BASELINE BIOLOGICAL RESOURCES EVALUATION

LAKESIDE LINKAGE OPEN SPACE PRESERVE

Prepared for:

County of San Diego
Department of Parks and Recreation
9150 Chesapeake Drive, Suite 200
San Diego, California 92123
Contact: Ms. Jennifer Haines

Prepared by:

ICF Jones & Stokes
9775 Businesspark Avenue, Suite 200
San Diego, CA 92131
Contact: Ted Lee
858/578-8964

December 2008

ICF Jones & Stokes Associates. Baseline Biological Resources Evaluation, Lakeside Linkage Open Space Preserves, County of San Diego, CA. Report prepared for County of San Diego Department of Parks and Recreation, December 2008.

Table of Contents

Tables

Table **Page**

Figures

Figure **Follows Page**

Executive Summary

ICF Jones & Stokes conducted a baseline biodiversity study of the County of San Diego's (County) Lakeside Linkage Preserve (Preserve) to provide the Department of Parks and Recreation with biological data to develop a Resource Management Plan (RMP) including Area Specific Management Directives (ASMDs). The Preserve consists of moderately high value natural communities and is located in the unincorporated community of Lakeside, southwest of Lake Jennings, and approximately 16 miles northeast of downtown San Diego. This report summarizes all survey methodologies and data collected during the 2008 survey period (February through October 2008). This report also includes recommendations for adaptive management, including management and monitoring of vegetation communities and sensitive plants and habitats, control of invasive non-native plants, and management and monitoring of sensitive wildlife species, including species covered by the South County Multiple Species Conservation Program (MSCP).

To provide a baseline evaluation of biological resources, the following studies were conducted by ICF Jones & Stokes, in addition to general, qualitative evaluation of each of the Preserve properties: (1) pitfall trap arrays to sample amphibians, reptiles, and small mammals; (2) focused surveys for Hermes Copper Butterfly; (3) avian point counts; (4) Coastal California Gnatcatcher surveys; (5) nocturnal bird surveys; (6) acoustic sampling and roost surveys for bats; (7) small mammal trapping; (8) a track and sign survey for medium-to-large mammals; and (9) a camera station survey for medium-to-large mammals. In addition, the following surveys were previously conducted and the data was provided to ICF Jones & Stokes for incorporation by reference: (1) 2001 general reconnaissance surveys, vegetation mapping, avian point counts, and Coastal California Gnatcatcher spot mapping conducted on the central and western properties and (2) spring and summer 2007 vegetation mapping and rare plant surveys conducted on the western, central, and eastern properties.

Surveys conducted in 2007 and 2008 documented six land cover types and 127 species that were detected throughout the Preserve. Our surveys detected 62 bird species, 26 mammal species (nine bats, eight small mammals, and nine medium and large bodied mammals), 10 herptiles (zero amphibians and 10 reptiles), and 29 invertebrate species. This list includes 20 sensitive species six of which are MSCP-covered species. One additional MSCP-covered species was observed immediately adjacent to the Preserve.

The Preserve is comprised of three properties that are almost entirely dominated by Diegan coastal sage scrub. Other land cover types present within the Preserve

consist of disturbed Diegan coastal sage scrub, non-native grassland, disturbed land, urban/developed areas and ornamental vegetation. Rare plant surveys conducted in 2007 documented San Diego Sunflower (*Viguieria laciniata*), a special-status plant species, occurring in several different location on all three properties. In addition, seven different invasive plant species were documented on the three properties including Tree of Heaven (*Ailanthus altissima*), Eucalyptus (*Eucalyptus* sp.), European Olive (*Olea europea*), Fountain Grass (*Pennisetum setaceum*) and Peruvian Pepper (*Schinus molle*).

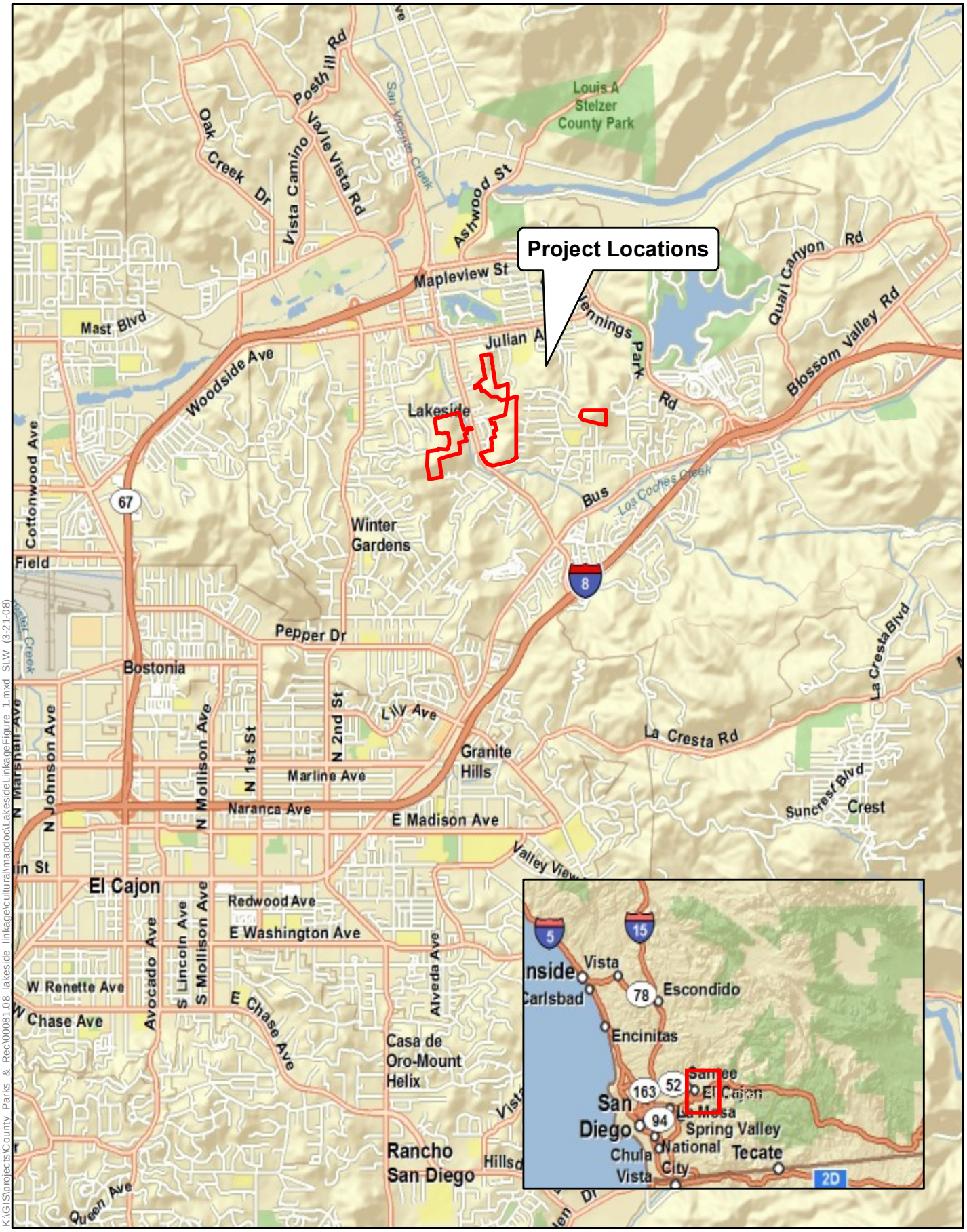
Chapter 1
Introduction

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

Beginning in 1932 and 1948, the County began acquiring parcels that would ultimately become part of the Preserve. In 1994, the Whitaker parcel (APN 394-330-19) located on the central property was donated to the County to be preserved in perpetuity as a park. From 1999-2000, the remaining parcels of what is now considered the Preserve (western, central, and eastern properties) were acquired as part of the South County Multiple Species Conservation Program (MSCP). These three properties are essential to the South County MSCP because they provide a corridor linkage for Coastal California Gnatcatcher (*Polioptila californica californica*) to reach other preserved properties in the plan area.

The Preserve consists of moderately high value natural communities as well as areas that have been impacted by human activities including existing dirt roads, trails, developed lands and habitat that is frequently disturbed (i.e. disturbed habitat). The Preserve property is located in San Diego County in the unincorporated community of Lakeside, southwest of Lake Jennings, and approximately 16 miles northeast of downtown San Diego, California (Figures 1 and 2).

To provide a baseline evaluation of biological resources, the following studies were conducted by ICF Jones & Stokes, in addition to general, qualitative evaluation of each of the Preserve properties: (1) pitfall trap arrays to sample amphibians, reptiles, and small mammals; (2) focused surveys for Hermes Copper Butterfly; (3) avian point counts; (4) Coastal California Gnatcatcher surveys; (5) nocturnal bird surveys; (6) acoustic sampling and roost surveys for bats; (7) small mammal trapping; (8) a track and sign survey for medium-to-large mammals; and (9) a camera station survey for medium-to-large mammals. In addition, the following surveys were previously conducted and data was provided to ICF Jones & Stokes for incorporation by reference: (1) 2001 general reconnaissance surveys, vegetation mapping, avian point counts, and Coastal



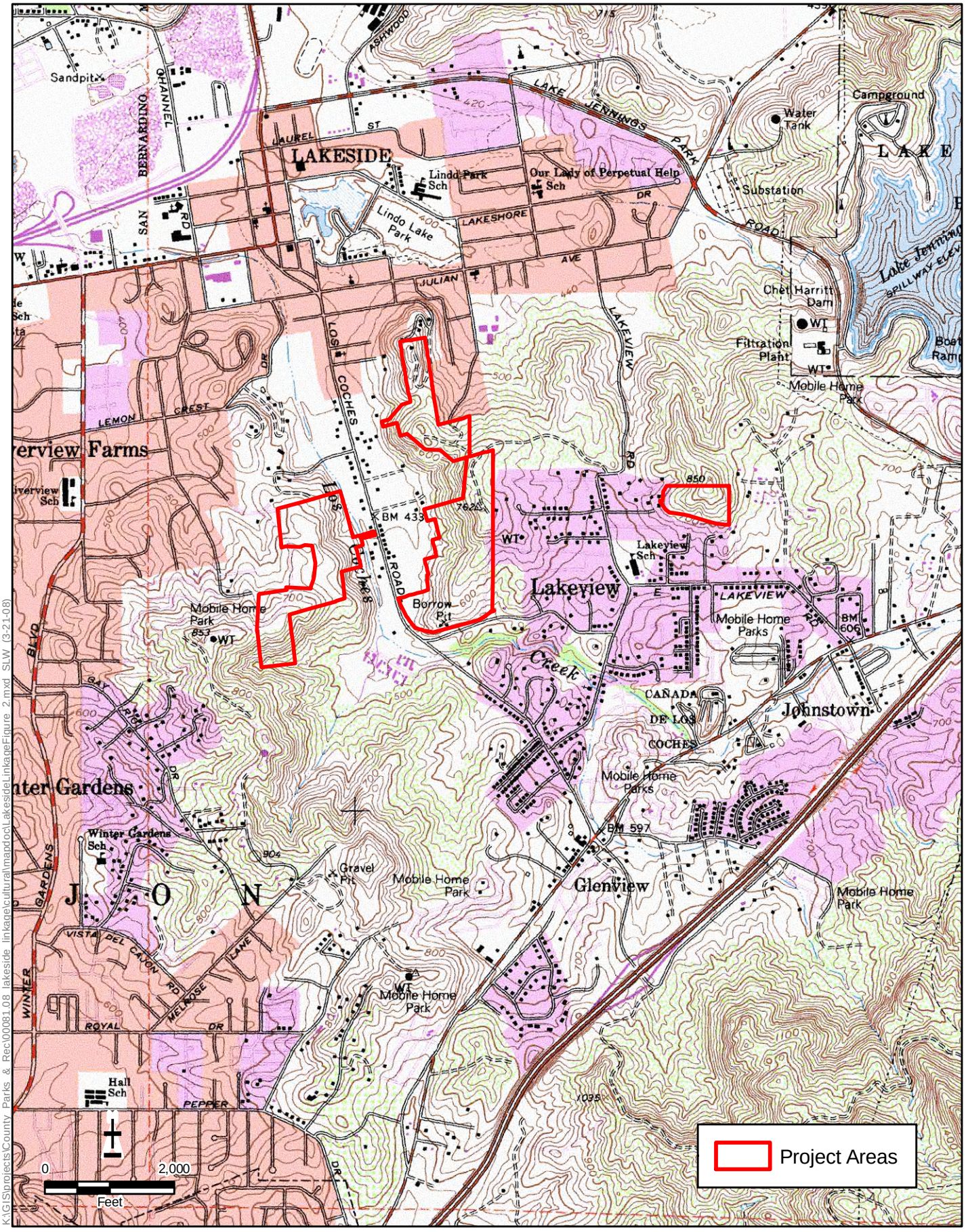
K:\GIS\projects\County Parks & Rec\00081.08 lakeside linkage\culturalmapdoc\LakesideLinkageFigure_1.mxd SLW (3-21-08)

SOURCE: ESRI Street Map (2008)

ICF Jones & Stokes
an ICF International Company

0 1
Miles

Figure 1
Regional Location
Lakeside-Linkage Preserve



K:\GIS\projects\County Parks & Rec\000081.08 lakeside linkage\culturalmapdoc\LakesideLinkageFigure 2.mxd SLW (3-21-08)

SOURCE: USGS 7.5' Quadrangle El Cajon 1967 Photorevised 1975

ICF Jones & Stokes
an ICF International Company

Figure 2
Project Vicinity
Lakeside Linkage Preserve

Chapter 2
Study Area

2.1 Physical and Climatic Conditions

2.1.1 Geography

The natural setting within the Preserve is characterized by steep coastal foothills with ridgelines separated by numerous small canyons, ravines, and drainages. Specifically, the two largest of the three Preserve properties, the western and central properties, lie on the western and eastern sides of Los Coches Creek. The third property lies immediately to the east of these properties (see Figure 2). Los Coches Creek flows into the San Diego River just north of the Preserve area. Elevations within the Preserve range between approximately 259 meters (m) (850 feet (ft)) above mean sea level (AMSL) along the northern edge of the easternmost property and approximately 140 m (460 ft) AMSL adjacent to Los Coches Creek in the southwest corner of the central property. The closest sources of fresh water are Los Coches Creek and the San Diego River.

2.1.2 Geology and Soils

The western and central Preserve properties are 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 Preserve, this exposed granitic bedrock is comprised of either the Woodson Mountain Granodiorite or the Green Valley Tonalite Formations, which consist principally of granodiorite, tonalite (quartz diorite), and minor occurrences of granite (Strand 1962; Weber 1963). Between these two properties is the Los Coches Creek Valley, which contains a narrow band of late Quaternary alluvium. The smaller eastern property lies in an area containing bedrock consisting of undifferentiated Pre-Cretaceous metamorphic rocks (Strand 1962).

Two general soil associations are represented within the Preserve: the Fallbrook-Vista association and the Friant-Escondido association (Figure 3). The Fallbrook-Vista association exists in rocky areas and consists of excessively drained to moderately well drained, gently sloping to very steep sandy loams to

silt loams on uplands in foothill areas with 9 to 30 percent slopes. The Friant-Escondido association exists in eroded areas and consists of well drained, fine sandy loams and very fine sandy loams over metasedimentary rock, with 30 to 70 percent slopes (USDA 1973). Within these associations, a number of specific soil types are present. The physical and chemical decomposition of the granitic rocks in the area has produced mainly two soil types, Vista and Cieneba. Vista soils, consisting of coarse sandy or rocky coarse loams ranging from 15 to 65 percent slopes, are present in the northern area of the central property and in the southern margins of the western property. Cieneba soils, consisting of very rocky coarse sandy loam with 30 to 75 percent slopes, are present in the central property and coarse sandy loam with 5 to 15 percent slopes occur in the southwestern area of the western property. Along the Los Coches Creek Valley, Grangeville fine sandy loam is present in areas of 0 to 2 percent slopes and Tujunga sand occurs in areas of 0 to 5 percent slopes. In the central property, in a transitional area between the granitic bedrock and the creek sediments, Fallbrook soils are present, consisting of sandy loam with 15 to 30 percent slopes. The eastern property is underlain principally by metamorphic bedrock. Here, friant soils are present, consisting of rocky fine sandy loam with 30 to 70 percent slopes (USDA 1973).

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 Western Regional Climate Center, a collaborative project of the National Oceanic and Atmospheric Agency and the Desert Research Institute, maintains a climatic station in El Cajon – the closest such station to the Preserve. Data collected at the station indicate that the area experiences a normal mean temperature of approximately 65 degrees Fahrenheit (^{o}F), with a mean maximum temperature of 77.8^{o}F and a mean minimum of 52.4^{o}F. The normal mean precipitation is approximately 12.2 inches. The El Cajon area tends to experience more sunshine than the coastal regions of southern California due to its inland location. In a normal year, precipitation at the Preserve averages 15 inches and falls mostly in the winter and spring (San Diego County Flood Control District 2007).

A predominant feature of the local climate is the sea-breeze/land-breeze cycle. During the daytime, particularly in the summer, 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. This cycle is also periodically affected by land airflow that dominates weather patterns. The most widely recognized of these are the Santa Ana conditions, during which strong, hot and dry easterly winds prevail for two- or three-day periods.

K:\GIS\PROJECTS\COUNTY_PARKS_&_REC\00081.08_LAKESIDE_LINKAGE\BIO\MAPDOC\AB_Soils.MXD AB (05-01-08)

ICF Jones & Stokes
an ICF International Company

N
0 300 600 Feet
1" = 600 ft

Figure 3
Soils Map
San Diego Parks and Rec, Lakeside Linkage

California Gnatcatcher spot mapping conducted on the central and western properties and (2) spring and summer 2007 vegetation mapping and rare plant surveys conducted on the western, central, and eastern properties. 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 within the three Preserve properties.

2.1.4 Fire Cycles

The Preserve properties are dominated by coastal sage scrub vegetation, which is naturally maintained by infrequent fires. If the natural fire cycle is suppressed, the coastal sage scrub 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 each Preserve property. Surrounding development and brush management actions associated with urban development have altered the fire cycles throughout most of western San Diego County. According to the County of San Diego fire burn data a small portion of the southern end of the western property burned in 1987; none of the other areas have burned in recent fires (Figure 4) (SanGIS 2008).

2.1.5 Hydrology

The Preserve properties are situated within the San Diego River Watershed area (Figure 4). Designated beneficial uses for the San Diego River and its tributaries include: municipal and domestic supply; agricultural supply; industrial service supply; industrial process supply; contact and non-contact water recreation; warm freshwater habitat; cold freshwater habitat; wildlife habitat; and rare, threatened, or endangered species habitat (California Regional Water Quality Control Board San Diego Region 2003). No blue-line streams occur on any of the three properties, although surface water flows likely are conveyed off of the western and central properties into Los Coches Creek. Water within Los Coches Creek eventually flows into the San Diego River.

2.1.6 Trails

Approximately 4.02 miles of existing trails occur within the Preserve (Figure 5). These trails are primarily used for recreational use including bicycling, hiking and horseback riding. In addition, off-highway vehicle use has been an ongoing issue within the western and central properties of the Preserve. Disturbed areas within the Preserve are an attractant to motorcycles and are being utilized.

This page intentionally left blank.

ICF Jones & Stokes
an ICF International Company

N

0 1,000 2,000 4,000
Feet

Figure 4
Watershed Map
San Diego Parks and Rec, Lakeside Linkage

ICF Jones & Stokes
an ICF International Company

N
0 300 600 1,200
Feet

Figure 5
Hermes Copper Larval Host Plant Locations
San Diego Parks and Rec, Lakeside Linkage

Chapter 3
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 Invertebrates

ICF Jones & Stokes biologists conducted focused surveys for the presence/absence of the Hermes Copper Butterfly (*Lycaena hermes;* Hermes Copper) within the three Preserve properties. This species is not currently listed; however, it has twice been proposed for listing and only 15 populations are known to exist in San Diego County after the Cedar fire destroyed 39% of the butterfly's suitable habitat and 19 known populations. Focused surveys for Hermes Copper occurred during the last two weeks of May 2008 and the first two weeks of June 2008 to coincide with the Hermes Copper flight season.

Qualified biologists conducted surveys on a roughly weekly basis under acceptable weather conditions. Approximately 3.2 acres of non-native grassland, 5.6 acres of disturbed habitat and 2.3 acres of urban/developed and ornamental vegetation were excluded from the survey area because these areas do not provide potentially suitable habitat for Hermes Copper. Each survey visit involved slowly walking transects throughout the areas of the three Preserve properties with highest potential for

Hermes Copper detection, i.e. areas considered to have the highest potential for Hermes Copper larval host plant populations of Spiny Redberry (*Rhamnus crocea*) (Figure 6). The survey visits were conducted at an average rate of 15 acres per hour. Surveyors stopped periodically to scan adjacent areas for moving butterflies. In addition, all butterfly species observed during the focused surveys were identified and recorded (Appendix A).

A Quino Checkerspot Butterfly (*Euphydryas editha quino*) survey was not completed as the three Preserve properties do not fall within the U.S. Fish and Wildlife (USFWS) recommended survey area. In addition to butterflies, several other invertebrates were either identified during active surveys or after being captured in the pitfall traps associated with the herptile arrays. All unidentifiable invertebrates were photographed, and those photographs were provided to a local entomologist for identification. All identified invertebrates are listed in the wildlife table in Appendix A.

3.2 Herpetofauna

ICF Jones & Stokes began surveys for herpetofauna (amphibians and reptiles) on the three Preserve properties in March and continued these surveys through July 2008. Terrestrial herpetological surveys were conducted using pitfall trap arrays as outlined in "Herpetological Monitoring Using a Pitfall Trapping Design in Southern California" (Stokes et al. 2001). This design uses a standardized array of pitfall traps, funnel traps, and drift fencing to perform long-term research over a wide geographic area with replicates among site localities, habitats, and environments.

The optimal design for drift fencing includes a three-arm array with seven pitfall traps and three funnel traps. This study's array design was consistent with this optimal design, and recommendations for array materials and trap construction were followed. As the site temperatures were not excessive during the trapping period, biologists constructed funnel traps with no pitfall trap retreat underneath, as described in the above referenced protocol.

Three sites were selected for the array construction within Diegan coastal sage scrub habitat in the western and central Preserve properties (Figure 5). One array (Array 2a) in the central portion was vandalized after the March trapping week. Another array was installed in a less conspicuous location in the central portion and labeled Array 2b on Figure 5 Pitfall array locations were mapped using GIS technologies.

All areas immediately surrounding the arrays were actively searched for herptiles during the array monitoring. Active searching included looking under shrubs and logs. All herptiles captured, or observed during active

ICF Jones & Stokes
an ICF International Company

N
0 300 600
Feet
1" = 600 ft

Figure 6
Herp Arrays and Existing Trails
San Diego Parks and Rec, Lakeside Linkage

searches and other wildlife surveys, were recorded and are included in the wildlife tables in Appendix A.

3.2.1 Monitoring Arrays

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

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

3.3 Birds

3.3.1 Diurnal Point Count Survey

Diurnal avian surveys were conducted using point count stations on all three properties of the Preserve. The point count stations for the western and central properties consisted of the same locations as the 2001 Draft Biological Reference Evaluation and Management Recommendations report (Figure 5). The point count surveys began in April 2008 and were completed in September 2008.

Avian use of the Preserve was formally documented through the use of point stations. Point counts provide a repeatable, quantitative sampling method for a broad spectrum of birds that is complementary to the general reconnaissance effort, strengthening the reference information developed on relative abundance of birds.

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

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

Stations were placed non-randomly to maximize sampling of the Preserve and to minimize coverage of outside areas. No particular features (e.g., plant community, slope or aspect) were selected for or avoided, primarily due to the broad objectives of the study. Stations were generally located at or near existing 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 (April through September). All birds detected, whether they were within the Preserve boundary or outside, were recorded during point count sampling. The assumption is that these individuals will use the area within the Preserve boundary at some point and are thus included in the data. If a sensitive species is only confirmed outside of the Preserve boundary, it is included in the point count data analysis as it does fall within the distance requirements but it's status on the Preserve will be treated as high potential to occur as it was not directly observed on the Preserve.

The following recommendations, drawn directly from Ralph et al. (1995), were followed:

- Stations were located at least 250 m (820 ft) apart to ensure independence (i.e., no or minimal overlapping of individual birds detected).
- Counts were conducted at each station for ten minutes (stratified into periods of 3, 2 and 5 minutes) and started quickly upon reaching the point.
- All detected birds were counted except for any judged to have been counted at a previous station.
- Both seen and heard individuals were recorded as long as clearly identified.
- Birds were recorded within each time stratum as: (1) within a 50 m (164 ft) radius from the station, (2) outside the 50 m (164 ft) radius, or (3) flying over. This will allow rudimentary density estimates (without weighting for detectability).
- Individuals were counted at the location where first detected and time of first detection, even when not identified until they have moved or a new time period has begun.
- Adverse weather was avoided (e.g., dense fog, strong winds, extended rain).

ICF Jones & Stokes
an ICF International Company

N
0 300 600
Feet
1" = 600 ft

Figure 7
Small Mammal Trap Line Locations
San Diego Parks and Rec, Lakeside Linkage

- Stations were counted in the same order each time, starting at approximately the same time relative to sunrise, and finishing within four hours after sunrise. Note that counting stations in the same order each time is recommended as the preferred method where the primary purpose of the data is for comparison with future data sets at the same Preserve. For the current work this was judged to be a higher priority than maximizing comparability with point counts investigating regional issues, which are best counted by randomizing the order of stations within sites and the order of sites within a day.

Additional point count methods used beyond those provided in Ralph et al. (1995) include:

- No attempts were made to attract birds, such as through use of taped vocalizations or "pishing" (imitating avian scold or alarm calls).
- Prior to the initial point counts, the observer practiced distance estimations by locating an object roughly 40 to 60 m (131 to 199 ft) away, assigning it as beyond or closer than 50 meters (160 ft), and then measuring the actual distance with a laser rangefinder (accuracy 0.5 m (1.6 ft)). This was done several times on several different days, in different directions, and on varied terrain, but always in open shrub lands similar to that in which the stations were located. 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 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 Preserve. However, totals here do include small numbers of birds judged to be foraging or hunting while in flight over the Preserve, as they are anticipated to be making use of the Preserve in the same way that a bird foraging from a perch at the same distance from the observer is making use of the Preserve. For the current work, most observations of swifts, swallows, and raptors (including Turkey Vultures) are included.

The point counts were designed as '2-interval' counts (referring to distance, not time), using the terminology of Bibby et al. (2000; pp. 101-102). A radius of 50 m (164 ft) was set, and all birds recorded were categorized as inside or outside of the resulting circle. This allows a calculation of density with an adjustment for detectability, but one must guess in applying the detectability adjustment, as this format does not allow testing of how detectability for a given species attenuates across distance (e.g., half normal to a fixed limit). Because the sample size is limited and fragmentation and disturbance make generalizations about distribution across the site tenuous, no density-based estimates of total abundance are provided for any species based on the current results.

3.3.2 Nocturnal Bird Survey

Prior to implementation of the point count surveys nocturnal bird surveys were conducted for nighttime birds on each of the three properties. Methods include a combination of walking and slowly driving roads, looking and listening for birds. A moderately powerful flashlight was used to aid identifications.

3.3.3 Coastal California Gnatcatcher

Intensive surveys were conducted within the three properties of the Preserve for avian species; however, these results have not provided a complete picture of the usage of the Preserve by the Coastal California Gnatcatcher (*Polioptila californica californica*). Surveys for this species were conducted in October 2008 to identify the number of Coastal California Gnatcatcher pairs residing on the Preserve.

3.4 Small Mammal Trapping

On March 3, 2008, ICF Jones & Stokes biologists Phillip Richards and Korey Klutz assessed the physical conditions, vegetative community distribution, vegetative cover, and accessibility for planning the trapping program for small mammals. Parcels were visually inspected to determine representative small mammal sampling locations. For the purposes of this project, "small mammals" include species in the shrew, squirrel, pocket gopher, heteromyid, mouse, rat, and vole families.

Small mammal trapping on the Preserve consisted of three traplines totaling 200 traps. Each trapline was set for four nights for a total of 800 trap nights. All 3 traplines were initially set and baited during the afternoon of June 23, 2008. Traps were systematically checked in the early morning between 4:00 and 10:00 from June 24 through June 27, 2008. Trapline 1, located on the eastern parcel, consisted of 25 traps. Trapline 2, located on the center parcel, consisted of 75 traps. Trapline 3, located on the western parcel, consisted of 100 traps. A summary of trapping personnel, dates, times, and weather conditions are provided in Table1 and brief description of the traplines is provided in Table 2.

All trapline locations are depicted on Figure 7. 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., rock outcrops). Sequentially numbered 12-inch Sherman live traps were set at dusk, approximately 5 to 10 m (16 to 33 ft) apart. Traps were sign set and placed where potential small rodent captures were judged to be most probable. Where rodent sign was not apparent, traps were placed near the base of shrubs. The location of each trap was recorded using a recreational grade GPS

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

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

Table 1. Personnel, Date, Time, and Conditions of the Small Mammal Trapping Program at the Preserve in 2008

Trapline	Personnel	Date Checked	Time Checked	Conditions
1	Phillip Richards James Hickman	6/24/08	0522	Cloudy; 62°F; Wind 0; No Moon Visible; Moderate-High Humidity
		6/25/08	0400	Cloudy; 62°F; Wind 0; No Moon Visible; Moderate-High Humidity
		6/26/08	0410	Cloudy; 62°F; Wind 0; No Moon Visible; Moderate-High Humidity
		6/27/08	0400	Cloudy; 61°F; Wind 0; No Moon Visible; Moderate-High Humidity
2	Phillip Richards James Hickman	6/24/08	0626	Cloudy; 64°F; Wind 0; No Moon Visible; Moderate-High Humidity
		6/25/08	0815	Cloudy; 65°F; Wind 0-3; No Moon Visible; Moderate-High Humidity
		6/26/08	0656	Cloudy; 64°F; Wind 0; No Moon Visible; Moderate-High Humidity
		6/27/08	0800	Partly Cloudy; 63°F; Wind 0-3; No Moon Visible; Moderate-High Humidity
3	Phillip Richards James Hickman	6/24/08	0840	Clear; 70°F; Wind 0-3; No Moon Visible; Moderate-High Humidity
		6/25/08	0516	Cloudy; 64°F; Wind 0-2; No Moon Visible; Moderate-High Humidity
		6/26/08	0502	Cloudy; 64°F; Wind 0; No Moon Visible; Moderate-High Humidity
		6/27/08	0507	Cloudy; 62°F; Wind 0; No Moon Visible; Moderate-High Humidity

Table 2. Trapline Description

Trapline	Trap Nights	Number of Traps	Trap Sequence	Physical Description	Vegetative Community
1	4	25	1 - 25	South facing slope on hillside; soils mostly loamy with scattered rock outcrops; dense shrub cover.	Diegan coastal sage scrub
2	4	75	26 - 100	Ridgeline; soils mostly loamy, with scattered rock outcrops, low growing scrub	Diegan coastal sage scrub
3	4	100	101 - 200	Low hill top; soils mostly loamy with scattered rock outcrops; mixed densities of shrubs	Diegan coastal sage scrub

3.5 Medium and Large Mammals

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

3.5.1 Camera Tracking Stations

Remote camera stations were used to help document the presence of medium and large mammals within the Preserve. These stations allow for the detection of species that are rarely encountered because of their nocturnal or crepuscular activity patterns. Within the Preserve, two camera tracking stations were set up at locations that were judged to have a high potential for movement of medium and large mammals (e.g., along game trails, abandoned roadways, and hiking trails; Figure 8).

Each station consisted of one Moultrie infrared digital game camera. These cameras were programmed to record an image every time the motion sensor was triggered. Each image includes an information tag that records the date, time, temperature, camera id, and moon phase. Once in place, the cameras were periodically checked and all recorded images were downloaded to a portable hard drive. This method allowed us to keep the cameras running continuously throughout the study period (June 10 – September 4, 2008). The digital images were then interpreted and all animals were identified to the species level.

3.5.2 Mammal Track and Sign Survey

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

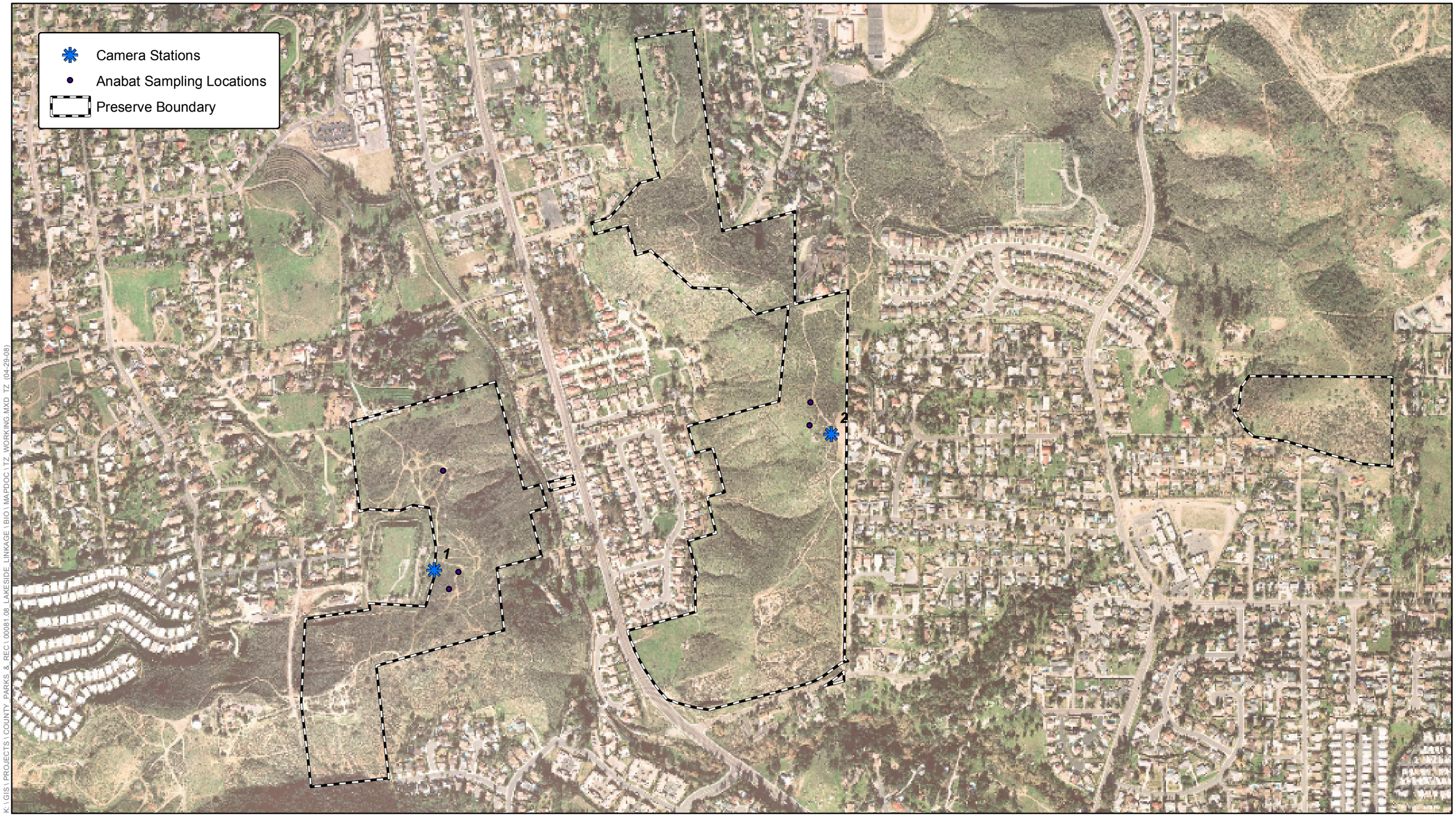
3.6 Bats

ICF Jones & Stokes biologist Kailash Mozumder and San Diego Natural History Museum biologist Drew Stokes conducted a comprehensive survey of the Preserve properties on March 25, 2008 to determine locations for conducting acoustic surveys for bats. The survey locations that were selected include two rocky outcrops - one in the western property and one in the central property of the Preserve. All survey locations were mapped using GIS technologies.

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

3.6.1 Passive Surveys

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



K:\GIS\PROJECTS\COUNTY_PARKS_&_REC\00081.08_LAKESIDE_LINKAGE\BIO\MAPDOC\TZ_WORKING.MXD TZ (04-29-08)

ICF Jones & Stokes
an ICF International Company

N

0 300 600 Feet

1" = 600 ft

Figure 8
Anabat & Cameral Stations
San Diego Parks and Rec, Lakeside Linkage

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

3.6.2 Active Surveys

One active roost survey was conducted using an Anabat bat detector and surveyors listened for audible bat echolocation calls in an attempt to document bats that might be roosting in the cliffs and rocky outcrops on the Preserve as they exit their roosts in the early evening. The survey was conducted at a group of cliffs/rock outcrops located near the north end of the central property of the Preserve on August 19, 2008.

Preserve Boundary

Special status plant species

- Viguiera laciniata
- Viguiera laciniata

Potential sensitive butterfly host plant

- Castilleja exserta (Quino)
- Rhamnus crocea (Hermes Copper)
- Rhamnus crocea (Hermes Copper)

Invasive plant

- Ailanthus altissima
- Ailanthus altissima
- Eucalyptus sp.
- Eucalyptus sp.
- Olea europaea
- Pennisetum setaceum
- Schinus molle

Nesting habitat for coastal cactus wren

- Opuntia littoralis
- Opuntia littoralis

Vegetation Communities

- Diegan Coastal Sage Scrub (CSS, 32500)
- Disturbed Diegan Coastal Sage Scrub (DCSS, 32500)
- Disturbed Habitat (DIST, 11300)
- Non-native Grassland (NNG, 42200)
- Ornamentals (ORN, 11000)
- Urban/Developed (DEV, 12000)

K:\GIS\PROJECTS\COUNTY_PARKS_&_REC\00081.08_LAKESIDE_LINKAGE\BIO\MAPDOC\TZ_WORKING.MXD TZ (04-29-08)

ICF Jones & Stokes
an ICF International Company

N

0 300 600 Feet

1" = 600 ft

Figure 9
Vegetation Communities and Special Status Plant Map
San Diego Parks and Rec, Lakeside Linkage

Chapter 4
Results and Discussion

4.1 Vegetation

Overall, the three Preserve properties are primarily dominated by Diegan coastal sage scrub plant species. Land cover types identified in 2007 by Fred Sproul included Diegan coastal sage scrub, disturbed Diegan coastal sage scrub, disturbed habitat, non-native grassland, ornamentals and urban/developed lands (Figure 9; Table 3). In addition, one special status plant species, San Diego sunflower (*Viguiera laciniata*), was documented in several locations on each of the Preserve properties (see Figure 9). Invasive plant species documented on the Preserve include Tree of Heaven (*Ailanthus altissima*), Eucalyptus (*Eucalyptus* sp.), European Olive (*Olea europea*), Fountain Grass (*Pennisetum setaceum*) and Peruvian Pepper (*Schinus molle*) (see Figure 9).

Table 3. Land Cover Types within the Preserve

Vegetation/Land Cover Type	Acreage
Diegan Coastal Sage Scrub	104.5
Disturbed Diegan Coastal Sage Scrub	19.5
Disturbed Land	5.6
Nonnative Grassland	3.2
Urban/Developed	1.9
Ornamentals	0.4
Total	**135.1**

4.2 Invertebrates

All invertebrates identified on the Preserve below the level of family are included in Appendix B.

4.2.1 Butterflies

Focused surveys for Hermes Copper occurred during the months of May and June, 2008. No Hermes Copper butterflies were observed. Other butterflies observed during the focused Hermes Copper surveys, herptile array and avian point count surveys include: Sara's Orangetip (*Anthocaris sara*), Behr's Metalmark (*Apedemia mormo virgulti*), Brown Elfin (*Callophyrs augustinus*), Orange Sulfur (*Colias eurytheme*), Funereal Duskywing (*Erynnis funeralis*), Pale Swallowtail (*Papillo eurymedon*), Common White (*Pontia protodice*), Painted Lady (*Vanessa annabella*), West Coast Lady (*Vanessa annabelle*), and Anise Swallowtail (*Papilio zelicaon*).

4.2.2 Other Invertebrates

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

4.2.3 Special-Status Invertebrate Species

No special-status invertebrate species are reported for the Preserve by the CNNDB (CDFG 2008).

Special-Status Invertebrate Species Observed

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

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

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

4.3 Amphibians

No amphibian species were captured by the herptile arrays or detected within the Preserve properties during other active surveys.

Amphibians with potential to occur on the Preserve are limited to Western Toad (*Bufo boreas*), Arboreal Salamander (*Aneides lugubris*), Garden Slender Salamander (*Batrachoseps major major*), and Common Ensatina (*Ensatina eschscholtzi*).

4.3.1 Special-Status Amphibian Species

Special-Status Amphibian Species Observed

No sensitive amphibian species were detected during the 2008 surveys.

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

No sensitive amphibian species have high potential to occur at the Preserve.

4.4 Reptiles

During the 2008 sampling at the Preserve, nine reptile species were detected (Table 4, Appendix A). Sensitive species captured include California Legless Lizard (*Anniella pulchra*), Coronado Skink (*Eumeces skiltonianus interparietalis*), Orange-throated Whiptail (*Cnemidophorus hyperythrus beldingi*), Coastal Western Whiptail (*Cnemidophorus tigris stejnegeri*), and San Diego Ringneck Snake (*Diadophis punctatus similis*). Other species captured include Southern Alligator Lizard (*Elgaria multicarinata*), Western Fence Lizard (*Sceloporus occidentalis*), Granite Spiny Lizard (*Sceloporus orcutti*), and Side-blotched Lizard (*Uta stansburiana*). One additional reptile species was observed or detected but not captured in the arrays, the Gopher Snake (*Pituophis catenifer*).

Based on the presence of potentially suitable habitat, several species may also occur onsite. Sensitive species include: San Diego Horned Lizard (*Phrynosoma coronatum blainvillii*), Coastal Rosy Boa (*Lichanura trivirgata roseofusca*), Coast Patch-nosed Snake (*Salvadora hexalepis vigultea*), and Red Diamond Rattlesnake (*Crotalus ruber ruber*). Other potential species include Western Banded Gecko (*Coleonyx variegatus*), Gilbert's Skink (*Eumeces gilberti*), Granite Night Lizard (*Xantusia henshawi*), Western Racer (*Coluber mormon*), Speckled Rattlesnake (*Crotalus mitchellii*), Western Rattlesnake (*Crotalus oreganus*), Western Blind Snake (*Leptotyphlops humilis*), Night Snake (*Hypsiglena torquata*), Coachwhip (*Masticophis flagellum*), Striped Racer (*Masticophis lateralis*), Longnose Snake (*Rhinocheilus lecontei*), Western Blackhead Snake (*Tantilla planiceps*), and Lyre Snake (*Trimorphodon biscutatus*).

Table 4. Reptile Species Observed or Captured at the Preserve in 2008

Scientific Name	Common Name	Special Status
Elgaria multicarinata	Southern Alligator Lizard	
Anniella pulchra	California Legless Lizard	CSC, CSDS Group I
Sceloporus occidentalis	Western Fence Lizard	
Sceloporus orcutti	Granite Spiny Lizard	
Uta stansburiana	Side-blotched Lizard	
Eumeces skiltonianusinterparietalis	Coronado Skink	CSC, CSDS Group I
Cnemidophorus hyperythrus beldingi	Orange-throated Whiptail	CSC, MSCP, CSDS Group I
Cnemidophorus tigris stejnegeri	Coastal Western Whiptail	CSDS Group I
Pituophis catenifer	Gopher Snake	
Diadophis punctatus similis	San Diego Ringneck Snake	CSDS Group I

Legend:

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

4.4.1 Special-Status Reptile Species

Five special-status reptile species were detected during the surveys: California Legless Lizard, Coronado Skink, Orange-throated Whiptail, Coastal Western Whiptail, and San Diego Ringneck Snake.

Special-Status Reptile Species Observed

California Legless Lizard (*Anniella pulchra pulchra*)

State Species of Special Concern, San Diego County Group II

The California (or Silvery) Legless Lizard is a small slender lizard that ranges from the southern edge of the San Joaquin River southward to the Mexican border (CDFG 2005). This species is sometimes confused for a snake but upon close observation, the presence of eyelids indentifies the animal as a lizard. Legless Lizards are common in a variety of vegetation communities including coastal dune, valley-foothill, chaparral, and coastal scrub (CDFG 2005). This lizard lives mostly underground, burrowing in loose sandy soil and is tolerant of low temperatures, so it can be found foraging in loose soil, sand, and leaf litter on cool days and during the cooler times of day (morning and evening). The decline of this species is due to loss of habitat due to agriculture and development and the introduction of non-native plant species such as ice plant (California Herps 2008). This species was captured in Array 1 in May 2008.

Coronado Skink (*Eumeces skiltonianus interparietalis*)

State Species of Special Concern, San Diego County Group II

The Coronado Skink is a medium-sized secretive lizard that is typically found in the moister areas of coastal sage, chaparral, oak woodlands, pinon-juniper, riparian woodlands and pine forests (Jennings and Hayes 1994). Their prey includes small invertebrates found in leaf litter or dense vegetation at the edges of rocks and logs. The Coronado Skink is found along the coastal plain and Peninsular Ranges west of the deserts from approximately San Gorgonio Pass in Riverside County south to San Quentin, Mexico (Jennings and Hayes 1994). This species was captured at herptile Array 1 in April 2008.

Orange-throated Whiptail (*Cnemidophorus hyperythrus beldingi*)

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

The Orange-throated Whiptail is a medium-sized lizard that ranges from Southern California (specifically Corona del Mar in Orange County and Colton in San Bernardino County) southward to the tip of Baja California, Mexico. Historically, most populations of the orange-throated whiptail were found on floodplains or terraces along streams in brushy areas with loose soil and rocks (McGurty 1980). Habitat types they are known to use include chaparral, non-native grassland, coastal sage scrub, juniper woodland, and oak woodland. California Buckwheat is an important indicator of appropriate habitat for Orange-throated Whiptails (Dudek 2000). This plant species is a colonizer of disturbed, sandy soils and usually indicates open shrub spacing that is required for foraging and thermoregulatory behavior. Orange-throated Whiptails appear to be dietary specialists with most (> 85%) of its prey being comprised of termites (Dudek 2000). The decline of Orange-throated Whiptails is likely due to loss of habitat to agriculture and urban development. This species was captured at herptile Arrays 1, 2, and 3 in March, April, May, June and July 2008.

Coastal Western Whiptail (*Cnemidophorus tigris multiscutatus*)

San Diego County Group II

Coastal Western Whiptail is a medium-sized slender lizard that is found in arid and semiarid desert to open woodlands where the vegetation is sparse so running is easy (Stebbins 2003). Its range includes coastal Southern California and western Baja California. The decline of Coastal Western Whiptails is likely due to loss of habitat to agriculture and urban development. This species was captured at herptile Array 1, 2 and 3 in April 2008.

San Diego Ringneck Snake (*Diadophis punctatus similis*)

San Diego County Group II

The San Diego Ringneck Snake is a small, thin snake that prefers moist habitats, including wet meadows, rocky hillsides, gardens, farmland, grassland, chaparral, mixed coniferous forests, and woodlands (Stebbins 2003). It is secretive in its behavior, usually found under the cover of rocks, wood, bark, boards, and other surface debris. Ringneck snakes eat small salamanders, tadpoles, small frogs, small snakes, lizards, worms, slugs, and insects. This species' range includes San Diego County along the coast and into the Peninsular range, southwestern San Bernardino County, and barely south into northern Baja California (Stebbins 2003). Threats to this species include habitat degradation and fragmentation from urban development. One San Diego Ringneck Snake was captured Array 2 in June 2008.

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

San Diego Horned Lizard (*Phyrnosoma coronatum blainvillii*)

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

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

The San Diego Horned Lizard's insectivorous diet consists mostly of native Harvester Ants (*Pogonmyrmex* sp.) which make up over 90% of their prey items, but it is an opportunistic feeder that will take other insects including termites, beetles, flies, wasps, and grasshoppers (Stebbins 2003, Jennings and Hayes 1994). This species has disappeared from about 45% of its former range and a number of factors have led to this decline including habitat fragmentation and degradation, loss of native prey to exotic species, and extensive collection for the curio trade (Jennings and Hayes 1994). The specialized diet of Harvester Ants has made Horned Lizards especially vulnerable to extirpation since the introduction of Argentine Ants (*Linepithema humile)*. This species has high potential to occur in the coastal sage scrub found at the Preserve.

CAGN pair
Unconfirmed CAGN Pair
COHA = Cooper's Hawk
RCSP = Southern California Rufous Crowned Sparrow
WEBL = Western Bluebird
TUVU = Turkey Vulture
RSH = Red Shouldered Hawk
Juvenile CAGN
CAGN = California Gnatcatcher
WEWH = Coastal Western Whiptail
COSK = Coronado Skink
OTWH = Orange-throated Whiptail
SDRS = San Diego Ringneck Snake
SILL = Silvery Legless Lizard
Sensitive Species Detected During Avian Point Count Surveys
Preserve Boundary

CAGN, RCSP, RSHA
OTWH
SDRS
CAGN, COHA, RSHA
SILL
COSK
WEWH
OTWH
CAGN, CCWR, RCSP, WEBL
CAGN
CAGN, RCSP
COHA, TUVU
OTWH
RSHA
TUVU
OTWH
CAGN
OTWH
CAGN
CAGN
CAGN, COHA, TUVU
TUVU
OTWH
RCSP, RSHA, TUVU
OTWH
WEWH
RCSP

ICF Jones & Stokes
an ICF International Company

N
0 300 600
Feet
1" = 600 ft

Figure 10
Special Status Wildlife Species
Lakeside Linkage Preserve

Coastal Rosy Boa (*Charina trivirgata roseofusca*)

San Diego County Group II

Coastal Rosy Boas are heavy-bodied snakes that inhabit arid scrublands, semi-arid and rocky shrublands, rocky deserts, canyons, and other rocky areas (Stebbins 2003). This species eats rodents, small birds, lizards, small snakes, and amphibians and kills its prey by constriction. Coastal Rosy Boas occur in southwestern California from the coastal slopes of the San Gabriel and San Bernardino mountains, and across the peninsular ranges into the desert in San Diego County (Stebbins 2003). Threats to this species include habitat degradation and fragmentation from urban development. This species has the potential to occur in any of the habitats found on the Preserve.

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

State Species of Special Concern, San Diego County Group II

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

Red Diamond Rattlesnake (*Crotalus ruber ruber*)

State Species of Special Concern, San Diego County Group II

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

4.5 Birds

Professional judgment determined avian species richness (total species detected) within the Preserve to be moderate. In total, 62 bird species were detected with 53 bird species during the point counts and nine during other fieldwork. These included year-round residents, winter-only species, breeding species that migrate to the Neotropics, and species that are strictly migratory through the Preserve, neither breeding nor wintering there.

The Preserve's avifauna is a mixture of species that are closely associated with coastal sage scrub and also with development as each of the properties of the Preserve are surrounded by development. These species include California Quail (*Callipepla californica*), Mourning Dove (*Zenaida macroura*), Costa's Hummingbird (*Calypte costae*), Anna's Hummingbird (*Calypte anna*), Cassin's Kingbird (*Tyrannus vociferans*), Western Scrub-jay (*Aphelocoma californica*), American Crow (*Corvus brachyrhynchos*), Common Raven (*Corvus corax*), Cliff Swallow (*Petrochelidon pyrrhonota*), Bushtit (*Psaltriparus minimus*), Bewick's Wren (*Thryomanes bewickii*), Wrentit (*Chamaea fasciata*), Northern Mockingbird (*Mimus polyglottos*), California Thrasher (*Toxostoma redivivum*), Spotted Towhee (*Pipilo maculates*), California Towhee (*Pipilo crissalis*), Southern California Rufous-crowned Sparrow (*Aimophila ruficeps canescens*), House Finch (*Carpodacus mexicanus*), Lesser Goldfinch (*Carduelis psaltria*), and House Sparrow (*Passer domesticus*).

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

A survey for Coastal California Gnatcatcher was conducted, with breeding season (May – June) and autumn (October) components. Each survey component consisted of two complete visits to all potentially suitable habitat by a qualified and experienced biologist, without use of taped vocalizations. The spring component also included data gathered anecdotally during the avian point count work. Thus, the survey was not equivalent in methods to a formal, presence/absence survey.

Coastal California Gnatcatchers were detected on the central and western properties of the Preserves. The central property was confirmed to support at least three pairs, probably four, with low but reasonable potential for five; thus the estimate is 3 to 5 pairs. One additional lone California Gnatcatcher was detected on this property during October 2008 (age/sex not determined). The western property was confirmed to

support at least one pair and potentially two pairs. One additional lone Coastal California Gnatcatcher was detected on this property during October 2008 (age/sex not determined). No Coastal California Gnatcatchers were detected on the eastern property. The eastern property does not support coastal sage scrub appropriate for this species as it is dominated by Laurel Sumac (*Malosma laurina*).

The tentative Preserve total is four to six pairs of Coastal California Gnatcatchers. There appears to be fewer pairs on the western property than in 2001. In 2001, the estimates were three to five pairs on the central property and three on the western property. The site currently appears to hold fewer pairs than potential capacity based on the number of acres of apparently suitable habitat available and the numbers of pairs detected. As discussed below, this may reflect either random (e.g., year-to-year) variation or a systematic change, though no obvious, relevant change in conditions between 2001 and 2008 was detected.

The general use areas of the pairs are shown from detections of the birds and marking their locations on aerial photos (Figure 10). No formal territory mapping program was conducted during 2008. It should be noted that in some instances, there are only two observation points associated with a pair location. These are not intended to show the complete home range of the California Gnatcatcher pairs on the Preserve, but rather show where these birds were detected in 2008.

The gnatcatcher use areas and the numbers present on a site are dynamic between seasons and between years. Home range changes can vary dramatically in response to resource availability, mate changes or loss, fledging of young, season, interspecific competition, predator dynamics, and human disturbance. Data from the 2008 survey indicates four to six pairs currently on the Preserve. The actual number could be higher as there is suitable habitat surrounding the Preserve that was not surveyed for the species and birds could move into the Preserve at any time. In addition, without individual markers that can identify the birds, there is no assurance that the detected birds were the same each time.

The Preserve does not support any habitat appropriate for use by Southwestern Willow Flycatcher (*Empidonax traillii extimus*) or Least Bell's Vireo (*Vireo bellii pusillus*) for breeding. It is possible that other subspecies of Willow Flycatcher pass through the Preserve in spring and fall, though they were not recorded during the current work.

4.5.1 Point Count Results

As detailed in Section 3.4, ten-minute avian point counts were conducted at twelve stations monthly from April through September 2008 (Figure 5). ICF Jones & Stokes Wildlife Biologists Kurt Campbell and Kylie

Fischer conducted the counts. Kurt Campbell sampled stations 0 through 10 and Kylie Fischer sampled station 11.

A total of 62 bird species were detected during the survey of the Preserve: 53 bird species were detected during the point counts and nine were detected during other fieldwork (Table 5). The most numerous bird and/or regularly encountered species were Mourning Dove, Anna's Hummingbird, American Crow, Common Raven, Cliff Swallow, Bushtit, Bewick's Wren, Wrentit, Northern Mockingbird, California Towhee, House Finch, and Lesser Goldfinch. Most of the species identified in Table 5 as confirmed breeders and probable breeders were regularly detected during the point counts.

Table 5. Avian Species Detected at the Preserve in 2008

Scientific Name	Common Name	Observed or Detected	Special Status	Breeding Status
Anas platyrhynchos	Mallard	X		
Callipepla californica	California Quail	X		pr
Cathartes aura	Turkey Vulture	X	CSDS Group I	
Accipiter cooperii	Cooper's Hawk	X	MSCP, CSDS Group I	?
Buteo lineatus	Red-shouldered Hawk	X	CSDS Group I	pr
Buteo jamaicensis	Red-tailed Hawk	X		pr
Falco sparverius	American Kestrel	X		?
Hydroprogne caspia	Caspian Tern	XFB		
**Columba livia*	Rock Pigeon	X		pr
Zenaida macroura	Mourning Dove	X		pr
*	Parrot Species	X		
Geococcyx californianus	Greater Roadrunner	X		
Tyto alba	Barn Owl	O	CSDS Group II	?
Bubo virginianus	Great Horned Owl	O		?
Aeronautes saxatalis	White-throated Swift	X		
Calypte anna	Anna's Hummingbird	X		pr
Calypte costae	Costa's Hummingbird	X		pr
Picoides nuttallii	Nuttall's Woodpecker	X		?
Colaptes auratus	Northern Flicker	O		
Empidonax difficilis	Pacific-slope Flycatcher	X		
Sayornis nigricans	Black Phoebe	X		pr
Sayornis saya	Say's Phoebe	O		
Myiarchus cinerascens	Ash-throated Flycatcher	X		
Tyrannus vociferans	Cassin's Kingbird	X		CO

Scientific Name	Common Name	Observed or Detected	Special Status	Breeding Status
Tyrannus verticalis	Western Kingbird	X		
Aphelocoma californica	Western Scrub-Jay	X		pr
Corvus brachyrhynchos	American Crow	X		pr
Corvus corax	Common Raven	X		pr
Tachycineta thalassina	Violet-green Swallow	X		
Stelgidopteryx serripennis	Northern Rough-winged Swallow	X		
Petrochelidon pyrrhonota	Cliff Swallow	X		
Hirundo rustica	Barn Swallow	O		
Psaltriparus minimus	Bushtit	X		pr
Campylorhynchus brunneicapillus sandiegensis	San Diego Cactus Wren (=Coastal Cactus Wren)	X	CSC, MSCP, CSDS Group I	
Thryomanes bewickii	Bewick's Wren	X		pr
Troglodytes aedon	House Wren	X		?
Polioptila caerulea	Blue-gray Gnatcatcher	O		
Polioptila californica californica	Coastal California Gnatcatcher	X	ST, CSC, MSCP, CSDS Group I	pr
Sialia mexicana	Western Bluebird	X	MSCP, CSDS Group II	
Catharus ustulatus	Swainson's Thrush	X		
Turdus migratorius	American Robin	O		
Chamaea fasciata	Wrentit	X		pr
Mimus polyglottos	Northern Mockingbird	X		pr
Toxostoma redivivum	California Thrasher	X		pr
**Sturnus vulgaris*	European Starling	X		?
Phainopepla nitens	Phainopepla	X		pr
Vermivora celata	Orange-crowned Warbler	X		
Dendroica coronata	Yellow-rumped Warbler	O		
Wilsonia pusilla	Wilson's Warbler	X		
Piranga ludoviciana	Western Tanager	X		
Pipilo maculatus	Spotted Towhee	X		pr
Pipilo crissalis	California Towhee	X		pr
Aimophila ruficeps canescens	Southern California Rufous-crowned Sparrow (=California Rufous-crowned Sparrow)	X	MSCP, CSDS Group I	pr
Zonotrichia leucophrys	White-crowned Sparrow	O		
Pheucticus melanocephalus	Black-headed Grosbeak	X		

Scientific Name	Common Name	Observed or Detected	Special Status	Breeding Status
Agelaius phoeniceus	Red-winged Blackbird	X		
**Molothrus ater*	Brown-headed Cowbird	X		?
Icterus cucullatus	Hooded Oriole	X		?
Icterus bullockii	Bullock's Oriole	X		?
Carpodacus mexicanus	House Finch	X		pr
Carduelis psaltria	Lesser Goldfinch	X		pr
**Passer domesticus*	House Sparrow	X		

Legend

*=Non-native or invasive species

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

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

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

Tables 6 and 7 provide quantitative summaries of the results for species and individuals. Anecdotally, the abundance and species richness observed during the avian point counts appear to be fairly typical for relatively uniform sage scrub sites in southern California. Abundance ranges from 65 observations at station 10 to 173 observations at station 11. The greatest number of species were detected at station 11 (31 species) and the lowest number was at stations 4 and 9 (17 species). Twelve observations of unknown hummingbird species were excluded from the calculation of total species. These were most likely female and/or juvenile Black-chinned, Anna's or Costa's hummingbirds that were seen in flight and the lighting and circumstances did not allow the observer to see any identifying characteristics beyond type of bird. Included in the species calculations is one sighting of an unknown parrot species and one sighting of an unknown swallow species. These birds were seen in flight and the lighting and circumstances did not allow the observer to see any identifying characteristics beyond type of bird.

Species richness of breeding birds appears about as expected given the food and nest site resources available. Virtually no hole-nesting habitat is available on the Preserve, and cavity nesters such as woodpeckers and western bluebird were present mainly as peripheral species due to adjacent resources in developed areas.

Table 6. Avian Point Counts–Totals for Individuals*

	Point Count Stations												Total # of Individuals	Mean # of Individuals
Month	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**		
April	15	9	19	19	13	11	28	13	10	16	9	23	185	15.4
May	24	7	19	10	15	18	32	30	14	8	15	28	220	18.3
June	22	8	15	17	10	14	18	28	13	15	7	51	218	18.2
July	10	21	16	11	12	10	20	27	5	11	12	26	181	15.1
August	16	8	13	16	22	8	33	9	23	14	10	23	195	16.3
September	9	25	8	8	13	11	16	17	18	16	12	22	175	14.6
Total # of Individuals	96	78	90	81	85	72	147	124	83	80	65	173	1174	
Mean # of Individuals	16.0	13.0	15.0	13.5	14.2	12.0	24.5	20.7	13.8	13.3	10.8	28.8		16.3

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

Table 7. Avian Point Counts–Totals for Species*

	Point Count Stations													
Month	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**Total # of Species**	**Mean # of Species**
April	9	9	9	8	8	8	14	10	10	9	7	12	31	11.1
May	11	7	11	7	9	8	13	14	12	7	12	13	36	12.3
June	9	7	7	11	7	10	14	12	7	8	5	18	33	11.4
July	6	10	10	11	6	12	11	14	5	9	6	14	33	11.3
August	8	8	9	5	7	6	11	9	7	9	7	12	30	9.8
September	8	7	9	4	8	8	6	10	9	10	9	13	27	9.8
Total # of Species	21	19	18	22	17	21	28	23	22	17	22	31		
Mean # of Species	8.5	8.0	9.2	7.7	7.5	8.7	11.5	11.5	8.3	8.7	7.7	13.7		11.0

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

4.5.2 Nocturnal Survey Results

The nocturnal bird surveys documented two nocturnal species using the Preserve: Barn Owl and Great Horned Owl. A Barn Owl was detected during nocturnal surveys in April, July and September 2008. Great horned owl was detected in April, May, August and September 2008. These species may be breeding on the Preserve or within trees in the surrounding residential neighborhoods. There is low potential for Common Poorwill (*Phalaenoptilus nuttallii*) and Lesser Nighthawk (*Chordeiles acutipennis*) as these species are sensitive to disturbance and development and the Preserve has a high level of human usage and is surrounded by development.

4.5.3 Special-Status Bird Species

Eight special-status species were detected during the point counts: Turkey Vulture, Cooper's Hawk, Red-shouldered Hawk, Barn Owl, San Diego Cactus Wren (*Campylorhynchus brunneicapillus sandiegensis*), Coastal California Gnatcatcher (*Polioptila californica californica*), Western Bluebird (*Sialia mexicana*), and Southern California Rufous-crowned Sparrow (*Aimophila ruficeps canescens).* See Figure 10 for locations of special-status birds detected during surveys of the Preserve.

Special-Status Bird Species Observed

Turkey Vulture (*Cathartes aura*)

San Diego County Group I

Turkey Vultures are often seen foraging over woodlands and nearby open country (Unitt 2004). They prefer dry, open country, ranch lands and often occur along roadsides where carrion is common. They nest in crevices among granite boulders (Unitt 2004). The Turkey Vulture's range has been retracting from the coast due to human disturbance, loss of foraging habitat and pesticide contamination (Unitt 2004). Turkey Vultures were detected foraging over the Preserve in May at point count stations 7, 8, 9, 10, and 11. This species is still common in the undeveloped areas of east San Diego County thus the sighting at the project site is not regionally significant.

Cooper's Hawk (*Accipiter cooperii*)

San Diego County Group I, MSCP Covered Species

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

mammals. The Cooper's Hawk population declined due to hunting and loss of habitat; however, this species is making a comeback through its adaptation to the urban environment (Unitt 2004). Cooper's Hawks were observed foraging over all three Preserve properties. These birds may use the surrounding ornamental trees for breeding. The sightings at the Preserve are not regionally significant as this species is still widespread.

Red-shouldered Hawk (*Buteo lineatus*)

San Diego County Group I

The Red-shouldered Hawk was once an uncommon breeder of lowland riparian woodlands but has been thriving in urban environments with large trees such as gum (*Eucalyptus sp.*) (Unitt 2004). On the west coast, this species is found in California and northern Baja California and is common throughout San Diego County (Unitt 2004). A Red-shouldered Hawk was observed sporadically through the season with observations at point count stations 1, 2, and 6. This species has also adapted well to development. The sightings at the Preserve are not regionally significant as this species is still widespread.

Barn Owl (*Tyto alba*)

San Diego County Group II

The Barn Owl is the owl species that is most tolerant to urban development (Unitt 2004). It will nest in buildings, nest boxes, at the base of the leaves in palm trees, and in cavities in native trees. Even though this species is tolerant of human development, dense housing communities do not provide suitable nesting habitat and loss of birds to increased traffic has a negative effect on the species (Unitt 2004). The Barn Owl was detected during nocturnal surveys in April, July and September 2008. This bird may breed nearby. This sighting is not regionally significant as this species is still widespread.

Coastal California Gnatcatcher (*Polioptila californica californica*)

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

The Coastal California Gnatcatcher is a small resident insectivorous species whose occurrence is strongly associated with sage scrub habitats found throughout southern California into northern Baja California, Mexico. Although Coastal California Gnatcatchers have a close association with sage scrub, this species has also been documented using coastal sage-chaparral scrub, chamise chaparral and other habitat types such as the ecotone between coastal sage scrub and grasslands (Campbell et al. 1998, Bontrager 1991, K. Fischer pers. obs.). Habitat destruction, fragmentation and modification have led to this species' decline (USFWS 1993). Loss resulting from agriculture and urban development were leading causes until 2003 when the Cedar Fire destroyed almost 28% of the remaining habitat that the U.S. Fish and Wildlife Service (USFWS) believed to

be suitable for the Coastal California Gnatcatcher (Bond and Bradley 2003). The Preserve supported four to six pairs of Coastal California Gnatcatchers in 2008.

Western Bluebird (*Sialia mexicana*)

San Diego County Group II, MSCP Covered Species

The Western Bluebird is a stocky blue bird with a chestnut chest and is considered common in the foothills and mountains of San Diego County. This species can usually be found in montane coniferous and oak woodlands (Unitt 2004). It can also occur in areas with scattered trees, open forests, scrubs and during the winter in the desert. Western Bluebirds breed in western North America from southern British Columbia south to central Mexico, east to western Montana and west Texas, but are absent from the Great Basin (Guinan et al. 2000). It can also winter outside its breeding range in central California and along the lower Colorado River (Guinan et al. 2000). Western Bluebird numbers are declining due to loss of nesting cavities to logging, fire suppression, and competition with non-native species such as European Starling and House Sparrow (*Passer domesticus*) (Unitt 2004). One Western Bluebird was observed in April. This bird may have been moving through the area as it was not detected during other sampling periods. As this species is still found throughout San Diego County in large numbers (Unitt 2004), the individual detected does not represent a regionally significant sighting.

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

San Diego County Group I, MSCP Covered Species

The Southern California Rufous-crowned Sparrow is a resident species that is closely associated with coastal sage scrub, steep rocky hillsides, burned chaparral, and openings in mature chaparral (Unitt 2004). Preferring open habitat, with approximately 50% shrub cover, this species seeks cover in shrubs, rocks, grass, and forb patches (Dudek 2000, Unitt 2004). The Southern California subspecies is restricted to semiarid coastal sage scrub and sparse chaparral from Santa Barbara south to the northwestern corner of Baja California (Dudek 2000). Rufous-crowned Sparrows are declining due to loss of appropriate habitat and are sensitive to habitat fragmentation (Unitt 2004). Southern California Rufous-crowned Sparrows are found occasionally throughout coastal sage scrub. As this species is still found throughout San Diego County in large numbers (Unitt 2004), the individuals detected do not represent a regionally significant population.

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

White-Tailed Kite (*Elanus caeruleus)*

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

The White-tailed Kite is found in lower elevations in open grasslands, agricultural areas, wetlands, and oak woodlands. Their primary source of food is the California vole (*Microtus californicus sanctidiegi*) (Unitt 2004). It typically forages in open undisturbed habitats and nests in the top of a dense oak, willow or other large tree (Unitt 2004). The White-tailed Kite population is on the decline mostly due to urban sprawl; however, this species is still considered fairly widespread throughout the foothills of San Diego County (Unitt 2004). There is high potential for White-tailed Kite to occur on site. There is suitable foraging and nesting habitat within the boundaries of the Preserve and immediately adjacent areas.

Sharp-shinned Hawk (*Accipiter striatus*)

San Diego County Group II

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

Merlin (*Falco columbarius*)

San Diego County Group II

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

San Diego Cactus Wren (*Campylorhynchus brunneicapillus sandiegensis*)

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

The San Diego Cactus Wren is associated with cactus thickets. This species builds multiple nests within their territory but they do not use them all for raising young (Unitt 2004). They will also use nests as winter roosts. The San Diego

Cactus Wren population decline has been due to habitat loss resulting from urban sprawl and fire (Unitt 2004). The fires throughout the County in 2003 and 2007 have decimated many acres of coastal sage scrub occupied by this species and cactus takes many years to grow to a level appropriate for use by Cactus Wrens (Unitt 2004). This species is historically documented as having four regions where the population is concentrated: southern Marine Corps Base Camp Pendleton/Naval Weapons Station Fallbrook, Lake Hodges/San Pasqual Valley, Lake Jennings and Sweetwater/Otay (Unitt 2004). All four areas had many acres burned by fires in 2003 and 2007. Lake Jennings, one of the core areas, is approximately three miles southwest of the Preserve.

One San Diego Cactus Wren was observed in July at point count station 3, which is located on the central property. The individual was observed just west of the Preserve boundary using a patch of cactus for breeding. As there is no cactus within the Preserve boundary, there is no potential for this species to breed on the central property although there is high potential for these birds to forage. The eastern property supports a patch of prickly pear cactus that could potentially support a breeding pair of Cactus Wrens; however, no individuals were observed and there was no sign of use by this species (i.e., abandoned nests). The western property does not support any habitat suitable for this species and there are no cactus patches in the immediate vicinity.

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

San Diego County Group I

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

4.6 Small Mammal Trapping

In total, eight small mammal species were recorded at the Preserve during small mammal trapping and other surveys (Tables 8 and 9). These species were detected through capture, direct observation or sign. The trapping results indicate that the Preserve has an abundant and diverse small mammal population with 381 total captures from six species (see Table 8). The species detected are commonly found in the habitats found on the Preserve.

Table 8. Trapline Capture Summary for 2008

Scientific Name	Common Name	Special Status	Trapline Number/Captures 1	2	3	Total
Spermophilus beecheyi nudipes	California Ground Squirrel		2 released	9 released		11 released
Chaetodipus californicus femoralis	Dulzura Pocket Mouse	CSC, CSDS Group II	7 ♂ 5 ♀	60 ♂ 25 ♀ 1 esc	58 ♂ 38 ♀ 4 esc	125 ♂ 68 ♀ 5 esc
Peromyscus fraterculus (=Peromyscus eremicus fraterculus)	Northern Baja Mouse		1 ♂	9 ♂ 13 ♀ 3 esc	35 ♂ 39 ♀ 1 esc	45 ♂ 52 ♀ 4 esc
Peromyscus maniculatus gambelii	American Deer Mouse			19 ♂ 8 ♀ 3 esc	20 ♂ 15 ♀	39 ♂ 23 ♀ 3 esc
Neotoma macrotis (=Neotoma fuscipe macrotis)	Large-eared Woodrat (=Dusky-footed)	CSC, CSDS Group II	1 ♂ 3 ♀			1 ♂ 3 ♀
Neotoma lepida intermedia	San Diego Desert Woodrat		2 ♂			2 ♂
		TOTAL	**21**	**150**	**210**	**381**

Legend:

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

Special Status: CSC= California Species of Concern, CSDS=County of San Diego Sensitive Animal

Table 9. Small Mammals Detected through Other Survey Methods at the Preserve in 2008

Scientific Name	Common Name	Vegetation Communities	Method of Detection
Spermophilus beecheyi nudipes	California Ground Squirrel	all communities	visual, sign
Thomomys bottae	Botta's Pocket Gopher	coastal sage scrub	sign
Microtus californicus	California Vole	coastal sage scrub	captured in pitfall array

4.6.1 Special-Status Small Mammal Species

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

Special-Status Small Mammal Species Observed

Dulzura Pocket Mouse (*Chaetodipus californicus femoralis*)

State Species of Special Concern, San Diego County Group II

Dulzura Pocket Mouse is mainly active on the ground, but also climbs shrubs and small trees when feeding (CDFG 2005). This species can become torpid by day at any time of the year, and is inactive in cold wet weather. It breeds in spring to early summer and occurs from sea level to approximately 2,408 m (7,900 ft) (CDFG 2005). This species prefers dense chaparral and is less common in dry grassland and desert scrub. During our trapping program, 198 of the 381 animals captured in Preserve were Dulzura Pocket Mouse. This accounts for 52% of the captures. This was the most abundant species captured during 2008.

San Diego Desert Woodrat (*Neotoma lepida intermedia*)

State Species of Special Concern, San Diego County Group II

San Diego Desert Woodrat requires large amounts of water, which it obtains from fleshy plants such as *Yucca* species and Prickly Pear Cactus (*Opuntia* sp.). It usually makes a stick house under one of these food plants, or may den among rocks (CDFG 2005). House materials include cacti, sticks, bones and a variety of debris. Houses provide insulation against excessive heat as well as protection from predators. This species breeds in late winter or spring, occurs from sea level to approximately 2,591 m (8,500 ft) in deserts and coastal sage scrub, and prefers areas with rocky outcrops and plentiful succulents (CDFG 2005). During our trapping program, two of the 381 animals captured in the Preserve were San Diego Desert Woodrat.

High Potential to Occur

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

State Species of Special Concern, San Diego County Group II

The Northwestern San Diego Pocket Mouse is typically found in coastal sage scrub, sage scrub/grassland ecotones, and chaparral (Dudek 2000). It inhabits open, sandy areas of both the Upper and Lower Sonoran areas of southwestern California and northern Baja California (Dudek 2000). This species is sensitive

to habitat fragmentation and degradation, which has led to its decline. This species has high potential to occur as there is suitable habitat on the Preserve.

4.7 Medium and Large Mammals

4.7.1 Camera Tracking Stations

After evaluating the images captured on the two camera stations set on the Preserve, a total of three species of medium and large bodied mammals were detected including Coyote (*Canis latrans*), Striped Skunk (*Mephitis mephitis*), and Desert Cottontail (*Sylvilagus audubonii*) (Table 10, Appendix A). See Figure 8 for camera station locations. During the course of this survey effort both camera stations were tampered with. Camera station 2 was stolen before any data was retrieved, and Camera station 1 was vandalized early in the second month of sampling. These incidents resulted in a decreased number or lack of detections for species thought, or known to occur within the Preserve.

4.7.2 Track & Sign Surveys

A total of nine mammal species were detected in the Preserve through tracks, sign, and nocturnal surveys (Table 10, Appendix A). One of these is an MSCP-covered species – Southern Mule Deer (*Odocoileus hemionus fuliginata*). Movement of larger animals appeared to be concentrated along easily traveled routes with good visibility such as trails and ridges. Most sign of smaller animals was within natural communities with cover, especially chaparral.

Due to the proximity to large amounts of open space and the presence of potentially suitable habitat, the following species may also utilize the Preserve: Brush Rabbit (*Sylvilagus bachmani*), Common Gray Fox (*Urocyon cinereoargenteus*), Black-tailed Jackrabbit (*Lepus californicus*), Western Spotted Skunk (*Spilogale gracilis*), and Opossum (*Didelphis virginiana*).

No clear evidence of regular or important, larger-scale dispersal across the site was found. The high density of residential homes, Los Coches Road and a large concrete channel found west of the road present large obstacles for animal movement between the three sections of this Preserve. However it can be assumed that larger mammals regularly move on, off of, and across the Preserve, to and from adjacent open space.

Table 10. Medium and Large Mammals Detected at the Preserve in 2008

Scientific Name	Common Name	Special Status	Vegetation Communities	Method of Detection
Sylvilagus audubonii	Desert Cottontail		all communities	sign, camera station
* *Canis familiaris*	Domestic Dog		all communities	visual, sign
Canis latrans	Coyote		all communities	sign, camera station
Mustela frenata	Long-tailed Weasel		all communities	visual
Mephitis mephitis	Striped Skunk		all communities	sign, camera station
**Felis catus*	Domestic Cat		all communities	visual, sign
Lynx rufus	Bobcat		all communities	sign
**Equus caballus*	Domestic Horse		all communities	visual, sign
Odocoileus hemionus fuliginata	Southern Mule Deer	MSCP, CSDS Group II	all communities	sign

Legend:

*=non-native species

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

4.7.3 Special-Status Medium and Large Mammal Species

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

Special-Status Medium and Large Mammal Species Observed

Southern Mule Deer (*Odocoileus hemionus fuliginata*)

San Diego County Group II, MSCP Covered Species

Southern Mule Deer are common across the western U.S. in a variety of habitats from forest edges to mountains and foothills (Whitaker 1996). Southern Mule Deer prefer edge habitats, rarely travel or forage far from water and are most active around dawn and dusk. Southern Mule Deer sign was seen at the Preserve.

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

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

State Species of Special Concern, San Diego County Group I

The San Diego Black-tailed Jackrabbit is a large, long legged hare, with distinctive long ears and a blackish tail (Whitaker 1996). The Black-tailed Jackrabbit inhabits a wide range of habitats, including deserts, irrigated croplands, high mountains to 2,500 m (8,202 ft), and is commonly found in the western United States to Mexico and Baja California. The San Diego population is found mostly on the coastal side of our local mountains in open habitats, usually avoiding dense stands of chaparral or woodlands (Stephenson and Calcarone 1999). This species has been declining due to urban development, habitat loss, and fragmentation leading to population isolation (Dudek 2000). Suitable habitat for this species occurs within the Preserve.

Mountain Lion (*Puma concolor*)

San Diego County Group II, MSCP Covered Species

Mountain Lions prefer rocky areas, cliffs, and ledges that provide cover within open woodlands and chaparral (Dudek 2000). Riparian areas also provide protective habitat connections for movement between fragmented habitats. This species is widespread in North and South America and occupies a broad variety of habitats from the northern limit of the Canadian forests to Patagonia in South America. Populations of this species require large areas to sustain themselves, requiring at least 850 square miles to remain stable (Dudek 2000). Habitat fragmentation, loss of large areas of undeveloped land, road kills, indiscriminate shootings, animal control measures, and loss of natural prey base have led to the decline of this species. This Preserve and the surrounding open space provide habitat for Mountain Lion to use for foraging and cover. As there is a large amount of open space surrounding the Preserve, potential for this species to move through the Preserve is high.

4.8 Bats

4.8.1 Acoustic Survey for Bats

A total of nine bat species were detected using passive anabats during the three seasons of monitoring (Table 11, Appendix A). The most active bat species detected were the Canyon Bat (*Parastrellus hesperus*), Mexican Free-tailed Bat (*Tadarida brasiliensis*), and Pocketed Free-tailed Bat (*Nyctinomops femorosaccus*). Species rarely detected included the Western Mastiff Bat

(*Eumops perotis*), California Myotis (*Myotis californicus*), and Hoary Bat (*Lasiurus cinereus*). There was a suite of species detected during all three seasonal monitoring sessions including the Canyon Bat, Pocketed Free-tailed Bat, and Mexican Free-tailed Bat. Species detected only during the spring included the Hoary Bat and Big Free-tailed Bat (*Nyctinomops macrotis*). The California Myotis was detected only during the summer and the Yuma Myotis (*Myotis yumanensis*) only during the fall. A Western Mastiff Bat was heard during the summer active survey.

Five bat species were detected during the active roost survey on August 19, 2008 (see Table 11). However, only two were suspected to be using the rocky outcrops on the central property of the Preserve as a roost site: the Canyon Bat and Big Brown Bat (*Eptesicus fuscus)*.

A moderate number of bat species appear to be supported by the Preserve. The Preserve is fairly homogeneous in nature and lacks habitat features important to bats in the southern California landscape such as riparian vegetation, open surface water, and oak woodland (Krutzsch 1948, Stokes et al 2005). The shrubland habitat provides at least marginal foraging opportunities for some bat species, and the small amount of exposed rocky habitats appears to support a small number of Canyon Bats and Big Brown Bats. Though there were not a large number of bats detected and activity was fairly low, the occurrence of the natural shrub and exposed rock in a setting surrounded by urbanization is likely important to the existence of bats in such a setting, and may help to provide habitat linkage to other natural areas nearby.

Table 11. Bat Species Detected at the Preserve in 2008

Bat Species			Relative Activity Index*			Average Activity Index**
Scientific Name	**Common Name**	**Special Status**	**Spring**	**Summer**	**Fall**	
Myotis californicus	California Myotis		nd	3.33	nd	1.11
Myotis yumanensis	Yuma Myotis	CSDS Group II	nd	nd	6.6666667	2.22
Lasiurus cinereus	Hoary Bat		1.67	nd	nd	0.56
Parastrellus hesperus	Canyon Bat		128.33	93.33	100.00	107.22
Eptesicus fuscus	Big Brown Bat		nd	1.67	46.67	16.11
Tadarida brasiliensis	Mexican Free-tailed Bat		75.00	28.33	76.67	60.00
Nyctinomops femorosaccus	Pocketed Free-tailed Bat	CSC, CSDS Group II	75.00	10.00	200.00	95.00
Nyctinomops macrotis	Big Free-tailed Bat	CSDS Group II	3.33	nd	nd	1.11
Eumops perotis	Western Mastiff Bat	CSC, CSDS Group II	nd	nd	3.3333333	1.11

Legend:

nd = not detected

* Number of bat passes per Anabat night X 10

** Average of seasonal measures of relative activity for each bat species detected

Special Status: CSC= California Species of Concern, CSDS= County of San Diego Sensitive Animal

4.8.2 Special-Status Bat Species

There were four sensitive species detected during the surveys. These include Yuma Myotis, Pocketed Free-tailed Bat and Western Mastiff Bat. All are cliff-roosting species that were not likely roosting in the Preserve. However, these species were using the Preserve as a foraging site indicating the important value of the Preserve as a foraging site for these species.

Special-Status Bat Species Observed

Yuma Myotis (*Myotis yumanensis*)

San Diego County Group II

The Yuma Myotis is found throughout much of the western U.S. and up into Canada (BCI 2008). The species is always found near lakes, creeks or ponds where the species forages over the water. Typically, individuals skim low over

the water and snatch up flying insects but they can forage in other mesic areas. The species roosts by day usually in buildings or bridges but have been documented using mines or caves (BCI 2008). Yuma Myotis are threatened by loss of riparian habitat and the decline in permanent water sources in the southwest. Yuma Myotis were detected forging at the Preserve. No potential roosting habitat is present.

Pocketed Free-tailed Bat (*Nyctinomops femorosaccus*)

State Species of Special Concern, San Diego County Group II

Pocketed Free-tailed Bats are rarely found in southwestern California. These bats live in arid desert areas and roost in crevices high on cliff faces in rugged canyons (BCI 2008). Nursery colonies are relatively small and usually include fewer than 100 individuals. This species primarily forages on large moths, especially over water. The regional status and species trends are unclear, but it is likely vulnerable to disturbance, especially at roosts, and perhaps also to threats to food supply from man-made toxins. The Pocketed Free-tailed Bat is likely not roosting in the Preserve as there are no cliffs. The individuals detected are using the Preserve as a place to forage.

Big Free-tailed Bat (*Nyctinomops macrotis*)

San Diego County Group II

Big Free-tailed Bats are typically found in desert and arid grasslands with rocky out-crops, canyons, or cliffs (BCI 2008). This species roosts on cliffs and occasionally in buildings. Isolated populations can be found throughout the southwestern U.S. into Mexico. The regional status and species trends are unclear, but it is likely vulnerable to disturbance, especially at roosts, and perhaps also to threats to food supply from man-made toxins. The Big Free-tailed Bat is likely not roosting on the Preserve as there are no cliffs. The individuals detected are using the Preserve as a place to forage.

Western Mastiff Bat *(Eumops perotis)*

State Species of Special Concern, San Diego County Group II

Western Mastiff Bats are the largest native bats in the United States. This subspecies occurs from the western foothills of the Sierra Nevada and the coastal ranges (south of San Francisco Bay) southward into Mexico (BCI 2008). In southern California, they are found throughout the coastal lowlands up to drier mid-elevation mountains, but avoid the Mohave and Colorado deserts (Zeiner et al. 1990). Habitats include dry woodlands, shrublands, grasslands, and occasionally even developed areas. This big bat forages in flight and most prey species are relatively small, low to the ground, and weak-flying. For roosting, Western Mastiff Bats appear to favor rocky, rugged areas in lowlands where abundant suitable crevices are available for day roosts (BCI 2008). Roost sites may be in natural rock or in tall buildings, large trees or elsewhere. The reasons for this species' decline are poorly understood but probably are related to

disturbance, habitat loss, and perhaps widespread use of pesticides. The Western Mastiff Bat is likely not roosting in the Preserve as there are no cliffs. The individuals detected are using the Preserve as a place to forage.

High Potential to Occur

Pallid Bat (*Antrozous pallidus*)

State Species of Special Concern, San Diego County Group II

Pallid bats are widely distributed in the southwestern United States and northern Mexico (BCI 2008). They are locally common across most of California except in the far northwest and in higher portions of the Sierra Nevada. Habitats utilized include a wide variety of grasslands, shrublands, woodlands, and forests, including mixed conifer forest (Zeiner et al. 1990). They appear to be most common in open, dry, rocky lowlands and they roost in caves, mines, as well as crevices in rocks, buildings and trees. This is a colonial species that forages low over open ground, often picking up beetles and other species of prey off the ground (Zeiner et al. 1990). Flight is slow and maneuverable, and they are able to take a wide variety of prey, including large, hard-shelled insects (Zeiner et al. 1990). They have separate night and day roosts, hibernate in winter, and the sexes segregate in summer. The foraging needs of the Pallid Bat could be supported by the Preserve.

Chapter 5
Conclusions and Management Recommendations

Surveys conducted in 2007 and 2008 documented six land cover types and 127 species that were detected throughout the Preserve. Our surveys detected 62 bird species, 26 mammal species (nine bats, eight small mammals, and nine medium and large bodied mammals), 10 herptiles (zero amphibians and 10 reptiles), and 29 invertebrate species. This list includes 20 sensitive species with six of these MSCP-covered species (Orange-throated Whiptail, Cooper's Hawk, Coastal California Gnatcatcher, Western Bluebird, Southern California Rufous-crowned Sparrow and Southern Mule Deer). One additional MSCP-covered species occurs immediately adjacent to the Preserve: San Diego Cactus Wren.

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

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

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

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

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

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

5.1 Flora

It is recommended that the County maintain an updated vegetation community map to be used as a tool for adaptive management within the Preserve. Updates should occur once every three years or within the first growing season following an unforeseen disturbance (i.e., fire, rock fall, flood or manmade disturbance). The purpose of the ongoing mapping effort should be to document changes in the vegetation communities within the Preserve that could affect quality and usage by wildlife. Vegetation monitoring for habitat value should also focus on identifying adverse changes and their effects on the vegetation over time. This includes dramatic changes such as fire, as well as slower but equally important effects such as invasion by non-natives or slow decline of existing species.

Periodic botanical surveys are recommended to monitor the special-status species detected on the Preserve. San Diego Sunflower was the only special status plant species detected during the 2007 surveys. Such surveys would ideally occur during years of average or above-average rainfall in order to maximize detection. Because the recent (i.e., 2007) botanical 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.

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 passive revegetation of unneeded roads or trail segments. The Preserve area should be managed for the benefit of special-status species and MSCP-covered species without substantive efforts to alter or restrict the natural course of ecosystem development and dynamics. To the extent feasible, natural wildfire cycles should not be suppressed as many of the plant species that occur within the Preserve properties rely on periodic burns to maintain healthy populations.

Six 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. Beyond general restoration of disturbed habitat and control of invasive species at roadsides, those species considered highest priority for control on the Preserve at this time are listed in Table 12 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 expanding on-site.

Table 12. Nonnative Plants with Highest Priority for Control on the Preserve

Species	Cal-IPC Status
Tree of Heaven (Ailanthus altissima)	Moderate
Eucalyptus species (*Eucalyptus* sp.)	Limited to Moderate
European olive (*Olea europea*)	Limited
Peruvian pepper (*Schinus molle*)	Limited
African Fountain Grass (*Pennisetum setaceum*)	Moderate

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 new trail construction should be minimized to take advantage of existing roads within the Preserve.

Due to the Preserve's close proximity to rural residential development, it is recommended that a fire management plan be completed. This Plan should make specific recommendation regarding appropriate limited building zones and fuel modification zones along the perimeter of the Preserve.

5.2 Invertebrates

Although no Hermes Copper or other special-status butterflies were observed on the Preserve in 2008, there is potential for their occurrence. Periodic presence/absence surveys for Hermes Copper species are recommended. In addition, other butterflies and invertebrates were observed. Quino Checkerspot Butterfly as well as many other common butterflies is known to exhibit "hilltopping" behavior. This behavior was observed on the Preserve at various rock outcrops at high points on the hills. Therefore, planned trails and public vistas should not be installed, or should be installed with minimal disturbance, on the highest points of hills.

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

5.3 Herpetofauna

The Preserve supports several special-status herpetofauna species that will likely be encountered by the public on the roads and trails. These include Red Diamond Rattlesnake, and Orange-throated Whiptail which are commonly found on roads and trails. Signs should be posted to inform Preserve users to stay on roads and trails and to avoid wildlife when encounters occur in order to reduce negative effects on the species listed above and other special-status herptiles. It should also be clear to Preserve users that animal collecting is prohibited.

As detailed above, the Orange-throated Whiptail is a MSCP covered species that was observed and trapped within the Preserve. According to the MSCP Monitoring Plan monitoring recommendation for this species includes site specific trapping for presence/absence. The pitfall arrays installed as a part of this study will be sampled periodically to monitor the Orange-throated Whiptail population at the Preserve.

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

5.4 Birds

A total of 62 bird species were documented on the Preserve; these include four MSCP-covered species: Cooper's Hawk, Coastal California Gnatcatcher (*Polioptila californica californica*), Western Bluebird (*Sialia mexicana*), and Southern California Rufous-crowned Sparrow (*Aimophila ruficeps canescens*) (Figure 10). San Diego Cactus Wren was observed adjacent to the central property of the Preserve and the eastern property supports suitable habitat. MSCP-covered species monitoring recommendations for each of these species are provided below.

Habitat based and management plans/directives (site specific nest territories) monitoring is required by the MSCP Monitoring Plan for Cooper's Hawk. As detailed section 4.5.3.1, nesting habitat for this species does not occur on the Preserve. It should be noted that nesting habitat does occur adjacent to each of the three Preserve properties.

MSCP monitoring requirements for the Coastal California Gnatcatcher include implementing area specific management directives at 31 locations within the plan area. Area specific management directives include measures to reduce edge effects and minimize disturbance during the nesting period, fire protection measures to reduce the potential for habitat degradation due to unplanned fire, and management measures to maintain or improve habitat quality including vegetation structure. As detailed above, the USFWS is currently in the process of updating the Coastal California Gnatcatcher MSCP monitoring protocols. It is

recommended that these new monitoring protocols be implemented within the Preserve for the Coastal California Gnatcatcher as necessary.

MSCP monitoring requirements for the Western Bluebird and the Southern California Rufous-crowned Sparrow include implementing habitat based monitoring. Site specific monitoring for these species is not required by the Monitoring Plan.

MSCP monitoring requirements for San Diego Cactus Wren include implementing area specific management directives at 31 locations within the plan area. Area specific management directives must include measures restoration of maritime succulent scrub habitat, including propagation of cactus patches, active/adaptive management of cactus wren habitat, monitoring of populations within preserves and specific measures to reduce or eliminate detrimental edge effects. As detailed above, the USFWS is currently in the process of updating the San Diego Cactus Wren MSCP monitoring protocols. It is recommended that these new monitoring protocols be implemented within the Preserve for the San Diego Cactus Wren as necessary.

Native habitats are vulnerable, as bird habitat, from alteration by invasive plants, from fires at short intervals, and from increased development in the surrounding areas. The Preserve is vulnerable to continued development of adjacent open space, and is probably of insufficient size to maintain the substantial levels of functions, values, and species richness in the absence of buffering these areas. Conserving and actively managing as much of the contiguous open space as possible is recommended.

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

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

5.5 Small Mammals

Habitat fragmentation is a leading cause in the decline of small mammal populations in species with low mobility (Vander Haegen et al. 2001). Patches of habitat occupied by sensitive species should be connected to wildlife corridors

(such as riparian areas) to allow individuals to disperse and not become isolated and vulnerable. Future plans for the Preserve should address the potential isolation and genetic flow effects it may have on small mammal populations.

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

5.6 Medium and Large Mammals

The Preserve is surrounded by additional areas of open space, and has the potential to serve as an important corridor for wildlife movement. Improving movement connections across Los Coches Road will be an important consideration over time, especially if traffic volumes increase.

Southern Mule Deer was the only MSCP-covered mammal species detected during the field surveys. MSCP monitoring requirements for Southern Mule Deer includes monitoring suitable habitat and wildlife corridor sites within the MSCP. As detailed above, the Preserve has the potential to serve as an important corridor for wildlife movement between adjacent open space areas. Improving wildlife movement connections across Los Coches Road is recommended to further enhance quality of the Preserve's function as a wildlife corridor. Monitoring for medium and large mammals will include periodic sampling at the camera stations used during this study.

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

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

5.7 Bats

The following item is recommended to maintain and increase the habitat suitability for bats within the Preserve.

- Protect rocky habitats – Rocky outcrops are one of the most significant habitats on the property being used by bats. We recommend prohibiting recreational rock climbing activities on the Preserve unless focused roost surveys are conducted in areas designated as appropriate climbing areas.

Chapter 6
References

American Ornithologists' Union. 1998. Checklist of North American Birds, 7th edition. American Ornithologists' Union, Washington, D.C.

Arnett, Jr., R. H. 2000. American Insects: A Handbook of the Insects of America North of Mexico. 2nd ed. Boca Raton, FL: CRC Press.

Baker, R. J., L. C. Bradley, R. D. Bradley, J. W. Dragoo, M. D. Engstrom, R. S. Hoffmann, C. A. Jones, F. Reid, D. W. Rice, and C. Jones. 2003. Revised Checklist of North American Mammals North of Mexico, 2003. Lubbock, TX: Occasional Papers, Museum of Texas Tech University, Number 229.

Batcall Library: http://www.msb.unm.edu/mammals/batcall/html/news.html.

Bat Conservation International (BCI). 2008. Bat Species Profiles. Last revised: 2008. Available: http://www.batcon.org/SPprofiles/index.asp . Accessed: 10/17/08

Beauchamp, R.M. 1986. *A Flora of San Diego County, California.* Sweetwater River Press.

Bibby, C. J., N. D. Burgess, D. A. Hill, and S. H. Mustoe. 2000. Bird Census Techniques, 2nd ed. London: Academic Press.

California Department of Fish and Game(CDFG). 2005. California Wildlife Habitat Relationships System (CWHR), version 8.1 personal computer program. Sacramento, CA: California Department of Fish and Game.

CDFG. 2008. California Natural Diversity Data Base (CNDDB) RareFind 3 Report.

California Native Plant Society (CNPS). 2008. Electronic Inventory of Rare and Endangered Vascular Plants of California. California Native Plant Society, Sacramento.

Collins, J. T., and T. W. Taggart. 2002. Standard Common and Current Scientific Names for North American Amphibians, Turtles, Reptiles, and Crocodilians, 5th ed. Lawrence, KS: Center for North American Herpetology.

Corben, C. and M. J. O'Farrell. Anabat System Manual. 2nd Edition. Available by order from Michael J. O'Farrell, O'Farrell Biological Consulting,7320 Heggie Ave., Las Vegas, NV 89131.

Dudek and Associates (Dudek). 2000. Sensitive Species Accounts for the Western Riverside Multiple Species Habitat Conservation Plan (MSHCP).

Guinan, J. A., P. A. Gowaty, and E. K. Eltzroth. 2000. Western Bluebird (*Sialia mexicana*). *In* The Birds of North America, No. 510 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Hickman, J.C. (ed.). 1993. The Jepson Manual; Higher Plants of California. University of California Press, Berkeley.

Hogue, C. L. 1993. Insects of the Los Angeles Basin. Los Angeles, CA: Natural History Museum of Los Angeles County.

Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. State of California Department of Fish and Game, Non-game Heritage Program, Sacramento.

Jennings, M. R., and M. P. Hayes. 1994. Amphibian and reptile Species of Special Concern in California. Final report submitted to California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California, under Contract 8023.Keinath, D. A. 2006. Anabat call key for greater Yellowstone ecosystem. http://uwadmnweb.uwyo.edu/WYNDD/Bat_Call/Anabat%20CallKey3.pdf

Krutzsch, P. H. 1948. Ecological study of the bats of San Diego County, California. MA Thesis, Univ. Calif., Berkeley, Calif. 184 pp.

Lemm, J. 2006. *Field Guide to Amphibians and Reptiles of the San Diego Region* (California Natural History Guides). University of California Press,

McGurty, B. M. 1980. Preliminary review of the status of the San Diego horned lizard, *Phrynosoma coronatum blainvellei* and the orange-throated whiptail, *Cnemidophorus hyperythrus beldingi*. Inland Fisheries Endangered Species Program Special Publication, California Department of Fish and Game.

O'Farrell, M. J., B. W. Miller, and W. L. Gannon. 1999. Qualitative identification of freeflying bats using the Anabat detector. Journal of Mammalogy, 80:11-23.

Ogden. 1996. Biological Monitoring Plan for the Multiple Species Conservation Program (Ogden Environmental, 1996):

Opler, P. A., and A. B. Wright. 1999. A Field Guide to Western Butterflies. Boston, MA: Houghton Mifflin Co.

Ralph, C. J., J. R. Sauer, and S. Droege, technical editors. 1995. Monitoring Bird Populations by Point Counts. General Technical Report PSW-GTR-149. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Dept. Agriculture.

Rebman, J. P., and M. G. Simpson. 2006. Checklist of the Vascular Plants of San Diego County, 4th edition. San Diego, CA: San Diego Natural History Museum and San Diego State University.

San Diego County Flood Control District. 2007. http://www.sdcfcd.org/.

SanGIS. 2008. http://www.SanGIS.com/

Stebbins, R.C. 2003. *A Field Guide to Western Reptiles and Amphibians, Third Edition*. Houghton Mifflin Company, Boston, Massachusetts.

Stephenson, J.R. and G.M. Calcarone. 1999. Southern California mountains and foothills assessment: Habitat and species conservation issues. General Technical Report GTR-PSW-175. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture.

Stokes, D., C. Rochester, R. Fisher and T. Case. 2001. Herpetological Monitoring Using a Pitfall Trapping Design in Southern California. U.S. Geological Survey and University of California at San Diego.

Stokes, D.C., C.S. Brehme, R.N. Fisher. 2005. Bat inventory of the San Diego County Multiple Species Conservation Program Area, Final Report. USGS Technical Report prepared for the County of San Diego and the California Department of Fish and Game, 95 pp.

Department of Conservation, Division of Mines and Geology, Sacramento, California.

CRWQCB. 2003. The California Regional Water Quality Control Board website: http://www.swrcb.ca.gov/rwqcb9/programs/basinplan.html

U.S. Department of Agriculture. 1973. Soil Survey, San Diego Area, California. Washington, DC: U.S. Dept. of Agriculture, Soil Conservation Service [now Natural Resources Conservation Service] and Forest Service.

Unitt, P. 2004. *San Diego County Bird Atlas*. Proceedings of the San Diego Society of Natural History 39: i–vii, 1–639.

Whitaker, J.O. 1996. The Audubon Society Field Guide to North American Mammals. Revised and expanded. A.A. Knopf. New York.

Vander Haegen, W. M., S. M. McCorquodale, C. R. Peterson, G. A. Green, and E. Yensen. 2001. Wildlife of eastside shrubland and grassland habitats. Pages 474-500 *in* D. H. Johnson and T. A. O'Neil, editors. Wildlife-habitat

relationships in Oregon and Washington. Oregon State University Press, Corvallis, Oregon, USA.

Zeiner, D. C., W. F. Laudenslayer, K. E. Mayer, and M. White. 1990. California's Wildlife: volume 3: mammals. California Department of Fish and Game. Sacramento, CA.

Appendix A

Wildlife Species Detected at Lakeside Preserve in 2008

Scientific Name	Common Name	Method of Detection	Special Status
INVERTEBRATES			
Butterflies			
Anthocaris sara	Sara's Orangetip	X	
Apodemia mormo virgulti	Behr's Metalmark	X	
Callophrys augustinus	Brown Elfin	X	
Erynnis funeralis	Funereal Duskywing	X	
Papillo eurymedon	Pale Swallowtail	X	
Pontia protodice	Common White	X	
Vanessa cardui	Painted Lady	X	
Vanessa annabella	West Coast Lady	X	
Papilio zelicaon	Anise Swallowtail	X	
Colias eurytheme	Orange Sulfur	X	
Other Invertebrates			
Anuroctonus sp.	Burrowing Scorpion	XT	
Aphonopelmus eutylenum	Tarantula	XT	
Armadillidium vulgare	Pill Bug	XT	
Calosoma pustulosis	Common Calosoma	XT	
Centhophilus californicus	Camel Cricket	XT	
Cratidus osculans	Wooly Darkling Beetle	XT	
Paruroctonus silvestrii	Common California Scorpion	XT	
Dasymutilla gloriosa	Ashy-Gray Velvet Ant	XT	
Dasymutilla sp.	Red Velvet-Ant	XT	
Eleodes sp.	Stink Beetle	XT	
Gryllus sp.	Field Cricket	XT	
Latrodectus hesperus	Black Widow	XT	
Okanagana sp.	Cicada	XT	
Pardosa sp.	Wolf Spider	XT	
Phidippus johnsoni	Jumping Spider	XT	
Phloeodes pustulosis	Ironclad Beetle	XT	
Scolopendra polymorpha	Centipede	XT	
Stenopelmatus sp.	Jerusalem Cricket	XT	
Trimerotropis pallidipennis	Pallid-Winged Grasshopper	XT	

Scientific Name	Common Name	Method of Detection	Special Status
HERPTILES			
Elgaria multicarinata	Southern Alligator Lizard	XT	
Anniella pulchra	California Legless Lizard	XT	CSC, CSDS Group I
Sceloporus occidentalis	Western Fence Lizard	XT	
Sceloporus orcutti	Granite Spiny Lizard	XT	
Uta stansburiana	Side-blotched Lizard	XT	
Eumeces skiltonianusinterparietalis	Coronado Skink	XT	CSC, CSDS Group I
Cnemidophorus hyperythus	Orange-throated Whiptail	XT	CSC, MSCP, CSDS Group I
Cnemidophorustigris stejnegeri	Western Whiptail	XT	CSDS Group I
Pituophis catenifer	Gopher Snake	X	
Diadophis punctatus	Ringneck Snake	XT	CSDS Group I
BIRDS			
Anas platyrhynchos	Mallard	X	
Callipepla californica	California Quail	X	
Cathartes aura	Turkey Vulture	X	CSDS Group I
Accipiter cooperii	Cooper's Hawk	X	MSCP, CSDS Group I
Buteo lineatus	Red-shouldered Hawk	X	CSDS Group I
Buteo jamaicensis	Red-tailed Hawk	X	
Falco sparverius	American Kestrel	X	
Hydroprogne caspia	Caspian Tern	X	
**Columba livia*	Rock Pigeon	X	
Zenaida macroura	Mourning Dove	X	
Amazona sp	Parrot species	X	
Geococcyx californianus	Greater Roadrunner	X	
Tyto alba	Barn Owl	X	CSDS Group II
Bubo virginianus	Great Horned Owl	X	
Aeronautes saxatalis	White-throated Swift	X	
Calypte anna	Anna's Hummingbird	X	
Calypte costae	Costa's Hummingbird	X	
Picoides nuttallii	Nuttall's Woodpecker	X	
Colaptes auratus	Northern Flicker	X	
Empidonax difficilis	Pacific-slope Flycatcher	X	
Sayornis nigricans	Black Phoebe	X	

Scientific Name	Common Name	Method of Detection	Special Status
Sayornis saya	Say's Phoebe	X	
Myiarchus cinerascens	Ash-throated Flycatcher	X	
Tyrannus vociferans	Cassin's Kingbird	X	
Tyrannus verticalis	Western Kingbird	X	
Aphelocoma californica	Western Scrub-Jay	X	
Corvus brachyrhynchos	American Crow	X	
Corvus corax	Common Raven	X	
Tachycineta thalassina	Violet-green Swallow	X	
Stelgidopteryx serripennis	Northern Rough-winged Swallow	X	
Petrochelidon pyrrhonota	Cliff Swallow	X	
Hirundo rustica	Barn Swallow	X	
Psaltriparus minimus	Bushtit	X	
Campylorhynchus brunneicapillus sandiegensis	San Diego Cactus Wren (=Coastal Cactus Wren)	X	CSC, MSCP, CSDS Group I
Thryomanes bewickii	Bewick's Wren	X	
Troglodytes aedon	House Wren	X	
Polioptila caerulea	Blue-gray Gnatcatcher	X	
Polioptila californica californica	Coastal California Gnatcatcher	X	ST, CSC, MSCP, CSDS Group I
Sialia mexicana	Western Bluebird	X	MSCP, CSDS Group II
Catharus ustulatus	Swainson's Thrush	X	
Turdus migratorius	American Robin	X	
Chamaea fasciata	Wrentit	X	
Mimus polyglottos	Northern Mockingbird	X	
Toxostoma redivivum	California Thrasher	X	
**Sturnus vulgaris*	European Starling	X	
Phainopepla nitens	Phainopepla	X	
Vermivora celata	Orange-crowned Warbler	X	
Dendroica coronata	Yellow-rumped Warbler	X	
Wilsonia pusilla	Wilson's Warbler	X	
Piranga ludoviciana	Western Tanager	X	
Pipilo maculatus	Spotted Towhee	X	
Pipilo crissalis	California Towhee	X	
Aimophila ruficeps canescens	Southern California Rufous-	X	MSCP, CSDS Group I

Scientific Name	Common Name	Method of Detection	Special Status
	crowned Sparrow (=California Rufous-crowned Sparrow)		
Zonotrichia leucophrys	White-crowned Sparrow	X	
Pheucticus melanocephalus	Black-headed Grosbeak	X	
Agelaius phoeniceus	Red-winged Blackbird	X	
**Molothrus ater*	Brown-headed Cowbird	X	
Icterus cucullatus	Hooded Oriole	X	
Icterus bullockii	Bullock's Oriole	X	
Carpodacus mexicanus	House Finch	X	
Carduelis psaltria	Lesser Goldfinch	X	
**Passer domesticus*	House Sparrow	X	
MAMMALS			
Myotis californicus	California Myotis	X	
Myotis yumanensis	Yuma Myotis	X	CSDS Group II
Lasiurus cinereus	Hoary Bat	X	
Parastrellus hesperus	Canyon Bat	X	
Eptesicus fuscus	Big Brown Bat	X	
Tadarida brasiliensis	Mexican Free-tailed bat	X	
Nyctinomops femorosaccus	Pocketed Free-tailed Bat	X	CSC, CSDS Group II
Nyctinomops macrotis	Big Free-tailed bat	X	CSDS Group II
Eumops perotis	Western Mastiff Bat	X	CSC, CSDS Group II
Sylvilagus audubonii	Desert Cottontail	XSC	
Spermophilus beecheyi	California Ground Squirrel	XTS	
Thomomys bottae	Botta's Pocket Gopher	S	
Chaetodipus californicus femoralis	Dulzura Pocket Mouse	T	CSC, CSDS Group II
Peromyscus fraterculus	Northern Baja Mouse	T	
Peromyscus maniculatus gambelii	American Deer Mouse	T	
Neotoma macrotis	Large-eared Woodrat	T	
Neotoma lepida intermedia	San Diego Desert Woodrat	T	CSC, CSDS Group II
Microtus californicus	California Vole	XT	
**Canis familiaris*	Domestic Dog	X	
Canis latrans	Coyote	XSC	
Mustela frenata	Long-tailed Weasel	X	
Mephitis mephitis	Striped Skunk	SC	

Scientific Name	Common Name	Method of Detection	Special Status
**Felis catus*	Domestic Cat	X	
Lynx rufus [*Felis rufus*]	Bobcat	X	
**Equus caballus*	Domestic Horse	X	
Odocoileus hemionus fuliginata	Southern Mule Deer	S	MSCP, CSDS Group II

Legend:

*=invasive or non-native species

Observed or Detected: X = detected, T = trapped or captured, C = camera station, S = sign

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

Appendix B
Photographs

Photo 1. Coastal sage scrub on the western portion of the Preserve

Photo 2. Herpetological Array 3

Photo 3. Molting Orange-throated Whiptail captured in herpetological Array 2

Photo 4. California Pocket Mouse captured during small mammal trapping

Photo 5. California Mouse captured during small mammal trapping

Photo 6. California Legless Lizard captured in herpetological Array 1

Photo 7. Striped Skunk detected on the western parcel of the Preserve

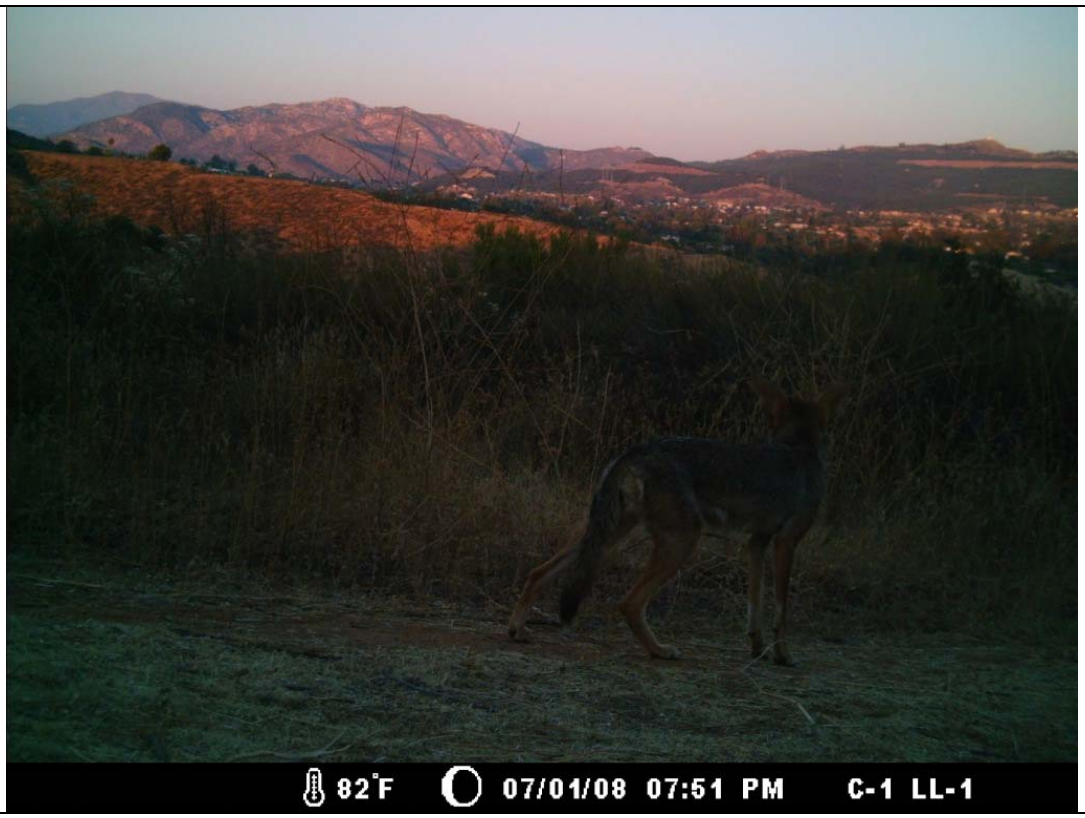


Photo 8. Coyote traveling along an access road on the western parcel of the Preserve