APPENDIX A

Biological Diversity Baseline Report for the Del Dios Highlands Preserve County of San Diego

Biological Diversity Baseline Report

for the

Del Dios Highlands Preserve

County of San Diego

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Executive Summary

Technology Associates, assisted by the San Diego Natural History Museum, conducted baseline biological surveys at Del Dios Highlands Preserve on behalf of the County of San Diego Department of Parks and Recreation. The purpose of these baseline surveys is to provide the County with information on existing biological conditions to develop Resource Management Plan including Area Specific Management Directives. The Preserve is located southwest of Escondido, west of Del Dios Highway, and northwest of Lake Hodges in San Diego County, California, and is owned and managed by the County of San Diego.

Baseline surveys were conducted in the winter, spring, and summer of 2007 and 2008. Biologists conducted the following surveys to assess the current status of biological resources onsite: (1) mapping of vegetation communities, (2) a floral inventory including rare plant surveys, (3) checklist butterfly surveys, (4) pitfall trapping to sample amphibians, reptiles, and small mammals, (5) avian point count surveys, (6) nocturnal avian surveys, (7) acoustic sampling and roost and foraging surveys for bats, (8) small mammal trapping using live Sherman traps, and (9) track and camera station surveys for medium and large mammals. Due to a series of drought years and recent wildfires that have burned much of the Preserve, results of these surveys may under represent the diversity of plant and wildlife species that occupy the Preserve.

Seven vegetation communities were mapped within the Preserve and consist of southern coast live oak riparian forest, southern willow scrub, Diegan coastal sage scrub, southern mixed chaparral, eucalyptus woodland, disturbed habitat, and urban/developed. The most abundant vegetation community on the Preserve is southern mixed chaparral. Floristic survey documented 213 plant taxa occurring in the seven vegetation communities. These include both native and non-native species along with five sensitive plant species: Brewer’s calandrinia, Palmer's sagewort, Robinson’s pepper-grass, wart-stemmed ceanothus, and summer holly.

A total of 153 wildlife species were documented from the Preserve during 2007 and 2008 baseline surveys. These include 14 species of butterflies, three species of amphibians, 15 species of reptiles, 92 species of birds, and 29 species of mammals. Thirty sensitive species were detected during baseline surveys including the federally threatened coastal California gnatcatcher and state endangered and federally delisted peregrine falcon.

1.0 INTRODUCTION

1.1 Purpose of the Report

The purpose of this report is to document biological baseline data collected by Technology Associates (TAIC) and the San Diego Natural History Museum (SDNHM) for the County of San Diego's Del Dios Highlands Preserve (Preserve). Biological surveys were conducted on behalf of the County of San Diego (County) in 2007 and 2008 to establish baseline habitat and species data. The Preserve is managed by the County of San Diego Department of Parks and Recreation (DPR), and the information will be used to direct future preserve management and monitoring and the development of a Resource Management Plan (RMP) including Area Specific Management Directives (ASMDs).

1.2 Project Location

The 468.8-acre[1] (190 ha) Preserve is located southwest of Escondido, west of Del Dios Highway, and northwest of Lake Hodges (Figure 1-1 – 1-3). The Preserve is within the USGS 7.5' Rancho Santa Fe/Escondido Quadrangle, Township 12 South, Range 2 West, Sections 6 and 31. The Preserve is bordered on the southwest by San Diego County Water Authority land (Olivenhain Reservoir), northwest by the Elfin Forest Preserve, and on the east and northeast by the community of Del Dios.

The Preserve is comprised of the following Assessor's Parcel Numbers (APN): 238-020-36, 238-020-34, 238-020-37, 270-010-03, 270-010-04, 270-010-05, 270-010-02, 270-030-15, and 270-030-07. Access to the Preserve occurs from Del Dios Highway at the main access gate near the northeast boundary of the Preserve.

1.3 Project Description

The Preserve was acquired by the County in 2002 for inclusion in the South County Multiple Species Conservation Program (MSCP) preserve system. The Preserve consists of valuable native habitats, as well as areas that have been marginally impacted by human activities. The County proposes to manage the Preserve in accordance with ASMDs that will be prepared based upon the baseline biological survey information established in this report.

[1] The County assessor's parcel data list the Preserve to be 464.34 acres; however, calculations generated from the SanGIS parcel database show the Preserve as 468.8. Therefore, this report references the Preserve as 468.8 acres.

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Del Dios Highlands Preserve Baseline Surveys

PARKS AND RECREATION
COUNTY OF SAN DIEGO

Basemap Legend

- Freeway
- River
- Lake/Reservoir/Lagoon

N

Miles

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Regional Location Map

Figure 1-1

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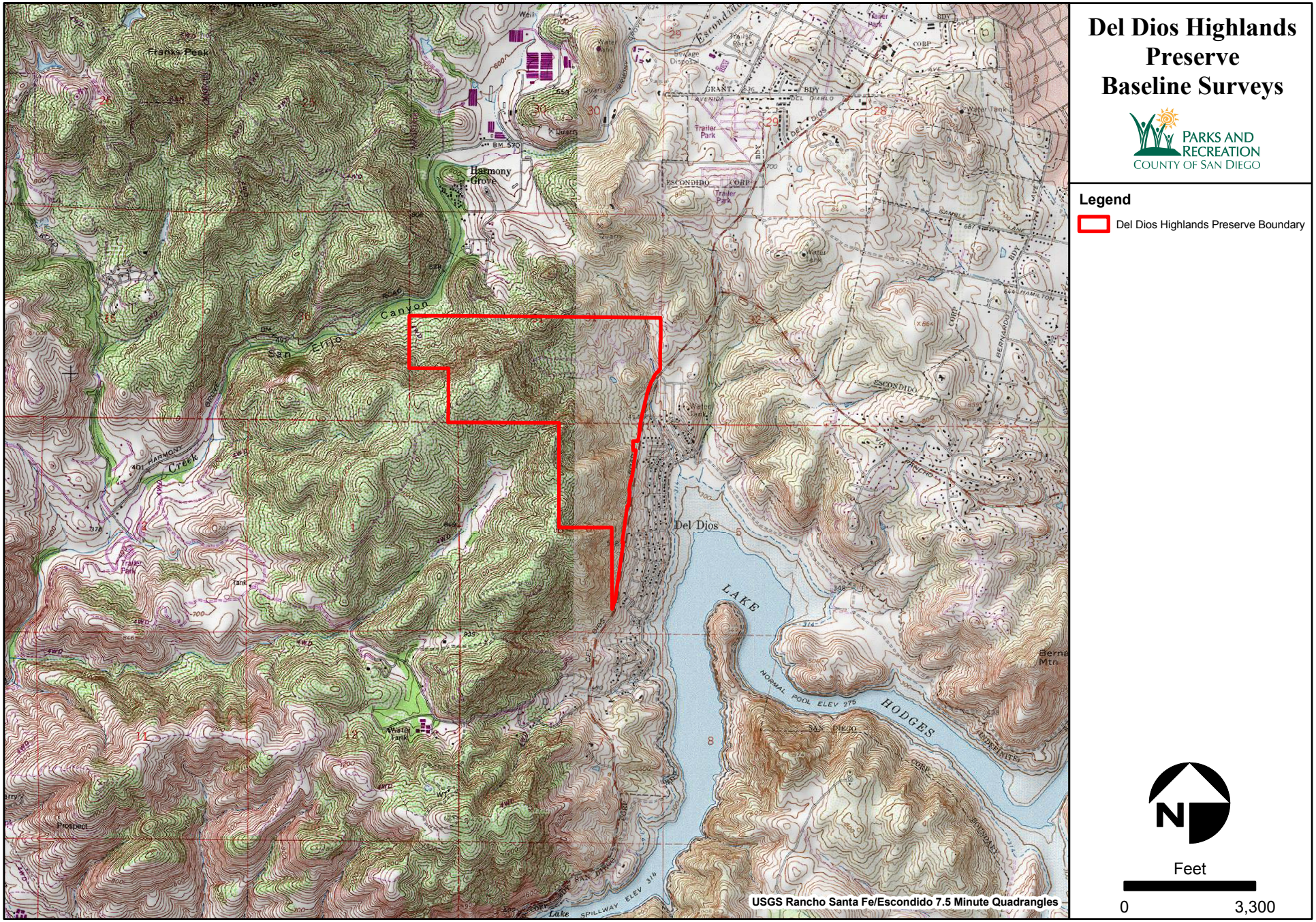

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USGS Togographic Quadrangle Map

Figure 1-2

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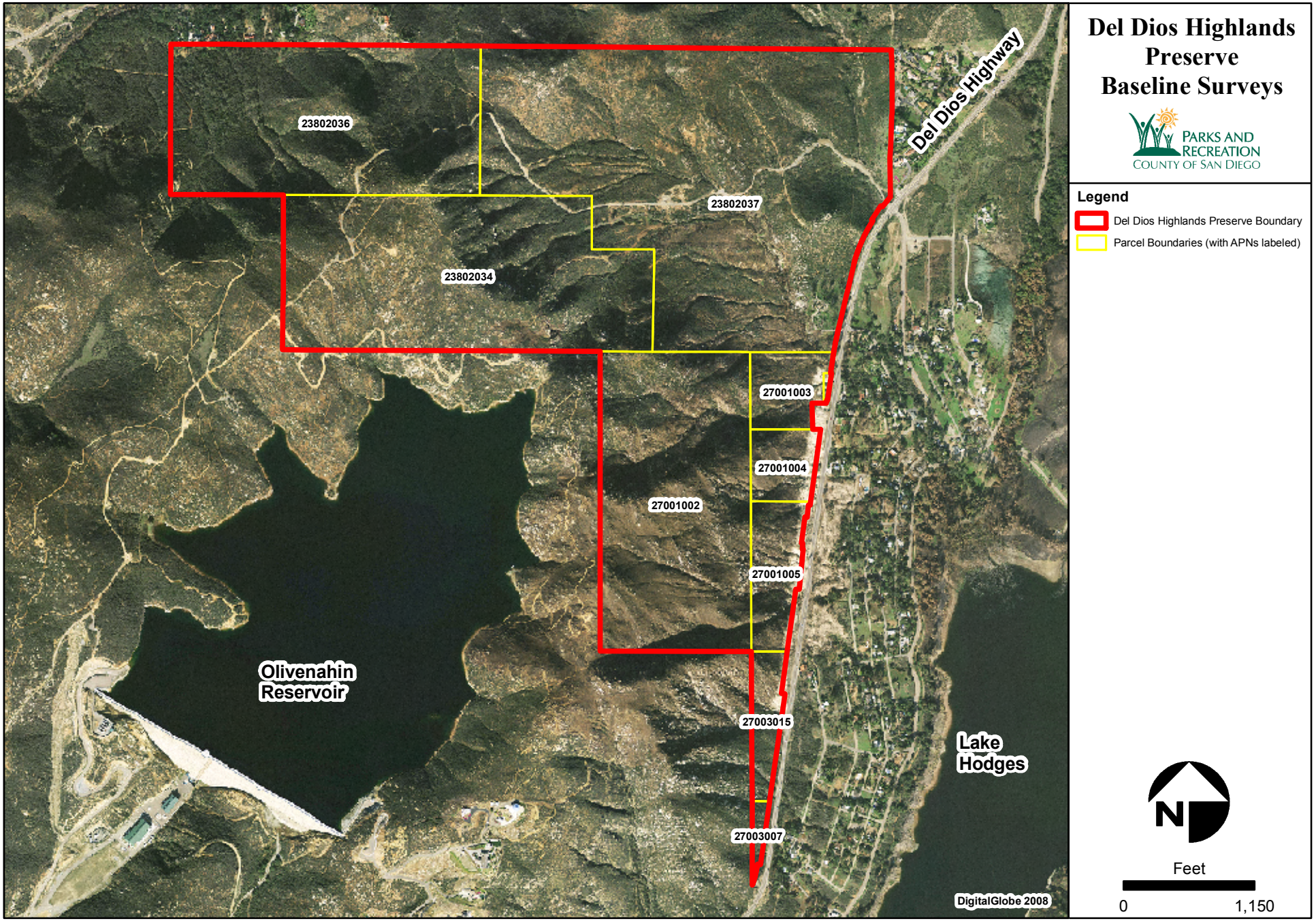

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Site Map

Figure 1-3

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2.0 STUDY AREA

2.1 Geography & Topography

The Preserve is located in the coastal foothills of northern San Diego County in the Peninsular Geomorphic Range. The site comprises moderately to steeply sloping terrain with a total elevation change of nearly 700 feet (from approximately 600 to 1,300 feet, or 180 to 400 meters) above mean sea level (msl).

2.2 Geology and Soils

According to the Natural Resource Conservation Service's (NRCS) Web Soil Survey (WSS), eight different soil types are present throughout the Preserve (Figure 2-1). The WSS provides soil data and information produced by the National Cooperative Soil Survey and provides access to the largest natural resource information system in the world. A brief description of each soil type is provided in the text below.

Cieneba Very Rocky Coarse Sandy Loam 30-75 percent slopes (CmrG). This soil type is similar in origin, texture, and permeability, to Cieneba Coarse Sandy Loam 15-30 percent slopes. Cieneba Very Rocky Coarse Sandy Loam 30-75 percent slopes are excessively drained, very shallow to shallow, coarse sandy loams formed from material weathered in place from granitic rock. This soil type occurs on steep to very steep terrain. Fertility is low. Runoff is rapid to very rapid, and the erosion hazard is high to very high. This soil type has poor overall productivity and supports wildlife habitat, recreation, and range. Within the project vicinity this soil type supports southern mixed chaparral and disturbed habitat.

Cieneba – Fallbrook Rocky Sandy Loam 30-65 percent slopes, eroded (CnG2). This complex is similar in origin, texture, runoff/drainage, permeability, and erosion hazard to Cieneba – Fallbrook Rocky Sandy Loam 9 to 30 percent slopes, eroded described below. This complex is a mixture of two discrete soil mapping types containing approximately 55 percent Cieneba Course Sandy Loam and 40 percent Fallbrook Sandy Loam with 10 percent rock outcrops and 10 percent large boulders. The Cieneba course sandy loam component of this complex is low in fertility, excessively drained, and moderately to rapidly permeable. Fallbrook Sandy Loam is medium in fertility, well drained, and slowly to moderately permeable. For both constituent soils included in this complex runoff is rapid to very rapid and the erosion hazard is high to very high. Sheet and gully erosion are classified as moderate. Within the project vicinity this soil type supports

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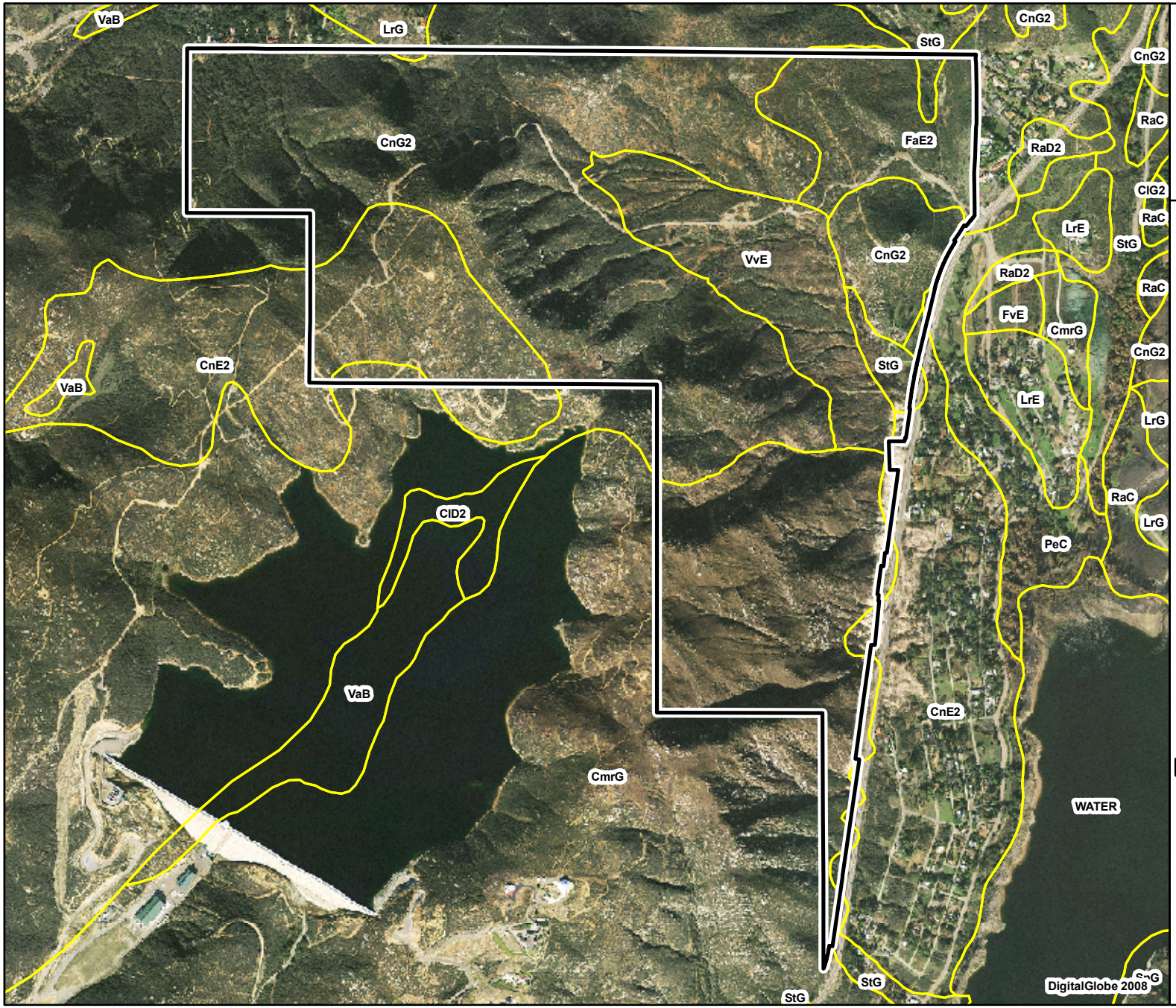

Del Dios Highlands Preserve Baseline Surveys

PARKS AND RECREATION
COUNTY OF SAN DIEGO

Legend

Code	Soil Type
CID2	Cieneba coarse sandy loam, 5 to 15 percent s eroded
ClG2	Cieneba coarse sandy loam, 30 to 65 percent eroded
CmrG	Cieneba very rocky coarse sandy loam, 30 to percent slopes
CnE2	Cieneba-Fallbrook rocky sandy loam,9 to 30 p slope,eroded
CnG2	Cieneba-Fallbrook rocky sandy loams, 30 to 6 slopes, eroded
FaE2	Fallbrook sandy loam, 15 to 30 percent slopes
FvE	Fallbrook-Vista sandy loams, 15 to 30 percent
LrE	Las Posas stony fine sandy loam, 9 to 15 per slopes
LrG	Las Posas stony fine sandy loam, 30 to 65 pe slopes
PeC	Placentia sandy loam, 2 to 9 percent slopes
RaC	Ramona sandy loam, 5 to 9 percent slopes
RaD2	Ramona sandy loam, 9 to 15 percent slopes,
SnG	San Miguel-Exchequer rocky silt loams, 9 to percent slopes
StG	Steep gullied land
VaB	Visalia sandy loam, 2 to 5 percent slopes
VvE	Vista rocky coarse sandy loam, 15 to 30 perc slopes
WATER	WATER

Basemap Legend

Del Dios Highlands Preserve Boundary

N

Feet

0 1,150

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Soils

Figure 2-1

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seven vegetation communities: (1) disturbed coastal sage scrub, (2) eucalyptus woodland, (3) southern coast live oak riparian forest, (4) southern mixed chaparral, (5) southern willow scrub, (6) disturbed habitat, and (7) developed/urbanized land.

Cieneba – Fallbrook Rocky Sandy Loam 9 to 30 percent slopes, eroded (CnE2). This complex is a mixture of two discrete soil mapping types containing approximately 55 percent Cieneba Course Sandy Loam and 40 percent Fallbrook Sandy Loam with 5 percent rock outcrops. This complex occurs in uplands between 200 and 3,000 feet (60-900 m) above mean sea level. This complex displays the geophysical characteristics of both of is constituent sources. The Cieneba course sandy loam component of this complex is excessively drained, permeability is moderately rapid, and the fertility is low. The Fallbrook sandy loam component is well drained, permeability is moderately slow, and fertility is medium. The runoff for both soils is medium to rapid and the erosion hazard is moderate to high with sheet erosion and gully erosion classified as moderate. Four vegetation types occur within this soil type on the subject property, including: (1) eucalyptus woodlands, (2) southern mixed chaparral, (3) disturbed habitat, and (4) developed/urbanized land.

Fallbrook Sandy Loam, 15 to 30 percent slopes, eroded (FaE2). Fallbrook Sandy Loam, 15 to 30 percent slopes (eroded) is well drained, moderately deep to deep sandy loam formed in material weathered in place from grandiorite. This soil type occurs on moderately steep terrain over rock. This soil type is similar in origin, texture, and permeability to Fallbrook Sandy Loam, 5 to 9 percent slopes. Runoff is medium to rapid and the erosion hazard is moderate to high. In other features this soil type is similar to Fallbrook Sandy Loam, 5 to 9 percent slopes. Like other soils of the Fallbrook series, this soil type can support range. On the subject property, this soil type supports six vegetation communities: (1) coastal sage scrub, (2) disturbed coastal sage scrub, (3) southern mixed chaparral, (4) southern willow scrub, (5) disturbed habitat, and (6) developed/urbanized land.

Las Posas stony fine sandy loam, 30 to 65 percent slopes (LrG). Las Posas stony fine sandy loam, 30 to 65 percent slopes is a well drained, moderately deep, stony, fine sandy loam with a clay subsoil. It occurs on steep to very steep terrain in uplands. Fertility is medium. Permeability is moderately slow in the subsoil. Water holding capacity is 4 to 6 inches. Runoff is rapid to very rapid and erosion hazard is high to very high. This soil type supports range and wildlife habitat. Within the subject property, this soils type supports southern mixed chaparral and developed/urbanized land.

Placentia sandy loam, 2 to 9 percent slopes (PeC). Placentia sandy loam, 2 to 9 percent slopes, is a gently sloping to moderately sloping soil found on alluvial fans and alluvial plains. Fertility is low to medium. The available water holding capacity is 3 to 4 inches; some moisture is slowly available from the sandy clay subsoil. Permeability is very slow in the subsoil. Runoff is slow to medium, and the erosion hazard is slight to moderate. The rooting depth is 9 to 19 inches, and roots are restricted by the sandy clay subsoil. This soil type is suitable for grazing and cultivation of some crop plants, including tomatoes. Within the subject property, southern mixed chaparral and disturbed habitat occur in conjunction with this soil type.

Steep Gullied Land (StG). Steep Gullied Land consists of strongly sloping to steep lands that are actively eroding into old alluvium or decomposed rock. It occurs as large individual gullies or networks of multiple connected gullies where vegetative cover is sparse or has been depleted by grazing or wildfire. Vegetation mostly consists of a sparse cover of shrubs, annual grasses, and forbs. Runoff is very rapid and the erosion hazard is very high. This soil type supports five vegetation types on the subject property, including: (1) eucalyptus woodland, (2) southern mixed chaparral, (3) southern willow scrub, (4) disturbed habitat, and (5) developed/urbanized land.

Vista Rocky Course Sandy Loam, 15 to 30 Percent Slopes (VvE). Vista Rocky Course Sandy Loam, 15 to 30 Percent Slopes is a well-drained, moderately deep to deep course sandy loam derived from granodiorite or quartz diorite which occurs on moderately steep terrain. About ten percent of the ground surface within the soil type is covered by rock outcrops and another ten percent with large boulders. Runoff is medium to rapid and erosion hazard is moderate to high. In other features, this soil type is similar to Vista Course Sandy Loam 9-15 percent slopes. This soil type can support range. In the project vicinity this soil type supports four vegetation communities: (1) eucalyptus woodland, (2) southern mixed chaparral, (3) southern willow scrub, and (4) disturbed habitat.

2.3 Climate

San Diego County and Southern California have a Mediterranean climate characterized by mild wet winters and arid summers. The growing season is generally considered to be 365 days per year in this area. Temperature data recorded at California Irrigation Management Information System (CIMIS 2008) San Pasqual Valley weather station (N 33° 05'; W 116° 58') is presented in Table 2-1. Precipitation data recorded at the Western Regional Climate Center (WRCC 2007) Hodges Dam sampling station (044014) (the closest sampling station to the Preserve) is presented in Table 2-2.

Table 2-1. Temperature Data (2000-2007) for the San Pasqual Valley Weather Station (N 33° 05'; W 116° 58')

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average High Temperature (°F)	68.4	67.8	69.8	71.5	77.0	81.3	87.1	88.0	85.9	77.9	73.6	68.4
Average Low Temperature (°F)	36.5	39.7	42.5	45.0	50.6	53.4	57.1	57.4	53.1	49.1	41.6	36.2

Table 2-2. Precipitation Data (1961-1990) for the Hodges Dam, California Weather Station (044014)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Total Precipitation (in.)	1.73	2.42	1.72	0.33	0.46	0.03	0.06	0.21	0.03	0.15	1.49	1.59	10.24

2.4 Fire Cycles

Wildfire is a natural disturbance cycle which has historically shaped the Preserve and the surrounding region. Plant species found in local vegetation communities (i.e. chaparral communities) have developed the ability to survive naturally spaced recurrent fires by producing seeds that require a fire-related cue to stimulate germination and/or by stump sprouting after being burned. The return frequency of wildfire on the Preserve is not well known, specifically as in recent years, the return cycle has increased due to human-caused fires exacerbated by Santa Ana wind conditions. A majority (99 percent) of the recent firestorms in San Diego County has been human-caused; in addition, the sources of wildfires have shifted over time, and the effects (including size and intensity) of these fires have increased compounded by drought and Santa Ana wind conditions. Historically, fires have occurred more frequently in more populated coastal environments, where the climate is moister and Santa Ana winds don't proliferate. However, populations in the County's interior has increased, and recent fires have ignited in the dryer eastern parts of the County, where they burned vast areas east to west driven by Santa Ana winds.

Recent wildfires have been recorded on the Preserve in 2007 (Witch Creek Fire) (SDSU 2008), as well as historic wildfire which has consumed all or portions of the Preserve in 1919, 1943, 1980, 1985, and 1990 (California Department of Forestry and Fire Protection, Fire Perimeter Data, 2008). The Witch Creek wildfire consumed portions of the eastern and southern parts of the Preserve in October 2007 (Figure 2-2); it also significantly affected the residential communities east of the Preserve.

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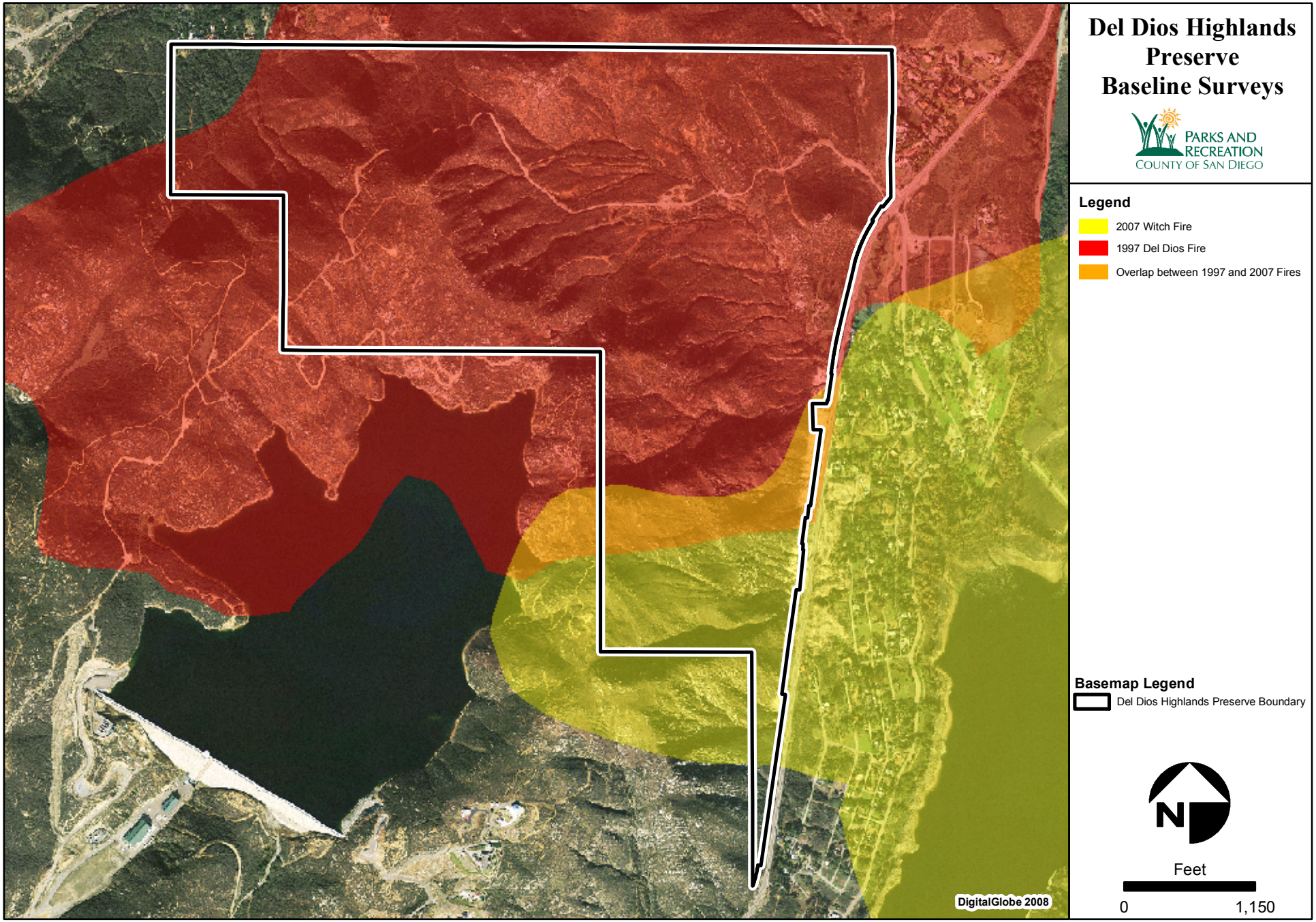

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Recent Fire History

Figure 2-2

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2.5 Hydrology

The Preserve is divided by several high ridges into three separate watersheds. Due to the stark topography and terrain of the Preserve and the multiple intersecting ridgelines, accumulated precipitation drains either east to the San Dieguito River (via Lake Hodges), north to Escondido Creek, or south and west to the Mt. Israel Reservoir (also known as the Emergency Storage Project Olivenhain Reservoir) (Figure 1-2). The majority of waters drain east to Lake Hodges, while water that falls in the northwestern corner of the Preserve drains northwest through the community of Del Dios and the Elfin Forest Preserve to Escondido Creek. Finally, all waters that fall along the southern and western corners of the Preserve drain to the artificial Olivenhain Reservoir where they are controlled by the Olivenhain Dam operated by the Olivenhain Municipal Water District (OMWD).

3.0 METHODS

3.1 Background Literature Review

Prior to conducting biological field surveys, potentially occurring sensitive biological resources were identified through a review of the following species databases: California Natural Diversity Database (CNDDB), MSCP Species Database, U.S. Fish and Wildlife Service (2004), California Department of Fish and Game (2004), California Native Plant Society's (CNPS) Inventory of Rare and Endangered Vascular Plants (CNPS 2004), the San Diego Natural History Museum (SDNHM) Plant, Bird, and Mammal Atlas, and the SD Herbarium databases (herbarium housed at the SDNHM).

3.2 Biological Field Surveys

Biological field surveys were conducted by qualified biologists of TAIC and SDNHM during the appropriate time of year ideal for detection and identification, as described in more detail below. Baseline surveys were conducted in the winter, spring, and summer of 2007 and 2008 (Table 3-1 details survey personnel and schedules). Biologists conducted the following surveys to assess the current status of biological resources onsite: (1) mapping of vegetation communities, (2) a floral inventory including rare plant surveys, (3) checklist butterfly surveys, (4) pitfall trapping to sample amphibians, reptiles, and small mammals, (5) diurnal avian point count surveys, (6) nocturnal avian surveys, (7) acoustic sampling and roost and foraging surveys for bats, (8) small mammal trapping using live Sherman traps, and (9) track and camera station surveys for medium and large mammals.

3.2.1 Vegetation Communities Mapping

Mapping of vegetation communities was conducted by qualified biologists within the Preserve on October 5 and 9, 2008 (Table 3-1). Vegetation communities were mapped within the Preserve boundaries plus a 100-foot buffer pursuant to survey guidelines published by the County of San Diego (2007). The presence or absence, and/or percent cover of indicator plant species were used to determine the vegetation type. The boundaries of vegetation communities were drawn onto a 200-scale (1" = 200') 2007 color aerial photograph. The natural vegetation community classification used in this report follows the Oberbauer (2005) modified Holland (1986) Vegetation Classification System.

Table 3-1. Schedule of Biological and Habitat Assessment Surveys

Survey Type	Dates	Personnel[1]
Vegetation Communities Mapping	October 5, 2007	JA, RH
	October 9, 2007	JA, RH, MH, MR
Flora Surveys	November 15, 2007, February 17, April 17, and May 16, 2008	MM, JR
Lepidoptera Surveys	February 28, April 17, and May 16, 2008	MW
Terrestrial Herpetofauna Surveys	March 24-28, 2008	MR, MA
	April 21-25, 2008	DS
	May 12-16, 2008	DS
	June 9-June 13, 2008	MR, MA
Avian Surveys	November 20 and 21, 2007	PU
	December 26 and 31, 2007	PU
	January 21 and 22, 2008	PU
	February 19 and 20, 2008	PU
	March 18 and 19, 2008	PU
	April 22 and 23, 2008	PU
	May 13 and 14, 2008	PU
	June 4 and 6, 2008	PU
Bat Surveys (Passive Surveys)	January 29-February 1, March 18-21, and June 3-6, 2008	DS
Bat Surveys (Active Surveys)	June 24, 2008	DS
Small Mammal Surveys	November 14-16, 2007	DH, DS
	November 27-29, 2007	DH
	March 19-21, 2008	DH
Medium and Large Mammal Surveys	November 15-17, 2007	DH, DS
	November 27-29, 2007	DH
	April 7 and 8, 2008	DH

[1] **TAIC Personnel**: JA=Jonathan Appelbaum, RH=Rosanne Humphrey, MH=Marissa Hedman, MR=Mark Roll, MA=Michael Anguiano; **SDNHM Personnel**: MM=Margie Mulligan, JR=Jon Rebman, PU=Philip Unitt, DS=Drew Stokes, DH=Dana Hogan, MW=Michael Wall.

3.2.2 Floristic Surveys

Floristic surveys consisted of surveying the Preserve to record common, readily detectable rare plants, and invasive non-native plant species for the purpose of future monitoring. A stratified sampling approach was employed in order to best characterize species occurrence and distribution within the Preserve. Survey sites were selected based upon accessibility, vegetation community, soil type, burn history, known rare plant locations, and other environmental factors such as slope, aspect, and unique geological features. By selecting sites based on these variables it was possible to focus efforts in areas with a greater potential to encounter high plant species diversity and interesting rare and/or previously undocumented species. Some areas were inaccessible due to dense vegetation and steep terrain and therefore not surveyed. These areas include some of the upper reaches of the washes in the western part of Preserve and much of the dense chaparral in the northeastern section of the Preserve.

Survey efforts were temporally spaced to allow for maximizing rare plant sightings in a one year period (Table 3-1). Emphasis was placed on collecting during the growing and flowering season for most species in the coastal areas of San Diego County (February through May 2008). A field visit was also made to the Preserve in the fall (November 15, 2007) to search for the sensitive fall-flowering shrub, Encinitas baccharis (*Baccharis vanessae*). This shrub is difficult to distinguish in dense chaparral unless it is flowering. It should be noted that conditions in the field and the amount and timing of seasonal precipitation may have influenced the number of rare plants encountered.

All federal, state, and local special-status species encountered during surveys were mapped with a Garmin Rino 130 Global Positioning System (GPS) Unit with less than 20 feet accuracy. Invasive non-native plant species or areas of high concentrations of non-natives (such as old homesteads) encountered were also mapped using a GPS unit.

A voucher-based species list was compiled for all reproductive species found in the Preserve, including the sensitive and invasive non-native species. Plants were collected and identified by Masters or Ph.D. level botanists. Following preliminary identification, all plant specimens were verified by Dr. Jon Rebman, Curator of Botany at the San Diego Natural History Museum (SDNHM). Plant specimens were then deposited in the SD Herbarium, located at SDNHM. The SD Herbarium is the primary repository in San Diego County of voucher specimens documenting plant diversity in the County. All species collections were submitted through the Plant Atlas Project, a multi-year program designed to improve scientific knowledge of regional plants through better documentation of the flora of San Diego County. Collection supplies and guidelines for

collecting, pressing, mounting, and storing of specimens are found in Appendix A of this report, prepared by the SD Herbarium.

3.2.3 Lepidoptera Surveys

Butterfly surveys were conducted as checklist surveys. Checklist surveys employ targeted walks that focus on habitat diversity for optimal detectability of butterfly species. It is an opportunistic method that is difficult to standardize. However, for butterflies checklist surveys have proven to be most efficient for maximizing diversity in preliminary diversity assessments (Royer et al. 1998).

Surveys were conducted on three dates including February 28, April 17, and May 16, 2008 (Table 3-1). Targeted walks were performed in all major vegetation areas within the Preserve to fully capture the diversity of the butterfly fauna. This included both native vegetation and areas dominated by non-natives. Attention was also focused on ridges and hilltops to take advantage of butterflies' tendency to congregate in these areas (Baughman et al. 1988). Walks were generally over six hours in length. Most butterflies were identified on sight. Some individuals were netted to confirm identification. Data were collected in the field using in a field notebook and GPS.

The survey method used maximizes diversity in initial biodiversity assessments. Because the survey method is opportunistic, repeatability for statistical purposes is limited. Weather can impact survey success. However, conditions were average to above average for most survey dates. Finally, although the southern coast live oak riparian forest section of Preserve was surveyed one afternoon, no species were documented in this habitat.

3.2.4 Herpetofauna Surveys

3.2.4.1 Terrestrial Herpetofauna Surveys

Pitfall trap arrays have been widely used to obtain data on amphibians and reptiles throughout southern California (Fisher and Case 2000). For this study, five pitfall arrays were constructed within the Preserve following a modified U.S. Geological Survey (USGS) protocol for herpetological monitoring using pitfall trapping (Atkinson et al. 2003). Each pitfall array consisted of four 5-gallon buckets and three box funnel (12" x 8" x 18") traps connected by shade cloth drift-fences (15 meter (50 ft) x 30 centimeter (12 in)). Each array was created around a center bucket (pitfall) with three arms of drift fence extending out 15 meters (50 ft) forming a Y-shape. In addition to the center bucket, each arm of the "Y" had a bucket placed in the middle and a box funnel trap placed at the end. Each box funnel trap and bucket contained a piece of PVC pipe to

provide shelter for captured animals, and was covered with boards and/or lids to protect animals captured from the heat of the sun (Appendix B). Arrays were strategically placed in representative areas within the Preserve to fully capture the diversity of the herpetofauna, including rock outcroppings and ravines (Figure 3-1).

Four 5-day sampling periods were conducted in March, April, May, and June of 2008 (Table 3-1). Traps were opened on day one and checked every morning for four consecutive mornings. Traps were closed on the last day of each sample period. All reptiles and amphibians captured were identified, age classed, sexed, measured (snout to vent), weighed, and released. Small mammals captured were not sexed, measured, or weighed. Data were recorded in the field using personal digital assistants (PDAs).

The survey method described above is the most widely used method for sampling amphibians and reptiles. The number of sampling periods, timing of sampling periods, and number of pitfall arrays play an important role in an accurate inventory. Surveys were limited to one week per month in March, April, May, and June 2008. The surveys may have missed some species, including salamanders, which are more active during wetter months. Confounding the issue of limited sampling periods are the low capture rates of most herpetofauna species. Finally, although arrays were placed in representative areas, multiple arrays per land cover type are generally preferred to capture habitat variances.

For the purposes of establishing a baseline herpetofauna species list, the use of mark/recapture methods was not necessary.

3.2.5 Avian Surveys

3.2.5.1 Diurnal Point Count Surveys

Avian surveys were conducted at the Preserve primarily by timed 10-minute unlimited-distance point counts (Ralph et al 1993). The survey points were selected to cover the range of habitat types within the Preserve and for their location to maximize detections of birds: the ideal position is in a natural amphitheatre where birds can be heard over a wide radius. Each point was a minimum 5-minute walk from other points or positioned so that small birds detected at one point had little or no chance of being the same as those detected at another point. For large soaring birds such minimization of overlap was not possible.

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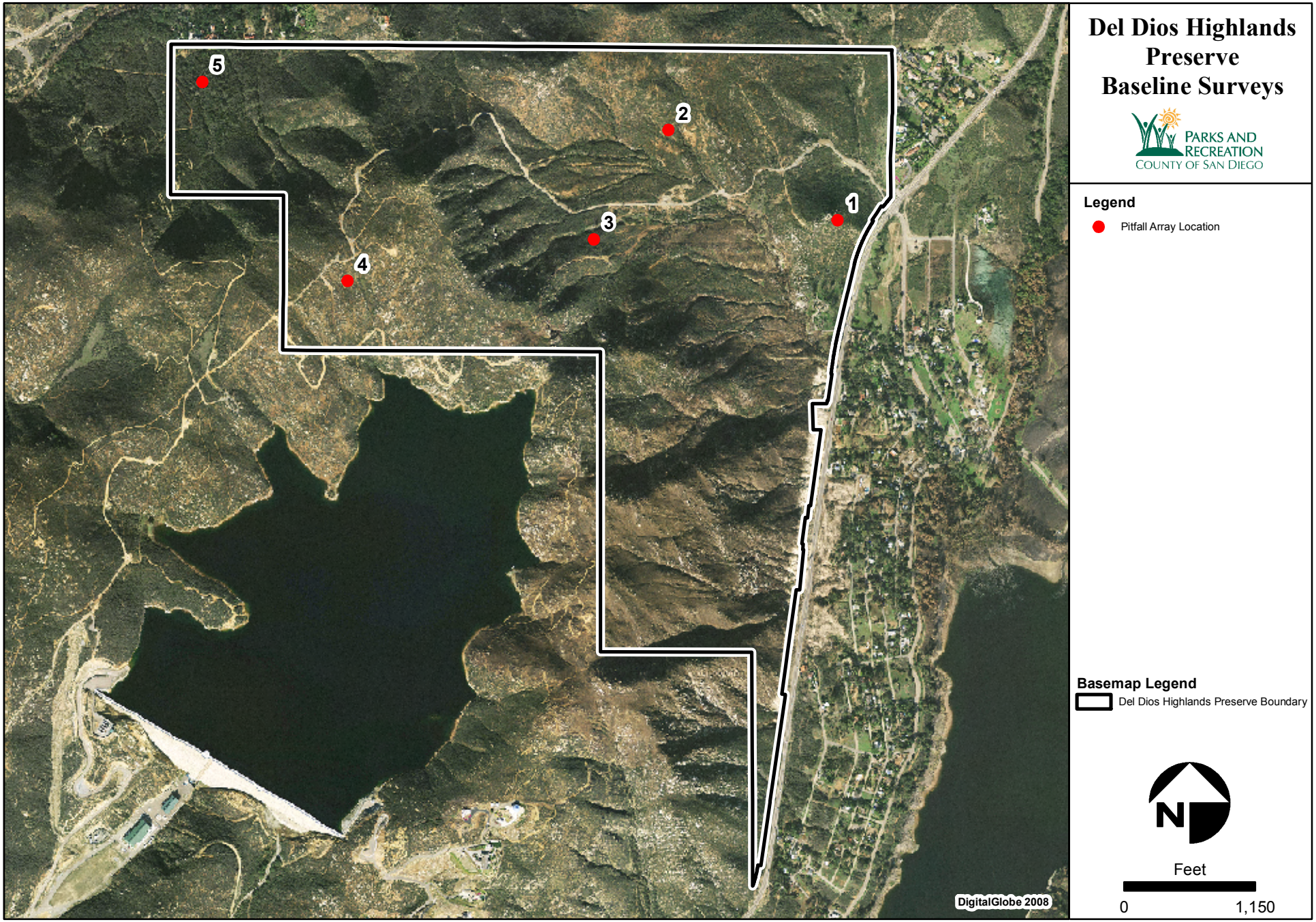

Del Dios Highlands Preserve Baseline Surveys

PARKS AND RECREATION
COUNTY OF SAN DIEGO

Legend

- Pitfall Array Location

Basemap Legend

- Del Dios Highlands Preserve Boundary

N

Feet

0 1,150

Technology Associates International Corporation

Pitfall Array Locations

Figure 3-1

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A total of 18 point count locations were established in the Preserve (Figure 3-2). Twelve of these were covered in a route leading from the parking area at the east side of the reserve (point 1) along the road to the boundary with the Elfin Forest Preserve (points 8 and 9) and back along the trail on the south-facing slope overlooking Olivenhain Reservoir (point 10) to the junction of the trail to the Lake Hodges overlook (point 11) and the north-facing granite boulders and cliffs overlooking the road (point 12). The other 6 more scattered points were covered on another day. One of these (point 17) was near the northeast corner of the Preserve, and three others were to the south of the parking area along the west-facing slopes overlooking Del Dios Highway. Point 13 was at the ruin of the old homestead, with its stand of eucalyptus and other exotic trees attracting species not found elsewhere on the Preserve. Point 18 was within the area burned in the Witch Creek fire of 2007, and points 11, 12, and 13 were on the edge of the burned area. Points 15 and 16, in the northwest corner of the Preserve, were reached from the Elfin Forest trailhead off Elfin Forest Road.

Surveys were conducted two days per month, from November 2007 to June 2008 (Table 3-1). Birds were counted at the points from dawn to mid-morning, with the surveys normally concluding by 10:30 AM. Additional species observed between the points were noted.

The point-count method prescribed for this survey is designed for use in evaluating densities and trends. It is not the ideal method for an exhaustive inventory of species, nor is it appropriate for assessing which species are migrants and which are local breeders. In the case of the Preserve, however, the Preserve is small enough, and the habitat heterogeneity is low enough, that the point counts very likely gave a complete inventory of year-round resident and summer visitors. The chaparral covering nearly all the Preserve is not expected to concentrate migrating birds.

3.2.5.2 Nocturnal Surveys

Nocturnal surveys were conducted on April 22 and June 5, 2008 in the Preserve beginning at dusk and continuing to approximately 11:00 PM. The nocturnal survey route extended from the burnt homestead (count point 13) north up the canyon to the main road and traveling west to the west end of the Preserve then back along the same route to the parking area at the east end of the Preserve and south to the burnt homestead (Figure 3-2). Along the route the calls of the lesser nighthawk (*Chordeiles acutipennis*), common poorwill (*Phalaenoptilus nuttallii*), great horned owl (*Bubo virginianus*), and barn owl (*Tyto alba*) were broadcast regularly, followed by pauses to listen and watch for responses.

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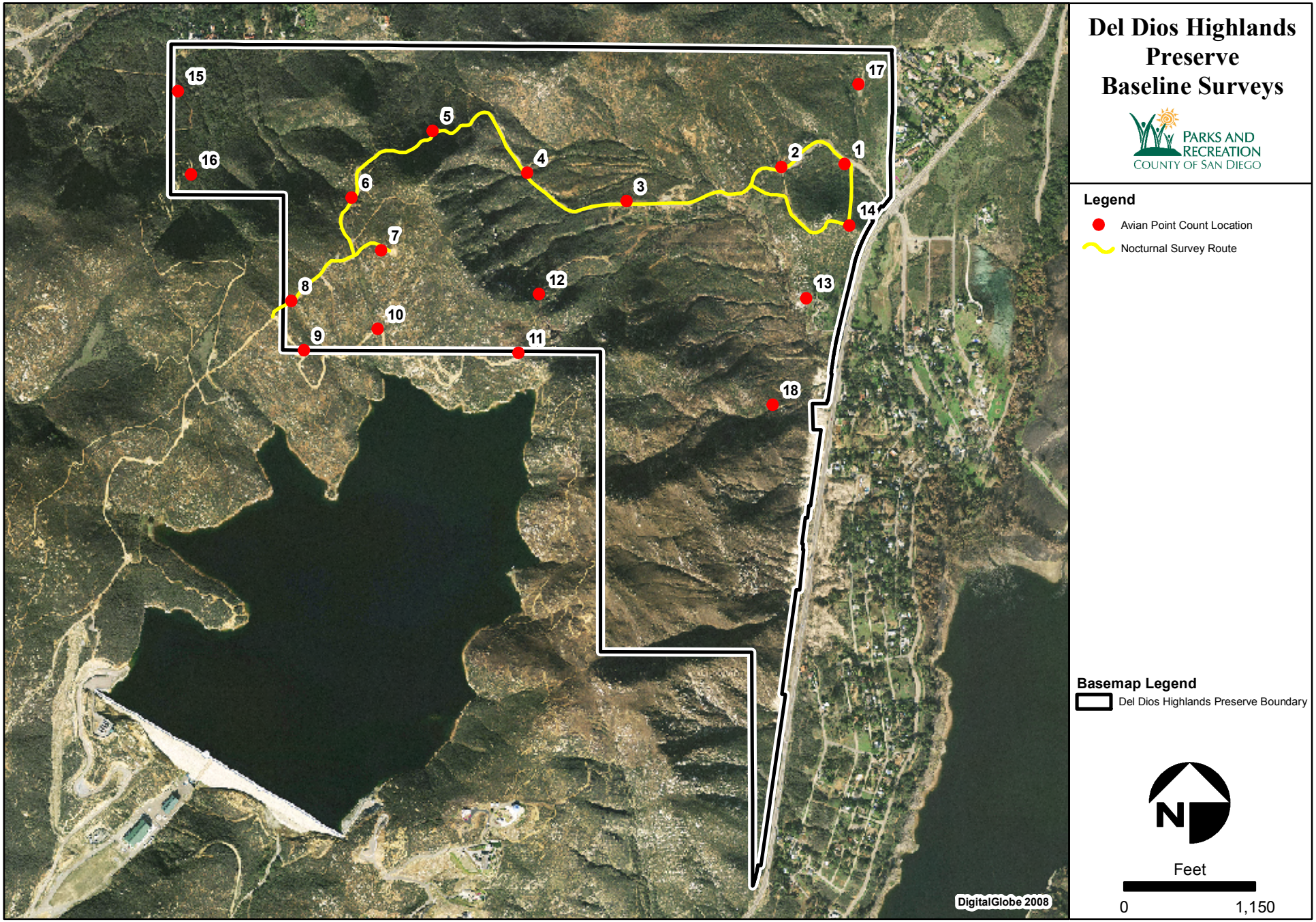

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Avian Point Count Locations and Nocturnal Survey Routes

Figure 3-2

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3.2.6 Mammal Surveys

3.2.6.1 Bats

Multiple bat survey techniques are needed to thoroughly document a diversity of bat species during an inventory study (Pierson 1993). In this study, we conducted two types of bat surveys, passive and active, and used a combination of techniques including acoustic surveys, mist-netting, and roost surveys.

3.2.6.1.1 Passive Surveys

Passive surveys using Anabat II bat detectors (Titley Electronics, New South Wales, Australia) were conducted within the Preserve. Anabat II bat detectors (simply called 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.

Passive Anabats were used to survey for bats in the Preserve during three monitoring sessions: winter, spring, and summer, 2008 (Table 3-1; Appendix C). During the winter and spring monitoring sessions, a total of six passive Anabat units were placed at various locations in the Preserve to monitor bats for three consecutive nights (Figure 3-3). During the summer session three passive units were used to monitor bats for three consecutive nights (Figure 3-3).

3.2.6.1.2 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 the base of the cliffs/rock outcrops located near the south end of the Preserve on June 24, 2008 (Table 3-1; Figure 3-3).

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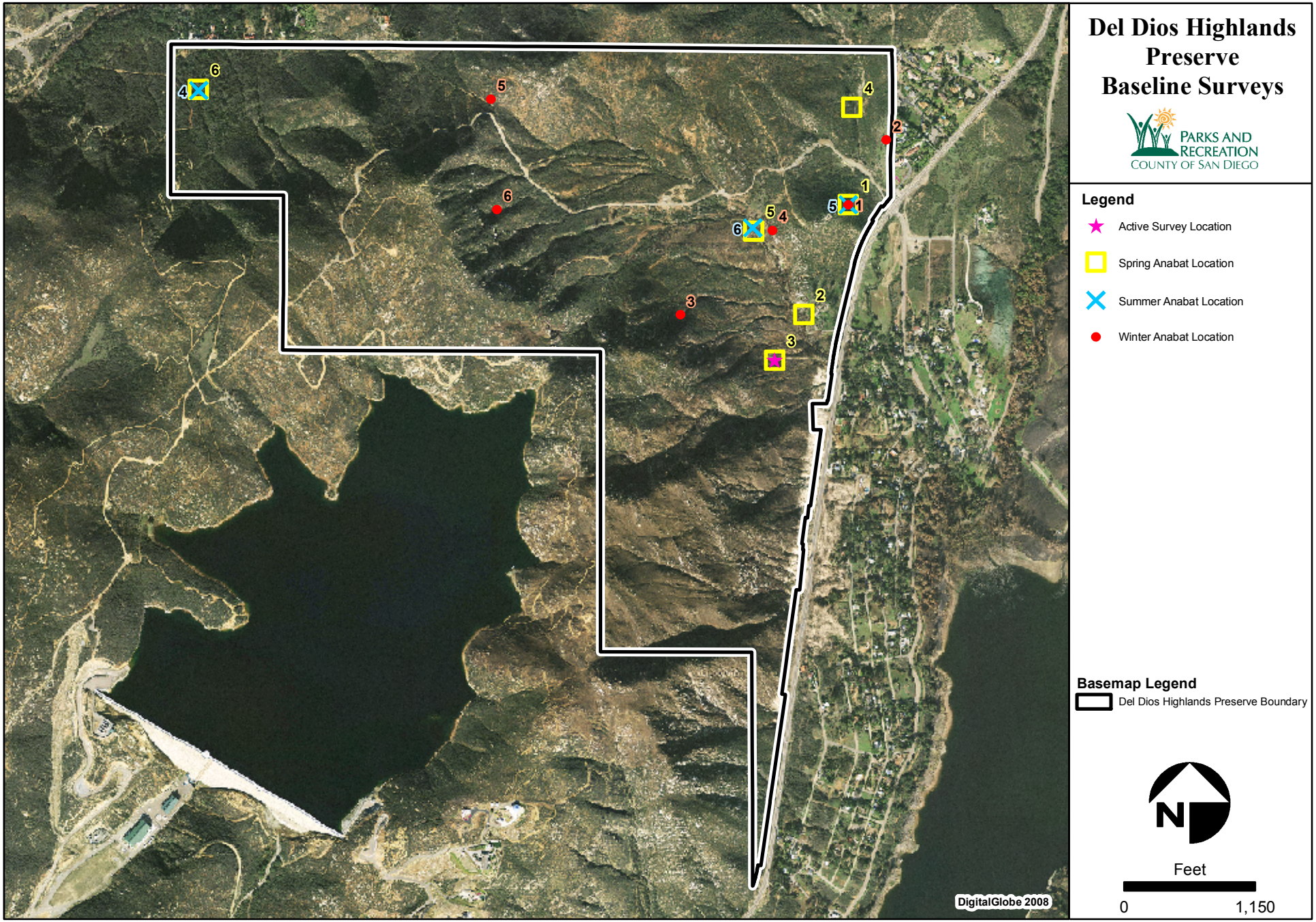

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Bat Survey Locations

Figure 3-3

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Not all bat species are equally detectable using Anabats. Certain species such as the Townsend's big-eared bat (*Corynorhinus townsendii*) and long-eared myotis (*Myotis evotis*) appear to use low-intensity echolocation calls and therefore may go undetected using acoustic monitoring techniques (O'Farrell et all 1999). Pallid bats (*Antrozous pallidus*) do not always use echolocation and sometimes rely on passively listening for arthropods in leaf litter and therefore may also go undetected acoustically (Orr 1982). There were not suitable locations to mist-net for bats on the property so this technique, which is often used to compliment acoustic monitoring for bats, was not used.

3.2.6.2 Small Mammals

Survey methods for small mammals included the use of Sherman and pit-fall traps. Both were utilized to assess the presence of all small mammal species. All major habitat types in the Preserve were sampled to ensure that all species were detected.

3.2.6.2.1 Sherman Live Trap Surveys

Survey plots consisted of 30 trapping stations, with one 12" model Sherman live trap per station. Traps were placed in two parallel transects of 15 stations each. Transects were separated by 10 meters (33 ft), and traps within transects were separated by 7 meters (23 ft). Transects were oriented to best fit the habitat (Wilson et al. 1996), and GPS coordinates were recorded. A total of 16 survey plots were established and all were run during each survey (Figure 3-4). Burned and unburned areas were sampled.

Two sampling sessions occurred in the fall of 2007 and one in the spring of 2008 (Table 3-1). Each sampling session consisted of three mornings of trapping. Traps were opened in the late afternoon on day one and baited with baked sunflower (to avoid germination) and checked and closed early the following morning for three consecutive mornings. Captured animals were identified to species and sexual characteristics were noted.

The number of surveys and timing play an important role in an accurate inventory. The inventory undertaken during the 2008 survey season was very successful and the data should be treated as nearly complete.

3.2.6.2.2 Pitfall Trap Surveys

Pitfall traps installed for the herpetology component of this study were also used for the mammal inventory. Certain mammal species are not normally captured in Sherman live traps but are often captured with pitfall traps (Wilson et al. 1996). Target species for pitfall traps are the southern grasshopper mouse (*Onychomys torridus*), California vole

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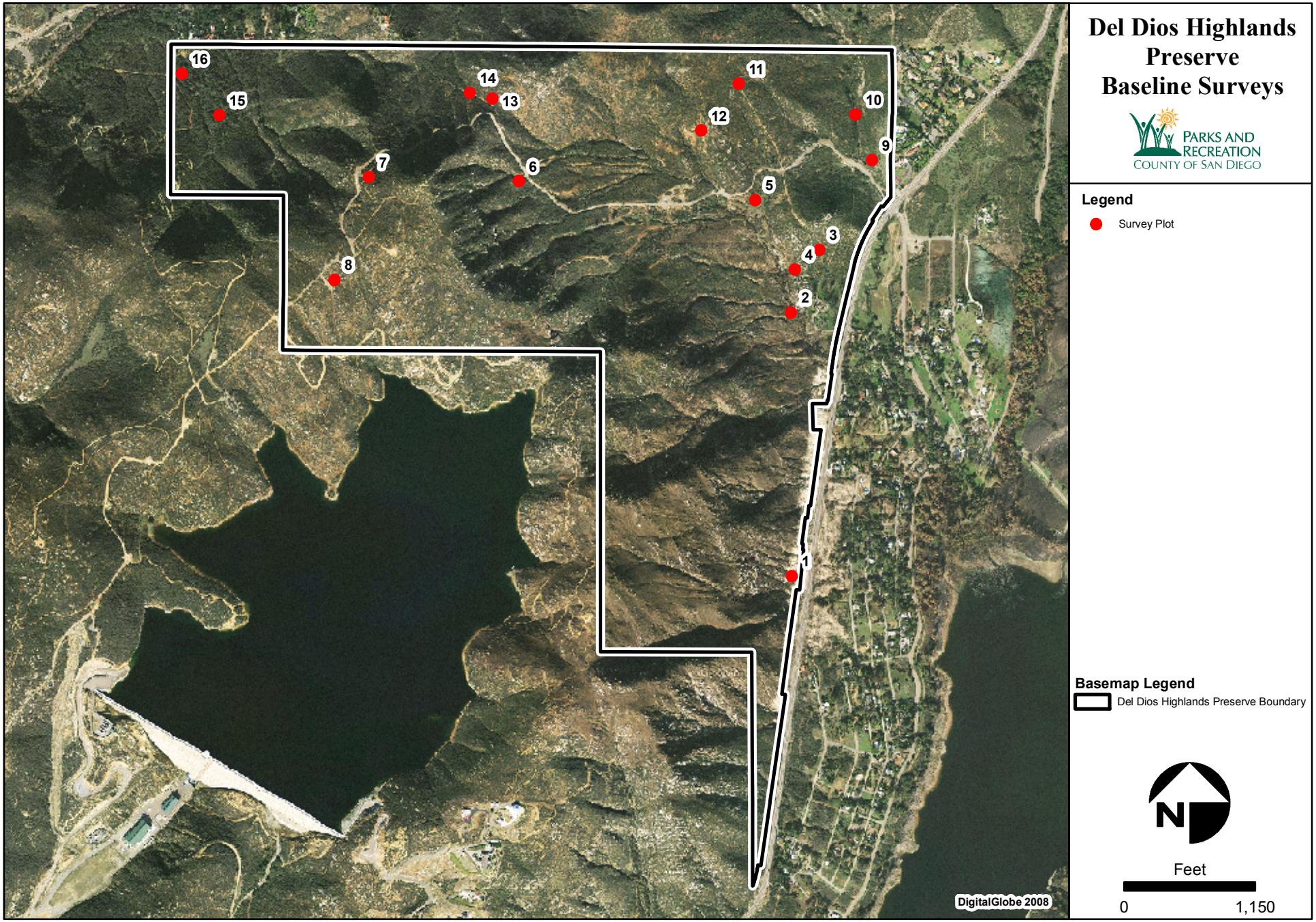

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Small Mammal Survey Plots

Figure 3-4

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(*Microtus californicus*), desert gray shrew (*Notiosorex crawfordi*), ornate shrew (*Sorex ornatus*), western harvest mouse (*Reithrodontomys megalotis*), and Botta's pocket gopher (*Thomomys bottae*). For these species, pitfall trapping followed the methods outlined in the herpetofauna survey section (Section 3.5.1).

3.2.6.3 Medium and Large Mammals

Motion-sensing cameras (Wilson et al. 1996) trained on baited lures are an effective method to assess presence of medium to large mammals and answer important research questions about population dynamics (Cutler and Swann 1999). This method, combined with track plots, was deployed throughout the Preserve. Given the public use of the Preserve all track plots were set off trail so they were not easily visible. However, a few cameras were placed adjacent to well used trails to detect the potential use of the trail as a wildlife movement corridor. Plots were distributed throughout the Preserve in order to record medium-to-large mammals and possibly yield data on their movement patterns (Figures 3-5 and 3-6).

Most stations consisted of one digital camera and two track plots within a 200-meter line transect. Both the camera's focal area and two track plots were baited with a scent lure suitable for multiple carnivore species (Carman's Pro-Choice) or for deer. The scent was placed on a pipe cleaner wrapped around the upper portion of a 12-inch metal stake. The scent was applied to the pipe cleaner with a toothbrush. There are two reasons for setting up the bait in this way: first, placing the bait on a removable stake prevents the scent from remaining on the plot after the survey; second, using a toothbrush to apply the lure to a pipe cleaner leaves a consistent amount of lure at each plot. Additionally, animals often rub against the stake, leaving hairs on the pipe cleaner. With each hair sample collected, the stake could be easily be cleaned and the pipe cleaner replaced.

A motion-sensing digital camera was placed approximately 1–2 meter (3.3-6.6 ft) from the lure and 20 centimeter (8 in.) off the ground. Track plots consisted of a 1-meter (3.3 ft) -diameter circle of 1-centimeter (0.4 in) -deep gypsum powder with scent lure placed in the center. Track plots were checked every day for three consecutive days, and the species visiting them were identified by their tracks. Photographs were taken of each track as vouchers. Track plots were reset every day by smoothing the gypsum powder, and bait was added every day.

Surveys occurred in the fall of 2007 and spring of 2008 (Table 3-1). A total of nine survey plots were located in potential wildlife corridors and high use areas (e.g., near water sources, drainages, ridgelines, etc.). All nine were run in the fall of 2007 and rerun

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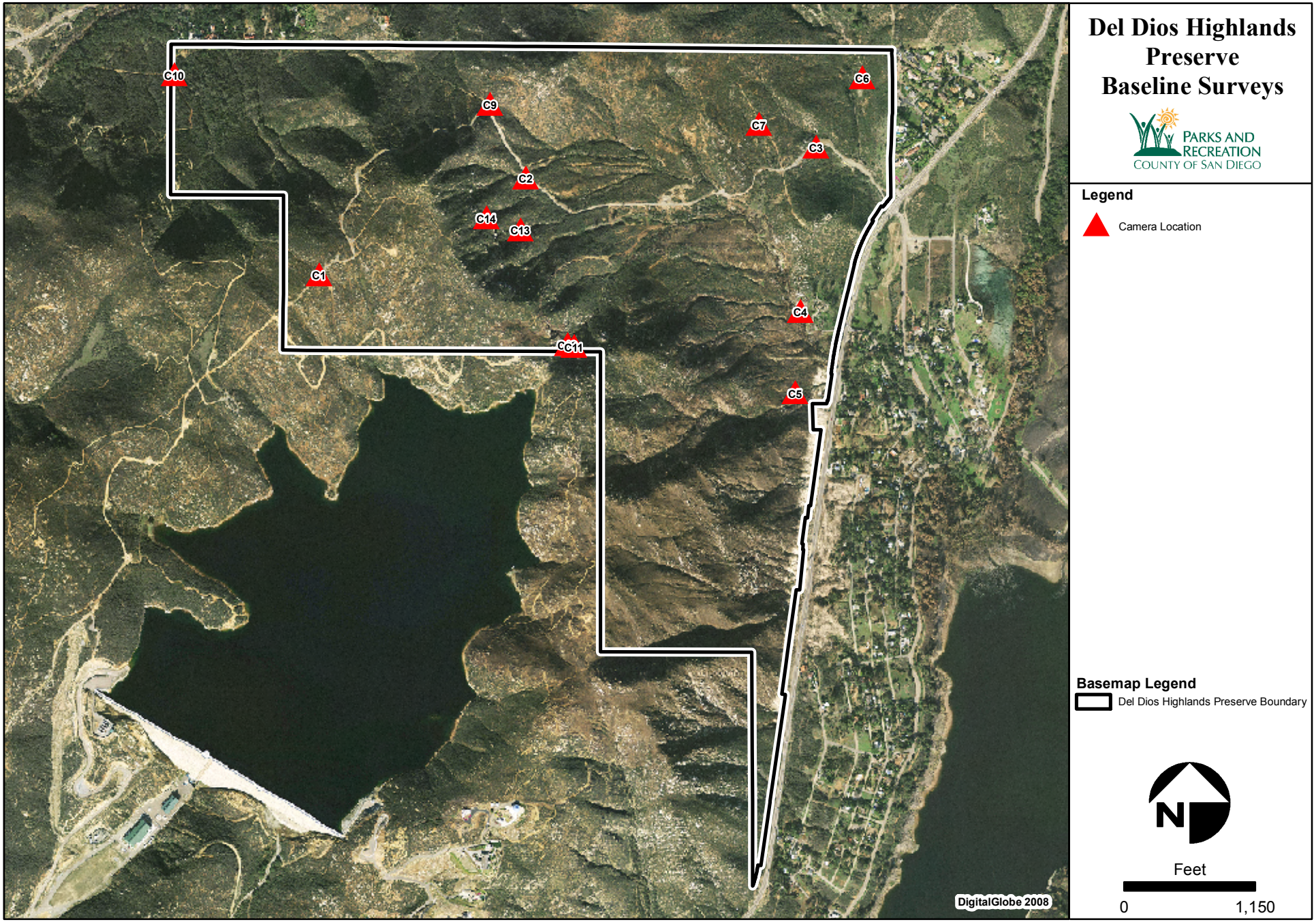

Del Dios Highlands Preserve Baseline Surveys

PARKS AND RECREATION
COUNTY OF SAN DIEGO

Legend

Camera Location

Basemap Legend

Del Dios Highlands Preserve Boundary

N

Feet

0 1,150

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Medium and Large Mammal Camera Locations

Figure 3-5

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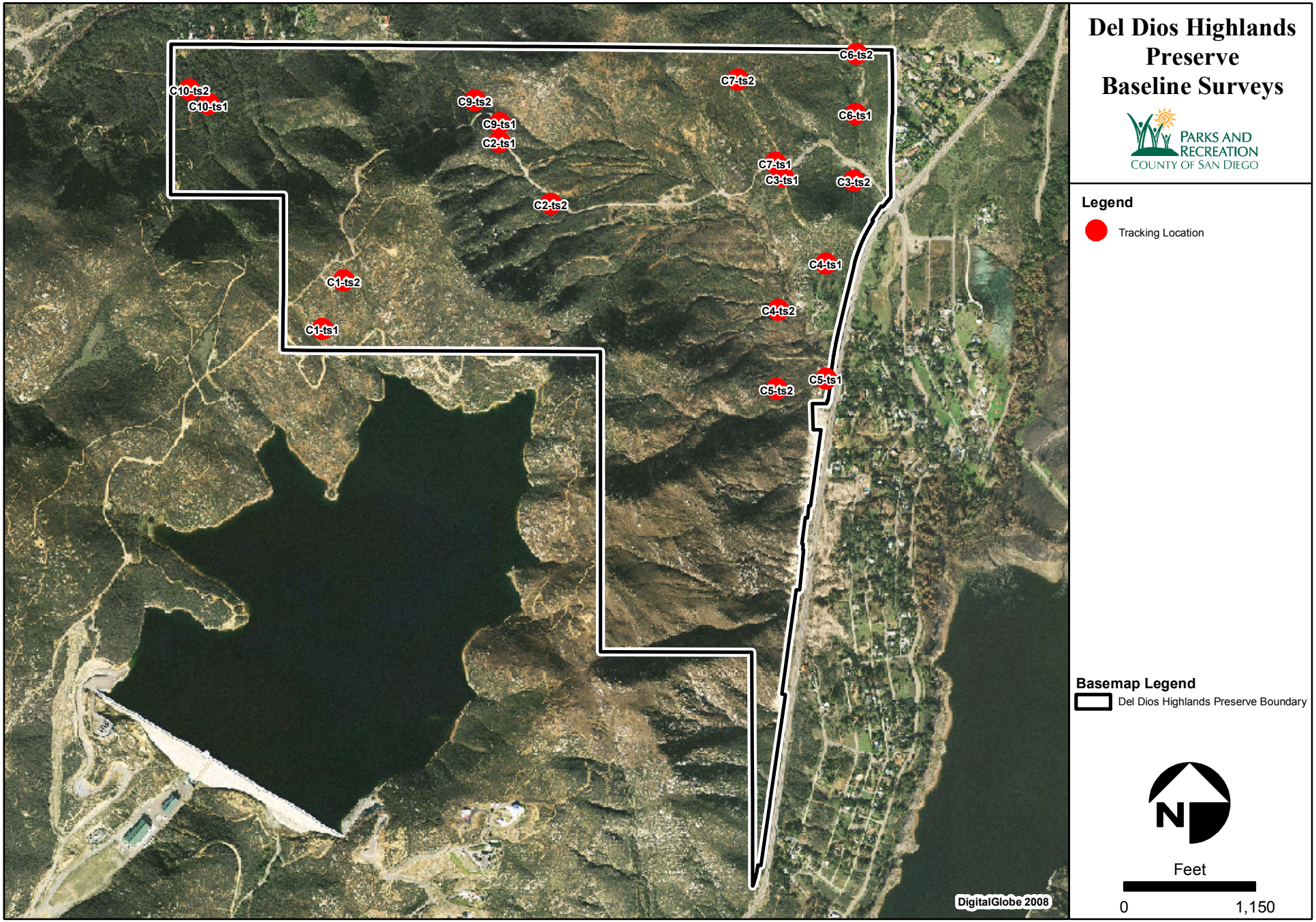

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Medium and Large Mammal Tracking Locations

Figure 3-6

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in the spring of 2008. All survey locations were mapped using GIS technologies. Along with measurements and photos, each observation included a confidence level for the identification of the track.

4.0 RESULTS AND DISCUSSION

4.1 Vegetation Communities

Seven vegetation communities were mapped within the Preserve during the 2007 and 2008 surveys (Table 4-1; Figure 4-1). The most abundant vegetation type within the Preserve, southern mixed chaparral, is located on much of the xeric (drier), more exposed southern and western facing slopes, as well as on open, northern facing slopes where soil moisture is limited by steep slopes and little shading. A few small patches of Diegan coastal sage scrub occur on the eastern side of the Preserve. In general, Diegan coastal sage scrub vegetation requires greater amounts of soil moisture than mixed chaparral. Within the Preserve, Diegan coastal sage scrub occurs on level areas and within various mesic (wetter) uplands.

In the lower elevations of the Preserve near its northwestern corner there is a unique mature stand of southern coast live oak riparian forest located at the bottom of a riparian valley near Escondido Creek. In some locations southern coast live oak riparian forests may intergrade with coast live oak woodlands depending on conditions.

In a few small areas near the northeastern corner of the Preserve, the riparian community southern willow scrub is present within the channels of two ephemeral streams. These small patches are both minor in terms of size and function, but appear to indicate that at least occasionally these channels convey measurable volumes of water.

In addition to the natural communities within the Preserve, many human altered habitats also occur. Disturbed habitats which occur within the Preserve include unpaved trails and other largely unvegetated areas and areas of soil disturbance. Other, developed areas occur within the Preserve including existing structures, paved roads and parking areas, landscaped areas, and the foundation of a burnt homestead destroyed in the 2007 Witch Creek Fire. A brief description of each vegetation community is provided in the text below.

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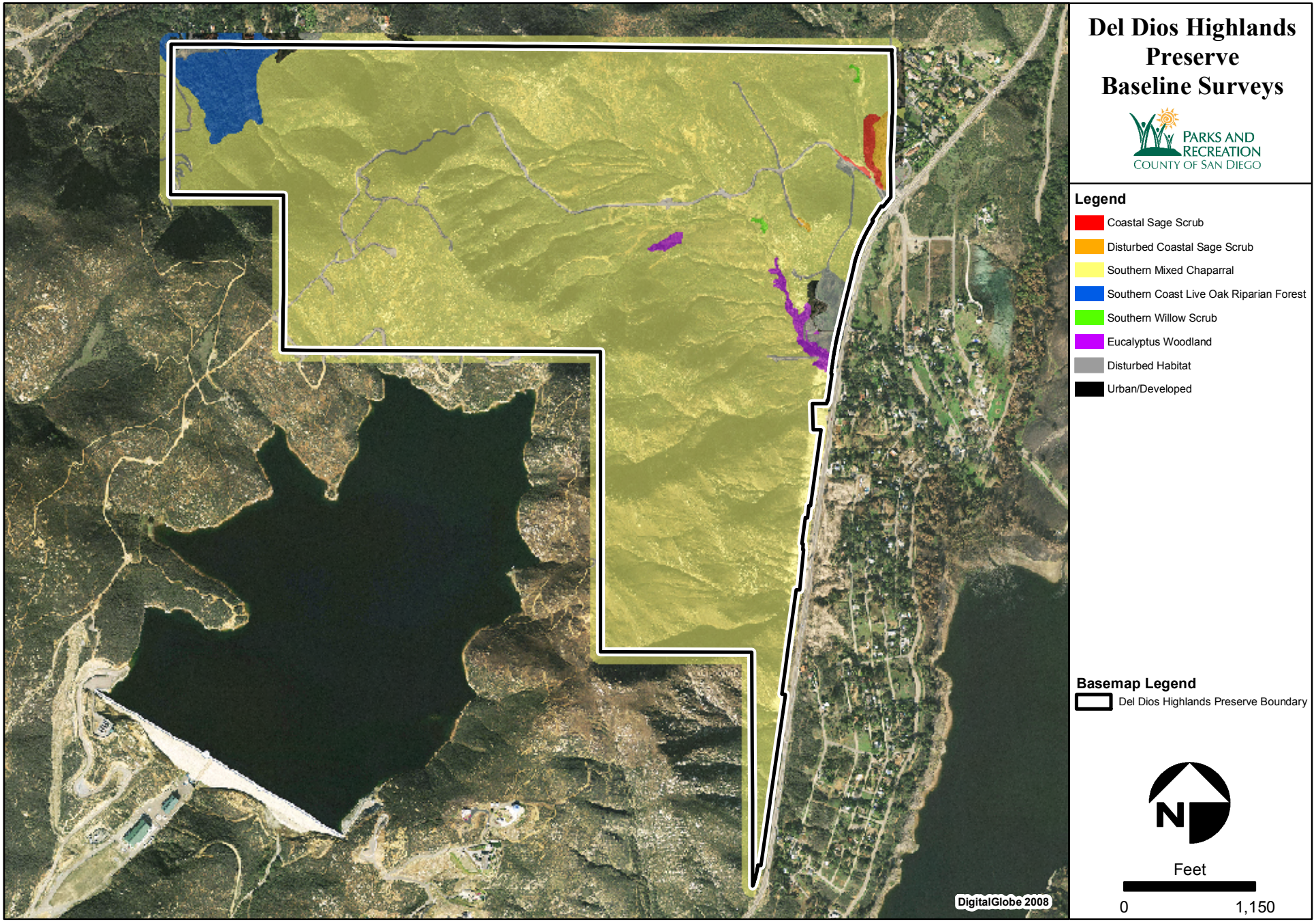

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Vegetation Communities

Figure 4-1

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Table 4-1. Vegetation Communities within the Preserve

Vegetation Community[1]	Acres[2]
RIPARIAN/WETLAND COMMUNITIES	
Southern Coast Live Oak Riparian Forest (61310)	10.6
Southern Willow Scrub (63320)	0.4
UPLAND COMMUNITIES	
Diegan Coastal Sage Scrub (32500)[3]	3.0
Southern Mixed Chaparral (37120)	439.5
Eucalyptus Woodland (11100)	3.1
Disturbed Habitat (11300)	10.7
Urban/Developed (12000)	1.5
TOTAL	**468.8**

[1] Holland code in parenthesis.

[2] Acres within the Preserve boundaries. Acreages do not include vegetation within the 100 ft. mapped buffer around the Preserve.

[3] Includes 1.5 acres of disturbed coastal sage scrub.

4.1.1 Southern Mixed Chaparral (37120)

As described by Holland (1986), southern mixed chaparral is a dense, relatively short, shrub-dominated community widely distributed on arid landscapes in coastal southern California. Southern mixed chaparral is the dominant vegetation community on the Preserve. Present throughout most of the Preserve, southern mixed chaparral occurs on north and south facing slopes, ridges, and canyons. Southern mixed chaparral covers approximately 439.5 acres (180 ha) on the Preserve (Table 4-1; Figure 4-1). Southern mixed chaparral frequently intergrades with other shrub-dominated vegetation communities such as Diegan and Venturan coastal sage scrub. Wart-stemmed ceanothus (*Ceanothus verrucosus*) and mission manzanita (*Xylococcus bicolor*) are co-dominant in the southern mixed chaparral present on the Preserve. Other species characteristic of this association present within the Preserve include Eastwood manzanita (*Arctostaphylos glandulosa* ssp. *glandulosa*), chamise (*Adenostoma fasciculatum*), laurel sumac (*Malosma laurina*), toyon (*Heteromeles arbutifolia*), mountain mahogany (*Cerocarpus minutiflorus*), holly-leaved cherry (*Prunus ilicifolia* ssp. *ilicifolia*), summer holly (*Comarostaphylis diversifolia* ssp. *diversifolia*), and Ramona lilac (*Ceanothus tomentosus*). Unique for this region is also the occurrence of the rare Encinitas baccharis within this vegetation community. Common coastal sage scrub species such as laurel sumac, black sage (*Salvia mellifera*) and California buckwheat (*Eriogonum fasciculatum* var. *foliolosum*) are also present in this association onsite, but at sub-dominant levels.

4.1.2 Diegan Coastal Sage Scrub (32500)

As described by Holland (1986) Diegan coastal sage scrub is a community dominated by drought deciduous soft-woody sub-shrub taxa frequently found on arid or steep sites. Diegan coastal sage scrub frequently intergrades with chaparral communities such as southern mixed chaparral at higher elevations. On the Preserve, Diegan coastal sage scrub is present in very limited distribution on the eastern side of the Preserve. This community is dominated by black sage in association with saw-toothed goldenbush (*Hazardia squarrosa* var. *grindelioides*), California buckwheat, toyon, and laurel sumac. Diegan coastal sage scrub and disturbed Diegan coastal sage scrub comprise approximately 3.0 acres (1.2 ha) of the Preserve (Table 4-1; Figure 4-1).

4.1.3 Southern Coast Live Oak Riparian Forest (61310)

As described by Holland (1986), southern coast live oak riparian forest is a locally dense riparian forest dominated by coast live oak (*Quercus agrifolia* var. *agrifolia*). Southern coast live oak riparian forest occurs along an unnamed ephemeral drainage in the northwestern corner of the Preserve. At higher elevations in this drainage, southern coast live oak riparian forest appears to intergrade with southern mixed chaparral. Contrary to the Holland description, the southern coast live oak riparian forest present on the Preserve is unique and richer in understory shrubs and poorer in herbaceous vegetation than other riparian communities. This community is dominated by coast live oak with sub-dominant species including mountain mahogany, toyon, holly-leaved cherry, lilac (*Ceanothus* spp.), Eastwood manzanita, mission manzanita, scrub oak (*Quercus* ×*acutidens*), lemonade berry (*Rhus integrifolia*) and summer holly (*Comarostaphylis diversifolia* ssp. *diversifolia*). This vegetation community comprises approximately 10.6 acres (4 ha) of the Preserve (Table 4-1; Figure 4-1).

4.1.4 Southern Willow Scrub (63320)

As described by Holland (1986), southern willow scrub is a dense broadleafed winter deciduous thicket dominated by several Salix species. Although most of the Preserve is too dry to support southern willow scrub, this community does occur in two small patches/clusters within two separate ephemeral drainages on the northeastern portion of the Preserve. The southern willow scrub on the Preserve consists entirely of black willow (*Salix gooddingii*) with a limited quantity of mule fat (*Baccharis salicifolia*) in its understory along with other southern mixed chaparral shrub species. Approximately 0.4 acre (0.2 ha) of southern willow scrub is present within the Preserve (Table 4-1; Figure 4-1).

4.1.5 Eucalyptus Woodland (11100)

As described by Holland (1986), eucalyptus woodland is typically characterized by dense monotypic stands of eucalyptus trees (*Eucalyptus camaldulensis*). Plants in this genus, imported primarily from Australia, were originally planted in groves throughout many regions of coastal California as a potential source of lumber and building materials, for their use as windbreaks, and for their horticultural novelty. They have increased their cover through natural regeneration, particularly in moist areas sheltered from strong coastal winds. Gum trees naturalize readily in the state and, where they form dense stands, tend to completely supplant native vegetation, greatly altering community structure and dynamics.

Within the Preserve, eucalyptus woodland occurs near a burnt residence adjacent to Del Dios Highway and in a small cluster a few hundred feet south of the main access trail on the northeastern corner of the Preserve. Eucalyptus woodland habitat on the Preserve uncharacteristically consists of an understory of native southern mixed chaparral species. Approximately 3.1 acres (1.3 ha) of eucalyptus woodland occurs on the Preserve (Table 4-1; Figure 4-1).

4.1.6 Disturbed Habitat (11300)

Disturbed habitat is any land on which the native vegetation has been significantly altered by agriculture, construction, or other land-clearing activities, and the species composition and site conditions are not characteristic of the disturbed phase of one of the plant associations within the study region. Such habitat is typically found in vacant lots, roadsides, construction staging areas, utility easements (i.e. telephone poles, power lines, etc.), or abandoned fields, and is dominated by non-native annual species and perennial broadleaf species.

Mostly, disturbed habitat within the Preserve was comprised of well worn unvegetated trails; however disturbed habitat was also observed to be present in a small area surrounding a burnt-down residence on the eastern edge of the Preserve along Del Dios highway. Dominant plant species observed within the disturbed areas of the Preserve included short-pod mustard (*Hirschfeldia incana*), sweet fennel (*Foeniculum vulgare*), tree tobacco (*Nicotiana glauca*), long-beak filaree (*Erodium botrys*), ripgut grass (*Bromus diandrus*), red brome (*Bromus rubens*), and tecolote (*Centaurea melitensis*). In addition, the disturbed habitat surrounding the burnt residence in the eastern portion of the Preserve, along Del Dios Highway supported several mature eucalyptus trees (*Eucalyptus camaldulensis*). Other species found within disturbed areas of the Preserve included African fountain grass (*Pennisetum setaceum*), Pampas grass (*Cortaderia*

selloana), and skunkweed (*Navarretia hamata* ssp. *hamata*). Approximately 10.0 acres (4 ha) of disturbed habitat occurs within the Preserve (Table 4-1; Figure 4-1).

4.1.7 Urban/Developed (12000)

Urban/developed areas are found where habitat has been altered by human activities to a state beyond the potential for recovery to a natural state. In general, free standing structures and surrounding areas that are paved, armored, or landscaped are considered developed. On the Preserve, developed lands include the foundation of a burnt residence, its paved driveway, ancillary structures, cistern tank, and immediate surroundings. This burnt homestead is located in the eastern portion of the Preserve, along Del Dios Highway. In addition, developed areas included discrete areas of ornamental landscaping within the Preserve boundaries included areas of planted non-native trees and shrubs including assorted eucalyptus (*Eucalyptus* spp.), ornamental acacia (*Acacia baileyana*), Peruvian pepper tree (*Schinus molle*), and jade plant (*Crassula ovata*). Approximately 1.5 acres (0.6 ha) of urban/developed land occurs within the Preserve (Table 4-1; Figure 4-1).

4.2 Flora

A total of 213 plant taxa were documented with 223 voucher specimens from in the Preserve during 2007 and 2008 surveys. Fifty-seven of these are non-native species. The remaining species (about 73 percent) consist of a diverse array of native riparian and upland plants that occur in natural assemblages as described below. A full inventory of plant species observed during the 2007 and 2008 surveys is included in this report (Appendix D).

4.2.1 Sensitive Plant Species

For the purpose of this report, sensitive plant species are those species listed as endangered, threatened, or rare, or identified as a candidate for listing pursuant to the Federal or State Endangered Species Acts (FESA, CESA). In addition, plant species considered being of special status by one or more special interest groups are also considered to be sensitive. These include plant species listed on the CNPS Inventory of Rare and Endangered Vascular Plants of California with a designation of 1, 2, 3, or 4 or included on the County's Sensitive Plant list (Group A, B, C, or D listed plants). Finally, species covered under the South County MSCP are also included in this discussion. This plan provides coverage for 85 plant and animal species.

4.2.1.1 Observed Sensitive Plant Species

Five sensitive plant taxa were detected within the Preserve during the 2008 surveys (Table 4-2; Figure 4-2). These include Brewer's calandrinia (*Calandrinia breweri*), Palmer's sagewort (*Artemisia palmeri*), Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*), wart-stemmed ceanothus (*Ceanothus verrucosus*), and summer holly (*Comarostaphylis diversifolia* ssp. *diversifolia*). Besides being observed during the 2008 baseline surveys, Palmer's sagewort, summer holly, and wart-stemmed ceanothus have also been previously documented from the Preserve (Figure 4-3). A brief species account for each sensitive species observed during 2007 and 2008 surveys is provided below.

Table 4-2. Sensitive Plant Species Observed on the Preserve during 2008 Baseline Surveys

Common Name	Scientific Name	Listing Status (Federal/State/ CNPS/County)[1]	South County MSCP Covered Species (Y/N)
Palmer's sagewort	*Artemisia palmeri*	--/--/4.2/D	No
Brewer's calandrinia	*Calandrinia breweri*	--/--/4.2/D	No
Wart-stemmed ceanothus	*Ceanothus verrucosus*	--/--/2.2/B	Yes
Summer holly	*Comarostaphylis diversifolia* ssp. *diversifolia*	--/--/1B.2/A	No
Robinson's pepper-grass	*Lepidium virginicum* var. *robinsonii*	--/--/1B.2/A	No

[1] Listing Status: Federal: E – endangered, T – threatened, DL – federally delisted. State: E – endangered, T – threatened, R – rare. California Native Plant Society (CNPS): List 1B – Plants rare, threatened, or endangered in California and elsewhere, List 2: Plants rare, threatened, or endangered in California, but more common elsewhere, List 3 – Plants about which we need more information, List 4 – Plants of limited distribution (a watch list). County List: List A – plants rare, threatened, or endangered in California and elsewhere; List B – plants rare, threatened, or endangered in California but more common elsewhere; List C – plants which may be quite rare, but need more information to determine their true rarity status; List D – plants of limited distribution and are uncommon, but not presently rare or endangered.

Palmer's sagewort – *Artemisia palmeri*
Federal Status: None
State Status: None
CNPS List: 4.2
County List: D
South County MSCP: Not Covered

Palmer's sagewort is an aromatic herb typically located in perennial creeks and drainages near the coast (Reiser 1994). In California, Palmer's sagewort is found only in San Diego County (CNPS 2008). This species is found in a wide range of habitat types including chaparral, coastal scrub, riparian forest, riparian scrub, and riparian woodland in sandy, mesic conditions between 15 and 915 meters (50-3,000 ft) in elevation (CNPS 2008). Palmer's sagewort is most often found in a riparian context. Palmer's sagewort grows within a shaded understory beneath willow, sycamore, or cottonwood canopy.

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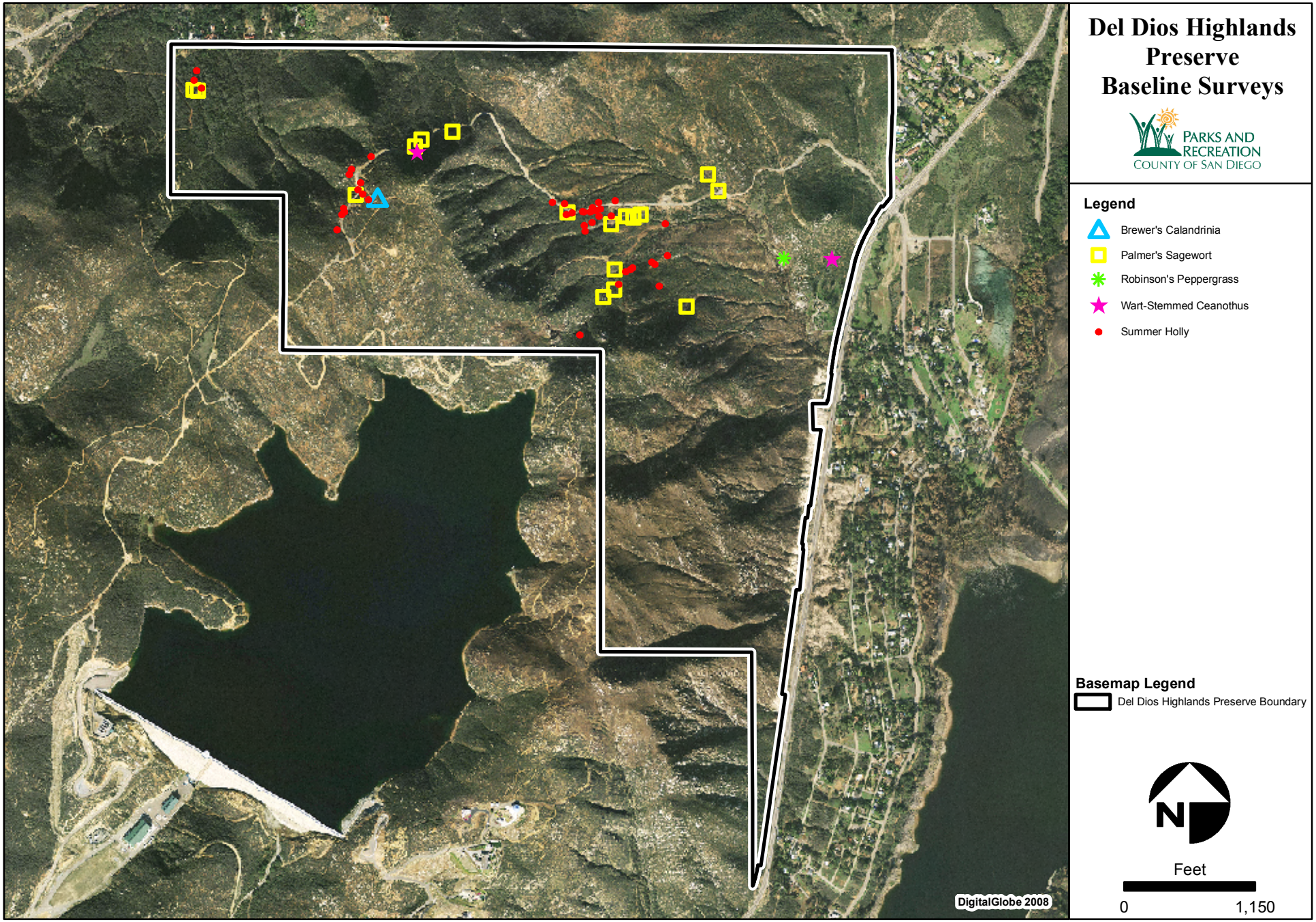

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Sensitive Plant Species Observed during 2008 Baseline Surveys

Figure 4-2

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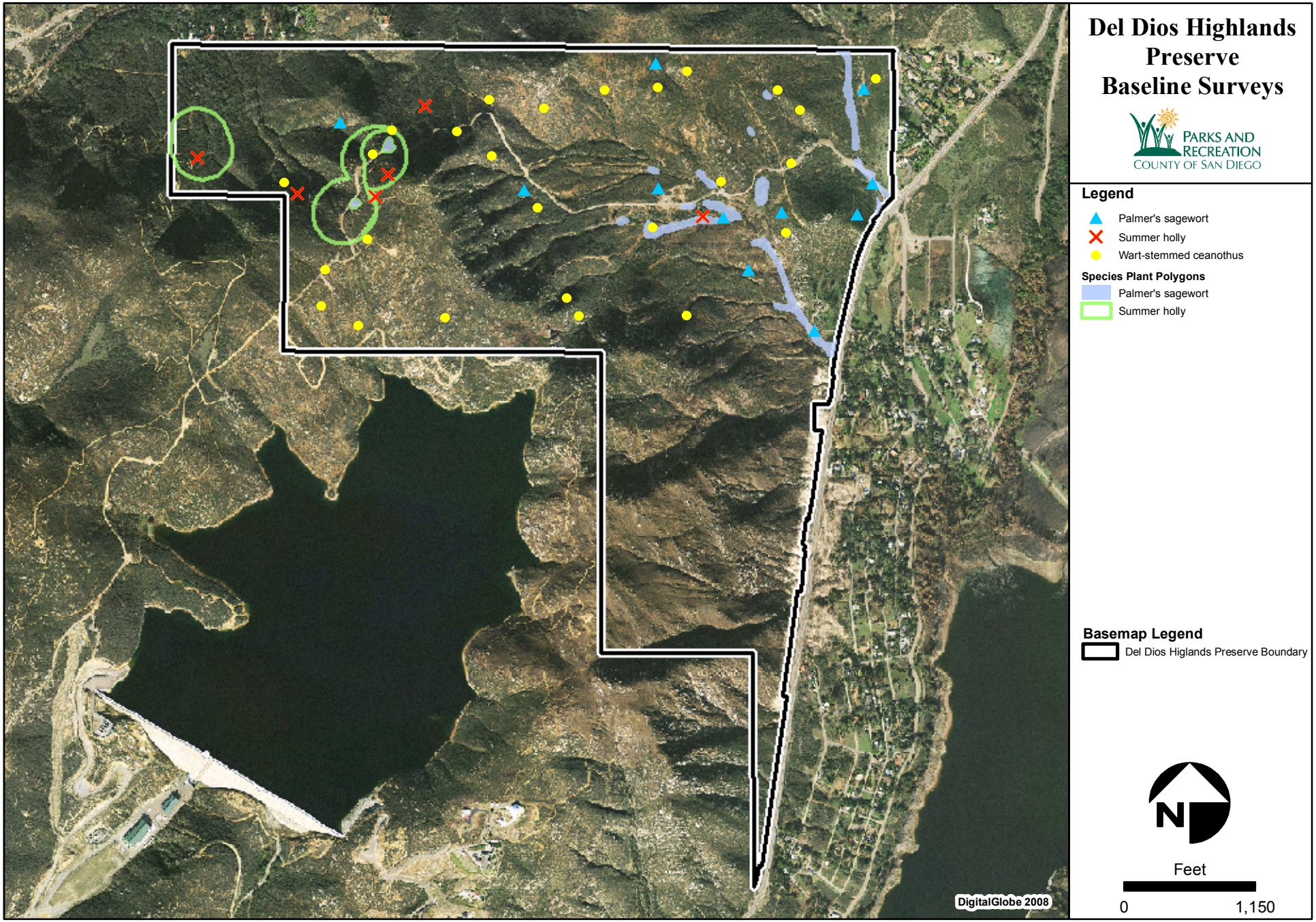

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Historic Locations for Sensitive Plant Species Observed during 2008 Baseline Surveys

Figure 4-3

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Occasionally it also is present beneath *Quercus agrifolia* canopy, but in decidedly mesic circumstances (Reiser 1994). Within the Preserve, Palmer's sagewort was observed throughout the central portion and northwestern portion of the Preserve (Figure 4-2).

Brewer's calandrinia – *Calandrinia breweri*
Federal Status: None
State Status: None
CNPS List: 4
County List: D
South County MSCP: Not Covered

In California, Brewer's calandrinia is found in San Diego, Los Angeles, San Bernardino, Contra Costa, Mendocino, Monterey, Mariposa, Marin, Napa, Santa Barbara, Santa Clara, Santa Cruz, San Luis Obispo, San Mateo, Sonora, and Ventura counties (Reiser 1994). The species is a fire-follower and typically reported in areas of recently burned chaparral and coastal sage scrub (Reiser 1994) on sandy or loamy soils (CNPS 2008). Brewer's calandrinia is apparently rare in Southern California and its populations are presumed to be declining due to loss of habitat along the coast (Reiser 1994). Within the Preserve, Brewer's calandrinia was observed in the northwestern portion of the Preserve (Figure 4-2).

Wart-stemmed ceanothus – *Ceanothus verrucosus*
Federal Status: None
State Status: None
CNPS List: 2.2
County List: B
South County MSCP: Covered

Wart-stemmed ceanothus is a large, evergreen shrub typically located in coastal chaparral intermixed with chamise and mission manzanita (CNPS 2008, Reiser 1994). Typically, this species is a dominant shrub within the vegetation community where it occurs. It may be particularly vigorous on north-facing slopes, but can accommodate more xeric aspects (Reiser 1994). The species occurs between up to 380 meters (1,250 ft) in elevation (CNPS 2008) and is known from records in San Diego County and Baja California, Mexico (Riser 1994). Once regionally abundant within the coastal canyons of the county, the species has been substantially reduced in numbers because of urban sprawl. Within the Preserve, wart-stemmed ceanothus was observed near the eastern boundary and in the northwestern portion of the Preserve (Figure 4-2).

Summer holly – *Comarostaphylis diversifolia* ssp. *diversifolia*
Federal Status: None
State Status: None
CNPS List: 1B.2
County List: A
South County MSCP: Not Covered

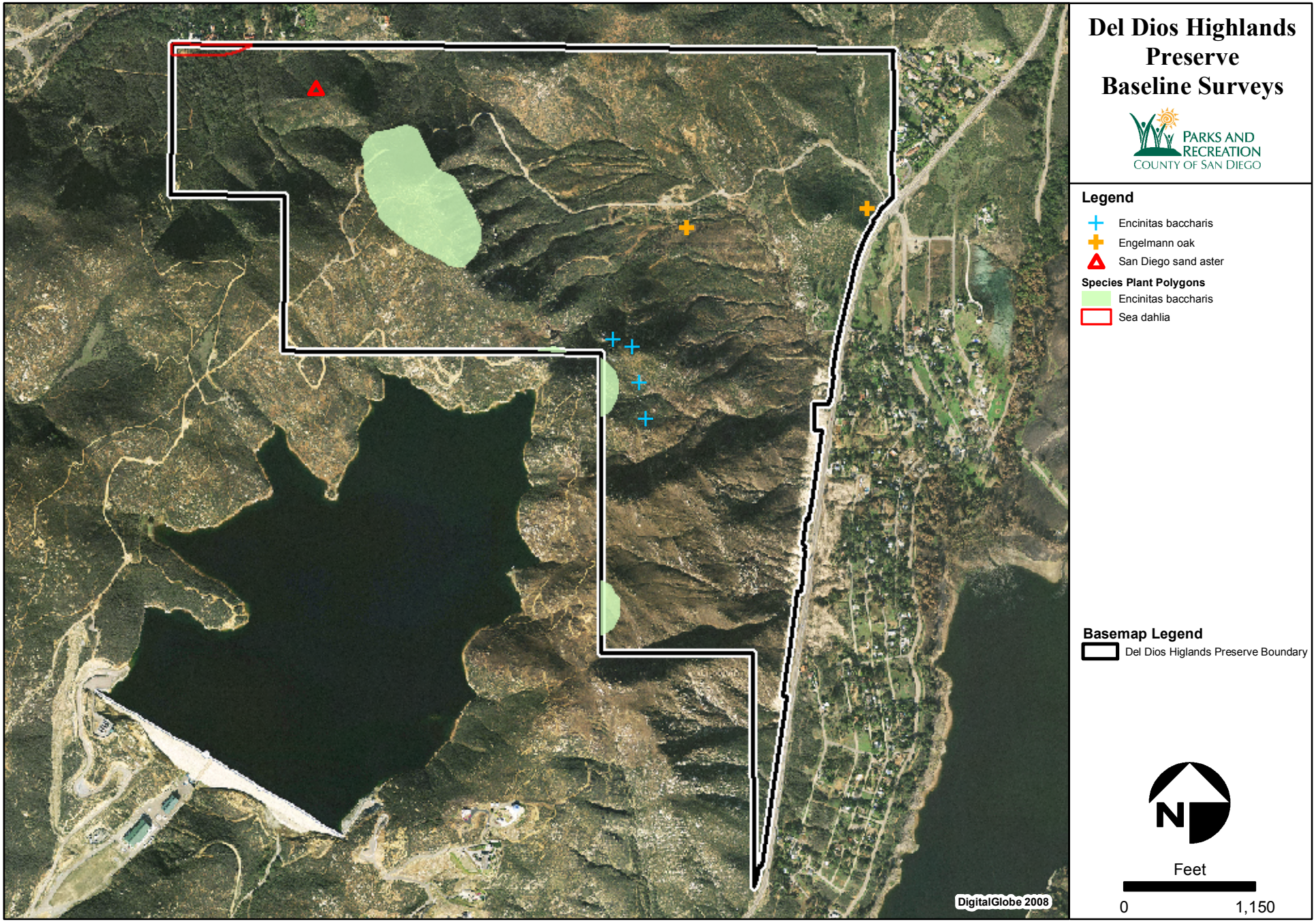
Summer holly is a large, showy, perennial shrub found in chaparral and cismontane woodland habitats between 30 and 550 meters (100-1,800 ft) in elevation (Reiser 1994, CNPS 2008). This species is usually found in southern mixed chaparral on mesic north-facing slopes (Reiser 1994) and is known from records in San Diego, Riverside, and Orange counties and Baja California, Mexico (Riser 1994). Summer holly is declining throughout its U.S. range where the species is threatened by residential development (Reiser 1994). Within the Preserve, summer holly was observed throughout the central portion and northwestern portion of the Preserve (Figure 4-2).

Robinson's pepper-grass – *Lepidium virginicum* var. *robinsonii*
Federal Status: None
State Status: None
CNPS List: 1B.2
County List: A
North County MSCP: Not Covered

Robinson's pepper-grass occurs in San Diego, Riverside, Orange, Los Angeles, San Bernardino, and Santa Barbara counties, on Santa Cruz Island, and in Baja California, Mexico (Reiser 1994). Robinson's pepper-grass occurs in chaparral and coastal scrub habitats between 1 and 885 meters (3.3-2,900 ft) in elevation (CNPS 2008). This annual herb grows in openings in chaparral and coastal sage scrub, generally well away from the coast in Southern California in foothill landscapes. Typically sites where this species is observed are relatively dry, exposed locales, rather than beneath a shrub canopy or along creeks (Reiser 1994). Robinson's pepper-grass was observed in the northeastern portion of the Preserve (Figure 4-2).

4.2.1.2 Potentially Occurring Sensitive Plant Species: Previously Documented

Four sensitive species have been previously documented within the Preserve (Table 4-3; Figure 4-4), including the federally listed as threatened and state listed as endangered Encinitas baccharis. Although surveys for this species were conducted during the



Technology Associates International Corporation

Potentially Occurring Sensitive Plant Species Previously Documented from the Preserve

Figure 4-4

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Date: Oct 13, 2008

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flowering period to allow conclusive identification, the effects of the 2006/2007 drought prevented this plant to flower and the stems were mostly leafless and dormant as well, thus precluding conclusive identification. Each of these species has a high potential to occur because they have been previously documented on the Preserve.

Table 4-3. Potentially Occurring Sensitive Plant Species Previously Documented from the Preserve

Common Name	Scientific Name	Listing Status (Federal/State/ CNPS/County)[1]	Potential to Occur
Encinitas Baccharis	***Baccharis vanessae***	**T/E/1B.1/A**	High. Previously documented on the Preserve.
Sea dahlia	*Coreopsis maritima*	--/--/2.2/B	High. Previously documented on the Preserve.
San Diego sand aster	*Corethrogyne filaginifolia* var. *incana*[2]	--/--/1B.1/A	High. Previously documented on the Preserve.
Engelmann oak	*Quercus engelmannii*	--/--/4.2/D	High. Previously documented on the Preserve.

[1] Listing Status: Federal: E – endangered, T – threatened, DL – federally delisted. State: E – endangered, T – threatened, R – rare. California Native Plant Society (CNPS): List 1B – Plants rare, threatened, or endangered in California and elsewhere, List 2: Plants rare, threatened, or endangered in California, but more common elsewhere, List 3 – Plants about which we need more information, List 4 – Plants of limited distribution (a watch list). County List: List A – plants rare, threatened, or endangered in California and elsewhere; List B – plants rare, threatened, or endangered in California but more common elsewhere; List C – plants which may be quite rare, but need more information to determine their true rarity status; List D – plants of limited distribution and are uncommon, but not presently rare or endangered.

[2] *Corethrogyne filaginifolia* var. *incana* is not recognized in current literature. According to Saroyan et al. (2000), this variety is placed in *Corethrogyne filaginifolia* var. *filaginifolia*. However, more molecular work may result in future taxonomic changes.

4.2.1.3 Potentially Occurring Sensitive Plant Species: Based on Habitat and Distribution

Potentially occurring sensitive plant species based on habitat presence and distribution were identified by searching species databases (see Section 3.1 for list of databases). Potentially occurring plant species are those; (1) with occurrence outside of, but within three kilometers (1.8 mi) of the Preserve, and/or (2) whose habitat preferences are consistent with available habitat within the Preserve. Sixteen sensitive plant taxa were identified as occurring within the region (Table 4-4); however, most of them are not expected to occur on the Preserve because the site lacks suitable habitat. Five of these 16 taxa have been identified as having moderate to high potential for occurrence in the Preserve.

Table 4-4. Potentially Occurring Sensitive Plant Species at the Preserve

Common Name	Scientific Name	Listing Status (Federal/State/ CNPS/County)[1]	Potential to Occur
San Diego thornmint	***Acanthomintha ilicifolia***	**T/E/1B.1/A**	Not expected. Suitable habitat not present.
California adolphia	*Adolphia californica*	-/-/2.1/B	High. Suitable habitat present on slopes of stream.
San Diego ambrosia	***Ambrosia pumila***	**E/--/1B.1/A**	Not expected. Suitable habitat not present.
Del Mar manzanita	***Arctostaphylos glandulosa* ssp. *crassifolia***	**E/-/1B.1/A**	Moderate. Suitable habitat present.
Orcutt's brodiaea	*Brodiaea orcuttii*	-/-/1B.1/A	Not expected. Suitable habitat not present.
Southern mountain misery	*Chamaebatia australis*	-/-/4.2/D	Not expected. Suitable habitat not present.
Western dichondra	*Dichondra occidentalis*	-/-/4.2/D	Moderate. Within species range. Suitable habitat in clay soils under coastal sage scrub.
Variegated dudleya	*Dudleya variegata*	-/-/1B.2/A	Not expected. Suitable habitat not present.
Sticky Dudleya	*Dudleya viscida*	-/-/1B.2/A	Not expected. Just out of species range.
San Diego barrel cactus	*Ferocactus viridescens* var. *viridescens*	-/-/2.1/B	Not expected. Out of species range.
Ramona horkelia	*Horkelia truncata*	-/-/1B.3/A	Not expected. Suitable habitat not present.
San Diego marsh-elder	*Iva hayesiana*	-/-/2.2/B	Moderate. Suitable habitat may be present in sandy streambeds.
Southwest spiny rush	*Juncus acutus* var. *leopoldii*	-/-/4.2/D	Not expected. Suitable habitat not present.
Felt-leaved monardella	*Monardella hypoleuca* ssp. *lanata*	--/--/1B.2/A	Not expected. Suitable soils and habitat not present.
Torrey pine	*Pinus torreyana* ssp. *torreyana*	--/--/1B.2/A	Not expected. Out of species range.
Nuttall's scrub oak	*Quercus dumosa*	-/-/1B.1/A	High. Suitable habitat present.

[1] Listing Status: Federal: E – endangered, T – threatened, DL – federally delisted. State: E – endangered, T – threatened, R – rare. California Native Plant Society (CNPS): List 1B – Plants rare, threatened, or endangered in California and elsewhere, List 2: Plants rare, threatened, or endangered in California, but more common elsewhere, List 3 – Plants about which we need more information, List 4 – Plants of limited distribution (a watch list). County List: List A – plants rare, threatened, or endangered in California and elsewhere; List B – plants rare, threatened, or endangered in California but more common elsewhere; List C – plants which may be quite rare, but need more information to determine their true rarity status; List D – plants of limited distribution and are uncommon, but not presently rare or endangered.

4.3 Fauna

A total of 153 wildlife species were documented from the Preserve during 2007 and 2008 baseline surveys. Four of these are non-native species with the remaining species (about 97 percent) being native. A full inventory of wildlife species observed during 2007 and 2008 surveys is included in Appendix D at the end of this report. The following subsections describe the results of each survey conducted within the Preserve.

4.3.1 Lepidoptera

4.3.1.1 Observed Lepidoptera

Surveys conducted in February – May 2008 resulted in 21 observations representing 14 species of butterflies (Appendix D). These include four species of the Family Hesperiidae, four species of the Family Lycaenidae, five species of the Family Nymphalidae, two species of the Family Papilionidae, five species of the Family Pieridae, and one species of the Family Riodinidae. The funereal duskywing was the most frequently observed species (4 observations) in the Preserve. Table 4-5 shows all butterfly species detected and the number of detections.

Table 4-5. Butterfly Species Detected within the Preserve

Common Name	Scientific Name	Number of Observations
Hesperiidae		
Funereal duskywing	*Erynnis funeralis*	4
Lycaenidae		
Acmon blue	*Plebejus acmon acmon*	2
Bramble hairsteak	*Callophrys dumetorum dumetorum*	1
Lupine blue	*Plebejus lupine monticola*	1
Nymphalidae		
Buckeye	*Junonia coenia*	1
Lorquin's admiral	*Limenitis lorquini*	1
Painted lady	*Cynthia cardui*	2
West Coast lady	*Cynthia annabella*	1
Papilionidae		
Anise swallowtail	*Papilio zelicaon*	1
Pale swallowtail	*Papilio eurymedon*	1
Pieridae		
Common (Checkered) white	*Pieris protodice*	2
Sara orangetip	*Anthocharis sara sara*	2
Orange sulfer	*Colias eurytheme*	1
Riodinidae		
Behr's metalmark	*Apodemia mormo virgulti*	1

The observed butterfly species composition is reflective of the vegetation communities comprising the Preserve. Most of the observed species use hosts that are relatively abundant in the CSS and mixed chaparral communities common in the Preserve. However, some species (i.e., checkered white and orange sulfer) probably benefit from the presence of non-native species at the site (i.e. *Hirschfeldia incana* and *Melilotus* spp., respectively).

4.3.1.2 Potentially Occurring Lepidoptera: Previously Documented

The federally endangered Quino checkerspot butterfly (*Euphydryas editha quino*) was not detected during 2008 surveys. However, it has been historically documented within the Preserve (USFWS 1930, 1931, and 1932) (Figure 4-5). This species is generally associated with sage scrub, open chaparral, grassland, and vernal pool habitats (USFWS 2002) where its host plant or nectar plants occur. Within these habitats the species usually occurs in open or sparsely vegetated areas (including trails and dirt roads), and on hilltops and ridgelines (USFWS 2002). Suitable habitat is present on the Preserve along with the species' larval host plants (USFWS 2002) dot-seed plantain (*Plantago erecta*), purple owl's clover (*Castilleja exserta* ssp. *exserta*), and dark-tipped bird's beak (*Cordylanthus rigidus* ssp. *setigerus*). No adult nectar plants were observed during the baseline surveys.

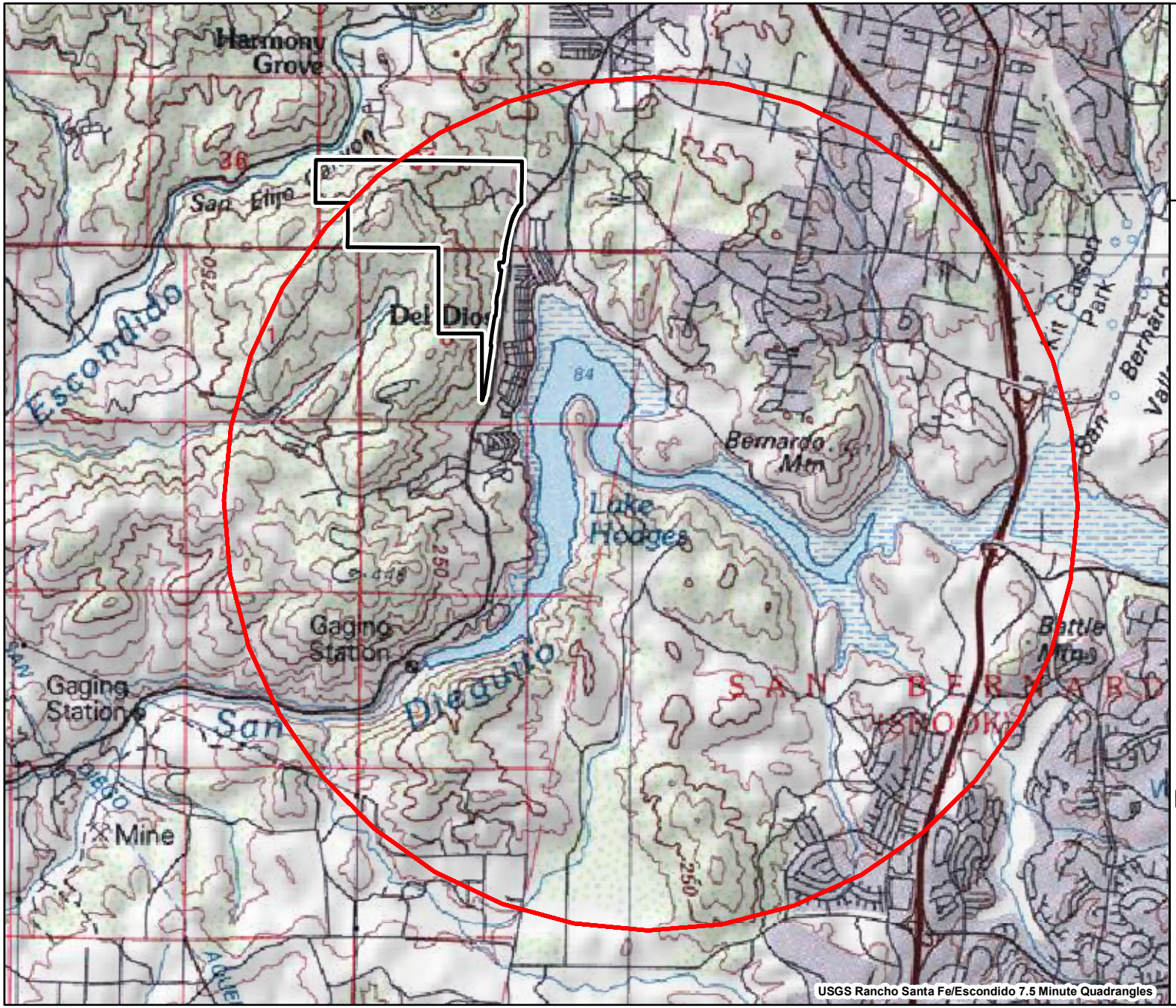
Recent drought years and the 2007 Witch Creek wildfire may have had detrimental effects on the species at the Preserve. Nevertheless, suitable habitat is available and, if the species is not currently occupying the Preserve, metapopulation dynamics may lead to future recolonization.

4.3.2 Terrestrial Herpetofauna

4.3.2.1 Observed Herpetofauna

A total of 148 herpetofauna captures representing 16 species were recorded during the four pitfall sampling months (March – June 2008). These include two species of amphibian, seven species of lizards, and seven species of snakes (Appendix D and E). No non-native herpetofauna species were captured during pitfall sampling.

Lizard species accounted for the majority of the herpetofauna captures (87.8%). Of the eight lizards captured, the western whiptail (*Cnemidophorus tigris*) and western fence lizard (*Sceloporus occidentalis*) were the two most captured species (47 and 33 captures respectively). Both of these species also represent the most widely distributed species of lizards, being captured at all arrays. Other species of lizards captured included the orange-throated whiptail (*Cnemidophorus hyperythrus*) (20 captures), southern alligator lizard (*Elgaria multicarinata*) (5 captures), Gilbert's skink (*Eumeces gilberti*) (7 capture), coast horned lizard (*Phrynosoma coronatum*) (15 captures), and side-blotched lizard (*Uta stansburiana*) (3 captures).



Del Dios Highlands Preserve Baseline Surveys

PARKS AND RECREATION
COUNTY OF SAN DIEGO

Legend

Quino checkerspot butterfly*

*Circle size indicates level of confidence in the spatial accuracy of the location. Larger circles indicate a lower level of spatial accuracy while smaller circles indicate a higher level of spatial accuracy, following CNDDB standards. This species is mapped as an 8km diameter circle, indicating a lower level of confidence in the spatial accuracy of the location.

Basemap Legend

Del Dios Highlands Preserve Boundary

N

Feet

0 4,400

Technology Associates International Corporation

Historic (1931/1932) Quino Checkerspot Butterfly Location per U.S. Fish and Wildlife Service

Figure 4-5

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Date: Oct 13, 2008

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Snake and amphibian species accounted for far less of the herpetofauna captures (9.5% and 2.7% respectively). All four amphibian captures were recorded at array 4 and included the western toad (*Bufo boreas*) (2 captures) and western spadefoot (*Spea hammondii*) (2 captures). Of the seven snake species captured, the California whipsnake (*Masticophis lateralis*) was the most captured (6 captures) and widely distributed (captured at 4 of 5 arrays) snake species. Other species of snake captured included the gopher snake (*Pituophis catenifer*) (1 capture), western patch-nosed snake (*Salvadora hexalepis*) (1 capture), western rattlesnake (*Crotalus viridis*) (2 captures), night snake (*Hypsiglena torquata*) (1 capture), red diamond rattlesnake (*Crotalus ruber*) (1 capture), and rosy boa (*Lichanura trivirgata*) (1 capture).

Arrays 2 and 3 had the most herpetofauna captures with 37 and 34 total captures, respectively. Arrays 1 and 2 captured the greatest number of herpetofauna species (9 species each). Array 5 had the fewest herpetofauna captures (23 captures) while array 3 had the fewest number of species captured (6 species). Table 4-6 shows the species captured and total captures for each array.

Table 4-6. Terrestrial Herpetofauna Captures at the Preserve

Common Name	Scientific Name	Array					
		1	2	3	4	5	Total
California whipsnake	*Masticophis lateralis*	2	1	1	2		**6**
Coast horned lizard	*Phrynosoma coronatum*	3	4	8			**15**
Gilbert's skink	*Eumeces gilberti*	2				5	**7**
Gopher snake	*Pituophis catenifer*		1				**1**
Night snake	*Hypsiglena torquata*				1		**1**
Orange-throated whiptail	*Cnemidophorus hyperythrus*	7	8	5			**20**
Red diamond rattlesnake	*Crotalus ruber*	1				1	**2**
Rosy boa	*Lichanura trivirgata*	1					**2**
Side-blotched lizard	*Uta stansburiana*		1		1	1	**3**
Southern alligator lizard	*Elgaria multicarinata*		1	2		2	**5**
Western fence lizard	*Sceloporus occidentalis*	2	8	8	4	11	**33**
Western patched-nosed snake	*Salvadora hexalepis*	1					**1**
Western rattlesnake	*Crotalus viridis*				1	1	**2**
Western spadefoot	*Spea hammondii*				2		**2**
Western toad	*Bufo boreas*				2		**2**
Western whiptail	*Cnemidophorus tigris*	9	13	10	13	2	**47**
	Total	**28**	**37**	**34**	**26**	**23**	

In addition to the pitfall captures recorded during pitfall surveys, two incidental herpetofauna observations were made in the Preserve. A ringneck snake (*Diadophis punctatus*) was observed crossing the main access road during the first sampling session

(March 24-28, 2008). Incidental observations of the Pacific treefrog (*Pseudacris regilla*) were made throughout the Preserve.

The species detected during pitfall sampling represent the majority of species expected to occur on the Preserve and commonly found in those habitat types present. The methods used for the 2008 pitfall sampling were successful in developing a preliminary herpetofauna inventory.

4.3.2.2 Potentially Occurring Herpetofauna: Based on Habitat and Distribution

The Preserve is within the range of a number other species that were not captured during baseline surveys including the two-striped garter snake (*Thamnophis hammondii*), lyresnake (*Trimorphodon biscutatus*), long-nosed snake (*Rhinocheilus lecontei*), California glossy snake (*Arizona elegans*), western yellow-bellied racer (*Coluber constrictor*), coachwhip (*Masticophis flagellum*), black-headed snake (*Tantilla planiceps*), western banded gecko (*Coleonyx variegatus*), granite spiny lizard (*Sceloporus orcutti*), garden slender salamander (*Batrachoseps major*), and arboreal salamander (*Aneides lugubris*). It is possible that these species are currently present onsite. However, because of generally low capture rates of reptile and amphibian species and the timing of this initial sampling effort, these species may have been missed.

4.3.3 Avifauna

4.3.3.1 Observed Avifauna

A total of 1,255 avian observations representing 89 species were made during point count surveys conducted from November 2007 through June 2008 (Appendix D). Point locations with the greatest number of observations include location 3 (93 observations), location 13 (120 observations), and location 17 (96 observations). Point locations with the fewest number of observations include location 7 (47 observations), location 8 (40 observations), and location 9 (52 observations). Point locations with the greatest number of species observed include location 3 (34 species), location 11 (36 species), and location 13 (38 species). Point locations with the fewest number of species observed include location 5 (24 species), location 8 (20 species), and location 9 (22 species). Point 13 had a relatively high number of species because of the habitat heterogeneity around the old homestead. The eucalyptus and other surviving exotic trees at this site provided the only habitat in the Preserve for certain arboreal birds, namely, the acorn woodpecker (birds recorded at points 6 and 15 were likely outside the Preserve along Escondido Creek), Cassin's kingbird (one recorded at point 17 was likely outside the Preserve in ornamental trees in adjacent yards), European starling, hooded oriole (birds recorded at other points

were likely visitors from nearby developed areas or Escondido Creek), and Bullock's oriole. Nesting of the Cassin's kingbird and hooded oriole (both urban adapters) was noted at point 13 and nowhere else in the Preserve. Species diversity at point 3 was relatively high because of more mesic vegetation growing in a disturbed area. Species diversity was lowest in the more level chaparral toward the east edge of the Preserve, lying at a greater distance from developed areas and water.

Species most frequently observed during point count surveys include the Bewick's wren (*Thryomanes bewickii*) (91 observations), California towhee (*Pipilo crissalis*) (110 observations), and wrentit (*Chamaea fasciata*) (116 observations), all characteristic and common birds of chaparral. These species were also three of the most widely distributed species, being observed at all of the 18 point locations. In addition to these species, the spotted towhee (*Pipilo maculatus*) and Anna's hummingbird (*Calypte anna*) were both observed at all 18 point locations. Species least frequently observed during point count surveys include 22 species observed only once. These species include the American robin (*Turdus migratorius*), calliope hummingbird (*Stellula calliope*), common loon (*Gavia immer*), dark-eyed junco (*Junco hyemalis*), ferruginous hawk (*Buteo regalis*), great blue heron (*Ardea herodias*), greater roadrunner (*Geococcyx californianus*), Hutton's vireo (*Vireo huttoni*), killdeer (*Charadrius vociferus*), Lawrence's goldfinch (*Carduelis lawrencei*), peregrine falcon (*Falco peregrinus*), pine siskin (*Carduelis pinus*), purple finch (*Carpodacus purpureus*), red-shouldered hawk (*Buteo lineatus*), Say's phoebe (*Sayornis saya*), Townsend's warbler (*Dendroica townsendi*), Vaux's swift (*Chaetura vauxi*), western bluebird (*Sialia mexicana*), western wood pewee (*Contopus sordidulus*), white-faced ibis (*Plegadis chihi*), yellow warbler (*Dendroica petechia*), and yellow-breasted chat (*Icteria virens*). All of these species were also the least widely distributed species, being observed at one location. In addition, the Bullock's oriole (*Icterus bullockii*), common yellowthroat (*Geothlypis trichas*), Cooper's hawk (*Accipiter cooperii*), and European starling (*Sturnus vulgaris*) were all observed at only one location.

Two non-native species, the European starling and domestic pigeon (*Columba livia*), were detected during avian point count surveys. Also, the brown-headed cowbird was detected twice, once each at point locations 2 and 13. The brown-headed cowbird, a native North American species but absent from the coastal slope of San Diego County before 1913, is a brood parasite known to parasitize more than 220 host species (Muehter 2008). The European starling was observed only at point 13, as a result of the eucalyptus trees persisting at this site and foraging habitat in adjacent developed areas at the Preserve.

Three additional species were detected during nocturnal surveys including the barn owl, common poorwill, and great horned owl. Three observations of the great horned owl were made on the Preserve. Two of these observations were made near diurnal point count location 13 and one was made near diurnal point count location 3. The common poorwill was detected twice near diurnal point count location 13. The barn owl was detected once near diurnal point count location 4.

The birds observed at the Preserve are largely those characteristic of chaparral in coastal southern California. Species characteristic of woodland or developed areas were less frequent but intruded because of nearby oak and riparian woodland along Escondido Creek and developed areas in the Preserve. At the beginning of the survey in November 2007 numbers of birds were remarkably low, presumably as a result of the preceding years of drought and Witch Creek Fire of October 2007, which burned into the Preserve from the southeast. Even in areas of the Preserve not burned, the vegetation on east-facing slopes looked dried and unattractive to birds. There was virtually no evidence of birds from the burned areas to the east being displaced into the Preserve. The only exception was the coastal California gnatcatcher (*Polioptila californica;* CAGN). The population center for CAGN in San Diego County is around Lake Hodges a short distance east of the Preserve. Single individuals were noted at point 14 on November 20, 2007, at point 11 on December 31, 2007, and at point 9 on February 19, 2008. Also two males were seen together on January 22, 2008, in the Elfin Forest Preserve just west of the Preserve. The Preserve lacks the sage scrub this federally threatened species prefers, and no CAGN were encountered during the spring or summer.

Because Lake Hodges and Olivenhain Reservoir are so close to the Preserve, several species of waterbirds were recorded flying over the Preserve, species that would have been lacking if these lakes had not been so close. Water birds at the north end of Olivenhain Reservoir were readily counted from point 10, but because this lake lacks aquatic vegetation the diversity and number of water birds on it were low. There is no water actually within the Preserve that these species might exploit.

The species of greatest conservation concern recorded as a resident within the Preserve in 2008 is the sage sparrow (*Amphispiza belli belli*). This species prefers semi-open chaparral, often on flat topography or moderate slopes, and is among the southern California birds most sensitive to habitat fragmentation. It was recorded at 8 of the 18 count points, most frequently at points 7, 8, 9, and 10, that is, on the higher, less rugged mesa in the southwestern section of the Preserve. The semi-open chaparral in this region is typical sage sparrow habitat. The sage sparrow also uses recovering burned chaparral, but during the 2007 and 2008 surveys only one was noted in burned habitat, at point 11

on May 13, 2008. Chaparral needs two or three years of recovery to get to the stage of density attractive to the sage sparrow.

Also of some note was the occurrence of the black-chinned sparrow (*Spizella atrogularis*) in the same area as the sage sparrows (points 7, 8, and 9). The black-chinned sparrow is one of the most common birds in montane chaparral, but generally occurs as a breeding species little if any closer to the coast than the Preserve.

4.3.3.2 Potentially Occurring Avifauna: Previously Documented

A species that might have been expected in the Preserve that was not recorded during this survey was the golden eagle (*Aquila chrysaetos*). This species had a traditional nest site on the steep slopes and cliffs just south of the reserve, which continued active into the study period for the San Diego County bird atlas (1997–2001). But we have no information on whether the eagles occupied the site in 2008, the last date they were known to nest in the area, or how they may have been affected by the Witch Creek fire.

4.3.4 Bats

A total of 11 bat species were detected using passive Anabats during the three seasons of bat monitoring (Table 4-7; Appendix D). The most active bat species detected were the Mexican free-tailed bat (*Tadarida brasiliensis*), Yuma myotis (*Myotis yumanensis*), and pocketed free-tailed bat (*Nyctinomops femorosaccus*). Species rarely detected included the western yellow bat (*Lasiurus xanthinus*), hoary bat (*Lasiurus cinereus*), and small-footed myotis (*Myotis ciliolabrum*). No bats were detected during the single active roost survey conducted on June 24, 2008.

In addition, an incidental observation of a dead hoary bat was made during pitfall sampling. The individual was found dead along Escondido Creek, on the trail leading from the Elfin Forest into the Preserve.

Bat species detected during all three seasons of monitoring included the Mexican free-tailed bat, pocketed free-tailed bat, California myotis (*Myotis californicus*), western pipistrelle (*Parastrellus hesperus*), and western mastiff bat (*Eumops perotis*). Bat species detected only during the summer included the big brown bat (*Eptesicus fuscus*), western red bat (*Lasiurus blossevillii*), small-footed myotis, and western yellow bat. No bat species detected were limited to the winter or spring monitoring periods.

A moderate number of bat species appear to be supported by the Preserve. While the Preserve itself is fairly homogeneous in nature, its juxtaposition between Escondido

Creek and Lake Hodges likely increases its use by bats, since bats are commonly found foraging in riparian areas and near open water sources in San Diego County (Krutzsch 1948, Stokes et al 2005). The shrubland habitat likely provides at least marginal foraging opportunities for most bat species, and the large amount of exposed rocky habitats could support roosting bats.

Table 4-7. Bats Detected at the Preserve Using Passive Anabats

Common Name	Scientific Name	Relative Activity Index[1]			Average Activity Index[2]
		Winter	Spring	Summer	
Mexican free-tailed bat	*Tadarida brasiliensis*	7.50	35.56	1223.89	422.31
Yuma myotis	*Myotis yumanensis*	nd[3]	20.00	95.56	38.52
Pocketed free-tailed bat	*Nyctinomops femorosaccus*	20.83	7.78	61.11	29.91
California myotis	*Myotis californicus*	2.50	2.22	41.11	15.28
Western pipistrelle	*Parastrellus hesperus*	1.67	1.11	39.44	14.07
Big brown bat	*Eptesicus fuscus*	nd[3]	nd[3]	32.78	10.93
Western mastiff bat	*Eumops perotis*	2.50	3.33	4.44	3.43
Western red bat	*Lasiurus blossevillii*	nd[3]	nd[3]	6.11	2.04
Small-footed myotis	*Myotis ciliolabrum*	nd[3]	nd[3]	3.89	1.30
Hoary bat	*Lasiurus cinereus*	nd[3]	2.22	0.56	0.93
Western yellow bat	*Lasiurus xanthinus*	nd[3]	nd[3]	0.56	0.19

[1] Number of bat passes per Anabat night multiplied by 10

[2] Average of seasonal measures of relative activity for each bat species detected

[3] nd = not detected

Observed seasonal trends include a suite of species detected during all three seasons of monitoring, and another suite of species detected only during the summer. These observations are consistent with previous bat monitoring efforts in the County (Krutzsch 1948, Stokes et al 2005).

The detection of the western yellow bat is likely a result of the occurrence of planted palm trees nearby the property, which are the species preferred roosting habitat (Barbour and Davis 1969). Finally, this area may represent the western edge of the small-footed myotis' current distributional range in the County (San Diego County Mammal Atlas, unpublished).

4.3.5 Small Mammals

4.3.5.1 Observed Small Mammals

A total of 474 small mammal captures representing ten species were recorded during three trapping sessions (November 14 - 16, 2007; November 27 - 29, 2007; March 19 - 21, 2008) using live Sherman traps (Appendix D and E). Of the ten species captured

using Sherman traps, the cactus mouse (*Peromyscus eremicus*) and California mouse (*Peromyscus californicus*) were the most frequently captured species (92 and 186 captures, respectively).

The California mouse was the most widely distributed species, being captured at 15 of the 16 plots. Plots 2, 5, and 9 captured the greatest number of species (each with 6 species) while plot 12 captured the least number of species (2 species). Plot 4 had the most number of captures with 73 captures, while plot 5 had the fewest number of captures with seven captures. Table 4-8 shows the species captured and total captures for each plot.

Plot 2 burned lightly in October 2007. The diversity at this site is due to proximity to unburned habitat. Most species will find cover in the unburned habitat but forage in the new growth of the recent burn. Plot 9 was unburned mature coastal sage scrub, which appeared to have not burned recently. This habitat should always support a greater diversity of small mammals. Plot 12 had an open canopy of disturbed coastal sage scrub with a denser canopy at the edges of each trap line. The cactus mouse was the dominant species captured here, although the Dulzura kangaroo rat (*Dipodomys simulans*) and few of other species were expected in this location. Most cactus mice were captured in traps located at the end of the trap lines.

Plot 4 was in unburned and mature chaparral. The high capture success was due to habitat quality and extensive rock outcroppings. Habitat quality was poor for most species at captured at plot 5. The diversity is most likely due to foraging animals from nearby coastal sage scrub.

The Botta's pocket gopher (*Thomomys bottae*) was not captured during small mammal trapping. However, pocket gopher burrows were observed throughout the property during baseline surveys.

Small mammal species were also captured during terrestrial herpetofauna pitfall sampling. A total of 30 small mammal captures representing six species were recorded during the four pitfall sampling months (March – June 2008). Of these six species, four species were captured only during pitfall sampling. These species include the western harvest mouse (*Reithrodontomys megalotis*), desert grey shrew (*Notiosorex crawfordi*), and ornate shrew (*Sorex ornatus*). These species are either too small to trip shut Sherman traps, prefer foods items not used as bait in Sherman traps, or are not regularly active above ground. In addition, an unknown species of rabbit (*Sylvilagus* ssp.) was captured during pitfall sampling.

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Table 4-8. Small Mammal Captures at the Preserve

Common Name	Scientific Name	Small Mammal Trapping Plot																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Cactus mouse	*Peromyscus eremicus*	9	5	10	21		1	1	4	6	4	10	9	5	6		1	**92**
California mouse	*Peromyscus californicus*	5	22	4	26	1	6	20	1	1	2	1		4	15	36	42	**186**
California pocket mouse	*Chaetodipus californicus*	7		2	7	2	5		4	2			1		20		7	**57**
Deer mouse	*Peromyscus maniculatus*		10			1				2					6		1	**20**
Desert woodrat	*Neotoma lepida*	3	4	6	13			5	6	2				2				**41**
Dulzura kangaroo rat	*Dipodomys simulans*					1						5			15			**21**
Large-eared woodrat	*Neotoma macrotis*	4	1	2	6		1	5			2					10	5	**36**
San Diego pocket mouse	*Chaetodipus fallax*		5			1			1	9								**16**
California ground squirrel	*Spermophilus beecheyi*															1		**1**
Western harvest mouse	*Reithrodontomys megalotis*					1					1							**2**
	Total	**28**	**47**	**24**	**74**	**7**	**13**	**31**	**16**	**22**	**9**	**16**	**10**	**11**	**62**	**47**	**57**	

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The small mammal inventory at this site appears to be very successful. The species list represents nearly all the species that would be expected for the habitat types present. Only two species, the California vole (*Microtus californicus*) and brush mouse (*Peromyscus boylii*), were not detected. Effects of the Witch Creek Fire of 2007 on the small mammal community are not evident. The diversity of small mammals captured here is high for the relatively short 2008 sample period. Most rodents and insectivores, except for the woodrats and voles, are not immediately impacted by the fires. Deep burrows allow them to escape from fire; however the lack of food will eventually impact populations in the burn areas.

4.3.5.2 Potentially Occurring Small Mammals: Based on Habitat and Distribution

The California vole was not detected during the baseline surveys. It is a species that is mostly captured in pitfall traps. This species spends most of its time above ground. Numerous dead voles were observed immediately following the Cedar Fire of 2003. California voles and the woodrats are highly affected by fire because they spend much of their life cycle above ground.

The brush mouse was also not detected during the baseline surveys. Although this species is often difficult to differentiate from the California mouse (*Peromyscus californicus*), museum specimens of past collections from the area assisted in the identification of the California mouse with a high level of confidence, and thus ruled out that the brush mouse was detected during the 2008 surveys. The brush mouse prefers taller and denser chaparral or oak woodland.

4.3.6 Medium and Large Mammals

4.3.6.1 Observed Medium and Large Mammals

Two target and a number of non-target mammal species were detected using two types of survey methods (scent station surveys and camera station surveys) for medium and large mammals (Appendix D and E). Target species for these surveys include native medium and large carnivores (i.e. bobcat, mountain lion, and coyote) and mule deer (*Odocoileus hemionus*). Non-target species include human associated animals such as the domestic dog (*Canis lupus familiaris*) and horse (*Equus caballus*).

One target mammal species were detected in the Preserve during scent station surveys. The coyote (*Canis latrans*) was detected four times during scent station surveys. A number of non-target species were also detected during scent station surveys. These

include the domestic dog (*Canis lupus familiaris*) and unidentified small mammal and rabbit species.

A gray fox (*Urocyon cinereoargenteus*) was possibly detected in the Preserve during camera station surveys (conclusive identification in the exposure was not possible). Target species detected during camera station surveys include coyote and, possibly, gray fox. The coyote was detected eight times across the Preserve at camera stations 1, 2, 5-9, and 11. The presumed gray fox was detected once at camera station 11. Two non-target species were also detected during camera station surveys. These include the domestic dog and unidentified woodrat species.

Visual encounters of the desert cottontail (*Sylvilagus audubonii*) were common. However, no brush rabbits (*Sylvilagus bachmani*) were seen while conducting these surveys; however, they are expected to occur on the Preserve.

Fire is an important component of mule deer habitat preference. Frequent fires restore the habitat and improve the food sources for mule deer. Mule deer are often seen foraging for immediate growth within several weeks of a burn. The absence of fire results in older and less nutritious plants reducing palatability of the deer's food source. Mule deer scat and track were observed throughout the Preserve.

4.3.6.2 Potentially Occurring Medium and Large Mammals: Based on Habitat and Distribution

No mountain lions were detected during these surveys. Mule deer sign was common and it is anticipated that mountain lion move through the Preserve. Unconfirmed reports of mountain lions in the San Pasqual Valley have been made in the past year (R. Botta, California Department of Fish and Game big-game biologist, pers. comm.). Further, Randy Botta recalls a road-killed mountain lion near the I-15/Lake Hodges overpass many years ago, however, none recently.

The long-tailed weasel was not detected during these surveys. The long-tailed weasel is not commonly seen, but is often present within a few miles from water. Sightings of this species throughout the County have increased dramatically since 2006. This species has the potential to be found on site.

The ringtail (*Bassariscus astutus octavus*) was not observed or detected during baseline surveys. There is a moderate chance that they occur on the Preserve since the type locality (Hall 1981) is 26 kilometers (16.2 mi) northeast of the Preserve. At other

occupied sites in San Diego County they are often found near vertical granitic cliff faces and within a few miles from a water source. Potential habitat is found in the rock outcroppings immediately north of Olivenhain Reservoir on the Preserve. This species is listed as a fully protected species by the California Department of Fish and Game (CDFG).

The medium to large mammals detected at the Preserve were expected for this site. Species not detected but expected include bobcat (*Lynx rufus*), raccoon (*Procyon lotor*), skunk (*Mephitis mephitis*), and the brush rabbit. These species have the potential to be found on site.

4.3.7 Sensitive Wildlife Species

This section discusses the sensitive wildlife species that have been documented from or have the potential to occur in the Preserve. For the purposes of this report, sensitive wildlife species refers to both listed and non-listed sensitive species. Listed wildlife species are those species listed as endangered, threatened, or rare, or identified as candidates for listing pursuant to the Federal or State Endangered Species Acts (FESA, CESA). Non-listed sensitive species include those species with the status "State Species of Special Concern" (SSC) and/or "Fully Protected Species". In addition, non-listed sensitive wildlife species include those species on the CDFG watch list. These species were either previously a SSC or do not meet the criteria for SSC. Nonetheless, there is concern for these species and additional data is needed to clarify the species' status. Finally, species covered under the South County MSCP are also included in this discussion. This plan provides coverage for 85 plant and animal species.

4.3.7.1 Observed Sensitive Wildlife Species

Two listed wildlife species were detected during baseline surveys, including the federally threatened CAGN and state endangered and federally delisted peregrine falcon. Five observations were made of CAGN during 2007 and 2008 surveys. The Preserve lacks suitable coastal sage scrub habitat CAGN prefers for nesting. Additionally, no observations were made of the species in the spring or summer. Therefore, it is suspected that individuals observed were transients (possible fire refugees) and not using the Preserve as a breeding ground. However, the patches of coastal sage scrub found on the Preserve still provide valuable "stepping stone" habitat to CAGN, providing foraging opportunities and, thus, aiding in the distribution of this species with the region.

The peregrine falcon was only observed once on June 6, 2008. If the species were nesting on the Preserve it is expected that more observations would have been made.

Although the species is not expected to be currently nesting on site, suitable nesting and foraging habitat is available on the Preserve and in the surrounding area. Due to increase in numbers, the peregrine falcon was federally delisted in August 1999. Additionally, this species is a candidate for state de-listing as of November 2007.

Twenty-three non-listed sensitive wildlife species were detected across the Preserve during baseline surveys (Table 4-9; Figures 4-6 – 4-9). These included 12 species of birds, three species of small mammals, three species of bats, one species of amphibian, and four species of reptiles. Seven of these species have also been previously documented from the Preserve (Figure 4-10). A brief species account for each sensitive species observed during 2007 and 2008 surveys is provided below.

Table 4-9. Sensitive Wildlife Species Detected at the Preserve during 2008 Baseline Surveys

Common Name	Scientific Name	Listing Status (Federal/State/ County)[1]	South County MSCP Covered (Y/N)
Amphibians			
Western spadefoot	*Spea hammondii*	--/SSC/2	No
Reptiles			
Orange-throated whiptail	*Cnemidophorus hyperythrus*	--/SSC/2	Yes
Red diamond rattlesnake	*Crotalus ruber*	--/SSC/2	No
Coast horned lizard	*Phrynosoma coronatum*	--/SSC/2	Yes
Western patch-nosed snake	*Salvadora hexalepis*	--/SSC/2	No
Birds			
Cooper's hawk	*Accipiter cooperii*	--/WL/1	Yes
Sharp-shinned hawk	*Accipiter striatus*	--/WL/1	No
Southern California rufous-crowned sparrow	*Aimophila ruficeps*	--/WL/1	Yes
Bell's sage sparrow	*Amphispiza belli*	--/WL/1	No
Ferruginous hawk	*Buteo regalis*	--/WL/1	Yes
Vaux's swift	*Chaetura vauxi*	--/SSC/--	No
Yellow warbler	*Dendroica petechia*	--/SSC/2	No
Peregrine falcon	***Falco peregrinus***	**DL/E/1**	**Yes**
Common loon	*Gavia immer*	--/SSC/2	No
Yellow-breasted chat	*Icteria virens*	--/SSC/1	No
White-faced ibis	*Plegadis chihi*	--/WL/1	Yes
Double-crested cormorant	*Phalacrocorax auritus*	--/WL/2	No
California gnatcatcher	***Polioptila californica***	**T/SSC/1**	**Yes**
Western bluebird	*Sialia mexicana*	--/--/2	Yes

Table 4-9. Sensitive Wildlife Species Detected at the Preserve during 2008 Baseline Surveys *continued*

Common Name	Scientific Name	Listing Status (Federal/State/ County)[1]	South County MSCP Covered (Y/N)
Mammals			
California pocket mouse	*Chaetodipus californicus*	--/SSC/2	No
Northwestern San Diego pocket mouse	*Chaetodipus fallax*	--/SSC/2	No
Western mastiff bat	*Eumops perotis*	--/SSC/2	No
Western red bat	*Lasiurus blossevillii*	--/SSC/2	No
Desert woodrat	*Neotoma lepida*	--/SSC/2	No
Pocketed free-tailed bat	*Nyctinomops femorosaccus*	--/SSC/2	No
Mule deer[2]	*Odocoileus hemionus*	--/--/2	Yes

[1] Listing Status: Federal: E – endangered, T – threatened, DL – federally delisted. State: E – endangered, T – threatened, R – rare, SSC – species of special concern, FP – fully protected, WL – watch list. County List: List 1 – Species with a very high level of sensitivity, either because they are listed as threatened or endangered or because they have very specific natural history requirements that must be met; List 2 – Species that are becoming less common, but are not yet so rare that extirpation or extinction is imminent without immediate action. These species tend to be prolific within their suitable habitat types.

[2] The mule deer was not directly observed during 2008 surveys. However, mule deer sign (track and scat) was detected throughout the Preserve.

Western spadefoot – *Spea hammondii*
Federal Status: None
State Status: Species of Special Concern
County List: 2
South County MSCP: Not Covered

The western spadefoot is almost endemic to California, ranging from the Central Valley and southward on the coastal slope from Point Conception to northern Baja California (Jennings and Hayes 1994). It generally occurs below 3,000 feet (914 m), but can be found as high as 4,500 feet (1,372 m). This species prefers grassland, scrub, and chaparral habitat; occasionally occurring in oak woodlands. During the breeding season (January to May), vernal pools or slow flowing creeks must be available for egg laying and larval development. The greatest threats to this species are loss and fragmentation of habitat due to urban and agricultural development, non-native predators, heavy grazing, off-road vehicles use, and contaminant runoff. Within the Preserve, the western spadefoot was captured at array 4 on a south-facing slope composed of sparse southern mixed chaparral (Figure 4-6).

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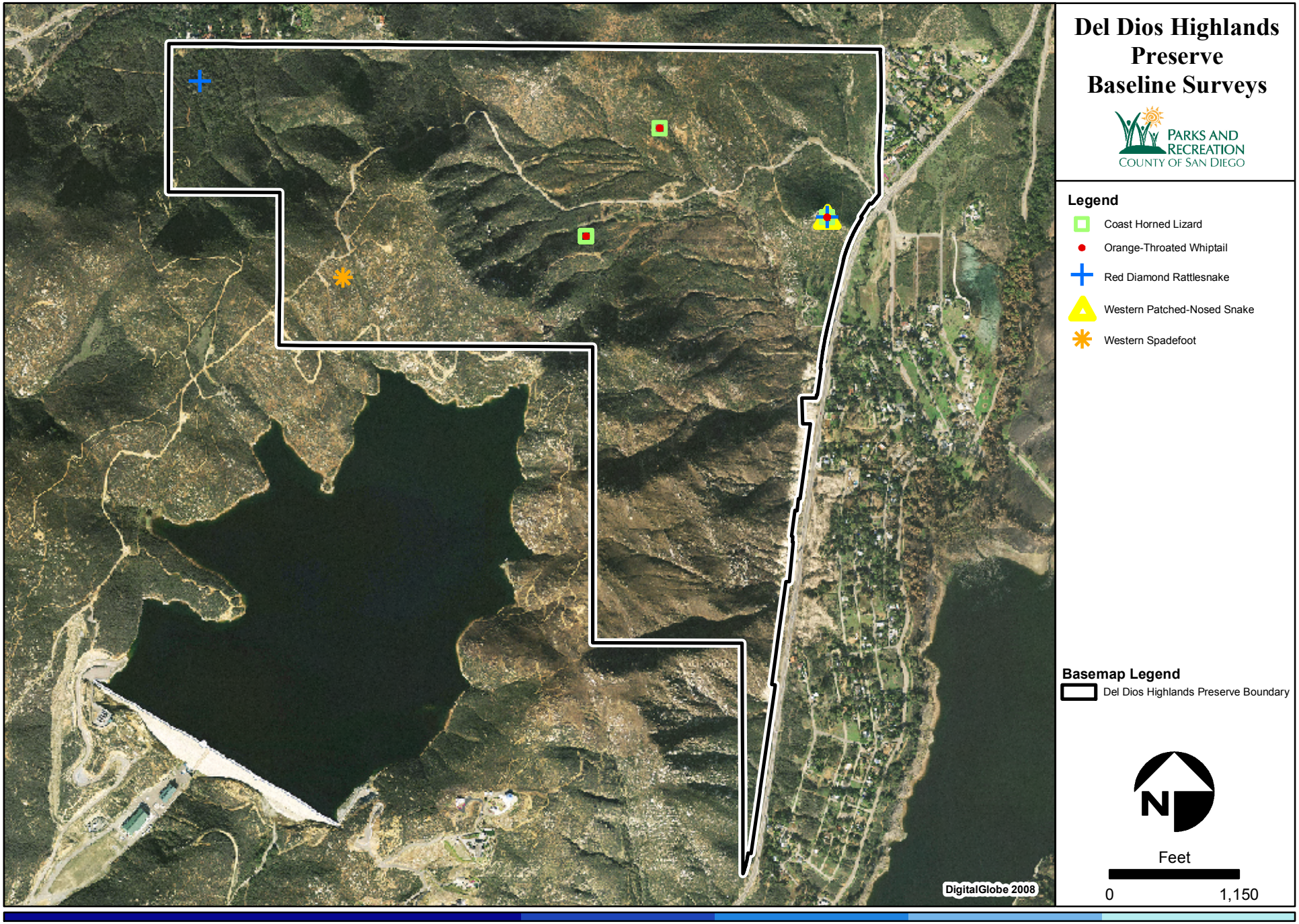

Technology Associates International Corporation

Sensitive Herpetofauna Species Observed during 2008 Baseline Surveys

Figure 4-6

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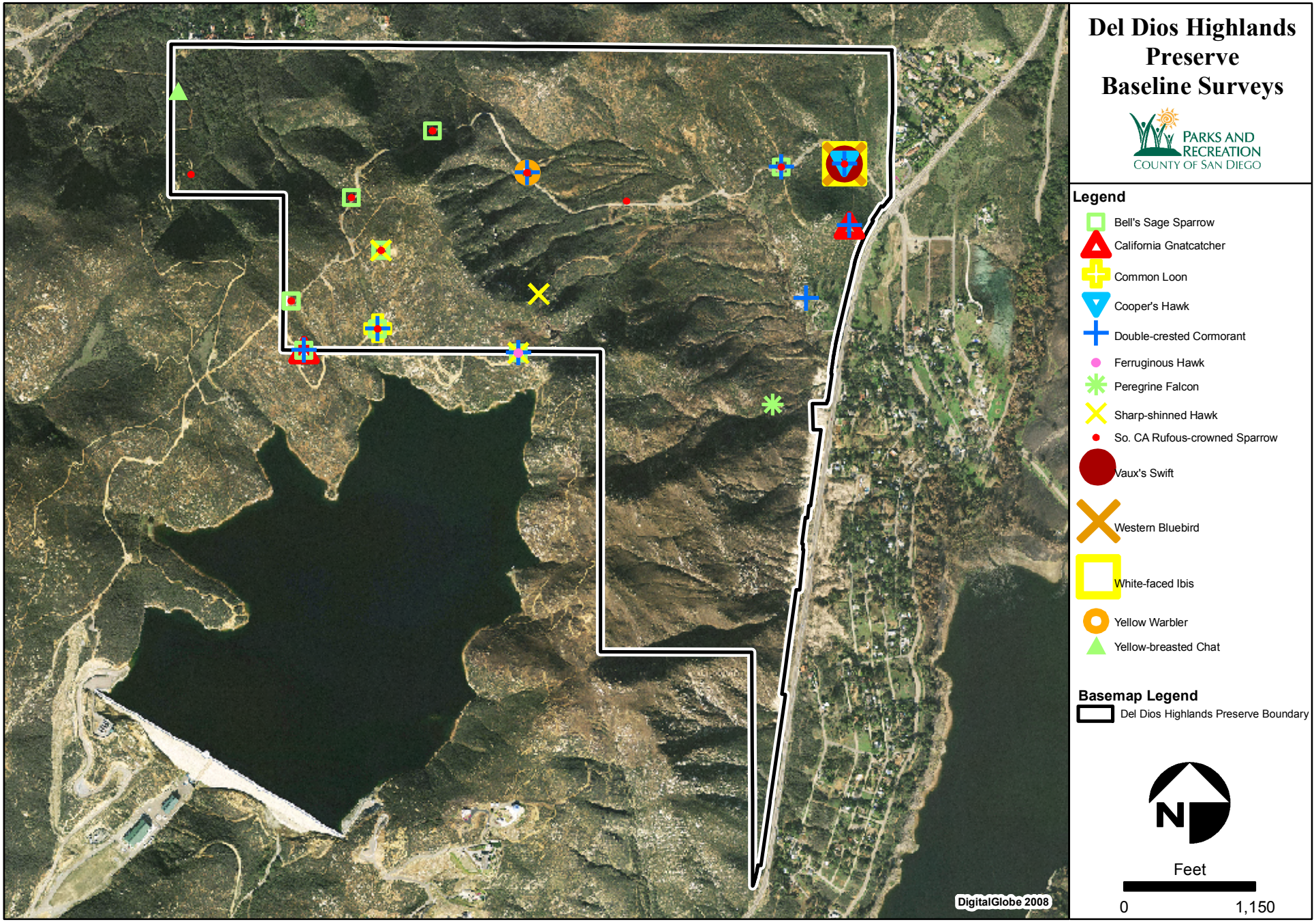

Technology Associates International Corporation

Sensitive Birds Species Observed during 2008 Baseline Surveys

Figure 4-7

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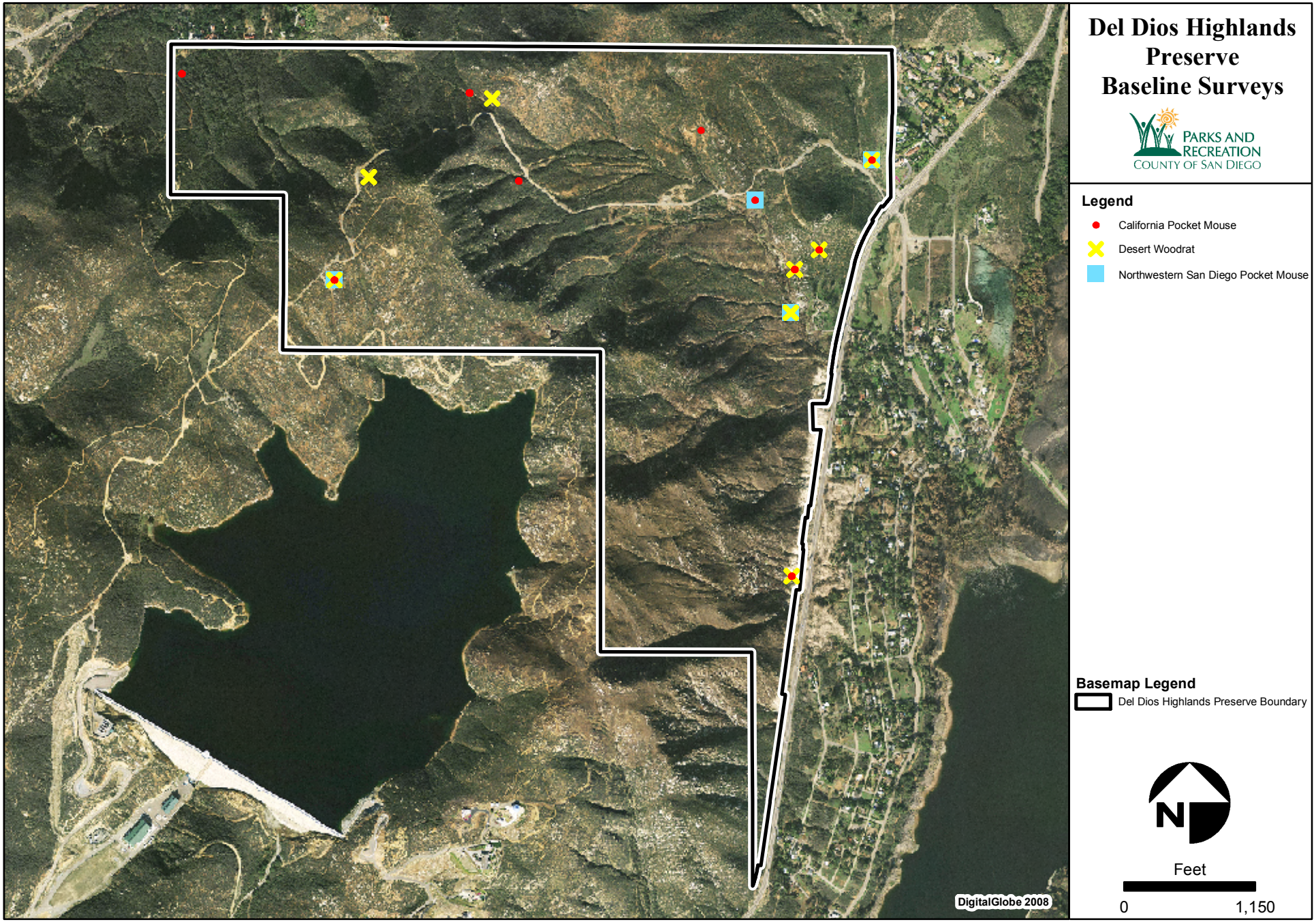

Technology Associates International Corporation

Sensitive Small Mammal Species Observed during 2008 Baseline Surveys

Figure 4-8

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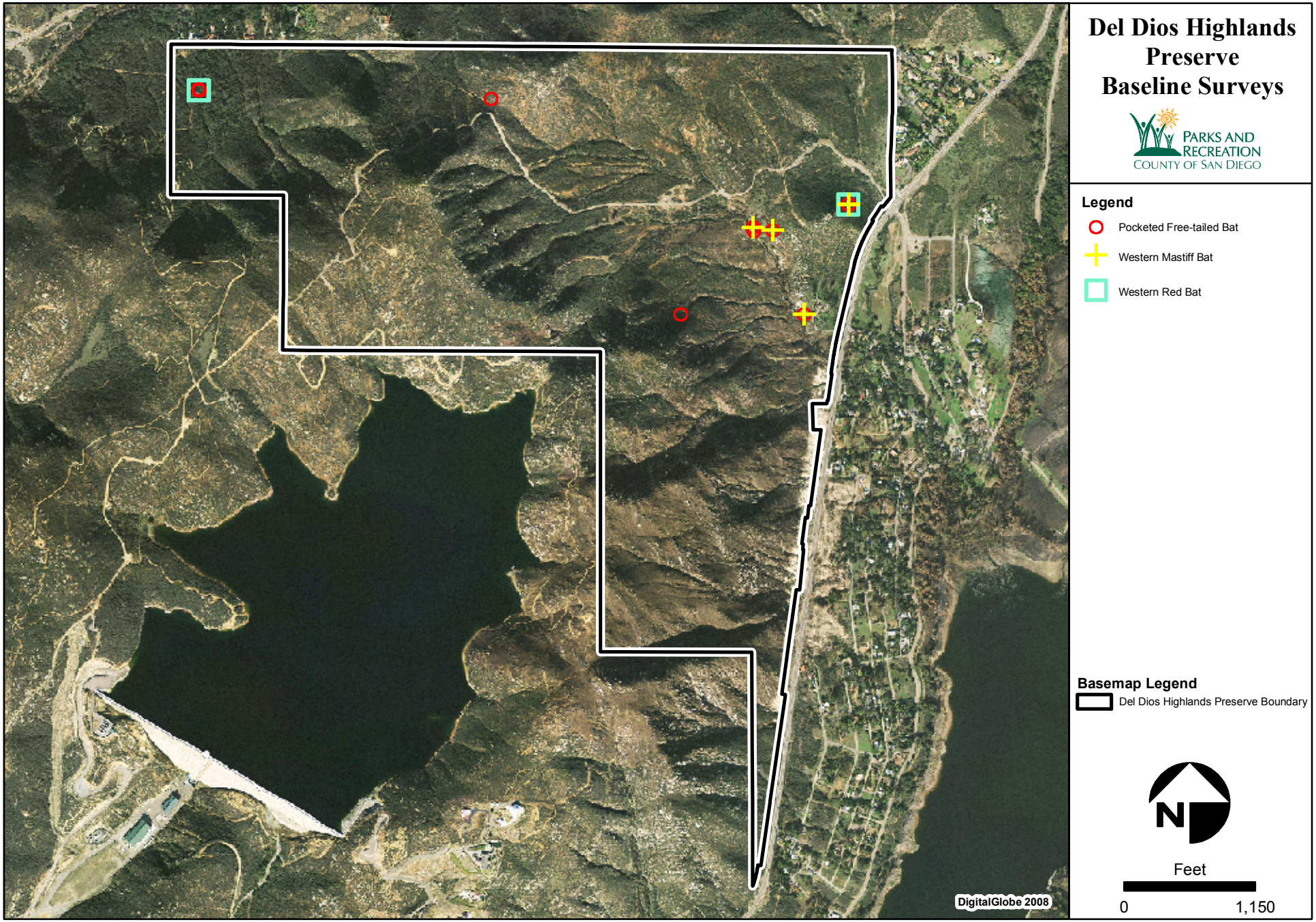

Technology Associates International Corporation

Sensitive Bat Species Observed during 2008 Baseline Surveys

Figure 4-9

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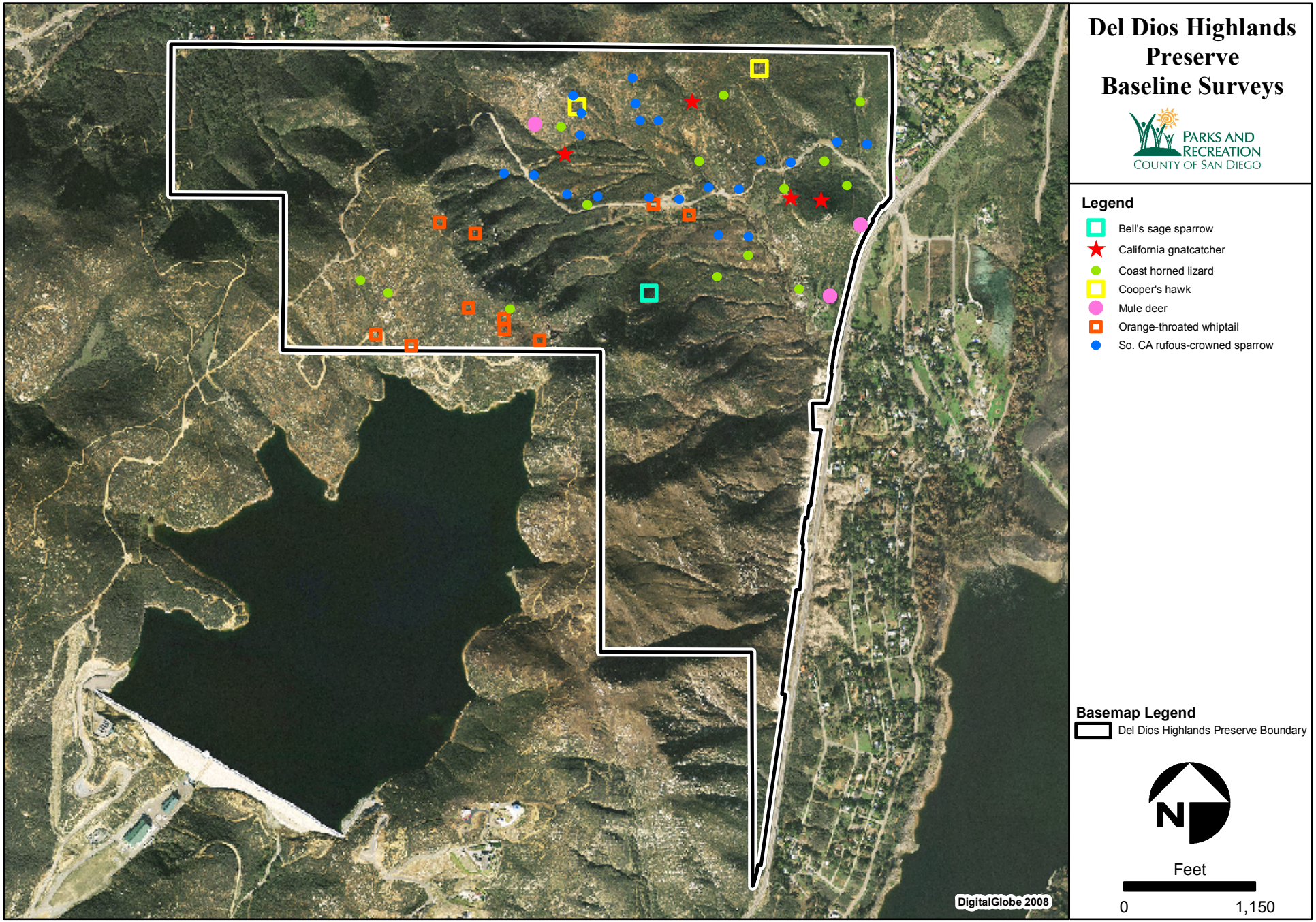

Technology Associates International Corporation

Historic Locations for Sensitive Wildlife Species Observed during 2008 Baseline Surveys

Figure 4-10

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Orange-throated whiptail – *Cnemidophorus hyperythrus*
Federal Status: None
State Status: Species of Special Concern
County List: 2
South County MSCP: Covered

The orange-throated whiptail inhabits low-elevation coastal scrub, chamise-redshank chaparral, mixed chaparral, and valley-foothill hardwood habitats (Morey 2000). This species is restricted to the extreme southwest of California and northwest of Baja California Norte, Mexico (Stebbins 2003). In California, it is found on the west side of the Peninsular Ranges between sea level and 3,000 feet (915 m), in Los Angeles, San Bernardino, Orange, Riverside and San Diego counties (Zeiner et al. 1988). It is still locally common in many areas where it remains. The principal threat to the orange-throated whiptail is degradation and loss of habitat, however it is also impacted by off-road vehicle activity, over-grazing by livestock, and predation by introduced predators (e.g., cats and dogs) (San Diego Herpetological Society 1980). A limiting factor to the species' range is the availability of its primary food item, the termite (*Reticulitermes hesperus*). Within the Preserve, the orange-throated whiptail was captured at arrays 1, 2, and 3 (Figure 4-6).

Red diamond rattlesnake – *Crotalus ruber*
Federal Status: None
State Status: Species of Special Concern
County List: 2
South County MSCP: Not Covered

The red diamond rattlesnake is found in southwestern California from the Morongo Valley west to the coast and south along the peninsular ranges to mid Baja California, Mexico. This heavy bodied species inhabits coastal chaparral, oak and pine woodlands, grasslands, arid scrub, and cultivated areas. Dense vegetation with rocky areas and an abundance of burrowing small mammals are important habitat factors for this species. In addition to small mammals, this species preys on lizards and birds. This species is inactive during cooler winter months. The primary threats to this species are loss of habitat and humans' negative attitude toward snake species. Within the Preserve, the red diamond rattlesnake was captured at arrays 1 and 5 (Figure 4-6).

Coast horned lizard – *Phrynosoma coronatum*
Federal Status: None
State Status: Species of Special Concern
County List: 2
South County MSCP: Covered

The coast horned lizard occurs from northern California to the tip of Baja California, Mexico (SDNHM 2008) from sea level to approximately 8,000 feet (2,438 m). This lizard occupies open habitats such as grasslands, coastal sage scrub, and chaparral, with loose soils. Horned lizards forage on the ground in open areas, often between shrubs and near ant nests (Morey 2000). They are also commonly found along dirt roads and trails. Current threats to the species include destruction of coastal habitat, introduction of non-native ant species, especially the Argentine ant (*Iridomyrmex humilis*), which displace its native ant food base, collection, and off-road activity. Within the Preserve, coast horned lizard captures were made frequently at arrays 1, 2, and 3 (Figure 4-6).

Western patch-nosed snake – *Salvadora hexalepis*
Federal Status: None
State Status: Species of Special Concern
County List: 2
South County MSCP: Not Covered

The western patch-nosed snake occurs in California from the northern Carrizo Plains in San Luis Obispo County, south through the coastal zone, south and west of the deserts, into coastal northern Baja California up to 7,000 feet (2,120 m) in elevation (Marlow 2005). It occurs in semi-arid brushy areas within chaparral, desert scrub, washes, and sandy flats and rocky areas (Marlow 2005). This species seems to require at least a low shrub structure of minimum density; it is not found in habitats lacking this habitat characteristic (Jennings and Hayes 1994). An opportunistic predator, it will prey on lizards (*Cnemidophorus* ssp., *Coleonyx* ssp.), small mammals (*Dipodomys* ssp.), and the eggs of lizards and snakes (Stebbins 1985, Zeiner et al. 1988). It probably eats anything it can overpower (Stebbins 1954). This species is normally active in the spring and early summer, with the greatest activity occurring in May and June (Marlow 2005). Within the Preserve, the western patch-nosed snake was captured at array 1 (Figure 4-6).

Cooper's hawk – *Accipiter cooperii*
Federal Status: None
State Status: Watch List
County List: 1
South County MSCP: Covered

The Cooper's hawk is distributed throughout much of the United States from southern Canada to northern Mexico. It is a regular nesting species in San Diego County. This species has previously been closely associated with oak woodland, and the densely foliaged crowns of the coast live oak remain a favored site for Cooper's hawks to place their nests. Recently, however, Cooper's hawks have adapted to the urban environment and often nest in eucalyptus trees. Additionally, they can be observed foraging in many types of upland and riparian habitats. Habitat loss, pesticide contamination, and human disturbance at the nest site limit this species population sizes (Remsen 1978). Within the Preserve, the Cooper's hawk was observed at point count location 1 (Figure 4-7).

Sharp-shinned hawk – *Accipiter striatus*
Federal Status: None
State Status: Watch List
County List: 1
South County MSCP: Not Covered

The Sharp-shinned hawk breeds from central and western Alaska and the greater portion of Canada south to central and south-central California, central Arizona, New Mexico, Texas, northern parts of the Gulf states, and into Mexico (American Ornithologists' Union 1998). In California, sharp-shinned hawks breed throughout the state, including the mountains of southern California, but the majority probably breed in the northern half of the state (Small 1994). In California this species typically nests in coniferous forests, often within riparian areas or on north-facing slopes (USFS 2008). Nests are often near water and are typically in close proximity to open areas (Zeiner et al. 1990). The nest is a large, well-built structure of twigs, typically located in a tree crotch 10–60 feet (3–18 m) high (Baicich and Harrison 1997). Breeding Bird Survey data over the last 20 years (1980-2000) indicate a significant decline in sharp-shinned hawk populations in California (Sauer et al. 2001). Within the Preserve, the sharp-shinned hawk was observed at avian point count locations 7, 11, and 12 (Figure 4-7).

Southern California rufous-crowned sparrow – *Aimophila ruficeps*
Federal Status: None
State Status: Watch List
County List: 1
South County MSCP: Covered

The southern California rufous-crowned sparrow is a common resident of scrub habitats of the coastal plain and foothills of southern California and Baja California, Mexico. It is locally common in open coastal sage scrub in San Diego County, and often occurs on slopes that are steep, sparsely vegetated, and rocky or recently burned. Urban development is greatest threat to this species due to the loss, degradation, and fragmentation of coastal sage scrub habitat and associated edge effects. Within the Preserve, the southern California rufous-crowned sparrow was observed at avian point count locations 1-8, 10, and 16 (Figure 4-7).

Bell's sage sparrow – *Amphispiza belli*
Federal Status: None
State Status: Watch List
County List: 1
South County MSCP: Not Covered

The sage sparrow is distributed in arid areas of the western United States and Mexico. Bell's sage sparrow, a dark colored subspecies, occurs year round in the western two thirds of San Diego County. This subspecies tends to forage on the ground, and as such, prefers open coastal sage scrub or chaparral habitat. It is often found in areas that are recovering from fire. Breeding activity generally occurs from late March through June. Nest building occurs low down in the brush, and sometimes on the ground. The greatest threat to the Bell's sage sparrow is habitat fragmentation resulting from urban development. This subspecies may be the most sensitive shrubland bird to habitat fragmentation (Bolger et al. 1997, Lovio 1996). Within the Preserve, the Bell's sage sparrow was observed at point count locations 2 and 5-11 (Figure 4-7).

Ferruginous hawk – *Buteo regalis*
Federal Status: None
State Status: Watch List
County List: 1
South County MSCP: Covered

The ferruginous hawk is an uncommon winter resident and migrant at lower elevations and open grasslands in the Modoc Plateau, Central Valley, and Coast Ranges (Polite and Pratt 2005). The species is fairly common winter resident of grasslands and agricultural areas in southwestern California (Garrett and Dunn 1981). In San Diego County, about 100 individuals reach the county annually (Unitt 2004). This species frequents open grasslands, sagebrush flats, desert scrub, low foothills surrounding valleys, and fringes of pinyon-juniper habitats (Polite and Pratt 2005). Loss of extensive grasslands, overgrazing, and indiscriminate use of rodenticides threaten this species (Unitt 2004). Within the Preserve, the ferruginous hawk was observed at avian point count location 11 (Figure 4-7).

Vaux's swift – *Chaetura vauxi*
Federal Status: None
State Status: Species of Special Concern
County List: None
South County MSCP: Not Covered

In North America, the Vaux's swift breeds from southeast Alaska, British Columbia, northern Idaho and western Montana south to the Coast Ranges and Sierra Nevada of central California (Bull and Collins 1993, Sterling and Paton 1996). In San Diego County, the Vaux's swift is largely a migrant, occasionally common (Unitt 2004). The Vaux's swift breeds in coniferous and mixed coniferous/deciduous forests, more often in old growth than younger stands (USFS 2008). The presence of live or dead large diameter, hollow trees is a necessary requisite for breeding, although chimneys are occasionally used (Bull and Collins 1993). Non-breeding and post-breeding birds also require hollow trees or chimneys for roosting (USFS 2008). Open water where insects congregate is probably an important element of high quality foraging habitat, and proximity of nest sites to such areas may be a factor influencing reproductive success (Sterling 2001). Within the Preserve, the Vaux's swift was observed and point location 1 (Figure 4-7).

Yellow warbler – *Dendroica petechia*
Federal Status: None
State Status: Species of Special Concern
County List: 2
South County MSCP: Not Covered

The yellow warbler breeds throughout most of San Diego County (Green 2005). In southern California, yellow warblers breed in riparian woodlands in the lowlands and foothill canyons (Garrett and Dunn 1981, Lehman 1994, Roberson and Tenney 1993, Unitt 2004). They typically occur in riparian forests that contain cottonwoods, sycamores, willows, or alders (Stephenson and Calcarone 1999). The breeding season of yellow warbler generally begins in May and can last to August. Available data show a strong tendency for breeding- and wintering-site fidelity over successive years (Lowther et al. 1999). Nest parasitism by brown-headed cowbirds has been strongly implicated as a cause of yellow warbler population declines in coastal lowland and foothill riparian areas of southern California (Garrett and Dunn 1981, Stephenson and Calcarone 1999, Unitt 2004). Within the Preserve, the yellow warbler was observed at point count location 4 (Figure 4-7).

Peregrine falcon – *Falco peregrinus*
Federal Status: Delisted (Endangered)
State Status: Endangered
County List: 1
South County MSCP: Covered

The peregrine falcon is in the process of recovering much of its former breeding range in North America. Within San Diego County, peregrine falcons occur along coastal areas and at reservoirs in the county during winter. Foraging habitat for this species includes coastal wetland areas, extensive riparian areas, and lakes that support large flocks of waterbirds (ducks, shorebirds) or pigeons. Peregrine falcons traditionally nest on cliff faces but have adapted to also nest on tall building ledges, towers, and similar tall structures. Nest sites need minimal human disturbance. Within the Preserve, the peregrine falcon was observed and point location 18 (Figure 4-7).

Common loon – *Gavia immer*
Federal Status: None
State Status: Species of Species Concern
County List: 2
South County MSCP: Not Covered

The common loon is fairly common in estuarine and subtidal marine habitats along entire coast and uncommon on large, deep lakes in valleys and foothills throughout California from September to May (Granholm 2005). This species needs at least 60 feet (18 m) of open water for running take-off from water surface (Palmer 1962). The common loon prefers to nest on small islets, but also uses protected sites on shore; usually less than 4 feet (1.2 m) from water and concealed by rocks or vegetation, but sometimes in open (Palmer 1962, Vermeer 1973). This species is highly sensitive to nest disturbance by humans and motorboats (Terres 1980). Within the Preserve, the common loon was observed at avian point count location 10 (Figure 4-7).

Yellow-breasted chat – *Icteria virens*
Federal Status: None
State Status: Species of Special Concern
County List: 1
South County MSCP: Not Covered

The yellow-breasted chat is a migratory species, arriving in San Diego County around April and departing by late September for wintering grounds in Mexico and Guatemala. This species requires dense riparian thickets of willows, vine tangles, and dense brush associated with streams, swampy ground and the borders of small ponds (Small 1994). Some taller trees (e.g., cottonwoods) are required for song perches (Dunn and Garrett 1997). It is most often found in areas in early stages of succession, as opposed to young and mature forests (Melhop and Lynch 1986). Loss and degradation of riparian habitat have caused a marked decline in the breeding population in recent decades in California. Another threat to this species includes potential nest predators such as western scrub jays (*Aphelocoma californica*), dusky-footed woodrats, raccoons, and several species of snakes. Additionally, chats are a frequent host of the brown-headed cowbird (Burhans and Thompson 1999). Within the Preserve, the yellow-breasted chat was observed at avian point count location 15 (Figure 4-7).

White-faced ibis – *Plegadis chihi*
Federal Status: None
State Status: Watch List
County List: 1
South County MSCP: Covered

The white-faced ibis is an uncommon summer resident in sections of southern California, a rare visitor in the Central Valley, and is more widespread in migration (Granholm 2005). It prefers to feed in fresh emergent wetland, shallow lacustrine waters, muddy ground of wet meadows, and irrigated or flooded pastures and croplands and nests in dense, fresh emergent wetland (Granholm 2005). This species roosts amidst dense, freshwater emergent vegetation such as bulrushes, cattails, reeds or low shrubs over water (Ryder and Manry 1994). The white-faced ibis has declined in California and stopped breeding regularly, probably from destruction of extensive marshes required for nesting (Remsen 1978). Elsewhere in range, pesticides have caused decline in numbers (Terres 1980). Within the Preserve, the white-faced ibis was observed at avian point count location 1 (Figure 4-7).

Double-crested cormorant – *Phalacrocorax auritus*
Federal Status: None
State Status: Watch List
County List: 2
South County MSCP: Not Covered

The double-crested cormorant is a yearlong resident along the entire coast of California and on inland lakes, in fresh, salt and estuarine waters (Granholm 2005). This species rests in daytime and roosts overnight beside water on offshore rocks, islands, steep cliffs, dead branches of trees, wharfs, jetties, or even transmission lines (Granholm 2005). Perching sites must be barren of vegetation (Bartholomew 1943). The species usually forages within 5 to 10 miles (8-16 km) of roost or nest colony (Palmer 1962). The double-crested cormorant is susceptible to reduced nesting success from persistent pesticides in water (Granholm 2005). Many nesting colonies in California have been abandoned after human disturbance and habitat destruction (Remsen 1978). Within the Preserve, the double-crested cormorant was observed at avian point count locations 1, 2, 4, 9-11, 13, and 14 (Figure 4-7).

California gnatcatcher – *Polioptila californica*
Federal Status: Threatened
State Status: Species of Special Concern
County List: 1
South County MSCP: Covered

The California gnatcatcher is a non-migratory bird endemic to the coastal slope of southern California and northwestern Baja California Norte, Mexico, from Ventura County southward to approximately El Rosario, Mexico. It is associated with coastal sage scrub plant communities, including Venturan coastal sage scrub, coastal sage scrub, maritime succulent scrub, Riversidean sage scrub, Riversidean alluvial fan scrub, southern coastal bluff scrub, and coastal sage-chaparral scrub. The breeding season extends from late February through July, with the peak of nest initiations occurring from mid-March through mid-May. The California gnatcatcher is threatened by urban development and nest parasitism by the brown-headed cowbird (*Molothrus ater*). Within the Preserve, the California gnatcatcher was observed at point count locations 9 and 14 (Figure 4-7).

Western bluebird – *Sialia mexicana*
Federal Status: None
State Status: None
County List: 2
South County MSCP: Covered

The western bluebird is a common cavity-nesting songbird of oak woodland and pine forests throughout the western United States. It breeds in open woodlands of oaks, riparian deciduous trees, or conifers with herbaceous understory, and winters in a wide variety of open habitats at elevations below 4,000 feet (1,200 m). Bluebirds breed from the eastern reaches of lowland coastal valleys such as Lake Hodges, along the San Diego River east of Santee, and drainages east of Otay Reservoir, up through the foothills and montane areas where suitable habitat occurs. This species is vulnerable to competition with more aggressive introduced species (e.g., European starling, [*Sturnus vulgaris*], and house sparrow, [*Passer domesticus*]) for scarce nesting cavities (McLaren 1963, Zeleny 1969, Patterson 1979). However, in San Diego County, this species appears to be extending its range, successfully colonizing urban areas and adapting to novel nest sites such as nest boxes and certain species of palms (Unitt 2004). Within the Preserve, the western bluebird was observed at avian point count location 1 (Figure 4-7).

California pocket mouse – *Chaetodipus californicus*
Federal Status: None
State Status: Species of Special Concern
County List: 2
South County MSCP: Not Covered

The California pocket mouse is distributed from San Francisco Bay south to the border of Mexico, east to the edge of the Great Valley and from Auburn south along the foothills of the Sierra Nevada, and west across the Tehachapi Mountains to the coast (Brylski 2005). It is found in a variety of habitats year-round, including coastal scrub, chamise-redshank and montane chaparral, sagebrush, annual grassland, valley foothill hardwood, valley foothill hardwood-conifer, and montane hardwood habitats at elevations from sea level to 7,900 feet (2,400 m) (Brylski 2005). The species occurs in brushy areas but probably is attracted to grass-chaparral edge (Brylski 2005). Grazing of grassland by domestic stock eliminates cover necessary for predator avoidance (Brylski 2005). Within the Preserve, the California pocket mouse was captured at small mammal plots 1, 3-6, 8, 9, 12, 14, 16 (Figure 4-8).

Northwestern San Diego pocket mouse – *Chaetodipus fallax*
Federal Status: None
State Status: Species of Special Concern
County List: 2
South County MSCP: Not Covered

The northwestern San Diego pocket mouse occurs from the eastern San Gabriel Mountains in the interior to near San Onofre on the coast (Lackey 1996), and south into Baja California. It is found in coastal scrub, chamise-redshank chaparral, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent shrub, pinyon-juniper, and annual grassland habitats (Brylski 2005). The availability of shelter provided by rocky slopes or habitats may increase species abundance (Lackey 1996). The San Diego pocket mouse generally exhibits a strong microhabitat affinity for moderately gravelly and rocky substrates (Bleich 1973, Price and Waser 1984). San Diego pocket mouse appears to be sensitive to habitat fragmentation and degradation. Data collected by Bolger et al. (1997) suggests that isolated habitat patches must be at least 62 acres (25 ha) to 198 acres (80 ha) to sustain native rodent populations. Within the Preserve, this species was captured at small mammal plots 2, 5, 8, and 9 (Figure 4-8).

Desert woodrat – *Neotoma lepida*
Federal Status: None
State Status: Species of Special Concern
County List: 2
South County MSCP: Not Covered

The desert woodrat occurs in coastal California from San Luis Obispo south through the Transverse and Peninsular Ranges into Baja California. This species commonly inhabits mixed chaparral, Joshua tree woodlands, pinyon-juniper woodlands, sagebrush, and desert habitats (Zeiner et al. 1990). Thompson (1982) observed desert woodrats actively avoiding open areas that did not provide adequate refuge sites. Nests are constructed with twigs, sticks, cactus parts, rocks and are usually built against a rock crevice, at the base of creosote or cactus, or in the lower branches of trees (Brylski 2005). Within the Preserve, the desert woodrat was captured at small mammal plots 1-4, 7-9, and 13 (Figure 4-8).

Western mastiff bat – *Eumops perotis*
Federal Status: None
State Status: Species of Special Concern
County List: 2
South County MSCP: Not Covered

The western mastiff bat is primarily known from low to mid elevations in southern and central California southeast to Texas and south to central Mexico (Best et al. 1996). This species is a year-round resident in California (Philpott 1997). The species is found in desert scrub, chaparral, mixed conifer forest, giant sequoia forests, and montane meadows (Philpott 1997). It requires large bodies of flat water for drinking sites (USFS 2008). Day roosts are generally found in areas with rugged, rocky canyons and cliffs (Best et al. 1996). Western mastiff bat populations in California are believed to have undergone significant declines in recent years, due primarily to extensive loss of habitat by urbanization and widespread use of insecticides (Williams 1986). Other factors likely contributing to their decline include loss of large open water drinking sites, pest control operations in structures and activities that disturb or destroy cliff habitat (e.g. water impoundments, highway construction, quarry operations, recreational climbing) (Texas Parks and Wildlife 2003). Within the Preserve, the western mastiff bat was observed in the eastern portion of the Preserve (Figure 4-9).

Western red bat – *Lasiurus blossevillii*
Federal Status: None
State Status: Species of Special Concern
County List: 2
South County MSCP: Not Covered

The western red bat occurs in western Canada, western United States, western Mexico, and Central and South America (Harvey et al. 1999). There is little information on the distribution and relative abundance of this species in southern California (Stephenson and Calcarone 1999). This bat is associated with large deciduous trees in riparian habitat and often occurs in streamside habitats dominated by cottonwood, oaks, sycamore, and walnut (Bolster 1998, Harvey et al. 1999). This species is primarily a solitary species that roosts in the foliage of trees and shrubs in habitats bordering forests, rivers, cultivated fields, and urban areas (Harvey et al. 1999). The western red bat forages over a wide variety of habitats including grasslands, shrublands, open woodlands and forests, and croplands (Harris 2005). The species does not form colonies and is difficult to find and census (USFS 2008). Within the Preserve, the western red bat was observed in the eastern and western portions of the Preserve (Figure 4-9).

Pocketed free-tailed bat – *Nyctinomops femorosaccus*
Federal Status: None
State Status: Species of Special Concern
County List: 2
South County MSCP: Not Covered

The pocketed free-tailed bat is rare in California and found in Riverside, San Diego, and Imperial counties (Harris 2005). Habitats frequently used by this species include pinyon-juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oasis (Harris 2005). The pocketed free-tailed bat prefers rock crevices in cliffs as roosting sites (Harris 2005). The status of this species in California is poorly known, but it appears to be rare (Harris 2005). Within the Preserve, the pocketed free-tailed bat was observed at all bat survey locations (Figure 4-9).

4.3.7.2 Potentially Occurring Sensitive Wildlife Species: Previously Documented

Sensitive wildlife species previously documented from the Preserve include those species not documented during 2008 baseline surveys but with occurrence data within the Preserve (see Section 3.1 for list of databases), and therefore a high potential to occur on

the Preserve. Six sensitive wildlife species have been previously documented from within the Preserve (Table 4-10; Figure 4-11), including the federally endangered Quino checkerspot butterfly. All species previously documented have a high potential to occur on the Preserve.

Table 4-10. Potentially Occurring Sensitive Wildlife Species Previously Documented from the Preserve

Common Name	Scientific Name	Listing Status (Federal/State/ County)[1]	Potential to Occur
Invertebrates			
Quino checkerspot butterfly	***Euphydryas editha quino***	**E/--/1**	High. Previously documented from the Preserve.
Reptiles			
Two-striped garter snake	*Thamnophis hammondii*	--/SSC/1	High. Previously documented from the Preserve.
Birds			
Golden eagle	*Aquila chrysaetos*	--/FP, WL/1	High. Previously documented from the Preserve.
White-tailed kite	*Elanus caeruleus*	--/FP/1	High. Previously documented from the Preserve.
Loggerhead shrike	*Lanius ludovicianus*	--/SSC/1	High. Previously documented from the Preserve.
Mammals			
San Diego black-tailed jackrabbit	*Lepus californicus*	--/SSC/2	High. Previously documented from the Preserve.

[1] Listing Status: Federal: E – endangered, T – threatened, DL – federally delisted. State: E – endangered, T – threatened, R – rare, SSC – species of special concern, FP – fully protected, WL – watch list. County List: List 1 – Species with a very high level of sensitivity, either because they are listed as threatened or endangered or because they have very specific natural history requirements that must be met; List 2 – Species that are becoming less common, but are not yet so rare that extirpation or extinction is imminent without immediate action. These species tend to be prolific within their suitable habitat types.

4.3.7.3 Potentially Occurring Sensitive Wildlife Species: Based on Habitat and Distribution

Potentially occurring sensitive wildlife species based on habitat presence and distribution are presented in Table 4-11. These potentially occurring wildlife species are those; (1) with occurrence outside of, but within 3 kilometers (1.8 mi) of the Preserve, and/or (2) whose habitat preferences are consistent with available habitat within the Preserve. Seven sensitive wildlife species have been detected within the region and could potentially occupy the Preserve. In addition, suitable habitat for the ringtail was determined to be present during 2007 and 2008 baseline surveys.

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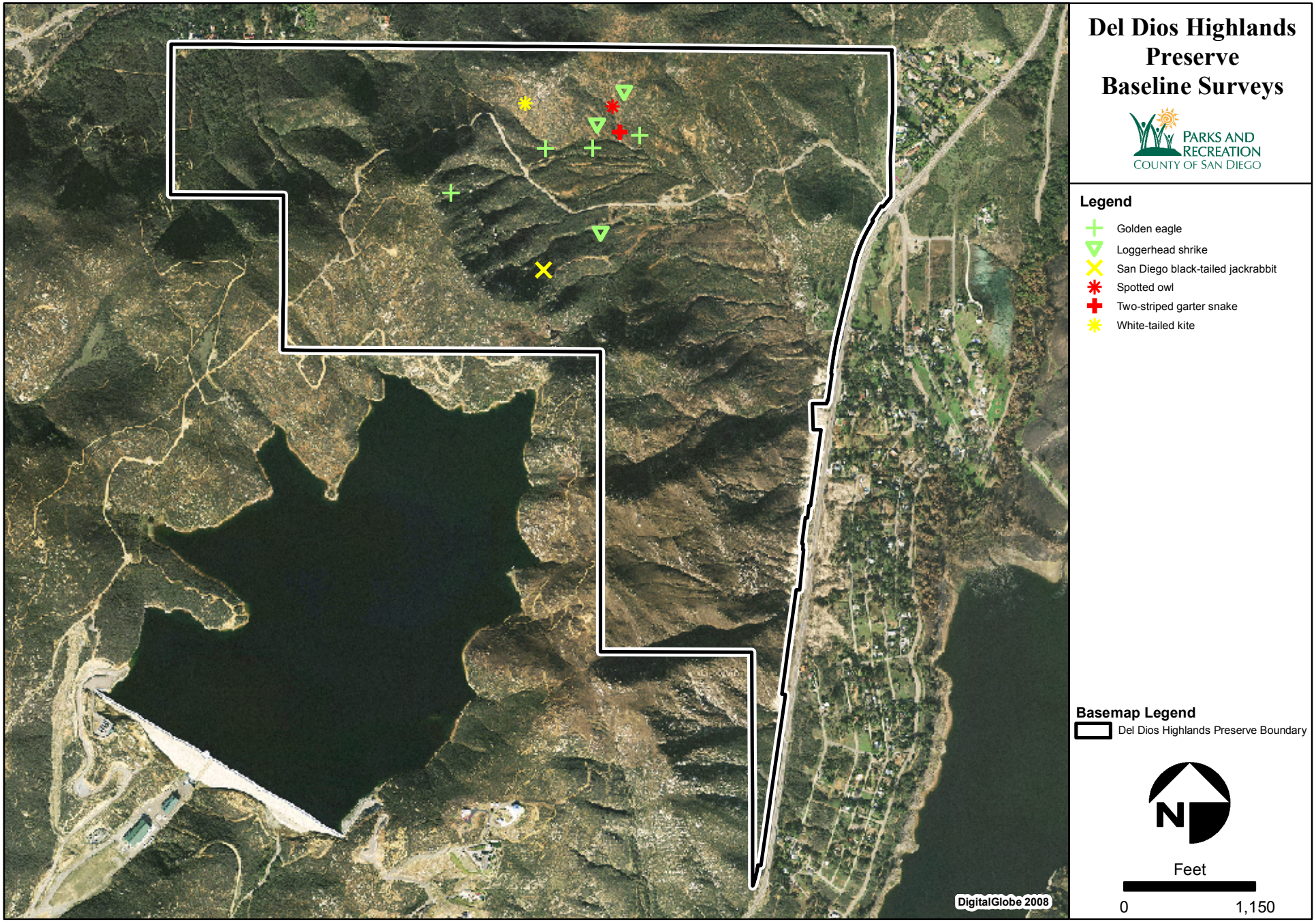

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Potentially Occurring Sensitive Wildlife Species Previously Documented from the Preserve

Figure 4-11

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Date: Oct 13, 2008

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Table 4-11. Potentially Occurring Sensitive Wildlife Species Based on Habitat and Distribution

Common Name	Scientific Name	Listing Status (Federal/State/ County)[1]	Potential to Occur
Birds			
Cactus wren[2]	*Campylorhynchus brunneicapillus sandiegensis*	--/SSC/1	Not Expected. No suitable habitat present.
Least bittern[2]	*Ixobrychus exilis*	--/SSC/2	Not Expected. No suitable habitat present.
Northern harrier[2]	*Circus cyaneus*	--/SSC/1	Moderate. Occasional fly over.
Osprey[2]	*Pandion haliaetus*	--/WL/1	Moderate. Occasional fly over.
Short-eared owl[2]	*Asio flammeus*	--/SSC/2	Not Expected. No suitable habitat present.
Spotted owl[2]	*Strix occidentalis occidentalis*	--/SSC/1	Not Expected. No suitable habitat present.
Mammals			
Mountain lion[2]	*Felis concolor*	--/--/2	Moderate. Likely to move through the Preserve.
Ringtail[3]	*Bassariscus astutus octavus*	--/FP/2	Moderate. Suitable habitat present.

[1] Listing Status: Federal: E – endangered, T – threatened, DL – federally delisted. State: E – endangered, T – threatened, R – rare, SSC – species of special concern, FP – fully protected, WL – watch list. County List: List 1 – Species with a very high level of sensitivity, either because they are listed as threatened or endangered or because they have very specific natural history requirements that must be met; List 2 – Species that are becoming less common, but are not yet so rare that extirpation or extinction is imminent without immediate action. These species tend to be prolific within their suitable habitat types.

[2] Species occurrence data outside the Preserve by within 3 km (1.8 mi) of the Preserve.

[3] Suitable habitat determined to be present during 2007 and 2008 baseline surveys.

4.4 Habitat Connectivity and Wildlife Corridors

The Preserve is an important component of a corridor connecting the coast to significant open space of inland North and East San Diego County. The development and fragmentation of this region has left little space for wildlife movement.

The corridor connects to the coast through the San Dieguito River and Escondido Creek. The drainages are separated closer to the coast but bridged by the Preserve. The urban edge abuts both drainages in some areas, constricting movement. Open space is more extensive along the coast, however, where San Elijo and Del Mar lagoons both lie amid significant conserved natural areas. Water is found throughout the year in both of these drainages, allowing many species (e.g., coyote, bobcat, gray fox) to reside permanently and maintain stable populations within this linkage.

The core area of this corridor is located west of I-15 and comprises the Preserve, Elfin Forest Preserve, and the undeveloped lands surrounding Olivenhain Reservoir and Lake Hodges. Most mammals can pass under the I-15 overpass of Lake Hodges. Passing over

the interstate is probably attempted but with little success. Randy Botta (California Department of Fish and Game big-game biologist) recalls a road-killed mountain lion near this overpass many years ago, but none recently.

The corridor widens east of I-15. The San Pasqual Valley consists mainly of open space, agriculture, and ranches. In the last year, Randy Botta (pers. comm.) has also received unconfirmed reports of mountain lions in the San Pasqual Valley. The corridor expands dramatically east of San Pasqual Valley to include the relatively undeveloped lands of Rancho Guejito, Boden Canyon, and the Cleveland National Forest.

5.0 CONCLUSIONS AND MANAGEMENT RECOMMENDATIONS

Biological baseline surveys detected seven land cover types and a total of 213 plant species and 153 wildlife species within the Preserve. Baseline surveys detected 14 invertebrate species, three amphibian species, 15 reptile species, 92 bird species, and 29 mammal species (11 bats, 13 small mammals, and 5 medium and large mammals) within the Preserve. Included on the list of species detected are five sensitive plant and 25 sensitive wildlife species, including the federally threatened CAGN and state endangered and federally delisted peregrine falcon. The data collected during these baseline surveys will provide valuable information for development of a RMP including ASMDs. Specific management recommendations are provided for each taxonomic group assessed during this survey effort.

We recommend implementing the monitoring protocols addressed in the 1996 Ogden Biological Monitoring Plan for the Multiple Species Conservation Program (Ogden 1996), as revised in 2001 by Conservation Biology Institute (CBI 2001). Vegetation and animal species specific monitoring will be performed according to the plans currently in preparation and once these plans are finalized, including United States Fish & Wildlife Service Animal Monitoring Protocol, U.S. Geological Survey Rare Plant Monitoring Protocol, and San Diego State University Vegetation Monitoring Protocol. The revised Animal Monitoring Protocol covers the following species: CAGN, 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. Additionally, management recommendations are given for issues that are common across all open space areas in San Diego County.

5.1 Vegetation Communities

Seven vegetation communities were mapped within the Preserve during 2007 and 2008 baseline surveys. The County should maintain at least the baseline acreages of native

vegetation communities, as determined by baseline surveys. It is recommended that the County maintain an updated vegetation community map to be used as a tool for adaptive management within the Preserve. An ongoing mapping effort will aid in identifying changes in vegetation communities that may affect quality and usage by wildlife. Vegetation mapping and monitoring should address habitat value for target species, including those proposed for coverage under the South County MSCP. Vegetation updates for the Preserve should be performed every five years and should include information about fire recovery of the vegetation communities.

5.2 Flora

A total of 213 plant taxa were observed during floristic surveys conducted in 2008, including five sensitive plant taxa. One South County MSCP-covered species, wart-stemmed ceanothus, was found during 2007 and 2008 baseline surveys. Monitoring for this species should be conducted to the protocols outlined in the MSCP Rare Plant Monitoring Review and Revision(McEachern et al. 2007). Monitoring should occur periodically (as recommended by Rare Plant Monitoring protocols) to monitor population trends of all MSCP-covered species documented on the Preserve. Surveys should be scheduled during ideal climatic conditions (average or above-average rainfall) and appropriate time of year (blooming period) to maximize detection. Should future monitoring at the Preserve uncover additional MSCP-covered species, these species will also be monitored following the protocols outlined in the Rare Plant Monitoring Review and Revision. Surveys for populations of the rare shrub Encinitas baccharis should be timed to coincide with the plant's blooming period in the fall of years that experience adequate or ample rainfall. In addition, prior to any ground disturbing activities, rare plant surveys are recommended in suitable habitats to ensure sensitive plant taxa will not be impacted by the activity.

The voucher-based species list of the Preserve is based on a few months of collections and additional collection trips are recommended to complete the list. Collecting efforts were temporally focused from March to June (San Diego County growing and flowering season) to maximize the total number of plant taxa collected in a one year period. Many of the summer and fall species were missed due to timing constraints of the baseline data collection effort. Collecting trips made in the summer and fall of a good rain year are recommended to be included in future monitoring methods.

5.3 Lepidoptera

Checklist surveys conducted in March, April, and May, 2008 resulted in the detection of 14 butterfly species. Butterfly species have a tendency to congregate on ridges and

hilltops, a phenomenon known as "hilltopping". Hilltopping was observed in butterfly species occurring in the Preserve. Therefore, it is recommended that the highest points of hilltops on the Preserve should remain free of developments and that planned trails, information kiosks and public vistas should not be installed, or should be installed with minimal disturbance, in these locations.

Depending on funding, a focused effort should be made to determine the presence of the Quino checkerspot butterfly to complement the 2008 baseline inventory. This species has been previously detected from the Preserve (USFWS 1930, 1931, and 1932) and suitable habitat is present along with dot-seed plantain (*Plantago erecta*), purple owl's clover (*Castilleja exserta* ssp. *exserta*), dark-tipped bird's beak (*Cordylanthus rigidus* ssp. *setigerus*), all larval host plants used by the species (USFWS 2002). Directed surveys for the Quino checkerspot butterfly should also be conducted for any future infrastructure projects potentially planned for the Preserve. This species is proposed to be added as a covered species under the South County MSCP. Focused surveys for Quino are warranted for the Preserve. If found, monitoring will be performed on the Preserve per the Quino amendment. In addition, during monitoring for Quino, other butterfly species would be recorded.

5.4 Herpetofauna

Pitfall trapping surveys resulted in the detection of two amphibian species, seven lizard species, and seven snake species. Two South County MSCP-covered species, the coast horned lizard and orange-throated lizard, were captured during 2008 baseline surveys. Monitoring frequency and methods for these two species should be consistent with the protocols developed for the South County MSCP. Should future monitoring for these species uncover additional MSCP-covered species, these species will also be monitored following MSCP monitoring protocols. During monitoring for these two species all reptile and amphibian species collected will be identified.

Many of the herpetofauna species captured may be encountered crossing, foraging, or basking on public roads and trails in the Preserve. This includes the coast horned lizard, which is commonly found on roads and trails and may burrow in loose sand along roads and trails. Appropriate signage should be posted to inform the public to stay on designated roads and trails and to avoid wildlife when encounters occur.

Downed wood provides refuge habitat for many herpetofauna species. This is often viewed as a fire hazard and removed. However, it is recommended that downed wood be

left in place to provide refuge habitat for species of salamanders, lizards, and snakes. Downed wood should be removed if blocking trails within the Preserve.

Rattlesnakes were detected on the Preserve during 2008 surveys. Signage and information kiosks are recommended to inform the public of their presence, that they shall not harm the species, and how to avoid encounters. Also, information should be provided to inform the public on what to do if bitten.

Unauthorized collection threatens many herpetofauna species. Appropriate signage should be in place to inform visitors to stay on designated trails, the impact of collection on species, and penalties for unauthorized collection. Gates at access points should remain locked during periods when the Preserve is closed.

5.5 Avifauna

Avian surveys resulted in the detection of 92 species within the Preserve. Seven MSCP-covered species were observed during baseline surveys including Cooper's hawk, southern California rufous-crowned sparrow, ferruginous hawk, peregrine falcon, white-faced ibis, CAGN, and western bluebird. Of these species, MSCP monitoring protocols have only been finalized for CAGN. Although CAGN was observed on the Preserve, breeding habitat is marginal and the species is believed to be transient. Nevertheless, monitoring for this species following the protocols outlined in the MSCP Animal Monitoring Protocols (USFWS 2008) should be conducted to determine CAGN use of the Preserve. Monitoring protocols for the remainder of the MSCP-covered species documented from the Preserve during baseline surveys should follow the original protocols developed for the South County MSCP. Future monitoring for these species will follow finalized MSCP monitoring protocols. Should future monitoring for these species uncover additional MSCP-covered species, these species will also be monitored following MSCP monitoring protocols.

Each of these seven species depends on various habitats within the Preserve. The southern California rufous-crowned sparrow relies on scrub habitats. The peregrine falcon and white-faced ibis require lacustrine (depressions or lakes containing standing water) and riparian habitat, both types found on or within the vicinity of the Preserve. Moreover, suitable cliff nesting sites are available on the Preserve. Finally, the Cooper's hawk and western bluebird require woodland habitats for breeding.

Although the mesa in the southwestern corner of the Preserve has the lowest diversity of birds, maintaining this area free of development is desirable for maintaining the sage

sparrow. This species' distribution in north-coastal San Diego County is already very patchy. Furthermore, if the lesser nighthawk occurs at the Preserve, this area is the most likely for it.

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.

5.6 Mammals

A total of 29 mammal species were detected across the Preserve during 2007 and 2008 baseline surveys. Mule deer sign was found throughout the Preserve during baseline surveys. Monitoring for this species should be conducted following the recommendations made by the South County MSCP. Should future monitoring for this species uncover additional MSCP-covered species, these species will also be monitored following MSCP monitoring protocols.

All mammals are sensitive to the human and human-associated animals (dogs, horses, etc.). It is recommended that appropriate measures be enforced to limit off-trail use by humans and human-associated animals. Dogs are permitted on the Preserve and dogs were observed unleashed on several occasions. Enforcing the leash law should be a priority at the Preserve.

5.6.1 Bats

Eleven species of bats were detected during baseline surveys conducted in the winter, spring, and summer of 2008. Rocky outcrops are one of the most significant habitats on the Preserve potentially used by bats. Though no bat roosts were located, the large amount of exposed rocky outcrops could easily support roosting bats. It is recommended that the County prohibit recreational rock climbing activities on the Preserve unless focused roost surveys are conducted in areas designated as appropriate climbing areas. Allow for passive restoration of the willow riparian habitat on the Preserve. This habitat could provide increased foraging opportunities for bats.

Most bat species are insectivorous and the use of insecticides on the Preserve may negatively impact these species. If insecticides or other chemicals are considered for use on the Preserve a qualified biologist should be consulted prior to application.

5.6.2 Small Mammals

No MSCP-covered small mammal species were documented on the Preserve during the 2008 baseline surveys. However, monitoring for small mammals could be performed on the Preserve if funding is available or it is determined by DPR that monitoring of small mammals is necessary to determine the health and longevity of other species within the Preserve. If monitoring is proposed it should be conducted every three years and follow similar methods as those used for the baseline surveys.

The small mammal population at the Preserve will generally benefit from habitat management measures, such as invasive species removal, provided that no herbicides are used in areas where animals sensitive to these chemicals occur. For example, the gray shrew (*Notiosorex crawfordi*) and ornate shrew (*Sorex ornatus*) is insectivorous and the use of insecticides on the Preserve may negatively impact these species. If insecticides or other chemicals are considered for use on the Preserve a qualified biologist should be consulted prior to application.

5.6.3 Medium and Large Mammals

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. Feces bags and disposal bins should be provided at trailheads to encourage the public to remove feces.

In addition, feral dogs can become efficient predators with rabbits and ground squirrels as preferred prey items. However, they also harass mule deer, thus discouraging use of the area. Dog owners often allow dogs to run off leash while hiking in open space areas. These dogs could kill or harass native animals. Leash laws should be strictly enforced on the Preserve.

The ringtail was not documented during the 2008 surveys. Suitable habitat for this inconspicuous species is present onsite and the Preserve is near the type locality for the species (Hall 1981). Focused surveys would help document new populations of this very rare species and determine its status onsite. More surveys using motion-sensing cameras in suitable areas across the Preserve are recommended. If it were found on this site it

would represent a very important coastal population, no other know populations are known to persist in coastal San Diego County.

5.7 Wildlife Corridors

The Preserve is an important component of a corridor connecting the coast to significant open space of inland North and East San Diego County and should be maintained as such. The mountain lion was never verified by camera/track station or a qualified biologist. However, this species has been documented from the region and likely moves through the Preserve. Periodic surveys using motion-sensing cameras or animal tracking surveys along movement corridors to detect this species are recommended throughout the Preserve. Monitoring should occur every three years.

5.8 Additional Management Recommendations

The Preserve faces similar threats as other open space preserves across San Diego County. Some of these threats, which affect many of the sensitive plants and animals that are to be protected by these preserves, include fire management, erosion, invasion of non-native species, illegal off-road activity, unauthorized trail development, and unauthorized collection. This section discusses these threats and the some of the appropriate management actions that should be implemented to reduce the impact of each on the natural habitat supported by the Preserve.

5.8.1 Fire

Wildfire is an integral part of the southern California ecosystem and has shaped the landscape of the Preserve and its surroundings. Natural wildfires adequately spaced in time and occurring during the spring or summer seasons benefit certain vegetation communities, among them chaparral (the major vegetation community on the Preserve) that includes plants that regenerate based on certain triggers provided by fire (e.g., heat, chemicals present in charcoal, etc.). If natural condition prevailed, fire management would not be necessary. However, increased human presence has changed the natural fire cycles and more frequent fires exasperated by hot and strong Santa Ana winds have caused considerable damage to the human and natural landscape. Specifically, the Preserve is bordered by residential communities on the east and north, and the recent Witch Creek Fire in 2007 destroyed much of this community. Therefore, fire management has become necessary in the wildland-urban interface as a safety feature to protect homes and life. Fire management in conserved open space in areas away from the wildland-urban interface should be restricted to vegetation management geared toward public safety, as described below.

5.8.1.1 Public Safety

The County should maintain all management roads within the Preserve to be accessible to fire fighting personnel. Managed fire access is important to prevent that fire access routes would need to be cut in sensitive habitats in an emergency. The management of fire access roads includes the periodic removal of exotic species or non-native grasses within the confines of these roads to avoid increased flammability. Fire management measures for the benefit of public safety are generally not applicable to the natural resources within the Preserve.

Continuing coordination among the state and local fire agencies (e.g. CDF, County of San Diego, etc.) with Federal [USFS] and other fire departments and with adjacent landowners and communities can increase the likelihood of sustaining long-term ecosystem health and processes in these fire-adapted lands.

5.8.1.2 Ecosystem and Vegetation Management

Vegetation management and fuel treatment have shown effectiveness in the wildland-urban interface, specifically within fuel breaks and 100-foot defensible space buffers. In areas of the Preserve directly adjacent to private residences, a 100-foot defensible space buffer should be maintained. Vegetation should be removed 30 feet (9 m) from structures down to the ground, but not disturbing the root structures and thinned for the remaining 70 feet (21 m).

Prescribed burns are currently not recommended for the management of the Preserve because it recently burned in the 2007 wildfires. Future discussions with CalFire and other fire agencies should occur to discuss the potential for future prescribed burns within the Preserve as the fuel loads rebuild. Planning for them now will allow for the establishment and maintenance of fuel modification zones that could be used as containment lines as needed.

While more intensive fire management to protect the public may be necessary at the eastern boundary of the Preserve, the remainder of the Preserve should be carefully and minimally managed. Fire management in open space intended for the conservation of biological and ecological resources is currently being evaluated in parts of the County of San Diego's Draft Vegetation Management Report. Post-fire recovery monitoring is crucial in the context of fire management for conservation purposes. It is recommended that the County participate in regional post-fire recovery monitoring and include monitoring plots (for plant and wildlife monitoring) in areas burned frequently (e.g., overlap areas burned in 2003 and 2007) and less frequently.

5.8.2 Restoration

Restoration opportunities exist on the Preserve specifically in disturbed areas (e.g., old trail alignments) and the old homestead. Restoration may include passive restoration of these areas by allowing natural revegetation. Erosion control and habitat enhancement involving the abatement of invasive species are additional methods of restoring degraded areas. Restoration needs to be carefully planned and implemented by experienced professionals and without disturbing the native landscape.

5.8.3 Invasive Species

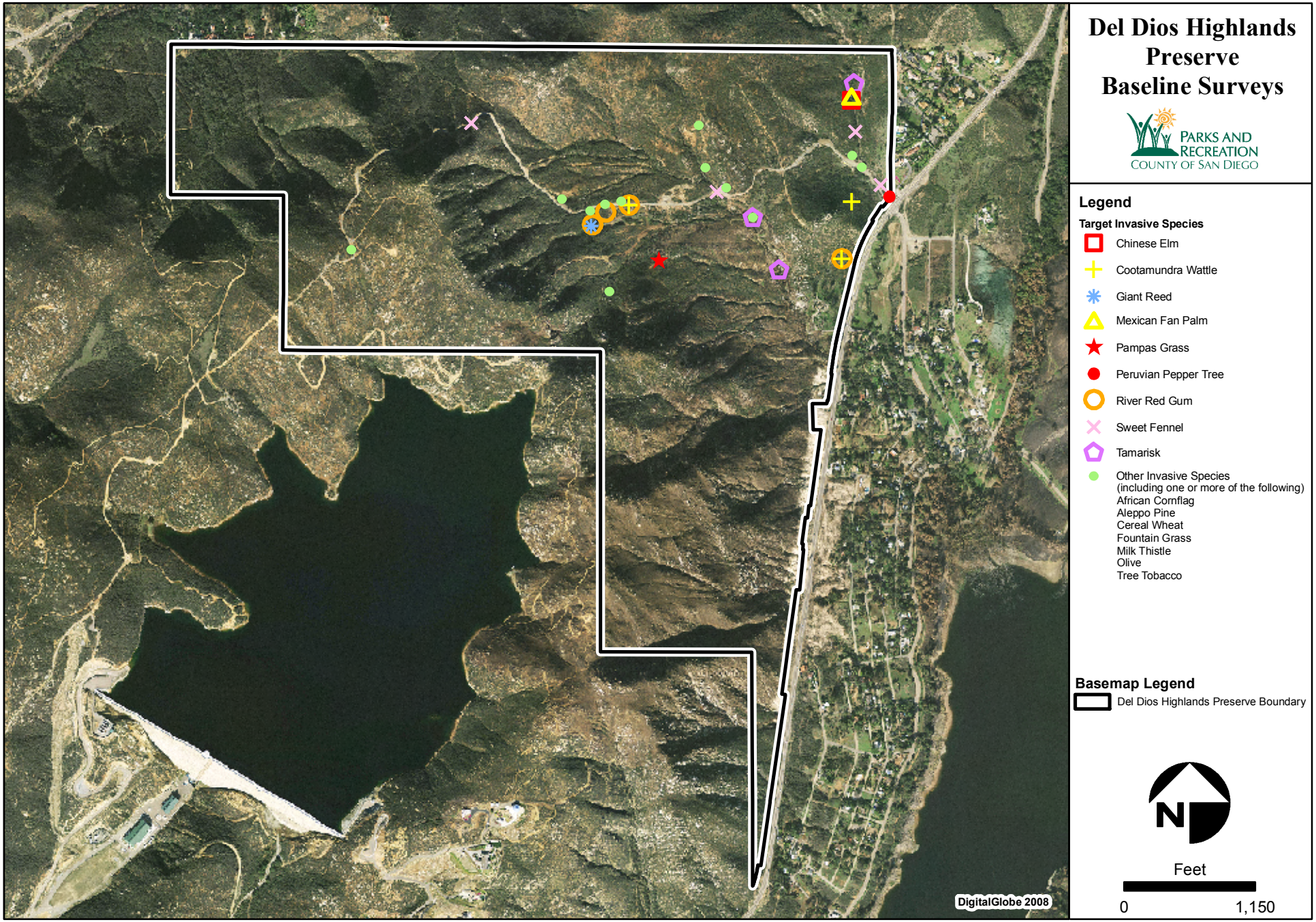
California Invasive Plant Council (Cal-IPC) listed plants were identified during the field surveys. These plants are shown in Figure 5-1 and are listed below in Table 5-1. Removal of invasive non-native species within the Preserve listed with a "High" status for control by Cal-IPC is recommended as a first priority. 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 the site.

Table 5-1. Cal-IPC Listed Plants Identified during 2007 and 2008 Surveys

Common Name	Scientific Name	Cal-IPC Status[1]
Giant Reed	*Arundo donax*	High
Selloa Pampas Grass	*Cortaderia selloana*	High
Sweet Fennel	*Foeniculum vulgare*	High
Tamarisk	*Tamarix ramosissima*	High
Mexican Fan Palm	*Washingtonia robusta*	Moderate
Peruvian Pepper Tree	*Schinus terebinthifolius*	Limited
River Red Gum	*Eucalyptus camaldulensis*	Limited

[1] **High** – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically. **Moderate** – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread. **Limited** – These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Treatment methods for removal of invasive species should be determined on a case-by-case, site-specific basis by professionals specifically experienced with open space preserves and in the context of ecosystem conservation. Prior to program implementation, the treatment methods, schedule, site maintenance, and monitoring methods should be reviewed and approved by DPR.



Technology Associates International Corporation

Invasive Plant Species

Figure 5-1

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Date: Oct 13, 2008

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5.8.4 Illegal Off-Road Activity

It is important that appropriate efforts are made to prevent illegal off-road activity from occurring on the Preserve. Off-road activities can have negative impacts on vegetation communities and plant and wildlife species. Off-road activity can increase the rate of weed invasion and lead to direct mortality of wildlife.

Gates are currently in place at access points around the Preserve. Maintenance of these gates is recommended to ensure only authorized access is permitted. Appropriate signage, fencing, frequent ranger patrol, and public education should also be implemented to reduce illegal off-road activity on the Preserve.

5.8.5 Collection

Unauthorized collection threatens many herpetofauna and plant species. Appropriate signage should be in place to inform visitors to stay on designated trails, the impact of collection on species, and penalties for unauthorized collection. Gates at access points should remain locked during periods when the Preserve is closed.

5.8.6 Patrol by County Staff

Patrol by park rangers is recommended to aid in the prevention of unauthorized activities and trespassing. Regular patrol will help prevent illegal off-road activity, trash dumping, pet leash enforcement, or unauthorized off-trail use by visitors. In addition, park rangers should be trained to identify and record non-native species and other species of interest. Patrol routes should be designed with minimal impact, avoiding areas supporting sensitive habitats or species.

5.8.7 Education

A small kiosk is currently in place at the main access point of the Preserve. The County is planning to provide more natural history information kiosks at the Preserve. It is recommended to place these kiosks along the main thoroughfare through the Preserve and keep the footprint as small as feasible to avoid direct and permanent impacts to vegetation and associated wildlife. The kiosks should be maintained and updated to provide the public with valuable information about plant and wildlife species that occur on the Preserve. Information regarding wildlife encounters and safety issues should be provided in these kiosks to ensure the protection of plant and wildlife species and visitors of the Preserve. Signage should also be placed in locations along trails identifying conservation goals, advising to stay on trails and keep pets on leash, and including safety instructions (see specific species recommendations sections for signage).

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Appendix A

Floristic Collection Supplies and Guidelines

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How to Collect and Press Plant Specimens

Here is the basic methodology used by SDNHM on how to collect and press museum-quality plant specimens. This information is the basic standard that is used at the SD Herbarium and many other herbaria have very similar guidelines. For a more detailed account of collecting, pressing, and drying plant specimens, and for recording appropriate label information such as locality and plant data see the San Diego Plant Atlas web site (http://www.sdplantatlas.org). Also, refer to Simpson, Michael G. (1997) *Plant Collecting and Documentation Field Notebook*, SDSU Herbarium Press, for an excellent explanation of plant collection techniques.

Before You Collect: It is legal to collect plants only with the permission of the owner of the property on which they are found. Government agencies that manage lands generally grant permits only to researchers working for an approved institution, such as a university, or to botanists conducting specific research projects. Private landowners are often willing to allow judicious collecting if asked. Be aware that many "sensitive" species, i.e., those that are rare, threatened, or endangered may be protected by law and may require special permits. Make sure that you have all appropriate permits that are required for access and/or plant collecting before you conduct any collection activities. Do not collect illegally.

Basic Information Needed: The date the plant was collected and the location as exactly as possible including elevation. With today's online resources and with the availability of hand-held GPS devices, collection localities should have exact geographic coordinates such as latitude/longitude or UTM values. Record anything that the specimen won't show, for example, the size of the plant, flower color, whether the plant is woody or not, etc. Note what kind of a place the plant was found, e.g., in gravel at stream edge, in shade under live oaks, in sidewalk crack outside Walmart. If you bring your plant to an herbarium, we will need all of this information in order to generate the specimen label. If you will be preparing your own labels, they must be printed on acid-free bond paper. For a more detailed account of how to record locality data please see the San Diego Plant Atlas web site (http://www.sdplantatlas.org). We recommend recording the field data for each specimen in your field notebook (including the collection number, and detailed information about the collecting location, surrounding vegetation, and characteristics of the plant itself). In this manner, the appropriate collection data is recorded in two different places (a private field book and on the newspaper where the specimen is pressed) and has a smaller chance of being lost before the specimen label is generated.

Field Collecting: Do not endanger the local population if there are only a few individuals present. In general, use the "1 to 20" rule of thumb: for every one specimen you collect, there should be at least 20 more present in the surrounding population. (For herbs, the rule applies to individual plants; for shrubs and trees, it applies to shoots removed.)

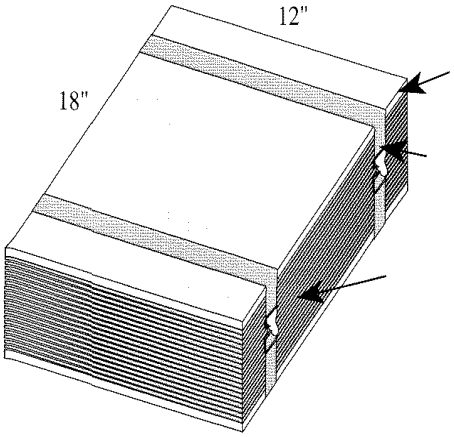
For herbs, dig up at least one whole plant to show roots that can help determine whether the plant is an annual, biennial, or perennial and identify the type of root (e.g., fibrous or tap) or underground stem (e.g., corm, bulb, rhizome, etc.). If the plant is small, take the whole thing, roots and all, or even several of them to make a decent voucher specimen. For shrubs, trees, or vines, clip one or more branches. If large, get a branch about 10 inches long, with leaves, flowers, and fruits, if possible.

The ideal plant specimen includes flowers (or other reproductive parts for ferns and non-vascular plants), fruit, leaves, and branches. Reproductive structures are often necessary to positively identify the plant, but it is not always possible to find flowers and fruit on the same plant at the same time. Do the best you can but do not mix together cuttings from different plants (i.e., don't take a branch from one plant and then take the fruits or flowers from another). Get enough of a sample to distribute over your 11x17 inch sheet in your plant press (e.g., a few branches of larger shrubs, or several small plants that can be distributed over the sheet).

For cacti and succulents, consult an herbarium on specific protocols regarding the preparation and processing of these plants. For the SD Herbarium, slice and press the flowers, but place the stems and fruits into a paper bag. Label the bag with the same collection number as the flowers and submit them to herbarium personnel for processing. Similarly, large cones cannot be pressed so they may be placed into a paper bag with the same collection number as the rest of the specimen.

How to Press a Plant: Place the specimen in a folded sheet of newspaper (like *The Reader*). Write the unique collection number, date, and collection locality on the upper outside edge of the newspaper, facing outwards. Arrange the plant so that all parts show; for example, don't get the flowers between layers of leaves. Clean up the specimen (e.g., shake off excess soil from the roots and pick off dead leaves, insects, etc.) and if necessary trim or bend into a "V", "N" or "M" shape to neatly fit inside the newspaper and press. Arrange the plants exactly as you want them to appear once they are mounted. Make sure leaves are spread out and not overlapping, that fruits and flowers are showing, and turn over a few leaves so that the underside of several can be seen. Remember, the voucher will need to be pressed and dried in such a way that all its parts can be studied after the specimen is mounted.

Place the specimens into a plant press. A basic plant press consists of two boards 12" by 18" (half-inch plywood or even thinner will do fine), plus two adjustable straps (or even ropes) and varying numbers of corrugated cardboard ventilators (see figure). Plants are pressed by placing each specimen inside one of the single sheets of folded newspapers, and separating each newspaper sheet with a cardboard ventilator (and blotters or paper towels can also be used to help absorb moisture) so you have an alternating stack of newspaper and cardboard. Place the stack between endboards and strap them tightly or place a heavy weight on top. Put the press where there is good air circulation--it is air, not heat that dries plants. Don't cook them.



Standard Plant Press

1/2" plywood endboards

Straps with buckles

Layers of cardboard ventilators

Figure from: Simpson, M.G. 1997 *Plant Collecting and Documentation Field Notebook*. SDSU Herbarium Press.

Examine the plants daily and change blotters as needed. It may take days to weeks for the plants to dry completely. Do not put the plants or plant press into a microwave or conventional oven. If required, change the paper every few days to prevent molding, especially for fleshy or succulent plants. Remove plants from the stack when they are dry (stiff and no longer cool to the touch). For the health of those who must handle the dried plants and the specimens, please do not use chemicals of any kind on the plants (e.g., use no mothballs, insecticides etc.). You can kill insects in dried plant specimens by freezing them for three or four days, and keep them pest-free in a tightly-sealed plastic bag.

Mounting and Storing Vouchers

Although we recommend submitting the dried, unmounted (in newspaper with basic collection data) specimens to a recognized and accredited herbarium so that they can be mounted and housed in a professional manner, here are some specifics in respect to the supplies needed for mounting and keeping museum-quality vouchers.

Paper for Mounting: Herbaria in the United States, and most other countries, use a standard size paper (11½ by 16½") for mounting plants. At the SD Herbarium, we use *University of California* type, a medium-weight acid-free buffered paper.

Glue: At the SD Herbarium, we use a neutral-pH formulation of PVA (polyvinyl acetate: a white glue like Elmer's) for mounting specimens. We dilute it with water for general mounting and use it full strength for specimens that need to be more firmly glued, such as a woody branch that only touches the sheet in a few spots.

Sources of Herbarium Supplies: Two sources of herbarium supplies are Herbarium Supply Co. (800-348-2388) and Pacific Papers (800-676-1151). Other archival quality supplies are available through University Products (800-628-1912 or www.universityproducts.com).

Gluing the Specimen: At the SD Herbarium, we usually use the "glass plate" method of mounting plants. A thin layer of glue is spread on an aluminum cookie sheet (traditionally a sheet of glass). If using white glue, some water can be stirred in to dilute it to the consistency you want.

The specimen is first arranged on the paper as it will be glued, and all necessary cleaning and trimming is done. Piece by piece the plant is placed into the glue, making sure all parts have touched down and picked up glue. It is then lifted and blotted on newspaper, and placed on the paper. A paper towel is gently pressed against all parts of the plant to squeeze out and blot up excess glue and to push the plant against the paper.

A thin layer of glue is spread on the back of the label with a palette knife, and the label smoothed into place and blotted.

Another method of gluing is useful for tricky specimens (like wispy grasses, which may gloop together in glue) or recalcitrant parts (such as roots or fuzzy leaves, which often seem glue-repellant). The specimen is arranged on the paper and held in place with weights. Then, working from the roots upward, the weights are removed and glue painted gently on the under side of the plant with a palette knife, and then blotted. The weight is then replaced before moving on to another part of the specimen. The weights are removed before placing the specimen for drying.

Allowing the Glue to Dry: The specimen is covered with a sheet of waxed paper so the glue won't stick to anything else. A square of cardboard is placed over the label to hold it

flat while it dries. Padding may be added to press down the flatter parts of the specimen if there are bulky parts like stems or fruits. A sheet of cardboard may be placed between specimens to distribute the weight. A board and a weight (we use a rock) top off the stack. The plants are left to dry overnight.

Storing Specimens: Although we suggest prompt deposition into a recognized and accredited herbarium, specimens that are well mounted using archival materials will last essentially forever, but *only* if protected from "agents of destruction" such as molds, light, and insects. They should be stored in a tightly-sealed box or cabinet. No pesticides need be used if no insects can get into this space.

Insects can be killed by freezing the specimens (after the plants are dried, but either before or after mounting) at a temperature of -10° F. for three days or longer, preferably in a freezer that is not self-defrosting (since these have cycles of warm temperatures). Specimens should be placed in a plastic bag first, and left in the bag until they reach room temperature after coming out of the freezer. Everything should be frozen before being placed in your storage space, and if an infestation is found, everything should be removed and frozen, and the space thoroughly cleaned before replacing the specimens.

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Appendix B

Pitfall Array Diagrams/Photographs

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Photographs/Diagrams of survey methods for herpetofauna pitfall sampling.

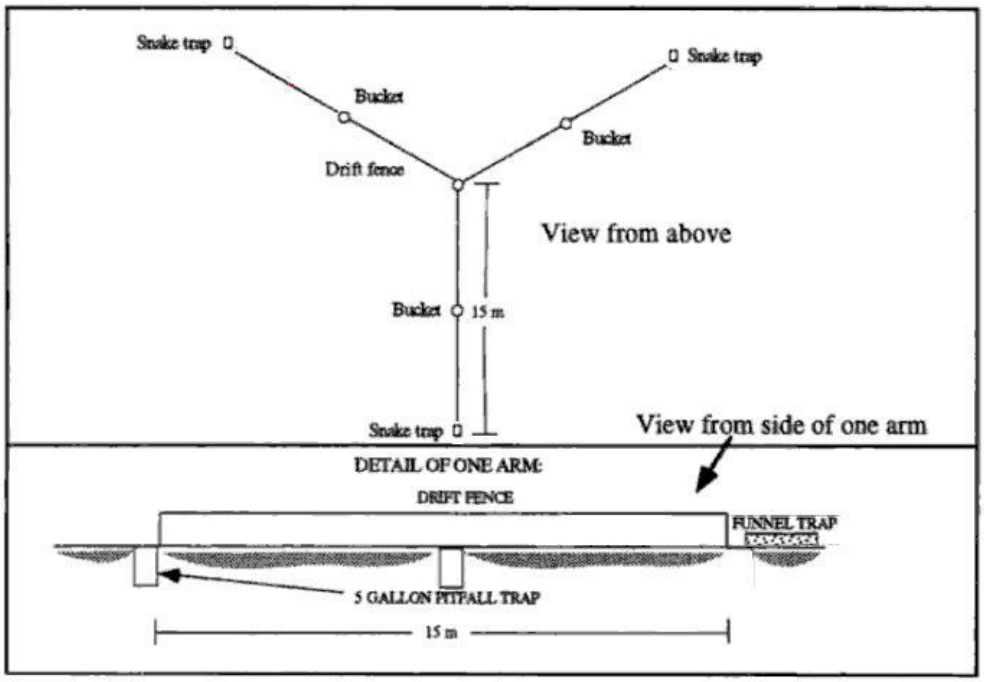

Diagram 1: Modified pitfall array design. Note snake trap (funnel trap) at terminus of each arm (See Photo 1).

Photo 1: Snake trap at terminus of array arm.

Photo 2: Pitfall array near Hell Creek (picture taken at Hellhole Canyon Preserve).

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Appendix C

Bat Survey Photographs (Anabats)

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Photographs of survey methods for bat surveys.

Photo 1: Drew Stokes setting up Anabat (picture taken at Hellhole Canyon Preserve).

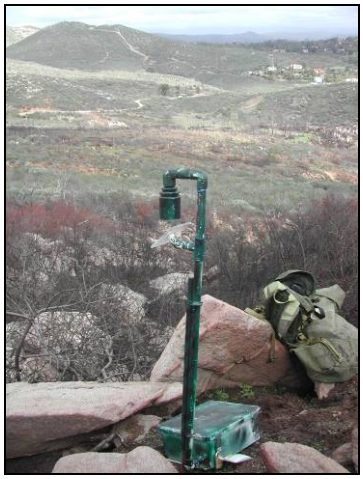

Photo 2: Anabat at Del Dios Highlands Preserve.

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Appendix D

Species Compendium

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Inventory of Plants and Animals Documented at Del Dios Highlands Preserve during 2007 and 2008 Baseline Surveys

Scientific Name	Common Name	Status[1]	Covered by South County MSCP
PLANTS			
FERNS AND FERN ALLIES			
DRYOPTERIDACEAE – Wood Fern Family			
Dryopteris arguta	Coastal Wood Fern	--/--/--/--	No
POLYPODIACEAE – Polypody Family			
Polypodium californicum	California Polypody	--/--/--/--	No
PTERIDACEAE - Brake Family			
Aspidotis californica	California Lace Fern	--/--/--/--	No
Cheilanthes newberryi	California Cotton Fern	--/--/--/--	No
Pentagramma triangularis ssp. *maxonii*	Maxon's Silverback Fern	--/--/--/--	No
SELAGINELLACEAE - Spike-Moss Family			
Selaginella bigelovii	Bigelow's Spike-Moss	--/--/--/--	No
Selaginella cinerascens	Mesa Spike-Moss	--/--/--/--	No
DICOTS			
ADOXACEAE – Adoxa Family			
Sambucus mexicana	Blue Elderberry	--/--/--/--	No
AMARANTHACEAE – Amaranth Family			
Chenopodium berlandieri	Berlandier's Pit-Seed Goosefoot	--/--/--/--	No
**Salsola tragus*	Prickly Russian-Thistle	--/--/--/--	No
ANACARDIACEAE - Sumac Family			
Malosma laurina	Laurel Sumac	--/--/--/--	No
Rhus ovata	Sugar Bush	--/--/--/--	No
Rhus integrifolia	Lemonadeberry	--/--/--/--	No
**Schinus molle*	Peruvian Pepper Tree	--/--/--/--	No
APIACEAE - Carrot Family			
**Anthriscus caucalis*	Bur Chervil	--/--/--/--	No
Daucus pusillus	Rattlesnake Weed	--/--/--/--	No
**Foeniculum vulgare*	Sweet Fennel	--/--/--/--	No
Tauschia arguta	Southern Tauschia	--/--/--/--	No
ASTERACEAE - Sunflower Family			
Acourtia microcephala	Sacapellote	--/--/--/--	No
Ambrosia psilostachya	Western Ragweed	--/--/--/--	No
**Anthemis cotula*	Mayweed, Stinkweed	--/--/--/--	No
Artemisia californica	Coastal Sagebrush	--/--/--/--	No
Artemisia palmeri	**Palmer's Sagewort**	**--/--/4.2/D**	**No**
Baccharis pilularis ssp. *consanguinea*	Chaparral Broom, Coyote Brush	--/--/--/--	No
Baccharis salicifolia	Mule-Fat, Seep-Willow	--/--/--/--	No
Brickellia californica	California Brickellbush	--/--/--/--	No
**Centaurea melitensis*	Tocalote	--/--/--/--	No
Chaenactis artemisiifolia	White Pincushion	--/--/--/--	No

Inventory of Plants and Animals Documented at Del Dios Highlands Preserve during 2007 and 2008 Baseline Surveys

Scientific Name	Common Name	Status[1]	Covered by South County MSCP
Cirsium occidentale var. *occidentale*	Cobwebby Thistle	--/--/--/--	No
**Conyza bonariensis*	Flax-Leaf Fleabane	--/--/--/--	No
**Cotula australis*	Australian Brass-Buttons	--/--/--/--	No
Deinandra fasciculata	Fascicled Tarweed	--/--/--/--	No
Eriophyllum confertiflorum var. *confertiflorum*	Long-Stem Golden-Yarrow	--/--/--/--	No
Hazardia squarrosa var. *grindelioides*	Southern Sawtooth Goldenbush	--/--/--/--	No
**Hedypnois cretica*	Crete Hedypnois	--/--/--/--	No
Helianthus annuus	Western Sunflower	--/--/--/--	No
Helianthus gracilentus	Slender Sunflower	--/--/--/--	No
**Hypochaeris glabra*	Smooth Cat's Ear	--/--/--/--	No
Logfia filaginoides	California Filago	--/--/--/--	No
**Logfia gallica*	Narrow-Leaf Filago	--/--/--/--	No
Osmadenia tenella	Osmadenia	--/--/--/--	No
Pseudognaphalium biolettii	Bicolor Cudweed	--/--/--/--	No
Pseudognaphalium californicum	California Everlasting	--/--/--/--	No
**Pseudognaphalium luteo-album*	Fragrant Cudweed	--/--/--/--	No
Pseudognaphalium stramineum	Cotton-Batting Plant	--/--/--/--	No
Rafinesquia californica	California Chicory	--/--/--/--	No
**Senecio vulgaris*	Common Groundsel	--/--/--/--	No
**Silybum marianum*	Milk Thistle	--/--/--/--	No
**Sonchus asper* ssp. *asper*	Prickly Sow-Thistle	--/--/--/--	No
**Sonchus oleraceus*	Common Sow-Thistle	--/--/--/--	No
Stephanomeria diegensis	San Diego Wreath-Plant	--/--/--/--	No
Stylocline gnaphaloides	Everlasting Nest-Straw	--/--/--/--	No
Venegasia carpesioides	Jesuit Flower	--/--/--/--	No
BORAGINACEAE - Borage Family			
Amsinckia menziesii var. *menziesii*	Rigid Fiddleneck	--/--/--/--	No
Cryptantha intermedia	Nievitas Cryptantha	--/--/--/--	No
Cryptantha micromeres	Minute-Flower Cryptantha	--/--/--/--	No
Cryptantha muricata	Prickly Cryptantha	--/--/--/--	No
Plagiobothrys collinus var. *fulvescens*	Rough Popcornflower	--/--/--/--	No
BRASSICACEAE - Mustard Family			
Cardamine californica var. *californica*	Milkmaids, Toothwort	--/--/--/--	No
Draba cuneifolia	Desert Whitlow	--/--/--/--	No
**Hirschfeldia incana*	Short-Pod Mustard	--/--/--/--	No
Lepidium virginicum* var. *robinsonii	**Robinson's Peppergrass**	**--/--/1B.2/A**	**No**
**Raphanus sativus*	Wild Radish	--/--/--/--	No
CAMPANULACEAE – Bellflower Family			
Triodanis biflora	Small Venus Looking-Glass	--/--/--/--	No
CAPRIFOLIACEAE – Honeysuckle Family			
Lonicera subspicata var. *denudata*	Johnston's Honeysuckle	--/--/--/--	No
CARYOPHYLLACEAE - Pink Family			
**Cerastium glomeratum*	Mouse-Ear Chickweed	--/--/--/--	No
**Polycarpon tetraphyllum* ssp. *tetraphyllum*	Four-Leaf Allseed	--/--/--/--	No
Sagina decumbens ssp. *occidentalis*	Western Pearlwort	--/--/--/--	No

Inventory of Plants and Animals Documented at Del Dios Highlands Preserve during 2007 and 2008 Baseline Surveys

Scientific Name	Common Name	Status[1]	Covered by South County MSCP
Silene antirrhina	Snapdragon Catchfly	--/--/--/--	No
**Silene gallica*	Common Catchfly	--/--/--/--	No
Silene laciniata ssp. *laciniata*	Southern Pink	--/--/--/--	No
Silene multinervia	Many-Nerve Catchfly	--/--/--/--	No
**Spergularia bocconi*	Boccone's Sand-Spurry	--/--/--/--	No
CISTACEAE - Rock-Rose Family			
Helianthemum scoparium	Peak Rush-Rose	--/--/--/--	No
CONVOLVULACEAE - Morning-Glory Family			
Calystegia macrostegia ssp. *tenuifolia*	San Diego Morning-Glory	--/--/--/--	No
Cuscuta subinclusa	Canyon Dodder	--/--/--/--	No
CRASSULACEAE - Stonecrop Family			
Crassula connata	Pygmyweed	--/--/--/--	No
CUCURBITACEAE - Gourd Family			
Marah macrocarpus var. *macrocarpus*	Manroot, Wild-Cucumber	--/--/--/--	No
ERICACEAE - Heath Family			
Arctostaphylos glandulosa ssp. *glandulosa*	Eastwood's Manzanita	--/--/--/--	No
Comarostaphylis diversifolia* ssp. *diversifolia	**Summer Holly**	**--/--/1B.2/A**	**No**
Xylococcus bicolor	Mission Manzanita	--/--/--/--	No
EUPHORBIACEAE - Spurge Family			
**Euphorbia peplus*	Petty Spurge	--/--/--/--	No
FABACEAE - Pea Family			
**Acacia baileyana*	Cootamundra Wattle	--/--/--/--	No
Lathyrus vestitus var. *alefeldii*	San Diego Sweet Pea	--/--/--/--	No
Lotus purshianus var. *purshianus*	Spanish-Clover	--/--/--/--	No
Lotus salsuginosus var. *salsuginosus*	Alkali Lotus	--/--/--/--	No
Lotus scoparius var. *brevialatus*	Short-Wing Deerweed	--/--/--/--	No
Lotus scoparius var. *scoparius*	Coastal Deerweed	--/--/--/--	No
Lotus strigosus	Bishop's/Strigose Lotus	--/--/--/--	No
Lupinus bicolor	Miniature Lupine	--/--/--/--	No
Lupinus hirsutissimus	Stinging Lupine	--/--/--/--	No
**Melilotus indicus*	Indian Sweetclover	--/--/--/--	No
Trifolium willdenovii	Valley Clover	--/--/--/--	No
FAGACEAE - Oak Family			
Quercus agrifolia var. *agrifolia*	Coast Live Oak, Encina	--/--/--/--	No
Quercus xacutidens	Torrey's Scrub Oak	--/--/--/--	No
GENTIANACEAE – Gentian Family			
Centaurium venustum	Canchalagua	--/--/--/--	No
GERANIACEAE - Geranium Family			
*Erodium botrys	Long-Beak Filaree/Storksbill	--/--/--/--	No
*Erodium moschatum	White-Stem Filaree/Storksbill	--/--/--/--	No

Inventory of Plants and Animals Documented at Del Dios Highlands Preserve during 2007 and 2008 Baseline Surveys

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*Erodium cicutarium	Red-Stem Filaree/Storksbill	--/--/--/--	No
Geranium carolinianum	Carolina Geranium	--/--/--/--	No
GROSSULARIACEAE – Gooseberry Family			
Ribes indecorum	White-Flower Currant	--/--/--/--	No
HELIOTROPACEAE – Heliotrope Family			
Heliotropium curassavicum	Salt Heliotrope	--/--/--/--	No
HYACINTHACEAE – Hyacinth Family			
Chlorogalum parviflorum	Small-Flower Soap-Plant/Amole	--/--/--/--	No
HYDROPHYLLACEAE - Waterleaf Family			
Eucrypta chrysanthemifolia var. *chrysanthemifolia*	Common Eucrypta	--/--/--/--	No
Phacelia cicutaria var. *hispida*	Caterpillar Phacelia	--/--/--/--	No
Phacelia grandiflora	Giant-Flower Phacelia	--/--/--/--	No
Phacelia parryi	Parry's Phacelia	--/--/--/--	No
Phacelia ramosissima var. *latifolia*	Branching Phacelia	--/--/--/--	No
Pholistoma racemosum	San Diego Fiesta Flower	--/--/--/--	No
LAMIACEAE - Mint Family			
**Marrubium vulgare*	Horehound	--/--/--/--	No
Salvia mellifera	Black Sage	--/--/--/--	No
LYTHRACEAE – Loosestrife Family			
*Lythrum hyssopifolia	Grass Poly	--/--/--/--	No
MALVACEAE - Mallow Family			
Malacothamnus fasciculatus	Chaparral Bushmallow	--/--/--/--	No
**Malva parviflora*	Cheeseweed	--/--/--/--	No
MELANTHIACEAE – Bunch Flower Family			
Zigadenus fremontii	Fremont's Camas	--/--/--/--	No
MYRTACEAE – Myrtle Family			
**Eucalyptus camaldulensis*	River Red Gum	--/--/--/--	No
NYCTAGINACEAE - Four-O'Clock Family			
Mirabilis laevis var. *crassifolia*	Coastal Wishbone Plant	--/--/--/--	No
OLEACEAE – Olive Family			
**Olea europaea*	Olive	--/--/--/--	No
ONAGRACEAE - Evening Primrose Family			
Camissonia hirtella	Field Sun Cup	--/--/--/--	No
Clarkia purpurea var. *quadrivulnera*	Four-Spot Clarkia	--/--/--/--	No
OROBANCHACEAE – Broom-rape Family			
Castilleja exserta ssp. *exserta*	Purple Owl's-Clover	--/--/--/--	No
Cordylanthus rigidus ssp. setigerus	Dark-Tip Bird's Beak	--/--/--/--	No

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Scientific Name	Common Name	Status[1]	Covered by South County MSCP
OXALIDACEAE - Oxalis Family			
**Oxalis pes-caprae*	Bermuda-Buttercup	--/--/--/--	No
PAPAVERACEAE - Poppy Family			
Dicentra chrysantha	Golden Ear-Drops	--/--/--/--	No
Papaver californicum	Fire Poppy	--/--/--/--	No
PHRYMACEAE – Hopseed Family			
Mimulus aurantiacus var. *pubescens* x var. *puniceus*	San Diego Monkey Flower	--/--/--/--	No
Mimulus brevipes	Slope Semiphore	--/--/--/--	No
Mimulus floribundus	Showy Monkey Flower	--/--/--/--	No
Mimulus guttatus	Seep Monkey Flower	--/--/--/--	No
Mimulus pilosus	Downy Monkey Flower	--/--/--/--	No
PINACEAE – Pine Family			
**Pinus halepensis*	Aleppo Pine	--/--/--/--	No
PLANTAGINACEAE - Plantain Family			
Antirrhinum kelloggii	Climbing Snapdragon	--/--/--/--	No
Antirrhinum nuttallianum ssp. *nuttallianum*	Nuttall's Snapdragon	--/--/--/--	No
Keckiella cordifolia	Climbing Bush Penstemon	--/--/--/--	No
Linaria canadensis	Large Blue Toadflax	--/--/--/--	No
Plantago erecta	Dot-Seed Plantain	--/--/--/--	No
POLEMONIACEAE - Phlox Family			
Allophyllum glutinosum	Blue False-Gilia	--/--/--/--	No
Navarretia hamata ssp. *hamata*	Hooked Skunkweed	--/--/--/--	No
POLYGONACEAE - Buckwheat Family			
Eriogonum fasciculatum var. *foliolosum*	Inland California Buckwheat	--/--/--/--	No
Pterostegia drymarioides	Granny's Hairnet	--/--/--/--	No
**Rumex crispus*	Curly Dock	--/--/--/--	No
Rumex salicifolius var. *salicifolius*	Willow Dock	--/--/--/--	No
PORTULACACEAE – Purslane Family			
Calandrinia breweri	**Brewer's Calandrinia**	**--/--/4.2/D**	**No**
Calandrinia ciliata	Red Maids	--/--/--/--	No
Claytonia parviflora ssp. *parviflora*	Utah Miner's-Lettuce	--/--/--/--	No
Claytonia perfoliata ssp. *mexicana*	Mexican Miner's-Lettuce	--/--/--/--	No
Claytonia perfoliata ssp. *perfoliata*	Miner's-Lettuce	--/--/--/--	No
PRIMULACEAE - Primrose Family			
**Anagallis arvensis*	Scarlet Pimpernel	--/--/--/--	No
RANUNCULACEAE - Crowfoot Family			
Clematis pauciflora	Ropevine Clematis	--/--/--/--	No
Thalictrum fendleri var. *polycarpum*	Smooth-Leaf Meadow-Rue	--/--/--/--	No
RHAMNACEAE - Buckthorn Family			

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Ceanothus leucodermis	Chaparral Whitethorn	--/--/--/--	No
Ceanothus tomentosus	Ramona-Lilac	--/--/--/--	No
Ceanothus verrucosus	**Wart-Stemmed Ceanothus**	**--/--/2.2/B**	**Yes**
Rhamnus crocea	Spiny Redberry	--/--/--/--	No
Rhamnus ilicifolia	Holly-Leaf Redberry	--/--/--/--	No
Rhamnus pilosa	Hairy-Leaf Redberry	--/--/--/--	No
ROSACEAE - Rose Family			
Adenostoma fasciculatum	Chamise	--/--/--/--	No
Cercocarpus minutiflorus	San Diego Mountain-Mahogany	--/--/--/--	No
Heteromeles arbutifolia	Toyon, Christmas Berry	--/--/--/--	No
Prunus ilicifolia ssp. *ilicifolia*	Islay, Holly-Leaf Cherry	--/--/--/--	No
RUBIACEAE - Madder Family			
Galium angustifolium ssp. *angustifolium*	Narrow-Leaf Bedstraw	--/--/--/--	No
Galium aparine	Common Bedstraw, Goose Grass	--/--/--/--	No
Galium nuttallii ssp. *nuttallii*	San Diego Bedstraw	--/--/--/--	No
RUTACEAE – Rue Family			
Cneoridium dumosum	Coast Spice Bush, Bush-Rue	--/--/--/--	No
SALICACEAE - Willow Family			
Salix gooddingii	Goodding's Black Willow	--/--/--/--	No
Salix laevigata	Red Willow	--/--/--/--	No
SAXIFRAGACEAE - Saxifrage Family			
Jepsonia parryi	Coast Jepsonia	--/--/--/--	No
SCROPHULARIACEAE - Figwort Family			
Scrophularia californica ssp. *floribunda*	California Bee Plant/Figwort	--/--/--/--	No
SOLANACEAE - Nightshade Family			
**Nicotiana glauca*	Tree Tobacco	--/--/--/--	No
Solanum americanum	White Nightshade	--/--/--/--	No
Solanum parishii	Parish's Nightshade	--/--/--/--	No
TAMARICACEAE - Tamarisk Family			
**Tamarix ramosissima*	Tamarisk, Salt-Cedar	--/--/--/--	No
ULMACEAE – Elm Family			
**Ulmus parvifolia*	Chinese Elm	--/--/--/--	No
URTICACEAE – Nettle Family			
Hesperocnide tenella	Western Nettle	--/--/--/--	No
Parietaria hespera var. *hespera*	Western Pellitory	--/--/--/--	No
MONOCOTS			
AGAVACEAE - Agave Family			
Hesperoyucca whipplei	Chaparral Candle	--/--/--/--	No

Inventory of Plants and Animals Documented at Del Dios Highlands Preserve during 2007 and 2008 Baseline Surveys

Scientific Name	Common Name	Status[1]	Covered by South County MSCP
ALLIACEAE – Onion Family			
Allium praecox	Early Onion	--/--/--/--	No
ARECACEAE – Palm Family			
**Washingtonia robusta*	Mexican Fan Palm	--/--/--/--	No
CYPERACEAE - Sedge Family			
Carex triquetra	Triangular-Fruit Sedge	--/--/--/--	No
Cyperus eragrostis	Tall Flatsedge	--/--/--/--	No
Eleocharis montevidensis	Dombey's Spike-Rush	--/--/--/--	No
IRIDACEAE – Iris Family			
*Chasmanthe floribunda	African Cornflag	--/--/--/--	No
Sisyrinchium bellum	Blue-Eyed-Grass	--/--/--/--	No
JUNCACEAE - Rush Family			
Juncus bufonius var. *bufonius*	Toad Rush	--/--/--/--	No
Juncus dubius	Mariposa Rush	--/--/--/--	No
Juncus bufonius var. *congestus*	Clustered Toad Rush	--/--/--/--	No
Juncus rugulosus	Wrinkled Rush	--/--/--/--	No
LILIACEAE - Lily Family			
Calochortus splendens	Splendid Mariposa Lily	--/--/--/--	No
Calochortus weedii var. *weedii*	Weed's Mariposa Lily	--/--/--/--	No
POACEAE - Grass Family			
Achnatherum coronatum	Giant Stipa	--/--/--/--	No
Agrostis exarata	Spike Redtop	--/--/--/--	No
**Arundo donax*	Giant Reed	--/--/--/--	No
**Avena barbata*	Slender Wild Oat	--/--/--/--	No
**Brachypodium distachyon*	Purple Falsebrome	--/--/--/--	No
**Bromus diandrus*	Ripgut Grass	--/--/--/--	No
**Bromus hordeaceus*	Soft Chess	--/--/--/--	No
**Bromus madritensis*	Compact Brome	--/--/--/--	No
**Bromus rubens*	Foxtail Chess, Red Brome	--/--/--/--	No
**Cortaderia selloana*	Selloa Pampas Grass	--/--/--/--	No
**Cynodon dactylon*	Bermuda Grass	--/--/--/--	No
**Ehrharta erecta*	Panic Veldt Grass	--/--/--/--	No
**Gastridium ventricosum*	Nit Grass	--/--/--/--	No
Melica imperfecta	Coast Range Melic	--/--/--/--	No
Muhlenbergia rigens	Deergrass	--/--/--/--	No
Nassella lepida	Foothill Needlegrass	--/--/--/--	No
**Pennisetum setaceum*	African Fountain Grass	--/--/--/--	No
Phalaris angusta	Timothy Canary Grass	--/--/--/--	No
**Polypogon monspeliensis*	Annual Beard Grass	--/--/--/--	No
**Triticum aestivum*	Cereal Wheat	--/--/--/--	No
**Vulpia myuros* var. *myuros*	Rat-Tail Fescue	--/--/--/--	No
THEMIDACEAE - Brodiaea Family			
Bloomeria crocea var. *crocea*	Common Goldenstar	--/--/--/--	No
Dichelostemma capitatum ssp. *capitatum*	Blue Dicks	--/--/--/--	No

Inventory of Plants and Animals Documented at Del Dios Highlands Preserve during 2007 and 2008 Baseline Surveys

Scientific Name	Common Name	Status[1]	Covered by South County MSCP
Muilla maritima	Common Muilla	--/--/--/--	No
ANIMALS			
INSECTA			
LEPIDOPTERA (Butterflies and Moths)			
Family Hesperidae (Skippers)			
Erynnis funeralis	Funereal Duskywing	--/--/--	No
Family Lycaenidae (Blues, Hairstreaks, Coppers)			
Callophrys dumetorum dumetorum	Bramble Hairsteak	--/--/--	No
Plebejus acmon acmon	Acmon Blue	--/--/--	No
Plebejus lupini monticola	Lupine Blue	--/--/--	No
Family Nymphalidae (Brushfoots)			
Cynthia annabella	West Coast Lady	--/--/--	No
Cynthia cardui	Painted Lady	--/--/--	No
Junonia coenia	Common Buckeye	--/--/--	No
Limenitis lorquini	Lorquin's Admiral	--/--/--	No
Family Papilionidae (Swallowtails)			
Papilio eurymedon	Pale Swallowtail	--/--/--	No
Papilio zelicaon	Anise Swallowtail	--/--/--	No
Family Pieridae (Whites and Sulphurs)			
Anthocharis sara sara	Sara Orangetip	--/--/--	No
Colias eurytheme	Orange Sulfer	--/--/--	No
Pieris protodice	Common (Checkered) White	--/--/--	No
Family Riodinidae (Metalmarks)			
Apodemia mormo virgulti	Behr's Metalmark	--/--/--	No
AMPHIBIA (Amphibians)			
ANURA (Frogs and Toads)			
PELOBATIDAE (Spadefoot Toads)			
Spea hammondii	**Western Spadefoot**	**--/SSC/2**	**No**
Bufonidae (True Toads)			
Bufo boreas	Western Toad	--/--/--	No
Hylidae (Tree frogs and relatives)			
Pseudacris regilla	Pacific Tree Frog	--/--/--	No
REPTILIA (Reptiles)			

Inventory of Plants and Animals Documented at Del Dios Highlands Preserve during 2007 and 2008 Baseline Surveys

Scientific Name	Common Name	Status[1]	Covered by South County MSCP
SQUAMATA (Lizards and Snakes)			
Phrynosomatidae (Spiny lizards and relatives)			
Phrynosoma coronatum	**Coast Horned Lizard**	**--/SSC/2**	**Yes**
Sceloporus occidentalis	Western Fence Lizard	--/--/--	No
Uta stansburiana	Side-blotched Lizard	--/--/--	No
Scincidae (Skinks)			
Eumeces gilberti	Gilbert's Skink	--/--/--	No
Teiidae (Whiptails and relatives)			
Cnemidophorus hyperythrus	**Orange-Throated Whiptail**	**--/SSC/2**	**Yes**
Cnemidophorus tigris	Western Whiptail	--/--/2	No
Anguidae (Alligator Lizards and relatives)			
Elgaria multicarinata	Southern Alligator Lizard	--/--/--	No
Boidae (Boas)			
Lichanura trivirgata	Rosy Boa	--/--/2	No
Colubridae (Colubrids)			
Diadophis punctatus	Ringneck Snake	--/--/2	No
Hypsiglena torquata	Night Snake	--/--/--	No
Masticophis lateralis	California Whipsnake	--/--/--	No
Pituophis catenifer	Gopher Snake	--/--/--	No
Salvadora hexalepis	**Western Patched-Nosed Snake**	**--/SSC/2**	**No**
Viperidae (Vipers)			
Crotalus ruber	**Red Diamond Rattlesnake**	**--/SSC/2**	**No**
Crotalus viridis	Western Rattlesnake	--/--/--	No
AVES (Birds)			
PODICIPEDIFORMES (Grebes)			
Podicipedidae (Grebes)			
Podiceps nigricollis	Eared Grebe	--/--/--	No
Podilymbus podiceps	Pied-Billed Grebe	--/--/--	No
GAVIIFORMES (Loons)			
Gaviidae (Loons)			
Gavia immer	**Common Loon**	**--/SSC/2**	**No**
PELECANIFORMES (Pelicans and Allies)			
PHALACROCORACIDAE (Cormorants)			
Phalacrocorax auritus	**Double-Crested Cormorant**	**--/WL/2**	**No**
CICONIIFORMES (Herons, Storks, Ibises, and relatives)			

Inventory of Plants and Animals Documented at Del Dios Highlands Preserve during 2007 and 2008 Baseline Surveys

Scientific Name	Common Name	Status[1]	Covered by South County MSCP
Ardeidae (Herons and Bitterns)			
Ardea albus	Great Egret	--/--/--	No
Butorides virescens	Green Heron	--/--/--	No
Cathartidae (New World Vultures)			
Cathartes aura	Turkey Vulture	--/--/1	No
Threskiornithidae (Ibises and Spoonbills)			
Plegadis chihi	**White-faced Ibis**	**--/WL/1**	**Yes**
ANSERIFORMES (Screamers, Ducks, and relatives)			
Anatidae (Swans, Geese, and Ducks)			
Anas platyrhynchos	Mallard	--/--/--	No
Anas strepera	Gadwall	--/--/2	No
Mergus merganser	Common Merganser	--/--/--	No
FALCONIFORMES (Vultures, Hawks, and Falcons)			
Accipitridae (Hawks, Old World Vultures, and Harriers)			
Accipiter cooperii	**Cooper's Hawk**	**--/WL/1**	**Yes**
Buteo jamaicensis	Red-tailed Hawk	--/--/--	No
Buteo lineatus	Red-shouldered Hawk	--/--/1	No
Buteo regalis	**Ferruginous Hawk**	**--/WL/1**	**Yes**
Accipiter striatus	**Sharp-shinned Hawk**	**--/WL/1**	**No**
Falconidae (Caracaras and Falcons)			
Falco sparverius	American Kestrel	--/--/--	No
Falco peregrinus	**Peregrine Falcon**	**DL/E/1**	**Yes**
GRUIFORMES (Cranes, rails, and relatives)			
Rallidae (Rails, coots)			
Fulica americana	American Coot	--/--/--	No
Odontophoridae (New World Quail)			
Callipepla californica	California Quail	--/--/--	No
CHARADRIIFORMES (Shorebirds, Gulls, and relatives)			
Charadriidae (Plovers and relatives)			
Charadrius vociferus	Killdeer	--/--/--	No
Laridae (Gulls and Terns)			
Larus delawarensis	Ring-billed Gull	--/--/--	No
COLUMBIFORMES (Pigeons and Doves)			
Columbidae (Pigeons and Doves)			
**Columba livia*	Domestic Pigeon	--/--/--	No
Zenaida macroura	Mourning Dove	--/--/--	No

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Scientific Name	Common Name	Status[1]	Covered by South County MSCP
CUCULIFORMES (Cuckoos and relatives)			
Cuculidae (Typical Cuckoos)			
Geococcyx californianus	Greater Roadrunner	--/--/--	No
Strigidae (Typical Owls)			
Bubo virginianus	Great Horned Owl	--/--/--	No
Tyto alba	Barn Owl	--/--/2	No
CAPRIMULGIFORMES (Nightbirds)			
Caprimulgidae (Nighthawks And Nightjars)			
Phalaenoptilus nuttallii	Common Poorwill	--/--/--	No
APODIFORMES (Swifts and Hummingbirds)			
Apodidae (Swifts)			
Chaetura vauxi	**Vaux's Swift**	**--/SSC/--**	**No**
Trochillidae (Hummingbirds)			
Calypte anna	Anna's Hummingbird	--/--/--	No
Calypte costae	Costa's Hummingbird	--/--/--	No
Stellula calliope	Calliope Hummingbird	--/--/--	No
PICIFORMES (Woodpeckers and relatives)			
Picidae (Woodpeckers and Wrynecks)			
Colaptes auratus	Northern Flicker	--/--/--	No
Melanerpes formicivorus	Acorn Woodpecker	--/--/--	No
Picoides nuttallii	Nuttall's Woodpecker	--/--/--	No
PASSERIFORMES (Perching Birds)			
Tyrannidae (Tyrant Flycatchers)			
Empidonax difficilis	Western Flycatcher	--/--/--	No
Contopus sordidulus	Western Wood Pewee	--/--/--	No
Myiarchus cinerascens	Ash-throated Flycatcher	--/--/--	No
Sayornis nigricans	Black Phoebe	--/--/--	No
Sayornis saya	Say's Phoebe	--/--/--	No
Tyrannus vociferans	Cassin's Kingbird	--/--/--	No
Vireonidae (Typical Vireos)			
Vireo gilvus	Warbling Vireo	--/--/--	No
Vireo huttoni	Hutton's Vireo	--/--/--	No
Corvidae (Jays, Magpies, and Crows)			
Aphelocoma californica	Western Scrub Jay	--/--/--	No
Corvus brachyrhynchos	American Crow	--/--/--	No
Corvus corax	Common Raven	--/--/--	No

Inventory of Plants and Animals Documented at Del Dios Highlands Preserve during 2007 and 2008 Baseline Surveys

Scientific Name	Common Name	Status[1]	Covered by South County MSCP
Bombycillidae (Waxwings and Silky Flycatchers)			
Phainopepla nitens	Phainopepla	--/--/--	No
Turdidae (Thrushes)			
Catharus guttatus	Hermit Thrush	--/--/--	No
Sialia mexicana	**Western Bluebird**	**--/--/2**	**Yes**
Turdus migratorius	American Robin	--/--/--	No
STURNIDAE (Starlings & Allies)			
**Sturnus vulgaris*	European Starling	--/--/--	No
Mimidae (Mockingbirds and Thrashers)			
Mimus polyglottos	Northern Mockingbird	--/--/--	No
Toxostoma redivivum	California Thrasher	--/--/--	No
Troglodytidae (Wrens)			
Thryomanes bewickii	Bewick's Wren	--/--/--	No
Troglodytes aedon	House Wren	--/--/--	No
Catherpes mexicanus	Canyon Wren	--/--/--	No
Polioptilidae (Verdin and Gnatcatcher)			
Polioptila caerulea	Blue-gray Gnatcatcher	--/--/--	No
Polioptila californica	**California Gnatcatcher**	**T/--/1**	**Yes**
Polioptila melanura	Black-tailed Gnatcatcher	--/--/--	No
Aegithalidae (Bushtit)			
Psaltriparus minimus	Bushtit	--/--/--	No
Hirundinidae (Swallows)			
Petrochelidon pyrrhonota	Cliff Swallow	--/--/--	No
Regulidae (Kinglets)			
Regulus calendula	Ruby-crowned Kinglet	--/--/--	No
Timaliidae (Babblers)			
Chamaea fasciata	Wrentit	--/--/--	No
Fringillidae (Finches)			
Carduelis lawrencei	Lawrence's Goldfinch	--/--/--	No
Carduelis pinus	Pine Siskin	--/--/--	No
Carduelis psaltria	Lesser Goldfinch	--/--/--	No
Carpodacus mexicanus	House Finch	--/--/--	No
Carpodacus purpureus	Purple Finch	--/--/--	No
Emberizidae (Emberizines)			
Aimophila ruficeps	**So. CA Rufous-crowned Sparrow**	**--/WL/1**	**Yes**
Amphispiza belli	**Bell's Sage Sparrow**	**--/WL/1**	**No**
Junco hyemalis	Dark-eyed Junco	--/--/--	No
Melospiza melodia	Song Sparrow	--/--/--	No
Passerella iliaca	Fox Sparrow	--/--/--	No

Inventory of Plants and Animals Documented at Del Dios Highlands Preserve during 2007 and 2008 Baseline Surveys

Scientific Name	Common Name	Status[1]	Covered by South County MSCP
Pipilo crissalis	California Towhee	--/--/--	No
Pipilo maculatus	Spotted Towhee	--/--/--	No
Spizella atrogularis	Black-chinned Sparrow	--/--/--	No
Zonotrichia leucophrys	White-crowned Sparrow	--/--/--	No
Zonotrichia atricapilla	Golden-crowned Sparrow	--/--/--	No
Parulidae (Wood Warblers and relatives)			
Dendroica coronata	Yellow-rumped Warbler	--/--/--	No
Dendroica occidentalis	Hermit Warbler	--/--/--	No
Geothlypis trichas	Common Yellowthroat	--/--/--	No
Icteria virens	**Yellow-breasted Chat**	**--/SSC/1**	**No**
Vermivora celata	Orange-crowned Warbler	--/--/--	No
Wilsonia pusilla	Wilson's Warbler	--/--/--	No
Dendroica townsendii	Townsend's Warbler	--/--/--	No
Dendroica petechia	**Yellow Warbler**	**--/SSC/2**	**No**
Cardinalidae (Cardinals, Grosbeaks & Allies)			
Passerina amoena	Lazuli Bunting	--/--/--	No
Passerina caerulea	Blue Grosbeak	--/--/--	No
Pheucticus melanocephalus	Black-headed Grosbeak	--/--/--	No
Icteridae (Blackbirds, Orioles & Allies)			
Icterus bullockii	Bullock's Oriole	--/--/--	No
Icterus cucullatus	Hooded Oriole	--/--/--	No
**Molothrus ater*	Brown-headed Cowbird	--/--/--	No
MAMMALIA (Mammals)			
INSECTIVORA (Insectivores)			
Soricidae (Shrews)			
Notiosorex crawfordi	Grey Shrew	--/--/--	No
Sorex ornatus	Ornate Shrew	--/--/--	No
CHIROPTERA (Bats)			
Vespertilionidae (Evening Bats)			
Eptesicus fuscus	Big Brown Bat	--/--/--	No
Lasiurus blossevillii	**Western Red Bat**	**--/SSC/2**	**No**
Lasiurus cinereus	Hoary Bat	--/--/--	No
Lasiurus xanthinus	Western Yellow Bat	--/--/--	No
Myotis californicus	California Myotis	--/--/--	No
Myotis ciliolabrum	Small-footed Myotis	--/--/2	No
Myotis yumanensis	Yuma Myotis	--/--/2	No
Parastrellus hesperus	Western Pipistrelle	--/--/--	No
Molossidae (Free-tailed Bats)			
Eumops perotis	**Western Mastiff Bat**	**--/SSC/2**	**No**
Nyctinomops femorosaccus	**Pocketed Free-tailed Bat**	**--/SSC/2**	**No**
Tadarida brasiliensis	Mexican Free-tailed Bat	--/--/--	No

Inventory of Plants and Animals Documented at Del Dios Highlands Preserve during 2007 and 2008 Baseline Surveys

Scientific Name	Common Name	Status[1]	Covered by South County MSCP
LAGOMORPHA (Rabbits, Hares, and Pikas)			
Leporidae (Rabbits and Hares)			
Sylvilagus audubonii	Desert Cottontail	--/--/--	No
RODENTIA (Squirrels, Rats, Mice, and relatives)			
Sciuridae (Squirrels, Chipmunks, and Marmots)			
Spermophilus beecheyi	California Ground Squirrel	--/--/--	No
Geomyidae (Pocket Gophers)			
Thomomys bottae (burrows)	Botta's Pocket Gopher	--/--/--	No
Heteromyidae (Pocket Mice and Kangaroo Rats)			
Chaetodipus californicus	**California Pocket Mouse**	**--/SSC/2**	**No**
Chaetodipus fallax	**San Diego Pocket Mouse**	**--/SSC/2**	**No**
Dipodomys simulans	Dulzura Kangaroo Rat	--/--/--	No
Muridae (Mice, Muskrats, Rats, and Voles)			
Neotoma macrotis	Large-Eared Woodrat	--/--/--	No
Neotoma lepida	**Desert Woodrat**	**--/SSC/2**	**No**
Peromyscus californicus	California Mouse	--/--/--	No
Peromyscus maniculatus	Deer Mouse	--/--/--	No
Peromyscus eremicus	Cactus Mouse	--/--/--	No
Reithrodontomys megalotis	Western Harvest Mouse	--/--/--	No
CARNIVORA (Carnivores)			
Canidae (Foxes, Wolves, and relatives)			
**Canis lupus familiaris*	Domestic Dog	--/--/--	No
Canis latrans	Coyote	--/--/--	No
Urocyon cinereoargenteus	Gray Fox	--/--/--	No
ARTIODACTYLA (Even-toed Ungulates)			
Cervidae (Deer, Elk, and relatives)			
Odocoileus hemionus	**Southern Mule Deer**	**--/--/2**	**Yes**

[1] Listing Status – **Plants (Federal/State/CNPS/County)**: Federal: E – endangered, T – threatened, DL – federally delisted. State: E – endangered, T – threatened, R – rare. California Native Plant Society (CNPS): List 1B – Plants rare, threatened, or endangered in California and elsewhere, List 2: Plants rare, threatened, or endangered in California, but more common elsewhere, List 3 – Plants about which we need more information, List 4 – Plants of limited distribution (a watch list). County List: List A – plants rare, threatened, or endangered in California and elsewhere; List B – plants rare, threatened, or endangered in California but more common elsewhere; List C – plants which may be quite rare, but need more information to determine their true rarity status; List D – plants of limited distribution and are uncommon, but not presently rare or endangered.

Animals (Federal/State/County): Federal: E – endangered, T – threatened, DL – federally delisted. State: E – endangered, T – threatened, R – rare, SSC – species of special concern, FP – fully protected, WL – watch list. County List: List 1 – Species with a very high level of sensitivity, either because they are listed as threatened or endangered or because they have very specific natural history requirements that must be met; List 2 – Species that are becoming less common, but are not yet so rare that extirpation or extinction is imminent without immediate action. These species tend to be prolific within their suitable habitat types.

***** Introduced Species.

Appendix E

Photograph Vouchers

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Photographs of herpetofauna captured during pitfall sampling.

Photo 1: Western spadefoot (*Spea hammondii*).

Photo 2: Western toad (*Bufo boreas*).

Photo 3: Night snake (*Hypsiglena torquata*) captured in bucket.

Photo 4: Western fence lizard (*Sceloporus occidentalis*).

Photo 5: Rosy boa (*Lichanura trivirgata*).

Photo 6: Southern alligator lizard (*Elgaria multicarinata*).

Photographs of herpetofauna captured during pitfall sampling *continued*.

Photo 7: Coast horned lizard (*Phrynosoma coronatum*).

Photo 8: Red diamond rattlesnake (*Crotalus ruber*) entering snake trap.

Photo 9: Orange-throated whiptail (*Cnemidophorus hyperythrus*).

Photo 10: Gilbert's skink (*Eumeces gilberti*).

Photographs of small mammals captured during small mammal trapping.

Photo 1: California pocket mouse (*Chaetodipus californicus*).

Photo 2: Dulzura kangaroo rat (*Dipodomys simulans*).

Photo 3: Large-eared woodrat (*Neotoma macrotis*).

Photo 4: California mouse (*Peromyscus californicus*).

Photo 5: Woodrat nest.

Photographs of medium and large mammals detected.

Photo 1: Coyote (*Canis latrans*).


Photo 2: Mule deer (*Odocoileus hemionus*) tracks.

Photo 3: Domestic dog (*Canis lupus familiaris*) off leash.