Biological Diversity Baseline Report

FOR THE

Lawrence and Barbara Daley Preserve

County of San Diego

January 2011

Prepared for:

Department of Parks and Recreation
County of San Diego
9150 Chesapeake Dr., Suite 200
San Diego, CA 92123

Contact: Jennifer Haines

Prepared by:

Technology Associates
9089 Clairemont Mesa Blvd.,
Suite 200
San Diego, CA 92123

Contact: Christina Schaefer






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January, 2011

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Executive Summary

The purpose of this Biological Diversity Baseline Report for the Lawrence and Barbara Daley Preserve is to provide the County of San Diego with information on existing biological conditions to assist in the development of Area Specific Management Directives. The approximately 597-acre[1] Preserve is located in the south central portion of San Diego County, in the community of Dulzura, north and east of Highway 94 and south of Honey Springs Road. Technology Associates International Corporation (Technology Associates) assisted by the San Diego Natural History Museum, conducted baseline biological surveys at the Preserve on behalf of the County of San Diego Department of Parks and Recreation.

Baseline surveys were conducted in the winter, spring, and summer of 2009-2010. 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) butterfly inventory surveys, (4) pitfall trapping for amphibians, reptiles, and small mammals, (5) arroyo toad surveys, (6) aquatic herpetofauna surveys, (7) diurnal avian point count surveys, (8) nocturnal avian surveys, (9) acoustic bat surveys, (10) small mammal trapping, and (11) track and camera station surveys for medium and large mammals. Due to the 2007 Harris fire that burned all of the Preserve, results of these surveys may under-represent the diversity of plant and wildlife species that occupy the Preserve.

Ten vegetation communities were mapped within the Preserve and consist of Diegan coastal sage scrub, coastal sage-chaparral scrub, southern mixed chaparral, native grassland, non-native grassland, southern riparian woodland, coast live oak woodland, eucalyptus woodland, disturbed habitat, and urban/developed habitat. The most abundant vegetation community on the Preserve is Diegan coastal sage scrub, which makes up approximately 417.20 acres or 70% of the total area. Floristic surveys documented 355 plant taxa occurring on site. These include both native and non-native species along with eleven sensitive (California Native Plant Society List 1-4) plant species, including: desert fragrance (*Ambrosia monogyra*), San Diego needlegrass (*Achnatherum diegoensis*), Palmer's sagewort (*Artemisia palmeri*), San Diego sunflower (*Bahiopsis* [*Viguiera*] *laciniata*), delicate clarkia (*Clarkia delicata*), Palmer's goldenbush (*Ericameria palmeri* var. *palmeri*), chocolate lily (*Fritillaria biflora* var. *biflora*), southwestern spiny rush

[1] The assessor's parcel data reports the Preserve to be 604 acres; however, calculations generated from the SanGIS parcel database show the Preserve as 597 acres. Therefore, this report references the Preserve as 597 acres.

(*Juncus acutus* spp. *leopoldii*), Cooper's rein orchid (*Piperia cooperi*), Fish's milkwort (*Polygala cornuta* var. *fishiae*), and Engelmann's oak (*Quercus engelmannii*)

A total of 131 animal species were documented from the Preserve during 2009-2010 baseline surveys. These include 13 species of butterflies, three (3) species of amphibians, 15 species of reptiles, 71 species of birds, and 29 species of mammals. No federally or state listed species were detected; however, five (5) species covered locally under the South County San Diego County Multiple Species Conservation Plan (South County MSCP) were detected during baseline surveys: orange throated whiptail (*Aspidoscelis hyperythra*), northern harrier (*Circus cyaneus*), Cooper's hawk (*Accipiter cooperii*), western bluebird (*Sialia mexicana*), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*),and southern mule deer (*Odocoileus hemionus*).

Evidence of human migrant use was present on the Preserve judging from trash accumulation along the central ridge on the Preserve. Monthly trash removal and ranger patrols to discourage the use of the Preserve by undocumented migrants should be one of the highest management priorities in the event public access is allowed in the Preserve. Currently, no roads exist on the Preserve except for minor spur roads straddling peripheral areas. Infrastructure development, including trails, kiosks, gates, and signage, must be carefully implemented to avoid sensitive biological and cultural resources on the Preserve and provide safe public access. Site-specific biological surveys should be conducted in sensitive species habitat before any infrastructure development is implemented. The Preserve is in various stages of recovery from the 2007 Harris Fire; therefore, restoration opportunities were not currently identified; however, fire management along the north-eastern portion of the Preserve, adjacent to rural residential development, will need to be evaluated when developing a Resources Management Plan for the Preserve.

1.0 Introduction

1.1 Purpose of the Report

The purpose of this report is to document biological baseline data collected by Technology Associates International (TAIC) and the San Diego Natural History Museum (SDNHM) in 2009-2010 for the County of San Diego's Lawrence and Barbara Daley Preserve (Preserve). The Preserve is located in the south-central portion of San Diego County (Figure 1-1). It is managed by the County of San Diego Department of Parks and Recreation, and the information contained in this report 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 MSCP Context

The Preserve was acquired by the County in the year 2000. The footprint of the Preserve was originally not identified as planned conserved lands in the South Metro-Lakeside-Jamul Segment of the South County Multiple Species Conservation Program (MSCP) Subarea Plan (1998) (Figure 1-2). However, it was added to the County's South County MSCP preserve system upon acquisition. The Preserve is adjacent to the South County MSCP designated Otay Mountain/Jamul Mountains to Sycuan Peak Habitat Linkage and provides an important open space linkage between preserved lands, including CDFG's Rancho Jamul Ecological Reserve and Hollenbeck Canyon Wildlife Area to the north of the Preserve, and BLM conserved open space to the south of the Preserve (Figure 1-3). No particular management directives have been identified in the South County MSCP that apply specifically to the Preserve.

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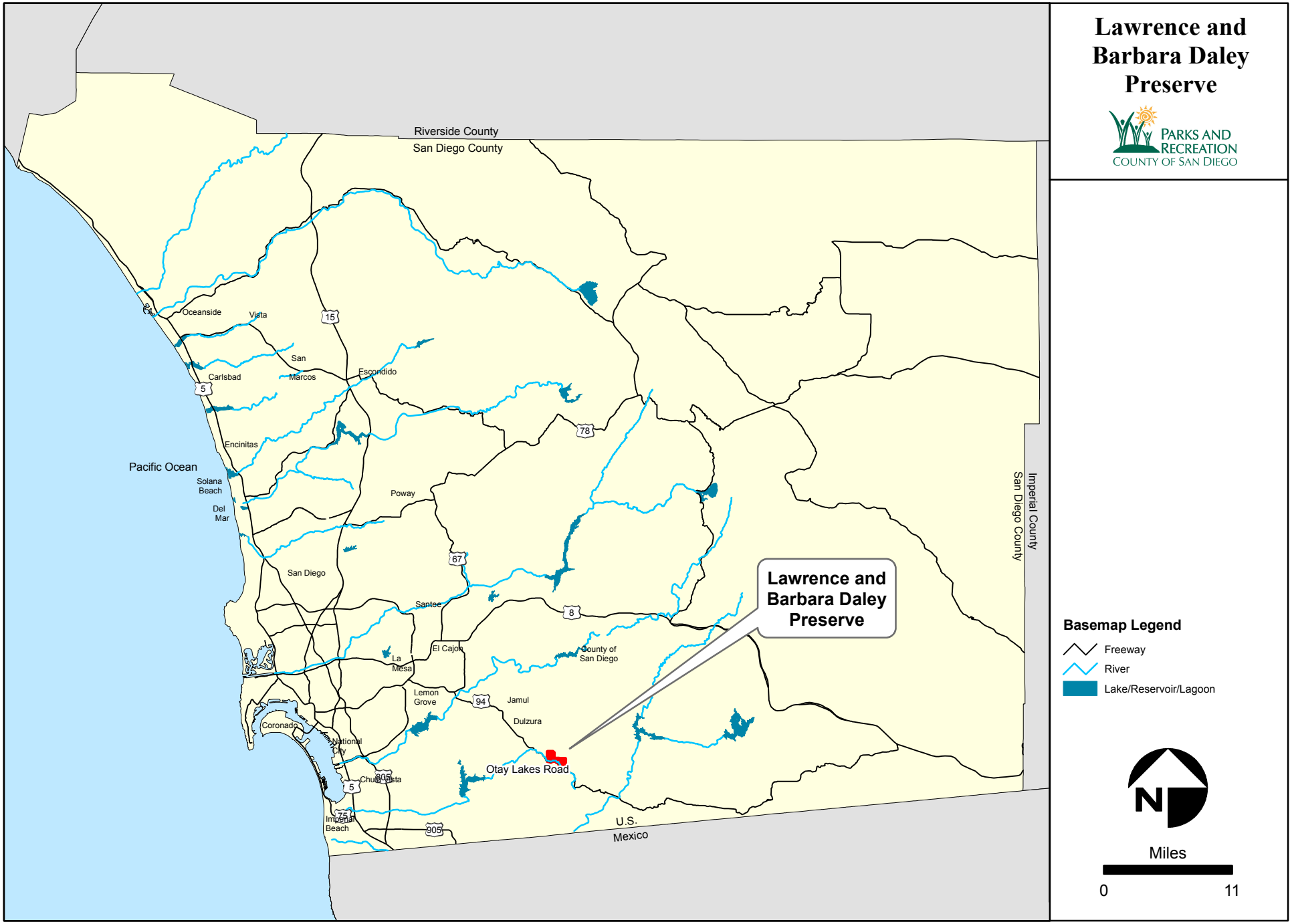

Technology Associates International Corporation

Regional Location Map

Figure 1-1

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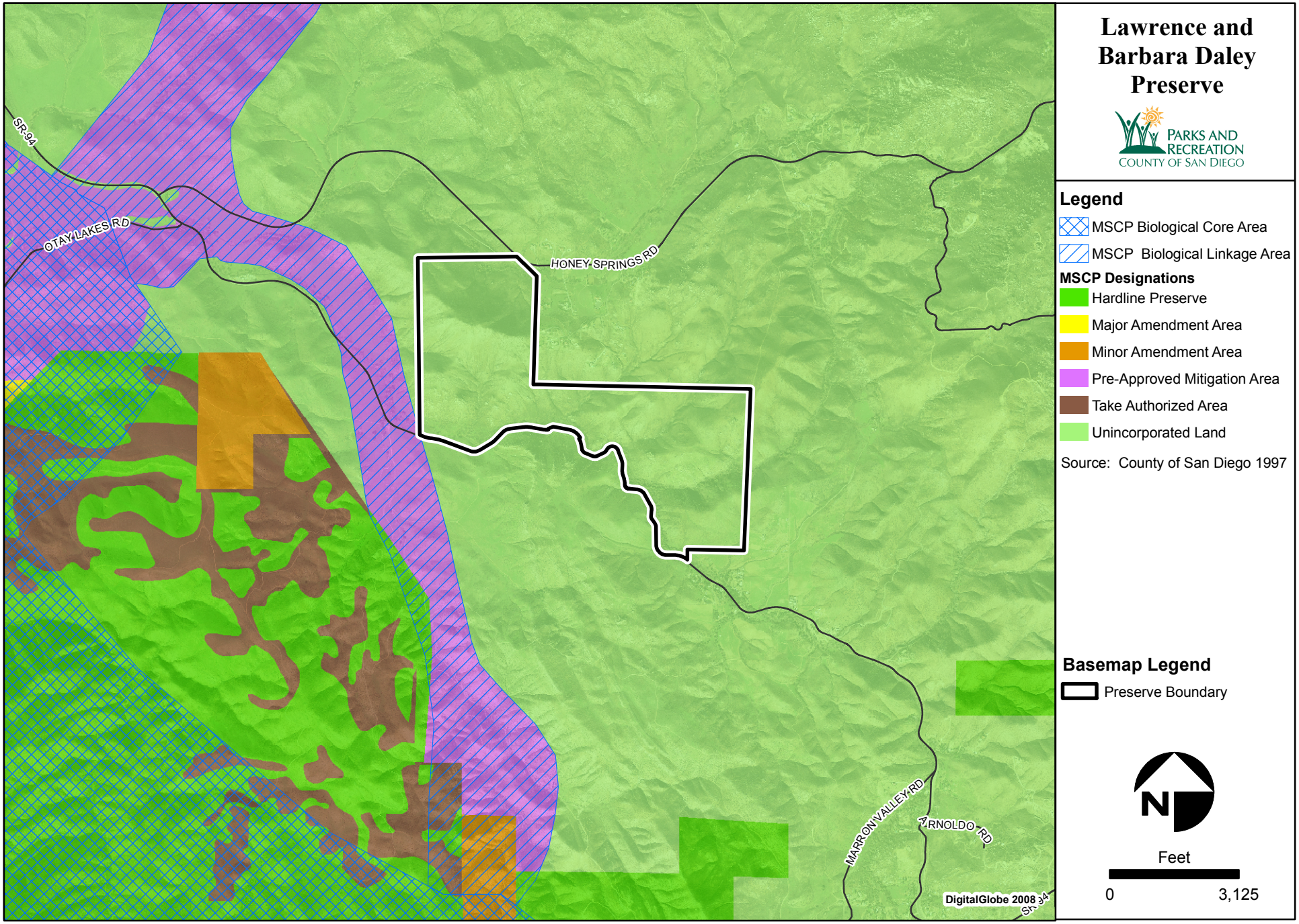

Lawrence and Barbara Daley Preserve

PARKS AND RECREATION
COUNTY OF SAN DIEGO

Legend

- MSCP Biological Core Area
- MSCP Biological Linkage Area

MSCP Designations

- Hardline Preserve
- Major Amendment Area
- Minor Amendment Area
- Pre-Approved Mitigation Area
- Take Authorized Area
- Unincorporated Land

Source: County of San Diego 1997

Basemap Legend

- Preserve Boundary

N

Feet

0 3,125

Technology Associates International Corporation

County of San Diego MSCP Preserve System

Figure 1-2

File: T:\projects\DaleyRanch\Plots\Figures\MSCP.mxd

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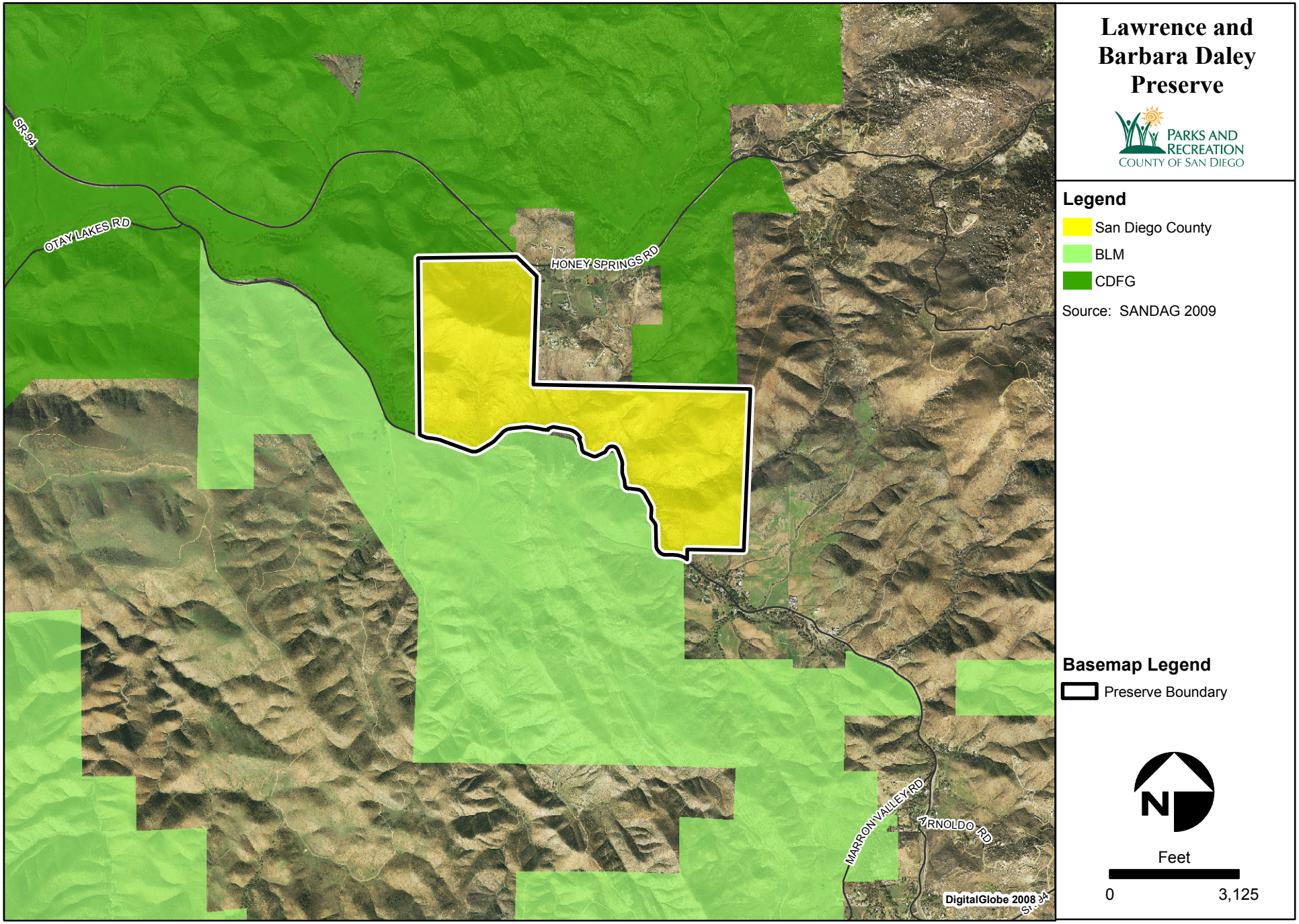

Lawrence and Barbara Daley Preserve

PARKS AND RECREATION
COUNTY OF SAN DIEGO

Legend

- San Diego County
- BLM
- CDFG

Source: SANDAG 2009

Basemap Legend

- Preserve Boundary

N

Feet

0 3,125

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Conserved Lands

Figure 1-3

File: T:\projects\DaleyRanch\Plots\Figures\Conserved Lands.mxd

Date: Oct 01, 2010

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2.0 Study Area Description

2.1 Project Location

The approximately 597-acre[2] Preserve is located in the south central portion of San Diego County just north and east of Highway 94 and south of Honey Springs Road in the community of Dulzura. The Preserve is located within the southwest quarter of Section 29, the north quarter of Section 32 and northwest quarter of Section 33 in Township 17 South, Range 2 East; it is shown on the Dulzura USGS 7.5' Quadrangle (Figure 2-1).

The Preserve is comprised of the following Assessor's Parcel Numbers (APN): 60009027; 60015007; 60015008; and 60016017 (Figure 2-2). The Preserve is currently not open to the public and no public access to the Preserve is currently being maintained. Public access may be planned in the future and is at the discretion of the County of San Diego Department of Parks and Recreation (DPR). Gated access to the Preserve is located at Honey Springs Road on the north side and at State Route 94 on the south side.

2.2 Geographical Setting

The Preserve is situated in the foothill region of the southern portion of San Diego County, Dulzura area. Dulzura Creek follows the southwestern boundary of the Preserve forming a narrow canyon (Figure 2-1). Honey Springs Creek forms a drainage along the northern edge of the Preserve and the two drainages converge west of the Preserve. A third drainage, Pringle Creek, flows into the eastern portion of the Preserve. The Preserve itself includes these three canyon drainages but is dominated by steeply sloped granitic ridges. These ridges make up the dominant landforms within the Preserve and are separated by small steeply dropping westerly and southern trending seasonal drainages. The Preserve is at an elevation between approximately 780 to 1,560 feet (24 to 475 meters) above mean sea level (AMSL).

[2] The assessor's parcel data reports the Preserve to be 604 acres; however, calculations generated from the SanGIS parcel database show the Preserve as 597 acres. Therefore, this report references the Preserve as 597 acres.

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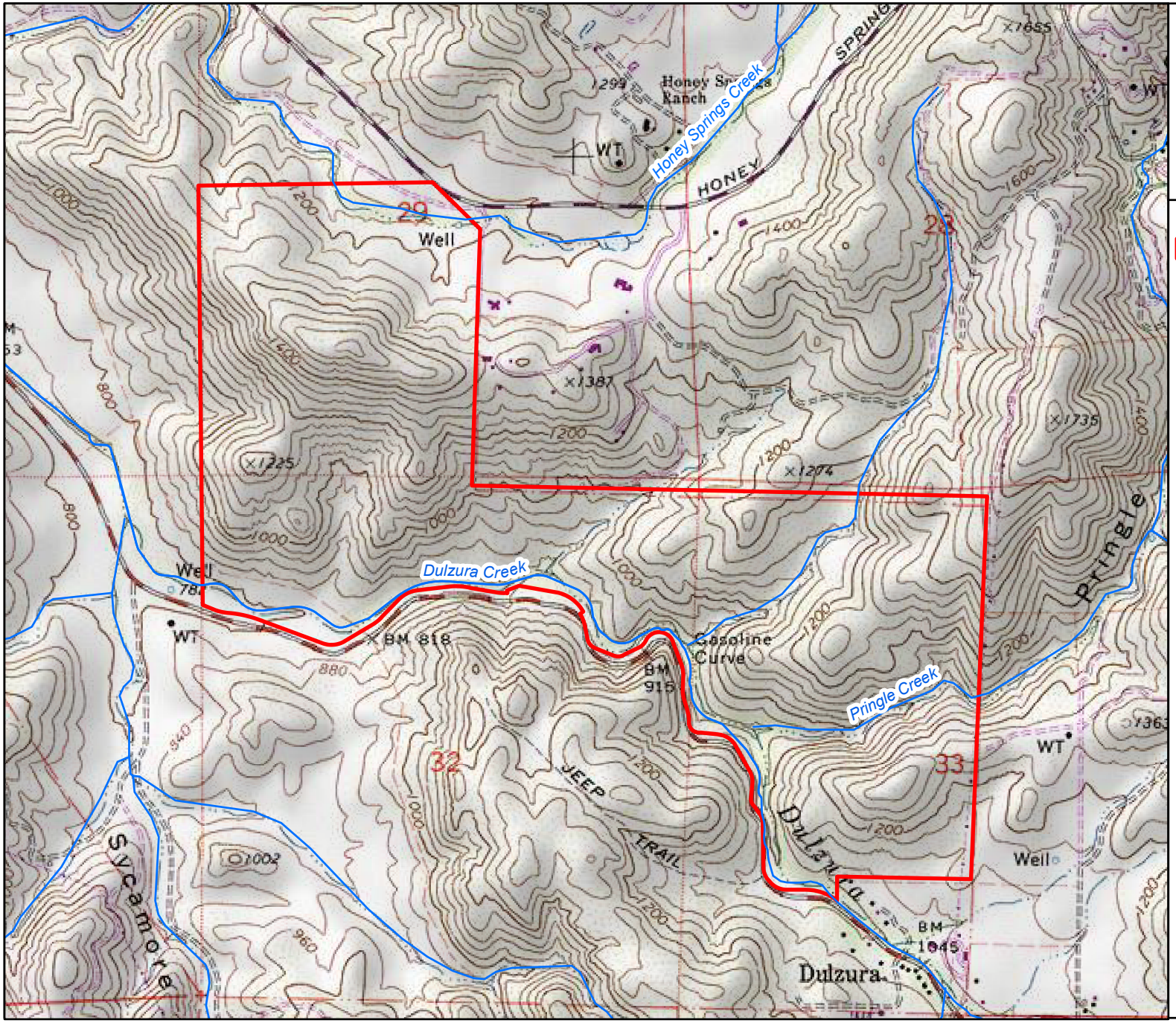

Lawrence and Barbara Daley Preserve

PARKS AND RECREATION
COUNTY OF SAN DIEGO

Legend

Preserve Boundary

N

Feet

0 1,460

Technology Associates International Corporation

USGS 7.5 Minute Dulzura Quadrangle

Figure 2-1

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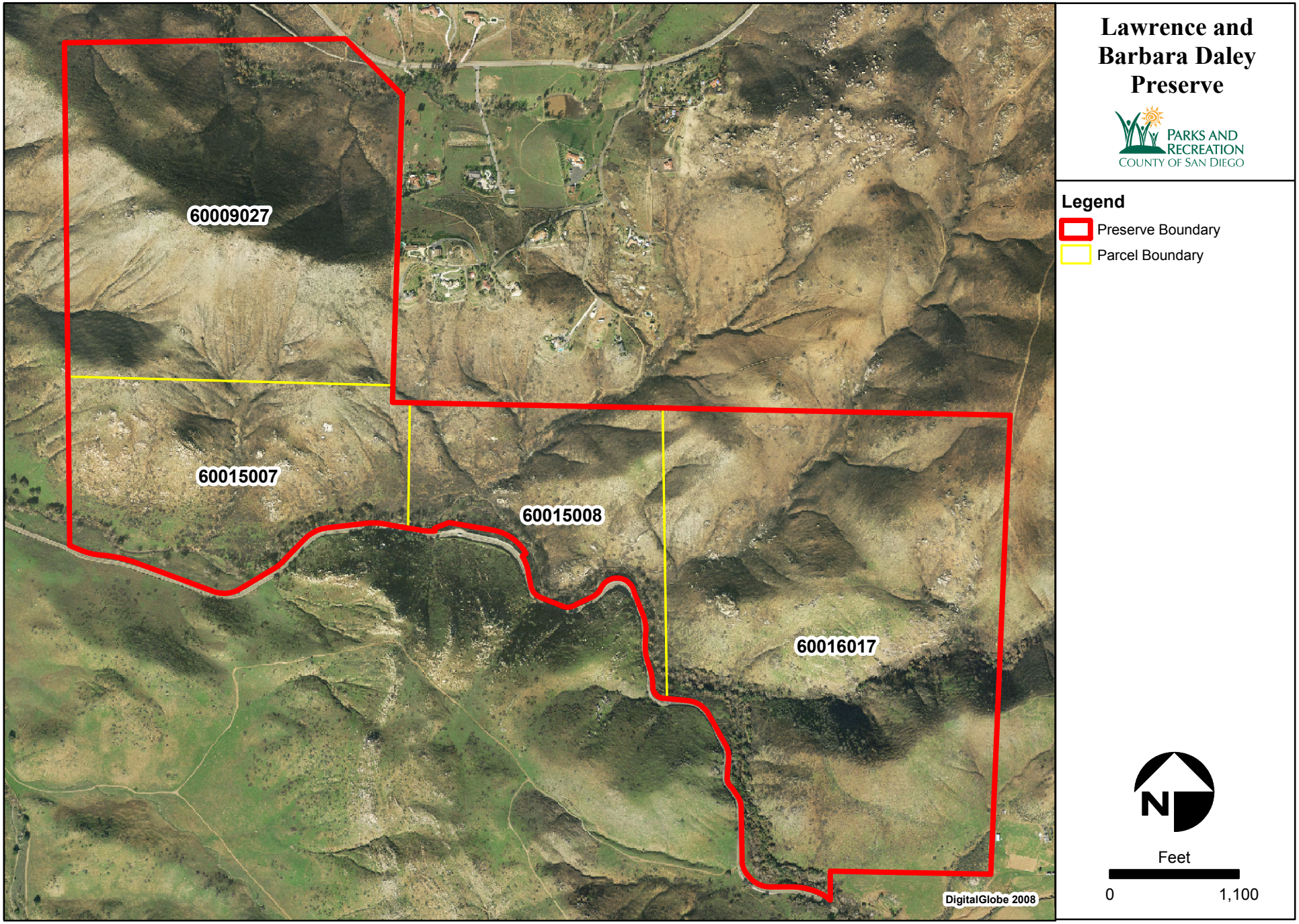

Technology Associates International Corporation

Study Area with Assessor's Parcel Numbers

Figure 2-2

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2.3 Geology and Soils

The geomorphology of the Preserve is a product of the region's geologic history. During the Jurassic and late Cretaceous (more than 100 million years ago) a series of volcanic islands ran parallel to the current coastline in the San Diego region. After the ocean receded, the remnants of these volcanic islands became Double Peak, Black Mountain, and the Jamul Mountains among others. At about the same time, a granitic and gabbroic batholith was being formed under and east of these Jurassic and late Cretaceous-age volcanoes. This batholith was uplifted and forms the granitic rocks and outcrops of the Peninsular Range and the foothills to the west of this range (California Division of Mines and Geology 1975).

Seven different soil series are represented on the Preserve (Figure 2-3): Cieneba, Escondido, Fallbrook, Friant, Ramona, Visalia, and Vista (USDA Soil Survey 1973). The soils and quantitative coverage of these soils in the Preserve are listed in Table 2-1.

Table 2-1.Aerial Coverage of Soil Series on the Preserve.

Soil Series	**Total Acres**
Cieneba-Fallbrook	315.49
Escondido	1.12
Fallbrook	31.96
Fallbrook-Vista	1.78
Friant	102.12
Ramona	35.64
Stony Land	0.60
Visalia	49.52
Vista	59.25

Cieneba Series: Soils tend to be excessively drained, very shallow, to shallow coarse sandy loams (USDA Soil Survey 1973). These soils are from weathered granitic rock. They are usually found on rolling to mountainous uplands with slopes ranging from five (5) to 75 percent. Cieneba-Fallbrook rocky sandy loams are mix of coarse sandy loams and sandy loams. Rock outcrops cover about 5 percent of the surface and large boulders about 10 percent. The soil is very well drained with moderate erosion.

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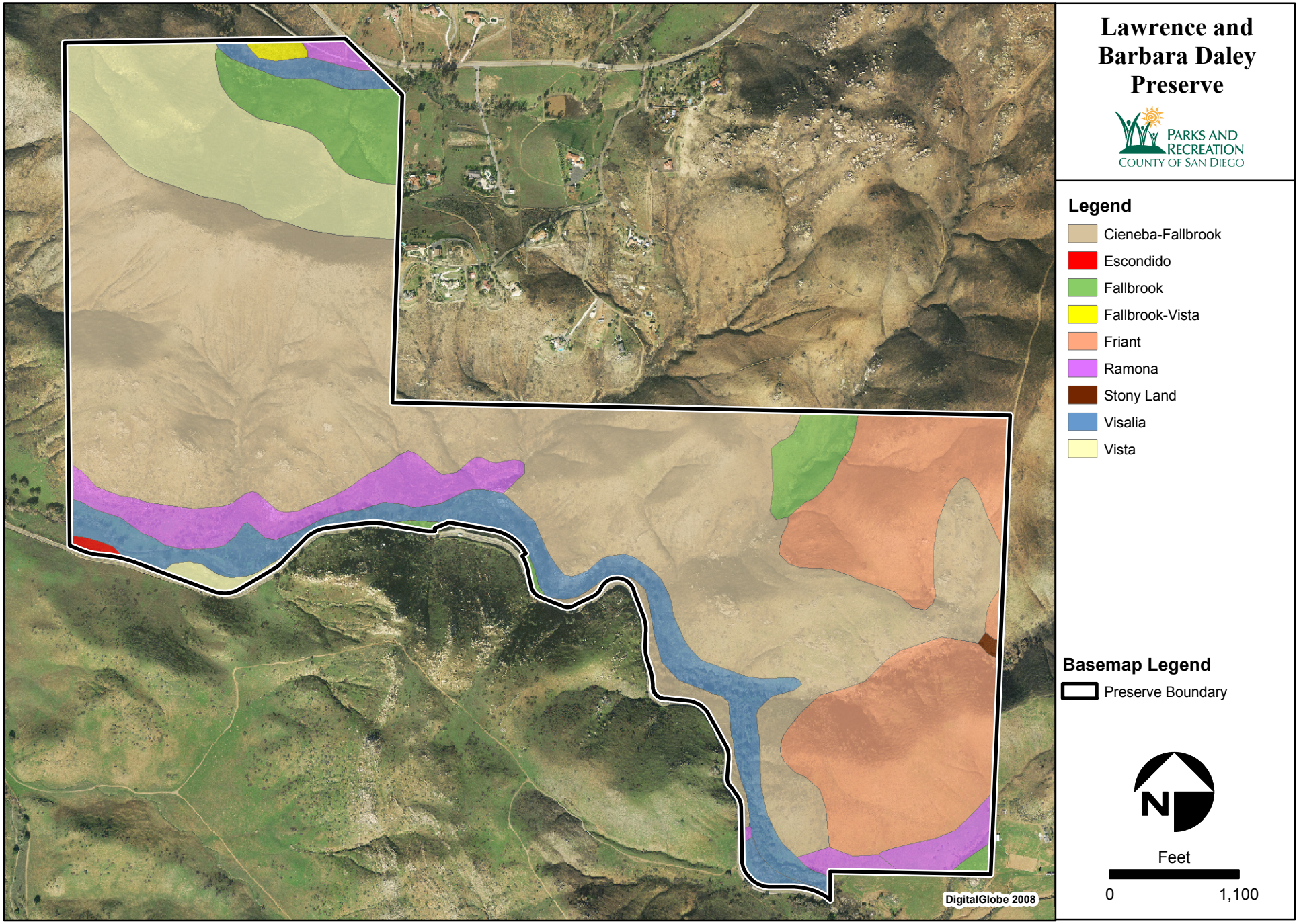

Technology Associates International Corporation

Soils

Figure 2-3

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Date: Oct 01, 2010

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Escondido Series: Soils tend to be dark brown and slightly acid, well-drained, and moderately permeable. Horizons vary with A horizons generally consisting of very fine sandy loam and B2 horizons consisting of very fine sandy loam over hard metamorphic bedrock. These soils are found in hilly areas and foothills at 400-2,800 feet in elevation (USDA Cooperative Soil Survey 2010).

Fallbrook Series: Soils consist of deep, well drained soils that are formed from weathered granitic rocks. These soils are found on rolling hills at slopes of 5-75 percent. Fallbrook sandy loams are usually a yellow-brown color at the surface with subsoils ranging from reddish-browns to light brown or brown (USDA Cooperative Soil Survey 2010).

Friant Series: Soils consist of shallow and very shallow, well-drained fine sandy loams (USDA Soil Survey 1973). These are usually found on mountainous uplands and have formed from weathered fine-grained metasedimentary rock such as mica schist, quartz schist and gneiss. Friant fine sandy loams are a steep soil and are found on moderate slopes and range in color from dark brown to brown. Slopes range from 9-75 percent and elevations from 500-3,500 feet (USDA Cooperative Soil Survey 2010).

Ramona Series: Soils are generally brown, slight to medium acidity, and sandy loam to fine sandy loam for the A horizons. B horizons are generally reddish brown and yellowish red, slightly acid, sandy clay loam. Soils tend to be well-drained with slow to rapid runoff. Soils are moderately permeable and found at elevations of 250-3,500 feet (USDA Cooperative Soil Survey 2010).

Stony Land: Stony land occurs at the base of cliffs or below steep rocky slopes. Stony land is usually strongly sloping to very steep. The material consists mainly of large quantities of stones, boulders, and cobblestones, and some finer material (USDA Soil Survey 1973).

Visalia Series: Soils consist of moderately well drained, very deep sandy loams derived from granitic alluvium (USDA Soil Survey 1973). These soils are usually on alluvial fans and flood plains. In areas the soil is gravelly throughout. The gravelly sandy loams are moderately sloping and with about 15 percent gravel. Runoff is slow with little erosion. Visalia sandy loams are found on more level areas or on flood plains with slopes less than 2 percent.

Vista Series: Soils consist of well-drained, moderately deep coarse sandy loams formed from decomposed granitic rocks. These soils are usually found on uplands and with

slopes ranging from 2 to 75 percent. These soils range in color form dark grayish-brown to dark brown and yellowish-brown at deeper layers. Soils have slow to rapid runoff and moderately rapid permeability (USDA Cooperative Soil Survey 2010).

2.4 Climate

Cismontane portions of San Diego County and Southern California largely have a Mediterranean climate. This is characterized by mild winters with modest precipitation and arid, warm to hot summers according to the Koppen Classification System[3] (Pryde 2004). The Preserve is located far enough inland to frequently minimize marine influence and keep summer temperatures warm to hot. Also due to lessened marine influence, winter low temperatures can occasionally drop to the freezing range. Monthly mean temperature data recorded at a weather station in Dulzura (N 32.6°; W 116.8°) from 1 January 2009 to 30 December 2009 are presented in Table 2-2. Precipitation data are presented in Table 2-3 (Weather Underground 2010).

Table 2-2.Monthly Mean High and Low Temperatures (2009) for Dulzura, California (N 32.6°; W 116.8°)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average High Temperature (°F)	69	67	68	78	67	70	76	84	82	75	68	64
Average Low Temperature (°F)	47	47	51	53	60	62	66	65	67	56	52	47

Table 2-3.Monthly Mean Precipitation in inches (2009) for Dulzura, California (N 32.6°; W 116.8°)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Total Precipitation (in.)	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.16

The climate data shown in Tables 2-2 and 2-3 highlight the generally arid precipitation regime characteristic of the region. Precipitation in minimal amounts can occasionally

[3] The Koppen Classification System is based on the concept that native vegetation is the best expression of climate. Thus, the system delineates climate zone boundaries based on vegetation distribution. The climate zones are also defined by average annual and monthly temperatures and precipitation, and the seasonality of precipitation.

occur in summer from tropical weather systems but the majority comes from winter storms originating in the middle to high latitudes of the North Pacific Ocean.

2.5 ***Hydrology***

Hydrology within the Preserve is typical for the region's semiarid climate and is, other than Dulzura Creek, restricted to small ephemeral drainages. Located in the south-eastern portion of the Otay River watershed bordering onto the Tijuana River watershed, the Preserve is drained by Honey Springs Creek on the northwest, Dulzura Creek along almost the entire southwestern boundary, and to a lesser extent, Pringle Creek in the extreme southeast portion (Figure 2-1). Pringle Creek merges with Dulzura Creek northwest of the town of Dulzura and Honey Springs merges with Dulzura Creek west of the Preserve in the vicinity of Otay Lakes Road. Two unnamed blue-line drainages flow southward into Dulzura Creek near the central portion of the Preserve. In addition to local runoff, Dulzura Creek receives regulated flow from Cottonwood Creek and its watershed by way of the Dulzura Conduit (City of San Diego 2006). Dulzura Creek then flows into Lower Otay Reservoir.

2.6 ***Fire History***

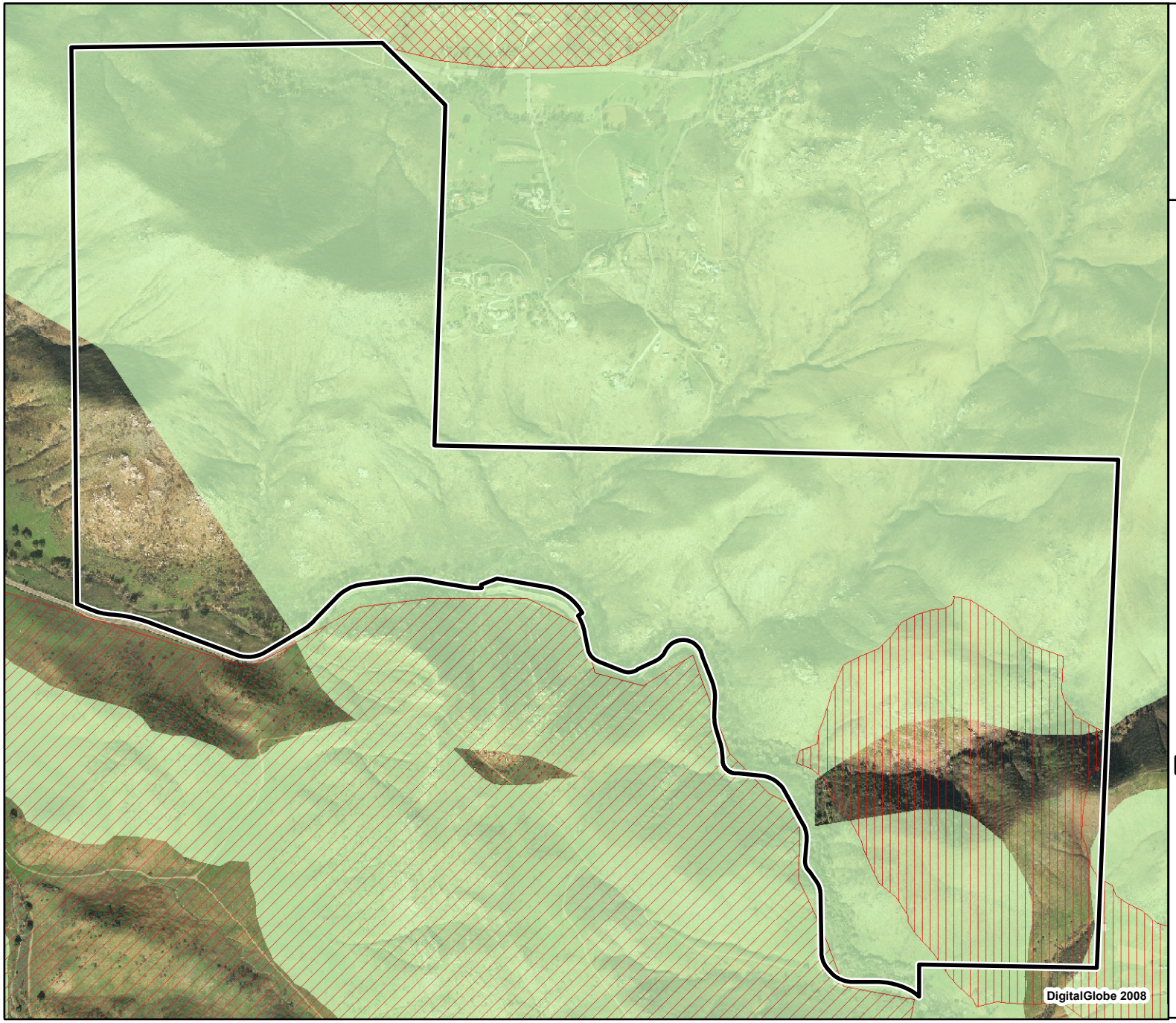
Wildfire is a natural disturbance cycle which has historically shaped the Preserve and the surrounding region. Plant species found in local vegetation communities (i.e. chaparral communities) have developed the ability to survive naturally spaced recurrent fires by producing seeds that require a fire-related 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 because in recent years the return cycle has increased due to human-caused fires exacerbated by Santa Ana wind conditions. The most recent firestorms in San Diego were human-caused (as are most wildfires); in addition, the sources of wildfires have shifted over time. The effects (including size and intensity) of these fires have increased and have been 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 have 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.

The most recent noteworthy wildfire recorded on the Preserve was the 2007 Harris Fire. This fire consumed the entire Preserve, although damage to riparian areas along Honey Springs, Dulzura, and Pringle Creeks was somewhat minimized by their moisture retention and substantial degree of fire resistance (Figure 2-4). The Otay Fire of 2003 was contained south of the Preserve along SR 94 and thus did not harm land within the

Preserve, but likely caused a major influx of animal species into the Preserve and northward. Recently, a majority of scrublands in the foothills of San Diego County have experienced more frequent fires than historically was the case. In these areas, specifically those hard hit and double-burned by the 2003 and 2007 wildfires, fire frequency has exceeded the threshold of tolerance for native vegetation communities allowing non-native grasses to establish and out-compete native species. This has resulted in type conversion from scrublands to non-native grasslands in many areas recovering from fire. Within the Preserve, vegetation community recovery from the 2007 Harris Fire has not yet progressed to a point where impacts can be assessed, given that no quantitative fire recovery data are available.

2.7 ***Trails***

Currently, no official trails exist on the Preserve. An unofficial trail can be found in the northernmost portion of the site, adjacent to Honey Springs Road (Figure 2-5). Small walking paths have been created by unauthorized immigrants that traverse the Preserve. Trash accumulation and other signs of use by unauthorized immigrants exist in many parts of the site, specifically along the eastern half of the ridge top in the northern portion of the property, adjacent to rural residential development (Figure 2-5).



Lawrence and Barbara Daley Preserve

PARKS AND RECREATION
COUNTY OF SAN DIEGO

Legend

- Fires Prior to 1990
- 1996 Honey Fire
- 2003 Otay/Mine Fire
- 2007 Border Fire

Note: The 2007 Harris Fire encompassed the entire preserve.

Basemap Legend

- Preserve Boundary

N

Feet

0 1,100

Technology Associates International Corporation

Fire History

Figure 2-4

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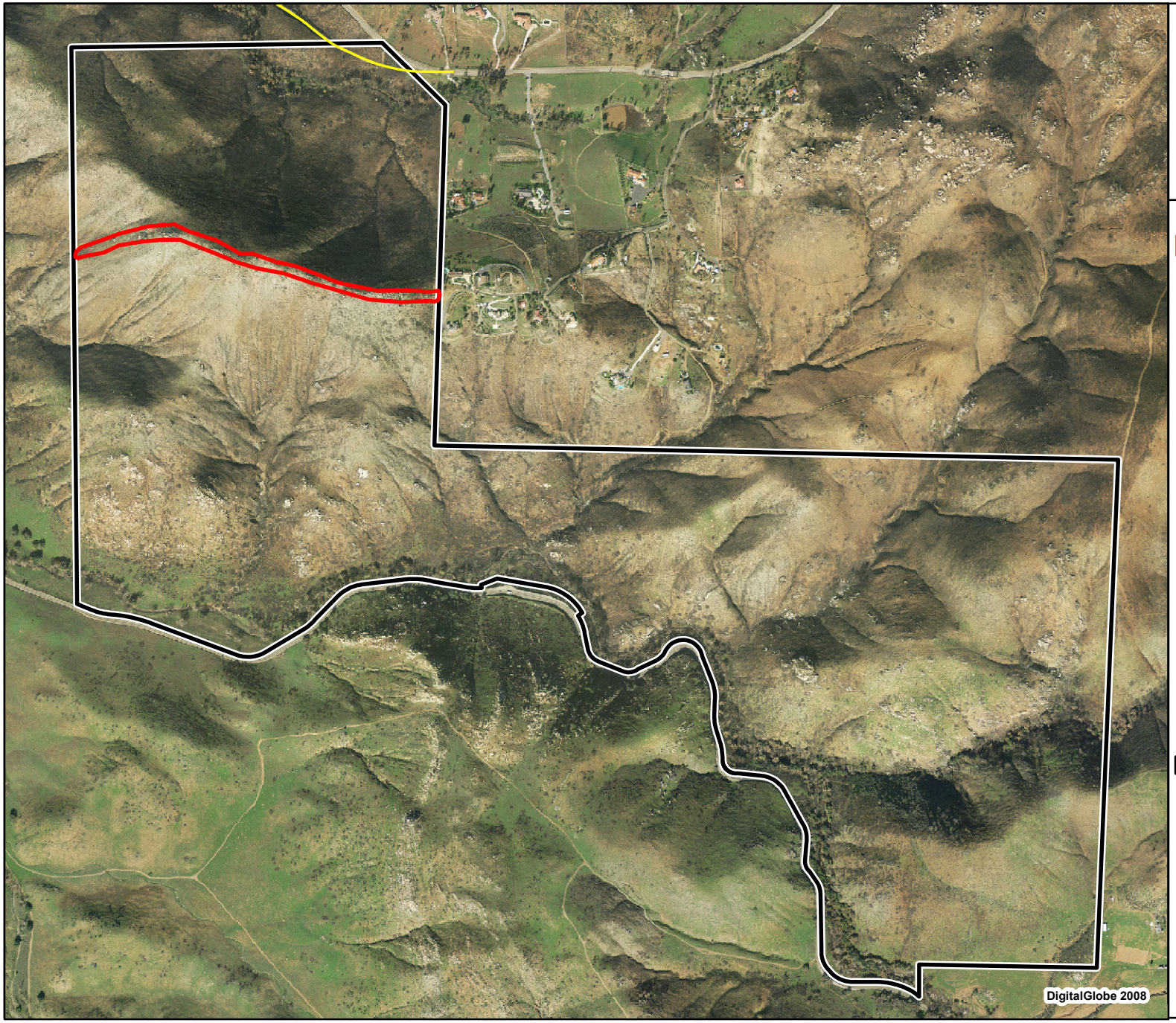

Lawrence and Barbara Daley Preserve

PARKS AND RECREATION
COUNTY OF SAN DIEGO

Legend

- Accumulated Trash*
- Trail

* Scattered trash, clothing, shoes, packs, etc.

Basemap Legend

- Preserve Boundary

N

Feet

0 1,100

Technology Associates International Corporation

Site Features

Figure 2-5

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Date: Nov 29, 2010

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3.0 **Methods**

Field surveys and field sampling was conducted during the 2009-2010 field season(s) by TAIC and SDNHM. Surveys were conducted using protocols provided by the County of San Diego and based on highest cost to protocols ratio, relying on a stratified approach rather than comprehensive sampling. Vegetation communities mapping and baseline biological surveys for plants and wildlife were conducted on the Preserve from September 2009 through May 2010. The protocols used for the field surveys are described below. Survey personnel and survey schedules are detailed in Table 3-1. All survey and GIS data were entered into San Diego County's Biological Database (SanBIOS) forms and submitted to the County.

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 (2010a), California Department of Fish and Game (2010), San Diego Bird Atlas (Unitt 2004), and Mammals of San Diego County (SDNHM in progress), and HerpNet for museum voucher specimens.

3.1 ***Vegetation Communities/Habitat***

Mapping of vegetation communities was conducted by qualified biologists within the Preserve on March 5, 2010 (Table 3-1). Vegetation communities were mapped within the Preserve boundaries plus a 100-foot buffer pursuant to County of San Diego guidelines (County of San Diego 2009a). 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 150-scale (1" = 150') 2009 color aerial photograph. The natural vegetation community classification system used in this report is consistent with the classification used in the County of San Diego Guidelines (2009), which is based on the Holland classification system (1986), as modified by Oberbauer (2006).

3.2 ***Plants***

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 (2010a), California Department of Fish and Game (2004), California Native Plant Society's (CNPS) Inventory of Rare and Endangered Vascular Plants (CNPS 2010), and

the SDNHM Plant Atlas Project and Herbarium databases (San Diego Natural History Museum 2010). Floristic collection guidelines are detailed in Appendix A.

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

Survey Type	Dates	Personnel[1]
Vegetation Communities Mapping	5 March 2010	RH, DL
Habitat Assessments (Quino Checkerspot Butterfly)	5 March 2010	MW
Rare Plant and floristic Surveys	6 April 2010	RH, JR
	8 April 2010	RH, JR
	13-15 April 2010	RH, JR
Lepidoptera Surveys	15 April 2010	MW
	11 May 2010	MW
	27 May 2010	MW
	2-9 June 2010	MW
Herpetofauna Pitfall Surveys	22-26 March 2010	BH, MS
	5-9 April 2010	MS, DM
	12-16 July 2010	MS, DM
Herpetological Visual Encounter Surveys (terrestrial and aquatic)	23 March 2010	BH, MS
	15 July	BH, LW
Aquatic and Arroyo Toad Surveys	23 March 2010	BH, MS, LW
	14 April 2010	BH, MS
	28 June 2010	MS, DM
Avian Surveys	2 February 2010	GR
	26 February 2010	GR
	12 March 2010	GR
	24 March 2010	GR
	7 April 2010	GR
	26 April 2010	GR
Bat Surveys (Passive)	16-21 September 2009	DS
	25-29 June 2010	DS
Small Mammals	22-26 March 2010	DM, MS,
	5-9 April 2010	DM, MS
	12-16 July 2010	DM, MS
Large Mammals	22-26 March 2010	DM, MS
	5-9 April 2010	DM, MS
	12-16 July 2010	DM, MS

[1] Technology Associates Personnel: RH=Rosanne Humphrey, DL=Dr. Derek Langsford, GR=Geoffrey Rogers; SDNHM Personnel: BH= Dr. Bradford Hollingsworth, TM=Tom Myers, JR= Dr. Jon Rebman, DS=Drew Stokes, DM=Dana McLaughlin, MS=Melissa Stepek, LW=Laura Williams; MW= Dr. Michael Wall .

3.2.1 **Floristic and Rare Plant Surveys**

A general floristic survey and rare plants survey were conducted concurrently on April 6, 8, 13, and 15, 2010 to identify the general floristic diversity, sensitive endemic species, and other rare plants in the Preserve. 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. Surveys were conducted in the month of April, which is within the growing and flowering season for most species in the coastal areas of San Diego County (March through May). It should be noted that survey season, conditions in the field, and the amount and timing of seasonal precipitation may have influenced the number of rare plants encountered.

A species list was compiled for all identifiable species found in the Preserve, including native and non-native plants. All plant species were identified by Dr. Jon Rebman, Curator of Botany at the San Diego Natural History Museum (SDNHM). Locations of 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, and individuals within a given population were counted or estimated when feasible. To document some of the rare species onsite, herbarium samples were taken by Dr. Rebman. 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[4]).

3.2.2 **Invasive Species Surveys**

Highly invasive exotic plant species or areas of high concentrations of non-natives encountered during the floristic survey were mapped as points or polygons using a GPS unit, or by drawing the approximate area of coverage onto a 150-scale color aerial photograph.

[4] 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 B, prepared by the SD Herbarium.

3.3 Wildlife

Biologists conducted the following wildlife surveys to assess the current status of biological resources onsite: (1) checklist butterfly surveys, (2) visual encounter surveys and pitfall trapping to sample amphibians, reptiles, and small mammals, (3) focused arroyo toad surveys and aquatic herpetofauna surveys, (4) diurnal avian point count surveys, (5) nocturnal avian surveys, (6) acoustic sampling, and roost and foraging surveys for bats, (7) small mammal trapping using live Sherman traps, and (8) track and camera station surveys for medium and large mammals.

3.3.1 **Invertebrates**

Invertebrate surveys were limited to butterflies and 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 15 April, 11 and 27 May and 2-9 June 2010 (Table 3-1) and detected a total of 13 species of butterfly. Targeted walks were performed in all major vegetation communities 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). Most butterflies were identified on sight. Some individuals were netted to confirm identification. Data were collected in the field using a field notebook and GPS.

The survey method maximizes detection of diversity in initial biodiversity assessments; however, more comprehensive surveys will be needed in the future. Because the survey method is opportunistic, repeatability for statistical purposes is limited. Weather can impact survey success. For instance, an overcast and cool day can limit butterfly activity and lower the probability of observing butterflies in flight. In addition, vegetation has not yet fully recovered from the 2007 Harris fire, which may affect the overall recorded species richness during this initial checklist survey. Additional future monitoring surveys in the Preserve will undoubtedly uncover additional diversity.

3.3.2 **Herpetofauna**

Terrestrial Herpetofauna

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 (Fisher et al. 2008), modified per Anguiano (2008) by replacing funnel traps with box traps to increase the capture rate for snakes. Each pitfall array consisted of four 5-gallon buckets and 3 box funnel (12" x 8" x 18") traps connected by shade cloth drift-fences (15 m x 30 cm). Each array was created around a center bucket (pitfall) with three arms of drift fence extending out 15 meters 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).

Three 4-day sampling periods were conducted as follows: 22-26 March 2010, 5-9 April 2010, and 12-16 July 2010 (Table 3-1). This includes two separate visual encounter surveys performed on 23 March 2010 and 15 July 2010. 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 collected in the field using personal digital assistants (PDAs) and the Magellan MobileMapper CX.

The methods described above are the most widely used methods 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, and July.

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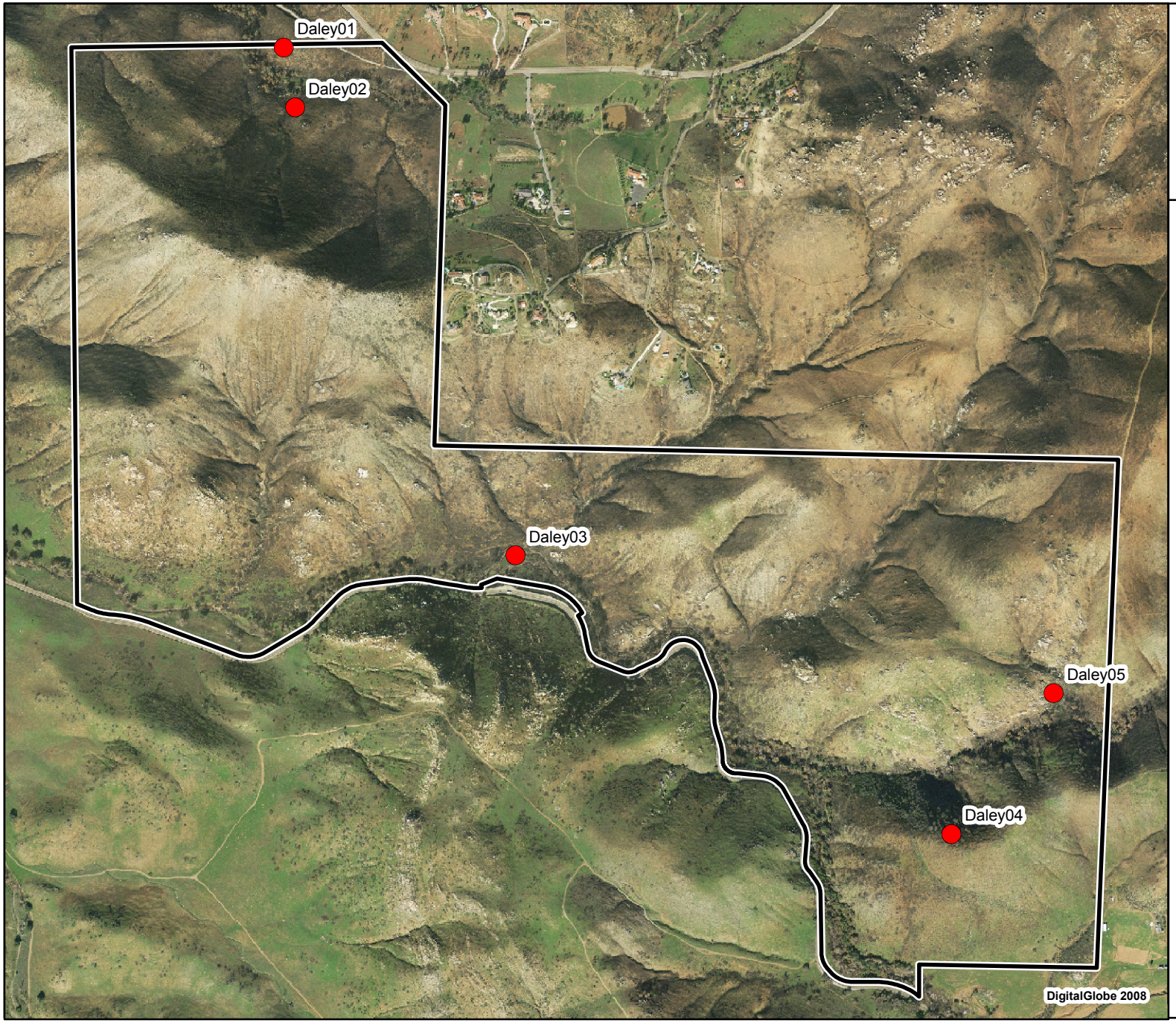

Lawrence and Barbara Daley Preserve

PARKS AND RECREATION
COUNTY OF SAN DIEGO

Legend

- Pitfall Array Location

Basemap Legend

- Preserve Boundary

N

Feet

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Technology Associates International Corporation

Terrestrial Herpetofauna Pitfall Array Locations

Figure 3-1

File: T:\projects\DaleyRanch\Plots\Figures\Herp Pitfalls.mxd

Date: Oct 01, 2010

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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. With generally low capture rates, additional sampling periods are needed for a complete inventory. Finally, although arrays were placed in representative areas, multiple arrays per land cover type are generally preferred to capture habitat variances.

Arroyo Toad Surveys

Focused surveys were conducted for the arroyo toad (*Anaxyrus californicus*) within the Preserve along Dulzura and Pringle Creeks following modified guidelines of the U.S. Fish and Wildlife Service (1999) with the exception that three surveys were conducted, which is consistent with recommendations by USGS (Atkinson et. al 2002) and USFWS (1999) for monitoring purposes (versus impact assessments, for which the USFWS protocol was intended). Early season arroyo toad surveys were conducted on 23 March 2010 and 14 April 2010 in Dulzura Creek and Pringle Canyon. The third survey was conducted in late breeding season, on 28 June 2010, to correspond with lower flow rates of both Dulzura and Pringle Creeks (Table 3-1).

Habitat was assessed along Dulzura and Pringle Creeks by searching for habitat features known to be associated with suitable arroyo toad habitat (i.e. low gradient drainages, predominant sandy substrate and adjacent banks, and terraces composed of friable soil types) as identified by Madden-Smith et al. (2005). In addition to this habitat assessment, biologists searched for physical evidence of arroyo toad life stages such as egg masses or tadpoles.

Nighttime surveys were conducted along Dulzura and Pringle Creeks where high or good quality habitat existed as determined during the daytime habitat assessment. These surveys included searching along the creeks for all life stages of the arroyo toad by visual or aural detections and commenced approximately one hour after sunset during appropriate weather conditions. Data were collected in field notebooks and the Magellan MobileMapper CX to document air and water temperature, habitat conditions, water velocity, and species observed. Biologists used headlamps and flashlights to assist with nighttime surveys.

3.3.3 **Birds**

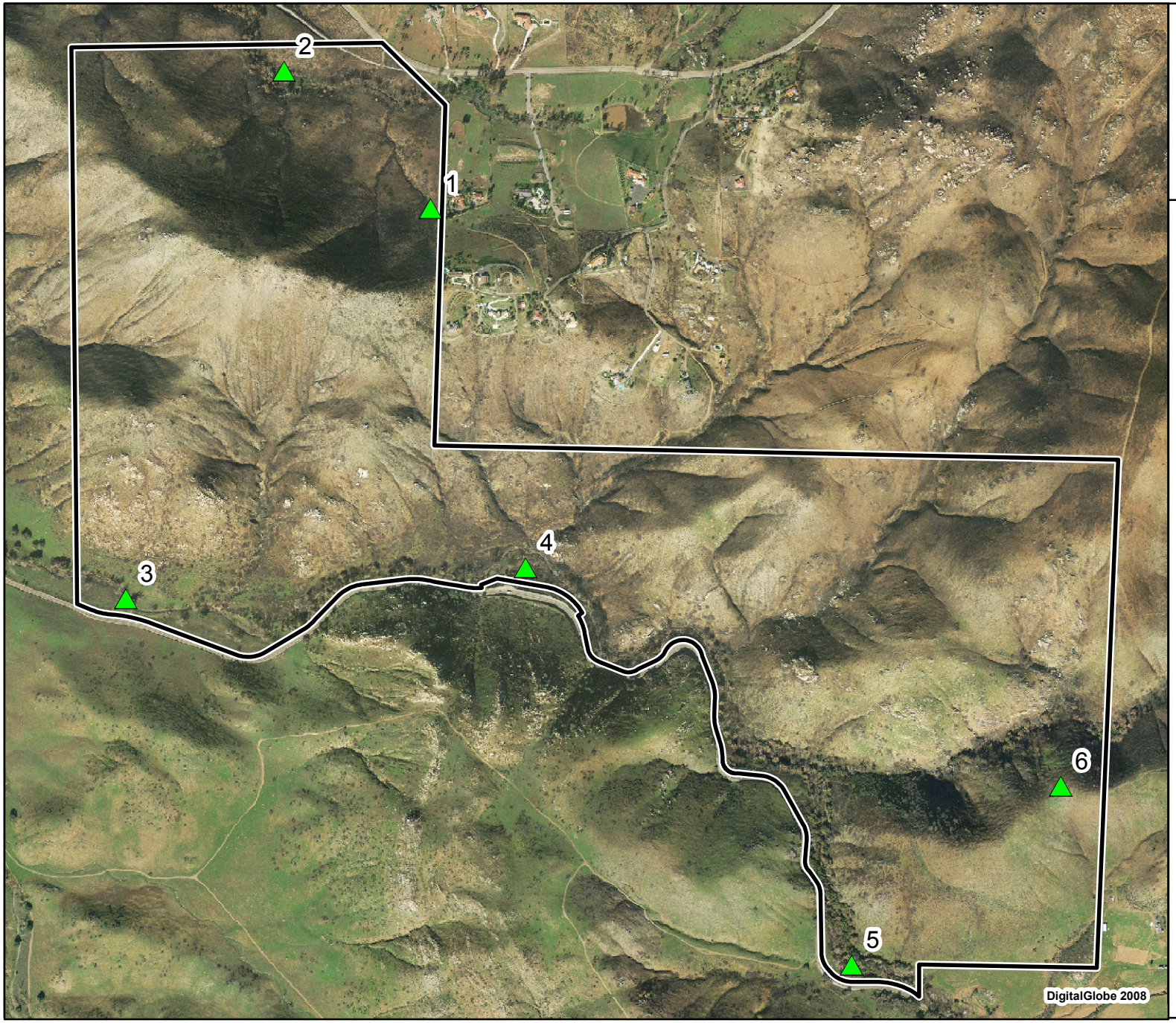
Diurnal Point Count Surveys

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. Stations 1 and 2 were separated by a 5-minute walk; while other points required a combination of driving and walking to reach. The positioning was such 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.

A total of six (6) point count stations were established in the Preserve (Figure 3-2). Two were located at the northwestern boundary of the property along Honey Springs Road (Stations 1 and 2), one was located near the southwestern corner of the property along Dulzura Creek (Station 3), two more were located further east also along Dulzura Creek (Stations 4 and 5), and one was located near the eastern property boundary on the ridge south of Pringle Canyon (Station 6). The logic behind the selection of point count stations was based on the fact that avian species richness reflects carrying capacity of habitat. Capacity is increased by structural variation and available vegetation, thus lower elevation riparian areas were given priority in the selection process. Migratory passerines are generally detected in greatest number foraging within a riparian canopy, or as flyovers. Although expected to be greatly limited in number, birds singing or calling from upslope scrubland areas of the Preserve can be detectable at some distance due to reduced vegetation (in this case from fire) and a corresponding reduction in sound absorption. Constraints imposed by the protocol's temporal limits were also considered. Additional points over steeper upslope locations would have consumed observer effort largely in transit from station to station with little gain in additional species. Areas within riparian habitat between stations are more likely to contain birds than upslope areas, and species were noted when occurring here.

Surveys were conducted two days per month, from 2 February to 28 April 2010 (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.



Lawrence and Barbara Daley Preserve

PARKS AND RECREATION
COUNTY OF SAN DIEGO

Legend

Survey Location

Basemap Legend

Preserve Boundary

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Feet

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Technology Associates International Corporation

Avian Survey Locations

Figure 3-2

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Date: Oct 05, 2010

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The counts were completed just as the peak of migratory activity approached to increase the probability of detection. Each morning, a set of points were counted before the heat of the day; the hottest part of the day depresses bird activity. However, counts conducted for this study commenced early in the season, and therefore, were not subject to high temperature concerns, because sub-normal temperatures occurred early in the count period.

Nocturnal Survey

The nocturnal avian survey was planned to be accomplished in a single night and 26 April was selected as providing maximal detection rates for the three-month period. In San Diego County, the passage of migrants and breeding of some non-migratory species peaks toward the end of April into May. Point count stations 2, 4, and 6 were selected as providing both a mixture of vegetation types and favorable auditory detection points with a broad view of the Preserve at each station. A total of 20 minutes was allotted at each station to search and listen. Auditory assessment is a vital component of terrestrial avian surveys and especially so at night. The survey began at 19:15 hours (sunset) and ended at 21:45 hours. Conditions were generally excellent in terms of weather with clear skies and no wind. A waxing moon, approximately 98 percent full, was at approximately 30 degrees above the horizon in the eastern sky.

3.3.4 **Mammals**

Small Mammals

Survey methods for small mammals included the use of Sherman live traps and pitfall traps (small mammals are often captured in the herpetological pitfall arrays). Both were utilized to assess the presence of small mammal species. All major habitat types in the Preserve were sampled to ensure that species captured were representative.

Survey plots consisted of 15 stations containing two (2), 12" model Sherman live traps each placed in parallel transects, for a total of 30 traps. Transects were separated by 10 meters, and traps within transects were separated by seven (7) meters. Transects were oriented to best fit the habitat (Wilson et al. 1996) and GPS coordinates were recorded. A total of 15 survey plots were established in the Preserve to maximize coverage of the property, however, they were distributed within five general survey locations (Figure 3-3).

Two sampling sessions occurred in the spring and one in the summer of 2010 (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 rolled oats (to avoid germination) and checked

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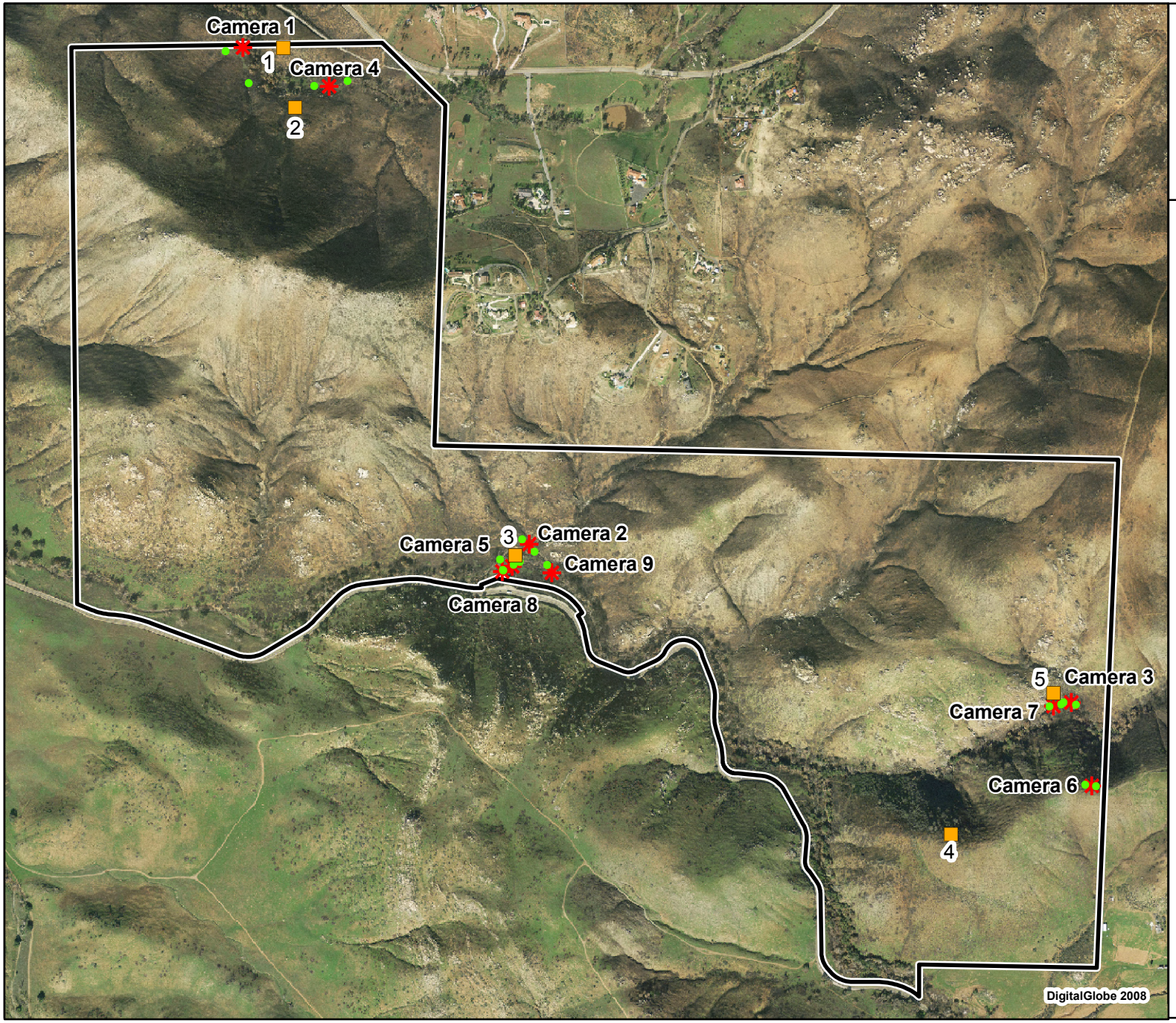

Lawrence and Barbara Daley Preserve

PARKS AND RECREATION
COUNTY OF SAN DIEGO

Legend

- Small Mammal Plot Location

Medium and Large Mammal

- Camera Station
- Track Plot

Basemap Legend

- Preserve Boundary

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Feet

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Technology Associates International Corporation

Small, Medium, and Large Mammal Survey Plot and Station Locations

Figure 3-3

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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. Surveys conducted over several years tend to yield more accurate information and usually detect population fluctuations due to environmental conditions (e.g. fire, rainfall, temperature) and land use.

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 mammalian carnivores and mesopredators and answer important research questions about population dynamics (Cutler and Swann 1999). This method, combined with track plots, which can detect other non-carnivorous mammals, was implemented throughout the Preserve. Plots were distributed throughout the Preserve in order to record medium-to-large mammals and possibly yield data on their movement patterns (Figure 3-3).

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). The scent was placed on a pipe cleaner wrapped around the upper portion of a 12-inch metal stake (i.e. rebar). 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. A motion-sensing digital camera was placed approximately 1–2 meter from the lure and 20 centimeter off the ground. Track plots consisted of a 1-meter-diameter circle of 1-centimeter-deep gypsum powder with scent lure placed in the center. Track plots were checked daily 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.

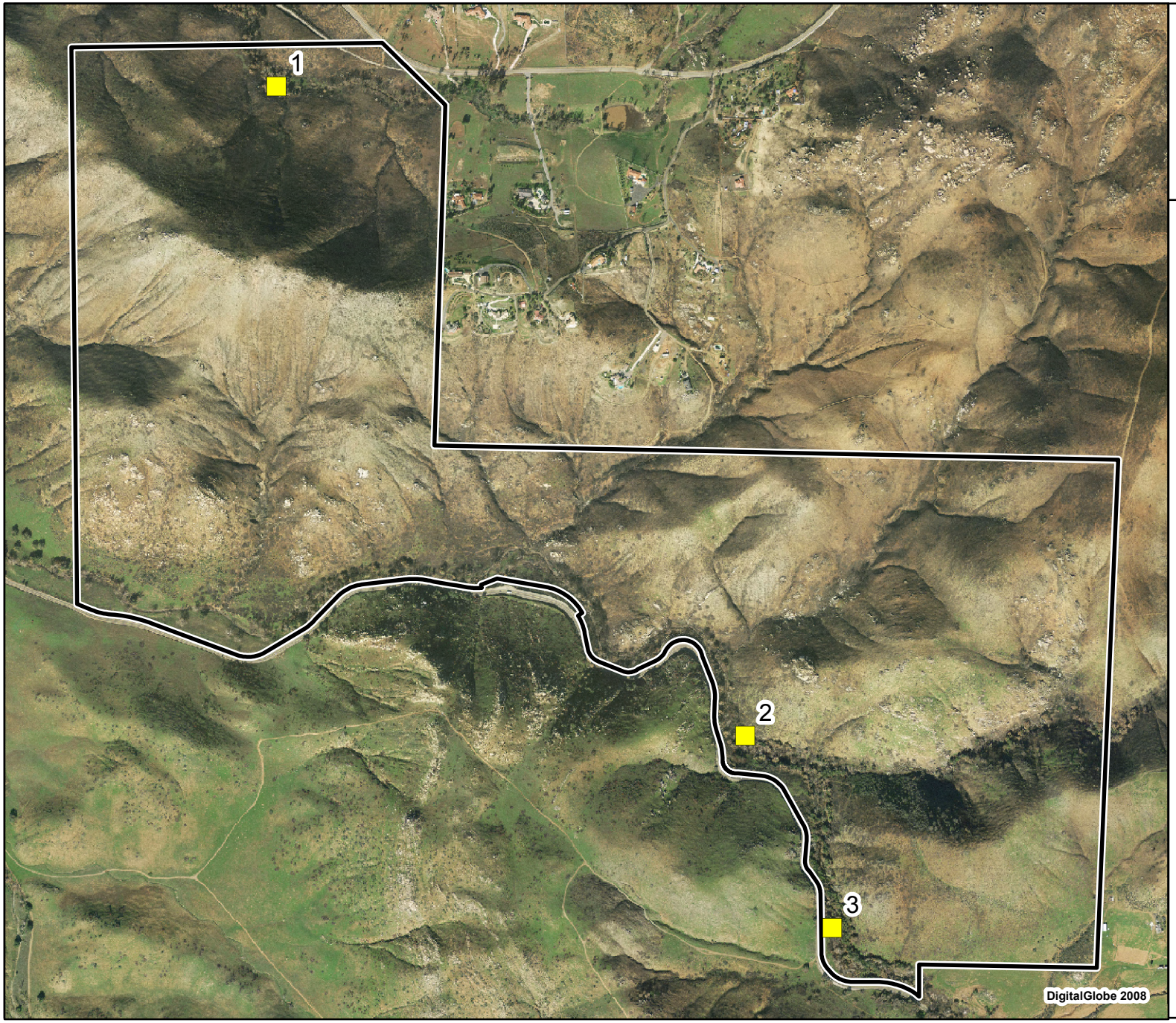
Surveys occurred in the spring and the summer of 2010 (Table 3-1). These surveys were usually run concurrently with the surveys for small mammals. A total of nine (9) survey plots were located in potential wildlife corridors and high use areas (e.g., near water sources, drainages, ridgelines, etc.). Survey locations were mapped using GIS technologies.

Bats

Multiple bat survey techniques are needed to thoroughly document a diversity of bat species during an inventory study (Pierson 1993). For this baseline assessment, passive bat surveys were employed in areas of potentially high detectability to gain a cursory understanding of the bat inventory at the Preserve.

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).

Passive Anabats were used to survey for bats in the Preserve during two monitoring sessions: fall 2009 and summer 2010 (Table 3-1). During the fall monitoring sessions, a total of three (3) passive Anabat units were placed for six consecutive nights at various locations in the Preserve, including near the northwest boundary of the Preserve, and along the central and eastern portions of Dulzura Creek (Figure 3-4). During the summer session, two passive units were used for four consecutive nights; one near the northwest boundary and one along the eastern portion of Dulzura Creek (Figure 3-4).



Lawrence and Barbara Daley Preserve

PARKS AND RECREATION
COUNTY OF SAN DIEGO

Legend

Anabat Locations

Basemap Legend

Preserve Boundary

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Technology Associates International Corporation

Bat Survey Locations

Figure 3-4

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4.0 Results and Discussion

4.1 Vegetation Communities/Habitat

The vegetation communities on the Preserve were greatly affected by the 2007 Harris Fire (see Section 2.6; examples are included in Appendix C), which burned the entire Preserve area. Vegetation mapping was conducted only two and a half years after the fire, during the early stages of fire recovery. As such, shrub cover is generally low, invasive species cover (e.g., non-native grasses and mustards) is high, and boundaries between upland vegetation community types are often unclear. Using dominant plant associations as an indicator, eight vegetation communities were identified within the Preserve during the 2010 surveys (Table 4-1; Figure 4-1).

Table 4-1.Vegetation Communities within the Preserve

Vegetation Community[1]	Acres[2]
RIPARIAN/WETLAND COMMUNITIES	
Southern Riparian Woodland (62500)	46.70
UPLAND COMMUNITIES	
Diegan Coastal Sage Scrub (32500)	417.20
Coastal Sage-Chaparral Scrub (37G00)	10.34
Southern Mixed Chaparral (37120)	49.58
Native Grassland (42100)	2.85
Non-native Grassland (42200)	61.57
Coast Live Oak Woodland (711160)	4.23
Eucalyptus Woodland (79100)	2.73
Disturbed Habitat (11300)	1.55
Urban/Developed (12000)	0.73
TOTAL	**597.47**

[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.

Within the Preserve, the most abundant vegetation type, coastal sage scrub, 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. Smaller patches of southern mixed chaparral vegetation or coastal sage scrub-chaparral ecotone, which require greater amounts of moisture, occur mostly on north-facing slopes in the northwestern and northeastern portions of the Preserve.

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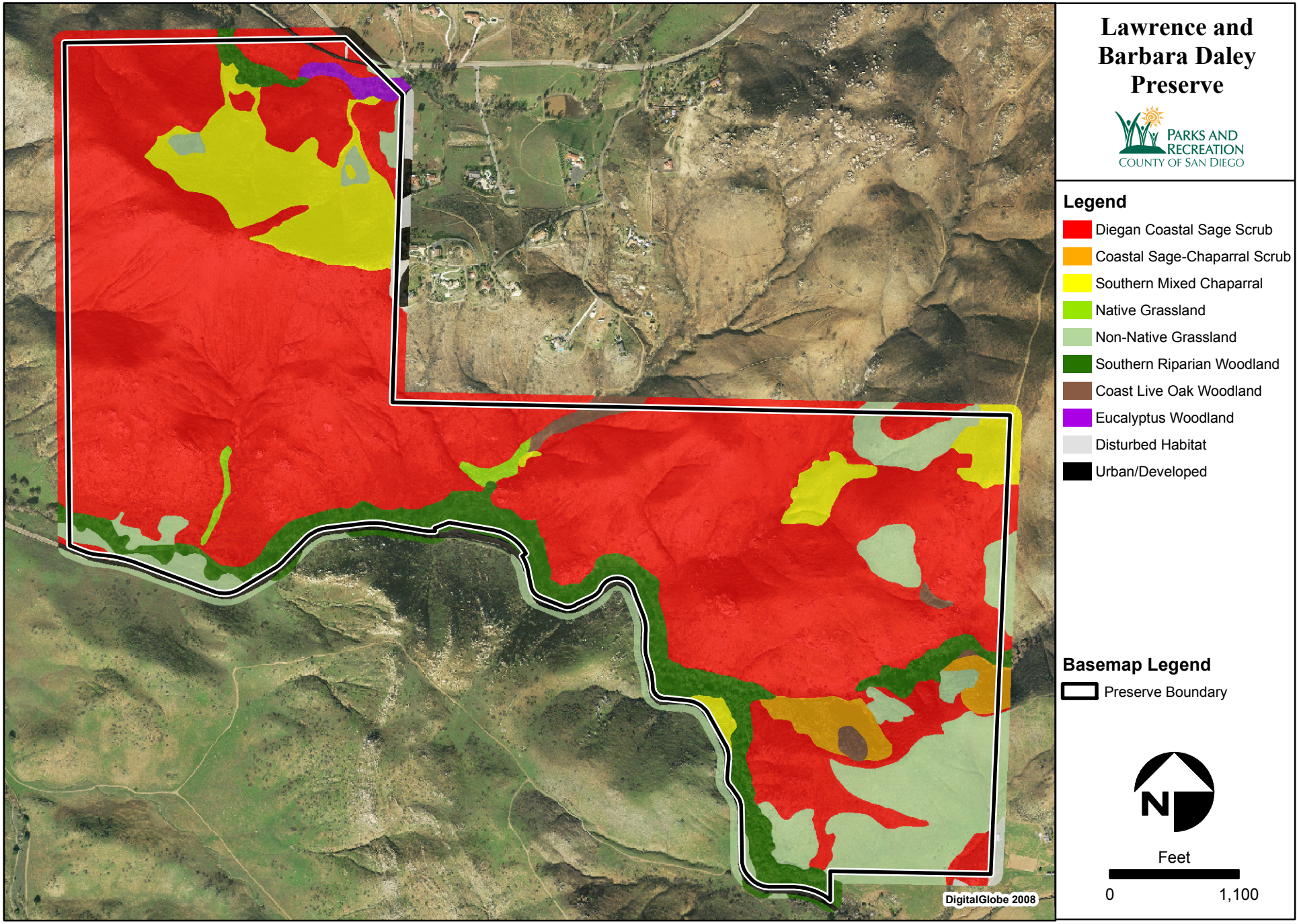

Technology Associates International Corporation

Vegetation Communities

Figure 4-1

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Date: Oct 01, 2010

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Non-native grassland occurs mostly in the eastern portion of the Preserve on the south-facing slopes, some of which is adjacent to rural development and agricultural land, and in isolated patches on north-facing slopes. In these areas it is difficult to distinguish between non-native grassland and disturbed coastal sage scrub or chaparral which can have a high percent cover of non-native grasses and low shrub cover due to the disturbance caused by the 2007 Harris Fire. Other patches of non-native grasses occur along the southern edge of Dulzura Creek and in isolated patches in the northwestern portion of the Preserve. Native grassland occurs in two small areas along the edge of dry drainages. These areas look much like the surrounding open, disturbed scrub habitat except that there is a relatively high concentration of native grasses present.

Along Dulzura and Pringle Creeks on the south side and a small creek on the north side of the Preserve, mature stands of recovering (post-fire) southern riparian woodland are more common. Coast live oak woodland, which does not have a well-developed riparian understory and is often less dense than southern riparian woodland, occurs in small isolated patches upslope from Pringle Creek or along dry drainages.

In addition to the natural communities within the Preserve, some human altered habitats also occur on the Preserve. Remnants of a paved road occur in the northern part of the Preserve along with disturbed habitats consisting of unpaved trails, areas affected by unauthorized immigrants (Figure 2-5) and areas of disturbance adjacent to rural development. A brief description of each vegetation community is provided below.

Diegan Coastal Sage Scrub (32500)

Diegan coastal sage scrub is an endemic, fire-adapted drought-deciduous community typically dominated by coastal sagebrush (*Artemisia californica*) and California buckwheat (*Eriogonum fasciculatum*). Other species characteristic of this vegetation community include black and white sage (*Salvia mellifera* and *Salvia apiana*), lemonadeberry (*Rhus integrifolia*), laurel sumac (*Malosma laurina*), deerweed (*Lotus scoparius*), and California encelia (*Encelia californica*). Diegan coastal sage scrub is typically low in stature and occurs on steep, xeric slopes or on clay soils that are slow to release stored water. Formerly widely distributed in the region, Diegan coastal sage scrub has lost much of its historic range to residential development and agricultural conversion. Diegan coastal sage scrub frequently intergrades with chaparral vegetation communities at higher elevations.

Diegan coastal sage scrub covers approximately 417.20 acres on the Preserve (Table 4-1). Around the large granite outcrops, the dominant native species are laurel sumac, bee plant (*Scrophularia californica*), odora (*Porophyllum gracile*), many-flowered

bushmallow (*Malacothamnus densiflorus*) and coast range melic (*Melica imperfecta*). Other native species in these areas include San Diego needlegrass (*Achnatherum diegoensis*), California wishbone plant (*Mirabilis californica)* and wild cucumber (*Marah macrocarpus* var. *macrocarpus*). On the southwestern portion of the Preserve, two small north-facing slopes on the south side of the ridge just west of the rural development consisted of deerweed and/or yellow bush penstemon and little else. The rest of the coastal sage scrub in the Preserve (e.g., the majority of this vegetation community) is dominated by grassland communities. Overall, San Diego sunflower (*Bahiopsis* [*Viguiera*] *laciniata*, herein referred to as *Viguiera laciniata*) and deerweed (*Lotus scoparius*) were the dominant species observed in CSS habitat within the Preserve. Subdominant species include shrub species, which varied by location, included deerweed, yellow bush penstemon (*Keckiella antirrhinoides*), coastal sagebrush, and California buckwheat and California wishbone plant. San Diego needlegrass (*Agnatherum diegoensis*) was observed in rocky outcrops within the sage scrub habitat.

Within the Preserve, Diegan coastal sage scrub is moderately to highly disturbed and of marginal quality. Much of the sage scrub onsite intergrades with the surrounding grassland communities. Areas showing the greatest level of disturbance (e.g., highest cover of non-native species) are located in the southeastern corner of the Preserve. The dominant non-native species include non-native grasses such as oats (*Avena spp.*), bromes (*Bromus* spp.), Mediterranean schismus (*Schismus barbatus*) and rat-tail fescue (*Vulpia myruos*), and forbs such as filarees (*Erodium* spp.), smooth cat's ear (*Hypochaeris glabra*), and short-pod mustard (*Hirschfeldia incana*).

Coastal Sage-Chaparral Scrub (37G00)

Coastal sage-chaparral scrub (CSS/CHP) is an ecotonal habitat with dominant species characteristic of both Diegan coastal sage scrub and southern mixed chaparral. The presence of this ecotonal habitat on the Preserve could be due to high fire frequency, which can be damaging to some chaparral species that require sufficient time to recover before being able to withstand another fire (Zedler et al, 1983). Chaparral species that are dependent on fire for seed germination may lose substantial cover to other functional types, including drought deciduous coastal sage scrub shrubs and non-native annual grasses, if fires are too frequent (Syphard et al. 2006). This scenario might also explain the absence of chaparral habitat on most of the north-facing slopes within the project area. A total of 10.34 acres of coastal sage-chaparral scrub occurs on a north-facing slope in the southeastern portion of the Preserve. Based on the native species diversity, shrub cover, and the age structure of the plant, it appears that this area may not have burned in 2007. Invasion by non-native species was fairly low in this area.

Southern Mixed Chaparral (37120)

As described by Holland (1986), southern mixed chaparral is a dense, shrub-dominated community widely distributed on arid landscapes in coastal southern California, generally below 3,000 feet in elevation. The dominant shrub cover in this community consists of evergreen, sclerophyllous (hardened leaves) woody shrubs approximately one to three meters tall, often with a closed canopy and undeveloped understory. Characteristic species include chamise (*Adenostoma fasciculatum*), manzanitas (*Arctostaphylos* spp.), mission manzanita (*Xylococcus bicolor*), ceanothus species (*Ceanothus* spp.), toyon (*Heteromeles arbutifolia*), and redberry (*Rhamnus crocea*).

A total of 49.58 acres of southern mixed chaparral occur on the Preserve in small, isolated patches, mostly on north-facing slopes. The area on the northern portion of the Preserve occurs on reddish, clayey soils, much of which is bare between stump-sprouting shrubs. This area is dominated by mission manzanita, chamise and laurel sumac. Other species in this area included yellow bush-penstemon, deerweed, redberry, coast spice bush (*Cneoridium dumosum*). Although there are non-native grasses in this area, the level of invasion was fairly low. Other chaparral areas were dominated by chamise and mission manzanita. Yellow-bush penstemon was typically subdominant. These areas were heavily infested by non-native grasses and the diversity of native annuals and perennials appeared to be fairly low.

Native Grasslands (42100)

Native grassland is mid-height (to two feet) grassland dominated by native perennial grasses such as needlegrasses (*Nassella* spp.). Native and non-native grasses and annuals commonly co-occur and often outnumber the native grasses; however, these areas are considered native grassland as long as there is at least 20 percent cover of native grasses. Within the Preserve, native grassland is limited to the edges of dry drainages adjacent to coastal sage scrub and/or oak woodland habitat in two locations. These areas tend to have native and non-native grasses, low growing forbs, such as smooth cat's ear, patches of open ground, and isolated shrubs. It is possible that these areas were once a component of the coastal sage scrub vegetation community, and the recent fires caused the shrub cover to decline to the point that grasses and forbs became dominant. Although non-native species in these areas are dominant, several species of native grasses were also observed, including coast range melic, San Diego needlegrass and other species of needlegrasses (*Nassella pulchra*, *Nassella cernua*, and *Nassella lepida*). Native forbs included dot-seed plantain (*Plantago erecta*), white pincushion (*Chaenactis artemisiifolia*) and California poppy (*Eschscholzia californica*). Native grasslands make up 2.85 acres of the Preserve.

Non-Native Grasslands (42200)

Non-native grasslands occur in disturbed areas and are dominated by non-native grasses, non-native forbs, or both. Within the Preserve, 61.57 acres of non-native grassland occur in isolated patches and integrate readily with the adjacent coastal sage scrub habitat, especially on the eastern portion of the Preserve. The dominant species on the Preserve, which are typical of this vegetation community, are slender oat, (*Avena barbata*), wild oat (*Avena fatua*), ripgut brome (*Bromus diandrus*), red brome (*Bromus rubens*), soft chess (*Bromus hordeaceus*), rat-tail fescue, and short-pod mustard. Small to moderate amounts of native forbs such as California poppy, wild hyacinth (*Dichelostemma capitatum*), San Diego bird's foot trefoil (*Lotus hamatus*), and California wishbone plant.

One patch of non-native grassland appears to be on a small clay lens and has a very different character than the surrounding coastal sage scrub and the rest of the non-native grassland on site. This area is the westernmost patch located on the north-facing slope west of the rural development on the northern end of the Preserve. Although dominated by short non-native grasses and filarees, this area also has a prevalence of native perennials such as Padre's shooting star (*Dedecatheon clevelandii* ssp. *clevelandii*), chocolate lily (*Fritillaria biflora* var. *biflora*), and Johnny jump-ups (*Viola pedunculata*).

Southern Riparian Woodland (62500)

Southern riparian woodland occurs along rivers, creeks, or drainages and is dominated by a mixture of coast live oak (*Quercus agrifolia* var. *agrifolia*), western sycamore (*Platanus racemosa*), willows (*Salix* spp.) and Freemont's cottonwood (*Populus fremontii*). Unlike riparian forests, this community does not tend to have a well-developed riparian understory. Within the Preserve, this community occurs along Dulzura and Pringle Creeks, and along a small tributary just south of Honey Springs Road. Small patches of giant reed (*Arundo donax*) are prevalent along Dulzura creek. The understory generally consists of non-native grasses and other exotics, as well as a number of sensitive species, such as southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*), Palmer's sagewort (*Artemisia palmeri*), and Fish's milkwort (*Polygala cornuta* var. *fishiae*). Within the Preserve, there are 46.70 acres of Southern riparian woodland.

Coast Live Oak Woodland (71160)

Coast live oak woodland is dominated by coast live oak, an evergreen oak that reaches roughly 10 to 25 meters in height. Coast live oak woodland is characterized by poor understory development and low species diversity. The shrub layer may include toyon, laurel sumac or Mexican elderberry (*Sambucus nigra* ssp. *caerulea*). Most of the coast live oaks within the Preserve are intermixed with western sycamore, willows, and

cottonwood within the southern riparian woodland habitat. However, a couple of areas consist of coast live oak alone or intermixed with a few Engelmann oak trees. The understory in these areas is generally dominated by non-native grasses and forbs intermixed with native shrubs. Coast live oak woodland occurs in a small clump upslope from Dulzura Creek, and along a dry drainage in the north central portion of the Preserve. Approximately 4.23 acres of this community occur on the Preserve (Table 4-1).

Eucalyptus Woodland (79100)

As described by Holland (1986), eucalyptus woodland is typically characterized by dense monotypic stands of eucalyptus trees (*Eucalyptus* spp.). 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 California and, where they form dense stands, tend to completely supplant native vegetation, greatly altering community structure and dynamics.

Within the Preserve, a small patch of eucalyptus woodland occurs along a small tributary between a rural development area to the east and southern riparian woodland to the west. Approximately 2.73 acres of eucalyptus woodland composed of river red gum (*Eucalyptus camaldulensis*) occurs on the Preserve within this patch (Table 4-1).

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, or abandoned fields, and is dominated by non-native annual species and perennial broadleaf species. Disturbed habitat covers approximately 1.55 acres on the Preserve and is located along the boundary with the residential development on the northern portion of the Preserve (Table 4-1).

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. Within the Preserve, approximately 0.73 acre of Urban/Developed area

occurs within a small section of an old paved road that enters the Preserve off of Honey Springs Road (Table 4-1).

4.2 Plants

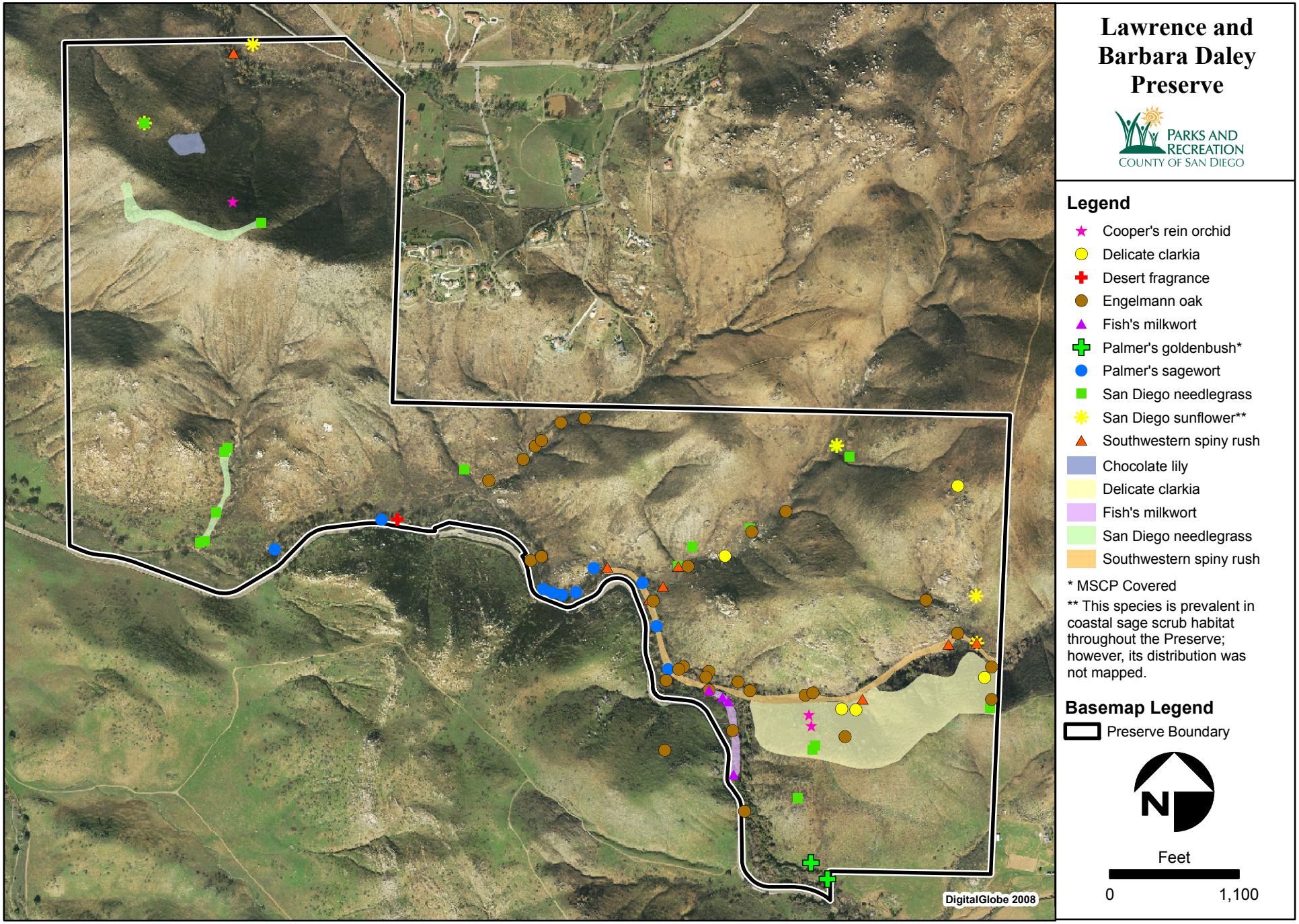
A total of 355 plant taxa were observed in the Preserve during the 2010 surveys. Approximately 21 percent of these are non-native species, many of which are grasses. The remaining species (about 79 percent) consist of a diverse array of native riparian and upland plants that occur in natural assemblages. A full inventory of plant species observed included in Appendix D.

4.2.1 Special Status Plant Species Observed

For the purpose of this report, special status plant species are those species identified as (a) endangered, threatened, rare, or a candidate for listing pursuant to the Federal or State Endangered Species Acts (FESA, CESA); (b) sensitive or special status by the County of San Diego, California Native Plant Society, CDFG, or USFWS; or (c) covered by the South County MSCP. A total of 11 sensitive plant taxa were observed within the Preserve during 2010 rare plant surveys (Table 4-2; Figure 4-2). These include desert fragrance (*Ambrosia monogyra*), San Diego needlegrass, Palmer's sagewort (*Artemisia palmeri*), San Diego sunflower, delicate clarkia (*Clarkia delicata*), Palmer's goldenbush (*Ericameria palmeri* var. *palmeri*), chocolate lily, southwestern spiny rush, Cooper's rein orchid (*Piperia cooperi*), Fish's milkwort (*Polygala cornuta* var. *fishiae*), and Engelmann's oak (*Quercus engelmannii*). Species accounts for these species are included below, and unless otherwise noted, the accounts are based on Reiser (1994) and CNPS (2010).

Desert fragrance – *Ambrosia monogyra*
Federal Status: None
State Status: None
CNPS List: 2.2
County List: None
South County MSCP: Not Covered

This species occurs in Riverside County, San Bernardino County, San Diego County, Arizona, New Mexico, Texas, Nevada and Baja California, Mexico. Within San Diego County, Desert fragrance occurs in chaparral habitat below approximately 500 meters in elevation. Desert fragrance is a perennial shrub that blooms from August to November. Three shrubs were observed onsite along the fence line separating the southern boundary of the Preserve from State Highway 94.



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Sensitive Plant Species

Figure 4-2

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Table 4-2.Sensitive Plant Species Documented from the Preserve

Common Name	Scientific Name	Listing Status (Federal/State/ CNPS/County)[1]	MSCP Covered (Y/N)
Desert fragrance	*Ambrosia monogyra*	--/--/List 2.2/--	No
San Diego needlegrass	*Achnaterum diegoensis*	--/--/List 4.2/List D	No
Palmer's sagewort	*Artemisia palmeri*	--/--/List 4.2/ List D	No
San Diego sunflower	*Viguiera laciniata*	--/--/List 4.2/List D	No
Delicate clarkia	*Clarkia delicate*	--/--/List 1B.2/List A	No
Palmer's goldenbush	*Ericameria palmeri* var. *palmeri*	--/--/List 1B.1/List B	Yes
Chocolate lily	*Fritillaria biflora* var. *biflora*	--/--/--/ List D	No
Southwestern spiny rush	*Juncus acutus* spp. *leopoldii*	--/--/List 4.2/List D	No
Cooper's rein orchid	*Piperia cooperi*	--/--/List 4.2/List D	No
Fish's milkwort	*Polygala cornuta* var. *fishiae*	--/--/List 4.3/List D	No
Engelmann oak	*Quercus engelmannii*	--/--/List 4.2/List D	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.

San Diego needlegrass – *Achnatherum diegoensis*
Federal Status: None
State Status: None
CNPS List: 4.2
County List: D
South County MSCP: Not Covered

This native bunch grass occurs in southwestern San Diego County, Baja California, Mexico, and on various off-shore islands. The preferred habitat type of this species is coastal sage scrub or chaparral-coastal sage scrub ecotone (Reiser 1994). During the fall when many native grasses have senesced, this species can look very similar to other native needlegrasses (e.g., *Nassella* spp.). This species was observed in coastal sage scrub habitat throughout the Preserve, almost always in association with rocky outcrops.

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 found distributed along creeks and drainages or occasionally in mesic chaparral habitat in western San Diego County and Baja California, Mexico. It often occurs in shaded understory of riparian woodland or forest trees, such as willows, sycamore or cottonwood. Within the Preserve, this species was found in a few locations along Dulzura Creek.

San Diego sunflower – *Bahiopsis* [*Viguiera*] *laciniata*
Federal Status: None
State Status: None
CNPS List: 4.2
County List: D
South County MSCP: Not Covered

San Diego sunflower occurs throughout southern San Diego County and in Baja California, Mexico. It occurs in coastal sage scrub habitat on a variety of soil types and is often a dominant component of the landscape where it occurs, as is the case within the Preserve. This species is the dominant shrub in most areas of coastal sage scrub on the Preserve. Because it was so widespread, San Diego sunflower was not mapped within the Preserve.

Delicate clarkia – *Clarkia delicata*
Federal Status: None
State Status: None
CNPS List: 1B.2
County List: A
South County MSCP: Not Covered

Delicate clarkia occurs in San Diego County and Baja California, Mexico. It often occurs at the periphery of oak woodlands or in chaparral habitat. Due to its relatively narrow blooming period (approximately April 23 – June 13) this species may be missed during surveys because it can be difficult to see when not in bloom. Within the Preserve, this species was very widespread throughout a large north-facing slope within chaparral-coastal sage scrub ecotone or coastal sage scrub habitat in the southeastern portion of the Preserve. Most of the population in this area had not started blooming yet during the 2010 surveys; however enough individuals were in bloom to confirm the species' identity in the field.

Palmer's goldenbush – *Ericameria palmeri* var. *palmeri*
Federal Status: None
State Status: None
CNPS List: 1B.1
County List: B
South County MSCP: Covered

Palmer's goldenbush occurs in San Diego County and Baja California, Mexico. The preferred habitat of this large shrub is along coastal drainages or moist areas within chaparral, although it has also been documented from coastal sage scrub habitat. Approximately 40 goldenbush shrubs were observed onsite in two locations next to one another near the eastern border of the Preserve just south of Pringle Creek.

Chocolate lily – *Fritillaria biflora* var. *biflora*
Federal Status: None
State Status: None
CNPS List: None
County List: D
South County MSCP: Not Covered

Chocolate lily is distributed from Mendocino County to San Diego County and Baja California, Mexico. The preferred habitat of this species is in mesic openings of coastal sage scrub, chaparral, and grassland habitats. It is often found on clay soils, although it occurs on other soils as well, and it is often found in association with small seeps. This species is locally abundant within the Preserve on a small clay lens in non-native grassland habitat, surrounded by coastal sage scrub. Padre's shooting stars were also common on this clay lens.

Southwestern spiny rush – *Juncus acutus spp. leopoldii*
Federal Status: None
State Status: None
CNPS List: 4.2
County List: D
South County MSCP: Not Covered

Southwestern spiny rush occurs in the counties of Los Angeles, San Diego, Santa Barbara, Ventura, Orange, and San Luis Obispo as well as Baja California, Mexico. This species is generally associated with riparian drainages, wet meadows and marsh habitat.

Within the Preserve, southwestern spiny rush was found scattered throughout the creek beds of Dulzura and Pringle Creeks.

Cooper's rein orchid – *Piperia cooperi*
Federal Status: None
State Status: None
CNPS List: 4.2
County List: D
South County MSCP: Not Covered

Cooper's rein orchid occurs in Los Angeles County, Orange County, Riverside County, San Bernardino County, Santa Catalina Island, San Diego County, Ventura County and Baja California, Mexico. This species is a perennial herb that blooms from March through June. The preferred habitat for Cooper's rein orchid is chaparral, cismontane chaparral, and grassland habitat. A total of five orchids were found onsite. Two were found on the north-facing slope west of the adjacent rural development in chaparral habitat, and three were found on the north-facing slope in the southeastern portion of the Preserve in chaparral-coastal sage scrub ecotone habitat.

Fish's milkwort – *Polygala cornuta* var. *fishiae*
Federal Status: None
State Status: None
CNPS List: 4.3
County List: D
South County MSCP: Not Covered

Fish's milkwort occurs in cismontane southern California and northwestern Baja California, Mexico. The species is known to occur in San Diego, Orange, Los Angeles, Riverside, and Ventura counties and Baja California, Mexico at elevations between 100 and 1,000 m. Fish's milkwort is often associated with shaded areas within cismontane woodland and riparian woodlands with coast live oak, although it also occurs in xeric and mesic chaparral habitats. Because this species is easily overlooked when not in bloom, it can be missed during plant surveys and may be more widespread than suspected. Within the Preserve, this species was observed in shady areas within the riparian woodland habitat along Dulzura Creek in the southeastern portion of the Preserve.

Engelmann's oak – *Quercus engelmannii*
Federal Status: None
State Status: None

CNPS List: 4.2
County List: D
South County MSCP: Not Covered

Engelmann's oak occurs in San Diego, Orange, and Riverside counties, on Santa Catalina Island, and in Baja California, Mexico. This species of oak may occur as isolated individuals within chaparral habitat, in southern oak woodlands where canopy cover ranges from ten to fifty percent, or in riparian woodlands where there is a closed canopy of mixed hardwood species along canyon bottoms and watercourses (Scott 1990). The Engelmann oak is often associated with alluvial fans, interior valleys, and occasionally slopes with mesic aspect (Roberts 1995). Poor reproduction is an apparent problem with this species and overgrazing, herbivory, browsing from deer, and a need for specific weather conditions for seedling establishment exacerbate this issue. Within the Preserve, more than 130 Engelmann oaks were observed on the banks of dry creeks in scrub habitat, or mixed with coast live oaks and/or riparian tree species along Dulzura Creek. (Figure 4-2).

4.2.2 **Special-Status Plant Species with a High Potential to Occur**

Potentially occurring sensitive plant species based on habitat preferences and distribution were identified by searching the SDNHM Plant Atlas and Herbarium species databases. Potentially occurring plant species are those (1) that occur outside of, but within the general vicinity of the Preserve, and/or (2) whose habitat preferences are consistent with available habitat within the Preserve. A total of 39 sensitive plant taxa were identified as having the potential to occur within the Preserve (Appendix E); 12 of these have a high potential to occur onsite (Table 4-3), 15 have a moderate potential, and 12 have a low potential.

4.2.3 **Invasive Plants**

A total of 11 moderate to high risk non-native invasive species, as determined by the California Invasive Plant Council (Cal-IPC), were observed on the Preserve (Table 4-4). With the exception of most of the grass species, the majority of these invasive species were mapped (Figure 4-3). The complete list of non-native plant species observed in the Preserve is included in Appendix D. Giant reed (*Arundo donax*) poses the greatest threat to the Preserve. There are numerous small to large clumps located all along Dulzura Creek. Giant reed spreads quickly, forming dense stands in riparian drainages, choking out native species, and changing the hydrological regime by reducing groundwater availability. This, in turn, results in a reduction of habitat and food supply for native birds and aquatic wildlife.

Table 4-3. Sensitive Plant Species with a High Potential to Occur on the Preserve

Common Name	Scientific Name	Listing Status (Federal/State/ CNPS/County)[1]	MSCP Covered[2]	Habitat[3]	Potential to Occur
Robinson's peppergrass	*Lepidium virginicum* var. *robinsonii*	--/--/List 1B.2/List A	No	CHP, CSS	**High**- habitat present onsite
Dehesa beargrass	*Nolina interrata*	--/SE/List xx/ List A	Yes, narrow endemic	CHP, CSS, gabbro soils	**High** - appears to respond well to fire
Morena currant	*Ribes canthariforme*	--/--/List 1B.3/ List A	No	CHP, moist	**High**- habitat present onsite
Munz's sage	*Salvia munzii*	--/--/List 2.2/ List B	No	CHP, CSS	**High** - habitat present onsite
Parry's tetracoccus	*Tetracoccus dioicus*	--/--/1B.2/ List A	Yes	CHP, gabbro/ metavolcanic soils	**High** - habitat present onsite
Rush-like bristleweed	*Xanthisma (Machaeranthera) juncea*	--/--/List 4.3/---/	No	CHP, CSS,	**High** – this species was observed just outside the Preserve boundary

[1] Listing Status: Federal: FE – endangered, FT – threatened, State: SE – endangered, ST – threatened, SR – rare. California Native Plant Society (CNPS) Lists: 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). CNPS Threat Rank: 0.1 – seriously threatened in California, 0.2 fairly threatened in California, 0.3 not very threatened in California. County Lists: 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] Species covered by the San Diego County Multiple Species Conservation Plan. Coverage indicates that there is a long-term conservation plan for this species.

[3] Habitat: CBS – coastal bluff scrub, CF – coniferous forest, CHP – chaparral, CS – coastal scrub, CSS – coastal sage scrub, CW – cismontane woodland, G – grassland, RF – riparian forest, VP – vernal pools

Table 4-4.Moderate and High Risk Invasive Plant Species Observed on the Preserve

Common Name	Scientific Name	Cal-IPC Risk Category
Giant reed	*Arundo donax*	High
Red brome	*Bromus rubens*	High
Fennel	*Foeniculum vulgare*	High
Himalaya blackberry	*Rubus armeniacus*	High
Saltcedar (Tamarisk)	*Tamarix ramosissima*	High
Slender wild oat	*Avena barbata*	Moderate
Wild oat	*Avena fatua*	Moderate
Ripgut brome	*Bromus diandrus*	Moderate
Shortpod mustard	*Hirschfeldia incana*	Moderate
Tree tobacco	*Nicotiana glauca*	Moderate
Rattail fescue	*Vulpia myuros*	Moderate

Other moderate and high risk species mapped along Dulzura Creek include Fennel (*Foeniculum vulgare*), Himalaya blackberry (*Rubus armeniacus*), saltcedar (*Tamarix ramosissima*), and tree tobacco (*Nicotiana glauca*); however these species only occurred as isolated individuals. Ripgut brome (*Bromus diandrus*) occurred as a thick carpet along the banks of some portions of Dulzura Creek and the riparian tributary on the north side of the Preserve. This species and other non-native grasses occur throughout the Preserve presumably due to the disturbance caused by the 2007 Harris wildfire. Non-native forbs also occur throughout the Preserve mixed in among the non-native grasses and native annuals and perennials. A large concentration of shortpod mustard (*Hirschfeldia incana*) was observed on the south-facing slope on the western portion of the Preserve.

4.3 Wildlife

A total of 131 wildlife species were documented in the Preserve during the 2009-2010 baseline surveys. European starling and brown-headed cowbirds are the only non-native bird species on the Preserve. A full inventory of wildlife species observed during the 2009-2010 surveys is included in Appendix D. The following subsections describe the results of each survey conducted within the Preserve.

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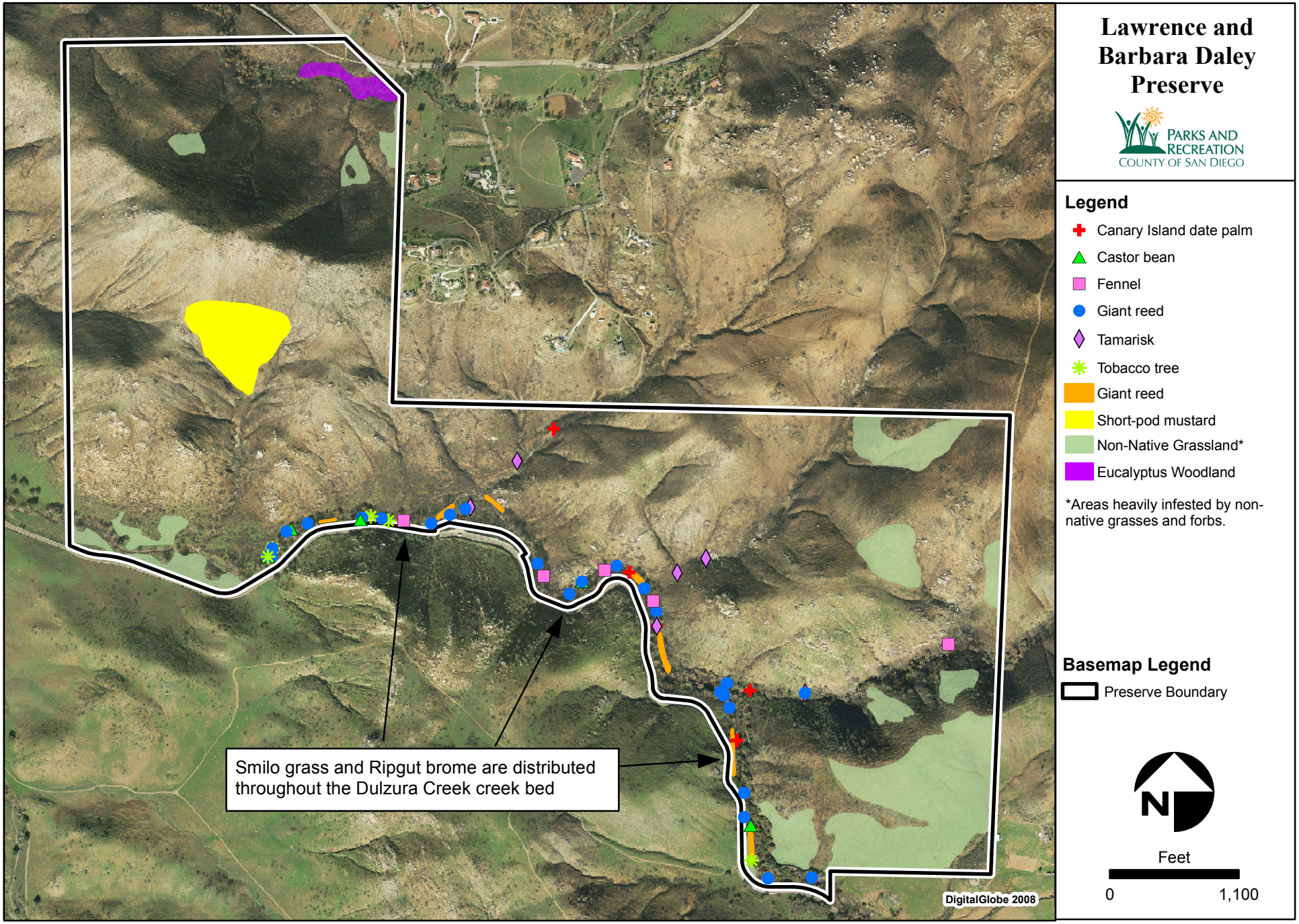

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Invasive Plant Species

Figure 4-3

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4.3.1 **Invertebrates**

Butterflies

Surveys conducted in May–June resulted in 71 observations representing 13 species of butterflies (Appendix D). These include one species of the Family Hesperiidae, four species of the Family Lycaenidae, three species of the Family Nymphalidae, two species of the Family Papilionidae, and three species of the Family Pieridae. The common (checkered) white (*Pontia protodice*) was the most frequently observed species (25 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*	5
Lycaenidae		
Marine blue	*Leptotes marina*	3
Edward's blue	*Hemiagris ceraunus gyas*	1
Acmon blue	*Plebejus acmon acmon*	9
Gold-hunter hairstreak	*Satyrium auretorum*	2
Nymphalidae		
Callippe fritillary	*Speyeria edwardsii*	8
Common buckeye	*Juonia coenia*	2
Gabb's checkerspot	*Chlosyne gabbii*	1
Papilionidae		
Anise swallowtail	*Papilio zelicaon*	2
Western tiger swallowtail	*Papilio rutulus*	2
Pieridae		
Pacific Sara orangetip	*Anthocharis sara sara*	3
Common (Checkered) white	*Pontia protodice*	25
Cabbage white	*Pieris rapae*	7

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 coastal sage scrub communities common in the Preserve. However, the common (checkered) whites present probably benefit from the presence of non-native mustards at the site.

Two potentially occurring sensitive lepitopteran species were identified based on habitat preferences and distribution by searching species databases: Quino Checkerspot butterfly (Quino, *Euphydryas editha quino*) and Hermes Copper butterfly (*Lycaena hermes*). The

Harbison dun skipper (*Euphyes vestries harbisoni*) is likely not occurring on the Preserve due to lack of habitat and its host plant, San Diego sedge (*Carex spissa*).

Quino is a federally endangered species with potential to occur on the Preserve. While the Preserve is mostly open and in recovery from fire, there are portions of habitat that are potentially suitable for Quino if host plants were present. Specifically along the ridges and high points in the north where vegetative growth is limited and openness is likely a long-term condition. In addition, the species has been detected historically on the Rancho Jamul Ecological Reserve a short distance west of the Preserve (Technology Associates 2006). Currently, the County is pursuing coverage for the Quino through an amendment to the County Subarea Plan which is expected to be completed by late 2011 (County of San Diego 2010). The habitat assessment conducted on 5 March, 2010, consisted of floristic and topographic surveys along with focused surveys for the primary host plant for Quino, the dot seed plantain, secondary host plants for Quino, purple owl's clover (*Castilleja exserta*), and the adult nectaring sources for Quino which includes California buckwheat, forget-me-not (*Cryptantha* sp.), and evening snow (*Linanthus* sp.). While most of the chaparral is recovering from the 2007 Harris fire, a majority of it was already too dense to support Quino habitat. Other open habitats were present, but conditions varied. Areas of recovering coastal sage scrub contained very thick stands of non-native grasslands making it unlikely that Quino host plants or nectaring sources would be supported. Only small numbers and sparsely distributed dot seed plantain were detected. Overall, the majority of the survey area is considered low to marginal quality habitat. It is likely that conditions may change in the future as the Preserve recovers further from the effects of the 2007 Harris fire and with the potential for host plants or nectaring resources increasing.

The Hermes copper butterfly occurs primarily in San Diego County, California; a few species have been documented in Baja California, Mexico. It is a small, brightly-colored butterfly that lays eggs on its larval host plant, spiny redberry (*Rhamnus crocea*). Adult butterflies are known to nectar on the flowers of chamise, California buckwheat, slender sunflower (*Helianthus gracilentus*), poison oak, and short-pod mustard located among coastal sage scrub and chaparral habitat. They are rarely seen far from their host plant or nectar source. Potential threats to the butterfly may be attributable to the following factors: wildfire and habitat loss and fragmentation; inadequacy of existing regulatory mechanisms; and natural or manmade threats which include the effects of wildfire on individuals and vulnerability of isolated populations and a restricted geographical range. The species has been detected historically on the Rancho Jamul Ecological Reserve a short distance west of the Preserve (Technology Associates 2006). Spiny redberry was observed within recovering chaparral habitat on the north-facing slope in the

northwestern portion of the Preserve, just west of the rural residential development. Dominant species in this area are mission manzanita and chamise which can provide a nectar resource for this butterfly (USFWS 2010b). Other dominant shrubs in this area include bush penstemon, deerweed and spice bush. It has been postulated that Hermes copper butterfly requires mature redberry to complete its lifecycle, and that frequent fires can negatively impact habitat suitability (USFWS 2010b). Because the redberry and chamise are in the very early stages of fire recovery and other nectar sources (e.g., California buckwheat, slender sunflower, poison oak and short-pod mustard) were not observed in the area, the suitability of the habitat is currently fairly low. However, this may improve over time as the area recovers.

Other Invertebrates

No other specific invertebrate surveys were conducted or invertebrate species noted during surveys.

4.3.2 **Herpetofauna**

A total of 89 herpetofauna captures representing 18 species were recorded during the trapping weeks in March, April and July. The species captured include three frog species, seven (7) species of lizards, and eight (8) species of snakes (Appendix D). No non-native herpetofauna species were captured during pitfall sampling.

Amphibians

The three frog species identified during the surveys include: Western toad (*Anaxyrus boreas*), California treefrog (*Pseudacris cadaverina*) and Pacific treefrog (*Pseudacris regilla*). All three captures of western toad occurred at array 2 (located in the northwestern area of the Preserve in coastal sage scrub habitat), while the California treefrog and Pacific treefrog were noted during aural and visual surveys. In addition, Western toad tadpoles and treefrog tadpoles were detected in both Dulzura and Pringle Creeks during arroyo toad surveys. Breeding California and Pacific treefrogs were observed (in amplexus) during aquatic (arroyo toad) surveys.

During the aquatic surveys, vegetation within and along the Dulzura and Pringle Creeks was relatively open except for a few stands of giant reed. These creeks are recovering from the 2007 Harris Fire and typically support denser vegetation than what was observed during 2009-2010 aquatic baseline surveys.

Dulzura and Pringle Creeks were surveyed for the federally endangered arroyo toad. No toads were detected during three focused surveys along these creeks on the Preserve.

Habitat suitability ranges from poor to moderate, with short stretches having secondary channels and deposits of sandy sediment. Both Dulzura and Pringle Creeks have small, intermittent pockets of sandy shore habitat, preferred by toads during the breeding season. Pringle Creek is within a narrow canyon, with little to no upland habitat for toads to forage in. Along Dulzura Creek, the canyon is slightly wider within the Preserve and contains short stretches with sandy benches and some secondary braiding of the main creek channel. These benches are heavily vegetated, lacking the open sandy habitat preferred by arroyo toads. The western, downstream section of Dulzura Creek becomes deeply channelized as the canyon opens up, making stream access unsuitable to arroyo toads. Water flowed continuously in both Dulzura and Pringle Creeks due to good rainfall during the first two surveys. During the third survey in June, Dulzura Creek exhibited little to no flow towards the western boundary of the Preserve.

Although there are historic records in Dulzura for arroyo toads (most likely in Dulzura Creek) (Madden-Smith et al. 2005), only marginal quality arroyo toad habitat exists within the Preserve. The hydrology of Dulzura Creek was altered by the completion of the Dulzura conduit in 1909, which was engineered to transport water from Cottonwood Creek (now Barrett Lake) within the Tijuana River watershed over the Dulzura summit to the Otay River watershed. Water is diverted into Dulzura Creek, via the conduit, on a "as need basis" and is not regulated to mimic natural flow. It is likely these changes in Dulzura Creek hydrology have reduced habitat quality for the arroyo toad over the years.

Significant arroyo toad populations do not exist along either Dulzura or Pringle Creeks. Arroyo toad movement across adjacent conserved open space into the Preserve is unlikely due to the channelized nature of the western portion of Dulzura Creek. Deeply channelized streams prevent secondary braiding to occur, have restrictive high banks, and allow vegetation to become established along the stream margins. Within the Preserve, there is a lack of continuous suitable habitat, steep topography (especially in Pringle Creek) and unpredictably dynamic hydrological gradient. Arroyo toad breeding habitat appears to be minimal and, therefore, a self-sustaining population on the Preserve would be unlikely.

Reptiles

Of the seven (7) lizards captured, the western fence lizard (*Sceloporus occidentalis*) was the most frequently captured (37), while the western skink (*Plestiodon skiltonianus*) and granite spiny lizard (*Sceloporus orcutti*) were both captured only once. The western fence lizard was captured at all five arrays. Other species of lizards captured included the orange-throated whiptail (*Aspidocelis hyperythra*) (24 captures), western whiptail

(*Aspidocelis tigris*) (5 captures), southern alligator lizard (*Elgaria multicarinata*) (2 captures), and side-blotched lizard (*Uta stansburiana*) (8 captures).

The visual encounter surveys added 42 sightings but did not significantly change proportions among species (Table 4-6). Two granite night lizards (*Xantusia henshawi*) were found, as was a dead (roadkill) red diamond rattlesnake (*Crotalus ruber*) along Honey Springs Road (incidental observation). Because this snake observation was not recorded by GPS, it is not displayed on the sensitive species graphic (Figure 4-4).

Table 4-6.Terrestrial Herpetofauna Visual Encounters at the Preserve

Common Name	Scientific Name	Detection		
		Auditory	Visual	Total
Western toad	*Bubo boreas*		5	5
Western rattlesnake	*Crotalus oreganus*		2	2
Red diamond rattlesnake	*Crotalus ruber**		1	1
Rosy boa	*Lichanura trivirgata*		2	2
Gophersnake	*Pituophis catenifer*		1	1
Californnia treefrog	*Pseudacris cadaverina*	2	10	12
Pacific treefrog	*Pseudacris regilla*	1	5	6
Western fence lizard	*Sceloporus occidentalis*		11	11
Side-blotched lizard	*Uta stansburiana*		3	3
Granite night lizard	*Xantusia henshawi*		2	2
Total		**3**	**42**	**45**

*This species was an incidental roadkill observation and was not recorded by GPS. For that reason, it is not displayed on the sensitive species graphic (Figure 4-4).

Of the eight (8) snake species found, the common kingsnake (*Lampropeltis getula*), California whipsnake (*Masticophis lateralis*), and two-striped gartersnake (*Thamnophis hammondii*) were trapped twice, while the rosy boa (*Lichanura trivirgata*) and western rattlesnake (*Crotalus oreganus*) were seen twice. The western rattlesnake was also trapped twice in array 1 and one time in array 3. The gophersnake (*Pituophis catenifer*) was seen once and the infrequently detected western threadsnake (*Leptotyphlops humilis*) was trapped once in array 4.

Array 4 had the most herpetofauna captures with 34, while Arrays 1 and 2 both had 18 captures. Arrays 3 and 5 both had 12 captures. Twenty of the captures from array 4 were western fence lizards and 10 of the captures from Array 1 were orange-throated whiptails. Arrays 1 and 2 are at the north end of the Preserve near Honey Springs Creek in coastal sage scrub, Array 4 is on the north-facing slope comprising the south side of Pringle Canyon in coastal sage scrub/chaparral ecotone. These were expected to have a high number of captures due to vegetation structure and diversity. Array 4 was tied for the fewest herpetofauna captures (12) but had the highest number of species (10). This array

was located near Pringle Creek in Diegan Coastal Sage Scrub. Table 4-7 shows the species captured and total captures for each array.

Table 4-7.Terrestrial Herpetofauna Captures at the Preserve

Common Name	Scientific Name	Array					
		1	2	3	4	5	Total
Orange-throated whiptail	*Aspidocelis hyperythra*	10	4	3	3	4	24
Western whiptail	*Aspidocelis tigris*				2	3	5
Western toad	*Bubo boreas*		3				3
Western rattlesnake	*Crotalus oreganus*	2		1			3
Southern alligator lizard	*Elgaria multicarinata*				2		2
Common kingsnake	*Lampropeltis getula*				2		2
Western threadsnake	*Leptotyphlops humilis*				1		1
Baja California coachwhip	*Masticophis fulginosus*				1		1
California whipsnake	*Masticophis lateralis*	1				1	2
Western skink	*Plestiodon skiltonianus*					1	1
California treefrog	*Pseudacris cadaverina*				1		1
Western fence lizard	*Sceloporus occidentalis*	4	5	7	20	1	37
Granite spiny lizard	*Sceloporus orcutti*					1	1
Two-striped gartersnake	*Thamnophis hammondii*			1		1	2
Side-blotched lizard	*Uta stansburiana*	1	6		1		8
Total		**18**	**18**	**12**	**33**	**12**	**93**

4.3.3 **Birds**

Over the survey period in the winter and spring of 2010, 71 bird species were detected during the 36 diurnal visits to Stations 1 through 6; and three additional nocturnal visits to Stations 2, 4, and 6. (Appendix D). Count stations with the greatest number of bird detections included Station 1 (106 detections on 17 April), Station 2 (52 detections on 26 April), and Station 3 (30 detections on 26 April). The station with the lowest number was Station 4 (three detections on 26 February and six each on 2 February and 12 March). Count stations with the greatest number of species detected were Stations 2 and 6 (32 species) and 1 and 5 (30 species). Count stations with the lowest number of species detected were Station 4 (22 species) and Station 3 (27 species). Stations with the greatest number of detections and number of species were located in or bordering riparian habitat. Station 1 was located in recovering sage scrub and chaparral but detections from nearby eucalyptus woodland on Honey Springs Creek caused the higher number of species detections. Station 2, located in riparian forest on Honey Springs Creek, and Station 5, located in riparian forest along Dulzura Creek, both had an expectedly high number of species due to high habitat suitability. Station 6, located in recovering type-converting to grassland (from scrublands), also had a high number of species due to expected grassland species, proximity of riparian forest on Pringle Creek, and rocky cliffs comprising Pringle

Canyon. In contrast, stations with the fewest number of detections and species were located generally in areas of minimal riparian growth, both pre- and post-fire, and in recovering scrubland.

Species most frequently detected during point count surveys include the California quail (*Callipepla californica*) (169 detections), house finch (*Carpodacus mexicanus*) (66 detections), white-crowned sparrow (*Zonotrichia leucophrys*) (50 detections), European starling (*Sturnus vulgaris*) (49 detections), house wren (*Troglodytes aedon*) (42 detections), and California towhee (*Melozone crissalis*) (25 detections). These species, except house wren and, to a lesser extent, European starling, represent a high degree of adaptability in usage of different habitats. The California quail, white-crowned sparrow, and California towhee have been found to respond positively to fire elsewhere in San Diego County (Unitt, 2010). The house wren, a cavity nester and thus obligate woodland species, is a prolific breeder although somewhat affected by fire; drought can also limit their reproductive rate (Unitt, 2010). European starling, a non-native species, has expanded over the last few decades throughout the coastal slope and occupies a variety of park and semi-urban woodland settings as seen in their higher numbers at predominately riparian count stations. The house wren and California towhee were the only species to be detected from all six stations; the Lazuli bunting (*Passerina amoena*) and spotted towhee were detected from five. The latter two are all considered fire-followers while the house wren seems to owe its abundance to prolific breeding.

A total of 21 species were detected only once. These included many common migrant or widespread resident species of expected occurrence but frequently low detectability, such as the green heron (*Butorides virescens*) at Station 5 along Dulzura Creek. From a conservation standpoint, the most notable of these were northern harrier, Cooper's hawk, and grasshopper sparrow, and also the parasitic brown-headed cowbird (*Molothrus ater*). While three of the four species are considered sensitive, the brown-headed cowbird poses a significant threat to many sensitive bird species in the County. The yellow warbler (*Dendroica petechia*) was detected twice, both on late April counts at Station 5, but due to lack of mature willows within the Preserve, may migrate through rather than breed on-site. The oak titmouse (*Baeolophus inornatus*), another cavity nester and thus somewhat averse to early post-fire conditions, was detected at five stations as were the acorn woodpecker (*Melanerpes formicivorus*) and Nuttall's woodpecker (*Picoides nuttallii*). All three are generally non-migratory and as such, their presence at multiple stations indicates recovery of oak riparian forest. Six stations also reported ash-throated flycatcher (*Myiarchus cinerascens*), another cavity nester; however, this species frequently forages in areas where it does not nest (Unitt 2004). A total of 10 western scrub-jay (*Aphelocoma californica*) detections over three stations is not unusual for this

nomadic species and may reflect offsite incursion since it is somewhat averse to post-fire conditions. The common yellowthroat (*Geothlypis trichas*) was detected only at Station 5 on Dulzura Creek. This species is considered resident in the county although there is evidence of some degree of migration. The non-native, invasive giant reed along Dulzura Creek is largely avoided by birds but anecdotal evidence of common yellowthroat usage of this invasive species exists (Greaves 2007).

The Preserve has a minimal amount of open native grassland, mostly located in the southeast corner of the site, south of Pringle Creek, in an area that also has recovering sage scrub. Species detected in this area were rufous-crowned sparrow (*Aimophila ruficeps canescens*), Brewer's sparrow (*Spizella breweri*), savannah sparrow (*Passerculus sandwichensis* [*nevadensis* Group]), grasshopper sparrow (*Ammodramus savannarum*), blue grosbeak (*Passerina caerulea*) and western meadowlark (*Sturnella neglecta*). Also occurring in this location but detected from one other station were Cassin's kingbird (*Tyrannus vociferans*), western kingbird (*Tyrannus verticalis*), rock wren (*Salpinctes obsoletus*), and lark sparrow. A single grasshopper sparrow was detected near the Preserve boundary on 24 March at Station 6. During breeding season field work for the San Diego County Bird Atlas prior to the year 2004, the grasshopper sparrow was noted within the Preserve, but breeding was not confirmed. The species prefers native grassland but has been forced to adapt to non-native grasslands.

The nocturnal survey detected two additional species, the common poorwill (*Phalaenoptilus nuttallii*) and great horned owl (*Bubo virginianus*). Station 2 produced the highest number of birds with two (2) great horned owls and three (3) common poorwills. The male/female pair of great horned owls was in coast live oak along the Honey Springs Creek drainage while the common poorwills were to the south, upslope in recovering sage scrub vegetation. Finding the male and female owls both at this location at this time of year suggests that they nested in the trees on the Preserve. At the time of the observation they could have been attending dependant young (Geoffrey Rogers pers. comm.). Common poorwill is expected in local scrubland habitats but seasonal status of this species in the county is not well understood. Some migrate while others become somewhat torpid with the onset of cold weather and minimal insect supply. Wetter, warmer winters, as occur in El Nino years, may prompt these individuals to call and attempt feeding thus revealing their presence (Unitt 2004). No birds were detected at Station 4. Station 6 produced only a flyover barn owl but a common poorwill was detected to the east just off the Preserve. The barn owl (*Tyto alba*) was also detected but had been found in daylight on an earlier date. This detection is nearly a mile from the one at Station 3 and may represent a different individual. Personal comments from Mr.

Garth Camp, an owner of property adjacent to the Preserve, referenced frequent sightings of barn owls at the east end of the Preserve.

Potentially Occurring Non-listed Species

Two species considered potentially occurring on the Preserve, lesser nighthawk (*Chordeiles acutipennis*) and western screech-owl (*Megascops kennicottii*), were not detected. The effect of fire on nocturnal birds is poorly known. Where they occur in low density they are difficult to detect, and many repeated surveys may be necessary.

The greater roadrunner (*Geococcyx californianus*), a species now considered to be in decline locally, was not detected, likely due to lack of habitat as the species prefers unburned habitat. The entire Preserve burned in the 2007 Harris Fire and upslope scrubland habitat is still in an early seral stage. This re-growth has not yet provided sufficient biomass to attract typical avian species (e.g., California Towhee, rufous-crowned sparrow, wrentit, etc.) in numbers anywhere near carrying capacity. Riparian areas of predominately oak woodland burned less due to fire resistance of coast live oak and California sycamore. After the fire, coast live oak riparian forest along Dulzura and Pringle Creeks still contained potential to host more species than upslope scrublands due to structural variation of canopy and remaining vegetation.

The canyon wren (*Catherpes mexicanus*), a species of rocky outcrops and cliffs, was expected in Pringle Canyon but not detected. The effect of fire on this species is not well documented, but since it is essentially independent of vegetation, it seems unlikely to be seriously affected.

4.3.4 **Mammals**

Small Mammals

A total of 411 small mammal captures representing 14 species were recorded during three trapping sessions (22-25 March, 2010, 5-8 April, 2010, 12-15 July, 2010) using 12" Sherman live traps (Appendix D; Figure 3-3). Of the 12 species captured using Sherman traps, northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*) was the most frequent (104 captures). The deer mouse (*Peromyscus maniculatus*) was second most frequent (68 captures) while the Dulzura kangaroo rat (*Dipodomys simulans*) was third (65 captures). The California mouse (*Peromyscus californicus*) was captured 53 times. In addition to these species, other captures included the cactus mouse (*Peromyscus eremicus*) (14 captures), California vole (7 captures), western harvest mouse (6 captures), California pocket mouse (*Chaetodipus californicus*) (2 captures), and brush mouse (*Peromyscus boylii*) (9 captures). The Bryant's woodrat (*Neotoma bryanti*) was captured

19 times and big-eared woodrat (*Neotoma macrotis*) seven (7) times. Table 4-8 shows the species captured and total captures for each Sherman trap plot as well as the small mammal species captured in herpetological pitfall traps.

Pitfall traps, used primarily for herptofauna sampling, also sample for small mammals not readily captured by Sherman traps. The desert shrew was captured once, by bucket, at Array 3 located adjacent to Dulzura Creek. The California vole was detected at Plots 3, 9, 12 and 13. This is another species that is mostly captured in pitfalls. This species spends most of its time above ground. Along with woodrats, voles are significantly negatively affected by fire.

Among all size classes of mammals, the deer mouse was the most widely distributed species, being captured at 12 of the 15 plots. The desert shrew, as mentioned above, was least distributed. Plot 12 accounted for the greatest number of species (10) while Plots 4 and 15 accounted the least number of species (3 each). Multiple rodent species tend to find shelter under large rocks after a fire; prior to a fire burrows are often found at the base or near vegetation. Both structures provide escape cover from predators. Plot 12 was established within the riparian zone on Dulzura Creek. This habitat type is preferred by many species including the California mouse and brush mouse.

In order to gauge the progress of fire recovery on the Preserve and its effect on small mammals, it is important to compare the data from the 2009-2010 survey results to the long-term study results at nearby Rancho Jamul Ecological Reserve (RJER), where Dr. Jay Diffendorfer and SDNHM have conducted pre- and post-fire surveys (Scott Tremor, pers. comm.). It is difficult to draw conclusions on the recovery of the small mammal community on the Preserve as the data collected in the 2009-2010 survey represent one year of recovery rather than the longer sampling periods necessary for adequate analysis. Most rodents and insectivores, except for the Bryant's woodrat and voles, are not immediately impacted by the fires as deep burrows allow them to escape. However, the lack of food will eventually impact some species in burn areas.

Table 4-8.Small Mammal Captures at the Preserve

Common Name	Scientific Name	Small Mammal Trapping Array (Sherman & Pitfall)															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
California pocket mouse	*Chaetodipus californicus*								2								**2**
Northwestern San Diego pocket mouse	*Chaetodipus fallax fallax*	6	10	5	4	9	3				11		36	5	14	13	**116**
Dulzura kangaroo rat	*Dipodomys simulans*	2	2	1	10	5	2				6	18	1		8	14	**69**
California vole	*Microtus californicus*			6						2			3	2			**13**
Bryant's woodrat	*Neotoma bryanti*		3	1							1	1	11	2			**19**
Big-eared woodrat	*Neotoma macrotis*							3					1		3		**7**
Desert shrew	*Notiosorex crawfordi*			1													**1**
Brush mouse	*Peromyscus boylii*	1							1	1			3	3			**9**
California mouse	*Peromyscus californicus*	2	6			4	3	7	8	4			2	5	9	5	**55**
Cactus mouse	*Peromyscus eremicus*	4	6										1		3		**14**
Deer mouse	*Peromyscus maniculatus*	7	10	7	9	3	9	6		16	5	11	4	3			**90**
Cottontail rabbit	*Sylvilagus* sp.						2			1							**3**
Western harvest mouse	*Reithrodontomys megalotis*	1				2		1		1		1		2			**8**
California ground squirrel	*Spermophilus beecheyi*						2		1				1		1		**5**
Botta's pocket gopher	*Thomomys bottae*			2		1											**3**
Total Captures		**23**	**37**	**23**	**23**	**24**	**21**	**17**	**12**	**25**	**23**	**31**	**63**	**22**	**38**	**32**	**414**

Over time, the cycle of small mammal species found within the Preserve will change, which is natural and expected.

The 2009-2010 survey data from the Preserve indicates that the transition from more open canopy species (e.g., Dulzura kangaroo rat) with denser canopy species (e.g., California mouse, Bryant's woodrat) is occurring. Comparisons are also compounded by degree of burn severity and distance to refugia in relation to survey plots. It appears that some habitat along Dulzura Creek did not burn which allowed some small mammals to persist, thus allowing recolonization to adjacent areas.

The California mouse did not recover from the 2003 Otay Fire at RJER during the long-term study period on the Reserve. Locations where they were detected pre-fire burned hot in the 2003 Otay Fire and were not detected through the final surveys in 2008 on RJER. The species was detected at the Preserve in an area of light burn and unburned refugia. Recolonization into these burn areas likely occurred from Dulzura Creek or individuals survived the light burn.

The San Diego pocket mouse, California pocket mouse, and Dulzura kangaroo rat survived the Otay Fire at RJER and persisted throughout the study at the Reserve. Because kangaroo rats require open areas, it can be assumed that captures decrease as canopy and density of shrub cover increase as a result of fire recovery; this would be considered a normal fire recovery process. Bryant's woodrat survived the Otay Fire at RJER in unburned patches, but did not persist in hot burn areas. The species was found on the Preserve at Plot 12 in the riparian woodland along Dulzura Creek in light burn areas that have a greater chance of recovery.

Further trapping efforts would be needed at the Preserve over multiple seasons and years to determine overall abundance and population trends in various indicator species and fire recovery. The diversity of small mammals captured at the Preserve is high for a relatively short sample period.

Medium and Large Mammals

The largest mammal species detected at the camera/track stations on the Preserve was coyote (*Canis latrans*). One was detected by tracks and camera station surveys (Appendix D; Figure 3-3). Target species for these surveys include native medium and large carnivores (i.e. bobcat, *Lynx rufus*, mountain lion, *Puma concolor*, and coyote) and southern mule deer (*Odocoileus hemionus*). Non-target species include domestic animals such as the domestic dog (*Canis lupus familiaris*) and horse (*Equus caballus*). The results of each survey type are reported independently below.

Two medium native mammalian carnivores were detected by track and camera station, a coyote and a raccoon. In addition, a small rabbit species, either desert cottontail (*Sylvilagus audubonii*) or brush rabbit (*Sylvilagus bachmani*) and California ground squirrel (*Spermophilus beecheyi*) were observed three times by camera. Given the short time period and seasons of sampling, these species are expected and typical of the habitat type.

The ringtail (*Bassariscus astutus octavus*) was not observed or detected during baseline surveys. They are not expected to be detected during baseline surveys and would require focused surveys. The probability of ringtail to occur with the Preserve is low. 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 north-central section of the Preserve.

The medium to large mammal surveys produced only a small number of species, other species typical of the area, but not detected, include grey fox (*Urocyon cinereoargenteus*, bobcat, badger (*Taxidea taxus*) and opossum (*Didelphis virginiana*). The number of species detected was less than anticipated, possibly due to the 2007 Harris Fire. This fire burned approximately 20% of the Preserve; the majority of the southwestern portion. Species that prefer more heavily vegetated areas (i.e. bobcat and grey fox) may not be readily detected until post-fire recovery is further along.

The presence of carnivores at multiple camera stations was expected. In a similar study (Diffendorfer et al. 2007) of the Cedar Fire in the Cleveland National Forest there was no evidence that fire affected occupancy patterns or colonization patterns for any carnivore species detected at the camera stations. The carnivores were capable of persisting in both unburned and burned chaparral. However, results may be confounded by differences in size and quality of surrounding habitat and metapopulation dynamics (Plowman et al. 2006, Riley 2006).

Outside of the effects of fire on vegetation and carnivore communities, temporal sampling period as well as camera effort (i.e. number of cameras deployed in the field, and distance between camera and track stations) can have a huge effect on detection rates (Larrucea et al. 2007, Nielsen and McCollough 2009, Heilbrun et al. 2006)). Territory sizes of species and inter and intra-specific interactions can cause huge variability in data collection per sampling effort (Plowman et al. 2006, Moorcraft 2006). While these baseline surveys have detected some native mammals, it is likely there are many more that will be detected during future monitoring and survey efforts.

Due to its wide distribution and generally low density, the mountain lion is not frequently detected using camera station surveys (Dickson and Beier 2002). The habitat within the Preserve is suitable for mountain lion, so it is likely that this species may be detected in the future. The presence of mule deer is also a good indicator of habitat suitability for mountain lion. Southern mule deer, while easily detected by camera station, are known to avoid or circumvent track stations. Southern mule deer were not detected through the track and camera station methods. However, southern mule deer tracks were observed throughout the Preserve while conducting small mammal and herpetofauna surveys. Sign was most often found in the riparian areas and tracks were marked using GPS at the eastern Preserve boundary.

Bats

An attempt was made to identify all recorded bat echolocation calls and a species list was generated for the Preserve based on identified calls. A total of 12 bat species were detected by passive surveys (Table 4-9; Appendix D; Figure 3-4). Bats on the Preserve are diverse in species and reflective of those found on the nearby Rancho Jamul Ecological Reserve. The most active species included the big brown bat (*Eptesicus fuscus*), pocketed free-tailed bat (*Nyctinomops femorosaccus*), and Yuma myotis (*Myotis yumanensis*). Sensitive bat species detections included the Townsend's big-eared bat (*Corynorhinus townsendii*), western red bat (*Lasiurus blossevillii*), pocketed free-tailed bat and western mastiff bat (*Eumops perotis*).

Table 4-9.Bat Species Detected at the Preserve Using Passive Anabats

Common Name	Scientific Name	Anabat Station
California myotis	*Myotis californicus*	1,
Long-eared myotis	*Myotis evotis*	1, 2, 3
Yuma myotis	*Myotis yumanenesis*	1,2
Western small-footed myotis	*Myotis ciliolabrum*	1, 2, 3
Western red bat	*Lasiurus blossevellii*	1, 2*, 3*
Hoary bat	*Lasiurus cinereus*	2*,3*
Canyon bat	*Parastrellus hesperus*	1, 2, 3
Big Brown bat	*Eptisicus fuscus*	1, 2, 3
Townsend's big-eared bat	*Corynorhinus townsendii*	1*, 2*
Mexican free-tailed bat	*Tadarida brasiliensis*	1, 2, 3
Pocketed free-tailed bat	*Nyctinimops femorosaccus*	1, 2, 3
Western mastiff bat	*Eumops perotis*	1,2

*Stations with an asterisk represent probable (but not confirmed) detections.

The Preserve supports a high number of bat species including multiple sensitive species. Two of the three foliage roosting bat species (bats of the genus *Lasiurus*) found in San Diego County was detected on site. Crevice and cave roosting species, such as Mexican free-tailed bat, was detected as well. The variety of bat species with diverse ecological needs detected on site indicates the Preserve is quite supportive of bats in general. This is likely due to the presence of a diversity of undisturbed habitats on site that bats are known to utilize in southern California (Krutzsch 1948, Stokes et al 2005). These habitats include riparian woodland, oak woodland, exposed rocky outcrops, cliffs, boulder caves, scrub-covered hillsides and ridges, and a near-permanent water source - Dulzura Creek.

4.3.5 **Special-Status Wildlife Species Observed**

This section discusses the sensitive wildlife species that have been documented from 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, wildlife species covered under the South County MSCP are also included in this discussion.

No state- or federally-listed wildlife species were detected. However, a total of 19 non-listed sensitive wildlife species were detected across the Preserve during baseline surveys (Table 4-10. These included three species of reptiles (Figure 4-4), nine species of birds (Figure 4-5), and ten species of mammals (Figure 4-4). A brief species account for each sensitive species observed during baseline surveys is provided below.

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

Common Name	Scientific Name	Listing Status (MBTA/Federal/State/County)[1]	South County MSCP Covered (Y/N)[2]
Reptiles			
Orange-throated whiptail	*Aspidocelis hyperythra*	--/SSC/2	Yes
Red diamond rattlesnake	*Crotalus ruber*[3]	--/SSC/2	No
Two-striped gartersnake	*Thamnophis hammondii*	--/SSC/1	No
Birds			
Barn owl	*Tyto alba*	MBTA/--/--/2	No
Cooper's hawk	*Accipiter cooperii*	MBTA/--/WL/1	Yes
Grasshopper sparrow	*Ammodramus savannarum*	MBTA/--/SSC/1	No
Green heron	*Butorides virescens*	MBTA//--/2	No
Northern harrier	*Circus cyaneus*	MBTA/--/SSC/1	Yes
Red-shouldered hawk	*Buteo lineatus*	MBTA--/--/1	No
Southern California rufous-crowned sparrow	*Aimophila ruficeps canescens*	MBTA/--/WL/1	Yes
Western bluebird	*Sialia Mexicana*	MBTA/--/--/2	Yes
Yellow warbler	*Dendroica petechia*	MBTA/--/SSC/2	No
Mammals			
California pocket mouse	*Chaetodipus californicus femoralis*	--/SSC/2	No
Long-eared myotis	*Myotis evotis*	--/--/2	No
Northwestern San Diego pocket mouse	*Chaetodipus fallax fallax*[4]	--/SSC/2	No
Pocketed free-tailed bat	*Nyctinomops femorosaccus*	--/SSC/2	No
Western Small-footed myotis	*Myotis ciliolabrum*	--/--/2	No
Townsend's big-eared bat*	*Corynorhinus townsendii*	--/SSC/2	No
Western mastiff bat	*Eumops perotis*	--/SSC/2	No
Western red bat	*Lasiurus blossevillii*	--/SSC/2	No
Yuma myotis	*Myotis yumanensis*	--/--/2	No
Southern mule deer	*Odocoileus hemionus fulginatus*	--/--/2	Yes

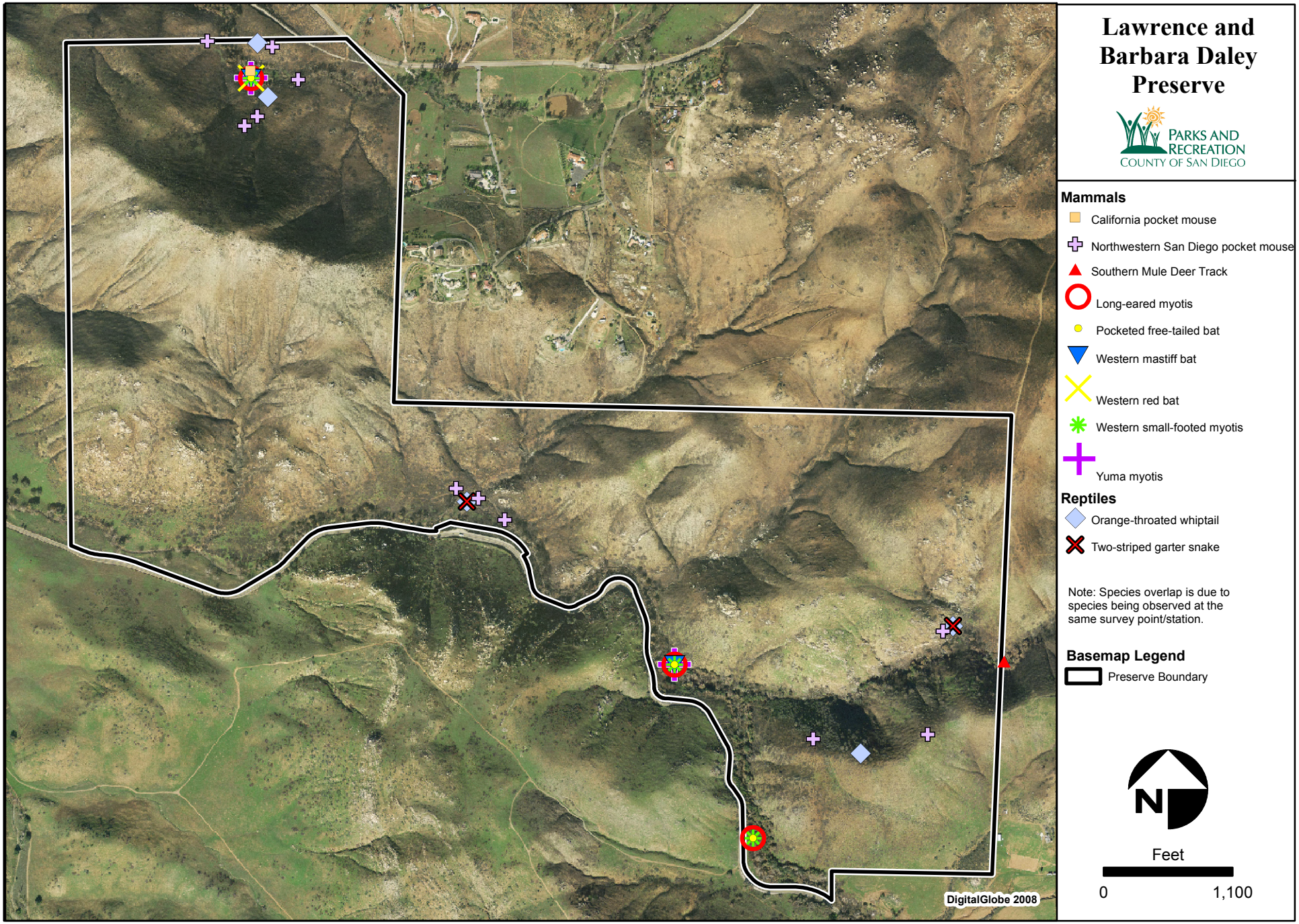
[1] Listing Status: MBTA: protected under the Federal Migratory Bird Treaty Act. Federal: E – endangered, T – threatened, DL – federally delisted. State: E – endangered, T – threatened, R – rare, SSC – species of special concern, FP – fully protected, WL – watch list. County: Group 1—endangered, Group 2—threatened, Group 3—sensitive.

[2] South County MSCP

[3] Only the northern subpopulation of red-diamond rattlesnake is considered sensitive (*Crotalus ruber ruber*)

[4] The DFG "Species of Special Concern" designation refers to the full species.

[*] Detections of this species were probable but not confirmed, therefore this species is not displayed on Figure 4-4.



Technology Associates International Corporation

Sensitive Reptile and Mammal Species

Figure 4-4

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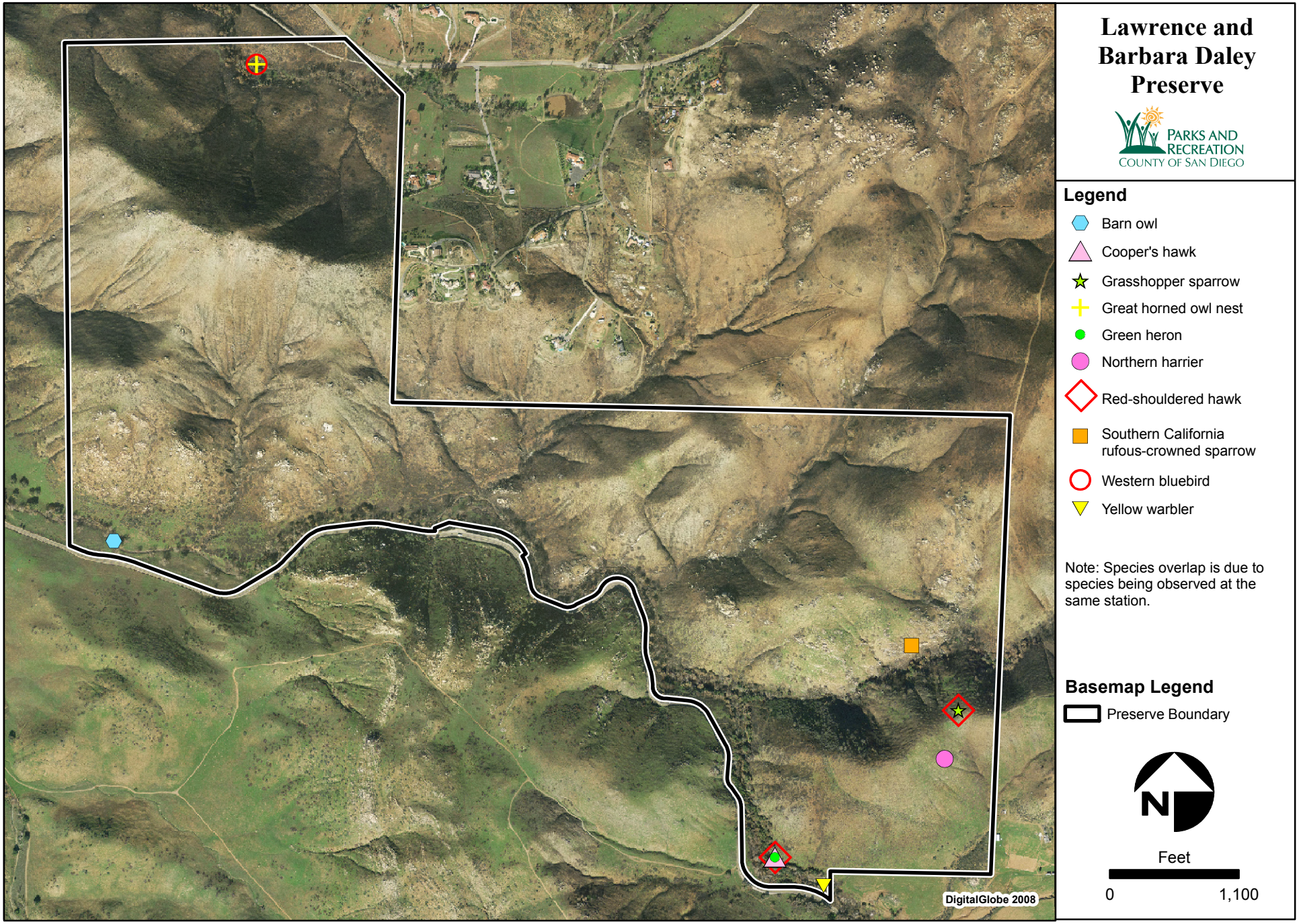

Technology Associates International Corporation

Sensitive Bird Species

Figure 4-5

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Orange-throated whiptail – *Aspidocelis hyperythra*
Federal Status: None
State Status: Species of Special Concern
County List: Group 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, 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 1988). 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 all pitfall arrays.

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

Although *Crotalus ruber ruber* is recorded from a number of vegetation types, it is most commonly associated with heavy brush with large rocks or boulders. Dense chaparral in the foothills, cactus or boulder associated coastal sage scrub, and desert slope scrub associations are known to carry populations of *C. r. ruber*, however, chamise and red shank associations may offer better structural habitat for refuges and food resources for this species than other habitats. The known range of *C. r. ruber* extends from Pioneertown and Morongo Valley in San Bernardino County southward on both coastal and desert sides of the Peninsular Ranges and the Santa Ana Mountains in California southward to Loreto, Baja California. The elevation range of the species is from near sea level to 4,987 feet (1,520 meters) (Palomar Mountain), though it is most frequently encountered below 3,937 feet (1,200 meters). Rattlesnakes inhabiting high altitudes are characteristically smaller than lowland forms. The red diamond rattlesnake observed at the Preserve was a roadkill observation along Honey Springs Road. This incidental

observation was not recorded by GPS, therefore the species is not displayed on the sensitive species figure (Figure 4-4).

Two-striped gartersnake – *Thamnophis hammondii*
Federal Status: None
State Status: Species of Special Concern
County List: Group 1
South County MSCP: Not Covered

The two-striped gartersnake is distributed from central California to Baja California (SDNHM 2008). In southern California it occurs from the coast to the mountains and is usually found in riparian habitat in or near sources of freshwater, including streams, ponds, and lakes. Its preferred diet consists of small fish, tadpoles, frogs, toads, and insect larvae. However, small mammals and invertebrates such as leeches and earthworms are also taken (Fitch 1941, Nussbaum et al. 1983, Rathburn et al. 1993). The breeding season for this live-bearing species begins in April or May, and continues through the summer (SDNHM 2008). The species is now common only in eastern San Diego County and populations are threatened by habitat elimination, predation by raptors, and introduced species including bullfrogs, fish, and feral pigs (Jennings and Hayes 1994). Within the Preserve, two striped gartersnakes were captured at arrays 3 and 5.

Barn Owl—(*Tyto alba*)
Federal Status: None
State Status: None
County Status: Group 2
South County MSCP: Not Covered

The barn owl is the most widely distributed species of owl and is ubiquitous in North America. This bird is a nocturnal hunter preying on small mammals, especially mice, rats and other rodents. A cavity nester and year round resident (non-migratory), this bird prefers open grassland habitat, marshes, deserts, agricultural fields, or any open area that would support populations of small mammals. The barn owl was observed along Dulzura Creek in the western portion of the Preserve (Figure 4-5).

Cooper's hawk – *Accipiter cooperii*
Federal Status: None
State Status: Watch List
County List: Group 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, Cooper's hawk was observed at point count station 5 (Figure 3-2; Figure 4-5).

Grassshopper sparrow – *Ammodramus savannarum*
Federal Status: None
State Status: Species of Special Concern
County List: Group 1
South County MSCP: Not Covered

The grasshopper sparrow is an inconspicuous species of open grassland (Vickery 1996). Males of the species are easily seen during breeding season when they sing from prominent stalks of grass or occasionally shrubs within grassland. Historically, in southern California, they were found with perennial bunchgrasses, which have now been largely converted to annual, non-native grasses. The species adapted to this new habitat in many cases, but non-native grasslands have now been lost to urban development thus leaving the grasshopper sparrow greatly reduced in number (Unitt 2004). Its status outside of breeding season is not clear and winter records away from breeding areas are frequent enough to indicate some degree of migration (Unitt 2004). Within the Preserve, a single grasshopper sparrow was detected along the eastern boundary near the southeast corner near Station 6 (Figure 3-2; Figure 4-5).

Green Heron—(*Butoroides striatus*)
Federal Status: Migratory Bird Treaty Act
State Status: None
County List: Group 2
South County MSCP: Not Covered

A terrestrial bird which forages in water, the green heron constructs nests in trees (i.e. willow) and shrubs along the edges of marshes, larkes, rivers or ponds (Ehrlich et al. 1988). Mature riparian forests are needed as habitat for these species. The diet of the green heron includes aquatic invertebrates (such as crawfish), fish, earthworms, snakes and even small mammals (such as mice). While the green heron in migratory in other

parts of North America (including the east coast), it is a year-round resident in southern California. The species was observed at point count station 5 (Figure 3-2; Figure 4-5).

Northern harrier – *Circus cyaneus*
Federal Status: None
State Status: Species of Special Concern
County List: Group 1
South County MSCP: Covered

The northern harrier is distributed throughout North America and Eurasia (Johnsgard 1988). Northern harriers breed from northern Alaska and Canada, south into roughly the northern two-thirds of the western United States, and the northern one-third of the eastern United States. Wintering harriers utilize the southern portion of the breeding range and extend farther south into Central America. San Diego County lies at the southwest edge of the harrier's breeding range in North America (Johnsgard 1988). Northern harrier is an uncommon to fairly common winter visitor and rare and local summer resident in the coastal lowlands of San Diego County (Unitt 2004). Harriers breed in marshes and grasslands and forage in grasslands, agricultural fields, wetlands, and open coastal sage scrub. Home ranges and breeding territories are variable in size and probably reflect differing habitat resources (Johnsgard 1988). Harriers have declined in California in recent decades but can be locally abundant where suitable habitat remains free of disturbance, especially from intensive agriculture (Zeiner et al. 1990). The breeding population, especially in coastal southern California, is reduced because of destruction of native wetland, meadow, and grassland habitats, and burning and plowing of nesting areas during early stages of the breeding cycle (Remsen 1978). The species was observed in the southeastern portion of the Preserve on a south-facing slope foraging in non-native grassland (Figure 4-5).

Red Shouldered Hawk—(*Buteo lineatus*)
Federal Status: None
State Status: None
County Status: Group 1
South County MSCP: Not Covered

The red-shoulder hawk has a wide distribution across the eastern United States but in the west is limited to the coastal areas. This raptor feeds primarily on small mammals and reptiles (including snakes and lizards). Nesting occurs in tall trees (such as sycamore or non-native eucalyptus) and open grasslands are required for foraging. This species is

widely distributed throughout San Diego County and often found in association with the closely related red-tailed hawk.

Southern California rufous-crowned sparrow – *Aimophila ruficeps canescens*
Federal Status: None
State Status: Watch List
County List: Group 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, southern California rufous-crowned sparrow was detected on the rocky slopes north of Pringle Creek near Station 6 (Figure 3-2; Figure 4-3).

Western bluebird – *Sialia mexicana*
Federal Status: None
State Status: None
County List: Group 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. 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, 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, western bluebird was observed at point count station 2 (Figure 3-2; Figure 4-3).

Yellow warbler – *Dendroica petechia*
Federal Status: None
State Status: Species of Special Concern
County List: Group 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, yellow warbler was detected at point count station 5 (Figure 3-2; Figure 4-3).

California pocket mouse – *Chaetodipus californicus femoralis*
Federal Status: None
State Status: Species of Special Concern
County List: Group 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 Central 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 has eliminated cover necessary for predator avoidance (Brylski 2005). The species was captured in the northern portion of the study area on a north-facing slope by a small strip of the oak woodland, under oaks in leaf litter and sparse patches of grass/forbs (Figure 4-4)

Long-eared myotis—*Myotis evotis*
Federal Status: None
State Status: None
County List: Group 2
South County MSCP: Not Covered

The long-eared myotis is a small brown bat of the *Vespertilionidae* family with long black ears. This bat is often found roosting in caves and crevices and also in man-made structures such as mines, bridges, and drainage culverts. Often referred to as "evening bats" this species, like other *Myotis*, emerges at dusk and feeds primarily on small insects and spiders. Small maternity colonies are formed in the spring and bats will care for a single young. The long-eared myotis was detected at all three anabat stations during passive surveys (Table 4-9; Figure 4-4).

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

The northwestern San Diego pocket mouse distribution area includes 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. The species is abundant across the Preserve (Figure 4-4).

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

The pocketed free-tailed bat is rare in California, but is 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 pocketed free tailed bat was confirmed during both fall and summer bat surveys (Table 4-9) at all Anabat stations (Figure 4-4). This is indicative of active foraging throughout the Preserve.

Western Small-footed Myotis—*Myotis ciliolabrum*
Federal Status: None
State Status: None
County List: Group 2
South County MSCP: Not Covered

The western small-footed myotis is distributed throughout most of the western U.S. and into Mexico. This bat is generally a solitary rooster with the exception of maternity colonies which form in the spring. This species roosts in rock crevices, abandoned mines, caves, or buildings. The western small-footed myotis has an insectivorous diet and feeds primarily on beetles and moths. This species, like most bats, requires open water for drinking and foraging. It is often found associated with chaparral vegetation communities. This species was found at all three anabat stations during passive surveys (Table 4-9 and Figure 4-4).

Townsend's big-eared bat – *Corynorhinus townsendii*
Federal Status: None
State Status: Species of Special Concern
County List: Group 2
South County MSCP: Not Covered

The Townsend's big-eared bat occurs throughout the western United States, including California, Nevada, Idaho, Oregon, and Washington, from near sea level to elevations well above 10,367 feet (3,160 m) (Nagorsen and Brigham 1993, Pearson et al. 1952). In California, the details of its distribution are not well known (Harris 2005). The species is most abundant in mesic habitats (Harris 2005). The Townsend's big eared bat roosts in caves, mines, tunnels, buildings, or other human-made structures (Harris 2005). The species may use separate sites for night, day, hibernation, or maternity roosts (Harris 2005). A high degree of site fidelity (more than 80 percent) has been noted for this species (Humphrey and Kunz 1976, Pierson et al. 1999). This species is extremely

sensitive to disturbance of roosting sites and a single visit may result in abandonment of the roost (Harris 2005). This species has a very low (kHz) call compared with many other species of bat. For this reason, the frequency range of a stationary anabat detector is often set too high. Often found at the bottom range of detections, Townsend's big eared bat can be hard to distinguish; a confirmed call is rarely collected by a stationary anabat detector. The best way to confirm presence of this species is to perform focused surveys using an active survey technique (usually a walking survey) with an anabat with sensitivity set to a lower frequency. An echolocation call resembling this species was recorded at Anabat Station 1 and 2 during passive surveys (Table 4-9). However, because these are not confirmed identifications, they are not displayed on Figure 4-4.

Western mastiff bat – *Eumops perotis*
Federal Status: None
State Status: Species of Special Concern
County List: Group 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). The western mastiff bat is non-migratory and a year-round resident, though, in San Diego, it does not enter torpor in the winter like other non-migratory species. 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). The western mastiff bat was detected within the Preserve during fall surveys at Anabat Stations 1 and 2 (Table 4-9; Figure 4-4).

Western red bat – *Lasiurus blossevillii*
Federal Status: None
State Status: Species of Special Concern
County List: Group 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, but it is a migratory species (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, scrublands, open woodlands and forests, and croplands (Harris 2005). The species does not form colonies and is difficult to find and census (USFS 2008). The western red bat was detected within the Preserve at Anabat Station 1 during summer surveys and may have been detected at Anabat Stations 2 and 3 during fall surveys based on recorded echolocation calls resembling this species (Table 4-9). This species has a call that can sometimes be confused with other species and it can be hard to confirm detection. There is at least one confirmed detection of western red bat from Anabat Station 1 which is displayed on Figure 4-4. Because detections at Anabat Stations 2 and 3 were inconclusive, these are not displayed on Figure 4-4.

Yuma myotis—*Myotis yumanensis*
Federal Status: None
State Status: None
County List: Group 2
South County MSCP: Not Covered
The Yuma myotis is widely distributed across western North America and found as far east as Colorado. This species is very closely associated with open water sources such as streams, ponds, lakes and wells. For that reason they are often found in riparian woodlands but can also be found in deserts regions and juniper woodlands if near a water source. This *Myotis* sp. feeds on insects including moths, beetles, cattisflies and other small insects (Whitaker 1996). The Yuma myotis roosts in a variety of locations including caves, attics, buildings, mines, palm trees (in the skirts), underneath bridges, and other structures. This species migrates south for the winter, but very little is known about its migration patterns or wintering areas. This species was detected at anabat stations 1 and 2 (Table 4-9; Figure 4-4).

Southern Mule Deer - *Odocoileus hemionus fuliginata*
Federal Status: None
State Status: None

County List: Group 2
South County MSCP: Covered

Mule deer are presently widespread throughout undeveloped portions San Diego County, although their numbers may be declining in the county. Deer require relatively large, undisturbed tracts of chaparral, coastal sage scrub, and mixed grassland/shrub habitats. The southern mule deer is not threatened with extinction within its range, but roads are a significant source of direct mortality and habitat fragmentation. Additionally, mule deer are an important prey for mountain lions. Incidental observation of mule deer, including tracks and scat, occurred at many locations throughout the study area, specifically along Dulzura and Pringle Creeks; mule deer tracks were recorded using GPS at the eastern boundary of the Preserve (Figure 4-4).

4.3.6 **Special-Status Wildlife with a High Potential to Occur**

Potentially occurring wildlife species are those that; (1) historically occur outside of, but within three (3) kilometers of the Preserve, and/or (2) whose habitat preferences are consistent with available habitat within the Preserve. Based on habitat preference and distribution, twenty-one sensitive wildlife species have been identified as having a high potential to occupy the Preserve (Table 4-11).

The southern grasshopper mouse has a very high probability of occurrence on the Preserve, especially in the region of Dulzura Creek where it has been documented historically. In addition, the mountain lion has a high probability of occurrence due to the presence of mule deer within the Preserve. The mountain lion has been documented at the nearby Rancho Jamul Ecological Reserve, increasing the probability that this species will be detected within the Preserve. While the Quino checkerspot butterfly was found in the vicinity of the Preserve, the lack of host plant (dot-seed plantain) reduces its likelihood to occur; however, as fire recovery progresses on the Preserve, the host plant may become more abundant, and thus increase habitat suitability for the Quino.

Table 4-11. Special-Status Wildlife Species with a High Potential to Occur at the Preserve

Common Name	Scientific Name	Listing Status (Federal/State/CNPS[2]/County/MSCP)[1]	Potential to Occur[3]
Reptiles			
Coronado skink	*Eumeces skiltonianus interparietalis*	--/SSC/--/Group 2/--	**High**: Adequate habitat exists on site
Mammals			
Southern grasshopper mouse	*Onychomys torridus Ramona*	--/SSC/--/Group 1/--	**High**: Historic captures at Dulzura Creek.
Mountain lion	*Puma concolor*	--/--/--/Group 2/MSCP	**High**: Probably uses Dulzura Creek for as movement corridor but also foraging. Has been documented to west on Rancho Jamul Ecological Reserve.

[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: (fauna) Group 1—endangered, Group 2—threatened, Group 3—sensitive (flora) List A – plants rare, threatened or endangered in California and elsewhere, List B – plants rare, threatened or endangered in California but more common elsewhere. MSCP: MSCP – Multiple Species Conservation Program coverage

[2] CNPS listing (plants only): List 1A – plants presumed extinct in California, 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 (watch list).

[3] Species occurrence data outside the Preserve by within 3 km of the Preserve.

4.3.7 Invasive Species

The brown-headed cowbird was detected once near point count Station 2 along Honey Springs Creek. Brown-headed cowbirds are brood parasites and are known to parasitize more than 220 host species (Muehter 2008). Expansion of the species has resulted in range-wide declines in populations of susceptible songbirds, including the willow flycatcher, Bell's, Cassin's and warbling vireos, blue-gray gnatcatcher, and yellow warbler (Unitt 2004). Cowbirds numbers on the Preserve may increase with post-fire recovery. The European starling is a European bird that has naturalized in the U.S. While it affects cavity nesting birds and can have an impact on the native avifauna it is not considered a threat at the Preserve because it does not occur in abundance and does not seem to have colonized the Preserve.

4.4 Habitat Connectivity and Wildlife Corridors

The Preserve does not fall within an identified linkage for either the South County MSCP or the South Coast Wildlands Missing Linkages Project. Although it does not fall within

a designated linkage area, the Preserve does contribute to overall landscape and habitat connectivity. It is in close proximity to conserved lands, lands which are a priority for conservation, and undeveloped and open space. For example, the Preserve provides linkage between sparsely inhabited areas to the east and the Hauser Wilderness Area of the Cleveland National Forest and westward toward Hollenbeck Canyon and the Rancho Jamul Ecological Reserve (Conservation Biology Institute 2003). The Preserve provides optimal topography, and with post-fire recovery will provide habitat for facilitating animal movement across its boundaries.

Most highly mobile animals seek cover when moving across the landscape as well as topographic and vegetative features that offer essential resources. Highly mobile mammals, such as coyote, southern mule deer, bobcat, and raccoon will preferentially travel along riparian corridors because of the vegetative cover and access to water. Dulzura, Honey Springs, and Pringle Creeks run through the Preserve and provide easily-traversed habitat features between lands to the west and east. The three creeks flow westward from private lands to the east and southeast before reaching the Preserve.

In this way, conservation of the Preserve increases the size of the linkage and increases overall landscape permeability while decreasing the edge effects apparent in many linkages (Hilty et al. 2006). The conservation of the Lawrence and Barbara Daley Preserve contributes to overall habitat connectivity in the region (Noss and Daly 2006).

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5.0 **Conclusions and Management Recommendations**

Data collected during the baseline surveys provides valuable information for resource management planning and the development of Area Specific Management Directives. This section provides specific management and monitoring recommendations for each taxonomic group assessed during this survey effort. Additionally, management recommendations are provided for issues that are common across all open space areas in San Diego County.

MSCP monitoring guidelines are currently being updated, revised and developed by the Regional Monitoring and Management Team, a group organized through the San Diego Association of Governments (SANDAG) Environmental Mitigation Program (EMP). Regional monitoring approaches and specific habitat monitoring protocols are being studied by researchers of San Diego State University (SDSU); animal monitoring protocols are being drafted by the U.S. Fish and Wildlife Service (USFWS) and U.S. Geological Survey (USGS), the latter of which is also researching specific monitoring protocols for sensitive plants. In lieu of the availability of preserve-specific monitoring protocols, monitoring methods described below either use established protocols or draft regional MSCP monitoring protocols adapted for preserve-level monitoring.

5.1 ***Vegetation Communities***

Ten vegetation communities were mapped within the Preserve during 2009-2010 baseline surveys. The vegetation communities are in a state of recovery from the 2007 Harris Fire that burned the entire Preserve. The Preserve is largely dominated by coastal sage scrub. The California gnatcatcher, which is associated with coastal sage scrub habitat, has not been documented on the Preserve. 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 covered under the South County MSCP. Vegetation updates should be consistent with recommendations for regional vegetation monitoring and should include information about post-fire recovery of the vegetation communities. The South County MSCP Framework Resource Management Plan (FRMP) recommends that habitat monitoring be repeated at least once every five years.

5.2 Plants

A total of 355 plant taxa were observed during floristic surveys conducted in 2010, including eleven sensitive plant species, including one South County MSCP covered species – Palmer's goldenbush. Palmer's goldenbush is currently ranked as a third priority species based on its sensitivity relative to MSCP conservation goals, and monitoring is not required per MSCP management and monitoring guidelines (McEarchen 2007).

Periodic floristic monitoring surveys (every three to five years) are recommended to monitor the sensitive plant species detected 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. Because floristic surveys were restricted to the height of blooming period in spring of 2010, 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. Monitoring surveys should follow monitoring protocols specifically developed for preserve-specific trend monitoring in perpetuity. Examples of such protocols are McEarchen (2007) and Deutschman and Strahm (2009). Both McEarchen and Deutschman are currently updating protocols for specific sensitive plant and vegetation communities monitoring.

All sensitive plants on the Preserve should be protected from ground disturbance such as infrastructure (e.g., trail) development. In addition, prior to any ground disturbing activities, rare plant surveys are recommended in suitable habitats to ensure that sensitive plant taxa will not be impacted.

5.3 Wildlife

5.3.1 **Lepidoptera**

Checklist surveys conducted in May and June 2010 resulted in the detection of 13 butterfly species. Continued butterfly surveys are recommended on the Preserve every five years to detect any potential trends or changes in the Lepidoptera population in the area. Checklist surveys are recommended to compile a comprehensive list of butterfly species occurring on the Preserve. This type of survey is more efficient than transects and results in a greater number of butterfly detections (Royer et al. 1998). Once a comprehensive butterfly species list has been compiled, long-term monitoring via Pollard walk transects are recommended to monitor butterfly populations. These surveys employ

fixed travel routes (transects) for counting and are repeatable, more practical, and statistically manageable for detecting population status and trends (Royer et al. 1998).

The Quino checkerspot butterfly has not been documented from the Preserve in the past, but has been observed in the Rancho Jamul Ecological Reserve located to the northwest of the Preserve. A focused effort should be made to determine the presence of the Quino checkerspot butterfly to complement the 2009-2010 baseline inventory surveys by conducting USFWS protocol surveys on the Preserve. Suitable habitat is present along with dot-seed plantain, Coulter's snapdragon (*Antirrhinum coulterianum*), and purple owl's-clover (*Castilleja exserta* ssp. *exserta*), all larval host plants used by the species (USFWS 2003). No adult nectar plants were observed on the Preserve during 2010 floristic surveys or Quino checkerspot habitat assessment.

Like the Quino checkerspot, the Hermes copper butterfly has not been recorded on the Preserve, but has been observed in the vicinity (Rancho Jamul Ecological Reserve). Thus, a focused Hermes copper survey on the Preserve is recommended. The Deutschman Lab at SDSU is currently conducting research on the life history of the Hermes copper butterfly, which will inform management and monitoring. In addition, survey techniques are being tested. This effort is being coordinated with the San Diego Regional Monitoring and Management Team so that a standard survey protocol can be developed.

Habitat or larval host plants for the Harbison's dun skipper were not found during the 2009-2010 baseline surveys, and this species has a low probability of occurrence. Therefore, a focused species survey for this species is not recommended.

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 and public vistas should not be installed, or should be installed with minimal disturbance in these locations.

5.3.2 **Herpetofauna**

The species detected on the Preserve likely represent the majority of herpetofauna on the Preserve; however, they do not likely represent the full extent of herpetofauna occupying the site. To monitor herpetofauna for MSCP-covered species, including the orange-throated whiptail lizard and also to detect fire recovery changes from recent wildfires, it is recommended that a long-term sampling/monitoring effort be implemented using the

pitfall traps currently in place. It is also recommended that additional pitfall arrays be installed to more adequately sample the Preserve, specifically as the Preserve is dominated by coastal sage scrub, the habitat for the orange-throated whiptail. Herptofauna monitoring should be conducted at five-year intervals during optimal weather conditions. Surveys should be conducted to capture the range of species expected on the Preserve; therefore, amphibians should be surveyed between mid-March to late June and reptiles are best surveyed between mid April to late September. Reptile hatchlings and juveniles appear in late summer to early fall, surveys between August and October would help collect data on breeding activity. Finally, it is recommended that future pitfall trapping employ mark/recapture techniques (i.e. scale and toe clipping) to better detect population trends, which is necessary to adequately monitor the herpetofauna on the Preserve.

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.

Rattlesnakes were detected on the Preserve during 2010 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.

No salamanders were captured during 2010 pitfall surveys. The wildfires that have burned much of the Preserve may have had detrimental effects on salamander populations. Therefore, it is recommended that pitfall trapping during winter months be conducted to increase likelihood of salamander captures and better assess the current status of salamander populations on the Preserve. Installation of additional pitfall arrays may also be necessary to increase detection probabilities due to very low capture rates of salamander species.

5.3.3 **Avifauna**

Avian surveys resulted in the detection of 71 species within the Preserve. It is recommended that continued monitoring be conducted at the Preserve to monitor populations and fire recovery. Continued monitoring including avian point count monitoring every three to five years will help determine a more accurate status of the status of both resident and migratory avian populations at the Preserve. The following MSCP-covered avian species should be monitored as described below:

Northern Harrier: Because of the threat to the breeding population in Southern California, monitoring this MSCP-covered species on the Preserve would be beneficial. Monitoring should occur through habitat-based monitoring (vegetation communities monitoring specifically in scrublands and grasslands on the Preserve). Nesting has not been observed on the Preserve but is likely. The species will also likely be encountered during avian bird count monitoring on the Preserve.

Cooper's Hawk: Monitoring should occur through habitat-based monitoring (woodland communities such as riparian and oak woodland vegetation communities monitoring) to identify trends in foraging habitat. Nesting has not been observed on the Preserve, but the species may nest in the eucalyptus grove in the northern portion of the Preserve, or along Dulzura Creek, where the species was observed. The species will also likely be encountered during avian bird count monitoring on the Preserve.

Western Bluebird: Western bluebirds are not threatened in the County and MSCP-monitoring is not a high priority. The species will also likely be encountered during avian bird count monitoring on the Preserve.

Southern rufous-crowned Sparrow: The rufous-crowned sparrow will benefit from habitat monitoring specifically within coastal sage scrub and chaparral habitat on the Preserve. The species will also likely be encountered during avian bird count monitoring on the Preserve. Management actions include invasive plant species removal on the Preserve as well as fire recovery of the species' habitat.

The riparian woodland along Dulzura Creek was significantly degraded by the 2007 Harris Fire. Among the birds likely affected was the oak titmouse, a riparian and oak woodland species that relies on cavities for nesting. A more exact census and monitoring of this species would be an index to the recovery of its habitat. Although only found once, the brown-headed cowbird is assumed to utilize titmouse nests.

Fire recovery of sage scrub habitat within the Preserve may facilitate occupation by the California gnatcatcher, which is also a frequent cowbird victim. The California gnatcatcher population within San Diego County is currently being monitoring on a regional scale by the USFWS. Regional California gnatcatcher monitoring data should be incorporated into the monitoring reports of the Preserve to inform future management decision that would aid in the recovery of these habitats. Monitoring of these other species with a history of population decline and recovery is appropriate to ensure these recoveries are sustained, if not extended.

If higher densities of cowbirds are detected during bird monitoring surveys, a cowbird trapping program is recommended. If feasible, this could be accomplished in collaboration with CDFG to protect least Bell's vireo (*Vireo bellii pusillus*) on the Rancho Jamul Ecological Reserve from this predatory species.

5.3.4 **Mammals**

Southern mule deer was the only MSCP covered mammal species documented on the Preserve during the 2009-2010 baseline surveys. Ongoing annual monitoring of mammal populations on the Preserve is recommended if funding is available. Similar methods to those employed during the baseline surveys should be used to ensure continuity of data and ease of analysis. Population trends and species richness are likely to fluctuate over time as fire recovery continues. This information can help inform long term fire studies within the region.

All mammals are sensitive to human activity and human-associated animals (dogs, horses, etc.). Specifically, feral dogs can become efficient predators. Rabbits and ground squirrels are a preferred prey item but they also harass mule deer, thus discouraging use of the area by the deer. In other cases, dog owners often allow dogs to run off leash while hiking in open space areas. These dogs will occasionally kill or harass native animals. If public access is allowed in the Preserve, leash requirements for pets should be required and that a public information campaign (e.g., through the distribution of informative flyers) should be initiated to encourage responsible pet ownership.

Small Mammals

Appropriate predator-prey relationships should be maintained in the Preserve. Small mammal population health is necessarily correlated with the health of their predators including raptors and medium mammalian carnivores (such as grey fox). If funding is available, small mammal populations should be regularly monitored to ensure their numbers are robust and appropriate for the habitat. The inventory completed on the Preserve during the 2010 survey year should be supplemented with additional monitoring surveys; this is especially imperative as the population trends of small mammals will change from year to year following a large fire event such as the one experienced by the Preserve in 2007. Initially for the first five years, mammals should be monitored annually to monitor fire recovery. Thereafter, trapping studies every five years is recommended; more frequent trapping should be conducted after stochastic events such as fires. While the 2010 trapping study was intended to capture an inventory of small mammal species on the Preserve, future monitoring should be conducted in the same locations.

The desert gray shrew is insectivorous and the use of insecticides on the Preserve may negatively impact this species. If insecticides or other chemicals are considered for use on the Preserve a qualified biologist should be consulted prior to application.

Medium and Large Mammals

Southern mule deer was the only MSCP-covered mammal species detected during the 2009-2010 field surveys. Mule deer monitoring methods should include incidental encounters of track, scat, and visual observations while conducting other monitoring surveys of the Preserve. Every five years, transects within Dulzura Creek and Pringle Canyon should be walked where track and scat were common. These surveys should be conducted in addition to camera surveys because mule deer are not reliably captured by these methods.

The ringtail was not documented during these surveys. Suitable habitat for this inconspicuous species is minimally present onsite (Hall 1981). If funding is available, focused surveys would help document new populations of this very rare species and determine its status onsite. More surveys using motion-sensing cameras near the grotto and the north-central border of the Preserve and in other suitable areas across the Preserve are recommended.

Both bobcat and mountain lion were undetected by camera/track station or casual observation; however, these species are known from the vicinity and anecdotal observations have been made at Hollenbeck Canyon Wildlife Area and Rancho Jamul Ecological Reserve. If funding is available, focused surveys using motion-sensing cameras and bait stations to detect this species are recommended throughout the Preserve. Additional motion-sensing cameras should be placed in potential movement corridors to increase detection probability.

Bats

If funding is available, continued seasonal bat monitoring at the Preserve using Anabat stations is recommended. This technique provides thorough documentation of most species and also provides relative measures of activity levels. However, these stations do not provide population numbers or reproductive status. Mist netting and/or roost surveys may augment bat data collected during baseline and during future surveys.

Not all bat species are equally detectable using Anabats. Certain species such as the long-eared myotis (*Myotis evotis*) appear to use low-intensity echolocation calls and

therefore may go undetected or may be underrepresented 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, or may be underrepresented (Orr 1982). A more complete survey including separate low frequency Anabat installations, active surveys in suitable habitat, and possibly mist-netting will be needed to fully capture these species and the species richness of the local bat population. In addition, since many resident bat species are migratory and many species will pass through the area during migrations, fall and spring surveys are the most essential. Summer surveys will capture year-round residents. Winter surveys may not be as productive unless coupled with roost surveys as some resident bats will enter torpor during the winter months.

Oak and riparian woodlands on the Preserve provide important bat habitat. It is recommended that healthy oak and riparian woodland be maintained. Impacts to these habitats, including limiting removal of dead trees and snags which bats are known to utilize as roost sites, should be minimized. In addition, disturbances of rocky habitats should be prevented (i.e. rock-climbing in potential or known bat habitat should be prohibited).

Dulzura and Pringle Creeks likely provide bats with water for at least of portion of the year. It is recommended that water quality in these be maintained through monitoring native vegetation and removing invasive species associated with the creek. In addition, the introduction of exotic species such as Mosquito fish, game fish, bullfrogs, crayfish, African clawed frogs, tamarisk, and giant reed that may affect (reduce) health of the aquatic ecosystem should be prevented and regularly monitored.

5.4 Non-Native Invasive Species Removal and Control

5.4.1 **Plants**

Removal of all high priority non-native invasive species is recommended as a high management priority across the Preserve. High priority plant species are listed in Table 4-4 of this document including giant reed, red brome, fennel, Himalaya blackberry, and tamarisk. Removal of such non-native grassland species as red brome will be difficult because this species dominates the non-native grasslands onsite, and removal may cause a temporary significant impact to the functions of these grasslands until native species have become established. Long-term successful removal methods for invasive non-native grassland species have not yet been conclusively identified, although eradication methods are being tested in different parts of the state, including eradication methods for Sahara mustard (*Brassica tournefortii*) at University of California Riverside. High

priority species for which long-term successful removal methods exist include giant reed, and tamarisk along the creeks (Figure 4-3) as well as Himalayan blackberry and fennel that occur along Dulzura Creek. DPR has commissioned a targeted invasive species control study for the Preserve. Non-native invasive plant removal efforts are planned to be performed in 2011 within riparian habitat associated with Dulzura Creek.

5.4.2 **Wildlife**

Currently, non-native or invasive animal species are not threatening the ecological integrity of the Preserve or the continued existence of any sensitive species. Sensitive species commonly affected by the presence of cowbirds, such as the California gnatcatcher, least Bell's vireo or southwestern willow flycatcher, have not been observed on the Preserve. However, habitat for the California gnatcatcher and least Bell's vireo exist and these species may recolonize the Preserve as a result of fire recovery. If monitoring of the Preserve reveals that the cowbird population is growing and threatening sensitive or MSCP-covered bird populations on the Preserve, a cowbird trapping program should be evaluated and implemented at that time.

5.5 Restoration Opportunities

Restoration opportunities have not been identified on the Preserve because vegetation communities are still recovering from the 2007 Harris Fire and it is too early to tell whether additional restoration would be required to foster the recovery process. If restoration is found to be needed post-fire seeding can be implemented. In general, post-fire seeding shall be kept to a minimum within the Preserve. No aerial or hydraulic seeding shall be conducted over burned areas within the Preserve. Aerial and hydraulic seeding is mostly unnecessary (as many chaparral species are adapted to crown sprout following wildfire), expensive, and may contribute to the introduction of non-native species or non-local genotypes of native species not collected locally. Post-fire soil stabilization methods using bio-engineering techniques and natural materials (e.g. fiber rolls, bonded fiber matrices) should be preferred to seeding.

If restoration is determined necessary in the future to stabilize slopes within the Preserve, only seed material collected within the Preserve shall be applied via land imprinting as slopes allow. Any seed materials applied shall be thoroughly inspected with all non-native or unidentifiable seed material removed to avoid potential contamination.

5.6 Fire Management

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 conditions prevailed, fire management would not be necessary. However, increased human presence in the County has changed the natural fire cycles and more frequent fires, especially those driven by hot and strong Santa Ana winds have caused considerable damage to the human and natural landscape. 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 areas away from the wildland-urban interface should be restricted to fire prevention and management geared toward public safety, as described below. Due to the vicinity of residential house immediately east of the Preserve, a fire management plan should be prepared identifying fuel management zones. 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.

5.6.1 **Public Safety**

Fire management for public safety purposes includes the use of fire prevention, zoning and planning, housing construction standards, sheltering in place, and fuel management zones to create defensible space around homes. The north-east section of the Preserve is immediately adjacent to a rural residential neighborhood (Figure 1-3). The 100-foot fuel modification zone required for the three residences adjacent to the Preserve boundary reach into the Preserve. The County will assure that the Preserve-side portion of defensible space surrounding the residential dwellings are maintained per the County's code (County of San Diego Consolidated Fire Code [County Health and Safety Code SS 13869.7]) by performing vegetation thinning in accordance with the defensible space guidelines presented in the County of San Diego, Department of Planning and Land Use (2004) publication *Fire, Defensible Space, and You…* and codified in the Combustible Vegetation and Other Flammable Materials Ordinance (Sections 68.401 through 86.406 of the County of San Diego's Zoning Ordinance). In addition, the County shall maintain access on the Preserve for firefighting personnel; currently, the Preserve has only a few minor roads at the Preserve's periphery, but no roads or trails exist in the interior of the Preserve. Managed fire access is important to prevent fire access routes from being cut in sensitive habitats in an emergency.

Management and fire access on the Preserve should be carefully planned in correlation with the criteria for the Preserve's infrastructure planning. 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. DPR will coordinate with the local fire district regarding access for fire fighting, including with the CalFire Dulzura Forestry Fire Station immediately south of the Preserve (17304 California 94, Dulzura, CA 91917) and the CalFire Jamul Rural Fire Station #36 (14145 Campo Road, Jamul, CA 91935).

5.6.2 **Ecosystem and Vegetation Management**

While vegetation management and fuel treatment have shown effectiveness in the wildland-urban interface, specifically within fuel breaks and 100-foot defensible space buffers, there is overwhelming evidence that these management methods fail in remote areas because they can be surmounted by wind driven fires and lead to type conversions of native scrublands to non-native grasslands. Ongoing studies initiated after the 2003 Cedar Fire by the San Diego Natural History Museum and USGS are now showing that type conversations have occurred in the County as a direct result from too frequent and intense fires. Type conversions can result from any management action that might lead to increased disturbance frequency including loss of native flora and fauna; increase in exotic weeds that are more flammable and, in turn, increase fire frequency; increase in erosion and sedimentation; loss of soil holding capacity for deeply rooted vegetation in favor of shallow rooted grasses and exotic species; and loss of carbon storage capacity. Fire and fuel management, such as prescribed burns or thinning of vegetation, are not found to benefit non-forest ecosystems such as scrublands. Therefore, fire management to benefit the Preserve's ecosystem and natural resources needs to be carefully evaluated and implemented based on the most current available science, and restricted to areas where it directly benefits a sensitive species or habitat. Measures and treatment areas should be identified based on landscape-level fire models and risk analyses, such as The Nature Conservancy's LANDFIRE program. This "Landscape Fire and Resource Management Planning Tool" is a five-year multi-partner project producing consistent and comprehensive maps and data describing vegetation, wildland fuel, and fire regimes across the United States. The data are based the most current science and include field-derived data, including layers of vegetation composition and structure, surface and canopy fuel characteristics, and historical fire regimes at a 30-meter grid spatial resolution raster data set.

Fire management in open space intended for the conservation of biological and ecological resources is described the County of San Diego's Vegetation Management Report (County of San Diego 2009b) and the fire management section of the South County

MSCP. 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.

5.7 Wildlife Linkages and Corridors

The Preserve is surrounded by conserved open space (Figure 1-3). Although no distinct wildlife movement corridors have been identified, wildlife movement is most likely occurring throughout this area. The riparian habitat on-site is an essential component of wildlife corridors in the Preserve. It provides cover and allows movement for many of the bird and mammal species. Non-native invasive plants have been identified within the riparian habitat of Dulzura Creek and are planned for removal in 2011.

Wildlife moves across the landscape, and therefore, linkages and corridors are best studied in a regional context. SANDAG and the MSCP's Regional Monitoring and Management Team are currently evaluation a regional wildlife movement study and monitoring protocol combining genetic studies with field data collection methods. The protocol is expected in 2011 and should be reviewed with relevance to the Preserve.

5.8 Additional Management Recommendations

The Preserve faces similar threats as other open space preserves face 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, inadequate patrol by County staff, and unauthorized collection. This section discusses these threats and 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 **Public Access**

The Preserve is not currently open to the public and no infrastructure for public access exists. Infrastructure planning for the Preserve must be done carefully with public safety in mind specifically as the Preserve is currently used by undocumented immigrants. Appropriate signage, fencing, frequent ranger patrol, and public education should also be implemented to reduce illegal trespassing of the Preserve, as discussed in the following sections. Multi-use public access will need to be planned to avoid disturbance to sensitive biological and cultural resources. Allowing multi-use public access on the Preserve would add to recreational uses available on public land in the area. The adjacent

Hollenbeck Canyon Wildlife Area allows for multi-use access (including mountain bikes and equestrian), while Rancho Jamul Ecological Reserve only allows for pedestrian access (with the exception of guided trail hikes).

5.8.2 **Fencing and Gates**

The entire Preserve is fenced. Fencing along SR-94 (western border of the Preserve) is operated by Caltrans. The majority of the fencing around the Preserve is old, but it is maintained. In the event the Preserve is open to the public, fencing will need to maintained and repaired on a regular basis.

Gates are currently in place at the Honey Springs Road entry point on the north side of the Preserve and opposite the CDF station on State Route 94 just southeast of the Preserve. Maintenance of these gates is recommended to ensure only authorized access is permitted. Additional gates may need to be installed pending the County's public access planning for this Preserve. Gates at access points should remain locked when the Preserve is closed.

5.8.3 **Trails and Access Roads**

Currently, no official trails exist on the Preserve with the exception of an unofficial trail in the northernmost portion of the site, adjacent to Honey Springs Road (Figure 2-5). In addition, no access roads occur within the Preserve. While the 2009-2010 baseline surveys provide a general understanding of the natural occurrence of flora and fauna within the Preserve, they did not cover the entire Preserve on a site-specific basis. Therefore, any proposed infrastructure development project within the Preserve, including the construction of new trails and access roads, would require site-specific surveys of the development footprint plus a buffer (approximately 100 feet) to assure that no sensitive species would be affected by the project. This includes focused surveys (pursuant to USFWS protocol) for such listed species as the Quino checkerspot butterfly and the California gnatcatcher in areas that may affect these species' habitats. Surveys for the Hermes copper butterfly may also be recommended. It is unlikely that arroyo toad would occupy the creeks on the Preserve unless the hydrology of the creeks change in the future; therefore, focused arroyo toad surveys may not be necessary. However, wetlands permits and associated site-specific surveys and mapping may also be necessary for any infrastructure projects or improvements that would affect Dulzura, Pringle, and Honey Springs Creeks and associated wetlands and riparian areas.

5.8.4 **Signage and Education**

The Preserve is not currently open to the public, and no kiosks and signage have been installed. Once the Preserve has been opened to the public, public education facilities will be planned and installed in accordance with the public trail system on the Preserve. If kiosks will be installed, they should be maintained to provide the public with valuable information about sensitive 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. If the County determines that equestrian access to the Preserve is desirable and feasible, an equestrian education program should be conducted to educate the equestrian community about manure removal and the potentially significant impacts of horse manure on the ecosystem (including the potential to attract predatory cowbirds and the resulting harm to the native and sensitive bird population on the Preserve).

Unauthorized collection, feral pets and off-road access has been found to threaten many herpetofauna and plant species. When the Preserve is opened to the public, appropriate signage should be in place to inform visitors to stay on designated trails, keep their pets leashed, remove dog and horse feces, and advise on the impact of collection on species, and penalties for unauthorized collection. Signage should also be placed in locations along trails identifying conservation goals and safety instructions.

5.8.5 **Litter and Trash Removal**

A concentration of trash and debris left by migrants can be found along the central ridge on the Preserve (Figure 2-5). Monthly litter and trash removal in this area will need to be a high priority to further discourage use of the area by undocumented migrants and to provide safe public access to the Preserve.

5.8.6 **Illegal Off-Road Activity**

Although off-road vehicle use was not noticed during the 2009-2010 baseline surveys, unauthorized foot traffic occurs frequently on the Preserve. Patrol by park rangers is recommended to aid in the prevention of unauthorized activities and trespassing. Patrols may help prevent illegal activity, trash dumping, pet leash enforcement, or unauthorized off-trail use by visitors once the Preserve is open to public use. Patrol routes should be designed with minimal impact, avoiding areas supporting sensitive habitats or species.

5.8.7 **Hydrological Management**

Hydrological resources on the Preserve are subject to upstream water operations over which the County has no control. However, Dulzura and Pringle Creeks should be managed to maintain existing natural drainage and maintain natural hydrological processes as much as feasible. This includes the removal of invasive species and potential restoration of stream bank erosion, if and where necessary. Best Management Practices (BMP) should be used to protect creeks from adverse effects of erosion and sedimentation, specifically during trail construction and operation, and to maintain water quality.

5.8.8 **Emergency and Safety Issues**

Sign of the Preserve's use by undocumented migrants was evident during the 2009-2010 baseline surveys. Small walking trails criss-cross the Preserve and trash piles are a significant management issue. Although a Border Patrol station is located a short distance south of the Preserve, the presence of U.S. agents have not deterred migrants for traversing the Preserve. In addition, a shooting incident occurred during the 2009-2010 baseline surveys that originated from immediately outside the Preserve. Ranger and law enforcement patrols are necessary to ensure public safety on the Preserve. Law enforcement officials will need to have access to the Preserve as necessary. Any law enforcement actions will need to be coordinated with County staff to assure that sensitive resources are protected.

5.8.9 **Global Climate Change**

The effects of global climate change pose a challenge to resources managers, specifically as conflicts between desires of people versus wildlife needs will escalate as climate crises become more frequent and severe. In the future, agriculture may require the same spaces currently used for biodiversity conservation. The adverse impacts of climate change can impose severe stresses on biodiversity resources that are fragile, vulnerable and already under stress.

A recent study based on climate models predicts that, as a worst case scenario, California plant diversity could decrease by as much as 25 percent, and 66 percent of all species unique to California would suffer more than an 80 percent decrease in range (Loarie et al. 2008). Some ranges may contract, others expand, and the distribution of threatened species versus more common species will also shift. Plant species would move into different ranges, potentially breaking up familiar California native plant associations and

eliminating pollinators and dispersal mechanisms. In Southern California, plants may move to higher elevations from the inland toward the coast.

With the shifting ranges of endemic species, species conservation becomes a moving target. Adaptive management and regular, rigorous monitoring are key to maximizing species' survival as ecosystems change. On a reserve scale, ecosystem changes may be slow and barely visible, and may appear chaotic; therefore, regular long-term monitoring is important to capturing gradual ecosystem changes. Monitoring target or indicator species should be selected, starting with the monitoring of vegetation as the basis for species habitats, (plants will move, animals will follow), and amphibians that have already shown susceptibility to global climate change. In addition, management to reduce other stresses (e.g. grazing, fire, and trespassing) should be considered to enhance the resilience for current resident species. Planning for new plant refugia and acquiring funding for large scale restoration efforts may also be a crucial management tool.

It is recommended that the County institute collaborations with scientific research organizations geared toward understanding the effects of global climate change on biodiversity, apply for funding to participate in data collection and modeling efforts, and participate in working toward achievable management goals that incorporate rapid, fundamental changes in the County's biodiversity.

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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.)

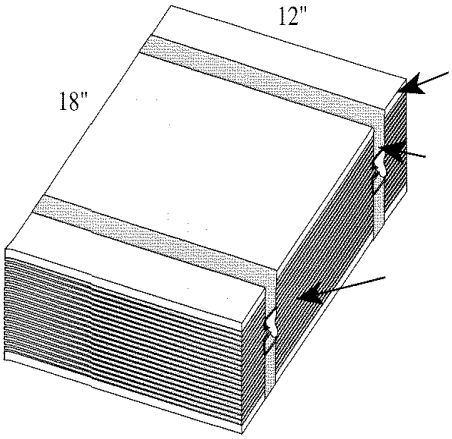
For herbs, dig up at least one whole plant to show roots that can help determine whether the plant is an annual, biennial, or perennial and identify the type of root (e.g., fibrous or tap) or underground stem (e.g., corm, bulb, rhizome, etc.). If the plant is small, take the whole thing, roots and all, 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 underside 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 and Photographs

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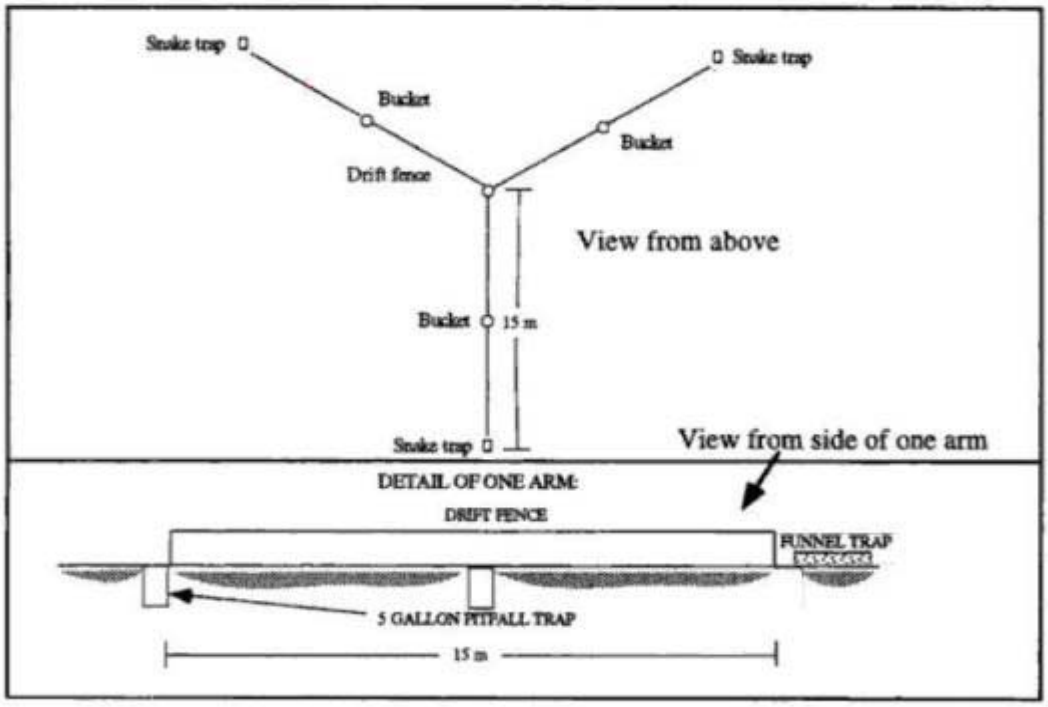

Diagram 1: Modified pitfall array design. Note snake trap (funnel trap) at terminus of each arm.

Photo 1. Aerial view of pitfall array

Photo 2: Pitfall Array, buried

Photo 3: Fully installed pitfall array

Photo 4: Aerial view of installation process of pitfall array

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Appendix C.
Photographs

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Photo 1: Post Fire Recovery

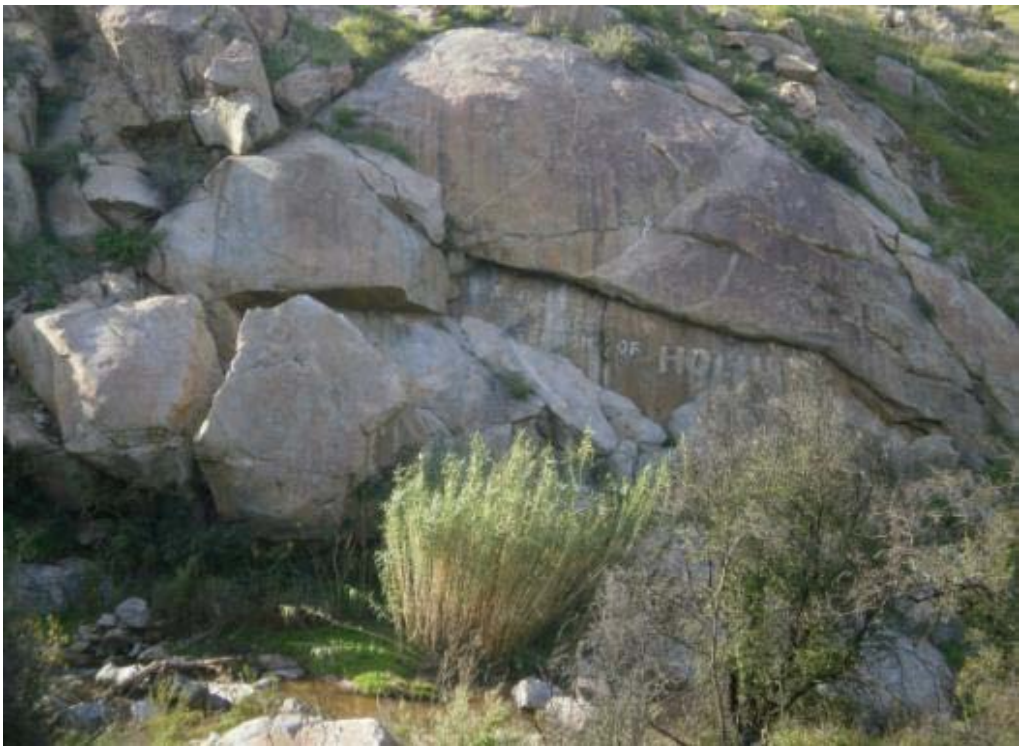

Photo 2: Graffiti

Photo 3: Lawrence and Barbara Daley Preserve, Fall 2009

Photo 4: Chocolate Lily (*Fritillaria bifolia*)

Photo 5: Lupine (*Lupinus* sp.)

Photo 6: Indian Paintbrush (*Castilleja* sp.)

Photo 7: Shooting Star (*Dodecatheon clevelandii*)

Photo 8: Bush rue (*Cneoridium dumosum*)

Photo 9: Lawrence and Barbara Daley Preserve, Spring 2010

Photo 10: Trash and clothing at Lawrence and Barbara Daley Preserve

Photo 11: Bird point count station

Photo 12: Bird point count station (Also a herp array station, pre-installation)

Photo 13: Bird point count station

Photo 14: Bird point count station

Photo 15: Bird point count station

Photo 16: Dulzura Creek, potential arroyo toad habitat

Photo 17: California vole (*Microtus californicus*)

Photo 18: Pocket mouse (*Chaetodipus californicus*)

Photo 19: Coyote (*Canis latrans*)

Photo 20: Raccoon (*Procyon lotor*)

Photo 21: Cotton tail rabbits (*Sylvilagas* sp.)

Photo 22: California quail (*Callipepla californica*)

Appendix D.
Species Compendium

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Inventory of Plants and Animals Documented at Lawrence and Barbara Preserve during 2009-2010 Baseline Surveys

Scientific Name	Common Name	Status[1]	Covered by South County MSCP
PLANTS			
Adoxaceae-Adoxa Family			
Sambucus nigra spp. caerulea	Blue Elderberry	--/--/--/--	No
Agavaceae—Agave Family			
Hesperoyucca whippeli	Our Lord's candle	--/--/--/--	No
Alliaceae—Onion Family			
Allium peninsulare var. peninsulare	Red-Flowered Onion	--/--/--/--	No
Amaranthaceae—Amaranth Family			
*Chenopodium cf. album**	Lamb's Quarters	--/--/--/--	No
*Chenopodium murale**	Nettle-leaf Goosefoot	--/--/--/--	No
*Salsola tragus**	Russian Thistle	--/--/--/--	No
Chenopodium californicum	California Goosefoot	--/--/--/--	No
Anacardiaceae—Sumac or Cashew Family			
Malosma laurina	Laurel Sumac	--/--/--/--	No
Rhus ovata	Sugar Bush	--/--/--/--	No
Rhus trilobata	Skunkbrush	--/--/--/--	No
Toxicodendron diversilobum	Poison Oak	--/--/--/--	No
Apiaceae—Carrot Family			
Anthriscus caucalis	Bur Chervil	--/--/--/--	No
*Anthriscus caucalis**	Fennel	--/--/--/--	No
*Foeniculum vulgare**	Weedy Shepherd's Needle	--/--/--/--	No
*Scandix pecten-veneris**	Mock Parsley	--/--/--/--	No
Apiastrum angustifolium	American Bowlesia	--/--/--/--	No
Bowlesia incana	Common Poison Hemlock	--/--/--/--	No
Conium maculatum	Rattlesnake Weed	--/--/--/--	No
Daucus pusillus	Marsh-Pennywort	--/--/--/--	No
Hydrocotyle sp.	Sharp-toothed Sanicle	--/--/--/--	No
Sanicula arguta	Pacific Sanicle	--/--/--/--	No
Sanicula crassicaulis	California Hedge-Parsley	--/--/--/--	No
Yabea microcarpa	Fennel	--/--/--/--	No
Apocynaceae—Dogbane Family			
Funastrucm cynanchoides var. hartewegii	Climbing Milkweed	--/--/--/--	No
Araceae—Arum/Duckweed Family			
Phoenix canariensis	Canary Island Date Palm	--/--/--/--	No
Washingtonia robusta	Mexican Fan Palm	--/--/--/--	No
Asteraceae—Sunflower Family			
*Carduus pycnocephalus**	Italian Thistle	--/--/--/--	No
*Centaurea melitensis**	Tocalote	--/--/--/--	No

Inventory of Plants and Animals Documented at Lawrence and Barbara Preserve during 2009-2010 Baseline Surveys

Scientific Name	Common Name	Status[1]	Covered by South County MSCP
*Chrysanthemum coronarium**	Garland Chrysanthemum	--/--/--/--	No
*Cirsium vulgare**	Bull Thistle	--/--/--/--	No
*Conyza bonariensis**	Flax-leaf Fleabane	--/--/--/--	No
*Cotula australis**	Australian Brass-Buttons	--/--/--/--	No
*Dimorphotheca sinuata**	Blue-Eye Cape-Marigold	--/--/--/--	No
*Filago gallica**	Narrow-leaf Filago	--/--/--/--	No
*Hedypnois cretica**	Crete Hedypnois	--/--/--/--	No
*Hypochaeris glabra**	Smooth Cat's Ear	--/--/--/--	No
*Lactuca serriola**	Prickly Lettuce	--/--/--/--	No
*Matricaria discoidea**	Common Pineapple-Weed	--/--/--/--	No
*Senecio vulgaris**	Common Groundsel	--/--/--/--	No
*Silybum marianum**	Milk Thistle	--/--/--/--	No
*Sonchus asper**	Prickly Sow Thistle	--/--/--/--	No
*Sonchus oleraceus**	Common Sow Thistle	--/--/--/--	No
Achillea millefolium	Yarrow	--/--/--/--	No
Acourtia microcephala	Sacapellote, Purpleheads	--/--/--/--	No
Ambrosia monogyra	**Desert fragrance**	**--/--/2.2/--**	**No**
Ambrosia psilostachya	Western Ragweed	--/--/--/--	No
Artemisia californica	California Sagebrush	--/--/--/--	No
Artemisia douglasiana	Douglas Mugwort	--/--/--/--	No
Artemisia palmeri	**Palmer's Sagewort**	**--/--/4.2/List D**	**No**
Baccharis pilularis	Chaparral Broom, Coyote Brush	--/--/--/--	No
Baccharis salicifolia	Mule-Fat, Seep-Willow	--/--/--/--	No
Baccharis sarothroides	Broom Baccharis	--/--/--/--	No
Viguiera laciniata	**San Diego Sunflower**	**--/--/4.2/List D**	**No**
Brickellia californica	California Brickellbush	--/--/--/--	No
Chaenactis artemisiifolia	White Pincushion	--/--/--/--	No
Cirsium occidentale var. californicum	California Thistle	--/--/--/--	No
Conyza canadensis	Horseweed	--/--/--/--	No
Corethrogyne filaginifolia var. filaginifolia	Common Sand-Aster	--/--/--/--	No
Deinandra cf. fasciculata	Fascicled Tarweed	--/--/--/--	No
Ericameria palmeri* var. *palmeri	**Palmer's Goldenbush**	**--/--/1.1/List B**	**Yes**
Erigeron foliosus var. *foliosus*	Leafy Daisy	--/--/--/--	No
Eriophyllum confertiflorum var. *confertiflorum*	Golden-yarrow	--/--/--/--	No
Euthamia occidentalis	Western Goldenrod	--/--/--/--	No
Filago arizonica	Arizona Filago	--/--/--/--	No
Filago californica	California Filago	--/--/--/--	No
Gamochaeta cf. stagnalis	Desert Cudweed	--/--/--/--	No
Gnaphalium californicum	California Everlasting	--/--/--/--	No

Inventory of Plants and Animals Documented at Lawrence and Barbara Preserve during 2009-2010 Baseline Surveys

Scientific Name	Common Name	Status[1]	Covered by South County MSCP
Gutierrezia californica	California Matchweed	--/--/--/--	No
Hazardia squarrosa	Saw-toothed Goldenbush	--/--/--/--	No
Heterotheca grandiflora	Telegraph Weed	--/--/--/--	No
Isocoma menziesii var. *vernonioides*	Coastal Goldenbush	--/--/--/--	No
Lasthenia coronaria	Southern Goldfields	--/--/--/--	No
Lasthenia gracilis	Common Goldfields	--/--/--/--	No
Machaeranthera juncea	Rush Chaparral-star, Rush-Like Bristleweed	--/--/--/--	No
Micropus californicus var. *californicus*	Slender Cottonweed	--/--/--/--	No
Pluchea sericea	Arrow Weed	--/--/--/--	No
Porophyllum gracile	Odora	--/--/--/--	No
Pseudognaphalium biolettii	Bicolor Cudweed	--/--/--/--	No
Pseudognaphalium microcephalum	White Everlasting	--/--/--/--	No
Rafinesquia californica	California Chicory	--/--/--/--	No
Solidago velutina ssp. *californica*	California Goldenrod	--/--/--/--	No
Stephanomeria sp.	Wreath-Plant	--/--/--/--	No
Stylocline gnaphaloides	Everlasting Nest-Straw	--/--/--/--	No
Uropappus lindleyi	Silver Puffs	--/--/--/--	No
Xanthium strumarium	Cocklebur	--/--/--/--	No
Boraginaceae—Borage Family			
Amsinckia menziesii var. *intermedia*	Rancher's Fireweed	--/--/--/--	No
Amsinckia retrorsa	Harvest Fiddleneck	--/--/--/--	No
Cryptantha intermedia	Nievetas	--/--/--/--	No
Cryptantha micromeres	Minute-Flower Cryptantha	--/--/--/--	No
Cryptantha muricata	Prickly Cryptantha	--/--/--/--	No
Pectocarya linearis ssp. *ferocula*	Slender Pectocarya	--/--/--/--	No
Pectocarya recurvata	Recurved Pectocarya	--/--/--/--	No
Plagiobothrys collinus var. *fulvenscens*	Rough Popcornflower	--/--/--/--	No
Plagiobothrys collinus var. *gracilis*	San Diego Popcornflower	--/--/--/--	No
Plagiobothrys collinus var. californicus	California Popcornflower	--/--/--/--	No
Brassicaceae—Mustard Family			
*Brassica tournefortii**	Sahara Mustard	--/--/--/--	No
*Capsella bursa-pastoris**	Shepherd's Purse	--/--/--/--	No
*Hirschfeldia incana**	Short-pod Mustard	--/--/--/--	No
*Raphanus raphanistrum**	Jointed Charlock	--/--/--/--	No
*Raphanus sativus**	Wild Radish	--/--/--/--	No
*Sisymbrium irio**	London Rocket	--/--/--/--	No
*Sisymbrium orientale**	Hare's-Ear Cabbage	--/--/--/--	No
Athysanus pusillus	Dwarf Athysanus	--/--/--/--	No
Caulanthus stenocarpus	San Diego Jewelflower	--/--/--/--	No

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Guillenia lasiophylla	California Mustard	--/--/--/--	No
Lepidium nitidum var. *nitidum*	Shining Peppergrass	--/--/--/--	No
Lepidium virginicum	Virginia Peppergrass	--/--/--/--	No
Rorippa nasturtium-aquaticum	Watercress	--/--/--/--	No
Thysanocarpus laciniatus	Notch Fringepod	--/--/--/--	No
Thysanocarpus curivpes	Lacepod, Fringepod	--/--/--/--	No
Campanulaceae—Bellflower Family			
Nemacladus sp.	Threadplant	--/--/--/--	No
Triodanis biflora	Small Venus Looking Glass	--/--/--/--	No
Caprifoliaceae—Honeysuckle Family			
Lonicera sbuspicata var. denudate	Johnston's Honeysuckle	--/--/--/--	No
Caryophyllaceae—Pink Family			
*Cerastium glomeratum**	Mouse-Ear Chickweed	--/--/--/--	No
Herniaria hirsuta ssp. *cinerea**	Gray Herniaria	--/--/--/--	No
*Silene gallica**	Common Catchfly	--/--/--/--	No
*Spergularia bocconi**	Buccone's Sand-Spurry	--/--/--/--	No
*Stellaria media**	Common Chickweed	--/--/--/--	No
*Stellaria pallida**	Chickweed	--/--/--/--	No
Cistaceae—Rock-Rose Family			
Helianthemum scoparium	Peak Rush-rose	--/--/--/--	No
Concolculaceae—Morning Glory Family			
Calystegia macrostegia ssp. tenuifolia	Narrow-leaf Morning-glory	--/--/--/--	No
Cuscuta	Dodder	--/--/--/--	No
Cuscuta subinclusa	Dodder	--/--/--/--	No
Crassulaceae—Stonecrop Family			
Crassula connate	Pygmyweed	--/--/--/--	No
Dudleya edulis	Ladies Fingers	--/--/--/--	No
Dudleya pulverulenta	Chalk-lettuce	--/--/--/--	No
Cucurbitaceae—Gourd Family			
Marah macrocarpus var. macrocarpus	Manroot, Wild-Cucumber	--/--/--/--	No
Cyperaceae—Sedge Family			
Carex spissa	San Diego Sedge	--/--/--/--	No
Carex triquetra	Triangular-Fruit Sedge	--/--/--/--	No
Cyperus eragrostis	Tall Flatsedge	--/--/--/--	No
Eleocharis montevidensis	Dombey's Spike-Sedge	--/--/--/--	No
Schoenoplectus acutus var. *occidentalis*	Viscid Bulrush	--/--/--/--	No
Datiscaceae—Datisca Family			
Datisca glomerata	Durango Root	--/--/--/--	No
Dryopteridaceae—Wood Fern Family			

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Scientific Name	Common Name	Status[1]	Covered by South County MSCP
Dryopteris arguta	Coastal Wood Fern	--/--/--/--	No
Equisitaceae—Horsetail Family			
Equisetum cf. laevigatum	Smooth Scouring-Rush	--/--/--/--	No
Ericaceae—Heath Family			
Xylococcus bicolor	Mission Manzanita	--/--/--/--	No
Euphorbiaceae—Spurge Family			
*Ricinus communis**	Castor-bean	--/--/--/--	No
Chamaesyce polycarpa	Prostrate Spurge	--/--/--/--	No
Croton setigerus	Doveweed	--/--/--/--	No
Euphorbia spathulata	Reticulate-Seed Spurge	--/--/--/--	No
Fabaceae—Legume Family			
*Medicago polymorpha**	California Burclover	--/--/--/--	No
*Melilotus indicus**	Indian Sweetclover	--/--/--/--	No
Vicia villosa ssp. *villosa**	Hairy Vetch, Winter Vetch	--/--/--/--	No
Amorpha fruticosa	False Indigo	--/--/--/--	No
Astragalus gambelianus	Gambel's Locoweed	--/--/--/--	No
Astragalus didymocarpus var. *didymocarpus*	White Dwarf Locoweed	--/--/--/--	No
Lathyrus vestitus ssp. *alefeldii*	San Diego Sweat Pea	--/--/--/--	No
Lotus hamatus	San Diego Bird's Foot Trefoil	--/--/--/--	No
Lotus humistratus	Hill Lotus	--/--/--/--	No
Lotus purshianus	Spanish Clover	--/--/--/--	No
Lotus salsuginosus var. *salsuginosus*	Alkali Lotus	--/--/--/--	No
Lotus scoparius var. *brevialatus*	Short-Wing Deerweed	--/--/--/--	No
Lotus strigosus	California Deerweed	--/--/--/--	No
Lupinus bicolor	Miniature Lupine	--/--/--/--	No
Lupinus concinnus	Bajada Lupine	--/--/--/--	No
Lupinus hirsutissimus	Stinging Lupine	--/--/--/--	No
Lupinus sparsiflorus	Coulter's Lupine	--/--/--/--	No
Lupinus succulentus	Arroyo Lupine	--/--/--/--	No
Lupinus truncatus	Collar Lupine	--/--/--/--	No
Prosopis glandulosa var. *torreyana*	Mesquite	--/--/--/--	No
Trifolium gracilentum var. *gracilentum*	Pin-Point Clover	--/--/--/--	No
Trifolium microcephalum	Maiden Clover	--/--/--/--	No
Trifolium willdenovii	Valley Clover	--/--/--/--	No
Trifolium variegatum	White-Tip Clover	--/--/--/--	No
Vicia ludoviciana var. *ludoviciana*	Deer Pea Vetch	--/--/--/--	No
Fagaceae—Oak Family			
Quercus agrifolia	Coast Live Oak	--/--/--/--	No
Quercus berberidifolia	Scrub Oak	--/--/--/--	No

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Quercus engelmannii	**Engelmann's/Mesa Blue Oak**	**--/--/4.2/List D**	**No**
Quercus xacutidens	Torrey's Scrub Oak	--/--/--/--	No
Geraniaceae—Geranium Family			
*Erodium brachycarpum**	Short-Beak Filaree/Storksbill	--/--/--/--	No
*Erodium botrys**	Long-beak Filaree	--/--/--/--	No
*Erodium cicutarium**	Red-stem Filaree	--/--/--/--	No
*Erodium moshcatum**	White-stem Filaree	--/--/--/--	No
Geranium carolinianum	Carolina Geranium	--/--/--/--	No
Grossulariaceae—Gooseberry Family			
Ribes indecorum	White-flowered Currant	--/--/--/--	No
Hyacinthaceae—Hyacinth Family			
Chlorogalum parviflorum	Small-flower Soap-plant	--/--/--/--	No
Hydrophyllaceae—Waterleaf Family			
Emmenanthe penduliflora var. *penduliflora*	Whispering Bells	--/--/--/--	No
Eriodictyon crassifolium var. *crassifolium*	Felt-Leaf Yerba Santa	--/--/--/--	No
Eucrypta chrysanthemifolia var. chrysanthemifolia	Common Eucrypta	--/--/--/--	No
Phacelia cicutaria var. *hispida*	Caterpillar Phacelia	--/--/--/--	No
Phacelia parryi	Parry's Phacelia	--/--/--/--	No
Phacelia ramosissima var. *latifolia*	Branching Phacelia	--/--/--/--	No
Pholistoma racemosum	San Diego Fiesta Flower	--/--/--/--	No
Iridaceae—Iris Family			
Sisyrinchium bellum	Blue-eyed Grass	--/--/--/--	No
Juglandaceae—Walnut Family			
Juglans nigra	Black Walnut	--/--/--/--	No
Juncaceae—Rush Family			
Juncus acutus* ssp. *leopoldii	**Southwestern Spiny Rush**	**--/--/4.2/List D**	**No**
Juncus balticus	Wire Rush	--/--/--/--	No
Juncus bufonius	Toad Rush	--/--/--/--	No
Juncus mexicanus	Mexican Rush	--/--/--/--	No
Juncus textilis	Basket Rush	--/--/--/--	No
Lamiaceae—Mint Family			
*Marrubium vulgare**	Horehound	--/--/--/--	No
Lamium amplexicaule	Henbit	--/--/--/--	No
Salvia apiana	White Sage	--/--/--/--	No
Salvia columbariae	Chia	--/--/--/--	No
Salvia mellifera	Black Sage	--/--/--/--	No
Stachys ajugoides var. *rigida*	Hedge-Nettle	--/--/--/--	No
Liliaceae—Lily Family			

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Calochortus splendens	Splendid Mariposa	--/--/--/--	No
Fritillaria biflora var. biflora	**Chocolate Lily**	**--/--/--/List D**	**No**
Lythraceae—Loosestrife Family			
Lythrum hyssopifolium	Grass Poly	--/--/--/--	No
Malvaceae—Mallow Family			
Malva parviflora	Cheeseweed	--/--/--/--	No
Malacothamnus densiflorus	Many Flowered Bush Mallow	--/--/--/--	No
Myrtaceae—Myrtle Family			
Eucalyptus camaldulensis	River Red Gum	--/--/--/--	No
Nyctanginaceae—Four O'clock Family			
Mirabilis laevis var. crassifolia	California Wishbone Plant	--/--/--/--	No
Oleaceae—Olive Family			
Fraxinus velutina	Velvet Ash	--/--/--/--	No
Onagraceae—Evening Primrose Family			
Camissonia bistorta	California Sun Cup	--/--/--/--	No
Camissonia californica	False-Mustard	--/--/--/--	No
Camissonia hirtella	Field Sun Cup	--/--/--/--	No
Camissonia ignota	Jurupa Hills Sun Cup	--/--/--/--	No
Clarkia cf. purpurea ssp. *quadrivulnera*	Four-Spot Clarkia	--/--/--/--	No
Clarkia epilobioides	Canyon Godetia	--/--/--/--	No
Clarkia delicata	**Delicate clarkia**	**--/--/1B.2/List A**	**No**
Epilobium cf. ciliatum	Willow Herb	--/--/--/--	No
Epilobium canum ssp. *canum*	California Fuchsia	--/--/--/--	No
Oenothera elata	Evening Primrose	--/--/--/--	No
Orichidaceae—Orchid Family			
Piperia cooperi	**Cooper's Rein Orchid**	**--/--/4.2/List D**	**No**
Orobanchaceae—Broom-Rape Family			
Castilleja affinis ssp. affinis	Coast Paintbrush	--/--/--/--	No
Castilleja exserta	Purple Owl's-clover	--/--/--/--	No
Oxalidaceae—Oxalis Family			
Oxalis pres-caprae	Bermuda Buttercup	--/--/--/--	No
Oxalis albicans ssp. californica	California Wood Sorrel	--/--/--/--	No
Paeoniaceae—Peony Family			
Paeonia californica	California Peony	--/--/--/--	No
Papaveraceae—Poppy Family			No
Dendromecon rigida	Bush Poppy	--/--/--/--	No
Dicentra chrysantha	Golden Ear-Drops	--/--/--/--	No
Eschscholzia californica	California Poppy	--/--/--/--	No

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Platystemon californicus	Cream Cups	--/--/--/--	No
Romneya trichocalyx	Hairy Matilija Poppy	--/--/--/--	No
Phrymaceae—Hopseed Family			No
Mimulus aurantiacus var. *pubescens x var. puniceus*	Bush Monkey Flower hybrid	--/--/--/--	No
Mimulus cardinalis	Scarlet Monkey Flower	--/--/--/--	No
Mimulus guttatus	Common Monkeyflower	--/--/--/--	No
Mimulus pilosus	Downy Monkey Flower	--/--/--/--	No
Plantaginaceae—Plantain Family			No
*Plantago major**	Common Plantain	--/--/--/--	No
Antirrhinum kelloggii	Climbing Snapdragon	--/--/--/--	No
Antirrhinum nuttallianum ssp. *nuttallianum*	Nuttall's Snapdragon	--/--/--/--	No
Antirrhinum nuttallianum ssp. *subsessile*	Big-Gland Nuttall's Snapdragon	--/--/--/--	No
Collinsia heterophylla	Chinese Houses	--/--/--/--	No
Keckiella cordifolia	Climbing Bush Penstemon	--/--/--/--	No
Keckiella antirrhinoides var. *antirrhinoides*	Yellow Bush Penstemon	--/--/--/--	No
Linaria canadensis	Large Blue Toadflax	--/--/--/--	No
Penstemon spectabilis var. *spectabilis*	Showy Penstemon	--/--/--/--	No
Plantago erecta	Dot-seed Plantain	--/--/--/--	No
Plantanaceae—Sycamore Family			No
Plantanus xacerifolia	London Plane Tree	--/--/--/--	No
Plantanus racemosa	Western Sycamore	--/--/--/--	No
Poaceae—Grass Family			No
*Arundo donax**	Giant Reed	--/--/--/--	No
*Avena barbata**	Slender Oat	--/--/--/--	No
*Avena fatua**	Wild Oat	--/--/--/--	No
*Bromus diandrus**	Ripgut Grass	--/--/--/--	No
*Bromus hordeaceus**	Soft Chess	--/--/--/--	No
*Bromus madritensis**	Compact Brome	--/--/--/--	No
*Bromus rubens**	Foxtail Chess, Red Brome	--/--/--/--	No
*Cynodon dactylon**	Bermuda Grass	--/--/--/--	No
*Gastridium ventricosum**	Nit Grass	--/--/--/--	No
Hordeum murinum ssp. *glaucum**	Glaucous Barley	--/--/--/--	No
*Piptatherum miliaceum**	Smilo Grass	--/--/--/--	No
*Polypogon monspeliensis**	Annual Beard Grass	--/--/--/--	No
*Schismus barbatus**	Mediterranean Schismus	--/--/--/--	No
Vulpia myuros var. *hirsuta**	Rat-tail Fescue	--/--/--/--	No
Achnatherum coronatum	Giant Stipa	--/--/--/--	No
Achnahterum diegoensis	**San Diego Needlegrass**	**--/--/4.2/List D**	**No**

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Scientific Name	Common Name	Status[1]	Covered by South County MSCP
Aristida adscensionis	Six-weeks Three Awn	--/--/--/--	No
Bromus carinatus	California Brome	--/--/--/--	No
Koeleria macrantha	Junegrass	--/--/--/--	No
*Lamarckia aurea**	Goldentop	--/--/--/--	No
Leymus condensatus	Giant Wild Rye	--/--/--/--	No
Leymus triticoides	Beardless Wild Rye	--/--/--/--	No
Melica imperfecta	Coast Range Melic	--/--/--/--	No
Melica frutescens	Tall Melic	--/--/--/--	No
Muhlenbergia microsperma	Littleseed Muhly	--/--/--/--	No
Muhlenbergia rigens	Deergrass	--/--/--/--	No
Nassella cernua	Nodding Needlegrass	--/--/--/--	No
Nassella lepida	Foothill Needlegrass	--/--/--/--	No
Nassella pulchra	Purple Needlegrass	--/--/--/--	No
Poa secunda ssp. secunda	One-Sided Bluegrass	--/--/--/--	No
Vulpia bromoides	Six-Weeks Fescue	--/--/--/--	No
Vulpia microstachys	Desert Fescue	--/--/--/--	No
Vulpia octoflora	Tufted Fescue	--/--/--/--	No
Polemoniaceae—Phlox Family			No
Eriastrum filifolium	Thread-Leaf Woolly-Star	--/--/--/--	No
Gilia angelensis	Grassland Gilia	--/--/--/--	No
Gilia capitata ssp. *abrotanifolia*	Ball Gilia	--/--/--/--	No
Linanthus dianthiflorus	Ground Pink	--/--/--/--	No
Navarretia atractyloides	Holly-Leaf Skunkweed	--/--/--/--	No
Navarretia hamata	Hooked Skunkweed	--/--/--/--	No
Polygalaceae—Milkwort Family			No
Polygala cornuta var. fishiae	**Fish's Milkwort**	**--/--/4.3/List D**	**No**
Polygonaceae—Buckwheat Family			
*Rumex crispus**	Curly Dock	--/--/--/--	No
Chorizanthe fimbriata var. *fimbriata*	Fringed Spineflower	--/--/--/--	No
Eriogonum fasciculatum var. *foliolosum*	Inland California Buckwheat	--/--/--/--	No
Polygonum cf. lapathifolium	Willow Weed	--/--/--/--	No
Pterostegia drymarioides	Granny's Hairnet	--/--/--/--	No
Rumex sp.	Dock	--/--/--/--	No
Rumex salicifolius	Willow Dock	--/--/--/--	No
Polypodiaceae—Polypody Family			No
Polypodium californicum	California Polypody	--/--/--/--	No
Portulacaceae—Purslane Family			No
Calandrinia ciliata	Red Maids	--/--/--/--	No
Calyptridium monandrum	Common Calyptridium	--/--/--/--	No
Claytonia parviflora ssp. *parviflora*	Utah Miner's-Lettuce	--/--/--/--	No

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Claytonia parviflora ssp. *viridis*	Green Miner's-Lettuce	--/--/--/--	No
Claytonia perfoliata ssp. *perfoliata*	Miner's-Lettuce	--/--/--/--	No
Calandrinia ciliata	Red Maids	--/--/--/--	No
Primulaceae—Primrose Family			No
Anagallis arvensis	Scarlet Pimpernel	--/--/--/--	No
Dodecatheon clevelandii	Padre's Shooting Star	--/--/--/--	No
Pteridaceae—Brake Family			No
Adiantum jordanii	California Maidenhair	--/--/--/--	No
Aspidotis californica	California Lace Fern	--/--/--/--	No
Cheilanthes newberryi	California Cotton Fern	--/--/--/--	No
Cheilanthes clevelandii var. *clevelandii*	Cleveland's Lip Fern	--/--/--/--	No
Cheilanthes newberryi	California Cotton Fern	--/--/--/--	No
Pellaea andromedifolia	Coffee Fern	--/--/--/--	No
Pellaea mucronata var. *mucronata*	Bird's-foot Fern	--/--/--/--	No
Pentagramma triangularis ssp. *maxonii*	Maxon's Silverback Fern	--/--/--/--	No
Pentagramma triangularis ssp. *triangularis*	California Goldback Fern	--/--/--/--	No
Ranunculaceae—Buttercup Family			No
Clematis pauciflora	Small-Leaf Virgin's Bower	--/--/--/--	No
Clematis cf. lasiantha	Pipestem Virgin's Bower	--/--/--/--	No
Delphinium parryi	Parry's Larkspur	--/--/--/--	No
Delphinium sp.	Larkspur	--/--/--/--	No
Thalictrum fendleri var. polycarpum	Smooth-Leaf Meadow-Rue	--/--/--/--	No
Rhamnaceae—Buckthorn Family			No
Ceanothus leucodermis	Chaparral Whitethorn	--/--/--/--	No
Ceanothus tomentosus	Ramona-Lilac	--/--/--/--	No
Rhamnus crocea	Spiny Redberry	--/--/--/--	No
Rhamnus ilicifolia	Holly-Leaf Redberry	--/--/--/--	No
Rose Family			No
*Rubus armeniacus**	Himalayan Blackberry	--/--/--/--	No
Adenostoma fasciculatum	Chamise	--/--/--/--	No
Aphanes occidentalis	Western Lady's Mantle	--/--/--/--	No
Heteromeles arbutifolia	Toyon	--/--/--/--	No
Rosa californica	California Rose	--/--/--/--	No
Rubus ursinus	California Blackberry	--/--/--/--	No
Rubiaceae—Madder or Coffee Family			No
*Galium parisiense**	Wall Bedstraw	--/--/--/--	No
Galium aparine	Common Bedstraw	--/--/--/--	No
Galium nuttallii ssp. *nuttallii*	San Diego Bedstraw	--/--/--/--	No
Galium angustifolium	Narrow-leaf Bedstraw	--/--/--/--	No

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Galium porrigens var. *porrigens*	Climbing/Oval-Leaf Bedstraw	--/--/--/--	No
Rutaceae—Rue or Citrus Family			No
Cneoridium dumosum	Coast Spice Bush, Bush-Rue	--/--/--/--	No
Salicaceae—Willow Family			No
Populus fremontii	Fremont Cottonwood	--/--/--/--	No
Salix exigua var. *hindsiana*	Narrow-leaved Willow	--/--/--/--	No
Salix gooddingii	Goodding's Black Willow	--/--/--/--	No
Salix laevigata	Red Willow	--/--/--/--	No
Salix lasiolepis	Arroyo Willow	--/--/--/--	No
Saururaceae—Lizard's Tail Family			No
Anemopsis californica	Yerba Mansa	--/--/--/--	No
Saxifragaceae—Saxifrage Family			No
Jepsonia parryi	Coast Jepsonia	--/--/--/--	No
Lithophragma affine	Woodland Star	--/--/--/--	No
Saxifraga californica	California Saxifrage	--/--/--/--	No
Scrophulariaceae—Figwort Family			No
Scrophularia californica	California Figwort	--/--/--/--	No
Selaginellaceae—Spike-Moss Family			No
Selaginella bigelovii	Bigelow's Mossfern	--/--/--/--	No
Simmondsiaceae—Jojoba Family			No
Simmondsia chinensis	Jojoba	--/--/--/--	No
Solanaceae—Nightshade Family			No
*Datura wrighti**	Western Jimson Weed	--/--/--/--	No
*Nicotiana glauca**	Tree Tobacco	--/--/--/--	No
Solanum americanum	White Nightshade	--/--/--/--	No
Solanum douglasii	Douglas' Nightshade	--/--/--/--	No
Solanum parishii	Parish's Nightshade	--/--/--/--	No
Solanum xanti	Chaparral Nightshade	--/--/--/--	No
Tamaricaceae—Tamarisk Family			No
Tamarix ramosissima	Tamarisk, Salt-Cedar	--/--/--/--	No
Themidaceae—Brodiaea Family			
Bloomeria cf. crocea	Common Goldenstar	--/--/--/--	No
Dichelostemma capitatum ssp. capitatum	Wild Hyacinth/Blue Dicks	--/--/--/--	No
Typhaceae—Cattail Family			
Typha domingensis	Southern Cattail	--/--/--/--	No
Urticaceae—Nettle Family			
*Urtica urens**	Dwarf Nettle	--/--/--/--	No
Hesperocnide tenella	Western Nettle	--/--/--/--	No
Parietaria hespera var. *californica*	California Pellitory	--/--/--/--	No

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Parietaria hespera var. *hespera*	Western Pellitory	--/--/--/--	No
Urtica dioica ssp. *holosericea*	Hoary Nettle	--/--/--/--	No
Violaceae—Violet Family			
Viola pedunculata	Johnny jump-up	--/--/--/--	No
Phoradendron macrophyllum	Big-leaf Mistletoe	--/--/--/--	No

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ANIMALS			
INSECTA			
LEPIDOPTERA (Butterflies and Moths)			
Family Papilionidae (Swallowtails)			
Papilio zelicaon	Anise Swallowtail	--/--/--	No
Papilio rutulus	Western Tiger Swallowtail	--/--/--	No
Family Pieridae (Whites and Sulphurs)			
Anthocharis sara sara	Pacific Sara Orangetip	--/--/--	No
Pontia protodice	Common (Checkered) White	--/--/--	No
Pieris rapae	Cabbage White	--/--/--	No
Family Lycaenidae (Blues, Hairstreaks, Coppers)			
Leptotes marina	Marine Blue	--/--/--	No
Hemiagris ceraunus gyas	Edward's Blue	--/--/--	No
Plebejus acmon acmon	Acmon Blue	--/--/--	No
Satyrium auretorum	Gold-hunter Hairstreak	--/--/--	No
Family Nymphalidae (Brushfoots)			
Speyeria edwardsii	Callippe Fritillary	--/--/--	No
Junonia coenia	Common Buckeye	--/--/--	No
Chlosyne gabbii	Gabb's Checkerspot	--/--/--	No
Family Hesperidae (Skippers)			
Erynnis funeralis	Funereal Duskywing	--/--/--	No
AMPHIBIA (Amphibians)			
ANURA (Frogs and Toads)			
Bufonidae (True Toads)			
Bufo boreas	Western Toad	--/--/--	No
Hylidae (Tree frogs and relatives)			
Pseudacris cadaverina	California Tree Frog	--/--/--	No
Pseudacris regilla	Pacific Tree Frog	--/--/--	No
REPTILIA (Reptiles)			
SQUAMATA (Lizards and Snakes)			
Phrynosomatidae (Spiny lizards and relatives)			
Sceloporus occidentalis	Western Fence Lizard	--/--/--	No
Uta stansburiana	Side-blotched Lizard	--/--/--	No
Scincidae (Skinks)			
Plestiodon skiltonianus	Western Skink	--/--/--	No

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Teiidae (Whiptails and relatives)			
Aspidoscelis hyperythra	**Orange-throated Whiptail**	**--/SSC/Group 2**	**Yes**
Aspidocelis tigris	Western Whiptail	--/--/--	No
Anguidae (Alligator lizards and relatives)			
Elgaria multicarinata	Southern Alligator Lizard	--/--/--	No
Leptotyphlopidae (Threadsnakes)			
Leptotyphlops humilis	Western Threadsnake	--/--/--	No
Boidae (Boas)			
Lichanura trivirgata	Rosy Boa	--/--/--	No
Colubridae (Colubrids)			
Lamprpeltis getula	Common Kingsnake	--/--/--	No
Masticophis fuliginosus	Baja California Coachwhip	--/--/--	No
Masticophis lateralis	California Whipsnake	--/--/--	No
Thamnophis hammondii	**Two-Striped Garter Snake**	**--/SSC/Group 1**	**No**
Pituophis catenifer	Gophersnake	--/--/--	No
Viperidae (Vipers)			
Crotalus ruber	**Red Diamond Rattlesnake**	**--/SSC/Group 2**	**No**
Crotalus oreganus	Western Rattlesnake	--/--/--	No
AVES (Birds)			
GALLIFORMES (Turkeys, Grouse, Chickens, Quail, and Pheasants)			
Odontophoridae (New World Quail)			
Callipepla californica	California Quail	--/--/--/--	No
CICONIIFORMES (Herons, Storks, Ibises, and relatives)			
Ardidae (Bitterns and Herons)			
Butorides striatus	**Green Heron**	**MBTA/--/Group 2**	**No**
FALCONIFORMES (Vultures, Hawks, and Falcons)			
Accipitridae (Hawks, and Harriers)			
Accipiter cooperii	**Cooper's Hawk**	**MBTA/--/WL/Group1**	**Yes**
Circus cyaneus	**Northern Harrier**	**MBTA/--/SSC/Group 1**	**Yes**
Buteo lineatus	**Red-shouldered Hawk**	**MBTA--/--/Group 1**	**No**
Buteo jamaicensis	Red-tailed Hawk	MBTA--/--/--	No
Falconidae (Caracaras and Falcons)			
Falco sparverius	American Kestrel	MBTA--/--/--	No
COLUMBIFORMES (Pigeons and Doves)			
Columbidae (Pigeons and Doves)			
Zenaida macroura	Mourning Dove	MBTA--/--/--	No

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STRIGIFORMES (Owls)			
Tytonidae (Barn Owls)			
Tyto alba	**Barn Owl**	**MBTA--/--/Group 2**	**No**
Strigidae (Typical Owls)			
Bubo virginianus	Great Horned Owl	MBTA--/--/--	No
CAPRIMULGIFORMES (Nighthawks and Nightjars)			
Caprimulgidae (Nightjars)			
Phalaenoptilus nuttallii	Common Poorwill	MBTA--/--/--	No
APODIFORMES (Swifts and Hummingbirds)			
Trochillidae (Hummingbirds)			
Archilochus alexandri	Black-chinned Hummingbird	MBTA/--/--/--	No
Calypte anna	Anna's Hummingbird	MBTA/--/--/--	No
Calypte costae	Costa's Hummingbird	MBTA/--/--/--	No
PICIFORMES (Woodpeckers and relatives)			
Picidae (Woodpeckers and Wrynecks)			
Melanerpes formicivorus	Acorn Woodpecker	MBTA/--/--/--	No
Picoides nuttallii	Nuttall's Woodpecker	MBTA/--/--/--	No
Colaptes auratus	Northern Flicker	MBTA/--/--/--	No
PASSERIFORMES (Perching Birds)			
Tyrannidae (Tyrant Flycatchers)			
Empidonax difficilis	Pacific-slope Flycatcher	MBTA/--/--/--	No
Sayornis nigricans	Black Phoebe	MBTA/--/--/--	No
Sayornis saya	Say's Phoebe	MBTA/--/--/--	No
Myiarchus cinerascens	Ash-throated Flycatcher	MBTA/--/--/--	No
Tyrannus vociferans	Cassin's Kingbird	MBTA/--/--/--	No
Tyrannus verticalis	Western Kingbird	MBTA/--/--/--	No
Vireonidae (Vireos)			
Vireo huttoni	Hutton's Vireo	MBTA/--/--/--	No
Vireo gilvus	Warbling Vireo	MBTA/--/--/--	No
Corvidae (Jays, Magpies, and Crows)			
Aphelocoma californica	Western Scrub Jay	MBTA/--/--/--	No
Corvus brachyrhynchos	American Crow	MBTA/--/--/--	No
Corvus corax	Common Raven	MBTA/--/--/--	No
Hirundinidae (Swallows)			
Tachycineta bicolor	Tree Swallow	MBTA/--/--/--	No
Stelgidopteryx serripennis	Northern Rough-winged Swallow	MBTA/--/--/--	No
Petrochelidon pyrrhonota	Cliff Swallow	MBTA/--/--/--	No
Paridae (Titmice and relatives)			

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Baeolophus inornatus	Oak Titmouse	MBTA/--/--/--	No
Aegithalidae (Bushtit)			
Psaltriparus minimus	Bushtit	MBTA/--/--/--	No
Sittidae (Nuthatches)			
Sitta carolinensis	White-breasted Nuthatch	MBTA/--/--/--	No
Troglodytidae (Wrens)			
Salpinctes obsoletus	Rock Wren	MBTA/--/--/--	No
Thryomanes bewickii	Bewick's Wren	MBTA/--/--/--	No
Troglodytes aedon	House Wren	MBTA/--/--/--	No
Regulidae (Kinglets)			
Regulus calendula	Ruby-crowned Kinglet	MBTA/--/--/--	No
Sylviidae (Old World Warblers)			
Chamaea fasciata	Wrentit	--/--/--/--	No
Turdidae (Thrushes)			
Sialia mexicana	**Western Bluebird**	**MBTA/--/--/Group 2**	**Yes**
Catharus guttatus	Hermit Thrush	MBTA/--/--/--	No
Mimidae (Mockingbirds and Thrashers)			
Mimus polyglottos	Northern Mockingbird	MBTA/--/--/--	No
Toxostoma redivivum	California Thrasher	MBTA/--/--/--	No
Sturnidae (Starlings)			
Sturnus vulgaris	European Starling	--/--/--/--	No
Bombycillidae (Waxwings and Silky Flycatchers)			
Phainopepla nitens	Phainopepla	MBTA/--/--/--	No
Parulidae (Wood Warblers and relatives)			
Oreothlypis celata	Orange-crowned Warbler	--/--/--/--	No
Dendroica petechia	**Yellow Warbler**	**MBTA/--/SSC/Group 2**	**No**
Dendroica coronata	Yellow-rumped Warbler	MBTA/--/--/--	No
Geothlypis trichas	Common Yellowthroat	MBTA/--/--/--	No
Wilsonia pusilla	Wilson's Warbler	MBTA/--/--/--	No
Emberizidae (Emberizines)			
Pipilo maculatus	Spotted Towhee	MBTA/--/--/--	No
Melozone crissalis	California Towhee	--/--/--/--	No
Aimophila ruficeps canescens	**Rufous-crowned Sparrow**	**MBTA/--/WL/Group 1**	**Yes**
Spizella passerina	Chipping Sparrow	MBTA/--/--/--	No
Spizella breweri	Brewer's Sparrow	MBTA/--/--/--	No
Chondestes grammacus	Lark Sparrow	MBTA/--/--/--	No
Passerculus sandwichensis	Savannah Sparrow	MBTA/--/--/--	No
Ammodramus savannarum	**Grasshopper Sparrow**	**MBTA/--/SSC/Group 1**	**No**
Melospiza melodia	Song Sparrow	MBTA/--/--/--	No
Zonotrichia leucophrys	White-crowned Sparrow	MBTA/--/--/--	No

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Junco hyemalis	Dark-eyed Junco	MBTA/--/--/--	No
Cardinalidae (Cardinals, Grosbeaks & Allies)			
Piranga ludoviciana	Western Tanager	MBTA/--/--/--	No
Passerina caerulea	Blue Grosbeak	--/--/--/--	No
Passerina amoena	Lazuli Bunting	--/--/--/--	No
Icteridae (Blackbirds, Orioles & Allies)			
Sturnella neglecta	Western Meadowlark	MBTA/--/--/--	No
Agelaius phoeniceus	Red-winged Blackbird	MBTA/--/--/--	No
Molothrus ater	Brown-headed Cowbird	MBTA/--/--/--	No
Icterus cucullatus	Hooded Oriole	MBTA/--/--/--	No
Icterus bullockii	Bullock's Oriole	MBTA/--/--/--	No
Fringillidae (Finches)			
Carpodacus mexicanus	House Finch	MBTA/--/--/--	No
Spinus psaltria	Lesser Goldfinch	MBTA/--/--/--	No
MAMMALIA (Mammals)			
INSECTIVORA (Shrews)			
Soricidae (Shrews)			
Notiosorex crawfordi	Desert Shrew	--/--/--	No
CHIROPTERA (Bats)			
Vespertilionidae (Evening Bats)			
Myotis californicus	California Myotis	--/--/--	No
Myotis evotis	**Long-eared myotis**	**--/--/Group 2**	**No**
Myotis yumanensis	**Yuma Myotis**	**--/--/Group 2**	**No**
Myotis ciliolabrum	**Western small-footed Myotis**	**--/--/Group 2**	**No**
Lasiurus blossevillii	**Western Red Bat**	**--/SSC/Group 2**	**No**
Lasiurus cinereus	Hoary Bat	--/--/--	No
Parastrellus hesperus	Canyon Bat	--/--/--	No
Corynorhinus townsendii	**Townsend's Big-eared Bat**	**--/SSC/Group 2**	**No**
Eptesicus fuscus	Big Brown Bat	--/--/--	No
Molossidae (Free-tailed Bats)			
Tadarida brasiliensis	Mexican Free-tailed Bat	--/--/--	No
Nyctinomops femorosaccus	**Pocketed Free-tailed Bat**	**--/SSC/Group 2**	**No**
Eumops perotis californicus	**Western Mastiff Bat**	**--/SSC/Group 2**	**No**
CARNIVORA (Carnivores)			
Canidae (Foxes, Wolves, and relatives)			
Canis latrans	Coyote	--/--/--	No
Procyonidae (Raccoons and relatives)			
Procyon lotor	Raccoon	--/--/--	No
ARTIODACTYLA (Even-toed Ungulates)			

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Cervidae (Deers)			
Odocoileus hemionus	**Southern Mule Deer**	**--/--/Group 2**	**Yes**
RODENTIA (Squirrels, Rats, Mice, and relatives)			
Sciuridae (Squirrels, Chipmunks, and Marmots)			
Spermophilus beecheyi	California Ground Squirrel	--/--/--	No
Geomyidae (Pocket Gophers)			
Thomomys bottae	Botta's Pocket Gopher	--/--/--	No
Heteromyidae (Pocket Mice and Kangaroo Rats)			
Dipodomys simulans	Dulzura Kangaroo Rat	--/--/--	No
Chaetodipus californicus femoralis	**California Pocket Mouse**	**--/SSC/Group 2**	**No**
Chaetodipus fallax fallax	**San Diego Pocket Mouse**	**--/SSC/Group 2**	**No**
Muridae (Mice, Muskrats, Rats, and Voles)			
Microtis californicus	California Vole	--/--/--	No
Neotoma bryanti	Bryant's Woodrat	--/--/--	No
Neotoma microtis	Big-eared Woodrat	--/--/--	No
Peromyscus boylii	Brush Mouse	--/--/--	No
Peromyscus californicus	California Mouse	--/--/--	No
Peromyscus eremicus	Cactus Mouse	--/--/--	No
Peromyscus maniculatus	Deer Mouse	--/--/--	No
Reithrodontomys megalotis	Western Harvest Mouse	--/--/--	No
LAGOMORPHA (Rabbits, Hares, and Pikas)			
Leporidae (Rabbits and Hares)			
Sylvilagus audubonii / *Sylvilagus bachmani*	Desert Cottontail / Brush Rabbit	--/--/--	No

[1] Listing Status – **Plants (Federal/State/County)**: Federal: E – endangered, T – threatened, DL – federally delisted. State: E – endangered, T – threatened, R – rare. County: Group 1—more sensitive, Group 2—less sensitive.

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): MBTA: Migratory Bird Treaty Act (http://www.fws.gov/migratorybirds/RegulationsPolicies/mbta/taxolst.html) 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: Group 1—endangered, Group 2—threatened, Group 3—sensitive.

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***** Introduced Species

Appendix E.
Potentially Occurring Sensitive Plant and Wildlife Species

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Potentially Occurring Sensitive Plant Species

Common Name	Scientific Name	Listing Status (Federal/State/ CNPS/County)[1]	MSCP Covered[2]	Habitat[3]	Potential to Occur
Gander's pitcher sage	*Lepechinia gander*	--/--/List 1B.3/ List A	Yes, narrow endemic	Metavolcanic soils	**Moderate** – known only from Otay and San Miguel Mtns.
Robinson's peppergrass	*Lepidium virginicum* var. *robinsonii*	--/--/List 1B.2/List A	No	CHP, CSS	**High**- habitat present onsite
Otay Mountain lotus	*Lotus crassifolius* var. *otayensis*	--/--/List 1B.1/ List A	No	CHP	**Low to Moderate** – known only from Otay mountain
Small-flowered microseris	*Microseris douglasii* var. *platycarpha*	--/--/List 4.2/List D	No	CHP, CSS, G, VP, clay soils	**Low –** outside known distribution
Dehesa beargrass	*Nolina interrata*	--/SE/List 1B.1/ List A	Yes, narrow endemic	CHP, CSS, gabbro soils	**High** - appears to respond well to fire
California adder's-tongue	*Ophioglossum californicum*	--/--/List 4.2/List A	No	CHP, G, VP, mesic	**Moderate –** on the edge of known distribution
Montana chaparral pea	*Pickeringia Montana*	--/--/List 4.3/--	No	CHP; gabbroic, granitic or clay soils	**Low –** limited habitat onsite
Nuttall's scrub oak	*Quercus dumosa*	--/--/List 1B.1/List A	No	CHP, CSS; sandy or clay loam soils	**Moderate –** limited habitat onsite
Cedros Island oak	*Quercus cedrosensis*	--/--/List 2.2/ List B	No	CF, CHP, CSS	**Low** – known only from the top of Otay mountain
Morena currant	*Ribes canthariforme*	--/--/List 1B.3/ List A	No	CHP, moist	**High**- habitat present onsite
Munz's sage	*Salvia munzii*	--/--/List 2.2/ List B	No	CHP, CSS	**High** - habitat present onsite
San Miguel savory	*Satureja chandleri*	--/--/List 1B.2/ List A	Yes	CHP, OW, gabbro/ metavolcanic soils	**Moderate** – limited habitat onsite
Southern skullcap	*Scutellaria bolanderi* var. *austromontana*	--/--/List 1B.2/ List A	No	moist CHP, montane	**Low** – this species occurs at higher elevations
Ashy spike-moss	*Selaginella cinerascens*	--/--/List 4.1/List D	No	CHP, CSS	**Moderate –** on the edge of known distribution
Laguna Mountain jewel-flower	*Streptanchus bernardinus*	--/--/List 4.3/List D	No	CHP, CF	**Low –** no habitat onsite
Parry's tetracoccus	*Tetracoccus dioicus*	-/-/1B.2/ List A	Yes	CHP, gabbro/ metavolcanic soils	**High** - habitat present onsite
Rush-like bristleweed	*Xanthisma (Machaeranthera) juncea*	--/--/List 4.3/--	No	CHP, CSS	**High** – this species was observed just outside the Preserve boundary

[1] Listing Status: Federal: FE – endangered, FT – threatened, State: SE – endangered, ST – threatened, SR – rare. California Native Plant Society (CNPS) Lists: 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). CNPS Threat Rank: 0.1 – seriously threatened in California, 0.2 fairly threatened in California, 0.3 not very threatened in California. County Lists: 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]MSCP Covered: Yes: Covered by the South County subarea plan of the San Diego County Multiple Species Conservation Plan, No: Not covered by the South County subarea plan of the San Diego County Multiple Species Conservation Plan.

[3] Habitat: CBS – coastal bluff scrub, CF – coniferous forest, CHP – chaparral, CS – coastal scrub, CSS – coastal sage scrub, CW – cismontane woodland, G – grassland, RF – riparian forest, VP – vernal pools

Potentially Occurring Sensitive Animal Species

Common Name	Scientific Name	Listing Status (Federal/MBTA/State/County)[1]	MSCP Covered[2]	Potential to Occur
Invertebrates				
Quino checkerspot butterfly	*Euphydryas editha quino*	FE/--/Group 1	Yes	**Moderate**: Suitable habitat present
Hermes copper butterfly	*Lycaena hermes*	--/SSC/Group 1	No	**Low** (currently): Suitable habitat (host plant) is expected to regrow.
Harbison's dun skipper	*Euphyes vestris harbinsoni*	--/--/Group 1	Yes	**Low:** No suitable habitat found (no host plant).
Amphibians				
Arroyo toad	*Anaxyrus californicus*	FE/SSC/Group 1	Yes	**Low**: Suitable habitat is present but minimal. No known populations up or downstream.
Western spadefoot	*Spea hammondii*	--/SSC/Group 2	No	**Moderate**: Has been documented to west on Rancho Jamul Ecological Reserve.
Reptiles				
California legless lizard	*Anniella pulchra*	--/SSC/Group 2	No	**Moderate**: Many found in and around Jamul, but not abundant.
Coronado skink	*Eumeces skiltonianus interparietalis*	--/SSC/Group 2	Yes	**High:** Adequate habitat exists on site
Blainville's horned lizard	*Phrynosoma blainvillii*	--/SSC/--	Yes	**Low:** Has been documented to west on Rancho Jamul Ecological Reserve.
Western pond turtle	*Actinemys marmorata*	--/SSC/--	Yes	**Low**: No habitat is present.
Fish				
Arroyo chub[3]	*Gila orcuttii*	--/SSC/Group 1	No	**Low:** Dulzura/Pringle creeks do not appear to support suitable habitat.
Birds				
Golden eagle	*Aquila chrysaetos*	BGE/MBTA/FP/Group 1	Yes	**Low:** No nesting habitat but may forage on site.
Loggerhead shrike	*Lanius ludovicianus*	--/MBTA/SSC/Group 1	No	**Moderate:** Species in decline locally but nesting habitat occurs on site.
Horned lark	*Eremophila alpestris actia*	--/MBTA/WL/Group 2	Yes	**Low:** No nesting habitat but may forage on site.

Coastal California gnatcatcher	*Polioptila californica californica*	FT/MTBA/SSC/Group 1	Yes	**Moderate:** Dependent on post-fire regrowth of habitat.
Bell's Sage sparrow	*Amphispiza belli belli*	--/MBTA/WL/Group 1	No	**Moderate:** Dependent on post-fire regrowth of habitat.
Mammals				
San Diego black-tailed jackrabbit	*Lepus californicus bennettii*	--/SSC/Group 2	No	**Moderate**: Has been documented immediately west at Rancho Jamul Ecological Reserve.
Southern grasshopper mouse	*Onychomys torridus Ramona*	--/SSC/Group 1	No	**High:** Historic captures at Dulzura Creek
Mountain lion	*Puma concolor*	--/--/Group 2	Yes	**High:** Probably uses Dulzura Creek for as movement corridor but also foraging. Has been documented to west on Rancho Jamul Ecological Reserve.
American badger	*Taxidea taxus*	--/SSC/Group 2	No	**Low**: Has been documented to west on Rancho Jamul Ecological Reserve.

[1] Listing Status: Federal: FE – endangered, FT – threatened, BGE – Bald and Golden Eagle Protection Act. MBTA: Federal Migratory Bird Treaty Act. State: SE – endangered, ST – threatened, SR – rare. County: Group 1—endangered, Group 2—threatened, Group 3—sensitive.

[2] Coverage status under the San Diego County Multiple Species Conservation Plan (MSCP)