

**Final Area Specific Management Directives  
for  
Boulder Oaks Open Space Preserve  
San Diego County  
Technical Appendices**



June 2008



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Open Space Preserve

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California



## **APPENDIX A**

### **Baseline Biological Resources Evaluation Boulder Oaks Open Space Preserve**

**BASELINE BIOLOGICAL RESOURCES  
EVALUATION  
BOULDER OAKS OPEN SPACE  
PRESERVE**

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# Executive Summary

Jones & Stokes conducted a baseline biodiversity study of the County of San Diego's Boulder Oaks Open Space Preserve (Preserve) to provide the Department of Parks and Recreation with the biological data to develop Area Specific Management Directives (ASMDs). The Preserve consists of very high value natural communities and is located approximately three miles south of the unincorporated township of Ramona, between State Route 67 and Mussey Grade Road, in central San Diego County, California.

During 2007, Jones & Stokes' biologists conducted the following studies, in addition to general, qualitative evaluation of the entire Preserve: (1) mapping of vegetation communities, (2) a floral inventory including rare plant surveys, (3) a focused survey for Quino Checkerspot butterfly, (4) a habitat evaluation to address Arroyo Toad, (5) pitfall trap arrays to sample amphibians, reptiles, and small mammals, (6) avian point counts, (7) a nocturnal bird survey, (8) acoustic sampling and roost surveys for bats, (9) a track and sign survey for medium-to-large mammals, and (10) a camera station survey for medium-to-large mammals. Due to the low rainfall during the 2006-2007 winter, results of these surveys may under represent the diversity of plants and wildlife that occur within the Preserve.

The Preserve supports a diverse flora dominated by native species and native vegetation communities. Vegetation communities and land cover types present within the Preserve consist of open coast live oak woodland, open Engelmann oak woodland, southern mixed chaparral, scrub oak chaparral, nonnative grassland, southern willow scrub, freshwater marsh, open water, and disturbed land; southern mixed chaparral is the dominant vegetation community on the Preserve. Seasonal pools were also observed within several rock outcroppings and potential vernal pools were observed within the meadow areas within the Preserve. Floristic inventories documented 228 native and naturalized plant species. These include eight special status plant species: Felt-leaved Monardella, Ramona Horkelia, Orcutt's Brodiaea, San Miguel Savory, Lakeside Ceanothus, California Adder's Tongue, Mountain Misery, and Engelmann Oak.

Quino Checkerspot was not detected during directed surveys for this species on the Preserve. Other invertebrate species were documented through direct observation or were captured in pitfall traps; rare or sensitive invertebrate species were not detected during surveys. A total of 45 invertebrates were detected and identified below the level of family, including 14 butterfly species.

A total of 17 herpetiles (three amphibians and 14 reptiles) were detected during current surveys of the Preserve including six sensitive species: Coastal Western Whiptail, Coronado Western Skink, Coastal Patchnose Snake, Coast Horned



Lizard, Red Diamond Rattlesnake, and Rosy Boa. One additional special-status species was previously recorded (Western Spadefoot) and may simply have been undetected this year due to drought conditions.

Avian species richness (total species detected) was found to be moderately high at the Preserve. A total of 104 species of birds was detected during the 2007 surveys including six species of raptors, 15 species of waterbirds, and numerous songbirds. Surveys documented 14 birds considered sensitive by the County including Rufous-crowned Sparrow and Western Bluebird, which are also MSCP-covered species.

A total of 30 mammal species was detected within the Preserve through direct observation, trapping, by track or sign, using an Anabat detector for bats, or remote cameras. This included nine species considered sensitive by the County including six bat species, Desert Woodrat, California Pocket Mouse, and Mule Deer. Another sensitive species, Mountain Lion was recorded as a probable occurrence based on sign (i.e., scat).

The Preserve provides habitat for the 196 wildlife and 228 plant species detected during the 2007 surveys as well as additional species known to occur in the area. There are undoubtedly additional species that use the Preserve that were not detected due to the severe drought conditions experienced during 2006-2007. Management considerations of the Preserve include: enhancement and restoration of disturbed habitat; siting staging areas and new trails away from high concentrations of rare plants, wildlife corridors, and potential vernal pools; and control of invasive plants to prevent degradation of native habitats. Management of the ponds on site should be done in a manner that considers their high value to a wide range of wildlife.

Recommendations include precautions regarding Preserve use by the public, specific monitoring efforts regarding oak woodlands and birds, and focused efforts to control or eradicate specific invasive plants that appear to pose the greatest risk to continued health of the Preserve.

# 1.0 Introduction

Baseline biological resources surveys were conducted within the County of San Diego's Boulder Oaks Open Space Preserve (Preserve). The purpose is to identify and map existing resources and to provide the Department of Parks and Recreation with information as the basis for development of Area Specific Management Directives (ASMDs). These ASMDs will provide the management framework for monitoring and managing the Preserve's resources. An earlier report (Jones & Stokes 2007) provided an evaluation of potential impacts associated with construction of interim trails and a staging area on the Preserve.

The County acquired the 1,268-acre<sup>1</sup> Preserve in 2003 for inclusion in the County of San Diego's Multiple Species Conservation Program (MSCP) preserve system. The Preserve consists of very high value natural communities as well as areas that have been moderately impacted by human activities including existing dirt ranch roads. The Preserve property is located approximately three miles south of the unincorporated township of Ramona, between State Route 67 and Mussey Grade Road, in central San Diego County, California (Figure 1). It is situated in the meadows and hills just northwest of the San Vicente Reservoir, extending east from Iron Mountain and north of Fosters Canyon, and is bisected by Foster Truck Trail. On the USGS 7.5' San Vicente Reservoir, California quadrangle, the Preserve area includes portions of Sections 11, 12, 13, 14 and 24 of Township 14 S, Range 1 W, and of Sections 18 and 19 of Township 14 S, Range 1 E (Figure 2).

To provide a baseline evaluation of biological resources, the following studies were conducted, in addition to general, qualitative evaluation of the entire Preserve: (1) mapping of vegetation communities, (2) a floral inventory including rare plant surveys, (3) a focused survey for Quino Checkerspot, (4) a habitat evaluation to address arroyo toad, (5) pitfall trap arrays to sample amphibians, reptiles, and small mammals, (6) avian point counts, (7) a nocturnal bird survey, (8) acoustic sampling and roost surveys for bats, (9) a track and sign survey for medium-to-large mammals, and (10) a camera station survey for medium-to-large mammals.

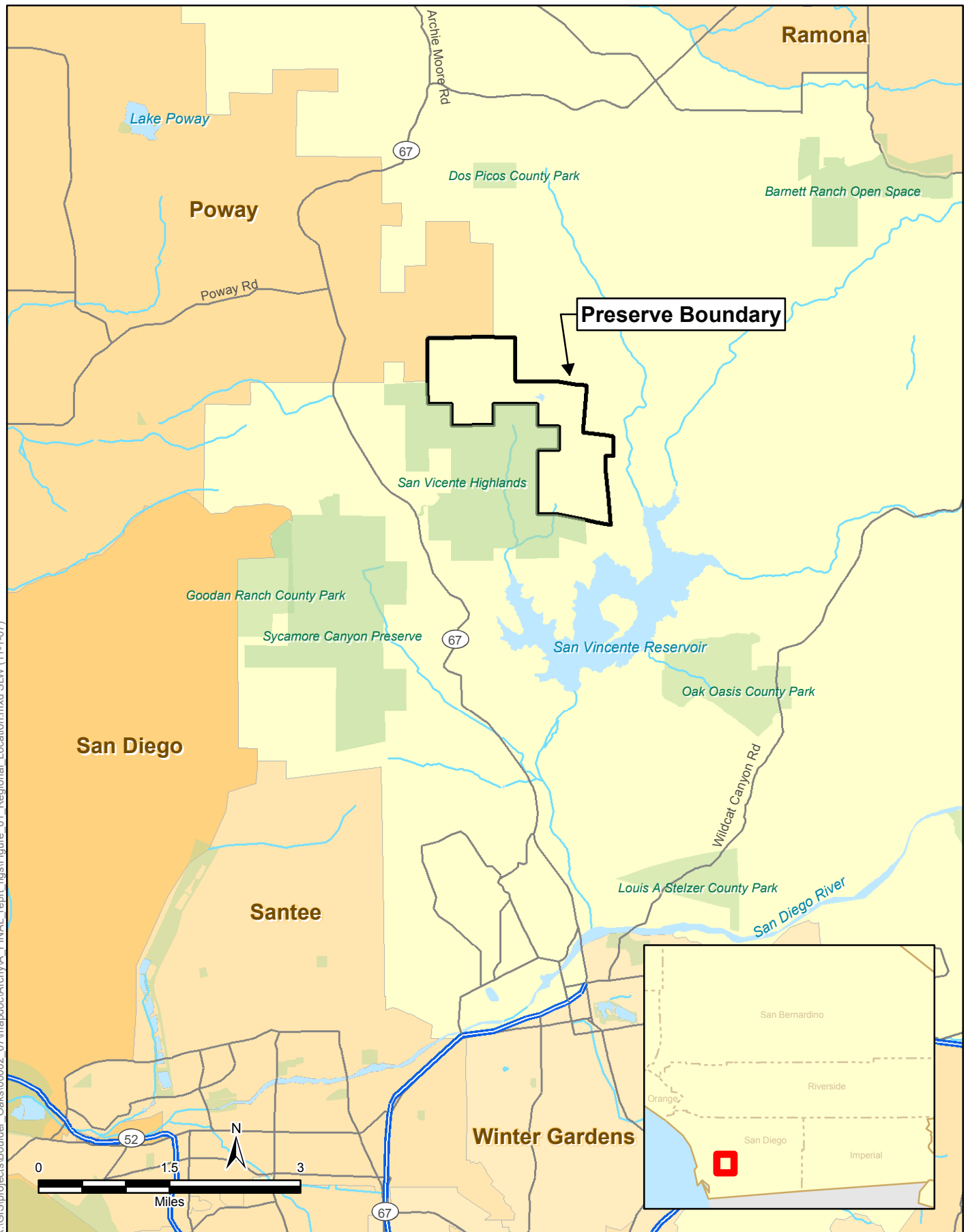
In addition to methods and results for all the work conducted, this report provides brief recommendations and options to preserve and enhance the biological resources present on the Preserve.

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<sup>1</sup> The assessor's parcel data list the Preserve to be 1,215 acres; however, calculations generated from the GIS data show the Preserve as 1,268. Therefore, this report references the property as 1,267.6 acres.

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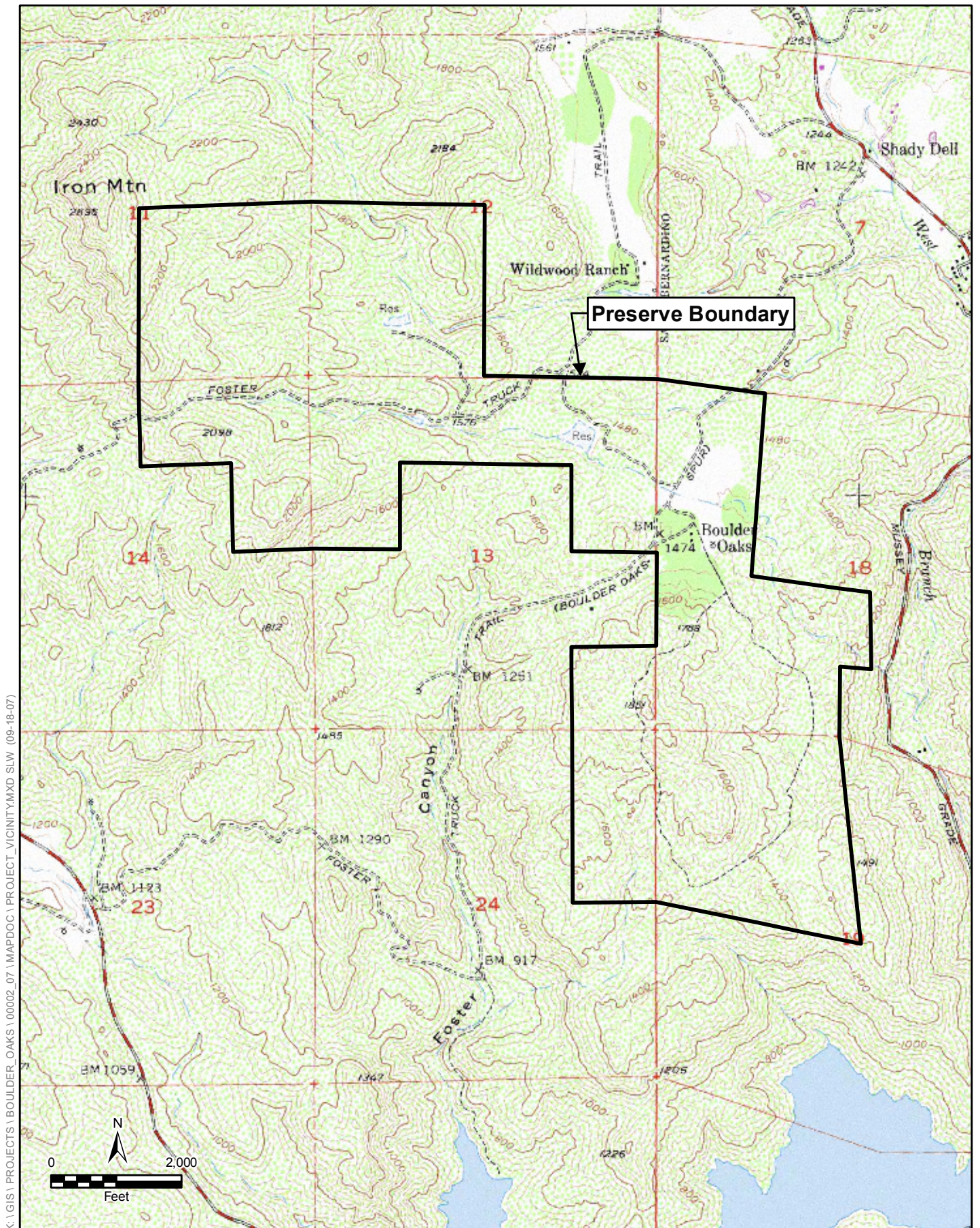
SOURCE: ESRI Streetmap USA (2006)

**Figure 1**  
**Regional Location**  
**Boulder Oaks Open Space Preserve**









Source: USGS 7.5' Quad., California: San Vicente Reservoir (1955; Photorevised 1971)

**Figure 2**  
**Project Vicinity**  
**Boulder Oaks Open Space Preserve**





## 2.0 Study Area

### 2.1. Physical and Climatic Conditions

#### 2.1.1. Geography

The natural setting of the Preserve consists of steep mountain uplands with ridgelines separated by numerous canyons, ravines, and drainages. The western edge of Preserve is bounded by a ridgeline that extends beyond the Preserve to include Iron Mountain. The top of Iron Mountain (2696 feet) is roughly 0.1 miles west of the northwest corner of the Preserve. The west branch of San Vicente Creek valley lies along the Preserve's eastern boundary. The central portion of the Preserve includes relatively flat areas, with most outlying portions composed of moderately steep canyons (see Figure 2 and Figure 3). Elevations on the Preserve range from approximately 2400 feet above mean sea level at the northwest corner of the Preserve to 1150 feet about 1 mile north of the southeastern corner.

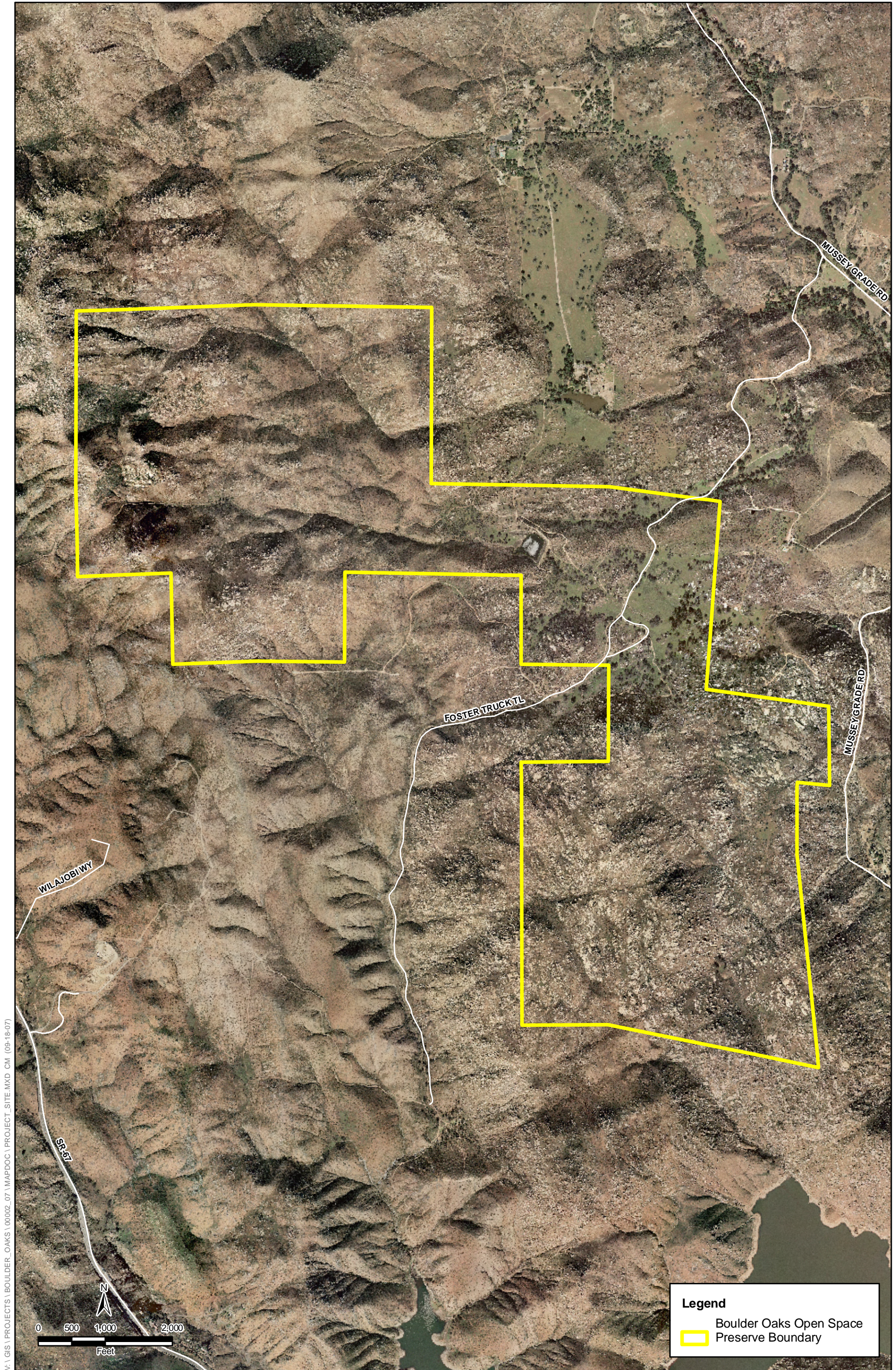
#### 2.1.2. Geology and Soils

The Preserve is situated atop the southern California batholith consisting of Cretaceous granitic rocks. These rocks form the majority element of this massive feature that underlies roughly two-fifths of San Diego County. In the project area this exposed granitic bedrock is comprised of the Woodson Mountain Granodiorite Formation, consisting, principally, of granodiorite with minor granite and quartz diorite (tonalite) (Strand 1962; Weber 1963). The physical and chemical decomposition of these rocks has produced two soil associations within the project area. In the western portion of the project area, the Friant-Escondido association presents "well-drained fine sandy loams and very fine sandy loams over metasedimentary rock in 30 to 70 percent slopes" and, in the eastern portion, the Cieneba-Fallbrook association exhibits "excessively drained to well-drained coarse sandy loams and sandy loams that have a sandy clay loam subsoil over decomposed granodiorite, with slopes ranging from 9 to 75 percent" (USDA 1973).



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SOURCE: SANDAG (Aerial - 2004; Roads - 2007)

**Figure 3**  
**Project Site**  
**Boulder Oaks Open Space 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 area are typically warm and dry, while winters are mild with occasional rain (USDA 1973). The average temperatures range from approximately 53.3°F (low) to 94.4°F (high) in the summer and approximately 35.4°F (low) to 67.8°F (high) in the winter (Ramona Chamber of Commerce). In a normal year, precipitation averages 15-18 inches and falls mostly in the winter and spring (San Diego County Flood Control District).

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 chaparral vegetation, which is naturally maintained by infrequent fires. If the natural fire cycle is suppressed, the chaparral can become senescent, declining in both health and diversity. If the fire frequency is increased, vegetation could shift towards disturbed grassland habitats or opportunistic pioneering shrub communities. The fire cycles within the area are affected by actions within and adjacent to the Preserve. Surrounding development and brush management actions associated with urban development have altered the fire cycles throughout most of western San Diego County. The entire Preserve burned during the 2003 Cedar Fire.

### **2.1.5. Hydrology**

The Preserve is in the San Vicente Hydrologic Area of the San Diego River Watershed. Designated beneficial uses for the San Diego River and its tributaries, include municipal and domestic supply, agricultural supply, industrial service supply, industrial process supply, contact and non-contact water recreation, warm freshwater habitat, cold freshwater habitat, wildlife habitat, and rare, threatened, or endangered species (California Regional Water Quality Control Board San Diego Region 2003).

Two unnamed drainages, shown as intermittent blue-line streams on the USGS 7.5-minute, San Vicente Reservoir quadrangle map, cross the site from west to

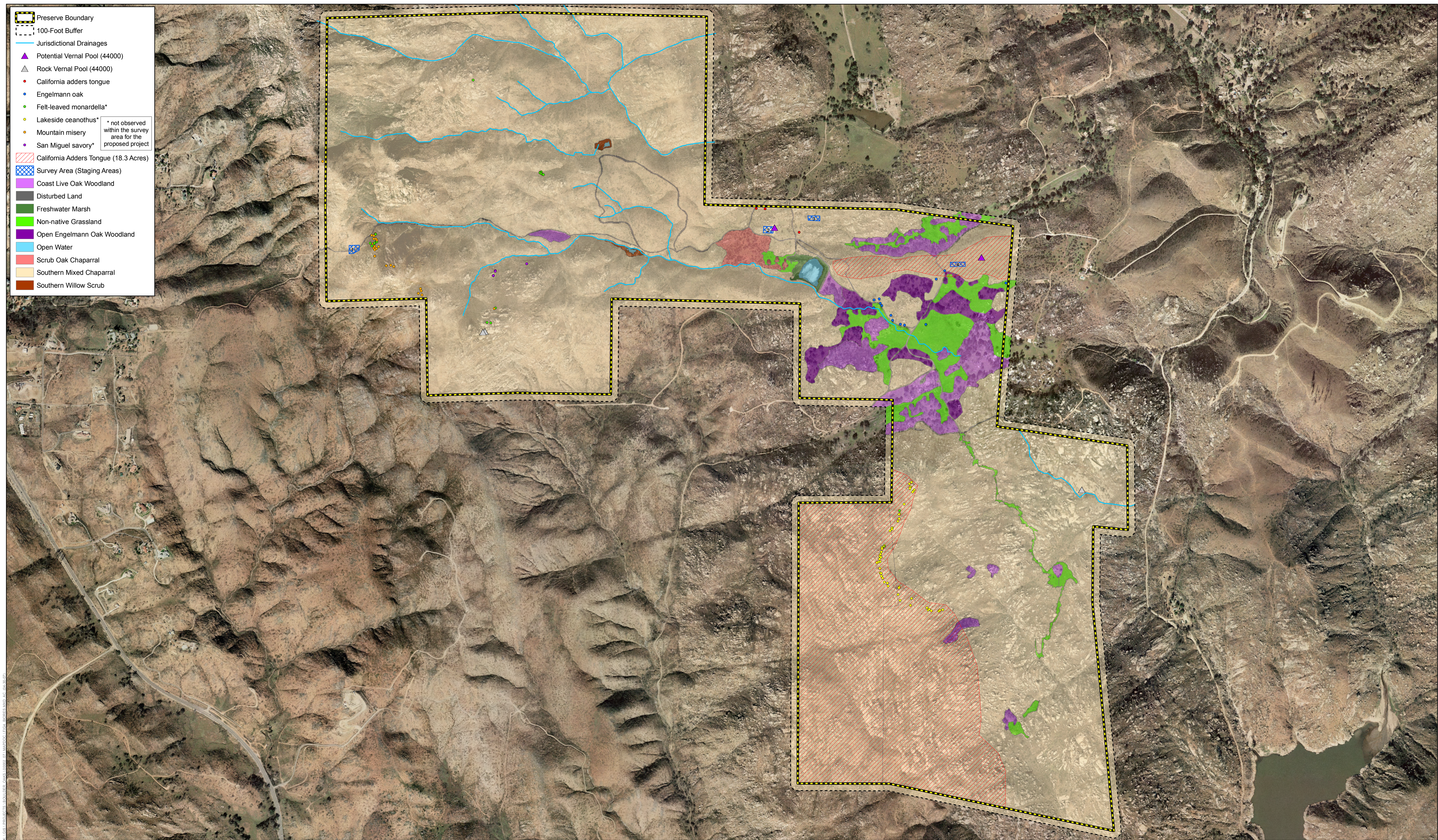
east. The more northerly drainage flows from the east face of Iron Mountain, crosses the Preserve for a short distance before extending across Wildwood Ranch, and empties into the west branch of San Vicente Creek. The other extends from just below the saddle in the west ridgeline on the Preserve, west across the central portion of the reserve and then southwest, emptying into the West Branch of San Vicente Creek shortly above where the latter empties into San Vicente Reservoir. Two of the three manmade reservoirs on the site consist of dammed portions of the more southerly of the two drainages. Both drainages are likely spring-fed and, therefore, may be important sources of fresh water.

For context, drainages presented in this report are from the County's GIS drainage layer, along with a few others observed on the site (Figure 4). However, those shown are illustrative only, and are not intended to define, for example limits of waters of the U.S. or other specific features.

During the current drought conditions, the two drainages were dry at the surface after early spring, and the two smaller reservoirs dried out by late spring. The largest reservoir had a ponded surface area of approximately 1.5 acres throughout the spring and summer fieldwork.

San Vicente Reservoir, approximately one-third of a mile south of the south boundary of the Preserve, is a steep-sided, deep, man-made reservoir. When full, it has 1,069 surface acres, a maximum water depth of 190 feet, and 14 shoreline miles (City of San Diego Water Department 2004).





Source : Aerial 2004

**Figure 4**  
**Biological Resources**





## 3.0 Methods

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 in the survey area as well as the physical characteristics of the site and surrounding areas. Available data that were reviewed included the California Natural Diversity Database (CDFG 2007), the U.S. Department of Agriculture (USDA) soil survey of the area (USDA 1973), U.S. Geologic Survey (USGS) topographic maps to identify potential stream courses and other notable topographic features, and the Draft Area Specific Management Directives for the San Vicente Open Space Preserve (Merkel and Associates, 2006), which occurs adjacent to the site. In addition to database searches, Jones & Stokes also consulted with Fred Sproul—a local botanist with extensive knowledge of the project site—regarding additional special-status plants that had been documented on site.

Surveys were conducted to categorize and map the plant communities within the survey area, map special-status plants and document all flora observed within the Preserve, to map the general locations of major water features, and to assess the habitat suitability for special-status plant species (Table 1). During each rare plant survey 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. It should



be noted that some plant species that occur on site might not have been detectable during the surveys as the 2006/2007 rainy season was well below average.

Vegetation communities were mapped on a “one-inch equals 400 feet” (1:4800) 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 1,268-acre Preserve and a 100-foot buffer area surrounding the site; vegetation communities were categorized using standard County classifications (Holland as modified by Oberbauer). 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**

Survey Personnel	Date	Survey Personnel	Date
Klutz, Korey	01/22/2007	Primrose, Brant	03/20/2007
Klutz, Korey	01/23/2007	Primrose, Brant	03/26/2007
Primrose, Brant	01/23/2007	Klutz, Korey	03/28/2007
Primrose, Brant	02/01/2007	Primrose, Brant	04/02/2007
Primrose, Brant	02/05/2007	Primrose, Brant	04/10/2007
Klutz, Korey	02/12/2007	Klutz, Korey	04/10/2007
Primrose, Brant	02/12/2007	Klutz, Korey	04/13/2007
Klutz, Korey	03/15/2007	Primrose, Brant	04/19/2007
Klutz, Korey	03/07/2007	Primrose, Brant	05/30/2007
Primrose, Brant	03/09/2007	Primrose, Brant	06/01/2007
Primrose, Brant	03/13/2007		

Locations of special-status plant populations were mapped using either sub-meter accurate global positioning system (GPS) or recreational grade GPS receivers (accurate from 1m to 5m). Groups of individuals were mapped as single points with attribute data including total individuals observed. Where California Adder’s Tongue (*Ophioglossum californicum*) occurred in a large patch, a polygon was mapped and the number of individuals within the polygon was estimated and recorded into the GPS unit. Similarly, a large polygon was mapped where Lakeside Ceanothus (*Ceanothus cyaneus*) is common in the southwestern chaparral-covered slopes; individual shrubs were not counted.

## 3.2. Invertebrates

Jones & Stokes biologists conducted a survey for the federally endangered Quino Checkerspot butterfly (Quino) from March 13 through April 18, 2007. All

biologists involved in the Quino survey have USFWS recovery permits or are listed as “Supervised Individuals” under permits of other permitted biologists. The surveys were conducted on a roughly weekly basis under acceptable weather conditions as defined in the USFWS protocol (USFWS 2002). Approximately 18.3 acres of southern mixed chaparral and 4.1 acres of open water and emergent vegetation were excluded from the survey area because they were determined to be too dense in cover or otherwise did not provide potentially suitable habitat for Quino. Each survey visit involved slowly walking transects throughout the area of the Preserve with highest potential for Quino detection. These were areas considered to have the highest potential for Quino larval host plant populations and/or are on ridgelines or hilltops. The survey visits were conducted at an average rate of 15 acres per hour. Surveyors stopped periodically to scan adjacent areas for moving butterflies. All butterfly species observed were identified and recorded in the wildlife table (Appendix A). Full details of the Quino survey are provided in the attached Quino Checkerspot Butterfly Survey Report (Appendix B).

In addition to butterflies, all other detected invertebrates identified at least to genus during or after fieldwork were recorded. This includes all invertebrates that were captured in the pitfall traps associated with the herp arrays. Invertebrates captured in the herp arrays are indicated in the wildlife tables in Appendix A.

### 3.3. Herpetofauna

Jones & Stokes performed surveys for herpetofauna (amphibians and reptiles) on the Preserve during the spring and early summer months of 2007. Trap design was similar to that in the United States Geological Survey 2001 draft report “Herpetological Monitoring Using a Pitfall Trapping Design in Southern California”. The USGS 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. Our arrays employed similar trapping techniques with alterations in the size and design in the arrays in order to maximize coverage under the given budget, the Preserve size, and limited access.

The USGS optimal design for drift fencing includes a three-arm array with seven pitfall traps and three funnel traps. Our array design consisted of one 20-foot arm of drift fence with two pitfall traps and one funnel trap. Two arrays were placed in close proximity to each other (within 50 feet) and the angle formed by the two arrays varied but approximated 90 degrees (See photos #31 and #32). Pitfall traps were placed at the end of each 20-foot arm of drift fence. One funnel trap was placed mid-way along the 20-foot arm. USGS’ recommendations for array materials and trap construction were followed. As the site temperatures were not excessive during the trapping period, we constructed funnel traps without a pitfall trap retreat underneath as described in the USGS protocol.

Five sites were selected at which the 2-single arrays (10 arrays total) were constructed. The five sites were placed in representative habitats throughout the Preserve including open coast live oak woodland, scrub oak chaparral, southern mixed chaparral, nonnative grassland and near the large pond (Figure 5). Limited vehicular access to much of the northern and southern portions of the Preserve restricted siting herp array locations to areas easily accessible by roads.

In addition to arrays, 15 cover boards, flat plywood sheets approximately 3 by 3 feet, were placed in locations that were monitored during array monitoring (see Figure 5). All areas immediately surrounding the arrays and between array sites were actively searched for herps during the array monitoring. Active searching included looking under shrubs and logs. All herps observed under cover boards, during active searches and during other wildlife surveys were recorded and are included in the wildlife tables in Appendix A.

### **3.3.1. Monitoring Arrays**

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

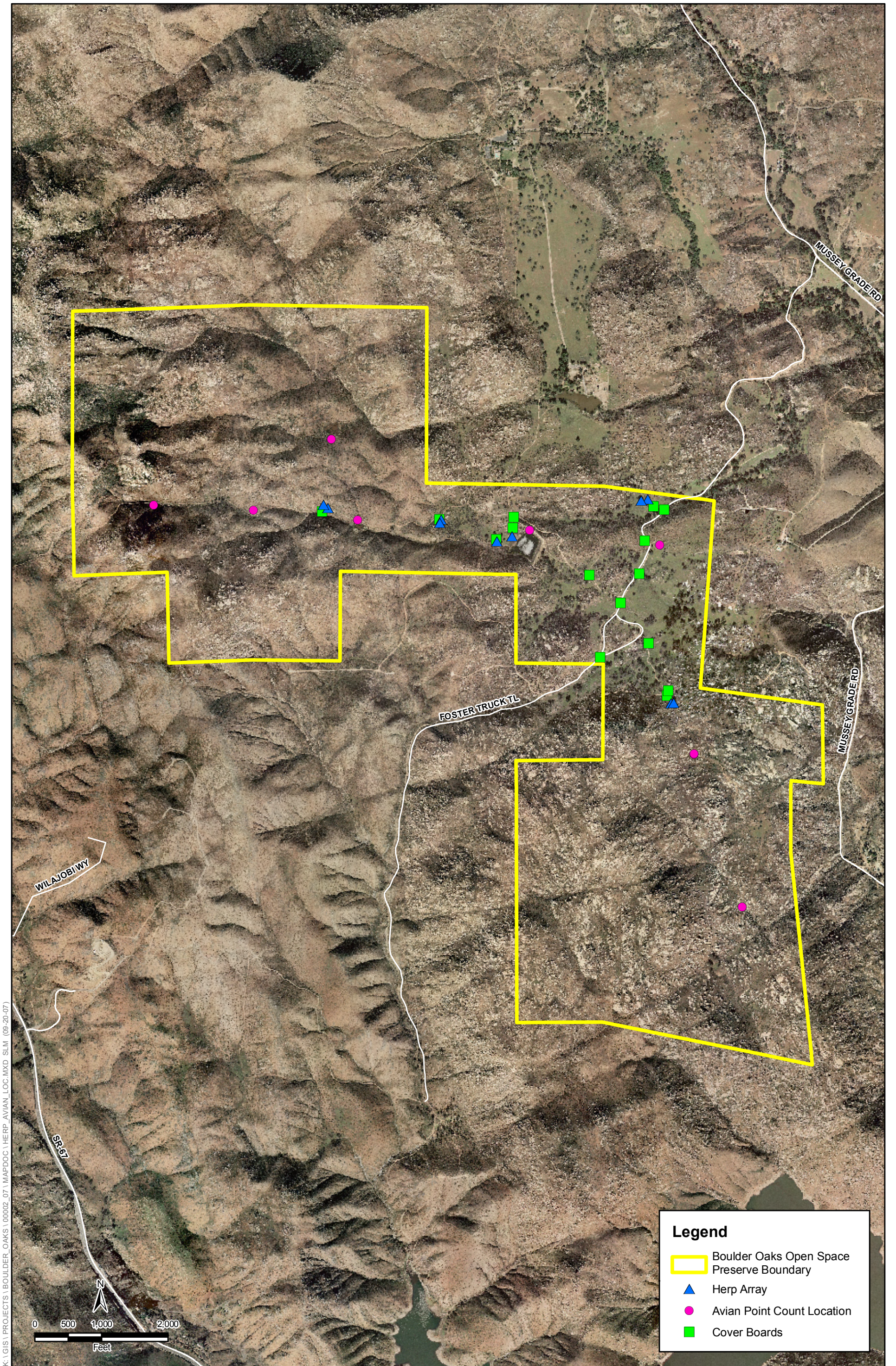
Array traps were checked during early morning hours to ensure that animals were released before daytime temperatures reached levels that could result in mortality. All animals were identified to species and immediately released at the point of capture. We did not handle animals other than to photograph and release them from the traps. Given that the purpose of the trapping effort 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 in the office. Information recorded included species and trap number in which the animal was found. To the extent possible, we also noted sex, approximate age, and reproductive condition.

### **3.3.2. Other Herpetofaunal Methods**

Based on site conditions of the Preserve, we concluded that focused breeding surveys for Arroyo Toad (*Bufo californicus*) would not be a productive use of survey effort, as there is no potentially suitable breeding habitat. This assessment was based on the lack of primary constituent elements of arroyo toad habitat such as sandy low gradient open wash habitat with slow moving or pooling water (U.S. Fish and Wildlife Service, 1999). Although the current surveys were conducted during a year of extreme drought, sandy low gradient open wash habitat is absent within the Preserve. Thus, the species is considered absent.





SOURCE: SANDAG (Aerial - 2004; Roads - 2007)

**Figure 5**  
**Herp Arrays & Avian Point Count Stations**  
**Boulder Oaks Open Space Preserve**





In addition to work by Jones & Stokes, USGS is conducting surveys for Southwestern Pond Turtle (*Actinemys marmorata pallida*; = *Clemmys marmorata pallida* under MSCP terminology) in the large pond on the Preserve. Therefore, extensive aquatic surveys were not conducted other than direct observations from the shoreline and hand dipping within ponded water in other portions of the site.

## 3.4. Birds

### 3.4.1. Diurnal Point Count Survey

Avian use of the study area was previously not formally documented. 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. See Appendix C for data. Nine stations were selected. Nine was found to be a practical maximum at the study area for a single morning of fieldwork given the time required to travel among stations on this site and the need to meet the recommendations (listed below), especially the assumption of data independence among stations.

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 each month (March through August) for a total of 53 counts (Station 1 was added in April). The complete data set is provided in Appendix C. The following recommendations, drawn directly from Ralph et al. (1995), were followed:

- Stations will be located at least 250 meters apart to ensure independence (i.e., no or minimal overlapping of individual birds detected).
- Counts will be 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 will be counted except for any judged to have been counted at a previous station.
- Both seen and heard individuals will be recorded as long as clearly identified.
- Birds will be recorded within each time stratum as: (1) within a 50-meters radius from the station, (2) outside the 50-meters radius, or (3) flying over. This will allow rudimentary density estimates (without weighting for detectability).
- Individuals will be 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 will be avoided (e.g., dense fog, strong winds, extended rain).
- Stations will be counted in the same order each time, starting at approximately the same time relative to sunrise, and finishing within 4 hours after sunrise. Note that counting stations in the same order each time is recommended as the preferred method where the primary purpose of the data is for comparison with future data sets at the same study area. For the current work this 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) are:

- No attempts were made to attract birds, such as through use of taped vocalizations or “pishing” (imitating avian scold or alarm calls).
- Prior to the initial point counts, the observer practiced distance estimations by locating an object roughly 40 to 60 meters away, assigning it as beyond or closer than 50 meters, and then measuring the actual distance with a laser rangefinder (accuracy 0.5 meters). 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. During point counts, the laser rangefinder and local terrain at known distances were both used to confirm distances of detected birds.
- 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 are only counted when they have 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 are not expected to have reached by walking or climbing.
- Vocalization type is typically used to categorize birds that are heard only with regard to whether or not they are assumed to be flying over or perched. Thus flight calls for a particular species are used to categorize a bird as in flight, making it important to separate calls accurately by type for species heard only.
- When a flock is only heard, only the number definitely heard is recorded, but when a flock is seen and individuals cannot be precisely counted, a best estimate is 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 should be ‘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 a 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. Few or no migrant or commuting individuals of these species were recorded during the current work, although all these groups are primarily diurnal in migration. Fly-by individuals counted in totals are marked in the raw data tables in Appendix A. These groups are otherwise poorly censused by point counts and their niches, which make important use of air space, are potentially underappreciated in evaluations emphasizing point counts with standard methods.

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-meters 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.

Working without assistance, the same, single observer conducted all point counts. The observer wore no brightly colored clothing and worked quietly. No significant logistical problems were encountered during the point counts, with no cancellations due to weather.

### **3.4.2. Nocturnal Bird Survey**

Surveys were conducted for nighttime birds on four nights by a combination of walking and slowly driving roads, looking and listening for birds. A moderately powerful flashlight was used to aid identifications. This work was conducted prior to the diurnal point counts, by the same observer, who is very experienced with both nighttime and daytime bird vocalizations. Each survey lasted between 1.5 and 2.5 hours, for a total time of just under eight hours.

### **3.4.3. General Encounter Survey**

Prior to the date when point counts were started, three general reconnaissance visits were conducted for birds. Each day that point counts were conducted (after all counts for each day were completed), and on one additional day during the period of the counts, general reconnaissance work was conducted for birds. This work was conducted to support coverage of all portions of the Preserve, to generate data on breeding status, and to enhance coverage for species richness. This work totaled approximately 48 hours on twelve dates from January 23 through September 21, 2007. Detailed field notes were compiled for all general reconnaissance work.

## 3.5. Mammals

### 3.5.1. Small Mammal Trapping

On May 24, 2007, Jones & Stokes biologists Phillip Richards and Kurt Campbell assessed the physical conditions, vegetative community distribution, vegetative cover, and accessibility for planning the trapping program for small mammals. Except for the far southern end of the property, all portions of the property were visually inspected to determine representative small mammal sampling locations.

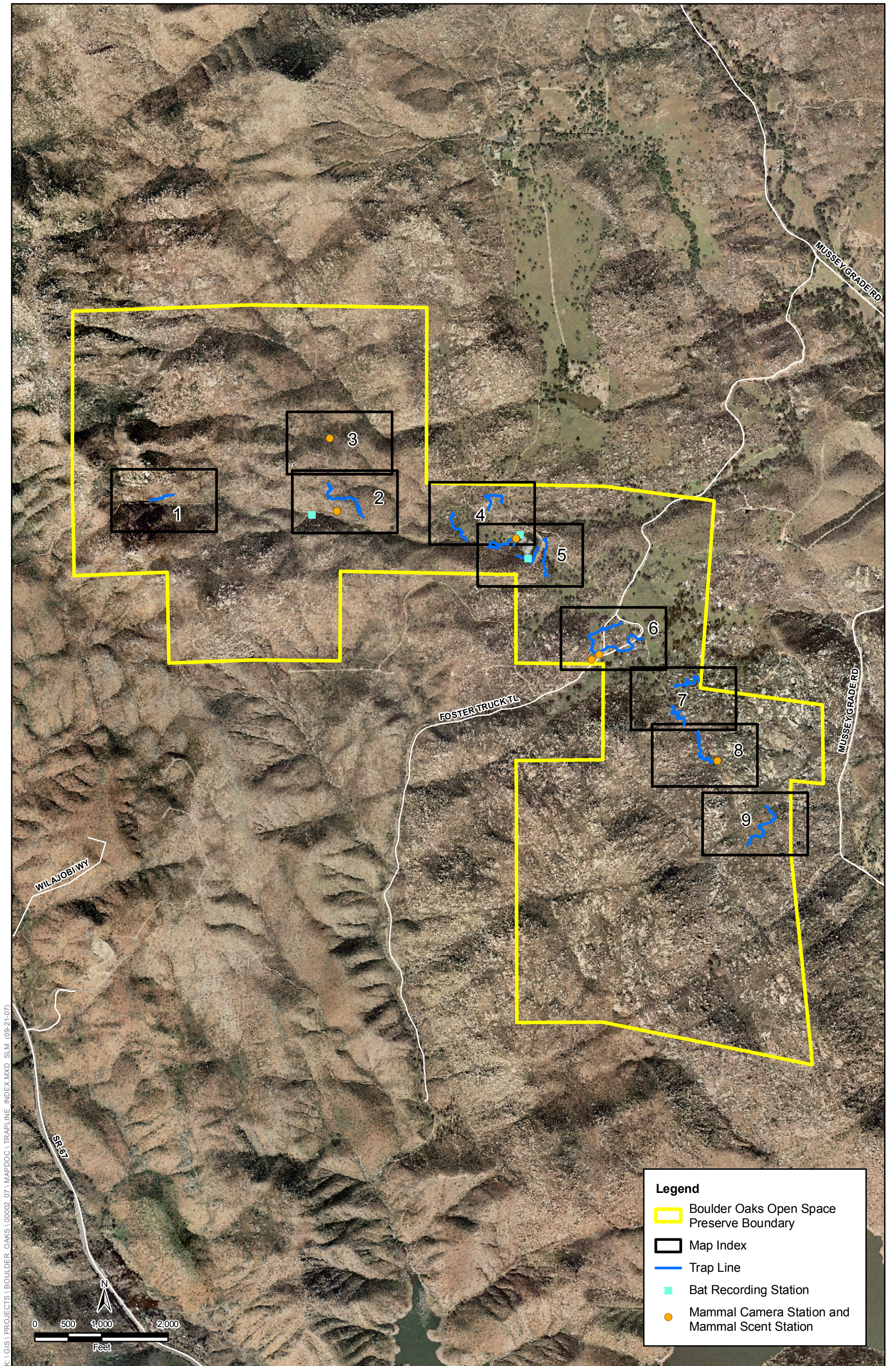
Small mammal trapping on the Preserve consisted of 12 traplines totaling 350 traps. Each trapline was set for two sequential nights for a total of 700 trap nights. Traplines 1 through 7 were set and baited July 11 and 12, 2007 and checked once during the morning of July 12 and 13, 2007. Traplines 1 through 7 ranged from 9 to 40 traps each. Traplines 8 through 12 were set and baited June 27 and 28, 2007 and checked once during the mornings of June 28 and 29, 2007. Traplines 8 through 12 ranged from 30 to 50 traps each. A summary of trapping personnel, dates, times, and weather conditions are provided in Table 2.

All trapline locations are depicted on Figure 6a-j. Trapline locations were selected based on three criteria: 1) sampling of different vegetative communities, 2) geographic distribution across the Preserve, 3) and sampling of unique features (e.g., area around a pond). Sequentially numbered 9-inch and 12-inch Sherman live traps were set at dusk, approximately 5 to 10 meters (16 to 33 feet) 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 9-inch Sherman live traps were modified by the addition of a binder clip to the lip of the trap body to prevent doors from closing on the tails of animals. 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.

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SOURCE: SANDAG (Aerial - 2004; Roads - 2007)

**Figure 6a**  
**Bat Recording Stations, Mammal Camera Stations,**  
**Mammal Scent Stations, and Trap Lines**  
**Boulder Oaks Open Space Preserve**









V:\GIS\PROJECTS\BOULDER\_OAKS\00002\_07\MAPDOC\TRAPLINE\_MAP1.MXD CM (09-21-07)

SOURCE: SANDAG (Aerial - 2004)

**Figure 6b**  
**Bat Recording Stations, Mammal Camera Stations, Mammal Scent Stations, and Trap Lines**  
**Boulder Oaks Open Space Preserve**









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SOURCE: SANDAG (Aerial - 2004)

**Figure 6c**  
**Bat Recording Stations, Mammal Camera Stations, Mammal Scent Stations, and Trap Lines**  
**Boulder Oaks Open Space Preserve**







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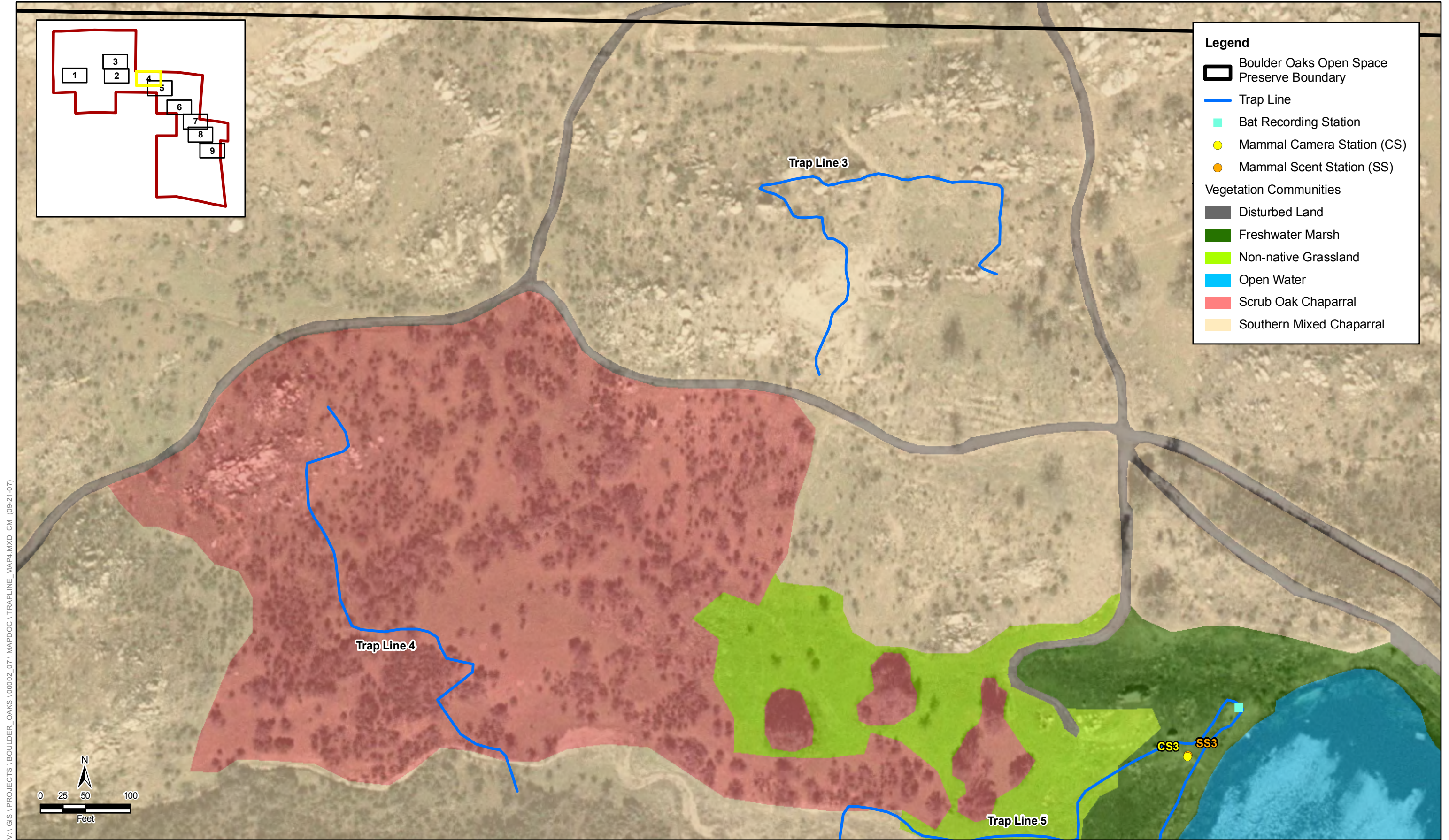
SOURCE: SANDAG (Aerial - 2004)

**Figure 6d**  
**Bat Recording Stations, Mammal Camera Stations, Mammal Scent Stations, and Trap Lines**  
**Boulder Oaks Open Space Preserve**









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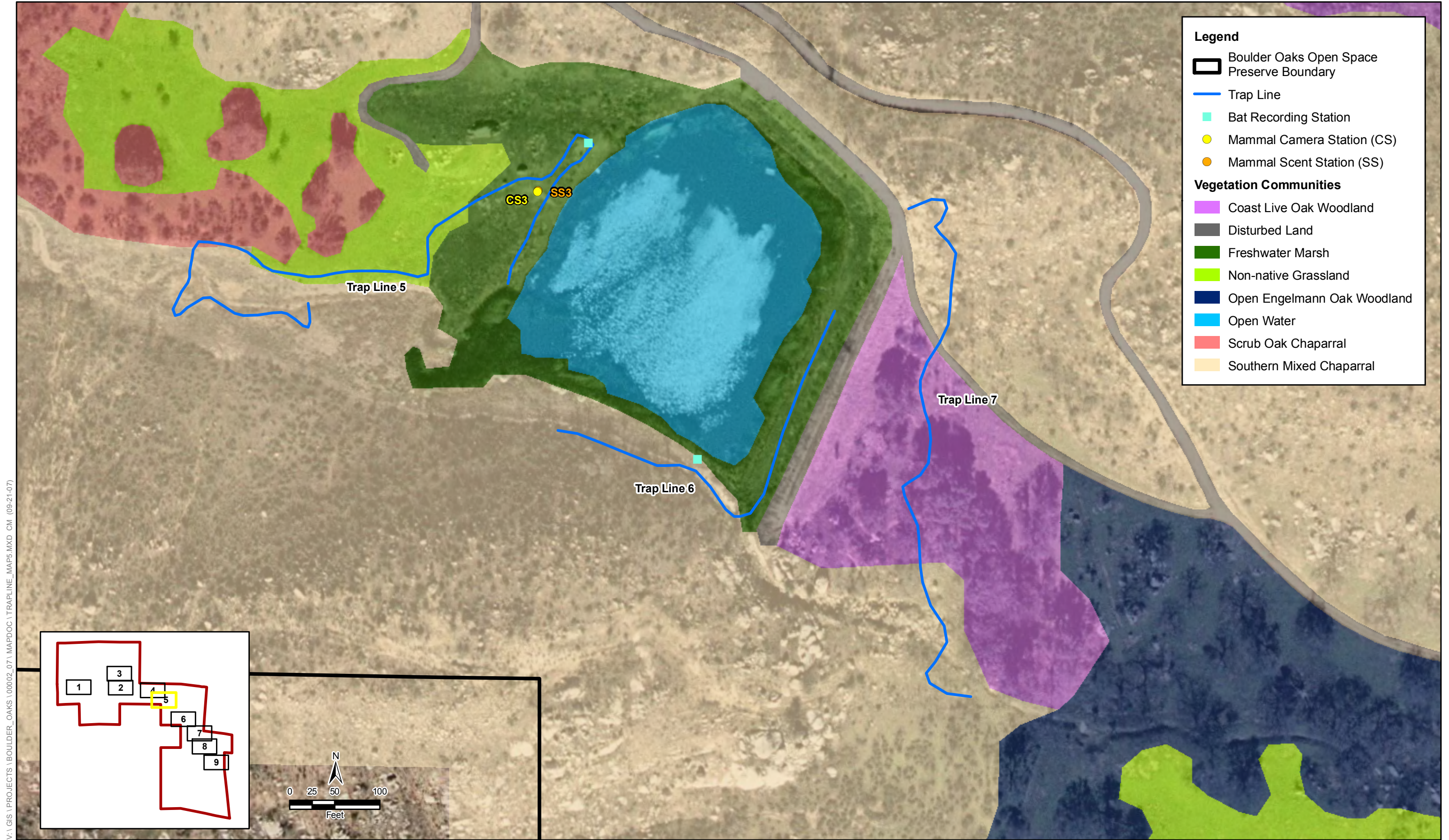
SOURCE: SANDAG (Aerial - 2004)

**Figure 6e**  
**Bat Recording Stations, Mammal Camera Stations, Mammal Scent Stations, and Trap Lines**  
**Boulder Oaks Open Space Preserve**









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SOURCE: SANDAG (Aerial - 2004)

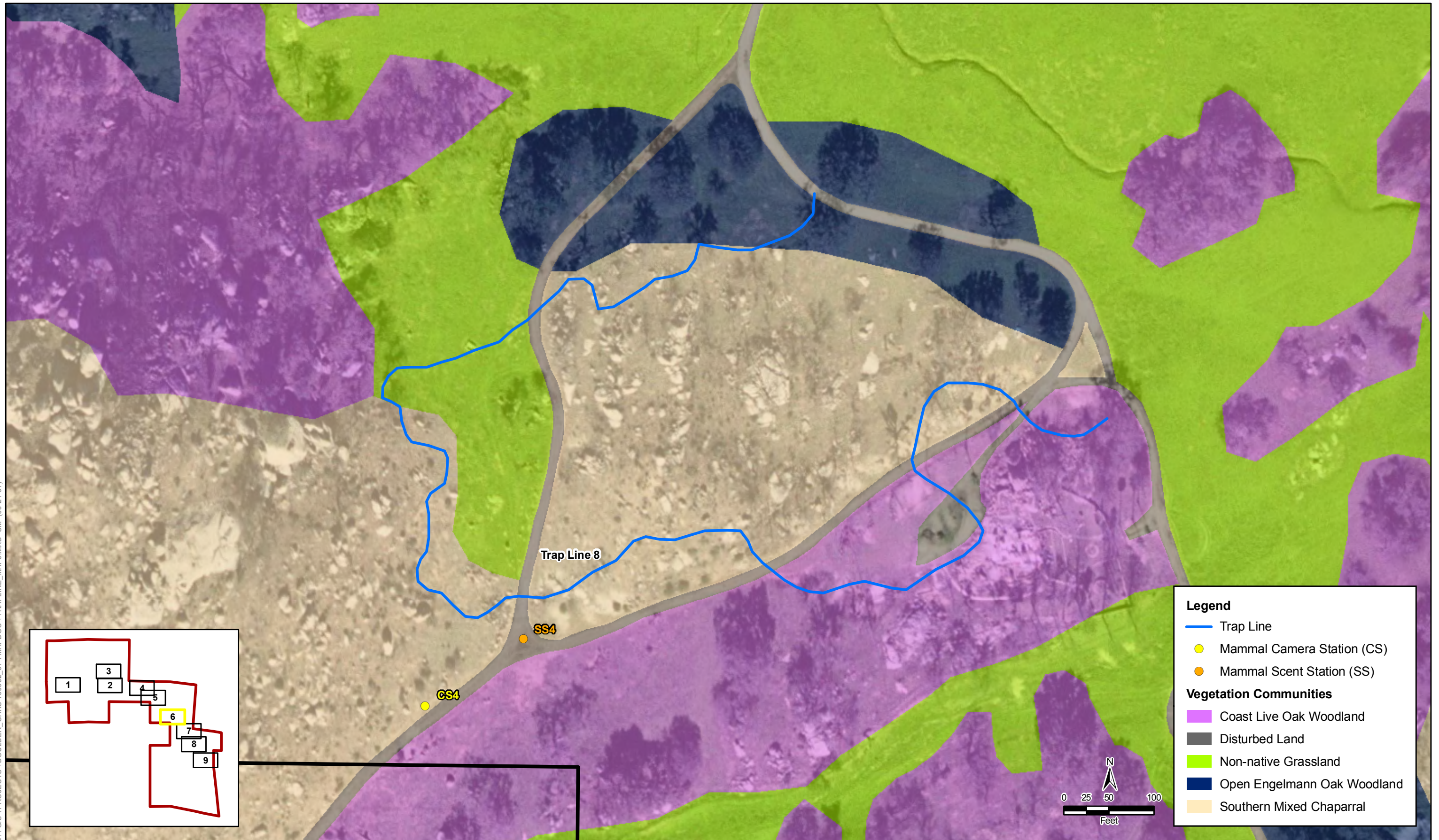
**Figure 6f**  
**Bat Recording Stations, Mammal Camera Stations, Mammal Scent Stations, and Trap Lines**  
**Boulder Oaks Open Space Preserve**







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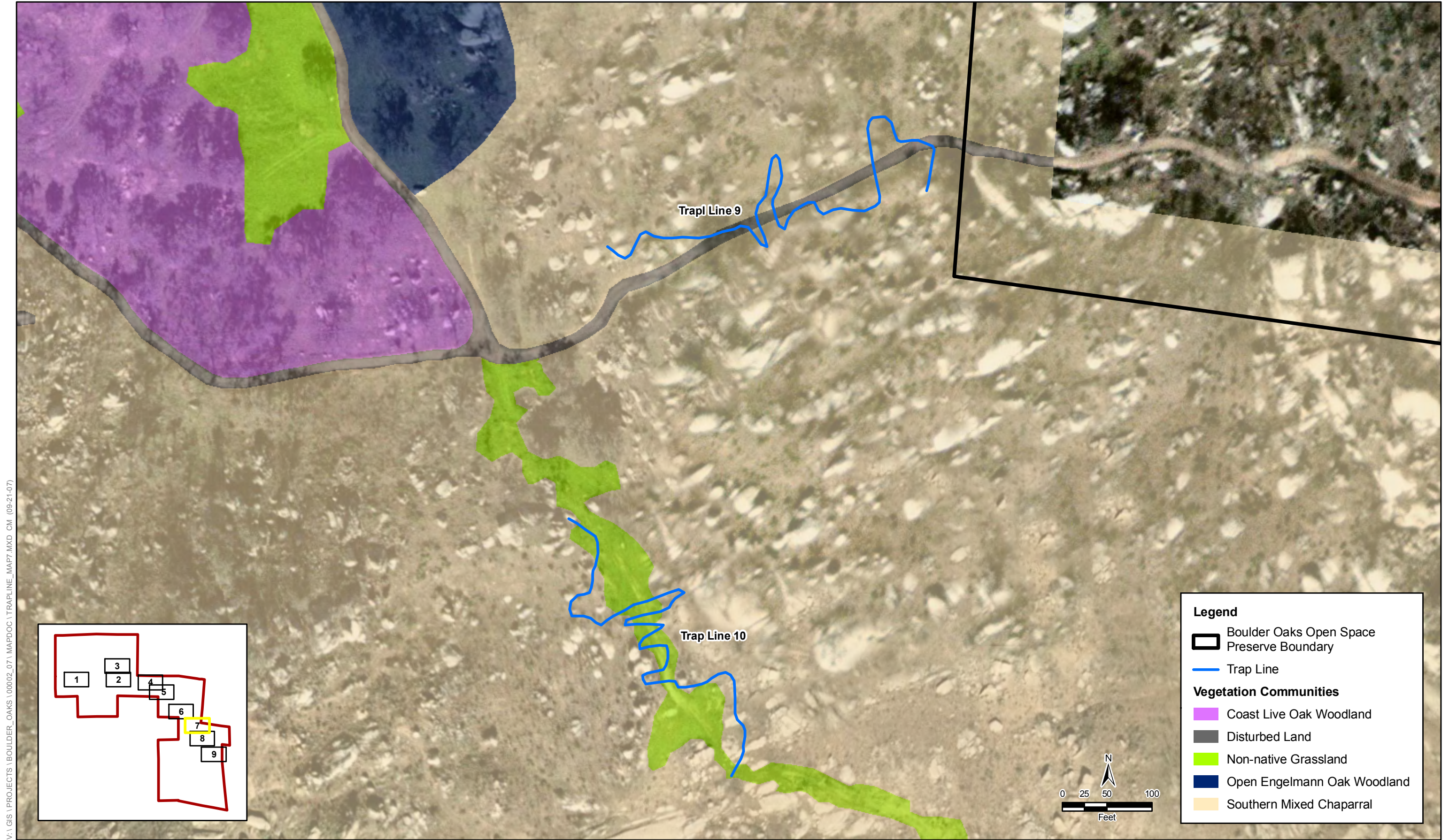
SOURCE: SANDAG (Aerial - 2004)

**Figure 6g**  
**Bat Recording Stations, Mammal Camera Stations, Mammal Scent Stations, and Trap Lines**  
**Boulder Oaks Open Space Preserve**









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SOURCE: SANDAG (Aerial - 2004)

**Figure 6h**  
**Bat Recording Stations, Mammal Camera Stations, Mammal Scent Stations, and Trap Lines**  
**Boulder Oaks Open Space Preserve**







V:\GIS\PROJECTS\BOULDER\_OAKS\00002\_07\MAPDOC\TRAPLINE\_MAP8.MXD CM (09-21-07)



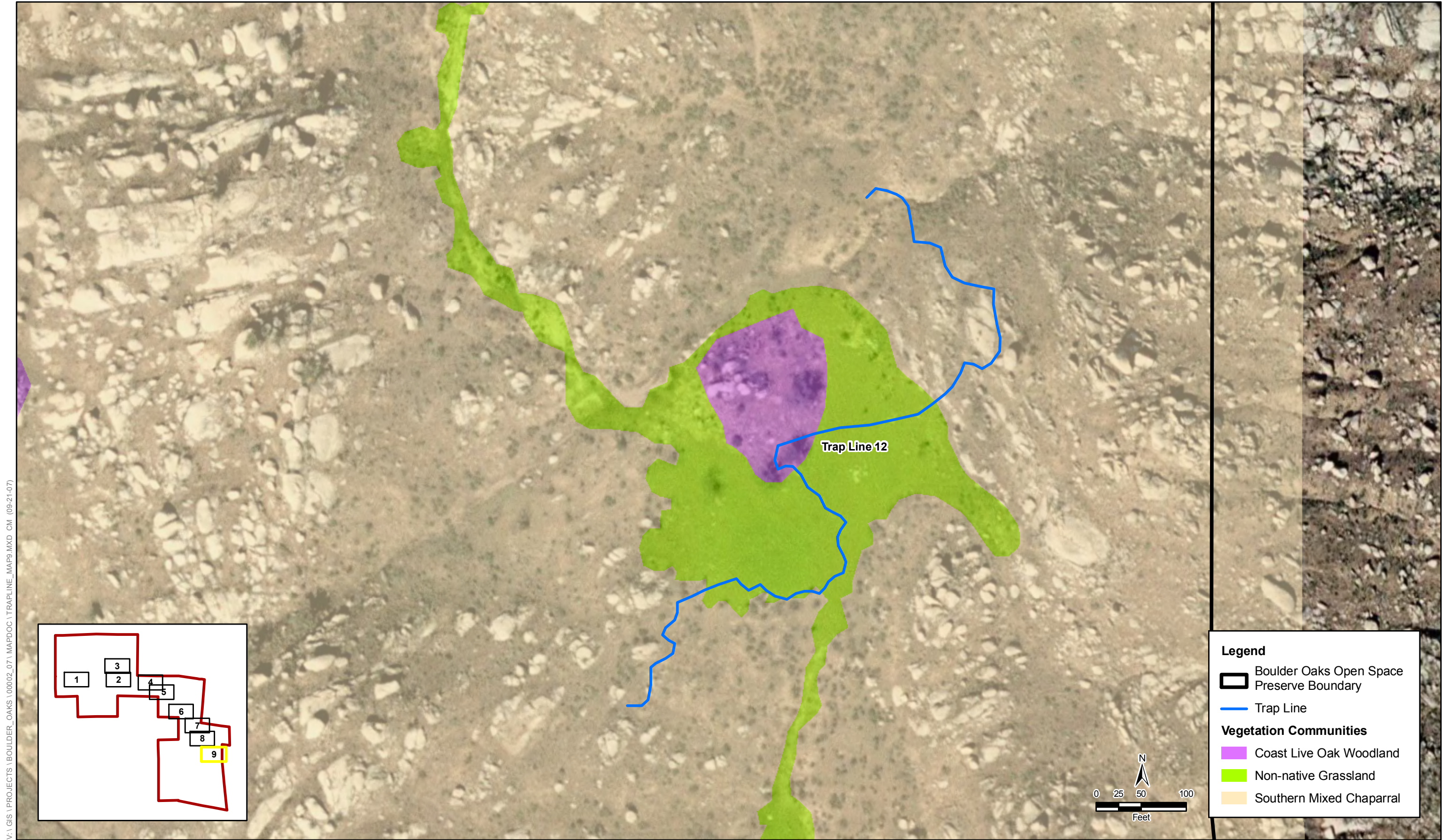
SOURCE: SANDAG (Aerial - 2004)

**Figure 6i**  
**Bat Recording Stations, Mammal Camera Stations, Mammal Scent Stations, and Trap Lines**  
**Boulder Oaks Open Space Preserve**









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SOURCE: SANDAG (Aerial - 2004)

**Figure 6j**  
**Bat Recording Stations, Mammal Camera Stations, Mammal Scent Stations, and Trap Lines**  
**Boulder Oaks Open Space Preserve**





**Table 2. Personnel, Date, Time, and Conditions of the Boulder Oaks Small Mammal Trapping**

Trapline	Personnel	Date Checked	Time Checked	Conditions
1	Phillip Richards Cindy Dunn	7/12/07	0548	Clear; 54°F; Wind 0-2; Last/4 moon visible; 82% relative humidity
		7/13/07	0735	Clear; 72°F; Wind 0-2; Last/4 moon visible; 78% relative humidity
2	Phillip Richards Cindy Dunn	7/12/07	0415	Clear; 54°F; Wind 0-1; Last/4 moon visible; 78% relative humidity
		7/13/07	0701	Clear; 65°F; Wind 0-2; Last/4 moon visible; 68% relative humidity
3	Phillip Richards Cindy Dunn	7/12/07	0612	Clear; 57°F; Wind 0-1; Last/4 moon visible; 80% relative humidity
		7/13/07	0616	Clear; 55°F; Wind 0-1; Last/4 moon visible; 76% relative humidity
4	Phillip Richards Cindy Dunn	7/12/07	0645	Clear; 58°F; Wind 0-2; Last/4 moon visible; 80% relative humidity
		7/13/07	0545	Clear; 57°F; Wind 0; Last/4 moon visible; 65% relative humidity
5	Phillip Richards Cindy Dunn	7/12/07	0709	Clear; 61°F; Wind 0-1; Last/4 moon visible; 77% relative humidity
		7/13/07	0454	Clear; 56°F; Wind 0-2; Last/4 moon visible; 74% relative humidity
6	Phillip Richards Cindy Dunn	7/12/07	0728	Clear; 63°F; Wind 0-1; Last/4 moon visible; 78% relative humidity
		7/13/07	0421	Clear; 56°F; Wind 0-1; Last/4 moon visible; 70% relative humidity
7	Phillip Richards Cindy Dunn	7/12/07	0735	Clear; 63°F; Wind 0-4; Last/4 moon visible; 78% relative humidity
		7/13/07	0333	Clear; 57°F; Wind 0; Last/4 moon visible; 79% relative humidity
8	Phillip Richards Kailash Mozumder	6/28/07	0415	Clear; 48°F; Wind 0-1; first/4 moon visible; relative humidity not recorded
		6/29/07	0350	Clear; 53°F; Wind 0-1; full moon visible; relative humidity recorded as low
9	Phillip Richards Kailash Mozumder	6/28/07	0449	Clear; 65°F; Wind 0; first/4 moon visible; relative humidity recorded as low
		6/29/07	0637	Clear; 53°F; Wind 0; full moon visible; relative humidity recorded as low
10	Phillip Richards Kailash Mozumder	6/28/07	0615	Clear; 60°F; Wind 0; first/4 moon visible; relative humidity not recorded
		6/29/07	0538	Clear; 55°F; Wind 0; full moon visible; relative humidity recorded as low
11	Phillip Richards Kailash Mozumder	6/28/07	0556	Clear; 54°F; Wind 0; first/4 moon visible; relative humidity not recorded
		6/29/07	0610	Clear; 57°F; Wind 0; full moon visible; relative humidity recorded as low



Trapline	Personnel	Date Checked	Time Checked	Conditions
12	Phillip Richards Kailash Mozumder	6/28/07	0523	Clear; 56°F; Wind 0; first/4 moon visible; relative humidity not recorded
		6/29/07	0641	Clear; 65°F; Wind 0-1; full moon visible; relative humidity not recorded

### 3.5.2. Acoustic Survey for Bats

Jones & Stokes biologists Ed West and Kailash Mozumder conducted a comprehensive survey of the Preserve on January 23, 2007 to determine locations for conducting acoustic surveys for bats.

An acoustic survey was used to detect and identify foraging bats at the main pond at the Preserve between June 28 and July 22, 2007. The survey was conducted using an Anabat SD1 detector (Titley Electronics, New South Wales, Australia) programmed to record all ultrasonic signals between 6 PM and 6AM each day. All of the recordings were then downloaded to a Dell Latitude D510 laptop computer using CFread, an Anabat ZCAIM interface program. Each recording was then converted to a sonogram for species identification analysis using Analook W, an Anabat conversion program. Sonograms of each bat call were then generated using the ANALOOKW (Windows version 3.3f, Corben 2006) program. Species were then identified by comparison of the sonograms with those of known bats available in the literature (e.g., Corben and O'Farrell 1999, Keinath 2004) and/or online (e.g., Batcall Library (<http://www.msb.unm.edu/mammals/batcall/html/news.html>)).

### 3.5.3. Camera Tracking Stations

Camera tracking stations were set up at five locations on the Preserve that were judged to have high potential for documenting movement of large mammals (e.g., along game trails, and near water features; see Figure 6a). Motion-sensitive cameras recorded animals moving past the stations from 14 September through 13 October (30 days). Each station consisted of one infrared transmitter, one infrared receiver and one 35mm camera (Trailmaster TM 1500 Active Infrared Trail Monitor). This setup allows for the placement of an infrared beam across the area of interest, and any interruption to the beam triggers the camera. Date and time information is recorded with each interruption, providing more detail about the animal activity in the area. These stations can allow for the detection of species that are rarely encountered because they are only active at night, or during the first/last light of day. Kailash Mozumder and Kurt Campbell performed the interpretation of resulting images, with discussion as needed. No animal images captured under this task remained uncertain or unidentified.



### **3.5.4. Mammal Track and Sign Survey**

At least once each month, sections of existing trails and roads were carefully examined for tracks and sign (scat, scrapings, etc.) of medium-sized and large mammals. Kurt Campbell, a qualified and experienced biologist, conducted this work on foot, documenting observations in field notes and with photographs (Appendix D). All road and trail reaches were walked at least once, and most roadways in the central portion of the Preserve were walked at least each month with a focus on this task. In addition, hilltops, ridges, drainages, and observed wildlife trails were specifically evaluated at least once each for use by such mammals. Finally, mammal tracks and sign were also carefully evaluated when detected during other fieldwork.



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## 4.0 Results and Discussion

### 4.1. Vegetation

Overall, the Preserve supports a diverse flora dominated by native species and native vegetation communities. Although one vegetation community dominates the Preserve (southern mixed chaparral), the diversity within this vegetation community is quite high. This is due presumably to modest levels of past disturbance, diversity of soils, and abundance of exposed granitic boulders. Floristic inventories documented 228 native and naturalized plant species, along with a few persisting ornamental species at the house pad. 85% of these species are considered native and 15% are considered nonnative. Nonnative species are most abundant at the house pad, along existing roads, and in the grasslands. The site has potential to support many additional native or naturalized species. However, due to the limited rainfall in 2006/2007 detection of some species may not have been possible. A complete list of all species observed during the surveys is presented as Appendix E.

### 4.2. Vegetation Communities

Vegetation communities and land cover types present within the Preserve consist of open coast live oak woodland, open Engelmann oak woodland, southern mixed chaparral, scrub oak chaparral, nonnative grassland, southern willow scrub, freshwater marsh, open water, and disturbed land (see Figure 4, Table 3). In addition, seasonal pools were observed within several rock outcroppings and potential vernal pools were observed within grasslands. Due to the low rainfall during the 2006-2007 winter, these areas could not be confirmed as supporting sufficient hydrology for vernal pool plant species. A description of the vegetation communities and the dominant plant species detected during the surveys are found below.



**Table 3. Land Cover Types within the Preserve**

<b>Vegetation/Land Cover Type</b>	<b>Acreage</b>
Open Coast Live Oak Woodland	42
Open Engelmann Oak Woodland	21
Southern Mixed Chaparral	1,145
Scrub Oak Chaparral	7
Nonnative Grassland	40
Southern Willow Scrub	1
Disturbed Land	7
Freshwater Marsh	2
Open Water	2
Total	1,268

#### **4.2.1. Open Coast Live Oak Woodland (71161)**

Open coast live oak woodland is typically dominated by Coast Live Oak trees, which reach 9 to 24 meters (30 to 80 ft) in height. The shrub layer within this vegetation community 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 within shaded ravines in southern California (Holland 1986).

Coast Live Oak is the dominant plant species in areas mapped as coast live oak woodland on the Preserve. This vegetation type is most common in the northeastern portion of the Preserve intermixed with nonnative grassland. There are scattered smaller patches of this community within ravines on the western and southern portions of the Preserve. Engelmann Oak (*Quercus engelmannii*), Western Poison-oak (*Toxicodendron diversilobum*), Toyon (*Heteromeles arbutifolia*), and Interior Scrub Oak (*Quercus berberidifolia*) are also present in this vegetative community within the Preserve.

The open coast live oak woodland located within the survey area has high ecological value. Oak woodlands are considered special-status vegetation communities by the County and state and provide nesting habitat and valuable cover for a wide range of wildlife species. The oak woodland within the Preserve provides suitable nesting habitat for several species of raptors and other birds.



## 4.2.2. Open Engelmann Oak Woodland (71181)

Open Engelmann oak woodland is evergreen woodland dominated by Engelmann oaks typically with an understory of annual grasses. The community is found on fine textured soils in areas with gentle slopes and in valley bottoms. It surrounds grassland meadows and often occupies the ecotone between the grassland and the surrounding shrublands. Engelmann oak is a California Native Plant Society (CNPS) List 4 and County Group D species and is the dominant plant species within the areas mapped as Engelmann oak woodland. Open Engelmann oak woodland occurs in the northeastern portion of the Preserve intermixed with the coast live oak woodland and nonnative grassland.

As with the other woodlands found within the survey area, the open Engelmann oak woodland has high ecological value. Oak woodlands are considered special-status vegetation communities by the County and state and provide nesting habitat and valuable cover for a wide range of wildlife species. The oak woodland within the survey area provides suitable nesting habitat for several species of raptors and other birds.

## 4.2.3. Southern Mixed Chaparral (37120)

Southern mixed chaparral is the most widespread vegetation type on the Preserve. This community typically consists of broad-leaved sclerophyllous shrubs approximately 1.5 to 3 meters tall. This vegetation community may include patches of bare soil, and sometimes forms a mosaic with coastal sage scrub or Riversidian sage scrub. The southern mixed chaparral on site was burned in the Cedar Fire in October 2003. The vegetation community has not fully recovered since the fire and shrubs are generally more sparse and shorter (0.5 to 2.0 meters) than more mature stands of mixed chaparral. Dominant plants occurring within the survey area include Chamise (*Adenostoma fasciculatum*), Ramona-lilac (*Ceanothus tomentosus*), Interior Scrub Oak, Laurel Sumac (*Malosma laurina*), Spiny Redberry (*Rhamnus crocea*), and Mission Manzanita (*Xylococcus bicolor*). Understory is generally sparse but dominated by native herbs on south-facing slopes, while on north-facing slopes the understory has somewhat greater cover due to the addition of a greater proportion of nonnative herbs, especially Foxtail Chess (*Bromus madritensis*) and other European grasses.

Southern mixed chaparral has high ecological value as it provides nesting and foraging habitat for several wildlife species including Rufous-crowned Sparrow (*Aimophila ruficeps*), Sage Sparrow (*Amphispiza belli*), many Neotropical migrant birds, pocket mice, and Desert Woodrat (*Neotoma lepida*), and can contain rare plant species. This vegetation community is considered a special-status community in San Diego County. The southern mixed chaparral in the northwestern portion of the Preserve occurs on metasedimentary soils. Based on survey results, these soils support special-status plants and the community as a whole should be recognized as having a higher sensitivity ranking than typical southern mixed chaparral.



#### 4.2.4. Scrub Oak Chaparral (37900)

Scrub oak chaparral consists of a dense, evergreen chaparral up to 20 feet tall dominated by Interior Scrub Oak. The scrub oak chaparral in the Preserve was burned in the Cedar Fire in October 2003 and consists of dense patches interspersed with open areas vegetated with herbaceous species. Dominating the understory and openings are nonnative grasses and herbs including Soft Chess (*Bromus hordeaceus*), Foxtail Chess (*Bromus madritensis*), and Red-stemmed Filaree (*Erodium cicutarium*).

Scrub oak chaparral is considered a special-status vegetation community in San Diego County.

#### 4.2.5. 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]).

Dominant species that characterize the nonnative grassland within the Preserve area include Harding Grass (*Phalaris aquatica*), Wild Oat (*Avena barbata*), Soft Chess, Foxtail Chess, and Spring Vetch (*Vicia sativa*). Cover is generally dense throughout the grasslands on the Preserve except within limited areas where drainages are present.

The nonnative grassland located on site has high conservation value. It is located within and adjacent to the open coast live oak woodland and the open Engelmann oak woodland, and represents a large, contiguous vegetation community that is unique in the area. This community is also known to support special-status species, including Orcutt's Brodiaea (*Brodiaea orcuttii*), and is considered prime foraging habitat for several species of raptors. Additionally, there is a fairly high potential for vernal pool resources to occur within the larger patches of nonnative grassland within the Preserve. Due to the low rainfall during the 2006-2007 winter, ponded areas were not observed within the grasslands. However, patches of hydrophytic vegetation such as rushes (*Juncus mexicanus*), Harding Grass, and Curly Dock (*Rumex crispus*) were observed within the grasslands on the Preserve, indicating that these areas may pond or remain wet for a substantial duration during typical years. This vegetation type is considered to be of special status by the County.

#### **4.2.6. Southern Willow Scrub (63320)**

Southern willow scrub is found on loose, sandy, or fine gravelly alluvium deposited near stream channels. This vegetation community was once extensive along the major rivers of coastal southern California but has been greatly reduced by urbanization, flood control, and streambed alterations. Southern willow scrub consists of dense, broad-leafed, winter-deciduous riparian thickets dominated by several *Salix* species, including Arroyo Willow (*Salix lasiolepis*) and sub-dominant Mule Fat (*Baccharis salicifolia*). This vegetation type occurs along margins of the two small ponds in the western portion of the Preserve.

The southern willow scrub on-site has moderate ecological value as it represents a relatively small patch of riparian vegetation community isolated from other riparian communities. Larger and more contiguous corridors of southern willow scrub often provide higher ecological value because they provide unique habitat for rare, threatened, and endangered species. However, the presence of even modest amounts of this community on the Preserve provides ecological and structural complexity, and may provide some buffer against drought for wildlife (i.e., “refugia”). This vegetation community is considered a special-status community by the County, state, and federal agencies.

#### **4.2.7. Disturbed Land (11300)**

Disturbed land consists of compacted dirt roads and trails that support very sparse or no vegetation, as well as the house pad area and olive orchard. This land cover type has a low ecological value due to the limited natural habitat elements. This land cover type is not considered to be of special status by any local, state, or federal agencies. Because of the limited extent of these areas, there appears to be little effect of attracting nonnative animals such as House Mouse (*Mus musculus*). Nonnative plants at the house pad area include ornamental not likely to naturalize or persist, as well as invasive species with potential to spread to natural communities and degrade biological values of the Preserve. The latter include Bermuda Grass (*Cynodon dactylon*), Mexican Fan Palm (*Washingtonia robusta*), and African Fountain Grass (*Pennisetum setaceum*). See Section 5.1, including Table 9, for more detail on this issue.

#### **4.2.8. Vernal Pool (44000)**

Vernal pools are a unique microhabitat with a flora that often includes several habitat-specialist species. Typically, vernal pools are wetlands that occur in shallow basins underlain by an impervious subsoil layer (clay, volcanic rock, or sometimes granitic rock). The basins are covered by shallow water for extended periods during the cool season but are dry during the summer and fall. Areas that may be vernal pools are within the nonnative grassland along the eastern portion of the project site and in rock basins atop some of the numerous mountain ridges on the property. With the exception of several rock pools along the



western portion of the project site, plant species typically limited to areas in or near vernal pools were not observed. However, within the rock pools several vernal pool indicator plants were observed including Prairie Plantain (*Plantago elongata*), and Water Pygmy Weed (*Crassula aquatica*). The absence of vernal pool indicator plants within areas mapped as potential vernal pools could be a result of the drought conditions during the survey period.

Vernal pools are considered a unique and special-status seasonal wetland community. Plants and animals found in these pools are highly specialized as they must survive aquatic conditions during the rainy season and extremely dry conditions during the rest of the year. This vegetation community is considered a special-status community by the County, state, and federal agencies.

#### **4.2.9. Freshwater Marsh (52410)**

Freshwater marsh communities are found in areas permanently inundated or flooded by fresh water, lacking significant current from water movement. Prolonged saturation in these communities allows for the accumulation of deep, peaty soils. Freshwater marshes are usually located in the coastal valleys near river mouths and around the margins of lakes and springs. Freshwater marsh is dominated by perennial, emergent monocots, typically ranging from 1.2 to 1.5 meters (4 to 5 feet) tall. Typically, species of the genera *Typha* (cat-tails) and *Scirpus* (bulrush) dominate this community. Dominant plants observed on site included California bulrush (*Scirpus californicus*), Red-root Flatsedge (*Cyperus erythrorhizos*) and Saltmarsh Fleabane (*Pluchea odorata*).

Freshwater marsh has high ecological value as it provides nesting and foraging habitat for several wildlife species including waterfowl. This vegetation community is considered a special-status community in San Diego County. The freshwater marsh within the Preserve occurs in patches within and along the margins of the ponds found in the western portion and near the middle of the Preserve.

#### **4.2.10. Open Water (13100)**

Open water consists of areas inundated by water and unvegetated. This land cover type typically occurs in depressions or areas of lower elevations than the surrounding land and with an impervious substrate. The open water within the Preserve consists of three small ponds (approximately 2 acres total) that were created by manmade earthen dams along natural drainage courses.

Open water has high ecological value as it provides nesting and foraging habitat for several wildlife species. Open water also provides a resting and feeding location for waterbirds.

## 4.2.11. 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).

The CNDDDB search, CNPS search, and field surveys identified 66 special-status plant species that occur or have potential to occur in the project vicinity (Appendix E). The CNDDDB and CNPS searches were conducted for the San Vicente Reservoir, San Pasqual, El Cajon, Ramona, El Cajon Mountain, Alpine, Escondido, Poway, and La Mesa, California 7.5-minute USGS quadrangles (CDFG 2007).

Eight special status plant species were detected within the survey area: Felt-leaved Monardella (*Monardella hypoleuca* ssp. *lanata*), Ramona Horkelia (*Horkelia truncata*), Orcutt's Brodiaea (*Brodiaea orcuttii*), San Miguel Savory (*Satureja chandleri*), Lakeside Ceanothus (*Ceanothus cyaneus*), California Adder's Tongue (*Ophioglossum californicum*), Southern Mountain Misery (*Chamaebatia australis*), and Engelmann Oak (*Quercus engelmannii*). Special status plant species with moderate or high potential to occur within the survey area are discussed in Section 4.2.13. Discussions of the plants species incorporate information from Reiser (1994) and Hickman (1993).

## 4.2.12. Special-Status Plant Species Observed

**Orcutt's Brodiaea** is on CNPS List 1B and is a County Group A species associated with grasslands and vernal pools. Due to the limited rainfall in 2007 an accurate assessment of the population size that would be present within the Preserve in more typical years is difficult to determine. However, over 200 individuals of Orcutt's brodiaea were observed within the nonnative grassland, Engelmann oak woodland and coast live oak woodland within the eastern most portion of the Preserve (Figure 7).

**Lakeside Ceanothus** is on CNPS List 1B and is a County Group A species 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. On-site Lakeside Ceanothus is found within the rocky chaparral located within the southern portion of the Preserve (see Figure 7). This species is a common component of the chaparral in the southwestern portion of the site; therefore, counting individuals was not feasible.

**Felt-leaved Monardella** is on CNPS List 1B and is a County Group A species typically found within the understory of mature chaparral. Felt-leaved



Monardella was found primarily on the Friant series soils along the western portion of the Preserve (see Figure 7). Given the extensive amount of suitable habitat and the wide distribution of documented individuals, it is estimated that over 400 individuals occur within the Preserve.

**Ramona Horkelia** is on CNPS List 1B and is a County Group A species typically associated with Chamise chaparral. Approximately 50 individuals of Ramona Horkelia were found within the northwestern portion of the Preserve. Specifically, these plants were found atop a prominent mountaintop within southern mixed chaparral (see Figure 7). Of note, at this location Felt-leaved Monardella was also observed growing side by side with Ramona Horkelia.

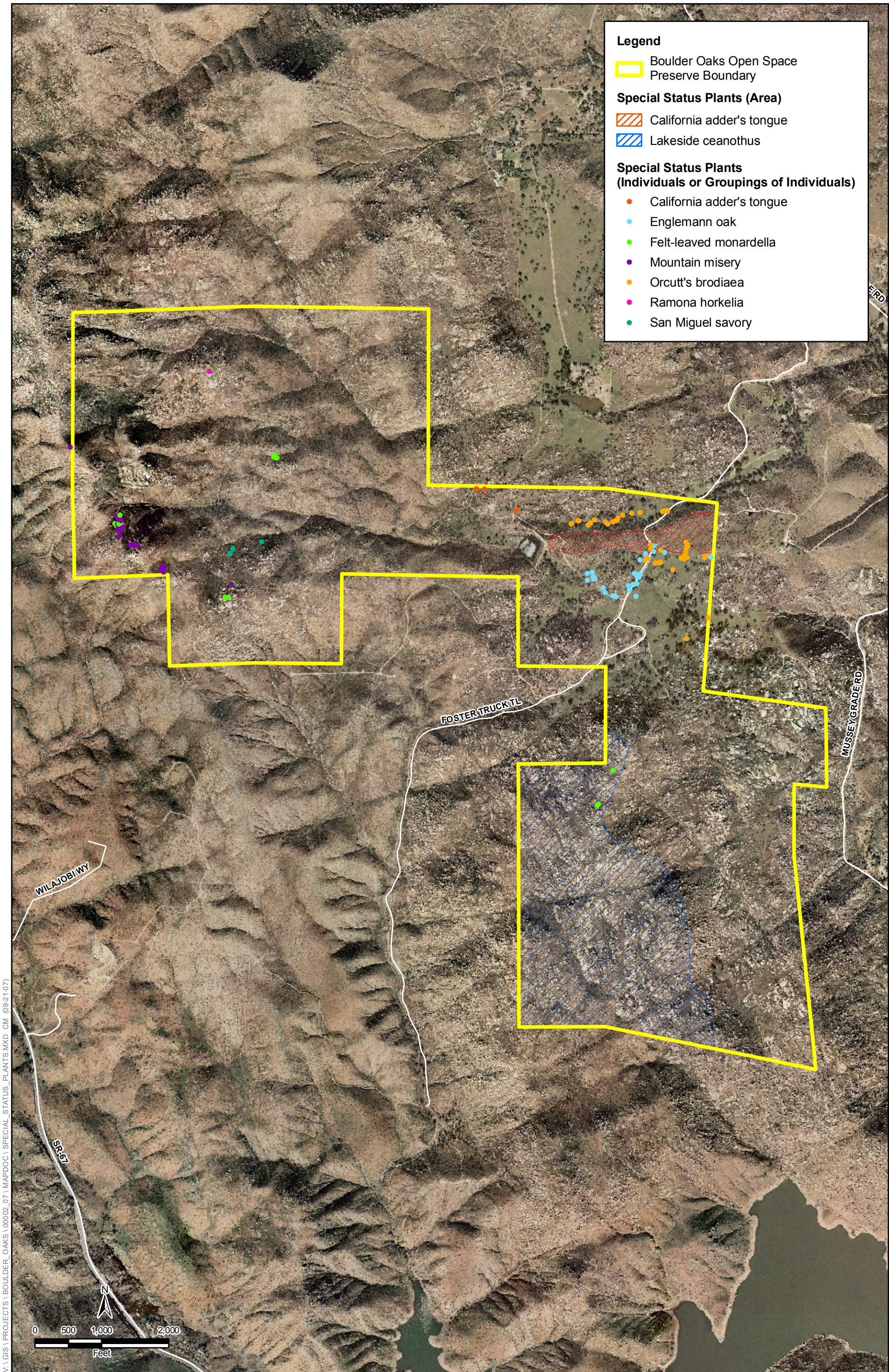
**San Miguel Savory** is on CNPS List 4 and is a County Group D small herbaceous shrub associated with chaparral and oak woodlands that primarily occur on gabbroic or metavolcanic soils. On-site San Miguel Savory was observed within the understory of southern mixed chaparral on a north-facing slope (see Figure 7). This slope contains soil mapped from the Friant series that is derived from metasedimentary rock.

**California Adder's Tongue** is on CNPS List 4 and is a County Group D species associated with chaparral, grasslands, and vernal pools at elevations ranging from 60–525 meters. Individuals of California Adder's Tongue were found within the survey area along segments of the existing ranch roads. In addition, a large patch of California Adder's Tongue was mapped within the northeastern portion of the Preserve and is estimated to include tens of thousands of individuals. This population covers approximately 18.3 acres (see Figure 7).

**Southern Mountain Misery** is on CNPS List 4 and is a County Group D species. This evergreen shrub is found in chaparral at elevations between 300–700 meters. Individuals were found primarily within the southern mixed chaparral along the western portion of the Preserve (see Figure 7).

**Engelmann Oak**, on CNPS List 4 and a County Group D species, is commonly found in the foothills between 152 and 1,219 m (500 and 4,000 ft). Growing to 12 m tall (40 ft), this tree has flat, grey-blue-green leaves and tolerates less water than coast live oak. Larger individuals are sometimes found growing in savannah grasslands but it may also occur as a shrubby element within the chaparral. All Engelmann Oaks on the Preserve were found along the existing ranch roads or within the nonnative grassland/Engelmann oak woodland interface along the eastern most portion of the project site (see Figures 4 and 7).





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SOURCE: SANDAG (Aerial - 2004; Roads - 2007)

**Figure 7**  
**Special Status Plants**  
**Boulder Oaks Open Space Preserve**





## 4.2.13. Special Status Plant Species not Observed but with High Potential to Occur.

**Gander's Ragwort (*Packera ganderi*)**, on CNPS List 1B and a County Group A species, is a very localized endemic ragwort, in San Diego County typically found in heavy leaf litter within chaparral. This species was not observed within the Preserve but the CNDDDB reports an account of this species just north of the Preserve boundary.

**San Diego Thorn-mint (*Acanthomintha ilicifolia*)** is Federally threatened, State endangered, on CNPS List 1B and a County Group A species typically associated with friable clay soils. This species was not observed during the surveys but it is considered to have a high potential to occur onsite because suitable habitat and soils occur within the Preserve. Furthermore, a CNDDDB record reports this species approximately 3.5 km to the northeast of the study area.

**San Diego Goldenstar (*Bloomeria clevelandii*)** is on CNPS List 1B and is a County Group A species typically associated with clay soils in a variety of vegetation communities including native grasslands, vernal pools, Diegan coastal sage scrub and southern mixed chaparral. This species was not observed during the surveys but is still considered to have a high potential to occur within the preserve because suitable habitat and soils occur on site. Furthermore, Merkel & Associates reports this species as occurring within the southern mixed chaparral directly south of the Preserve boundary (Merkel & Associates, 2006).

## 4.3. Invertebrates

### 4.3.1. Butterflies

Butterfly and skipper species observed during the 2007 focused Quino survey are Pacific Orangetip (*Anthocharis sara*), Behr's Metalmark (*Apodemia virgulti*), Western Green Hairstreak (*Callophrys affinis*), Brown Elfin (*Callophrys augustinus*), Funereal Duskywing (*Erynnis funeralis*), Silvery Blue (*Glaucopsyche lygdamus*), Acmon Blue (*Icaricia acmon*), Pale Swallowtail (*Papilio eurymedon*), Checkered White (*Pontia protodice*), Painted Lady (*Vanessa cardui*), West Coast Lady (*Vanessa annabella*), Monarch (*Danaus plexippus*), Anise Swallowtail (*Papilio zelicaon*) and Orange Sulphur (*Colias eurytheme*). All invertebrates identified on the Preserve below the level of family are included in the wildlife tables in Appendix A.

No Quino or any other special-status butterfly species was observed on the Preserve. Full details of the Quino survey are provided in the attached Quino Checkerspot Survey Report (see Appendix B). However, both Quino and Hermes Copper (*Lycaena hermes*) have potential to occur based on the presence of their host plants, Dwarf Plantain (*Plantago erecta*) and Spiny Redberry



(*Rhamnus crocea*), respectively. No additional, special-status invertebrate species are reported for the Preserve by the CNNDDB (CDFG 2007)

### 4.3.2. Other Invertebrates

Other invertebrate species captured in the pitfall traps associated with the herp arrays or during other fieldwork were identified in the field or photographed and identified in the office. No invertebrate species were collected. Invertebrate species captured in the herp arrays or during active herp searches and identified below the family level are indicated in the wildlife tables in Appendix A.

## 4.4. Herpetofauna

### 4.4.1. Amphibians

The array of pitfall traps captured two amphibian species during the 2007 sampling period at the Preserve. These are one native species, Western Toad (*Bufo boreas*) and one nonnative, invasive species, Bullfrog (*Rana catesbeiana*). The Bullfrog was captured at array #2, west of the main pond.

One other native amphibian species, Pacific Chorus Frog (*Pseudacris regilla*), was detected during active searches. It was breeding in the small pools along the drainage southeast of array #5.

One additional amphibian species is expected within the Preserve and has been observed in prior years by Fred Sproul and Kurt Campbell (unpublished notes), the Western Spadefoot (*Spea hammondi*); it is included in the current faunal list (see Appendix A). The County of San Diego considers this to be a special-status species. Sproul and Campbell noted spadefoot reproduction in ponded areas of the grasslands on the eastern portion of the Preserve during wetter years. Other amphibians with potential to occur are limited to California Chorus Frog (*Pseudacris cadaverina*), Arboreal Salamander (*Aneides lugubris*), Garden Slender Salamander (*Batrachoseps major major*), and Common Ensatina (*Ensatina eschscholtzi*).

### 4.4.2. Reptiles

Seven reptile species, representing five families, were captured by arrays during the 2007 sampling periods at the Preserve: Coastal Western Whiptail (*Aspidoscelis tigris stejnegeri*), Southern Alligator Lizard (*Elgaria multicarinata*), Gilbert's Skink (*Eumeces gilberti*), Coronado Western Skink (*Eumeces skiltonianus interparietalis*), Western Fence Lizard (*Sceloporus occidentalis*), Side-blotched Lizard (*Uta stansburiana*) and Coastal Patchnose Snake (*Salvadora hexalepis virgulata*). One additional species, Rosy Boa (*Lichanura trivirgata*), was observed under a cover board northwest of the large

pond. A complete list of herpetofauna observed within the Preserve during 2007 is in the wildlife table (see Appendix A).

Additional reptile species observed or detected but not captured in the arrays are Coast Horned Lizard (*Phrynosoma coronatum*), Granite Spiny Lizard (*Sceloporus orcutti*), Granite Night Lizard (*Xantusia henshawi*), Red Diamond Rattlesnake (*Crotalus ruber*), Western Rattlesnake (*Crotalus oregonus*), Rosy Boa (*Lichanura trivirgata*), and San Diego Gopher Snake (*Pituophis catenifer annectans*).

Based on the presence of potentially suitable habitat, the following species may also occur onsite: Western Racer (*Coluber mormon*), Speckled Rattlesnake (*Crotalus mitchellii*), Ringneck Snake (*Diadophis punctatus*), Night Snake (*Hypsiglena torquata*), Common Kingsnake (*Lampropeltis getula*), Western Blind Snake (*Leptotyphlops humilis*), Coachwhip (*Masticophis flagellum*), Striped Racer (*Masticophis lateralis*), Longnose Snake (*Rhinocheilus lecontei*), Western Blackhead Snake (*Tantilla planiceps*), Two-striped Garter Snake (*Thamnophis hammondi*), Lyre Snake (*Trimorphodon biscutatus*), California Legless Lizard (*Anniella pulchra*), Orangethroat Whiptail (*Cnemidophorus hyperythrus*) and Western Banded Gecko (*Coleonyx variegatus*). No additional sensitive herpetiles are currently listed on the Preserve by the CNDDDB (CDFG 2007)

Due to the low abundance and species richness captured by the arrays, the potential effect of dry conditions in 2006 and 2007 and the indiscernible variation among array captures, differences in abundance or diversity within the Preserve remain unclear.

Vertebrate wildlife species Detected during the 2007 herp surveys are indicated in the wildlife tables in Appendix A.

## 4.5. Birds

### 4.5.1. Diurnal Point Count Survey and Nocturnal Driving Survey

Avian species richness (total species detected) was found to be moderately high at the Preserve. A total of 102 species of birds was detected. 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. Compared with similar vegetation communities elsewhere in central San Diego County, spring migration appeared to be about average in strength to slightly weaker than expected, but no data were available to compare with other sites during this dry year.

The site has a good diversity of raptors (birds of prey), including eight species detected including one Osprey (*Pandion haliaetus*) high overhead that was likely



just commuting to San Vicente Reservoir from elsewhere. The other seven species all appeared to be represented by just one or two breeding pairs, except for Red-tailed Hawks (*Buteo jamaicensis*). It appeared that at least three pairs foraged on the Preserve, though not all of these may breed there. No active raptor nests were observed.

A significant component of the Preserve's avifauna is waterbirds, all of which utilized the main pond. This included at least seven species of ducks and at least another eight species including American Coot (*Fulica americana*) and Pied-billed Grebe (*Podilymbus podiceps*); both of the latter two nested. The pond also appeared to be very important to a wide variety of songbirds. These include Common Yellowthroat (*Geothlypis trichas*), Song Sparrow (*Melospiza melodia*), Red-winged Blackbird (*Agelaius phoeniceus*), all of which nested on the Preserve, as well as six species of swallows. Swallows that utilized the main pond included Violet-green (*Tachycineta thalassina*), which probably bred in cavities in the oaks, Cliff (*Petrochelidon pyrrhonota*) and Northern Rough-winged (*Stelgidopteryx serripennis*), which probably bred in nearby areas and foraged at the pond, and migrating Tree (*Tachycineta bicolor*) and Bank (*Riparia riparia*) swallows. The latter is a state-listed, threatened species (one was seen at the pond in migration).

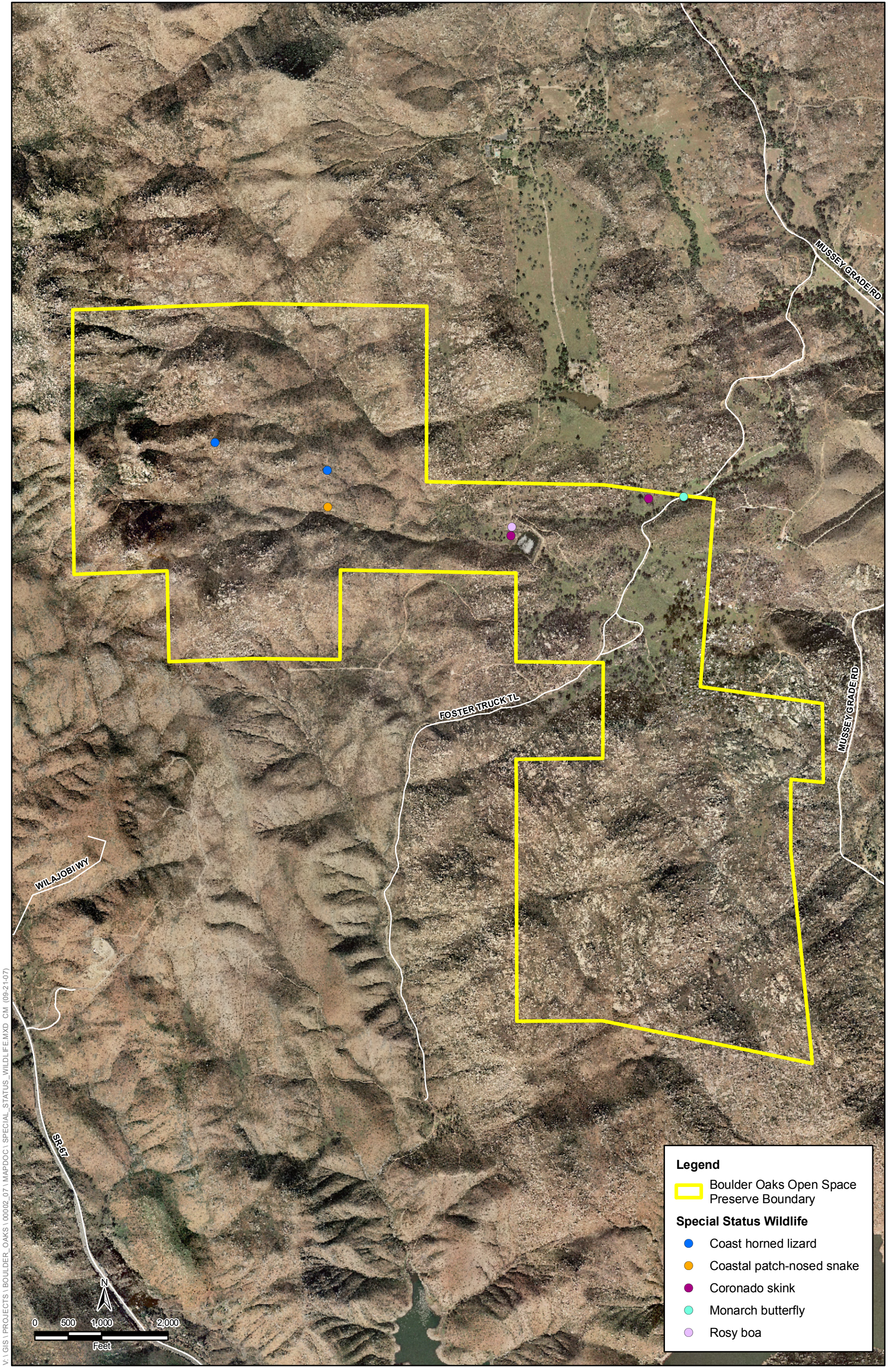
Woodpeckers construct most of the tree cavities on the Preserve and these provide vital nest sites for a variety of birds. At least two species of woodpeckers nest on the Preserve, and at least another six species of birds that nest there do so only in cavities, including Western Bluebird (*Sialia mexicanus*).

Acorn Woodpeckers (*Melanerpes formicivorus*) are resident on the Preserve in the general area of the house pad. They normally store food in highly visible granaries, consisting of acorns stored in holes. However, no granaries were found during the current work. They may have been missed, or may have been removed when trees were downed after the fire. If lost, this may put the colony at risk through combination with stresses due to the current drought.

Small numbers of the obligate nest parasite, Brown-headed Cowbird (*Molothrus ater*), were seen, including a juvenile being fed by a Song Sparrow at the main pond. The only nonnative birds seen are small numbers of European Starling (*Sturnus vulgaris*), which nested in cavities in oaks and then departed, and Rock Pigeon (*Columba livia*), small numbers of which flew over the area on a few occasions.

Turkey Vultures (*Cathartes aura*) were observed foraging over virtually the entire Preserve, and were fairly common to uncommon. Both Southern California Rufous-crowned (*Aimophila ruficeps canescens*) and Bell's Sage (*Amphispiza bellii bellii*) sparrows are widespread in chaparral on the preserve. Western Bluebirds were present only at selected ecotones between oak woodlands and grasslands in the central portion of the Preserve. Both Loggerhead Shrike (*Lanius ludovicianus*) and Yellow-breasted Chat (*Icteria virens*) were noted as single individuals, the former on multiple dates in the same area and the latter as a somewhat out-of-habitat migrant in chaparral. See Figure 8 for locations of special-status birds on the Preserve.





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SOURCE: SANDAG (Aerial - 2004; Roads - 2007)

**Figure 8**  
**Special Status Wildlife**  
**Boulder Oaks Open Space Preserve**





There is no reasonable potential for Southwestern Willow Flycatcher (*Empidonax traillii extimus*), Least Bell's Vireo (*Vireo bellii pusillus*), or Coastal California Gnatcatcher (*Polioptila californica californica*) 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. The southern willow scrub on the Preserve is grossly suitable, but much too isolated and limited in extent, to support nesting Bell's Vireos. No coastal sage scrub community is present on or adjacent to the Preserve, thus excluding California Gnatcatcher.

## Point Count Results

As detailed in Section 3.4, ten-minute avian point counts were conducted at each of nine stations, monthly from March through August 2007 (Station 1 was not included in March). See Figure 5 for station locations. Kurt Campbell conducted all counts. Tables 4 and 5 below provide quantitative summaries of the results for species and individuals.

**Table 4. Avian Point Counts—Totals for Individuals\***

Month	Point Count Stations									Total # of Individuals	Mean # of Individuals
	1	2	3	4	5	6	7	8	9		
March		15	21	21	33	18	5	9	14	136	17.0
April	14	19	17	19	29	14	18	16	12	158	17.6
May	15	19	21	18	41	17	15	21	12	179	19.9
June	12	24	28	29	44	21	19	15	15	207	23.0
July	11	10	16	21	41	14	9	8	12	142	15.8
August	15	10	14	6	47	10	4	2	4	112	12.4
Total # of Individuals	67	97	127	114	235	94	70	71	69	944	
Mean # of Individuals	13.4	16.2	21.2	19.0	39.2	15.7	11.7	11.8	11.5		17.8

\* - See Section 3.4.1 regarding the incorporation of individuals recorded as "fly-bys," which may cause the above totals not to appear to add correctly in conjunction with the raw data.



**Table 5. Avian Point Counts–Totals for Species\***

Month	Point Count Stations									Total # of Species	Mean # of Species
	1	2	3	4	5	6	7	8	9		
March		8	14	14	15	11	5	7	8	40	10.3
April	8	14	14	13	10	11	8	10	14	41	11.3
May	9	14	15	14	16	12	12	13	10	47	12.8
June	10	15	13	19	13	12	12	6	7	48	11.9
July	8	8	9	13	13	8	7	4	7	30	8.6
August	7	6	11	4	15	9	4	2	3	35	6.8
Total # of Species	19	28	34	38	42	29	24	23	24	86	
Mean # of Species	8.4	10.8	12.7	12.8	13.7	9.5	8	7	8.2		10.3

\* - See discussion below regarding the incorporation of individuals not identified to species, which may cause the above totals not to appear to add correctly in conjunction with the raw data.

The point counts recorded a total of 71 species of birds. An additional 31 bird species were recorded only off of the point counts, during other fieldwork. The most regularly encountered and/or most numerous bird species were Red-tailed Hawk, Mourning Dove, Anna's Hummingbird, Acorn Woodpecker, Western Scrub-Jay, Violet-green Swallow, Common Raven, Cliff Swallow, Western Bluebird, Wrentit, California Thrasher, Phainopepla, Spotted Towhee, California Towhee, Red-winged Blackbird, House Finch, and Lesser Goldfinch.

Anecdotally, the abundance and species richness observed during the avian point counts appear to be moderately high for the communities and conditions present, allowing for the drought conditions. Station 5 recorded the highest abundance and species richness, which was expected given that it was at the main pond and also included both chaparral and oak woodlands. Stations 8 and 9 had the lowest abundance and species richness. Station 8 was in chaparral, but Station 9 also included the upper pond (no standing water was present there during the current period).

## Nocturnal Survey Results

The nocturnal bird survey documented three species of birds primarily active at night: Barn Owl (*Tyto alba*), Great Horned Owl (*Bubo virginianus*), and Common Poorwill (*Phalaenoptilus nuttallii*). Great Horned Owl was noted in oak woodlands at several locations in the central portions of the Preserve. Barn Owls were noted at grassland edges in the central portions of the Preserve and at the house pad, and Barn Owl feathers were noted at two locations in oak woodlands. Common Poorwills were seen on roads and in chaparral across most

of the Preserve, heard calling from chaparral at night, and flushed on two occasions while hiking during daytime in chaparral. All three are common and widespread breeding species in the county, with the two owl species being the most common owls in human-altered landscapes.

The Preserve holds potentially suitable habitat for Western Screech-Owl (*Megascops kennicottii*) and Long-eared Owl (*Asio otus*). Both species could be present in small numbers, though undetected. However, they may be absent from the Preserve due to the open, fragmentary structure of the woodlands (both species appear to prefer dense woodlands), due to the 2003 fire, the 2007 drought, or other factors.

## **4.6. Mammals**

### **4.6.1. Small Mammal Trapping**

Six species of mammals, all rodents, were trapped on the Preserve during the current work. Table 6 provides details regarding traplines and Table 7 provides specific trapping results.



**Table 6. Trapline Description**

Trapline	Trap Nights	Number of Traps	Trap Sequence	Physical Description	Vegetative Community
1	2	20	1 - 20	Arid, south facing slope in canyon; soils rocky; low growing scrub	Southern mixed chaparral
2	2	40	41 - 80	Ridgeline; soils mostly loamy, low growing scrub	Southern mixed chaparral
3	2	30	51 - 80	Low hill top; soils mostly loamy with scattered rock outcrops; mixed densities of shrubs	Southern mixed chaparral
4	2	15	81 - 95	Flat valley floor; mostly loamy soil; scattered large shrubs with open space dominated by non-native grasses	Scrub oak chaparral
5	2	21	21 - 41	Edge of pond; soils mostly sandy; open areas within cattail and bullrush	Freshwater marsh and southern willow scrub
6	2	9	42 - 50	Vegetated dam of pond and edge of pond; soils mostly loamy; mixed densities of shrubs	Southern mixed chaparral, freshwater marsh, and southern willow scrub
7	2	15	96 - 110	Moderate sloped area and flat area at base of pond dam; soils mostly loamy; mixed densities of shrubs and oak trees	Southern mixed chaparral and coast live oak woodland
8	2	50	1 - 50	Relatively flat open area around former homestead; soils mostly loamy; mixed densities of shrubs and oak trees	Coast live oak woodland, open Engelmann oak woodland, non-native grassland and southern mixed chaparral
9	2	30	81 - 110	Moderate east facing slope; soils mostly loamy; dense shrubs and scattered oak trees	Southern mixed chaparral
10	2	30	51 - 80	Hill terrace; soils mostly loamy with abundant rock outcrops; dense shrubs	Southern mixed chaparral
11	2	40	41 - 80	Hill terrace; soils mostly loamy with abundant rock outcrops; dense shrubs	Southern mixed chaparral
12	2	50	1 - 50	Flat open area on hill terrace; soils mostly loamy with nearby abundant rock outcrops; mixed densities of shrubs, large open area dominated by non-native grasses, and a few oak trees	Southern mixed chaparral, non-native grassland, and coast live oak woodland

**Table 7: Boulder Oaks Trapline Capture Summary**

Species	Trapline Number												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
California Pocket Mouse (Chaetodipus californicus)			1 ♀ 1 esc	2 ♂			1 ♂		2 ♂ 1 ♀			1 ♂	6 ♂ 2 ♀ 2 esc
Dulzura Kangaroo Rat (Dipodomys simulans)	4 ♂ 1 ♀ 1 esc	7 ♂ 8 ♀	6 ♂ 9 ♀	2 ♀	4 ♀	1 ♂	1 ♀	1 ♂ 1 ♀		3 ♀	2 ♂ 2 ♀	2 ♂ 1 ♀	23 ♂ 32 ♀ 1 esc
California Mouse (Peromyscus californicus)				2 ♂		2 ♂		1 ♀			1 ♂		5 ♂ 1 ♀
Deer Mouse (Peromyscus maniculatus)		2 ♂ 4 ♀			2 ♂ 2 ♀						1 ♀		4 ♂ 7 ♀
Dusky-footed Woodrat (Neotoma fuscipes)							1 ♀						1 ♀
Desert Woodrat (Neotoma lepida)	1 ♂	1 ♂ 3 ♀	2 ♂ 4 ♀					1 ♀				1 ♀	4 ♂ 9 ♀ 1 esc
<b>Total</b>	<b>7</b>	<b>25</b>	<b>23</b>	<b>7</b>	<b>8</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>6</b>	<b>6</b>	<b>98</b>

♂ = male, ♀ = female, and esc = escaped prior to determining sex



## 4.6.2. Acoustic Survey for Bats

Anabat recordings totaled 516 recorded detections at Boulder Oaks pond over the 26-day survey period. Analysis of the sonograms showed that the majority of the bat activity (Total 84.9%; Table 8) was that of two species—the Brazilian Free-tailed Bat (*Tadarida brasiliensis*) and the Western Pipistrelle (*Pipistrellus hesperus*). Considerably fewer recordings were made of the echolocation calls of Western Small-footed Myotis (*Myotis ciliolabrum*), Yuma Myotis (*Myotis yumanensis*), Pallid Bat (*Antrozous pallidus*), Hoary Bat (*Lasiurus cinereus*), Big Brown Bat (*Eptesicus fuscus*), Long-eared Myotis (*Myotis evotis*), Western Red Bat (*Lasiurus blossevillii*) and Pocketed Free-tailed Bat (*Nyctinomops femorosaccus*). These represent 10 of approximately 23 species of bats known to occur in San Diego County.

The large pond provides a reliable water source that undoubtedly draws bats from considerable distances and a broad diversity of habitats. The many scattered boulders in the area and the trees of the riparian corridor leading up from the pond also are likely to provide suitable roost sites for many bats.

**Table 8. Anabat Detections Made on Boulder Oaks Pond June 28 – July 22, 2007**

Species	Number of Detections	Percentage
Brazilian Free-tailed Bat	223	43.2%
Western Pipistrelle	215	41.7%
Western Small-footed Myotis	32	6.2%
Yuma Myotis	20	3.9%
Pallid Bat	8	1.6%
Hoary Bat	7	1.4%
Big Brown Bat	4	0.8%
Long-eared Myotis	4	0.8%
Western Red Bat	2	0.4%
Pocketed Free-tailed Bat	1	0.2%

## 4.6.3. Camera Tracking Stations

The camera stations provided detections of eight species of mammals, as detailed below. See Figure 6 for camera station locations. Qualitatively, these results are very good, and indicate substantial use of the Preserve by a variety of medium to large mammals.

Camera Station 1 - Bobcat detected 9/20/07, Mule Deer detected 10/8/07, Common Gray Fox detected 9/19/07.

Camera Station 2 - Bobcat detected 10/2/07, Mule Deer detected 9/23/07, 9/25/07, 9/30/07, 10/2/07, & 10/5/07, Coyote detected 10/4/07, Domestic Horse detected 9/25/07, 10/6/07 & 10/8/07.

Camera Station 3 - Bobcat detected 9/14/07, 9/15/07, 9/16/07, 9/18/07, 9/19/07, & 9/25/07, Mule Deer detected 9/19/07, Striped Skunk detected 9/17/07, Common Raccoon detected 10/13/07, Desert Cottontail detected 9/14/07, 9/18/07, & 9/23/07.

Camera Station 4 - Mule Deer detected 9/16/07 & 9/19/07, Coyote detected 9/17/07.

Camera Station 5 - Bobcat detected 9/20/07, 9/21/07, 9/30/07, 10/12/07 & 10/13/07, Mule Deer detected 9/20/07, 9/24/07, 9/25/07, 9/28/07, 10/4/07, 10/5/07 & 10/6/07, Common Gray Fox detected 9/19/07, 9/22/07, 9/23/07, 9/28/07, 10/2/07, 10/5/07, & 10/11/07, Coyote detected 9/19/07, 9/21/07, 9/25/07, 9/27/07, 9/30/07, & 10/7/07.

#### **4.6.4. Mammal Track and Sign Survey**

A total of 11 species of medium to large mammal species was detected on the Preserve through tracks and sign, and a twelfth species was probable. The species and relevant notes are provided in Table 9, below. Based on these results, the Preserve appears to have a large and diverse population of larger mammals. As is typical for these species in open areas, 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 (rabbits, skunks) was within natural communities with cover, especially chaparral and oak woodlands.

No clear evidence of regular or important, larger-scale dispersal across the site was found, though such movement may well occur. Coyote sign composed largely of fish remains was found on several occasions on roads on the Preserve, and these are expected to be the result of local animals utilizing San Vicente Reservoir, south of the Preserve, as a food source. Certainly it can be assumed that larger mammals regularly move on, off of, and across the Preserve, to and from adjacent open space.

At the Preserve, Mule Deer (*Odocoileus hemionus*) appear to primarily use woodlands rather than grasslands, marsh, or chaparral for day beds and fawning, however sampling was limited to the period from March through September in a dry year and with chaparral relatively open after the Cedar Fire of October 2003. Thus, these conclusions may not hold for the Preserve year round or under other conditions.



**Table 9. Definite and Probable Detections on the Preserve from Tracks and Sign**

<b>Species</b>	<b>Special Regulatory Status</b>	<b>Vegetation Communities</b>	<b>Other Notes</b>
Desert Cottontail <i>Sylvilagus audubonii</i>	None	all communities	widespread but only fairly common, perhaps due to drought
Brush Rabbit <i>Sylvilagus bachmani</i>	None	Southern Mixed Chaparral	One mortality (cause not determined); sign in chaparral uncommon
Domestic Dog <i>Canis familiaris</i>	None (nonnative)	Disturbed Areas	detected on main roads on two occasions
Coyote <i>Canis latrans</i>	None	all communities	Common and widespread; one old mortality detected
Common Gray Fox <i>Urocyon cinereoargenteus</i>	None	Disturbed Areas; Southern Mixed Chaparral	Fairly common, mostly detected through sign on roads and paths
Common Raccoon <i>Procyon lotor</i>	None	Freshwater Marsh	Detected at and near the two lower ponds
Western Spotted Skunk <i>Spilogale gracilis</i>	None	Southern Mixed Chaparral, Disturbed Areas	Detected through small amounts of sign and tracks along roads and in chaparral
Striped Skunk <i>Mephitis mephitis</i>	None	oak woodland; Disturbed Areas	Detected along roads and sparingly in oak woodlands
Bobcat <i>Lynx rufus</i>	None	all communities	Sign common along roads, found sparingly but widely elsewhere
Domestic Horse <i>Equus caballus</i>	None (nonnative)	Disturbed Areas	Sign uncommon along main roads
Mule Deer <i>Odocoileus hemionus</i>	County List 2; MSCP	all communities	Ubiquitous; two old mortalities noted
Mountain Lion <i>Puma concolor</i>	None	Southern Mixed Chaparral	Probable only; one detection of scat (see Appendix D, Photo 43)

## 4.6.5. Special-status Mammals

See Section 4.6.1 for discussion of trapping results for California Pocket Mouse, Dulzura Kangaroo Rat, and Desert Woodrat. The Preserve lies within the range of the Dulzura subspecies of California Pocket Mouse (*Chaetodipus californicus femoralis*) and San Diego subspecies of Desert Woodrat (*Neotoma lepida interedia*); both subspecies are state Species of Special Concern. The Dulzura Kangaroo Rat is a state Species of Special Concern at the full species level.

The County of San Diego considers six of the bat species detected on the Preserve to be sensitive. These species consist of: Western Small-footed Myotis, Yuma Myotis, Pallid Bat, Long-eared Myotis, Western Red Bat, and Pocketed Free-tailed Bat. Among these, Pallid, Hoary, Western Red, and Pocketed Free-tailed bats are also state Species of Special Concern.

Stephens' kangaroo rat (SKR) is not expected both because the site is outside of this species' known range and because conditions do not appear to fit the species' habitat requirements. The woodlands and dense shrub and nonnative grassland communities that, together, cover nearly the entire site likely preclude the species. SKR is found almost exclusively in open grasslands or sparse shrublands with plant cover of less than 50%. SKR avoids dense grasses (for example, nonnative bromes [*Bromus* spp.]) and is more likely to inhabit areas where annual forbs disarticulate in summer and leave open areas.

Southern Grasshopper Mouse (*Onychomys torridus*) was expected but none was captured. Within coastal southern California, this species is found in low, arid scrub and semi-scrub vegetation. It is also found in grasslands and sparse coastal sage scrub habitats. It often occurs at low densities and, in addition, the recent fire and subsequent drought may have reduced the number present or locally extirpated it. It could either be absent or may simply have been missed.

The Northwestern San Diego Pocket Mouse (*Chaetodipus fallax fallax*) was expected, but none were captured. This species inhabits coastal sage scrub, sage scrub/grassland ecotones, and chaparral communities. It inhabits open, sandy areas of both the Upper and Lower Sonoran life zones of southwestern California and northern Baja California, Mexico. Like the Southern Grasshopper Mouse, numbers may have been reduced by fire and subsequent drought, or the species may simply have been missed.

Southern Mule Deer, noted above to be widespread on the Preserve, is on County List 2 and is an MSCP-covered species.



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## 5.0 Conclusions and Management Recommendations

The current surveys documented nine land cover types and 424 species that were detected throughout the Preserve. Our surveys detected 228 plant species, 104 bird species, 30 mammal species (10 bats, nine small mammals, and 11 medium and large bodied mammals), 17 herpetiles (three amphibians and 14 reptiles), and 45 invertebrate species. This list includes nine MSCP-covered species (five wildlife and four plants). There are undoubtedly additional species that use the Preserve that were not detected due to the severe drought conditions experienced during 2006-2007. These surveys provide a valuable baseline of the biological resources that occur within the Preserve that will help guide long-term management decisions. Specific management recommendations are provided for the various taxonomic groups assessed during this survey effort.

### 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 area. 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 mapping/monitoring should also address habitat value for target (i.e., MSCP-covered) species. MSCP-covered plant species detected during the 2007 surveys consist of: Felt-leaved Monardella, Orcutt's Brodiaea, San Miguel Savory, and Lakeside Ceanothus. The locations of these and other special-status plant species documented on the Preserve are shown on Figure 7. The Orcutt's Brodiaea population occurs in the northeastern portion of the Preserve within the grasslands and along the margins of the oak woodlands. Lakeside Ceanothus is a common component of the chaparral in the southwestern portion of the Preserve, while the Felt-leaved Monardella and San Miguel Savory were detected within the chaparral in the northwestern portion of the Preserve. One additional MSCP-covered species (San Diego Thorn-mint) has high potential to occur due to the occurrence of suitable soils in the northeastern portion of the Preserve. Facilities and trails should be sited in a manner to avoid concentrations of special-status plant species when feasible.

Periodic botanical surveys are recommended to monitor the special-status species detected on the Preserve. Such surveys would ideally occur during years of average or above-average rainfall in order to maximize detection. Because the current surveys were conducted in a dry year during a several year period of



drought, additional botanical surveys are recommended in order to more completely characterize botanical diversity within the Preserve.

Vegetation monitoring for habitat value should be focused to identify 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 nonnatives or slow decline of existing species.

Several unique habitats or features occur within the Preserve that should be protected to the maximum extent. These include the potential vernal pools in the grasslands, the seasonal rock pools that occur along several of the ridgelines on the Preserve, and the drainage areas.

It is recommended that disturbed land be restored through stabilization of eroded lands, strategic revegetation, and exotic plant species control. This could include closure and revegetation (either passive or active) of unneeded roads or trail segments and/or enhancement of potential vernal pool habitats through control of nonnative grasses within existing nonnative grassland areas. 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 rare plant species that occur within the Preserve (e.g., Lakeside Ceanothus) rely on periodic burns to maintain healthy populations. Although not natural, the manmade ponds on site provide valuable resources for a wide range of wildlife including rare bat species and waterbirds. Therefore, any modifications or management of the ponded areas on site should be considered with wildlife usage in mind.

Twenty-one California Invasive Plant Council (CAL-IPC) listed plants were identified during the field surveys. Monitoring and adaptive management policies/practices are recommended to maintain the biological value of the open space within the Preserve (see Appendix E for a list of CAL-IPC plants documented within the Preserve). Beyond general restoration of grasslands and control of invasives at roadsides, those species considered highest priority for control on the Preserve at this time are listed in Table 10 below. While other invasive species are present, these are judged to have the most potential to seriously degrade the biological value of the Preserve if not prevented from doing so.

**Table 10. Nonnative Plants with Highest Priority for Control on the Preserve**

Species	Cal-IPC Status	Comments
Harding Grass ( <i>Phalaris aquatica</i> )	Moderate	Common perennial in grasslands on Preserve
Pampas Grass ( <i>Cortaderia selloana</i> )	High	Single individuals at upper pond and along roadway
Bermuda Grass ( <i>Cynodon dactylon</i> )	Moderate	Currently, primarily at house pad, scattered elsewhere at roadsides, grasslands
Mexican Fan Palm ( <i>Washingtonia robusta</i> )	Moderate	Currently limited to house pad
Italian Thistle ( <i>Carduus pycnocephalus</i> )	Moderate	Currently rare to uncommon at scattered locations
African Fountain Grass ( <i>Pennisetum setaceum</i> )	Moderate	Currently limited to house pad
Yellow Star-thistle ( <i>Centaurea solstitialis</i> )	High	Currently rare along roadways
Salt Cedar ( <i>Tamarix ramosissima</i> )	High	Currently limited presence at ponds (an additional individual is present along the current access road a few yards east of the Preserve)

Plans for recreational use of the Preserve should address the potential effects of such use on flora. For example, hiking on trails will generally have little effect, while off-trail use by pets and horses would likely have severe, adverse effects over time even at moderate levels. Any trail or road construction should be performed to minimize introduction of weeds, and designed to minimize disturbance to ecotones.

Finally, as noted below in the discussion regarding birds, monitoring for the health of the oak woodlands should be a high priority. There was some indication that recruitment of oaks may be poor, though this impression may simply reflect the current drought and the effects of the Cedar Fire of 2003.

## 5.2. Butterflies and Other Invertebrates

Although no Quino Checkerspot or other special-status butterflies were observed on the Preserve, there is potential for their occurrence. In addition, other butterflies and invertebrates were observed. Quino as well as many other common butterflies are known to exhibit “hilltopping” behavior. This behavior was observed on the Preserve at various rock outcrops on hilltops 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 hilltops.

Centipedes, scorpions, ants, wasps, Honey Bees, and other venomous invertebrates are common within the Preserve. Ticks are also likely to occur.



Signs should be posted to alert park 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. This includes Coast Horned Lizard (an MSCP-covered species), which is commonly found on roads and trails and may burrow within loose sand along the roads. Signs should be posted to inform park users to stay on roads and trails and to avoid wildlife when encounters occur in order to reduce negative effects on Coast-Horned Lizard and other special-status herpetiles. It should also be clear to park users that animal collecting is prohibited.

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 damage 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 2007 fieldwork were observed on or near roads and trails. Signs should be posted to alert park 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 robust integrity. A total of 108 bird species was documented on the Preserve; these include three MSCP-covered species: Cooper's Hawk, Western Bluebird, and Rufous-crowned Sparrow. Although the most extensive vegetation community on the Preserve is chaparral, it is likely that, and the scale of the entire county, the most important features at the Preserve for birds are the ponds, the oak woodlands (including existing cavities for nesting), and, to a lesser degree, the drainages present.

These features are most 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 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.

At longer time scales, it will be important to ensure the continued viability of the oak woodlands 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 (e.g., breeding success of cavity-nesting birds or use of the ponds by waterbirds). 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. Mammals

The diversity and species richness of mammals on the Preserve is quite high. A total of 30 species of mammals was documented on the Preserve, which includes one MSCP-covered species: Southern Mule Deer. This reflects extensive, intact natural communities that retain excellent connections to larger, surrounding areas. Access to water certainly enhances the value of the Preserve as habitat for many of the larger mammals. Relatively low levels of human (and pet) disturbance and invasive plants (outside the grasslands and road edges) also encourage use by relatively reclusive species. All of these features should be maintained through controls for appropriate use of the site.

Because mammals are quite sensitive to the presence of humans and human-associated animals, use of the Preserve should be controlled to minimize such impacts. Certainly, preventing off-trail use by both humans and their pets and horses, should be a high priority. If pets and horses are allowed on the Preserve, the impacts of such use must be carefully evaluated, monitored, and mitigated.

If nighttime use is allowed, such use should be within restricted areas. Access to the ponds and drainages during nighttime hours should be avoided as such activity is likely to conflict with Preserve use by bat species, including several with special regulatory status.



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## 6.1. Personal Communications

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Appendix A

## **Boulder Oaks Preserve Faunal List**





# Appendix A

## Faunal List

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### Kingdom Animalia—Animals

#### *Phylum Mollusca—Mollusks*

##### *Class Gastropoda—Gastropods*

##### Order Stylommatophora—Snails

##### **Helminthoglyptidae—Helminthoglyptid Snail Family**

*Helminthoglypta* sp.                      shoulderband

#### *Phylum Arthropoda—Arthropods*

##### *Class Arachnida—Arachnids*

##### Order Scorpionida—Scorpions

##### **Vejovidae—Vejovid Scorpion Family**

*Paruroctonus silvestrii*                      Stripe-tailed Scorpion

##### *Class Malacostraca—Crustaceans*

##### Order Isopoda—Isopods

##### **Armadillidiidae—Pillbug Family**

\* *Armadillidium vulgare*                      Common Pillbug

##### **Porcellionidae—Sowbug Family**

\* *Porcellio laevis*                      Dooryard Sowbug

##### Order Decapoda—Shrimps and Allies

##### **Cambaridae—Crayfish Family**

\* *r* *Procambarus clarkii*                      Red Swamp Crayfish

##### *Class Chilopoda—Centipedes*

##### Order Scolopendromorpha—Tropical Centipedes

##### **Scolopendridae—Giant Centipede Family**

*Scolopendra polymorpha*                      Multicolored Centipede

##### *Class Insecta—Insects*

##### Order Odonata—Dragonflies and Damselflies

##### **Coenagrionidae—Pond Damsel Family**

*Enallagma civile*                      Familiar Bluet

##### **Aeshnidae—Darner Family**

*Anax junius* Common Green Darner

**Libellulidae—Skimmer and Emerald Family**

*Libellula saturata* Flame Skimmer

*Pachydiplax longipennis* Blue Dasher

*Sympetrum corruptum* Variegated Meadowhawk

*Tramea lacerata* Black Saddlebags

*Tramea onusta* Red Saddlebags

Order Orthoptera—Grasshoppers, Crickets, and Allies

**Acrididae—True Grasshopper and Locust Family**

*Trimerotropis pallidipennis* Pallid-winged Grasshopper

**Tettigoniidae—Katydid Family**

*Scudderella mexicana* [Scudderella furculata] Mexican Bush Katydid (Fork-tailed Bush Katydid)

**Gryllidae—True Cricket Family**

*Gryllus pennsylvanicus* Fall Field Cricket

**Stenopelmatidae—Jerusalem Cricket Family**

*Stenopelmatus* sp. Jerusalem cricket

Order Isoptera—Termites

**Rhinotermitidae—True Termites**

*Reticulitermes hesperus* Western Subterranean Termite

**Kalotermitidae—Drywood Termites**

*Incisitermes minor* Western Drywood Termite

Order Hemiptera—True Bugs

**Lygaeidae—Seed Bugs**

*Oncopeltus fasciatus* Large Milkweed Bug

**Reduviidae—Assassin Bugs**

*Rasahus thoracicus* Western Corsair

Order Neuroptera—Lacewings, Antlions, and Allies

**Myrmeleontidae—Ant Lion Family**

*Brachynemurus* / *Myrmeleon* sp. ant lion

Order Coleoptera—Beetles and Weevils

**Carabidae—Ground Beetle and Tiger Beetle Family**

*Calosoma* sp. calosoma

**Zopheridae - Zopherid Beetle Family**

*Phloeodes pustulosus* Common Ironclad Beetle

**Tenebrionidae - Darkling Beetle Family**

*Eleodes osculans* Woolly Darkling Beetle

*Eleodes* sp. darkling beetle

Order Hymenoptera—Bees, Ants, and Allies

**Apidae—True Bee Family**

\* *Apis mellifera* Honey Bee



**Mutillidae—Velvet-Ant Family**

<i>Dasymutilla</i> sp.	red velvet-ant
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**Pompilidae—Spider Wasp Family**

<i>Pepsis</i> / <i>Hemipepsis</i> spp.	tarantula hawk wasp
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## Order Lepidoptera—Moths, Skippers, and Butterflies

**Papilionidae—Swallowtail Family**

<i>Papilio zelicaon</i>	Anise Swallowtail
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<i>Papilio eurymedon</i>	Pale Swallowtail
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**Pieridae—White and Sulphur Family**

<i>Pontia protodice</i>	Checkered White (Common White)
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* <i>Pieris rapae</i>	Cabbage White (Cabbage Butterfly)
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<i>Anthocharis sara</i>	Pacific Orangetip (Sara Orangetip)
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<i>Colias eurytheme</i>	Orange Sulphur (Alfalfa Butterfly)
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**Lycaenidae - Gossamer-wing Butterfly Family**

<i>Callophrys affinis</i>	Western Green Hairstreak
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<i>Callophrys agastinus</i>	Brown Elfin
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(!) <i>Glaucopsyche lygdamus</i>	Silvery Blue
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<i>Icaricia acmon</i>	Acmon Blue
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**Riodinidae - Metalmark Family**

<i>Apodemia virgulti</i>	Behr's Metalmark
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**Nymphalidae - Brush-footed Butterfly Family**

<i>Vanessa cardui</i>	Painted Lady (American Lady)
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<i>Vanessa annabella</i>	West Coast Lady
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<i>Danaus plexippus</i>	Monarch
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**Hesperiidae - Skipper Family**

<i>Erynnis funeralis</i>	Funereal Duskywing
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## Order Diptera—Flies and Keds

**Muscidae—House Fly and Stable Fly Family**

* <i>Musca domestica</i>	House Fly
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\* = nonnative species

		Breeding (Birds)	County	MSCP	State	Federal	Nonnative	Trapped
<b><i>Phylum Cordata, Subphylum Vertebrata—Vertebrates</i></b>								
<i>Class Amphibians</i>								
Order Frogs and Toads								
	<i>Bufo boreas</i>	Western Toad						X
	<i>Pseudacris regilla</i>	Pacific Chorus Frog						
	<i>Spea hammondi</i>	Western Spadefoot	2		SC			
	<i>Rana catesbeiana</i>	Bullfrog					N	X
<i>Class Reptiles</i>								
Order Lizards								
	<i>Elgaria multicarinata</i>	Southern Alligator Lizard						X
	<i>Phrynosoma coronatum</i>	Coast Horned Lizard	2	X	SC			
	<i>Western Fence Lizard</i>	Western Fence Lizard						X
	<i>Sceloporus orcutti</i>	Granite Spiny Lizard						
	<i>Uta stansburiana</i>	Side-blotched Lizard						X
	<i>Eumeces gilberti</i>	Gilbert's Skink						X
	<i>Eumeces skiltonianus</i>	Western Skink	2		SC			X
	<i>Cnemidophorus tigris</i>	Western Whiptail	2					X
	<i>Xantusia henshawi</i>	Granite Night Lizard						
Order Snakes								
	<i>Charina trivirgata</i>	Rosy Boa	2					X
	<i>Pituophis catenifer</i>	Gopher Snake						
	<i>Salvadora hexalepis vigultea</i>	Coastal Patch-nosed Snake	2		SC			X
	<i>Crotalus ruber</i>	Red Diamond Rattlesnake	2		SC			
	<i>Crotalus oreganus</i>	Western Rattlesnake						



		Breeding (Birds)	County	MSCP	State	Federal	Nonnative	Trapped
<i>Class Aves—Birds</i>								
Order Anseriformes—Ducks and Geese								
<i>Anas strepera</i>	Gadwall		2					
<i>Anas americana</i>	American Wigeon							
<i>Anas platyrhynchos</i>	Mallard	pr						
<i>Anas crecca</i>	Green-winged Teal							
<i>Aythya collaris</i>	Ring-necked Duck							
<i>Aythya affinis</i>	Lesser Scaup							
<i>Lophodytes cucullatus</i>	Hooded Merganser							
<i>Oxyura jamaicensis</i>	Ruddy Duck							
Order Galliformes—Grouse and Quails								
<i>Callipepla californica</i>	California Quail	CO						
<i>Podilymbus podiceps</i>	Pied-billed Grebe	CO						
<i>Nycticorax nycticorax</i>	Black-crowned Night-Heron							
<i>Cathartes aura</i>	Turkey Vulture	?	1					
Order Falconiformes—Birds of Prey								
<i>Pandion haliaetus</i>	Osprey		1		SC			
<i>Elanus leucurus</i>	White-tailed Kite	CO	1		FP			
<i>Accipiter cooperii</i>	Cooper's Hawk	pr	1	X	SC			
<i>Buteo lineatus</i>	Red-shouldered Hawk	pr	1					
<i>Buteo jamaicensis</i>	Red-tailed Hawk	?						
<i>Falco sparverius</i>	American Kestrel	?						

		Breeding (Birds)	County	MSCP	State	Federal	Nonnative	Trapped
Order Gruiformes - Rails and Cranes								
	<i>Porzana carolina</i>	Sora						
	<i>Gallinula chloropus</i>	Common Moorhen						
	<i>Fulica americana</i>	American Coot	CO					
Order Charadriiformes - Shorebirds and Gulls								
	<i>Charadrius vociferus</i>	Killdeer						
	<i>Tringa melanoleuca</i>	Greater Yellowlegs						
	<i>Gallinago delicata</i>	Wilson's Snipe						
Order Columbiformes - Pigeons and Doves								
	<i>Columba livia</i>	Rock Pigeon (Rock Dove)					N	
	<i>Zenaida macroura</i>	Mourning Dove	CO					
Order Cuculiformes - Cuckoos								
	<i>Geococcyx californianus</i>	Greater Roadrunner	?					
Order Strigiformes - Owls								
	<i>Tyto alba</i>	Barn Owl	?	2				
	<i>Bubo virginianus</i>	Great Horned Owl	?					
Order Caprimulgiformes - Nightjars								
	<i>Phalaenoptilus nuttallii</i>	Common Poorwill	?					
Order Apodiformes - Swifts and Hummingbirds								



		Breeding (Birds)	County	MSCP	State	Federal	Nonnative	Trapped
<i>Chaetura vauxi</i>	Vaux's Swift							
<i>Aeronautes saxatalis</i>	White-throated Swift							
<i>Archilochus alexandri</i>	Black-chinned Hummingbird	CO						
<i>Calypte anna</i>	Anna's Hummingbird	CO						
<i>Calypte costae</i>	Costa's Hummingbird	?						
Order Piciformes - Woodpeckers								
<i>Melanerpes formicivorus</i>	Acorn Woodpecker	CO						
<i>Sphyrapicus ruber</i>	Red-breasted Sapsucker							
<i>Picoides nuttallii</i>	Nuttall's Woodpecker	pr						
<i>Colaptes auratus</i>	Northern Flicker	?						
Order Passeriformes - Perching Birds								
<i>Contopus sordidulus</i>	Western Wood-Pewee	?						
<i>Empidonax difficilis</i>	Pacific-slope Flycatcher	?						
<i>Sayornis nigricans</i>	Black Phoebe	pr						
<i>Sayornis saya</i>	Say's Phoebe							
<i>Myiarchus cinerascens</i>	Ash-throated Flycatcher	pr						
<i>Tyrannus vociferans</i>	Cassin's Kingbird	CO						
<i>Tyrannus verticalis</i>	Western Kingbird							
<i>Lanius ludovicianus</i>	Loggerhead Shrike		1		SC			
<i>Aphelocoma californica</i>	Western Scrub-Jay	?						
<i>Corvus brachyrhynchos</i>	American Crow	CO						
<i>Corvus corax</i>	Common Raven	?						
<i>Tachycineta bicolor</i>	Tree Swallow							
<i>Tachycineta thalassina</i>	Violet-green Swallow	pr						
<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	?						

		Breeding (Birds)	County	MSCP	State	Federal	Nonnative	Trapped
<i>Riparia riparia</i>	Bank Swallow		1		ST			
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	?						
<i>Hirundo rustica</i>	Barn Swallow	?						
<i>Baeolophus inornatus</i>	Oak Titmouse	CO						
<i>Psaltiriparus minimus</i>	Bushtit	CO						
<i>Sitta carolinensis</i>	White-breasted Nuthatch	?						
<i>Thryomanes bewickii</i>	Bewick's Wren	?						
<i>Troglodytes aedon</i>	House Wren	CO						
<i>Cistothorus palustris</i>	Marsh Wren							
<i>Regulus calendula</i>	Ruby-crowned Kinglet							
<i>Polioptila caerulea</i>	Blue-gray Gnatcatcher	pr						
<i>Sialia mexicana</i>	Western Bluebird	pr	2	X				
<i>Catharus ustulatus</i>	Swainson's Thrush							
<i>Catharus guttatus</i>	Hermit Thrush							
<i>Chamaea fasciata</i>	Wrentit	?						
<i>Mimus polyglottos</i>	Northern Mockingbird	pr						
<i>Toxostoma redivivum</i>	California Thrasher	pr						
<i>Sturnus vulgaris</i>	European Starling	CO					N	
<i>Phainopepla nitens</i>	Phainopepla	CO						
<i>Vermivora celata</i>	Orange-crowned Warbler	?						
<i>Dendroica petechia</i>	Yellow Warbler	?	2		SC			
<i>Dendroica coronata</i>	Yellow-rumped Warbler							
<i>Dendroica townsendi</i>	Townsend's Warbler							
<i>Geothlypis trichas</i>	Common Yellowthroat	pr						
<i>Wilsonia pusilla</i>	Wilson's Warbler							
<i>Icteria virens</i>	Yellow-breasted Chat		1		SC			
<i>Piranga ludoviciana</i>	Western Tanager							



		Breeding (Birds)	County	MSCP	State	Federal	Nonnative	Trapped
<i>Pipilo maculatus</i>	Spotted Towhee	pr						
<i>Pipilo crissalis</i>	California Towhee	CO						
<i>Aimophila ruficeps</i>	Rufous-crowned Sparrow	CO	1	X	SC			
<i>Spizella passerina</i>	Chipping Sparrow							
<i>Spizella atrogularis</i>	Black-chinned Sparrow	?						
<i>Chondestes grammacus</i>	Lark Sparrow	pr						
<i>Amphispiza belli</i>	Sage Sparrow	pr	1		SC			
<i>Passerella iliaca</i>	Fox Sparrow							
<i>Melospiza melodia</i>	Song Sparrow	CO						
<i>Zonotrichia leucophrys</i>	White-crowned Sparrow							
<i>Zonotrichia atricapilla</i>	Golden-crowned Sparrow							
<i>Junco hyemalis</i>	Dark-eyed Junco							
<i>Pheucticus melanocephalus</i>	Black-headed Grosbeak	pr						
<i>Passerina caerulea</i>	Blue Grosbeak	?						
<i>Passerina amoena</i>	Lazuli Bunting	?						
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	CO						
<i>Sturnella neglecta</i>	Western Meadowlark	?						
<i>Molothrus ater</i>	Brown-headed Cowbird	CO						
<i>Icterus cucullatus</i>	Hooded Oriole	CO						
<i>Icterus bullockii</i>	Bullock's Oriole	CO						
<i>Icterus parisorum</i>	Scott's Oriole	CO						
<i>Carpodacus mexicanus</i>	House Finch	CO						
<i>Carduelis psaltria</i>	Lesser Goldfinch	CO						
<i>Carduelis lawrencei</i>	Lawrence's Goldfinch	pr						

*Class Mammalia - Mammals*

Order Chiroptera - Bats

		Breeding (Birds)	County	MSCP	State	Federal	Nonnative	Trapped
<i>Myotis ciliolabrum</i>	Western Small-footed Myotis	2						
<i>Myotis evotis</i>	Long-eared Myotis	2						
<i>Myotis yumanensis</i>	Yuma Myotis	2						
<i>Pipistrellus hesperus</i>	Western Pipistrelle							
<i>Eptesicus fuscus</i>	Big Brown Bat							
<i>Lasiurus blossevillii</i>	Western Red Bat	2						
<i>Lasiurus cinereus</i>	Hoary Bat							
<i>Antrozous pallidus</i>	Pallid Bat	2			SC			
<i>Tadarida brasiliensis</i>	Brazilian Free-tailed Bat							
<i>Nyctinomops femorosaccus</i>	Pocketed Free-tailed Bat	2			SC			
Order Lagomorpha – Rabbits								
<i>Sylvilagus audubonii</i>	Desert Cottontail (Audubon's C.)							
<i>Sylvilagus bachmani</i>	Brush Rabbit							
Order Rodentia – Rodents								
<i>Spermophilus beecheyi</i>	California Ground Squirrel							
<i>Thomomys bottae</i>	Botta's Pocket Gopher							
<i>Chaetodipus californicus</i>	California Pocket Mouse	2			SC			X
<i>Dipodomys simulans</i>	Dulzura Kangaroo Rat							X
<i>Peromyscus californicus</i>	California Mouse							X
<i>Peromyscus maniculatus</i>	Deer Mouse							X
<i>Neotoma macrotis</i>	Big-eared Woodrat							X
<i>Neotoma lepida</i>	Desert Woodrat	2			SC			X
<i>Microtus californicus</i>	California Vole							X



		Breeding (Birds)	County	MSCP	State	Federal	Nonnative	Trapped
Order Carnivora - Carnivores								
<i>Canis familiaris</i>	Domestic Dog						N	
<i>Canis latrans</i>	Coyote							
<i>Urocyon cinereoargenteus</i>	Common Gray Fox							
<i>Procyon lotor</i>	Common Raccoon							
<i>Spilogale gracilis</i>	Western Spotted Skunk							
<i>Mephitis mephitis</i>	Striped Skunk							
<i>Lynx rufus</i>	Bobcat							
Perissodactyla - Odd-toed Ungulates								
<i>Equus caballus</i>	Domestic Horse						N	
Arteriodactyla - Even-toed Ungulates								
<i>Odocoileus hemionus</i>	Mule Deer		2	X				

Breeding (Birds): CO = confirmed breeding; pr = evidence found for probable breeding; ? = evidence found for possible breeding; see text

County: 1 = List 1; 2 = List 2

MSCP: X = Covered Species

State: ST=Threatened, SC=Special Concern; FP=Fully Protected

Federal: (no federally endangered or threatened species were found)

Nonnative: N = not native to California

Trapped: X = caught in pitfall arrays, cover boards, and/or small mammal trapping

Appendix B

**Quino Checkerspot Survey for  
Boulder Oaks, CA 2007**





**Quino Checkerspot Butterfly  
Survey Report for  
Boulder Oaks Preserve  
California**

*Prepared for:*

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*Prepared by:*

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August 2007



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## Attachment 1. Field Notes

## Tables and Figures

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## Summary

Protocol surveys were conducted for the 1,215-acre Boulder Oaks Preserve (Preserve) in southern San Diego County, California. The Preserve was acquired by the County of San Diego (County) for inclusion into the Multiple Species Conservation Program (MSCP) preserve system in 2003. Surrounding land uses include Iron Mountain Preserve to the northwest, the San Vicente Highlands Open Space Preserve to the south, and sparse residential development to the east and northeast.

The Preserve supports open coast live oak woodland, open Engelmann oak woodland, southern mixed chaparral, scrub oak chaparral, nonnative grassland, southern willow scrub, and disturbed land. It also includes several graded dirt roads, a steel lattice electrical transmission line that crosses the southern portion of the Preserve, an old home site, and wells. The entire Preserve burned in the 2003 Cedar Fire.

A total of six weekly surveys were conducted over the course of the 2007 flight season (March 13 - April 18, 2007). Quino checkerspot butterflies were not detected during the six focused surveys. Potential host plants observed on site include dot-seed plantain (*Plantago erecta*), woolly plantain (*Plantago ovata*), and purple owl's-clover (*Castilleja exserta* ssp. *exserta*). A total of fourteen butterfly species, including Behr's metalmark, Sara's orangetip, painted lady, pale swallowtail and perplexing hairstreak, were observed during the surveys.

# Introduction

Jones & Stokes conducted protocol surveys to determine presence/absence of the Quino checkerspot butterfly (*Euphydryas editha quino*) (Quino) for the Boulder Oaks Preserve, located approximately three (3) miles south of the unincorporated township of Ramona, between State Route 67 (SR-67) and Mussey Grade Road, and bisected by Foster Truck Trail, in southern San Diego County (Figures 1 and 2). A total of six weekly surveys were conducted between March 13 and April 18, 2007 largely in accordance with the most recent U.S. Fish and Wildlife Service Protocol (USFWS 2002).

A habitat assessment conducted on the property on March 8, 2007, determined that non-excluded areas, as defined by the U.S. Fish and Wildlife Service (USFWS 2002), occur on the property. Excluded areas, not recommended for Quino surveys, are defined as:

- Orchards, developed areas or in-fill parcels largely dominated by non-native vegetation;
- Active/in-use agricultural fields without natural or remnant inclusions of native vegetation; or
- Closed-canopy forest or riparian area, dense chaparral and small openings completely enclosed within a closed-canopy or dense chaparral area.

The excluded areas on site consist of dense southern mixed chaparral, as well as open water and associated fresh water marsh, for a total of 22.4 acres (Figure 3). This report documents the results of the 2007 focused surveys conducted in non-excluded areas, which comprise approximately 1,192.6 acres.

## Physical Characteristics

The Boulder Oaks Preserve is located south of Ramona, between SR-67 and Mussey Grade Road in southern San Diego County, California. The 1,215-acre Preserve consists of a patchwork of diverse vegetation communities on varying-grade slopes with scattered large granitic boulders. Vegetation communities present within the survey area consist of open coast live oak woodland, open Engelmann oak woodland, southern mixed chaparral, scrub oak chaparral, nonnative grassland, southern willow scrub, and disturbed land. The entire Preserve burned in the 2003 Cedar Fire. The Preserve site also includes several



graded dirt roads, a steel lattice electrical transmission line that crosses the southern portion of the Preserve, an old home site, and wells.

Surrounding land uses include Iron Mountain Preserve to the northwest, the San Vicente Highlands Open Space Preserve to the south, and sparse residential development to the east and northeast. A Salvation Army Camp is located immediately north of the property and San Vicente Reservoir occurs to the south. In 2003, the Preserve area was acquired by the County of San Diego (County) for inclusion into the Multiple Species Conservation Program (MSCP) preserve system.

The Preserve site is between 1,400 and 2,400 feet in elevation. In general, the Preserve is characterized by an east–west trending valley, with steep slopes in the northwestern, southwestern, and southern portions of the Preserve. Six soil types from five soil series, as defined by the U.S. Department of Agriculture, are mapped within the survey area (Bowman 1973). This includes Arlington Course Sandy Loam (2 to 9 percent slopes), Cienega Rocky Course Sandy Loam (9 to 30 percent slopes, eroded), Friant Rocky Fine Sandy Loam (9 to 30 percent slopes), Friant Rocky Fine Sandy Loam (30 to 70 percent slopes), Olivenhain Cobbly Loam (9 to 30 percent slopes) and Vista Rocky Coarse Sandy Loam (5 to 15 percent slopes).

K:\GIS\PROJECTS\BOULDER\_OAKS\00002\_07\MAPDOC\FIG1\_REGLOC.MXD AS (03-29-07)



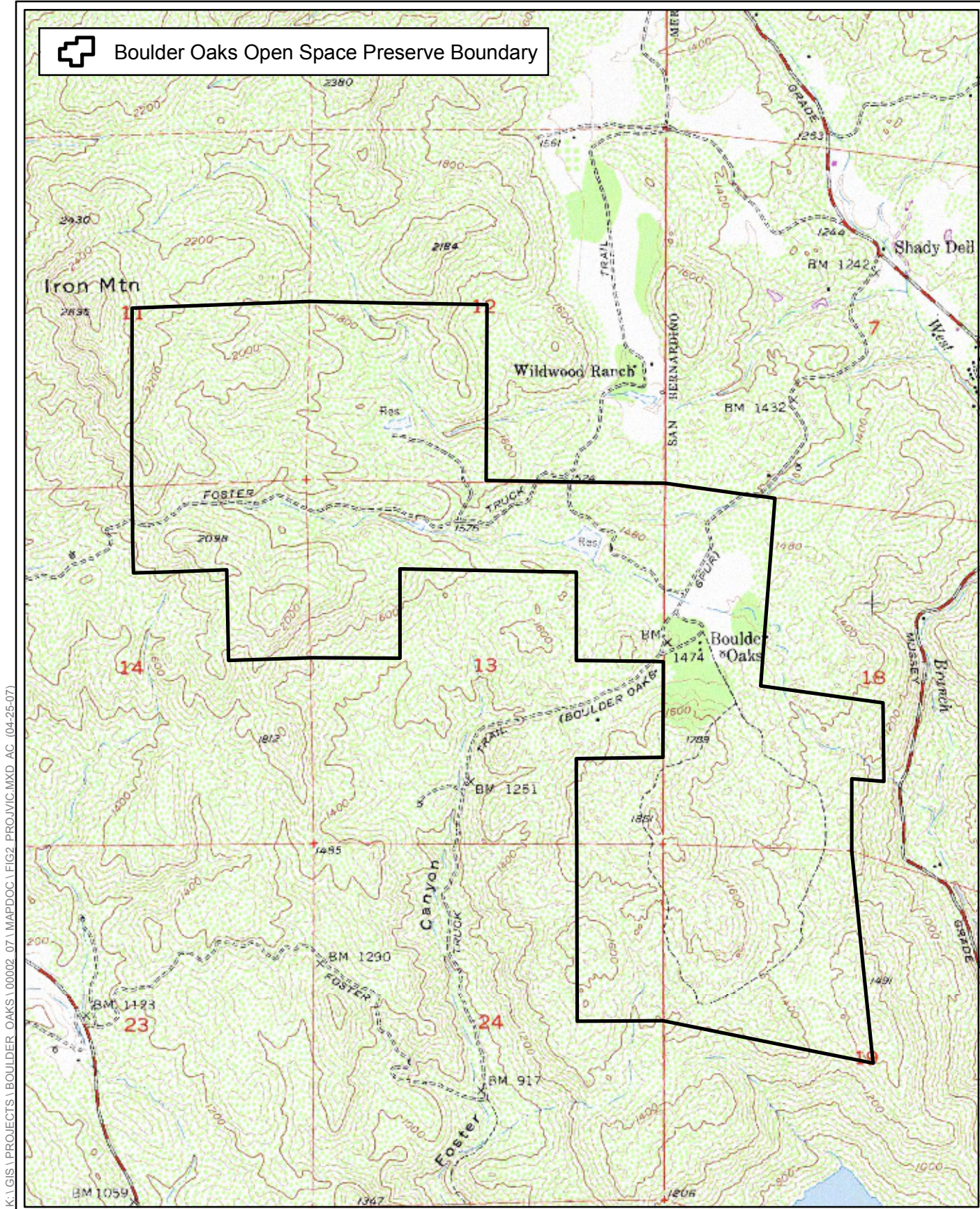
Source: ESRI Streetmap USA (2005)

**Figure 1**  
**Regional Location**  
**Boulder Oaks**





Boulder Oaks Open Space Preserve Boundary



K:\GIS\PROJECTS\BOULDER OAKS\00002\_07\MAPDOC\FIG2 PROJ.VIC.MXD AC (04-25-07)

Source: USGS 7.5' Quad., California: San Vicente Reservoir (1955; Photo Revised 1971)



Jones & Stokes

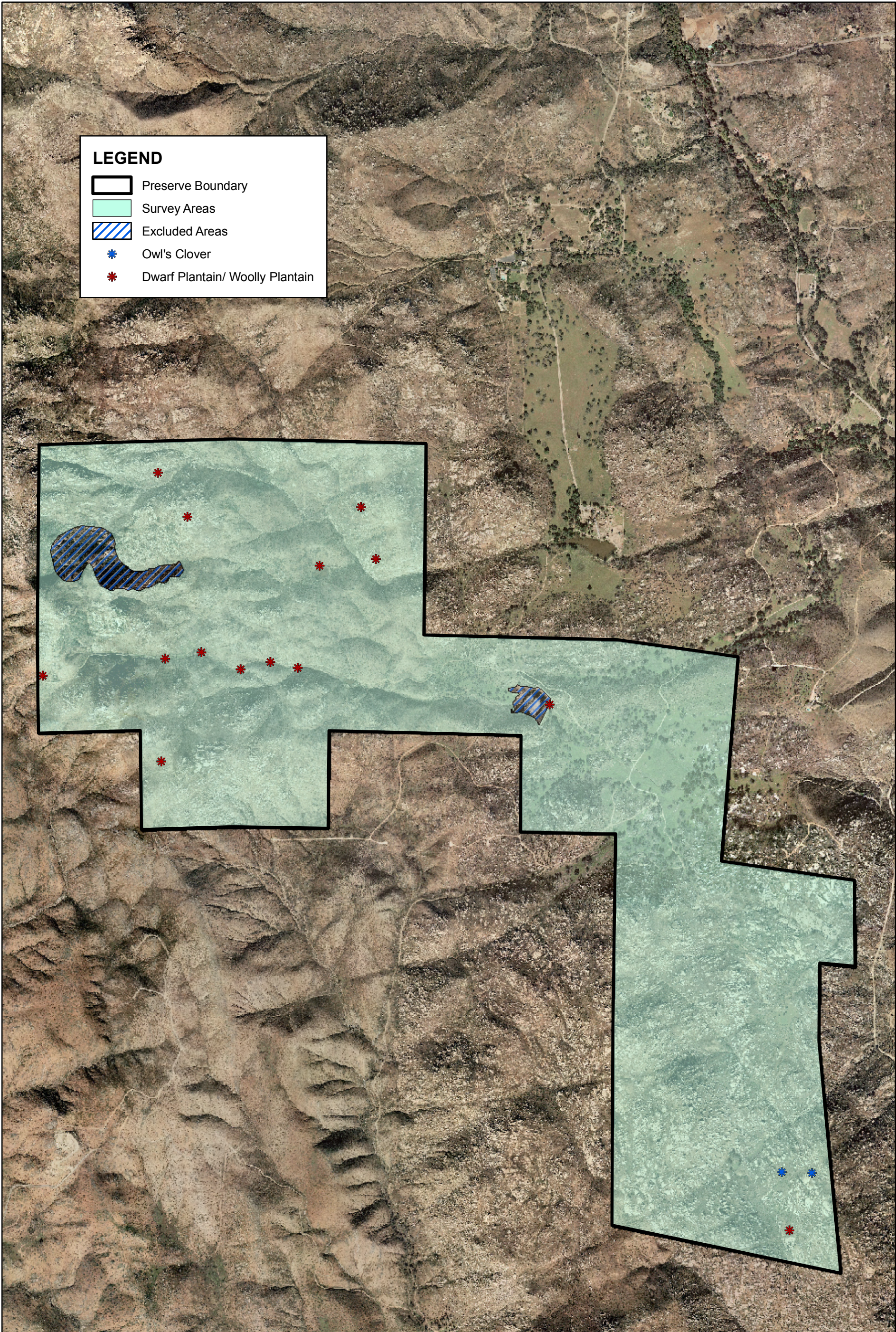
0 1,000 2,000 Feet



**Figure 2**  
**Project Vicinity**  
**Boulder Oaks**



K:\GIS\PROJECTS\BOULDER\_OAKS\00002\_07\MAPDOC\FIG3\_QUINO.MXD SLM (05-23-07)



**LEGEND**

- Preserve Boundary
- Survey Areas
- Excluded Areas
- Owl's Clover
- Dwarf Plantain/ Woolly Plantain

Source : Aerial 2004



## Methods

A. Borchert (Permit No. TE092162-0), B. Primrose (Permit No. TE-134370-0), K. Klutz (TE-036065-0), and D. Teel (supervised individual) of Jones & Stokes conducted surveys for adult Quino between March 13 and April 18, 2007. These surveys were conducted on a roughly weekly basis under acceptable weather conditions as defined in the U.S. Fish and Wildlife Service protocol (Table 1) (USFWS 2002). Approximately 18.3 acres of southern mixed chaparral and 4.1 acres of open water were excluded from the survey area (Figure 3). Each survey involved slowly walking transects throughout non-excluded portions of the property with highest potential for Quino detection. Areas considered to have the highest potential for Quino consisted of areas with host plant populations and/or areas on ridgelines or hilltops. This approach was used to collect the best information possible given budget constraints. The surveys were conducted at an average rate of 15 acres per hour. Surveyors stopped periodically to scan adjacent areas for moving butterflies. All butterfly species observed were identified and recorded (Table 2). Copies of daily field notes are provided as an attachment to this report (Attachment 1).



**Table 1.** Survey Dates and Conditions

Date	Survey Number	Start-End Time	Temperature (Start/Stop, °F)	Wind Speed (mph)	% Cloud Cover	Name of Surveyor
3/13/07	1	1030-1730	75°F	0	0	A. Borchert, B. Primrose
3/20/07	2a	1000-1200	62/57°F	0-2	5-30	A. Borchert
3/26/07	2b	0900-1600	55/65°F	0-2	0-15	A. Borchert, B. Primrose
4/2/07	3	0845-1515	65/75°F	0-3	0	A. Borchert, B. Primrose, D. Teel
4/10/07	4	0930-1730	63/65°F	0-2	0	K. Klutz, B. Primrose
4/13/07	5	11:00-1630	75/85°F	0-6	0	K. Klutz
4/19/07	6	0815-1600	60/72°F	1-6	0	A. Borchert, B. Primrose

**Table 2.** Butterflies Observed at the Boulder Oaks Site

Scientific Name	Common Name
<i>Anthocaris sara</i>	Sara's orangetip
<i>Apodemia mormo virgulti</i>	Behr's metalmark
<i>Callophrys affinis perplexa</i>	Perplexing hairstreak
<i>Callophrys augustinus</i>	Brown Elfin
<i>Erynnis funeralis</i>	Funereal duskywing
<i>Glaucopsyche lygdamus nittanyensis</i>	Silvery Blue
<i>Icaricia acmon</i>	Acmon Blue
<i>Papilio eurymedon</i>	Pale swallowtail
<i>Pontia protodice</i>	Common white
<i>Vanessa cardui</i>	Painted lady
<i>Vanessa annabella</i>	West Coast Lady
<i>Danaus plexippus</i>	Monarch
<i>Papilio zelicaon</i>	Anise Swallowtail
<i>Colias eurytheme</i>	Orange sulfur

## Reference Sites

Jones & Stokes biologist's visited two reference sites throughout the 2007 flight season in order to monitor Quino activity: Proctor Valley and Hollenbeck Canyon. Both references sites were surveyed in 2006 by Jones & Stokes biologist's for the USFWS post-fire Quino monitoring project. All reference monitoring information gathered at these sites in 2007 and presented in this report was provided to USFWS throughout the season to assist in determining the adult flight season.

The Proctor Valley reference site is located along Proctor Valley Road. The Hollenbeck Canyon reference site is located approximately 2.5 miles east of SR-94 between Jamul and Dulzura. Both sites are located in southern San Diego County, California. Both reference sites were burned during the Otay Fire in October 2003 and now support coastal sage scrub traversed by a network of dirt roads and trails.



The reference sites were visited from March 7 through April 18, 2007. The surveys were conducted under acceptable weather conditions as defined in the U.S. Fish and Wildlife Service protocol (USFWS 2002), with the exception of one visit on April 9, 2007 (Table 3). Each visit involved slowly walking transects throughout the site. The surveys were conducted at an average rate of 15 acres per hour. Surveyors stopped periodically to scan adjacent areas for moving butterflies. Adult and/or immature Quino were identified and recorded.

**Table 3.** Reference Site Dates, Conditions and Observations

Date	Start-End Time	Temperature (Start/Stop, °F)	Wind Speed (mph)	% Cloud Cover	Site	Name of Surveyor	Quino Observations
3/7/07	1045-1415	78°F	0-2	50	Hollenbeck Canyon	A. Borchers, B. Primrose, K. Klutz	20 larvae
3/16/07	1200-1330	72/75°F	0-3	0	Proctor Valley	A. Borchers, P. Richards	1 adult
3/16/07	1330-1700	72°F	1-3	0	Hollenbeck Canyon	A. Borchers, P. Richards, B. Primrose, K. Mozumder, A. Sartain, K. Klutz	1 larvae
3/23/07	1115-1315	63/64°F	0-3	0-15	Hollenbeck Canyon	A. Borchers, A. Sartain	5 adults
3/23/07	1330-1400	69°F	1-3	0	Proctor Valley	A. Borchers, A. Sartain	None
4/5/07	1045-1145	70°F	0-1	0	Hollenbeck Canyon	A. Borchers, B. Primrose, D. Teel	3 adults
4/9/07	1000-1130	57°F	5-8	50-75	Hollenbeck Canyon	A. Borchers, B. Primrose, P. Richards	None, bad weather
4/18/07	1100-1215	62/60°F	2-4	0	Hollenbeck Canyon	A. Borchers, K. Mozumder	None

Twenty Quino larvae were observed on March 7, 2007 at the Hollenbeck Canyon site. In addition, one Quino larva was observed at this site on March 16, 2007. The first flying adult reported to USFWS was observed by Jones & Stokes biologists at the Proctor Valley site on March 16, 2007. Subsequently, adult Quino were observed flying at the Hollenbeck Canyon site on March 23, 2007 and April 5, 2007. By April 18, 2007, Quino were no longer observed at the site.

## Results

Fourteen butterfly species were observed during the eight protocol surveys including Behr's metalmark, Sara's orangetip, painted lady, pale swallowtail and perplexing hairstreak (Table 2). No adult or immature Quino were detected. Potential host plants observed on site include Plantain (*Plantago erecta*), woolly plantain (*Plantago ovata*), and Purple owl's-clover (*Castilleja exserta* ssp. *exserta*). Potential nectar sources present and in bloom during the surveys include popcorn flower (*Cryptantha* spp.), deerweed (*Lotus scoparius*), fiddleneck (*Amsinkia menziesii*), and campo pea (*Lathyrus splendens*).

The majority of the site consists of open southern mixed chaparral. Given the low density of most of the habitat on site, as well as the presence of Quino primary and secondary host plants, the site has potential for supporting Quino checkerspot butterflies. Although no Quino were observed during the surveys at the Boulder Oaks Preserve site, the reference site visits confirmed Quino were actively flying during the majority of the survey dates.

In summary, Quino was not observed during the 2007 protocol surveys, but the site has potential to support Quino based on the presence of host plants, open vegetation communities and available nectar sources. Although winter/spring 2006-07 was one of the driest on record in San Diego County and Quino observations around the County and throughout its range were limited based on reports documented on the US Fish and Wildlife Service's Quino website (USFWS 2007), conditions on site appeared suitable based on the presence of flowering host plants and nectar sources.



## Certification

We certify that all relevant data have been accurately incorporated into the above document.



---

Korey Klutz (Permit No. TE036065-0)

Biologist  
*field surveys*



---

Andrew Borchert (Permit No. TE092162-0)

Biologist  
*co-author and field surveys*



---

Brant Primrose (Permit No. TE134370-0)

Biologist  
*field surveys*



---

Autumn Sartain (Supervised Individual)

Biologist  
*co-author and field surveys*

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Attachment 1  
**Field Notes**

Flowers

Sol per

caustom

Euc Chry

Pla ova

Sen wil

Camp

Pinto

Laserna ga

And col

lot shue

Other wildlife

TVW

WE LIZ

RT Ht

Ans Ht

EE SPY

Co Ra

Ca to

Sp to

Wt H

SB LIZ

Ca Ht

Ground Squirrel

BURROCKS

3/13/07

A. B. B. B. B.

W/ B. B. B. B.

10:30 AM

clear/sunny

78°

no wind

Suniothp 11

Red Blue 1

Silvery Blue 11

Pale Swal 11 11 11

Fra Dorky 11 11

Corn wilt 1

Purple 11 11

Bm Bm 1

5:30 PM

Sunny clear

- Several patches of flowering  
Platanus (mostly mixed)  
with patches of Lantana



Boulder Oaks 3/13/07

Quina Survey

BCP, A Bunch

Sooty sunbird	5	10:30 am.
Pale swallow	111	clear/sunny
Silver Blue	1111	75°F
Brown Elf	1	no wind
Green gnatcatcher	1111	
Com white	1	5:30 pm
Dusky wing	1111	sunny clear

Plantago (ovata?)

Lasthenia cal.

Senecio vulgaris

And

Lot SW

Cryptantha

Euc chry

# Flowers

tree poppy  
 ere cic  
 formaker  
 Air cap  
 Silver lilies  
 Plantago ovata?  
 fl. sic  
 fl. gal  
 lumbkin

Trillium  
 1999 711  
 9682

son kunkle  
 WF L12

# Other birds

WT 151  
 RC SP  
 CT 148  
 LE 100  
 RW B  
 at 70  
 No D  
 cur 77  
 SP 70  
 CA 70  
 BE 70  
 Co 141  
 DE JV  
 NV WD

# Barnard orders

Quana survey

3/20/07

at Bitter Lake  
 start 10:00 AM  
 6:20 0-2 mph  
 mostly sunny

Tim Ashley 111  
 Sibing Blue 111  
 Redwings 1  
 End 12:00 PM  
 6:70 0-2 mph  
 mostly cloudy

- same perhaps in Northwest corner  
 at west area.  
 - few nuclear flowers  
 - End due to bad survey weather







4/2/07

574 m 4 days

22/10

new 12 days  
11/13 09/

Is shy

1/5 21/11/13

center  
changes

2024

W

2/12 finished

650  
Sunny clear.  
No wind.

13 Jan 97  
Councilors' Meeting  
with the  
Bryan office  
Bryan City

[illegible]

Samuel Johnson  
+ on 21 Feb 1791

sidulica melle  
Hollander 510

End 3/5

10/1/1957  
 cost  
 750  
 3-0

1. Available  
 2. Candidates  
 3. 1.6.17  
 4. 2.6.17

*[Handwritten notes:]*

100 7.1 2.3 1.6  
4715W

*Lactuca coronata* L.  
Lactus coronatus

Isabel Ochoa Quins 4/8/07

05, 08, 48

245-315

65, Sunny Clear, 05 N100H  
75, 11 11 053 m10H

Endless

Yola parakeet-like

subtle molting

in hatching

Alt. this Spear

Yola. Santo

Yola to

Yola to

Yola to

Yola to

Yola to

Yola to

Yola to

Yola to

Yola to

Yola to

Yola to

Yola to

Yola to

From 4/8 111

Serve enough 111

S. 224 11

Yola King 11

Yola 1

Yola 1

Yola 1

Yola 1

Yola 1

Yola 1

Yola 1

Yola 1

Yola 1

Yola 1

Yola 1

Yola 1

Yola 1

Yola 1



plants to add

ISS

4/10/07 Boulder Oaks 180

Galium aparine

Scutellaria

Hedysarum cicutaria

no forest along

Medicago polymorpha

cuttings

Trigonotis filiformis

cuttings

Stemodia pulchra

Stemodia

Stemodia

Stemodia

Stemodia

Stemodia

Stemodia

Stemodia

Stemodia

Stemodia

Stemodia

Stemodia

Stemodia

Stemodia

Stemodia

Stemodia

Stemodia

Stemodia

Stemodia

Stemodia

Stemodia

Stemodia

28C cuttings sp. (S. Williams)

cuttings / cuttings

swamp w/ sun next

with large swamp

unknown within plant

Bankside drainage / to 2

Plant side drainage

Plant side drainage

Plant side drainage

Plant side drainage

Plant side drainage

Plant side drainage

Plant side drainage

Plant side drainage

Plant side drainage

Plant side drainage

Plant side drainage

Plant side drainage

Plant side drainage

9:30 a.m.

QCB survey

Adiantum purpureum

Lupinus bicolor

Viola purpurea

Viola

Viola

Viola

Viola

Viola

Viola

Viola

Viola

Viola

Viola

Viola

Viola

Viola

Viola

Viola

Viola

Viola

Viola

Viola

Viola

Viola

11:15 AM

11:15 AM

11:15 AM

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11:15 AM

11:15 AM

11:15 AM

11:15 AM

11:15 AM

11:15 AM

11:15 AM

11:15 AM

11:15 AM

11:15 AM

630F Sunny

0-2 mph

0-2 mph

0-2 mph

0-2 mph

0-2 mph

0-2 mph

0-2 mph

0-2 mph

0-2 mph

0-2 mph

0-2 mph

0-2 mph

0-2 mph

0-2 mph

0-2 mph

0-2 mph

0-2 mph

0-2 mph

0-2 mph

0-2 mph

0-2 mph

0-2 mph

Green poplars planted today

way point = Saker's chamber

Barn Owl

B.O. non-native exotics

4 gave anecdotals

4 gave anecdotals

South Platte fulcrum

\* Plunfay creek

5:30

5:30

4-11-57  
 to clear - 73-68"  
 12:45 - 5:00  
 all por  
 Dr Corp  
 Veneer  
 Counter  
 Xylite  
 enamel  
 Selap  
 Glauca  
 Cas cas  
 Cerythrin  
 Str dry  
 Sel un  
 Res ubi  
 Min ear  
 Elu an  
 Sph pla  
 Sel boy  
 Ly bic

Pal net  
 Gib bird  
 Veneer  
 Pulp  
 Enamel  
 F. J. gel  
 Vulp  
 Ant wall

General	11
Dist. K. L. M.	
pet. smallmouth	4
B. L. S.	1
General	1





P/ou243

Wildlife

Beverly Davis

4/19/07

A. Borcher

w/ B: Purnose

Simur 8:15

600 Clear

1-Zuph and

Print Society

Bein's	111
--------	-----

Bar 4

Estados Unidos

1000

Sarat Ave III

SN/Chet 111

one day

A

End 4:00

720

Child 2-Group B

Lat spl	Lat soil	1st yr	2nd yr
10 pond		Dec T.	Hyd Rab
Vicia		Sp Tb	Bw RK
Dec lamp		Ca Tb	5/8 L12
Uro cil			W/L12
Pha ere		W/L SP	6/20 S02
Gas ere		Nb Dc	3/21 W12
Poa spc		BE W/L	5/21 W12
Em cal		LE W/L	6/21 W12
Mim ac		RT Ha	6/21 W12
Pha p		LA Sp	
Pha p		Ho F.	
Esch cal		Bt cr	
Cal mac		WT <1	
Ben riv		TR S02	
141 Sid			
101 Sid			
Sis hel		VE SW	WE BL2
Can torn		Rw Bc	Am cr
Pha drs		Ru. Av	LA B2
Sid mal		Am to	WES TRW
Silene xl		CO Y	BUSIF.
Mal fas		SE Y	EPY JFA
Wes wtl		GH OW	
Sur cal		CO Hv	
Sol par		Ca Ov	
Tafelberg		Be SP	
Am out		Co Ra	
Dic Dms			
Cic Dms		BH CAN	
Cap ur		Ac W/L	
Gas PDS		Tu W	
Emp bc		Ami	
Sot dms		RCSP	
Ant mlt		ATFLV	
Sp. W/L			
Leaf litter			

11/1/20

11/1/20

CHAND SOUTHERY

Barns III  
Backlog 1  
Fun chaslay II  
WC Loper 1  
Sara's Chip III  
Chk brst III  
Chk dusky 1

<

End 4:00  
72°  
Cloud 2-temp

A. Boeth  
w/ B. Anna  
Sinter 8:14  
60° Clear  
1-2 mph Au

Boulder Oaks

4/19/07

9 a.m. Avino survey 700ft  
0-2 mph  
sunny

1-2000 ft  
Silver Blue  
5000 ft  
III 1015 by wings

Blue dics  
Siderien mull  
Caulophyllus similis  
Corymbus inter  
Helianthus so  
Syringella bell  
Ceanothus pauciflor  
Prunella purpurea  
Anemone multiflora  
Solanum purpure  
Eriodictyon cras  
Camissonia biza  
Lendocoma rigida  
Mimulus  
Oenothera  
Gutierrezia  
Elaeagnus  
Silene gallica  
Lactuca cal  
Panicum on spec  
Oenothera

encl-  
youn  
sunny  
720ft  
0-2 mph

apricot  
lily white

leaf of  
te next 2, each  
v snake  
+ snake

## **Boulder Oaks Preserve Avian Point Count Data**





Boulder Oaks Point Counts  
30-Aug-07

Station	Species	0-3 Minutes		3-5 Minutes		5-10 Minutes		Total ≤ 50m	Total > 50m	Fly-over Total	Total (no fl Total (all)
		≤ 50m	> 50 m	≤ 50m	> 50 m	fly-over	≤ 50m				
1	CATO		1					0	1	0	1
	CAQU		1					0	1	0	1
	MODO					5		0	0	7	0
	SPTO	1						1	0	0	1
	WREN							0	3	0	3
	BEWR				1		1	1	0	0	1
	WSJA							0	1	0	1
2	RCSA	1						1	0	0	1
	HOFI				2			0	2	0	2
	CATH			1				1	0	0	1
	CATO						2	2	1	0	3
	ACWO							0	2	0	2
	LEGO						1	1	0	0	1
	WBNU		1					0	1	0	1
3	WSJA		1		1			0	2	0	2
	HOFI	1						1	1	0	2
	CATO		1					0	1	0	1
	NUWO		1					0	1	0	1
	RSHA							0	0	1	0
	ACWO		1					0	2	0	2
	LEGO					1		0	0	1	0
	EUST				1			0	1	0	1
	HUMM							0	0	1	0
	SAPH							0	1	0	1
4	RTHA		1					0	1	0	1
	ACWO		2					0	2	1	2
	WBNU						1	1	0	0	1
	CATO							0	1	0	1
	AMCO							0	6	0	6
5	PBGR		3					0	3	0	3
	MALL		22					0	22	0	22
	CATO				1		2	2	1	0	3
	NUWO				1			0	1	0	1
	BHGR				1			0	1	0	1
	RNDU		1					0	1	0	1
	GWTE		3				1	1	3	0	4
	HOFI							0	0	0	0
	SPTO							0	1	0	1
	BLPH							0	1	0	1
	SOSP							0	1	0	1
	WREN							0	1	0	1
	WTSW						1	1	0	0	1
	TRSW						1	1	0	0	1

Boulder Oaks Point Counts  
30-Aug-07

Station	Species	0-3 Minutes		3-5 Minutes		5-10 Minutes		Total ≤ 50m	Total > 50m	Fly-over Total	Total (no fl)	Total (all)
		≤ 50m	> 50 m	≤ 50m	> 50 m	fly-over	≤ 50m	> 50 m	fly-over			
6	LOSH		1					0	1	0	1	1
	CATO	1						1	0	0	1	1
	CATH		1				1	1	1	0	2	2
	CAQU		1					0	1	0	1	1
	WREN		1					0	1	0	1	1
	RCSP				1			1	0	0	1	1
7	SGSP						1	1	0	0	1	1
	WSJA						1	1	0	0	1	1
	ANHU						1	1	0	0	1	1
	WSJA		1					0	1	0	1	1
	SWALL							0	0	1	0	1
	CATO			1				1	0	0	1	1
8	CATH							0	1	0	1	1
	SPTO	1						1	0	0	1	1
	HOFI							0	1	0	1	1
9	AMGO				1			1	0	0	1	1
	WREN							0	2	0	2	2
	WSJA							0	1	0	1	1



Boulder Oaks Point Counts  
15-Jul-07

Station	Species	0-3 Minutes		3-5 Minutes		5-10 Minutes		Total < 50m	Total > 50m	Fly-over Total	Total (no fly-over)	Total (all)
		≤ 50m	> 50 m	≤ 50m	> 50 m	≤ 50m	> 50 m					
1	ATFL		1		1			0	2	0	2	2
	WREN	2						2	1	0	3	3
	NUWO		1					0	1	0	1	1
	BEWR				1			0	1	0	1	1
	VGSW					1		1	0	0	1	1
	CATO					1		1	0	0	1	1
	BHGR					1		1	0	0	1	1
	SPTO					1		1	0	0	1	1
	CATO	2						2	0	0	2	2
	PHAL		1					0	2	0	2	2
2	WREN	1						1	0	0	1	1
	SPTO			1				1	0	0	1	1
	BEWR					1		1	0	0	1	1
	ATFL						1	0	1	0	1	1
	CLSW					1		1	0	0	1	1
	LEGO					1		1	0	0	1	1
	HOFI	3						4	0	0	4	4
	ACWQ	3						3	0	0	3	3
	PHAL		2					0	2	0	2	2
	ATFL							0	0	1	0	1
3	NOMO		1					0	1	0	1	1
	RTHA			1				0	0	1	0	1
	CATO	1						1	0	0	1	1
	SPTO		1					0	1	0	1	1
	CAQU							2	0	0	2	2
	RTHA	1						1	1	0	2	2
	ATFL		2					0	2	1	2	3
	ACWO							0	2	0	2	2
	WSJA	1						1	0	0	1	1
	CAKI		2					0	2	0	2	2
4	MODO		1					0	1	0	1	1
	LEGO							0	1	1	1	2
	WREN							0	2	0	2	2
	CATO			1				1	0	0	1	1
	PHAL							0	1	1	1	2
	VGSW							0	1	0	1	1
	HOFI							0	1	0	1	1
	BHGR							0	1	0	1	1
	MALL		15					0	15	0	15	15
	AMCO	2			1			0	3	0	3	3
5	PBGR		2					0	2	0	2	2
	CORA		3					0	3	0	3	3

Boulder Oaks Point Counts  
15-Jul-07

Station	Species	0-3 Minutes		3-5 Minutes		5-10 Minutes		Total < 50m	Total > 50m	Fly-over Total	Total (no fly-over)	Total (all)
		≤ 50m	> 50 m	≤ 50m	> 50 m	≤ 50m	> 50 m					
	RWBL	2	4			2		4	4	0	8	8
	CATO	1				1		2	0	0	2	2
	ATFL		1					0	1	0	1	1
	NRWS			1				1	0	0	1	1
	BCNH				1			0	1	0	1	1
	CLSW				1			0	2	0	2	2
	LEGO					1		1	0	0	1	1
	HOFI						1	0	1	0	1	1
	SPTO						1	0	1	0	1	1
	ATFL		3					0	3	0	3	3
	CATO	1				1		2	0	0	2	2
6	BEWR	1						1	0	0	1	1
	CAQU	2						2	0	0	2	2
	COHA	1						1	0	0	1	1
	WREN		1				1	0	2	0	2	2
	PHAI				2			0	2	0	2	2
	HOFI						1	0	1	0	1	1
	PHAI							0	1	0	1	1
	RCSP	1						1	0	0	1	1
	ATFL		1					0	2	0	2	2
	WREN				1			0	2	0	2	2
	SPTO						1	0	1	0	1	1
	MODO						1	0	1	0	1	1
7	HUMM							1	0	0	1	1
	CATO	1						1	0	0	1	1
	ATFL		1					0	1	0	1	1
	WREN	2	1					2	1	0	3	3
	CLSW						3	0	3	0	3	3
	WREN	1				2		3	0	0	3	3
8	HOFI		2					0	2	0	2	2
	PHAI		1					0	1	0	1	1
	MODO		1					0	1	0	1	1
	CATO	1						2	0	0	2	2
	COHA							1	0	0	1	1
	LEGO							0	0	2	0	2
9	WREN							0	0	0	0	0
	HOFI							3	0	0	3	3
	PHAI							0	2	0	2	2
	MODO							0	1	0	1	1
	CATO							0	1	0	1	1
	COHA							2	0	0	2	2
	LEGO							1	0	0	1	1
								2	0	0	2	2
								1	0	0	1	1
								0	0	0	0	0
								1	0	0	1	1
								0	0	2	0	2

**Boulder Oaks Point Counts**  
**21-Jun-07**

Station	Species	0-3 Minutes			3-5 Minutes			5-10 Minutes			Total > 50m	Fly-over Total	Total (no fly-over)	Total (all)
		≤ 50m	> 50 m	fly-over	≤ 50m	> 50 m	fly-over	≤ 50m	> 50 m	fly-over				
1	LEGO	1	1							1	1	0	2	2
	BHGR		1							0	1	0	1	1
	ATFL	1								1	1	0	1	1
	PHAI	1								1	0	0	1	1
	CATO		1							0	1	0	1	1
	HUMM		1							0	1	0	1	1
	CORA						2			0	0	2	0	2
	WREN					1				0	1	0	1	1
	CISW								1	0	0	1	0	1
	BCSP								1	0	1	0	1	1
	VGSW			1						0	1	0	1	1
	CATO		1							0	3	0	3	3
	LEGO	3					1		2	4	2	0	6	6
	CATH		1							0	1	0	1	1
	CISW			1						0	0	1	0	1
	ATFL		1							0	1	0	1	1
3	WREN	1				1				1	1	0	2	2
	WTSW									0	1	0	1	1
	BHCO							1		1	0	0	1	1
	CAQU								1	0	1	0	1	1
	BCSP								2	0	2	0	2	2
	MODO								1	0	1	0	1	1
	PHAI								1	0	1	0	1	1
	SPTO								1	0	1	0	1	1
	BHGR								1	0	1	0	1	1
	CAQU	6	1							6	1	0	7	7
	CORA	1	1							1	1	0	2	2
	ATFL		1							0	1	0	1	1
	WBNU		1							0	1	0	1	1
	MODO	1								1	0	0	1	1
	NUWO		1							0	1	0	1	1
	WSJA	1				1				1	0	0	1	1
4	NOFI									1	0	0	1	1
	PHAI					5			3	0	8	0	8	8
	ACWO								2	0	2	0	2	2
	LEGO							1		1	0	0	1	1
	NOMO								1	0	1	0	1	1
	CATO								1	0	1	0	1	1
	LASP		1							0	1	0	1	1
	ATFL		1							0	1	0	1	1
	AMCR		1			1				0	2	0	2	2
	BEWR	1							2	1	2	0	3	3



Station	Species	0-3 Minutes			3-5 Minutes			5-10 Minutes			Total ≤ 50m	Total > 50m	Fly-over Total	Total (all)	
		≤ 50m	> 50 m	fly-over	≤ 50m	> 50 m	fly-over	≤ 50m	> 50 m	fly-over					
5	HOFI	2	1								2	1	0	3	
	WSJA							1			1	0	0	1	
	PHAI		1						2		1	3	0	4	
	RCSP		1		1						1	1	0	2	
	ACWO					1					0	1	0	1	
	BCHU										0	0	0	0	
	MODO					1					0	1	0	1	
	WEBL					1					0	1	0	1	
	CORA						1				0	0	1	0	
	CAQU						1				0	0	1	0	
	CATH								1		0	1	0	1	
	WBNU								3		0	3	0	3	
	ELSW									1	0	0	1	0	
	RWBL									1	0	0	1	0	
	WTKI									1	0	0	1	0	
6	CLSW			1							0	0	5	0	5
	MALL		6								0	6	0	6	6
	AMCO		5								0	5	0	5	5
	PBGR		4								0	4	0	4	4
	RWBI	3	4						2		3	6	5	9	14
	PHAI	1	1								1	1	0	2	2
	GOHA		2								0	2	0	2	2
	MODO		1								0	1	0	1	1
	WSJA				1						1	0	0	1	1
	WREN				1						1	0	0	1	1
	RTHA								1		0	1	0	1	1
	ACWO								1		0	1	0	1	1
	SOSP									1	1	0	0	1	1
	CAQU		2								0	2	0	2	2
	7	MODO	1	1								0	1	0	1
SPTO			1						1		2	2	0	4	4
CATO			2								0	2	0	2	2
HOWR			1								0	1	0	1	1
LEGO			1								0	1	0	1	1
SGSP			1						1		0	2	0	2	2
BCSP			1								0	1	0	1	1
BLPH						1					0	1	0	1	1
PHAI							1				2	1	1	3	4
CLSW											0	0	1	0	1
SOSP										1	1	0	0	1	1
MODO		1	1						1		1	1	0	2	2
CAQU			1								0	1	0	1	1

Boulder Oaks Point Counts  
21-Jun-07

Station	Species	0-3 Minutes			3-5 Minutes			5-10 Minutes			Total ≤ 50m	Total > 50m	Fly-over Total	Total (no fly-overs)	Total (all)
		≤ 50m	> 50 m	fly-over	≤ 50m	> 50 m	fly-over	≤ 50m	> 50 m	fly-over					
	CLSW			5							0	0	5	0	5
	LEGO			1							0	0	1	0	1
	SPTO		2								0	2	0	2	2
	ATFL		1								0	1	0	1	1
	PHAI			1							0	0	1	0	1
	WREN		1			1					0	2	0	2	2
	LOSH					1					0	1	0	1	1
	RTHA					1					0	1	0	1	1
	WTSW									1	0	0	1	0	1
	HOFI									1	0	0	1	0	1
	PHAI	1	4	1			1				1	4	2	5	7
	SPTO	1						1			1	1	0	2	2
8	LEGO	2									2	0	0	2	2
	WSJA		1			1					0	2	0	2	2
	BUOR							1			0	1	0	1	1
	HOFI									1	0	0	1	0	1
	SPTO	2									2	0	0	2	2
	MODO			1				1			0	1	1	1	2
	WSJA	1									1	0	0	1	1
	PHAI		1			2					0	3	0	3	3
	CLSW						4				0	0	4	0	4
	HOFI									2	0	0	2	0	2
	COHU							1			1	0	0	1	1

Boulder Oaks Point Counts  
16-May-07

Station	Species	0-3 Minutes		3-5 Minutes		5-10 Minutes		Total ≤ 50m	Total > 50m	Fly-over Total	Total (all)
		≤ 50m	> 50 m	≤ 50m	> 50 m	≤ 50m	> 50 m				
1	MODO		1					0	1	0	1
	BEWR	1						1	0	0	1
	PHAI		1				1	0	2	0	2
	LZBU	1	1					1	1	0	2
	SPTO		2					0	2	0	2
	ATFL	1	1			1		2	1	0	3
	LEGO							0	0	1	1
	BGHR		1					0	1	0	1
	BCSP		1		1			0	2	0	2
	BGGN	1		1				2	0	0	2
	LEGO	3		1				4	0	0	4
	BEWR		1					0	1	0	1
2	SPTO	1						1	0	0	1
	LZBU			1				1	0	0	1
	PHAI				1			0	2	0	2
	CATO					1		1	0	0	1
	COHU			1				1	0	0	1
	WREN						1	0	1	0	1
	HOFI					1		1	0	0	1
	ATFL						1	0	1	0	1
	MODO							0	0	0	0
	NOFL					1		1	1	0	2
	BHGR						1	0	1	0	1
	ATFL		1				1	0	2	0	2
3	MODO	1						1	0	0	1
	RSHA		1					0	1	0	1
	LEGO		1				1	0	2	0	2
	SPTO		1				1	0	2	0	2
	WBNU		1					0	1	0	1
	CORA		1					0	1	1	2
	BLGR	1						1	0	0	1
	YEWA	1						1	0	0	1
	PHAI				1			1	1	0	2
	ACWO		1					0	2	0	2
	WSJA							0	1	0	1
	WTKI						1	0	1	0	1



**Boulder Oaks Point Counts**  
**16-May-07**

Station	Species	0-3 Minutes			3-5 Minutes			5-10 Minutes			Total ≤ 50m	Total > 50m	Fly-over Total	(no fly-over)	Total (all)
		≤ 50m	> 50 m	fly-over	≤ 50m	> 50 m	fly-over	≤ 50m	> 50 m	fly-over					
4	EUST								1		0	1	0	0	1
	NOFL								1		0	1	0	0	1
	MODO		3								0	3	0	0	3
	LEGO	2	1								2	1	0	0	3
	ATFL		1								0	1	0	0	1
	CATH		1								0	1	0	0	1
	BEWR		1								0	1	0	0	1
	HOWR		1								0	1	0	0	1
	CATO		1								0	1	0	0	1
5	PHAI					1					0	1	0	0	1
	CORA					1					0	1	0	0	1
	HOFI								1		0	1	0	0	1
	ANHU							1			1	0	0	0	1
	NOFL								1		0	1	0	0	1
	BHCO								1		0	1	0	0	1
	WEBL								1		0	1	0	0	1
	AMCO	1	3								1	3	0	0	4
	VGSW		5								0	5	0	0	5
	CLSW		7								0	7	0	0	7
	NRWS		2			1					0	3	0	0	3
	RWBL	3	4			1			2		3	7	0	0	10
	PBGR		1					1			0	2	0	0	2
	WTKI			1							0	0	1	1	1
	SOSP	1									1	0	0	0	1
	BKSW					1					0	1	0	0	1
	CORA					1					0	1	0	0	1
	AMCR								1		0	1	0	0	1
	BRSW					1					0	1	0	0	1
	WREN							1			0	1	0	0	1
	BHCO				1						1	0	0	0	1
	WSJA							1			0	1	0	0	1
	NOFL							1			0	1	0	0	1
	CATO	1						1			2	0	0	0	2
6	LEGO	1								1	1	0	0	0	1
	SPTO		1						1		1	1	0	0	2
	BEWR	1									1	0	0	0	1

Boulder Oaks Point Counts  
16-May-07

Station	Species	0-3 Minutes		3-5 Minutes		5-10 Minutes		Total ≤ 50m	Total > 50m	Fly-over Total (no fly-ov)	Total (all)
		≤ 50m	> 50 m	≤ 50m	> 50 m	≤ 50m	> 50 m				
7	RCSP	1						1	0	0	1
	WREN		1				1	0	1	1	2
	SGSP		1	1				1	1	0	2
	SOSP	1						1	0	0	1
	BCSP				2			0	2	0	2
	PHAI				1			0	1	0	1
	LKSP						1	0	0	1	1
	YEWA					1		0	1	0	1
	RTHA		1					0	1	0	1
	BCSP		2					0	2	0	2
	BEWR	1						1	0	0	1
	LEGO	1					1	1	0	1	2
	HOFI	1						1	0	0	1
	PHAI		1					0	1	0	1
8	LZBU	1						1	0	0	1
	SPTO				1			0	2	0	2
	SGSP			1				1	0	0	1
	WREN					1		0	1	0	1
	MODO					1		0	1	0	1
	RCSP					1		1	0	0	1
	LEGO	1	1					1	1	0	2
	MODO		1					0	1	0	1
	BCSP		1					0	1	0	1
	HOFI	1						1	0	0	1
	BHGR	1						1	0	0	1
	CATO		2					0	2	0	2
	SPTO		2			1		1	2	0	3
	WSJA		1					0	1	0	1
9	CAQU		1					0	1	0	1
	PHAI				1		4	0	1	4	5
	BEWR				1			0	1	0	1
	RCSP							0	1	0	1
	CHSP					1		1	0	0	1
	RTHA							0	0	1	1
	CAQU		2					0	2	0	2
	SOSP	1						1	0	0	1

Boulder Oaks Point Counts  
16-May-07

Station	Species	0-3 Minutes		3-5 Minutes		5-10 Minutes			Total ≤ 50m	Total > 50m	Fly-over Total	Total (no fly-ov)	Total (all)
		≤ 50m	> 50 m	≤ 50m	> 50 m	fly-over	≤ 50m	> 50 m					
	SPTO	1	1						1	1	0	0	2
	WREN		1						0	1	0	0	1
	ATFL								0	0	0	0	0
	CORA				2			1	0	3	0	0	3
	LEGO						1		1	0	0	0	1
	CATO							1	0	1	0	0	1
	RCSP								0	0	0	0	0



Boulder Oaks Point Counts  
29-Apr-07

Station	Species	0-3 Minutes			3-5 Minutes			5-10 Minutes			Total ≤ 50m	Total > 50m	Fly-over Total	Total (no fly)	Total (all)
		≤ 50m	> 50 m	fly-over	≤ 50m	> 50 m	fly-over	≤ 50m	> 50 m	fly-over					
1	CATO		2					1			1	2	0	3	3
	BCSP										0	1	0	1	1
	WREN										1	1	0	2	2
	BHGR		1		1						0	1	0	1	1
	PHAI					1					0	3	0	3	3
	LEGO		2					1			1	0	0	1	1
	MODO							1	1		1	1	0	2	2
	ATFL								1		0	1	0	1	1
	BHGR	1	1								1	1	0	2	2
	ATFL										0	0	0	0	0
2	BCSP		1								0	1	0	1	1
	CATO		2								0	2	0	2	2
	BGGN	1									1	0	0	1	1
	BEWR				1						1	0	0	1	1
	PHAI				1						1	0	0	1	1
	LEGO				1			1			2	0	0	2	2
	WREN				1				1		1	1	0	2	2
	SPTO							1			1	0	0	1	1
	LZBU							3			3	0	0	3	3
	HUMM							1			1	0	0	1	1
	CATH								1		0	1	0	1	1
	COHU							1			1	0	0	1	1
	SGSP	1									1	0	0	1	1
	ACWD		2								0	2	0	2	2
	ATFL		1						1		0	2	0	2	2
	HOWR	1									1	0	0	1	1
	CAQU	1									1	0	0	1	1
3	WSJA		1								0	1	0	1	1
	LZBU	1									1	0	0	1	1
	CATO				2						2	0	0	2	2
	BHGR					1					0	1	0	1	1
	HUMM				1						1	0	0	1	1
	MDDO								1		0	1	0	1	1
	AMCR										0	1	0	1	1
	WREN								1		0	1	0	1	1
	HOFI										0	1	0	1	1
	HOFI	3						1			3	0	0	3	3
	ACWO		1								0	1	0	1	1
	MODO	2	1								2	1	0	3	3
	WOMO		1								0	1	0	1	1
4	BHGR		1								0	1	0	1	1
	AMCR					1					0	1	0	1	1

Station	Species	0-3 Minutes		3-5 Minutes		5-10 Minutes		Total ≤ 50m	Total > 50m	Fly-over Total	Total (no fly)	Total (all)
		≤ 50m	> 50 m	≤ 50m	> 50 m	≤ 50m	> 50 m					
5	WSJA				1			0	1	0	1	1
	SPTO			1			1	1	1	0	2	2
	LEGO				1			0	1	0	1	1
	WBNJ			2				2	0	0	2	2
	RWBI				1			0	1	0	1	1
	GRRO					1		1	0	0	1	1
	RSHA				1			0	1	0	1	1
	WWPE	1						1	0	0	1	1
	AMCO	1				3		4	0	0	4	4
	RWBI	7	6	1			1	8	7	0	15	15
	AMCR		1					0	1	0	1	1
	COYE			1			1	1	1	0	2	2
	PBGR				1			0	1	0	1	1
	HUMM					1		1	0	0	1	1
6	WREN						1	0	1	0	1	1
	SOSP			1		1		2	0	0	2	2
	SORA						1	0	1	0	1	1
	MODO	1						1	0	0	1	1
	HOFT	1						1	0	0	1	1
	WSJA	1						1	0	0	1	1
	SPTO	1						1	0	0	1	1
	WREN		3					0	3	0	3	3
	LEGO	1						1	0	0	1	1
	BHGR		1					0	1	0	1	1
	SOSP			1		1		2	0	0	2	2
	WVWA			1				1	0	0	1	1
	CATH						1	0	1	0	1	1
	CATO					1		1	0	0	1	1
7	WREN	1	1					1	1	0	2	2
	SPTO		1					0	1	0	1	1
	LEGO			1				1	1	0	2	2
	BCSP			1			1	0	2	0	2	2
	CATO				2			0	2	0	2	2
	MODO					6	1	6	1	0	7	7
	YEWA						1	0	1	0	1	1
	ATEL						1	0	1	0	1	1
	SPTO	1						1	0	0	1	1
	SWTH	1	1					1	1	0	2	2
	BCSP	1	1		1	2		3	2	0	5	5
	WREN		1				1	0	2	0	2	2
	YBCH					1		1	0	0	1	1
	WETA							1	0	0	1	1
	BEWR					1		1	0	0	1	1
8	WREN							1	0	0	1	1
	SPTO							1	1	0	2	2
	LEGO							1	1	0	2	2
	BCSP							0	2	0	2	2
	CATO							0	2	0	2	2
	MODO						1	6	1	0	7	7
	YEWA						1	0	1	0	1	1
	ATEL						1	0	1	0	1	1
	SPTO	1						1	0	0	1	1
	SWTH	1	1					1	1	0	2	2
	BCSP	1	1		1	2		3	2	0	5	5
	WREN		1				1	0	2	0	2	2
	YBCH					1		1	0	0	1	1
	WETA							1	0	0	1	1
	BEWR					1		1	0	0	1	1

Station	Species	0-3 Minutes		3-5 Minutes		5-10 Minutes		Total $\leq 50m$	Total $> 50m$	Fly-over Total	Total (no fly)	Total (all)
		$\leq 50m$	$> 50m$	$\leq 50m$	$> 50m$	$\leq 50m$	$> 50m$					
9	MODO							1	0	0	1	1
	BHGR						1	0	1	0	1	1
	RTHA						1	0	1	0	1	1
	BHGR	1						2	0	0	2	2
	LZBU		1					0	1	0	1	1
	MODO	1						1	1	0	2	2
	SOSP	1						1	0	0	1	1
	CATO		1					1	1	0	2	2
	BCSP			1				1	0	0	1	1
	WSJA			1			1	1	1	0	2	2
	CAQU			1				1	0	0	1	1
	CORA				1			0	1	0	1	1
	LEGO					1		1	0	0	1	1
	SPTO						1	0	1	0	1	1
	WREN						1	0	1	0	1	1
	SGSP							1	0	0	1	1
	RWBI			1				1	0	0	1	1



Appendix D

# Photographs



Photo 1. View south. Typical example of chaparral in early recovery from 2003 fire.



Photo 2. View west. Chaparral in foreground showing both recovery from fire and some drought stress. Main pond on Preserve is visible near center of view.





Photo 3. View west. The Preserve has abundant, large boulders adding fine-scale topographic complexity and varied microhabitats.



Photo 4. View south. The Preserve has many areas ecotonal between grassland and chaparral. San Vicente Reservoir is visible in the background.





Photo 5. View northwest. The main pond on the Preserve held water throughout the drought, with the surface level falling only slightly between January and September of 2007.



Photo 6. View southeast. Small ponds on in rock on peaks in the south part of the northwest portion of the Preserve hold fairy shrimp in most years, but dried out mid-spring this year.





Photo 7. View east. Much of the Preserve holds rocky, rough topography. Recovery from the 2003 fire is evident throughout.



Photo 8. View north. Chamise in early stage recovery from fire.





Photo 9. View southwest. Fire recovery is evident in chaparral and oak woodland -- in this case, the stand of Coast Live Oaks toward the northwest corner of the Preserve.



Photo 10. View east. Large, healthy oaks such as this Engelmann are present across much of the Preserve lowlands. Foreground vegetation is predominantly nonnative, annual grasses.





Photo 11. View west. The house pad remains post-fire. Some ornamental plants remain alive, including a few potentially invasive species such as Mexican Fan Palm.



Photo 12. Indian Warrior, a beautiful native plant on the Preserve.





Photo 13. Southern Mountain Misery growing on a north-facing slope in chaparral



Photo 14. California Amaranth, growing in the drying bottom of the middle pond





Photo 15. House Fly on Water Pygmyweed in drying pools on a rocky hilltop.



Photo 16. Mexican Bush Katydid on a Weed's Mariposa Lily in chaparral





Photo 17. Tarantula hawk wasp on Narrow-leaved Milkweed in grassland



Photo 18. Red Saddlebags (dragonfly) by the main pond.





Photo 19. Checkered White butterfly on Short-pod Mustard in grassland, Most of the grass in this view is Ripgut Grass.



Photo 20. The preserve hosted several hives of Honey Bees in natural cavities such as this one in an Engelmann Oak in oak woodland.





Photo 21. Remains of a Red Swamp Crayfish in the dried out middle pond. Crayfish are nonnative and are known to predate eggs of native amphibians and fishes.



Photo 22. Shells of one of at least two native snail species found (probably *Helminthoglypta* sp.). The common, nonnative Brown Garden Snail was not found on the Preserve.





Photo 23. A desiccated Bullfrog tadpole in the dried, middle pond. The pond dried out too early in the season for the tadpoles to metamorphose, temporarily extirpating the frogs from that spot.



Photo 24. Adult Western Toad.





Photo 25. Granite Night Lizard. These small, colorful lizards appear to be fairly common in the boulder landscape of at least the southern portion of the Preserve.



Photo 26. Rosy Boa. This was the only Rosy Boa seen on the Preserve, though much of the site appears to be very suitable.





Photo 27. Juvenile Bullfrog, a nonnative amphibian abundant at the main pond.



Photo 28. A California Vole, caught in a funnel trap at the pitfall arrays on the Preserve.





Photo 29. Coastal Patch-nosed Snake in a pitfall trap on the Preserve.



Photo 30. Gilbert's Skink, a widespread but rather rarely seen lizard. Both skink species present in California were found on the Preserve.





Photo 31. Pitfall array on the Preserve.



Photo 32. Pitfall array on the Preserve.





Photo 33. Scorpions appear to be fairly common on the Preserve. This individual was tentatively identified as a Stripe-tailed Scorpion.



Photo 34. A very young Side-blotched Lizard, the most widespread lizard in southern California.





Photo 35. A Western Rattlesnake, one of two species found on the Preserve during the current work.



Photo 36. A Western Skink. Based on the blue tail and size, this is a young individual.





Photo 37. Western Fence Lizard.



Photo 38. Coastal Western Whiptail.





Photo 39. Barn Owl feather in oak woodlands.



Photo 40. Dark-eyed Junco in burned Coast Live Oak.





Photo 41. Brush Rabbit mortality (cause unknown).



Photo 42. Mule Deer sign is common and widespread on the site.





Photo 43. Probable Mountain Lion sign southeast of Iron Mtn. Typical diameter (1.2 inches) and contents indicate Mountain Lion, but could possibly be unusual sign of Bobcat.



Photo 44. Domestic Horse sign that has been marked with Common Gray Fox sign (center).

Appendix E

## **Boulder Oaks Preserve Floral List**





## Appendix E

<b>Scientific Name</b>	<b>Common Name</b>	<b>Habitat Observed</b>	<b>CAL-IPC Listing</b>
LYCOPHYTES [=LYCOPODS]			
SELAGINELLACEAE — Spike-Moss Family			
<i>Selaginella bigelovii</i>	BIGELOW'S SPIKE-MOSS	SMC	
<i>Selaginella cinerascens</i>	MESA SPIKE-MOSS	SMC	
EQUISETOPHYTES [=SPHENOPSIDS]			
EQUISETACEAE — Horsetail Family			
OPHIOGLOSSOID FERNS			
OPHIOGLOSSACEAE — Adder's Tongue Family			
<i>Ophioglossum californicum</i>	CALIFORNIA ADDER'S TONGUE	SMC	
LEPTOSPORANGIATE FERNS			
DRYOPTERIDACEAE — Wood Fern Family			
<i>Dryopteris arguta</i>	COASTAL WOOD FERN	SMC	
POLYPODIACEAE — Polypody Family			
<i>Polypodium californicum</i>	CALIFORNIA POLYPODY	SMC	
PTERIDACEAE — Brake Family			
<i>Cheilanthes covillei</i>	COVILLE'S LIP FERN	SMC	
<i>Pellaea andromedifolia</i>	COFFEE FERN	SMC	
<i>Pellaea mucronata</i> var. <i>mucronata</i>	BIRD'S FOOT CLIFF-BRAKE	SMC	
<i>Pentagramma triangularis</i> ssp. <i>triangularis</i>	CALIFORNIA GOLDBACK FERN	SMC	

<b>Scientific Name</b>	<b>Common Name</b>	<b>Habitat Observed</b>	<b>CAL-IPC Listing</b>
<b>ANGIOSPERMS: MONOCOTS</b>			
<b>ARECACEAE (PALMAE) — Palm Family</b>			
<i>Washingtonia robusta</i>	MEXICAN FAN PALM	DEV	Moderate
<b>AGAVACEAE — Agave Family</b>			
* <i>Agave americana</i>	AVAGE	DEV	
<i>Hesperoyucca whipplei</i>	CHAPARRAL CANDLE MOHAVE YUCCA	SMC	
<i>Yucca schidigera</i>	MOHAVE YUCCA	SMC	
<b>ASPHODELACEAE — Asphodel Family</b>			
* <i>Aloe (saponaria × striata)</i>	ALOE	DEV	
<b>CYPERACEAE — Sedge Family</b>			
<i>Cyperus erythrorhizos</i>	RED-ROOT FLATSEDGE	FWM	
<i>Schoenoplectus californicus</i>	CALIFORNIA BULRUSH	FWM	
<b>HYACINTHACEAE — Hyacinth Family</b>			
<i>Chlorogalum parviflorum</i>	SMALL-FLOWER SOAP PLANT	SMC, NNG	
<b>IRIDACEAE — Iris Family</b>			
<i>Sisyrinchium bellum</i>	BLUE-EYED-GRASS	NNG, SMC	
<b>JUNCACEAE — Rush Family</b>			
<i>Juncus arcticus</i> var. <i>mexicanus</i>	MEXICAN RUSH	NNG, SMC	
<b>LILIACEAE — Lily Family</b>			
<i>Calochortus splendens</i>	SPLENDID MARIPOSA LILY	NNG, SMC	
<i>Calochortus weedii</i> var. <i>weedii</i>	WEED'S MARIPOSA LILY	SMC	
<b>MELANTHIACEAE — Bunch Flower or Camas Family</b>			
<i>Zigadenus fremontii</i>	FREMONT'S CAMAS	SMC	
<b>POACEAE (GRAMINEAE) — Grass Family</b>			
<i>Achnatherum coronatum</i>	GIANT STIPA	SMC	
* <i>Avena barbata</i>	SLENDER WILD OAT	NNG, SMC, CLOW, EOW	
* <i>Bromus diandrus</i>	RIPGUT GRASS	NNG, SMC, CLOW, EOW	Moderate
* <i>Bromus hordeaceus</i>	SOFT CHESS	NNG, SMC, CLOW, EOW	Moderate



<b>Scientific Name</b>	<b>Common Name</b>	<b>Habitat Observed</b>	<b>CAL-IPC Listing</b>
<b>*<i>Bromus madritensis</i></b> ssp. <i>rubens</i>	FOXTAIL CHESS, RED BROME	NNG, SMC, CLOW, EOW	High
<b><i>Calamagrostis koelerioides</i></b>	SAN DIEGO REEDGRASS	SMC	
<b>*<i>Cortaderia selloana</i></b>	PAMPAS GRASS	DEV	
<b>*<i>Cynodon dactylon</i></b>	BERMUDA GRASS	NNG, DEV, FWM (note along edge)	Moderate
<b><i>Distichlis spicata</i></b>	SALTGRASS	NNG, CLOW	
<b>*<i>Gastridium ventricosum</i></b>	NIT GRASS	SMC, NNG	
<b>*<i>Hordeum marinum</i></b> ssp. <i>gussoneanum</i>	MEDITERRANEAN BARLEY	NNG	
<b>*<i>Hordeum murinum</i> L.</b> ssp. <i>glaucum</i>	GLAUCOUS BARLEY	NNG	
<b>*<i>Lamarckia aurea</i></b>	GOLDEN-TOP	SMC	
<b><i>Leymus triticoides</i></b>	BEARDLESS WILD WILD-RYE	NNG	
<b>*<i>Lolium multiflorum</i></b>	ITALIAN RYEGRASS	NNG, CLOW, EOW	Moderate
<b><i>Melica imperfecta</i></b>	COAST RANGE MELIC	SMC	
<b><i>Muhlenbergia rigens</i></b>	DEERGRASS	NNG, SMC, SOC	
<b><i>Nassella pulchra</i></b>	PURPLE NEEDLEGRASS	SMC, CLOW, NNG	
<b>*<i>Pennisetum setaceum</i></b>	AFRICAN FOUNTAIN GRASS	SMC	Moderate
<b>*<i>Phalaris aquatica</i></b>	HARDING GRASS	NNG, CLOW, SMC	
<b>*<i>Piptatherum miliaceum</i></b>	SMILO GRASS	SMC, NNG, CLOW, EOW	
<b>*<i>Polypogon monspeliensis</i></b>	ANNUAL BEARD GRASS	NNG, FWM	Limited
<b>*<i>Schismus barbata</i></b>	MEDITERRANEAN SCHISMUS	SMC	
<b>*<i>Vulpia myuros</i></b>	RAT-TAIL FESCUE	SMC, NNG, CLOW, EOW	Moderate
<b>THEMIDACEAE — Brodiaea Family</b>			
<b><i>Brodiaea orcuttii</i></b>	ORCUTT'S BRODIAEA	NNG, CLOW, EOW	
<b><i>Dichelostemma capitatum</i></b> ssp. <i>capitatum</i>	BLUE DICKS	NNG, SMC	
<b>TYPHACEAE — Cattail Family</b>			
<b><i>Typha latifolia</i> L.</b> {SD 122815}	BROAD-LEAF CATTAIL	FWM, SWS	
<b>ZOSTERACEAE — Eel-Grass Family</b>			
<b>ANGIOSPERMS: EUDICOTS</b>			

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<b>ADOXACEAE — Adoxa Family</b>			
<i>Sambucus mexicana</i>	BLUE ELDERBERRY	CLOW, SMC	
<b>AMARANTHACEAE - Amaranth Family</b>			
<i>Amaranthus blitoides</i>	PROSTRATE AMARANTH	NNG, SMC	
<i>Amaranthus californicus</i>	CALIFORNIA AMARANTH	FWM	
<b>AMARYLLIDACEAE — Amaryllis Family</b>			
* <i>Narcissus sp.</i>	NARCISSUS	DEV	
<b>ANACARDIACEAE - Sumac or Cashew Family</b>			
<i>Malosma laurina</i>	LAUREL SUMAC	SMC, CLOW	
<i>Rhus ovata</i>	SUGAR BUSH	SMC, CLOW	
<i>Toxicodendron diversilobum</i>	WESTERN POISON-OAK	SMC, CLOW	
<b>APIACEAE (UMBELLIFERAE) — Carrot Family</b>			
<i>Apiastrum angustifolium</i>	MOCK-PARSLEY	NNG, SMC	
<i>Daucus pusillus</i>	RATTLESNAKE WEED	SMC, NNG	
<i>Sanicula arguta</i>	SHARP-TOOTH SANICLE	SMC	
<i>Sanicula tuberosa</i>	TURKEY PEA SANICLE	SMC	
<i>Tauschia arguta</i>	SOUTHERN TAUSCHIA	SMC	
<b>APOCYNACEAE — Dogbane Family</b>			
<i>Asclepias californica</i>	CALIFORNIA/ROUND-HOOD MILKWEED	NNG	
<i>Asclepias fascicularis</i>	NARROW-LEAF MILKWEED	NNG	
* <i>Nerium oleander</i>	OLEANDER	DEV	
* <i>Vinca major</i>	GREATER PERIWINKLE	DEV	Moderate
<b>ASTERACEAE (COMPOSITAE) — Sunflower Family</b>			
<i>Acourtia microcephala</i>	SACAPELLOTE	SMC	
<i>Ambrosia acanthicarpa</i>	ANNUAL BUR-SAGE	NNG	
<i>Ambrosia psilostachya</i>	WESTERN RAGWEED	NNG, CLOW, SMC	
* <i>Anthemis cotula</i>	MAYWEED, STINKWEED, DOG-FENNEL	NNG	
<i>Artemisia californica</i>	COASTAL SAGEBRUSH	SMC	
<i>Baccharis salicifolia</i>	MULE-FAT, SEEP-WILLOW	SWS, CLOW	
<i>Baccharis sarothroides</i>	BROOM BACCHARIS	SMC, NNG	

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<b>*<i>Carduus pycnocephalus</i></b>	ITALIAN THISTLE	NNG, SMC	Moderate
<b>*<i>Centaurea melitensis</i></b>	TOCALOTE	NNG, SMC	
<b>*<i>Centaurea solstitialis</i></b>	YELLOW STAR-THISTLE	NNG, SMC, CLOW	High
<b>*<i>Chrysanthemum coronarium</i></b>	GARLAND/CROWN DAISY	DEV	
<b><i>Cirsium occidentale</i></b>	CALIFORNIA THISTLE	SMC	
<b>*<i>Cirsium vulgare</i></b>	BULL THISTLE	DEV, FWM	
<b>*<i>Conyza bonariensis</i></b>	FLAX-LEAF FLEABANE	FWM	
<b><i>Conyza canadensis</i></b>	HORSEWEED	NNG, SMC, CLOW	
<b><i>Corethrogyne filaginifolia</i> var. <i>filaginifolia</i></b>	COMMON SAND-ASTER	SMC, NNG	
<b>*<i>Cotula coronopifolia</i></b>	AFRICAN BRASS-BUTTONS	NNG	
<b><i>Deinandra fasciculata</i></b>	FASCICLED TARWEED	SMC, NNG	
<b><i>Erigeron foliosus</i> var. <i>foliosus</i></b>	LEAFY DAISY	NNG, SMC	
<b><i>Eriophyllum confertiflorum</i> var. <i>confertiflorum</i></b>	LONG-STEM GOLDEN-YARROW	NNG, SMC	
<b>*<i>Filago gallica</i></b>	NARROW-LEAF FILAGO	SMC	
<b><i>Gnaphalium californicum</i></b>	CALIFORNIA EVERLASTING	SMC	
<b><i>Pseudognaphalium canescens</i></b>	EVERLASTING CUDWEED	CLOW, SMC	
<b>*<i>Gnaphalium luteo-album</i></b>	EVERLASTING CUDWEED	FWM	
<b><i>Gutierrezia sarothrae</i></b>	BROOM MATCHWEED/SNAKEWEED	SMC	
<b><i>Hazardia squarrosa</i> var. <i>grindelioides</i></b>	SOUTHERN SAWTOOTH GOLDENBUSH	SMC	
<b>*<i>Hedypnois cretica</i></b>	CRETE HEDYPNOIS	SMC	
<b><i>Helianthus gracilentus</i></b>	SLENDER SUNFLOWER	SMC, CLOW	
<b><i>Heterotheca grandiflora</i></b>	TELEGRAPH WEED	SMC, NNG	
<b>*<i>Hypochaeris glabra</i></b>	SMOOTH CAT'S EAR	NNG, SMC, CLOW	Limited
<b><i>Isocoma menziesii</i> var. <i>menziesii</i></b>	SPREADING GOLDENBUSH	SMC, CLOW, NNG	
<b>*<i>Lactuca serriola</i></b>	PRICKLY LETTUCE	SMC, CLOW, NNG	



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<i>Lasthenia gracilis</i>	COMMON GOLDFIELDS	SMC	
<i>Madia exigua</i>	PYGMY/THREADSTEM MADIA	SMC	
<i>Osmadenia tenella</i>	OSMADENIA	SMC	
<i>Pluchea odorata</i>	SALT MARSH FLEABANE	FWM	
<i>Porophyllum gracile</i>	ODORA	SMC	
<i>Pseudognaphalium biolettii</i>	BICOLOR CUDWEED	SMC	
* <i>Senecio vulgaris</i>	COMMON GROUNDSEL	SMC, CLOW	
<i>Solidago californica</i>	CALIFORNIA GOLDENROD	CLOW	
* <i>Sonchus asper</i> ssp. <i>asper</i>	PRICKLY SOW-THISTLE	SMC, NNG	Evaluated no listing
* <i>Sonchus oleraceus</i>	COMMON SOW-THISTLE	SMC, NNG	
<i>Stephanomeria virgata</i> ssp. <i>pleurocarpa</i>	TALL WREATH PLANT	SMC, NNG	
<b>BORAGINACEAE — Borage Family</b>			
<i>Amsinckia menziesii</i> var. <i>intermedia</i>	RANCHER'S FIDDLENECK	NNG, SMC	
<i>Cryptantha intermedia</i>	NIEVITAS CRYPTANTHA	SMC	
<b>BRASSICACEAE (CRUCIFERAE) — Mustard Family</b>			
* <i>Hirschfeldia incana</i>	SHORT-POD MUSTARD	SMC, CLOW, NNG	
* <i>Sisymbrium altissimum</i>	TUMBLE/JIM HILL MUSTARD	NNG	
* <i>Sisymbrium irio</i>	LONDON ROCKET	NNG, CLOW	Moderate
* <i>Sisymbrium officinale</i>	HEDGE MUSTARD	NNG	
<b>CACTACEAE — Cactus Family</b>			
* <i>Opuntia ficus-indica</i>	MISSION PRICKLY PEAR	DEV	
<i>Opuntia littoralis</i>	PRICKLY PEAR	SMC	
<b>CAPRIFOLIACEAE — Honeysuckle Family</b>			
<i>Lonicera subspicata</i> var. <i>denudata</i>	JOHNSTON'S HONEYSUCKLE	SMC	
<b>CARYOPHYLLACEAE — Pink Family</b>			
* <i>Silene gallica</i>	COMMON CATCHFLY	NNG, SMC, CLOW	
* <i>Spergularia bocconi</i>	BOCCONE'S SAND-SPURRY	NNG	
* <i>Stellaria media</i>	COMMON CHICKWEED	NNG	

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<b>AMARANTHACEAE - Amaranth Family</b>			
<i>*Dysphania ambrosioides</i>	MEXICAN TEA	FWM	
<b>CISTACEAE — Rock-Rose Family</b>			
<i>Helianthemum scoparium</i>	PEAK RUSH-ROSE	SMC	
<b>CONVOLVULACEAE — Morning-Glory Family</b>			
<i>Calystegia macrostegia</i> ssp. <i>arida</i>	SOUTHERN CALIFORNIA MORNING-GLORY	NNG, SMC, CLOW, EO	
<b>CRASSULACEAE — Stonecrop Family</b>			
<i>Crassula aquatica</i>	WATER PYGMYWEED	SMC	
<i>Crassula connata</i>	PYGMYWEED	SMC	
<i>Dudleya edulis</i>	LADIES' FINGERS	SMC	
<i>Dudleya pulverulenta</i>	CHALK DUDLEYA	SMC	
<b>CUCURBITACEAE — Gourd Family</b>			
<i>Marah macrocarpus</i> var. <i>macrocarpus</i>	MANROOT, WILD-CUCUMBER	SMC, CLOW	
<b>ERICACEAE — Heath Family</b>			
<i>Arctostaphylos glandulosa</i> ssp. <i>adamsii</i>	LAGUNA MOUNTAIN MANZANITA	SMC, SOC	
<i>Arctostaphylos glauca</i>	BIG-BERRY MANZANITA	SMC	
<i>Xylococcus bicolor</i>	MISSION MANZANITA	SMC	
<b>EUPHORBIACEAE — Spurge Family</b>			
<i>Acalypha californica</i>	CALIFORNIA COPPERLEAF		
<i>Croton setigerus</i>	DOVEWEED	NNG	
<b>FABACEAE (LEGUMINOSAE) - Legume Family</b>			
<i>Lathyrus vestitus</i>	SAN DIEGO SWEET PEA	SMC	
<i>Lotus argophyllus</i> var. <i>argophyllus</i>	SILVER-LEAF LOTUS	SMC	
<i>Lotus purshianus</i> var. <i>purshianus</i>	SPANISH-CLOVER	NNG, CLOW	
<i>Lotus scoparius</i> var. <i>scoparius</i>	COASTAL DEERWEED	NNG, CLOW, SMC	
<i>Lotus strigosus</i>	BISHOP'S/STRIGOSE LOTUS	SMC	
<i>Lupinus bicolor</i>	MINIATURE LUPINE	SMC, NNG	
<i>*Medicago polymorpha</i>	CALIFORNIA BURCLOVER	NNG, CLOW	
<i>*Melilotus indicus</i>	INDIAN SWEETCLOVER	NNG, CLOW	

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<b>*<i>Parkinsonia aculeata</i></b>	MEXICAN PALO VERDE	DEV	
<b>*<i>Robinia pseudoacacia</i></b>	BLACK LOCUST	DEV	Limited
<b>*<i>Vicia sativa</i> ssp. <i>sativa</i></b>	SPRING VETCH	NNG, CLOW, EOW, DEV	
<b><i>Quercus berberidifolia</i></b>	INTERIOR SCRUB OAK	SOC, SMC	
<b>GERANIACEAE — Geranium Family</b>			
<b>*<i>Erodium botrys</i></b>	LONG-BEAK FILAREE/STORKSBILL	NNG, CLOW, EOW, DEV SOC, SMC	Evaluated no listing
<b>*<i>Erodium cicutarium</i></b>	RED-STEM FILAREE/STORKSBILL	NNG, CLOW, EOW, DEV SOC, SMC	Limited
<b><i>Geranium carolinianum</i></b>	CAROLINA GERANIUM	CLOW	
<b>GROSSULARIACEAE — Gooseberry Family</b>			
<b><i>Ribes indecorum</i></b>	WHITE-FLOWER CURRANT	SMC, CLOW	
<b>HELIOTROPACEAE — Heliotrope Family</b>			
<b><i>Heliotropium curassavicum</i></b>	SALT HELIOTROPE	NNG	
<b>HYDROPHYLLACEAE — Waterleaf Family</b>			
<b><i>Eriodictyon crassifolium</i> var. <i>crassifolium</i></b>	FELT-LEAF YERBA SANTA	SMC	
<b><i>Eucrypta chrysanthemifolia</i> var. <i>chrysanthemifolia</i></b>	COMMON EUCRYPTA	SMC, CLOW	
<b><i>Phacelia cicutaria</i> var. <i>hispida</i></b>	CATERPILLAR PHACELIA	CLOW	
<b><i>Phacelia distans</i></b>	WILD-HELIOTROPE	SMC	
<b><i>Phacelia parryi</i></b>	PARRY'S PHACELIA	SMC	
<b>LAMIACEAE (LABIATAE) — Mint Family</b>			
<b>*<i>Marrubium vulgare</i></b>	HOREHOUND	NNG, CLOW	Moderate
<b><i>Monardella hypoleuca</i> ssp. <i>lanata</i></b>	WHITE-LEAF MONARDELLA	SMC	
<b>*<i>Rosmarinus officinalis</i></b>	ROSEMARY	DEV	
<b><i>Salvia apiana</i></b>	WHITE SAGE	SMC	
<b><i>Salvia clevelandii</i></b>	FRAGRANT SAGE	SMC	
<b><i>Salvia columbariae</i></b>	CHIA	SMC	
<b><i>Salvia mellifera</i></b>	BLACK SAGE	SMC	
<b><i>Satureja chandleri</i></b>	SAN MIGUEL SAVORY	SMC	
<b><i>Scutellaria tuberosa</i></b>	DANNY'S SKULLCAP	SMC	



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<b><i>Stachys ajugoides</i> var. <i>rigida</i></b>	HEDGE-NETTLE	CLOW	
<b>LYTHRACEAE — Loosestrife Family</b>			
<b>*<i>Lythrum hyssopifolia</i></b>	GRASS POLY	NNG	Moderate
<b>MALVACEAE — Mallow Family</b>			
<b><i>Malacothamnus fasciculatus</i></b>	CHAPARRAL BUSHMALLOW	CLOW, SMC	
<b><i>Sidalcea malviflora</i> ssp. <i>sparsifolia</i></b>	CHECKER-BLOOM	NNG, CLOW	
<b>OLEACEAE — Olive Family</b>			
<b>*<i>Olea europaea</i></b>	OLIVE	SMC, CLOW, DEV	
<b><i>Camissonia bistorta</i></b>	CALIFORNIA SUN CUP	SMC	
<b><i>Camissonia californica</i></b>	FALSE-MUSTARD	SMC	
<b>OROBANCHACEAE — Broom-Rape Family</b>			
<b><i>Castilleja exserta</i> ssp. <i>exserta</i></b>	PURPLE OWL'S-CLOVER	NNG, SMC	
<b><i>Cordylanthus rigidus</i> ssp. <i>setigerus</i></b>	DARK-TIP BIRD'S BEAK	SMC	
<b><i>Pedicularis densiflora</i></b>	INDIAN WARRIOR	SMC	
<b>OXALIDACEAE — Oxalis Family</b>			
<b><i>Oxalis albicans</i> ssp. <i>californica</i></b>	CALIFORNIA WOOD-SORREL	SMC	
<b>PAEONIACEAE — Peony Family</b>			
<b><i>Paeonia californica</i></b>	CALIFORNIA PEONY	SMC	
<b>PAPAVERACEAE — Poppy Family</b>			
<b><i>Dendromecon rigida</i></b>	BUSH POPPY	SMC	
<b><i>Dicentra chrysantha</i></b>	GOLDEN EAR-DROPS	SMC	
<b><i>Eschscholzia californica</i></b>	CALIFORNIA POPPY	SMC, NNG	
<b><i>Romneya trichocalyx</i></b> Note: this species was not occurring naturally. It appears to be planted as a cultivar within the existing Developed Lands on site.	COULTER'S MATILIJIA POPPY	DEV	
<b>PHRYMACEAE — Hopseed Family</b>			
<b><i>Mimulus aurantiacus</i></b>	JACUMBA MONKEY FLOWER	SMC, CLOW	
<b>PLANTAGINACEAE — Plantain Family</b>			

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<i>Antirrhinum nuttallianum</i> ssp. <i>nuttallianum</i>	NUTTALL'S SNAPDRAGON	SMC, CLOW	
<i>Keckiella cordifolia</i>	CLIMBING BUSH PENSTEMON	SMC	
<i>Penstemon centranthifolius</i>	SCARLET BUGULER	CLOW	
<i>Penstemon spectabilis</i> var. <i>spectabilis</i>	SHOWY PENSTEMON	SMC	
<i>Plantago elongata</i>	PRAIRIE PLANTAIN	SMC	
<i>Plantago erecta</i>	DOT-SEED PLANTAIN	SMC	
<i>Plantago ovata</i>	WOOLLY PLANTAIN		
<b>PLATANACEAE — Plane Tree or Sycamore Family</b>			
<i>Platanus racemosa</i>	WESTERN SYCAMORE	CLOW	
<b>POLEMONIACEAE — Phlox Family</b>			
<i>Navarretia hamata</i> ssp. <i>hamata</i>	HOOKEED SKUNKWEED	SMC	
<b>POLYGONACEAE — Buckwheat Family</b>			
<i>Eriogonum fasciculatum</i> var. <i>fasciculatum</i>	COAST CALIFORNIA BUCKWHEAT	SMC, CLOW	
<i>Eriogonum fasciculatum</i> var. <i>foliolosum</i>	INLAND CALIFORNIA BUCKWHEAT	SMC	
<i>Polygonum amphibium</i>	KELP SMARTWEED	FWM	
<i>Polygonum lapathifolium</i>	WILLOW SMARTWEED, WILLOW WEED	NNG	
<i>Pterostegia drymarioides</i>	GRANNY'S HAIRNET, G. C. P.	SMC	
* <i>Rumex conglomeratus</i>	WHORLED DOCK	NNG	
* <i>Rumex crispus</i>	CURLY DOCK	NNG, FWM	Limited
<i>Rumex salicifolius</i>	WILLOW DOCK	NNG	
<b>PORTULACACEAE — Purslane Family</b>			
<i>Calandrinia ciliata</i>	RED MAIDS	SMC, NNG	
<b>PRIMULACEAE — Primrose Family</b>			
* <i>Anagallis arvensis</i>	SCARLET PIMPERNEL, POOR MAN'S WEATHERGLASS	NNG, SMC, CLOW	
<b>RANUNCULACEAE — Buttercup Family</b>			

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<i>Delphinium parryi</i> ssp. <i>parryi</i>	PARRY'S LARKSPUR	SMC	
<i>Thalictrum fendleri</i> var. <i>fendleri</i>	FENDLER'S MEADOW-RUE	SMC	
<b>RESEDACEAE — Mignonette Family</b>			
* <i>Reseda luteola</i>	DYER'S ROCKET	NNG, DEV, CLOW, SMC	
<b>RHAMNACEAE — Buckthorn Family</b>			
<i>Ceanothus crassifolius</i>	THICK-LEAF-LILAC	SMC	
<i>Ceanothus cyaneus</i>	LAKESIDE-LILAC	SMC	
<i>Ceanothus leucodermis</i>	CHAPARRAL WHITETHORN	SMC	
<i>Ceanothus oliganthus</i> var. <i>oliganthus</i>	HAIRY CEANOTHUS	SMC	
<i>Ceanothus tomentosus</i>	RAMONA-LILAC	SMC	
<i>Rhamnus crocea</i>	SPINY REDBERRY	SMC	
<i>Rhamnus ilicifolia</i>	HOLLY-LEAF REDBERRY	SMC, CLOW	
<b>ROSACEAE — Rose Family</b>			
<i>Adenostoma fasciculatum</i>	CHAMISE	SMC	
<i>Cercocarpus betuloides</i> var. <i>betuloides</i>	MOUNTAIN-MAHOGANY	SMC	
<i>Cercocarpus minutiflorus</i>	SAN DIEGO MOUNTAIN-MAHOGANY	SMC	
<i>Chamaebatia australis</i>	SOUTHERN MOUNTAIN MISERY	SMC	
<i>Heteromeles arbutifolia</i>	TOYON, CHRISTMAS BERRY	SMC, CLOW	
<i>Horkelia truncata</i>	RAMONA HORKELIA	SMC	
<i>Prunus ilicifolia</i> ssp. <i>ilicifolia</i>	ISLAY, HOLLY-LEAF CHERRY	SMC, CLOW	
<b>RUBIACEAE — Madder or Coffee Family</b>			
<i>Galium angustifolium</i> ssp. <i>angustifolium</i>	NARROW-LEAF BEDSTRAW	SMC, CLOW	
<i>Galium aparine</i>	COMMON BEDSTRAW, GOOSE GRASS	CLOW, NNG	
<i>Galium nuttallii</i> ssp. <i>nuttallii</i>	SAN DIEGO BEDSTRAW	SMC	
<b>SALICACEAE — Willow Family</b>			
<i>Salix lasiolepis</i>	ARROYO WILLOW	SWS	



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<i>Salix laevigata</i>	RED WILLOW	SWS	
<i>Salix gooddingii</i>	BLACK WILLOW	SWS	
<b>SCROPHULARIACEAE S.S. — Figwort Family</b>			
<i>Scrophularia californica</i> ssp. <i>floribunda</i>	CALIFORNIA BEE PLANT/FIGWORT	SMC	
<b>SOLANACEAE — Nightshade Family</b>			
* <i>Nicotiana glauca</i>	TREE TOBACCO	DEV, FWM	Moderate
<i>Solanum parishii</i>	PARISH'S NIGHTSHADE	SMC	
<b>STYRACACEAE — Storax Family</b>			
<i>Styrax redivivus</i>	SNOWDROP BUSH	SMC	
<b>TAMARICACEAE — Tamarisk Family</b>			
* <i>Tamarix ramosissima</i>	SALT CEDAR	FWM	High
<b>VERBENACEAE — Vervain Family</b>			
<i>Verbena lasiostachys</i>	WESTERN VERVAIN	SMC, NNG	
<b>VIOLACEAE — Violet Family</b>			
<i>Viola pedunculata</i>	JOHNNY JUMP-UP	SMC	
<p>Nomenclature follows Rebman &amp; Simpson 2006</p> <p>CAL-IPC = California Invasive Plant Council</p> <ul style="list-style-type: none"> <li>• = non-native or naturalized</li> <li>• SMC = southern mixed chaparral, NNG= non-native grassland, FWM = freshwater marsh,</li> <li>• CLOW = coast live oak woodland, EO = Engelmann oak woodland, DEV = developed lands</li> <li>• SOC = scrub oak chaparral</li> </ul>			