for this species to forage at the Preserve. The Preserve provides minimal suitable breeding habitat for this species and if it was breeding at the Preserve in 2008, this would have been detected.

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). Golden Eagles are known to occur at El Capitan Mountain. The Preserve may be used for foraging but does not provide suitable nesting habitat for the species. A pair of Golden Eagles is known to occur in the vicinity of the Preserve; therefore, there is high potential for this species to sporadically occur at the Preserve.

Sharp-shinned Hawk (*Accipiter striatus*)

San Diego County Group II

Sharp-shinned Hawks breed in young coniferous forests with high canopies. This species has not been documented breeding in San Diego, however some summer sightings have been recorded (Unitt 2004). It is considered a fairly common migrant and winter resident, except in areas with deep snow (Dudek 2000). The known population breeding within California is very small and is vulnerable to impacts from falconry and logging. This species has high potential to occur as a migrant on the Preserve.

Merlin (*Falco columbarius*)

San Diego County Group II

The Merlin is most often seen in grasslands but has the potential to occur in any habitat type except dense woodland (Unitt 2004). This species is a rare winter visitor to San Diego County that feeds mostly on small birds and can be found where small birds flock (Unitt 2004). This species has high potential to occur as a migrant on the Preserve.

Loggerhead Shrike (*Lanius ludovicianus*)

State Species of Special Concern, San Diego County Group I

Loggerhead Shrikes are found near grassland, open sage scrub and chaparral, and desert scrub (Unitt 2004). They nest in dense vegetation adjacent to their open foraging habitats. Shrikes prefer to sit on an exposed tree limb or utility line looking for prey. They attack their prey from either a hovering flight above, or from their perch. The Loggerhead Shrike population in San Diego County is on the decline due to loss of habitat to development and habitat fragmentation (Unitt 2004). The species is still found throughout the County on the coastal plain and into the desert. This species has high potential to occur as there is appropriate foraging and nesting habitat at the Preserve.

Bell's Sage Sparrow (*Amphispiza belli belli*)

San Diego County Group I

The Bell's Sage Sparrow is a resident species that is usually found in chaparral and coastal sage scrub in southern California into Baja California. This mostly ground-dwelling species prefers open chaparral and sage scrub and is one of the first species to inhabit recently burned habitat (Unitt 2004). This subspecies occurs along the coastal lowlands, inland valleys, and in the lower foothills of the local mountains in southern California into Baja California (Dudek 2000). The decline in this species can be attributed to fire suppression, invasion by exotic plant species, loss of habitat to agriculture and urban development, and population isolation due to habitat fragmentation (Unitt 2004, Dudek 2000). Bell's Sage Sparrow has high potential to occur as there is suitable nesting habitat for the species on the Preserve.

4.6 Small Mammal Trapping

In total, nine small mammal species were recorded at the Preserve during small mammal trapping and other surveys (Table 9 and 10). These species were detected through capture, direct observation or sign. The trapping results indicate that the Preserve has moderate diversity in small mammal species with 29 captures from five species (Table 9). The species detected are commonly found in the habitats found on the Preserve.

Table 9. Trapline Capture Summary for 2008

Scientific Name	Common Name	Special Status	Captures
<i>Chaetodipus californicus femoralis</i>	Dulzura Pocket Mouse	CSC, CSDS Group II	13 ♂
			6 ♀
<i>Dipodomys simulans</i> (= <i>Dipodomys agilis simulans</i>)	Dulzura Kangaroo Rat		1 ♀
<i>Peromyscus californicus insigni</i>	California Mouse		1 ♂
			2 ♀
			1 esc
<i>Peromyscus fraterculus</i> (= <i>Peromyscus eremicus fraterculus</i>)	Northern Baja Mouse		3 ♀
<i>Neotoma lepida intermedia</i>	San Diego Desert Woodrat	CSC, CSDS Group II	1 ♂
			1 ♀
Total			29

Legend:
♂ = male, ♀ = female, released = released prior to determining sex, and esc = escaped prior to determining sex
Special Status: CSC= California Species of Concern, CSDS= County of San Diego Sensitive Animal

Table 10. Small Mammals Detected through Other Survey Methods at the Preserve in 2008

Scientific Name	Common Name	Special Status	Vegetation Communities	Method of Detection
<i>Notiosorex crawfordi</i>	Desert Shrew		riparian/grassland	captured in pitfall array
<i>Spermophilus beecheyi nudipes</i>	California Ground Squirrel		all communities	visual, sign, camera station
<i>Thomomys bottae</i>	Botta's Pocket Gopher		coastal sage scrub	sign, captured in pitfall array
<i>Microtus californicus</i>	California Vole		coastal sage scrub	captured in pitfall array

4.6.1 Special-Status Small Mammal Species

Sensitive species captured include Dulzura Pocket Mouse (*Chaetodipus californicus femoralis*) and San Diego Desert Woodrat (*Neotoma lepida intermedia*). Other sensitive species with potential to occur include Northwestern San Diego Pocket Mouse (*Chaetodipus fallax fallax*).

Special-Status Small Mammal Species Observed

Dulzura Pocket Mouse (*Chaetodipus californicus femoralis*)

State 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 m (7,900 ft) (CDFG 2005). This species prefers dense chaparral and is less common in dry grassland and desert scrub. During the small mammal trapping program, 19 individuals were captured at the Preserve.

San Diego Desert Woodrat (*Neotoma lepida intermedia*)

State 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). House materials include cacti, sticks, bones and a variety of debris. Houses 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 m (8,500 ft) in deserts and coastal sage scrub, and prefers areas with rocky outcrops and plentiful succulents (CDFG 2005). During

the small mammal trapping program, two individuals were captured at the Preserve.

Special-Status Small Mammal Species not Observed but with a High Potential to Occur

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

State 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. One Northwestern San Diego Pocket Mouse was captured at the nearby El Monte County Park (ICF J&S 2008). Due to the proximity of this occurrence and the suitability of the habitat within the Preserve, there is high potential for this species to occur.

4.7 Medium and Large Mammals

4.7.1 Camera Tracking Stations

After evaluating the images captured on the three camera stations, a total of four species of medium to large mammals were detected including: Desert Cottontail (*Sylvilagus audubonii*), Coyote (*Canis latrans*), Bobcat (*Felis rufus*), and Southern Mule Deer (*Odocoileus hemionus fuliginata*) (Table 11, Appendix B). See Figure 5 for camera station locations.

4.7.2 Track & Sign Surveys

A total of eight medium and large mammals including: Desert Cottontail, Domestic Dog (*Canis familiaris*), Coyote, Striped Skunk (*Mephitis mephitis*), Common Raccoon (*Procyon lotor*), Bobcat, Domestic Horse (*Equus caballus*) and Southern Mule Deer were detected in the Preserve through direct observation, tracks, sign, and nocturnal surveys (Table 11, Appendix B). Movement of larger animals appeared to be concentrated along easily traveled routes with good visibility such as roads and ridges. Most sign of smaller animals was within natural communities with cover, especially chaparral.

Due to the proximity to large amounts of open space and the presence of potentially suitable habitat, the following species may also utilize the Preserve: Brush Rabbit (*Sylvilagus bachmani*), Common Gray Fox (*Urocyon*

cinereoargenteus), Long-tailed Weasel (*Mustela frenata*), Black-tailed Jackrabbit (*Lepus californicus*), Western Spotted Skunk (*Spilogale gracilis*), Opossum (*Didelphis virginiana*), and Mountain Lion (*Puma concolor*).

No clear evidence of regular or important, larger-scale dispersal across the site was found, though such movement may well occur. Certainly it can be assumed that larger mammals regularly move on, off of, and across the Preserve, to and from adjacent open space.

Table 11. Medium and Large Mammals Detected at the Preserve in 2008

Scientific Name	Common Name	Special Status	Vegetation Communities	Method of Detection
<i>Sylvilagus audubonii</i>	Desert Cottontail		all communities	sign
* <i>Canis familiaris</i>	Domestic Dog		all communities	visual, sign
<i>Canis latrans</i>	Coyote		all communities	sign, camera station
<i>Mephitis mephitis</i>	Striped Skunk		oak woodland	sign
<i>Procyon lotor</i>	Common Raccoon		oak woodland	sign
<i>Lynx rufus</i>	Bobcat		all communities	sign, camera station
* <i>Equus caballus</i>	Domestic Horse		all communities	sign
<i>Odocoileus hemionus fuliginata</i>	Southern Mule Deer	MSCP, CSDS Group II	all communities	sign

Legend:

*=non-native species

Special Status: MSCP= Multiple Species Conservation Program Covered Species, CSDS= County of San Diego Sensitive Animal

4.7.3 Special-Status Medium and Large Mammal Species

One special-status medium or large mammal species was detected during the surveys: Southern Mule Deer.

Special-Status Medium and Large Mammal Species Observed

Southern Mule Deer (*Odocoileus hemionus fuliginata*)

San Diego County Group II, MSCP Covered Species

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. Southern Mule Deer sign were observed and individuals were photographed by the camera stations.

Special-Status Medium and Large Mammal Species not Observed but with a High Potential to Occur

San Diego Black-tailed Jackrabbit (*Lepus californicus*)

State Species of Special Concern, San Diego County Group I

The San Diego Black-tailed Jackrabbit is a large, long legged hare, with distinctive long ears and a blackish tail (Whitaker 1996). The Black-tailed Jackrabbit inhabits a wide range of habitats, including deserts, irrigated croplands, high mountains to 2,500 m (8,200 ft), and is commonly found in the western United States to Mexico and Baja California. The San Diego population is found mostly on the coastal side of our local mountains in open habitats, usually avoiding dense stands of chaparral or woodlands (Stephenson and Calcarone 1999). This species has been declining due to urban development, habitat loss, and fragmentation leading to population isolation (Dudek 2000). This Preserve supports suitable habitat for this species.

Mountain Lion (*Puma concolor*)

San Diego County Group II, 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. This Preserve and the surrounding open space provide

habitat for Mountain Lion to use for foraging and cover. As there is a large amount of open space surrounding the Preserve, potential for this species to move through the Preserve is high.

4.8 Bats

A total of 12 bat species were detected in 2008: nine through the use of passive Anabats and three during active bat survey (Table 12). The most active bat species detected were the Long-eared Myotis (*Myotis evotis*), Canyon Bat (*Parastrellus hesperus*), and Pocketed Free-tailed Bat (*Nyctinomops femorosaccus*). Species detected infrequently included the California Myotis (*Myotis californicus*), Yuma Myotis (*Myotis yumanensis*), and Big Brown Bat (*Eptesicus fuscus*). The bat species detected during all three seasonal monitoring sessions included the Canyon Bat, Pocketed Free-tailed Bat, and Mexican Free-tailed Bat (*Tadarida brasiliensis*). The Big Free-tailed Bat (*Nyctinomops macrotis*) was detected only during the spring while the Long-eared Myotis was detected only during the summer.

Three additional bat species were detected with an Anabat during the single active foraging bat survey conducted on August 20, 2008; the Small-footed Myotis (*Myotis ciliolabrum*), Western Red Bat (*Lasiurus blossevillii*), and Townsend's Big-eared Bat (*Corynorhinus townsendii*). Three adult female Townsend's Big-eared Bats were captured in mist-nets placed under the coast live oak tree canopy found in the center portion of Preserve (Figure 5). One was post-lactating, indicating she had bred and nursed young this year.

A moderate number of bat species appear to be supported by the Preserve. The Preserve is fairly diverse and contains habitat features important to bats in the southern California landscape such as riparian vegetation, oak woodland, scrub vegetation, and a fairly extensive amount of exposed rocky outcrops (Kruttsch 1948, Stokes et al 2005). The occurrence of rare and sensitive species, such as the Townsend's Big-eared Bat, indicates the Preserve's importance to bat populations in this part of the County. The capture of three females of this species suggests there may be a maternity roost of this species in the Preserve or nearby. Interestingly, there was a maternity colony of this species known from the town of Foster in the early-mid 1900's, which was not too far from the Preserve (Kruttsch 1948). This town and maternity roost site was ultimately inundated by the creation of the San Vicente Reservoir, and the maternity colony was never observed again. It is possible these three bats are part of a maternity colony that is related ancestrally to the one observed over 50 years ago and was presumed lost.

Table 12. Bat Species detected at the Preserve in 2008

Bat Species			Relative Activity Index*			Average Activity Index**
Scientific Name	Common Name	Special Status	Spring	Summer	Fall	
<i>Myotis californicus</i>	California Myotis		3.33	5.00	nd	2.78
<i>Myotis ciliolabrum</i>	Small-footed Myotis	CSDS Group II	Detected during active survey only			
<i>Myotis evotis</i>	Long-eared Myotis	CSDS Group II	nd	40.00	nd	13.33
<i>Myotis yumanensis</i>	Yuma Myotis	CSDS Group II	nd	1.67	6.67	2.78
<i>Lasiurus blossevillii</i>	Western Red Bat	CSC, CSDS Group II	Detected during active survey only			
<i>Parastrellus hesperus</i>	Canyon Bat		6.67	331.67	90.00	142.78
<i>Eptesicus fuscus</i>	Big Brown Bat		nd	5.00	3.33	2.78
<i>Corynorhinus townsendii</i>	Townsend's Big-eared Bat	CSC, CSDS Group II	Detected during active survey only			
<i>Tadarida brasiliensis</i>	Mexican Free-tailed Bat		23.33	5.00	2.00	10.11
<i>Nyctinomops femorosaccus</i>	Pocketed Free-tailed Bat	CSC, CSDS Group II	63.33	16.67	76.67	52.22
<i>Nyctinomops macrotis</i>	Big Free-tailed Bat	CSDS Group II	16.67	nd	nd	5.56
<i>Eumops perotis</i>	Western Mastiff Bat	CSC, CSDS Group II	36.67	nd	13.33	16.67

Legend:
nd = not detected
* Number of bat passes per Anabat night X 10
** Average of seasonal measures of relative activity for each bat species detected
Special Status:
CSC= California Species of Concern, CSDS= County of San Diego Sensitive Animal

4.8.1 Special-Status Bat Species

Eight sensitive species were detected during the surveys. These include Small-footed Myotis, Long-eared Myotis, Yuma Myotis, Western Red Bat, Townsend's Big-eared Bat, Pocketed Free-tailed Bat, Big Free-tailed Bat, and Western Mastiff Bat (*Eumops perotis*). This Preserve together with the adjacent El Capitan Preserve provides suitable roosting and foraging opportunities for a number of sensitive bat species. These two areas are extremely important for bats in the region.

Special-Status Bat Species Observed

Small-footed Myotis (*Myotis ciliolabrum*)

San Diego County Group II

The Small-footed Myotis is found through most of western North America, from southwestern Canada south into Mexico (BCI 2008). There is not much information on the habitat requirements of this species, but it has been documented under rock slabs and in crevices, 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. There is minimal roosting habitat for this species available on site; therefore, the Preserve may just be used for foraging by this species.

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 forest in higher altitudes and will roost in caves, rock crevices, under tree bark or in buildings (BCI 2008). There is minimal roosting habitat for this species available on the Preserve. The Preserve may just be used for foraging 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 up 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 have been documented using mines or caves (BCI 2008). Yuma Myotis are threatened by loss of riparian habitat and the decline in permanent water sources in the southwest. Both suitable roosting and foraging habitat for the Yuma Myotis occurs in the Preserve.

Western Red Bat (*Lasiurus blossevillii*)

State Species of Special Concern, San Diego County Group II

Western Red Bats are found from southern Canada, throughout U.S., all the way down to South America (BCI 2008). Several species in the genus *Lasiurus* are commonly referred to as "tree bats" because they roost only in tree foliage. The Western Red Bat is a typical tree bat, with a close association with cottonwoods

(*Populus* sp.) and riparian areas (BCI 2008). Like all tree bats, this species is solitary, coming together only to mate and to migrate. Western Red Bats typically forage along forest edges, in small clearings, or around street-lights where they prefer moths (BCI 2008). Although largely undocumented, this species' decline appears to be in part due to the loss of lowland riparian forests in the Southwest. Both suitable roosting and foraging habitat for the Western Red Bat occurs in the Preserve.

Townsend's Big-eared Bat (*Corynorhinus townsendii*)

State Species of Special Concern, San Diego County Group II

Townsend's Big-eared Bat occurs throughout the drier portions of California (Zeiner et al. 1990). It is non-migratory and hibernates from approximately October through April. A wide variety of natural communities are occupied but mesic sites are preferred. They capture a variety of prey while in flight, which is slow and maneuverable, and they are capable of hovering (Zeiner et al. 1990). The species is known to roost predominantly in caves but will use lava tubes, mines, tunnels, buildings, and other man-made structures (BCI 2008). They are extremely sensitive to disturbance at their roosting sites and have suffered severe population declines throughout much of the U.S. (BCI 2008). The Townsend's Big-eared Bat may be roosting at the Preserve and using it for foraging. The mines located in the adjacent El Capitan Preserve also provide nearby roosting habitat for this species.

Pocketed Free-tailed Bat (*Nyctinomops femorosaccus*)

State 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 Pocketed Free-tailed Bat is likely not roosting in the Preserve as there are no cliffs but the adjacent El Capitan Preserve provides suitable roosting habitat for this species. The individuals detected are likely using the Preserve as a place to forage.

Big Free-tailed Bat (*Nyctinomops macrotis*)

San Diego County Group II

Big Free-tailed Bats are typically found in desert and arid grasslands with rocky out-crops, 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 is likely not roosting in the Preserve as there are no cliffs but the adjacent El Capitan Preserve does provide suitable roosting habitat. The individuals detected are using the Preserve as a place to forage.

Western Mastiff Bat (*Eumops perotis*)

State Species of Special Concern, San Diego County Group II

Western Mastiff Bats are the largest native bats in the United States. 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 Mohave 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 or in tall buildings, 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 is likely not roosting in the Preserve as there are no cliffs but the adjacent El Capitan Preserve does provide suitable roosting habitat. The individuals detected are using the Preserve as a place to forage.

Special-Status Bat Species not Observed but with a High Potential to Occur

Pallid Bat (*Antrozous pallidus*)

State Species of Special Concern, San Diego County Group II

Pallid bats are widely distributed in the southwestern United States 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, as well as crevices in rocks, 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. Both suitable roosting and foraging habitat for the Pallid Bat occurs in the Preserve.

Chapter 5

Conclusions and Management Recommendations

The current surveys documented six land cover types and 243 species that were detected throughout the Preserve. Our surveys detected 115 plant species, 63 bird species, 29 mammal species (12 bats, nine small mammals, and eight medium and large bodied mammals), 14 herptiles (two amphibians and 12 reptiles), and 22 invertebrate species. Two additional reptile species were observed by Park Rangers in 2008. This list includes 26 sensitive species (23 wildlife and three plants), of which six are MSCP-covered species (five wildlife and one plant).

Specific management recommendations are provided for the various taxonomic groups assessed during this survey effort. In addition to these management recommendations we also recommend implementing the monitoring protocols addressed in the Biological Monitoring Plan for the Multiple Species Conservation Program (Monitoring Plan) (Ogden 1996) as appropriate within the Preserve. The Monitoring Plan identifies three types of MSCP biological monitoring including 1) habitat monitoring, 2) corridor monitoring, and 3) covered species monitoring.

Habitat monitoring is designed to focus on three areas including 1) permanent habitat loss as a result of development; 2) temporary habitat changes as a result of natural events (e.g., fires and flooding); and 3) loss of habitat value as a result of edge effects or other human related impacts.

Corridor monitoring within the Monitoring Plan is designed to assess utilization of key habitat linkages within the MSCP. Specifically the use of animal sign (track and scat) and visual sightings shall be used to determine presence of focal species.

Covered species monitoring within the Monitoring Plan is designed to identify 1) short term threats to species persistence and 2) longer-term trends that may suggest declining populations. Specifically, the covered species monitoring will document protection of covered species, changes in preserved populations, collecting of new biological data, evaluating impacts of land uses and evaluating management activities within the Preserve.

The MSCP Monitoring Plan identifies 29 monitoring sites throughout the plan area. None of these sites are located within the Preserve; however monitoring of MSCP-covered species is required.

It should be noted that that the Monitoring Plan is in the process of being revised by the U.S. Fish and Wildlife Service (Animal Monitoring Protocol) and the United States Geological Service (USGS) (Plant Monitoring Protocol). The revised Animal Monitoring Protocol covers the following species: California Gnatcatcher, Coastal Cactus Wren, Light-footed Clapper Rail, Tricolored Blackbird, Southwestern Willow Flycatcher, Burrowing Owl, California Least Tern, Thorne's Hairstreak, Wandering Skipper, and San Diego and Riverside Fairy Shrimp. The revised Plant Monitoring Protocol covers all of the MSCP-covered plant species.

5.1 Flora

It is recommended that the County maintain an updated vegetation community map to be used as a tool for adaptive management within the Preserve. Updates should occur once every three years or within the first growing season following an unforeseen disturbance (i.e., fire, rock fall, flood, or manmade 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, as well as slower but equally important effects such as invasion by non-natives or slow decline of existing species.

One MSCP covered plant species was detected, Lakeside Ceanothus. MSCP monitoring requirements for Lakeside Ceanothus include implementing habitat based monitoring and photo plot monitoring. The Monitoring Plan also requires area specific management directives to include specific management measures to address the autecology and natural history of this species and to reduce the risk of catastrophic fire. Management measures to accomplish this may include prescribed fire. Monitoring the Lakeside Ceanothus population within the Preserve will adhere to the revised Plant Monitoring Protocol currently in preparation by USGS.

It is recommended that disturbed land be restored through stabilization of eroded lands, strategic revegetation, and exotic plant species control. Significant restoration potential exists within the area mapped as southern coast live oak riparian forest (Figure 5 - just west of the ranger house). This habitat lacks the typical understory elements and passive restoration opportunities are recommended. The Preserve area should be managed for the benefit of special-status species and MSCP-covered species without substantive efforts to alter or restrict the natural course of ecosystem development and dynamics. To the extent feasible, natural wildfire cycles should not be suppressed as many of the plant species that occur within the Preserve (e.g., Lakeside Ceanothus) rely on periodic burns to maintain healthy populations.

Due to the Preserve's close proximity to rural residential development, a fire management plan should be completed in order to establish appropriate limited building zones and fuel modification zones along the perimeter of the Preserve.

5.2 Invertebrates

During surveys within the Preserve, "hilltopping" behavior was observed by common butterflies. This behavior was observed at various rock outcrops at high points on the hills. Therefore, planned trails and public vistas should not be installed, or should be installed with minimal disturbance, on the highest points of hills.

Centipedes, tarantulas, scorpions, ants, wasps, bees, and other venomous invertebrates are common within the Preserve. Ticks are also likely to occur. Signs should be posted to alert Preserve users of their presence, recommending avoidance and providing information on what to do in case of a bite or sting.

5.3 Herpetofauna

The Preserve supports several special-status herpetofauna species that will likely be encountered by the public on the roads and trails and off trail in the natural communities. These include one MSCP-covered species, the San Diego Horned Lizard, which is commonly found on roads and trails and may burrow within loose sand along the roads. Signs should be posted to inform Preserve users to stay on roads and trails and to avoid wildlife when encounters occur in order to reduce negative effects on the species listed above and other special-status herptiles. It should also be clear to Preserve users that animal collecting is prohibited.

MSCP monitoring requirements for the San Diego Horned Lizard include implementing site specific trapping for presence/absence. The herpetological pitfall arrays installed as a part of this study will be sampled periodically to monitor the San Diego Horned Lizard population at the Preserve.

Many of the reptiles, most notably Granite Night Lizard, are dependent on the rock features of the Preserve. These features are vulnerable to disturbance and damage by rock climbing, as well as those who would vandalize the exfoliating rock, potentially resulting in loss of important microhabitat features. Monitoring should be performed to confirm damage is not occurring due to rock climbing, collecting, or vandalism.

Rattlesnakes occur within the Preserve and on all occasions during the 2008 fieldwork were observed on or near roads and trails. Signs should be posted to alert Preserve users of rattlesnake presence, recommending avoidance and providing information on what to do in case of a bite.

5.4 Birds

Avian diversity on the Preserve reflects healthy integrity. A total of 63 bird species was documented on the Preserve; these include three MSCP-covered species: Cooper's Hawk, Western Bluebird, and Southern California Rufous-crowned Sparrow. MSCP monitoring requirements for Western Bluebird and Southern California Rufous-crowned Sparrow include implementing habitat-based monitoring for both species. The Monitoring Plan also requires site specific nest monitoring for the Cooper's Hawk.

Although the most extensive vegetation community on the Preserve is chaparral, it is likely that, the most important features at the Preserve for birds are the oak woodlands and riparian forest (including existing cavities for nesting). Woodlands are vulnerable, as bird habitat, from alteration by invasive plants, from additional fires at short intervals, and from increased development in the surrounding areas. The latter is likely to lead to increased numbers of European Starlings, American Crows, and Western Scrub-jays. Though the latter two species are native, artificially elevated populations of these aggressive nest predators can lead to high nest mortality rates among other native birds.

Brown-headed Cowbirds were detected using the Preserve during this baseline study. No juveniles were detected throughout the course of the surveys and most observations were of males. This species does not appear to be adversely affecting the native species at this time. Cowbird use of the Preserve should be monitored and if juveniles are observed the County may consider implementing a trapping program. Trapping is not appropriate at this time.

Over the long term, it will be important to ensure the continued viability of the oak woodland through recruitment of new trees. Thus, the health of this community at the Preserve should be evaluated periodically to ensure that recruitment and lack of disease in the oaks can support a diversity of both plants and wildlife.

Both quantitative and qualitative monitoring of bird populations by qualified personnel is recommended. Quantitative monitoring can consist, for example, of maintaining the avian point counts. If necessary for budgetary reasons, they could be conducted at less frequent intervals (e.g., every other month), or only periodically (e.g., every other year). The accumulation of data over time will prove extremely valuable to identify trends in bird populations both at the Preserve and across the region.

Qualitative monitoring can range from informal efforts, such as compiling a bird checklist for the Preserve and soliciting new or interesting observations, to intensive efforts such as encouraging research use of the Preserve. It is important to recognize that the avifauna of the Preserve will naturally change over time, due to regional effects, climate change, and natural turnover. Without monitoring, there is potential for the Preserve to be managed for resources no longer present, or in conflict with resources present but unrecognized.

5.5 Small Mammals

Habitat fragmentation is a leading cause in the decline of small mammal populations in species with low mobility (Vander Haegen et al. 2001). Patches of habitat occupied by sensitive species should be connected to wildlife corridors (such as riparian areas) to allow individuals to disperse and not become isolated and vulnerable. Future plans for the Preserve should address the potential isolation and genetic flow effects it may have on small mammal populations.

The small mammal species captured or observed at the Preserve are associated with shrub- and grass-dominated habitats. Habitat conservation is the primary way to protect small mammal populations from decline. Habitats found on the Preserve should not be degraded through activities such as off-road or off-trail use, conversion to other vegetation types, or the spraying of insecticides for insect control (i.e., ants or mosquitoes). Insectivorous mammal species are sensitive to the use of insecticides and if these methods are proposed for use in control of pest insect species, other alternatives should be explored.

5.6 Medium to Large Mammals

The Preserve is surrounded by a large amount of open space, and has the potential to serve as an important corridor for wildlife movement. Maintaining/improving movement connections across Wildcat Canyon Road will be an important consideration over time, especially if traffic volumes increase. Some of the existing culverts that cross underneath the road may be improved to allow for increased wildlife movement.

Southern Mule Deer was the only MSCP-covered mammal species detected during the field surveys. MSCP monitoring requirements for Southern Mule Deer include monitoring suitable habitat and wildlife corridor sites within the MSCP. As detailed above, the Preserve has the potential to serve as an important corridor for wildlife movement between adjacent open space areas. Monitoring for medium and large mammals will include periodic sampling at the camera stations used during this study.

Due to the proximity to residential development, species such as domestic dog and cats are likely to be found utilizing the Preserve. Both of these species have the potential to negatively impact the native species by introducing disease, or simply causing the native species to avoid portions of the Preserve.

Domestic dogs on leash are allowed on the Preserve. It is recommended that the County amend signage to state that dog owners should remove all feces in order to minimize potential vector born disease transmission to the local coyote population. In addition, feces bags and disposal bins should be provided at trailheads to encourage the public to remove feces.

5.7 Bats

The following items are recommended to maintain and increase the habitat suitability for bats within the Preserve

- Maintain riparian forest and oak woodland vegetation – these habitats are likely very important to both foraging and roosting bats in the Preserve.
- Maintain natural oak woodland understory – this will provide increased foraging opportunities for the Pallid bat (*Antrozous pallidus*), which often forages for terrestrial arthropods over natural understory vegetation and leaf litter under oak canopy.

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Appendix A

**Vascular Plant Species Observed within the
Oakoasis Preserve**

Vascular Plant Species Observed within the Oakoasis Preserve

Scientific Name	Common Name	Status
Selaginellaceae - Spike-Moss Family		
<i>Selaginella bigelovii</i>	Bigelow's spike-moss	
Pteridaceae - Brake Family		
<i>Pellaea mucronata</i> var. <i>mucronata</i>	Bird's foot cliff-brake	
Anacardiaceae - Sumac or Cashew Family		
<i>Malosma laurina</i>	Laurel sumac	
<i>Rhus ovata</i>	Sugar bush	
<i>Toxicodendron diversilobum</i>	Western poison-oak	
Apiaceae (Umbelliferae) - Carrot Family		
<i>Daucus pusillus</i>	Rattlesnake weed	
<i>Sanicula arguta</i>	Sharp-tooth sanicle	
<i>Tauschia arguta</i>	Southern tauschia	
Asteraceae (Compositae) - Sunflower Family		
<i>Ambrosia psilostachya</i>	Western ragweed	
<i>Artemisia californica</i>	Coastal sagebrush	
<i>Artemisia douglasiana</i>	Douglas mugwort	
<i>Artemisia palmeri</i>	Palmer's sagewort	CNPS List 4, CSDS Group D
<i>Brickellia californica</i>	California brickellbush	
* <i>Centaurea melitensis</i>	Tocalote	
<i>Chaenactis artemisiifolia</i>	Artemisia pincushion	
<i>Conyza canadensis</i>	Horseweed	
<i>Deinandra fasciculata</i>	Fascicled tarweed	

Scientific Name	Common Name	Status
<i>Eriophyllum confertiflorum</i> var. <i>confertiflorum</i>	Long-stem golden-yarrow	
* <i>Filago gallica</i>	Narrow-leaf filago	
<i>Gnaphalium bicolor</i>	Bicolor cudweed	
<i>Gnaphalium californicum</i>	California everlasting	
<i>Gutierrezia sarothrae</i>	Broom matchweed/snakeweed	
<i>Hazardia squarrosa</i> var. <i>grindeloides</i>	Sawtooth goldenbush	
* <i>Hedypnois cretica</i>	Crete hedypnois	
<i>Isocoma menziesii</i>	goldenbush	
<i>Lessingia filaginifolia</i> var. <i>filaginifolia</i>	California-aster	
<i>Stephanomeria virgata</i>	Virgate wreath-plant	
Boraginaceae - Borage Family		
<i>Amsinckia menziesii</i> var. <i>intermedia</i>	Rancher's fiddleneck	
<i>Cryptantha intermedia</i>	Nievas cryptantha	
Brassicaceae (Cruciferae) - Mustard Family		
* <i>Brassica nigra</i>	Black mustard	
* <i>Hirschfeldia incana</i>	Short-pod mustard	
Cactaceae - Cactus Family		
<i>Opuntia</i> sp. (cultivated)	Prickly-pear	
Caprifoliaceae [incl. Adoxaceae] - Honeysuckle Family		
<i>Lonicera subspicata</i> var. <i>denudata</i>	Southern honeysuckle	
<i>Sambucus mexicana</i>	Blue elderberry	
Caryophyllaceae - Pink Family		
* <i>Silene gallica</i>	Common catchfly	

Scientific Name	Common Name	Status
<i>Silene laciniata ssp. major</i>	Southern pink	
Cistaceae - Rock-Rose Family		
<i>Helianthemum scoparium</i>	Peak rush-rose	
Convolvulaceae - Morning-Glory Family		
<i>Calystegia macrostegia</i>	Morning-glory	
Crassulaceae - Stonecrop Family		
<i>Dudleya pulverulenta</i>	Dudleya	
Cucurbitaceae - Gourd Family		
<i>Marah macrocarpus var. macrocarpus</i>	Manroot, wild-cucumber	
Cuscutaceae - Dodder Family		
<i>Cuscuta californica</i>	Dodder	
Ericaceae - Heath Family		
<i>Xylococcus bicolor</i>	Mission manzanita	
Euphorbiaceae - Spurge Family		
<i>Acalypha californica</i>	California copperleaf	
<i>Chamaesyce albomarginata</i>	Rattlesnake spurge	
Fabaceae (Leguminosae) - Legume Family		
<i>Lotus scoparius</i>	Deerweed	
* <i>Medicago polymorpha</i>	California burclover	
* <i>Melilotus indica</i>	Indian sweetclover	
<i>Trifolium willdenovii</i>	Valley clover	
Fagaceae - Oak Family		
<i>Quercus agrifolia var. agrifolia</i>	Coast live oak, encina	
<i>Quercus berberidifolia</i>	Scrub oak	

Scientific Name	Common Name	Status
Geraniaceae - Geranium Family		
<i>*Erodium botrys</i>	Long-beak filaree/storksbill	
<i>Ribes indecorum</i>	White flower currant	
Hydrophyllaceae - Waterleaf Family		
<i>Eucrypta chrysanthemifolia</i> var. <i>chrysanthemifolia</i>		
<i>Phacelia distans</i>	Wild-heliotrope	
Lamiaceae (Labiatae) - Mint Family		
<i>Salvia apiana</i>	White sage	
<i>Salvia mellifera</i>	Black sage	
Malvaceae - Mallow Family		
<i>Malacothamnus fasciculatus</i>	Chaparral bushmallow	
Onagraceae - Evening-Primrose Family		
<i>Camissonia bistorta</i>	California sun cup	
<i>Clarkia delicata</i>	Delicate/Campo clarkia	CNPS List 1B, CSDS Group A
<i>Clarkia purpurea</i>	Large clarkia	
<i>Epilobium canum</i>	California fuschia, zauschneria	
Oxalidaceae - Oxalis Family		
<i>*Oxalis pes caprae</i>	Bermuda-buttercup	
Paeoniaceae - Peony Family		
<i>Paeonia californica</i>	California peony	
Polemoniaceae - Phlox Family		
<i>Gilia angelensis</i>	Grassland gilia	
<i>Linanthus dianthiflorus</i>	Farinose ground pink	
<i>Navarretia hamata</i> ssp. <i>hamata</i>	Hooked skunkweed	

Scientific Name	Common Name	Status
Polygonaceae - Buckwheat Family		
<i>Chorizanthe fimbriata</i> var. <i>fimbriata</i>	Fringed spineflower	
<i>Eriogonum fasciculatum</i>	California buckwheat	
Portulacaceae - Purselane Family		
<i>Calandrinia ciliata</i>	Red maids	
<i>Claytonia perfoliata</i>	Miner's-lettuce	
Ranunculaceae - Buttercup Family		
<i>Clematis ligusticifolia</i>	Yerba de chiva	
<i>Delphinium parryi</i> ssp. <i>parryi</i>	Parry's larkspur	
<i>Thalictrum fendleri</i> var. <i>fendleri</i>	Fendler's meadow-rue	
Rhamnaceae - Buckthorn Family		
<i>Ceanothus cyaneus</i>	Lakeside Ceanothus	CNPS 1B, CSDS Group A, MSCP
<i>Ceanothus leucodermis</i>	Chaparral whitethorn	
<i>Ceanothus oliganthus</i>		
<i>Ceanothus tomentosus</i>	Ramona-lilac	
<i>Rhamnus crocea</i>	Spiny redberry	
<i>Rhamnus ilicifolia</i>	Holly-leaf redberry	
Rosaceae - Rose Family		
<i>Adenostoma fasciculatum</i>	Chamise	
<i>Cercocarpus minutiflorus</i>	San diego mountain-mahogany	
<i>Heteromeles arbutifolia</i>	Toyon, christmas berry	
Rubiaceae - Madder or Coffee Family		
<i>Galium angustifolium</i> ssp. <i>angustifolium</i>	Narrow-leaf bedstraw	
* <i>Galium aparine</i>	Common bedstraw, goose grass	

Scientific Name	Common Name	Status
<i>Galium nuttallii</i> ssp. <i>nuttallii</i>	San diego bedstraw	
Rutaceae - Rue or Citrus Family		
<i>Cneoridium dumosum</i>	Coast spice bush, bush-rue	
Salicaceae - Willow Family		
<i>Salix exigua</i>	Narrow-leaf willow	
<i>Salix laevigata</i>	Red willow	
<i>Salix lasiolepis</i>	Arroyo willow	
Saururaceae - Lizard's Tail Family		
<i>Anemopsis californica</i>	Yerba mansa	
Scrophulariaceae - Figwort Family		
<i>Antirrhinum nuttallianum</i> ssp. <i>nuttallianum</i>	Nuttall's snapdragon	
<i>Castilleja exserta</i> ssp. <i>exserta</i>	Purple owl's-clover	
<i>Keckiella cordifolia</i>	Climbing bush penstemon	
<i>Mimulus aurantiacus</i>	Coast monkey flower	
<i>Mimulus guttatus</i>	Seep monkey flower	
<i>Penstemon spectabilis</i> var. <i>spectabilis</i>	Showy penstemon	
Agavaceae - Agave Family		
<i>Yucca schidigera</i>	Mohave yucca	
<i>Yucca whipplei</i>	Our lord's candle	
Iridaceae - Iris Family		
<i>Sisyrinchium bellum</i>	Blue-eyed-grass	
Juncaceae - Rush Family		
<i>Juncus mexicanus</i>	Mexican rush	
Liliaceae - Lily Family		

Scientific Name	Common Name	Status
<i>Calochortus splendens</i>	Splendid mariposa lily	
<i>Calochortus weedii</i> var. <i>weedii</i>	Weed's mariposa lily	
Poaceae (Gramineae) - Grass Family		
<i>Achnatherum coronatum</i>	Giant stipa	
* <i>Avena barbata</i>	Slender wild oat	
* <i>Bromus diandrus</i>	Ripgut grass	
* <i>Bromus hordeaceus</i>	Soft chess	
* <i>Bromus madritensis</i> ssp. <i>rubens</i>	Foxtail chess	
* <i>Cortaderia selloana</i>	Selloa pampas grass	
<i>Leymus condensatus</i>	Giant wild rye	
* <i>Lolium multiflorum</i>	Italian ryegrass	
<i>Melica imperfecta</i>	Coast range melic	
<i>Nassella lepida</i>	Foothill needlegrass	
* <i>Piptatherum miliaceum</i>	Smilo grass	
* <i>Vulpia myuros</i> var. <i>myuros</i>		
Themidaceae - Brodiaea Family		
<i>Dichelostemma capitatum</i> ssp. <i>capitatum</i>	Blue dicks	
Legend:		
*=non-native species		
Status:		
CNPS List – California Native Plant Society		
1B – Rare, threatened or endangered in California and elsewhere		
2 – Rare, threatened or endangered in California but more common elsewhere		
3 – May be rare but more research needed to determine true status		
4 – Limited distribution and are uncommon but not presently rare or endangered		
San Diego County Group		
A – Rare, threatened or endangered in California and elsewhere		
B – Rare, threatened or endangered in California but more common elsewhere		

Scientific Name	Common Name	Status
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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

References

Scientific and common names are from Hickman (1993) and Skinner and Pavlik (1994). Additional common plant names are taken from Abrams (1923, 1944), Abrams and Ferris (1960), Beauchamp (1986), McAuley (1996), Munz (1974), Skinner and Pavlik (1994) and Simpson and Rebman (2006).

Appendix B
**Wildlife Species Detected at Oakoasis Preserve
in 2008**

Wildlife Species Detected at Oakoasis Preserve in 2008

Scientific Name	Common Name	Method of Detection	Special Status
INVERTEBRATES			
<i>Butterflies</i>			
<i>Anthocaris sara</i>	Sara's Orangetip	X	
<i>Apodemia mormo virgulti</i>	Behr's Metalmark	X	
<i>Callophrys augustinus</i>	Brown Elfín	X	
<i>Erynnis funeralis</i>	Funereal Duskywing	X	
<i>Papilio eurymedon</i>	Pale Swallowtail	X	
<i>Vanessa cardui</i>	Painted Lady	X	
<i>Colias eurytheme</i>	Orange Sulfur	X	
Other Invertebrates			
<i>Anuroctonus sp.</i>	Burrowing Scorpion	XT	
<i>Aphonopelmus eutylenum</i>	Tarantula	XT	
<i>Apis mellifera</i>	European Honey Bee	XT	
<i>Armadillidium vulgare</i>	Pill Bug	XT	
<i>Calosoma pustulosis</i>	Common Calosoma	XT	
<i>Centrophilus californicus</i>	Camel Cricket	XT	
<i>Cratidus osculans</i>	Wooly Darkling Beetle	XT	
<i>Paruroctonus silvestrii</i>	Common California Scorpion	XT	
<i>Eleodes sp.</i>	Stink Beetle	XT	
<i>Gryllus sp.</i>	Field Cricket	XT	
<i>Pardosa sp.</i>	Wolf Spider	XT	
<i>Phloeodes pustulosis</i>	Ironclad Beetle	XT	
<i>Prionus californicus</i>	California Prionus	XT	
<i>Stenopelmatus sp.</i>	Jerusalem Cricket	XT	
<i>Trimerotropis pallidipennis</i>	Pallid-Winged Grasshopper	XT	
HERPTILES			
<i>Bufo boreas</i>	Western Toad	X	
<i>Pseudacris regilla</i> [<i>Hyla regilla</i>]	Pacific Chorus Frog	X	
<i>Elgaria multicarinata</i>	Southern Alligator Lizard	XT	
<i>Phrynosoma coronatum blainvilli</i>	San Diego Horned Lizard	XT	CSC, MSCP, CSDS Group II
<i>Sceloporus occidentalis</i>	Western Fence Lizard	XT	

Scientific Name	Common Name	Method of Detection	Special Status
<i>Sceloporus orcutti</i>	Granite Spiny Lizard	XT	
<i>Uta stansburiana</i>	Side-blotched Lizard	XT	
<i>Eumeces gilberti</i>	Gilbert's Skink	XT	
<i>Eumeces skiltonianusinterparietalis</i>	Coronado Skink	X	CSC, CSDS Group II
<i>Cnemidophorus tigris stejnegeri</i>	Coastal Western Whiptail	XT	CSDS Group II
<i>Xantusia henshawi</i>	Granite Night Lizard	X	
<i>Masticophis lateralis</i>	Striped Racer	X	
<i>Leptotyphlops humilis</i>	Western Blind Snake	PC	
<i>Thamnophis hammondi</i>	Two-striped Garter Snake	X	CSC, CSDS Group I
<i>Crotalus oreganus</i> [<i>Crotalus viridis</i>]	Western Rattlesnake	X	
<i>Hypsiglena torquata</i>	Night Snake	PC	
BIRDS			
<i>Anas platyrhynchos</i>	Mallard	X	
<i>Callipepla californica</i>	California Quail	X	
<i>Ardea alba</i>	Great Egret	X	
<i>Cathartes aura</i>	Turkey Vulture	X	CSDS Group I
<i>Elanus leucurus</i>	White-tailed Kite	X	CFP, CSDS Group I
<i>Accipiter cooperii</i>	Cooper's Hawk	X	MSCP, CSDS Group I
<i>Buteo lineatus</i>	Red-shouldered Hawk	X	CSDS Group I
<i>Buteo jamaicensis</i>	Red-tailed Hawk	X	
<i>Charadrius vociferus</i>	Killdeer	X	
<i>Zenaida macroura</i>	Mourning Dove	X	
<i>Geococcyx californianus</i>	Greater Roadrunner	X	
<i>Tyto alba</i>	Barn Owl	X	CSDS Group II
<i>Bubo virginianus</i>	Great Horned Owl	X	
<i>Phalaenoptilus nuttallii</i>	Common Poorwill	X	
<i>Archilochus alexandri</i>	Black-chinned Hummingbird	X	
<i>Calypte anna</i>	Anna's Hummingbird	X	
<i>Calypte costae</i>	Costa's Hummingbird	X	
<i>Melanerpes formicivorus</i>	Acorn Woodpecker	X	
<i>Picoides nuttallii</i>	Nuttall's Woodpecker	X	

Scientific Name	Common Name	Method of Detection	Special Status
<i>Colaptes auratus</i>	Northern Flicker	X	
<i>Contopus sordidulus</i>	Western Wood-Pewee	X	
<i>Empidonax difficilis</i>	Pacific-slope Flycatcher	X	
<i>Sayornis nigricans</i>	Black Phoebe	X	
<i>Myiarchus cinerascens</i>	Ash-throated Flycatcher	X	
<i>Tyrannus sp</i>	Kingbird species	X	
<i>Aphelocoma californica</i>	Western Scrub-Jay	X	
<i>Corvus brachyrhynchos</i>	American Crow	X	
<i>Corvus corax</i>	Common Raven	X	
<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	X	
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	X	
<i>Baeolophus inornatus</i>	Oak Titmouse	X	
<i>Psaltriparus minimus</i>	Bushtit	X	
<i>Sitta carolinensis</i>	White-breasted Nuthatch	X	
<i>Salpinctes obsoletus</i>	Rock Wren	X	
<i>Catherpes mexicanus</i>	Canyon Wren	X	
<i>Thryomanes bewickii</i>	Bewick's Wren	X	
<i>Troglodytes aedon</i>	House Wren	X	
<i>Poliophtila caerulea</i>	Blue-gray Gnatcatcher	X	
<i>Sialia mexicana</i>	Western Bluebird	X	MSCP, CSDS Group II
<i>Catharus ustulatus</i>	Swainson's Thrush	X	
<i>Chamaea fasciata</i>	Wrentit	X	
<i>Mimus polyglottos</i>	Northern Mockingbird	X	
<i>Toxostoma redivivum</i>	California Thrasher	X	
* <i>Sturnus vulgaris</i>	European Starling	X	
<i>Phainopepla nitens</i>	Phainopepla	X	
<i>Vermivora celata</i>	Orange-crowned Warbler	X	
<i>Dendroica coronata</i>	Yellow-rumped Warbler	X	
<i>Dendroica nigrescens</i>	Black-throated Gray Warbler	X	
<i>Geothlypis trichas</i>	Common Yellowthroat	X	
<i>Wilsonia pusilla</i>	Wilson's Warbler	X	
<i>Icteria virens</i>	Yellow-breasted Chat	X	CSC, CSDS Group I
<i>Pipilo maculatus</i>	Spotted Towhee	X	

Scientific Name	Common Name	Method of Detection	Special Status
<i>Pipilo crissalis</i>	California Towhee	X	
<i>Aimophila ruficeps canscens</i>	Southern California Rufous-crowned Sparrow (=California Rufous-crowned Sparrow)	X	MSCP, CSDS Group I
<i>Spizella atrogularis</i>	Black-chinned Sparrow	X	
<i>Melospiza melodia</i>	Song Sparrow	X	
<i>Zonotrichia atricapilla</i>	Golden-crowned Sparrow	X	
<i>Pheucticus melanocephalus</i>	Black-headed Grosbeak	X	
<i>Passerina amoena</i>	Lazuli Bunting	X	
* <i>Molothrus ater</i>	Brown-headed Cowbird	X	
<i>Icterus cucullatus</i>	Hooded Oriole	X	
<i>Carpodacus mexicanus</i>	House Finch	X	
<i>Carduelis psaltria</i>	Lesser Goldfinch	X	
MAMMALS			
<i>Myotis californicus</i>	California Myotis	X	
<i>Myotis ciliolabrum</i>	Western Small-footed Myotis	X	CSDS Group II
<i>Myotis evotis</i>	Long-eared Myotis	X	CSDS Group II
<i>Myotis yumanensis</i>	Yuma Myotis	X	CSDS Group II
<i>Lasiurus blossevillii</i>	Western Red Bat	X	CSC, CSDS Group II
<i>Parastrellus hesperus</i>	Canyon Bat	X	
<i>Eptesicus fuscus</i>	Big Brown Bat	X	
<i>Corynorhinus townsendii</i>	Townsend's Big-eared Bat	XT	CSC, CSDS Group II
<i>Nyctinomops femorosaccus</i>	Pocketed Free-tailed Bat	X	CSC, CSDS Group II
<i>Eumops perotis</i>	Western Mastiff Bat	X	CSC, CSDS Group II
<i>Tadarida brasiliensis</i>	Mexican Free-tailed Bat	X	
<i>Nyctinomops macrotis</i>	Big Free-tailed Bat	X	CSDS Group II
<i>Sylvilagus audubonii</i>	Desert Cottontail	XCS	
<i>Notiosorex crawfordii</i>	Desert Shrew	XT	
<i>Spermophilus beecheyi</i>	California Ground Squirrel	XCS	
<i>Thomomys bottae</i>	Botta's Pocket Gopher	TS	
<i>Chaetodipus californicus femoralis</i> [<i>Perognathus californicus</i>]	Dulzura Pocket Mouse	T	CSC, CSDS Group II

Scientific Name	Common Name	Method of Detection	Special Status
<i>Dipodomys simulans</i>	Dulzura Kangaroo Rat	T	
<i>Peromyscus californicus</i>	California Mouse	T	
<i>Peromyscus fraterculus</i> [<i>Peromyscus eremicus fraterculus</i>]	Northern Baja Mouse	T	
<i>Neotoma lepida intermedia</i>	San Diego Desert Woodrat	T	CSC, CSDS Group II
<i>Microtus californicus</i>	California Vole	X	
* <i>Canis familiaris</i>	Domestic Dog	X	
<i>Canis latrans</i>	Coyote	X	
<i>Procyon lotor</i>	Common Raccoon	S	
<i>Mephitis mephitis</i>	Striped Skunk	S	
<i>Lynx rufus</i> [<i>Felis rufus</i>]	Bobcat	SC	
* <i>Equus caballus</i>	Domestic Horse	X	
<i>Odocoileus hemionus fuliginata</i>	Southern Mule Deer	SC	MSCP, CSDS Group II

Legend:

*=non-native or invasive species

Observed or Detected: X = detected, T = trapped or captured, C = camera station, S = sign only, PC = personal communication (PC not included in final species tallies)

Special Status: FE= Federally Endangered, FT=Federally Threatened, SE= State Endangered, CSC= California Species of Concern, CFP= California Fully Protected, MSCP= Multiple Species Conservation Program Covered Species, CSDS= County of San Diego Sensitive Animal

Appendix C
Photographs



Photo 1. Upper non-native grassland meadow



Photo 2. Southern mixed chaparral with southern coast live oak riparian forest in the background



Photo 3. Two-striped Garter Snake observed in drainage in the western portion of the Preserve



Photo 4. Townsend's Big-eared Bat captured during bat surveys



78°F 07/09/08 10:56 AM C-3 OA-1

Photo 5. Coyote in the oak woodland located in the central part of the Preserve



66°F 07/08/08 01:54 AM C-5 OA-3

Photo 6. Bobcat traveling along trail that leads up from the San Vicente Reservoir



Photo 7. Southern Mule Deer passing through the upper meadow