Biological Monitoring Report

FOR THE

Barnett Ranch Preserve

(Monitoring Year 2009)

March 24, 2010

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
International Corporation
(TAIC)
9089 Clairemont Mesa Blvd.
Suite 200
San Diego, CA 92123
Contact: Christina Schaefer




This page intentionally left blank.

Biological Monitoring Report

for

Barnett Ranch Preserve

(Monitoring Year 2009)

Prepared for

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

Prepared by

Technology Associates International Corporation (TAIC)
9089 Clairemont Mesa Blvd., Suite 200
San Diego, CA 92123
Contact: Christina Schaefer

March 24, 2010

This page intentionally left blank.

Table of Contents

Appendices

List of Figures

List of Tables

Glossary of Terms and Acronyms

Adaptive Management – In the context of biological resources management, adaptive management is dealing with complex systems by using applied science to take action in the face of uncertainty. Adaptive management requires an explicitly experimental scientific approach to managing conservation and incorporates research into conservation and management actions. Specifically, it is the integration of design, management, and monitoring to systematically test assumptions in order to adapt management actions.

ASMD – Area Specific Management Directives

CBI – Conservation Biology Institute

CDFG – California Department of Fish and Game

CNDDB – California Natural Diversity Database

CNPS – California Native Plant Society

DPR - County of San Diego Department of Parks and Recreation

EMP – TransNet Environmental Mitigation Program; a transportation tax-funded environmental conservation program that includes funding for conservation land acquisitions and management programs.

Forbs – Plants without significant woody tissues above or at the ground. Includes herbs, vines and ferns, but not grasses or sedges.

Functional Group – functionally related vegetation communities (e.g., scrub communities, grassland communities, riparian communities) as ecological indicators for the purpose of habitat monitoring.

Grasses – In the context the vegetation monitoring section of this report, "grasses" include grasses in the family Poaceae, sedges (Family: *Cyperaceae*), and rushes (*Juncaceae*).

GSOB – Gold Spotted Oak Borer

MHPA – Multiple Habitat Planning Area

MSCP – Multiple Species Conservation Program

NCMSCP – North County Multiple Species Conservation Program

NRCS – Natural Resources Conservation Service

Percent Cover – Percentage of an area covered by a given plant species.

Pitfall Array – A trapping method used to sample reptiles and amphibians, consisting of pitfall traps (buried five-gallon buckets) and terminal box traps connected by drift fences laid out in a "Y" pattern.

Point Counts – A method for conducting bird surveys in which a selected number of stations (points) are established from which to conduct timed surveys. Survey data may include a list of species observed, number of birds, and behavior.

Point Intercept – A method used to estimate percent plant cover in an area. A wooden dowel (or similar object) is held vertically along a transect at specific intervals and plant species touching the dowel are recorded.

Quadrat sampling – A square or rectangular sampling unit used for vegetation surveys. For this report, quadrats are defined as one-meter square measuring unit made of ½ inch PVC pipe.

Restricted randomization sampling – Sampling locations are placed randomly, but must meet specific criteria (greater than 50 meters from a road, for example).

SANDAG – San Diego Association of Governments

SDNHM – San Diego Natural History Museum

SDSU – San Diego State University

Species Richness – The number of species in a given area.

TAIC – Technology Associates International Corporation

USFWS – United States Fish and Wildlife Service

USGS – United States Geological Survey

Vines – A climbing or twining plant with relatively long stems. In the context of the vegetation monitoring section of this report, woody vines are included in the "shrubs" (native or non-native) functional groups, and non-woody vines are included in the "forbs (native or non-native) functional groups.

Executive Summary

The County of San Diego's Barnett Ranch Preserve (Preserve) is part of the South and North County Multiple Species Conservation Programs (MSCP) and managed by the County of San Diego Department of Parks and Recreation (DPR) pursuant to management and monitoring guidelines identified in the South County MSCP and in the Barnett Ranch Preserve Area Specific Management Directives (ASMD). A baseline monitoring study conducted between 2001 and 2003 collected biological data on the Preserve. However, the Cedar Fire in 2003 burned the entire Preserve, effectively changing short term habitat conditions. This report details results of the monitoring surveys conducted in 2009, and provides analysis and conclusions relative to habitat conditions and specific-specific management recommendations.

MSCP monitoring guidelines are currently being updated, revised and developed. 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 for the 2009 surveys either used established protocols or draft regional MSCP monitoring protocols adapted for preserve-level monitoring. The following monitoring surveys were performed in 2009: vegetation communities mapping, general wildlife, habitat monitoring, herpetological pitfall array, and wildlife corridor/movement surveys.

The Preserve consists mainly of non-native grassland habitats in the center of the Preserve, which were historically influenced by grazing. Chaparral habitats are also well represented and seem to be recovering from the effects of the 2003 Cedar Fire, although vegetation community transitions and chaparral ecotones are unusually frequent on the Preserve. However, coastal sage scrub, which has historically covered large portions on the site, seems to be receding, possibly due to the effects of several wildfires that have burned the site. Results from habitat monitoring surveys suggest that type conversion from scrub habitats to non-native grasslands seem to be occurring, most likely as a result of the 2003 Cedar Fire. In addition, the Preserve's oak woodlands were also significantly affected by the fire. Non-native plant species are abundant, specifically in non-native grasslands habitats, but also as understory in native scrub communities.

While the Preserve does not contain any MSCP-covered plant species, although one individual felt-leaved monardella plant was previously observed but not confirmed in

2009, animal species protected by the MSCP occupy several habitats. However, species diversity, abundance and richness of all plant and animal species were generally low at the time of the 2009 monitoring surveys, and significantly lower than those reported during baseline monitoring surveys conducted in 2001 and 2002. Specifically, many mammals that occurred prior to the 2003 Cedar Fire (including mule deer) could not be confirmed in 2009, most likely due to a lack of vegetative cover, but also insufficient water on the Preserve. The results of the 2009 monitoring study suggest that recovery from the 2003 Cedar Fire is slow. Continued monitoring will confirm this trend and show whether and where fire recovery is occurring.

Recommendations for the management of the Preserve's MSCP-covered species and habitats include continued monitoring of the Preserve, specifically to look for signs of fire recovery. Fire recovery studies should include a trend analysis of native species richness and cover of non-native species, focused plant surveys of delicate clarkia and fire recovery indicators, and an oak inventory, during which a survey for the gold spotted oak borer should also be conducted. In areas where type conversions are evident, it is recommended to undertake a restoration study to restore native scrub and oak habitats to pre-fire conditions. In addition, native habitats would benefit from an extensive invasive species control program, specifically at the edges of non-native grasslands, where non-native species encroach on native habitats. Both invasive species removal and restoration would benefit MSCP-covered species on the Preserve, such as the orange-throated whiptail, coast horned lizard, rufous-crowned sparrow, Cooper's hawk, and mule deer; it would also benefit other mammal species that require cover to migrate. While the pond in the center of the Preserve offers an ephemeral water source, supplemental water for wildlife should be provided, specifically during drought conditions. Evidence from wildlife corridor monitoring in 2009 suggests that the Preserve is not part of a regional corridor used for wildlife movement, and that movement may occur south of the Preserve where water sources exist. Coordination with neighboring preserves and regional monitoring efforts would facilitate a better understanding of wildlife movement across this area, including golden eagle foraging and nesting preferences. Foraging habitat for this raptor is abundant on the Preserve, but nesting habitat is currently absent. The cattle stock pond should be maintained in its current state to continue providing water for wildlife as well as habitat for the two-striped garter snake (a County List Group 1 species) and other aquatic reptiles and amphibians. Because the cattle stock pond dries during the summer, bullfrog and other non-native predators do not pose a management problem on the Preserve.

Recreational pressure was not significant at the time of the 2009 monitoring surveys, although illegal off-road vehicle trespassing was observed. Increased park staff patrol and appropriate signage are recommended as funding allows.

1.0 INTRODUCTION

1.1 Purpose of the Report

The purpose of this report is to document results of Year 2009 biological monitoring studies for the County of San Diego's Barnett Ranch Preserve (Preserve), and recommend methods and measures for future management and monitoring. The County of San Diego Department of Parks and Recreation (DPR) is responsible for all monitoring and management required for the Preserve. The information in this report, together with the Barnett Ranch Open Space Preserve Area Specific Management Directives (ASMD) (Helix 2004a) and data from the biological resources technical report (Helix 2004b), will be used by DPR to direct adaptive management and continued monitoring efforts.

Biological monitoring was conducted by Technology Associates International Corporation (TAIC) and the San Diego Natural History Museum (SDNHM) on behalf of DPR in 2009 pursuant to the South County's Multiple Species Conservation Program (South County MSCP) monitoring and management goals. The year 2009 constitutes Monitoring Year 2 of future monitoring and adaptive management of the Preserve (baseline monitoring surveys were conducted in the years 2001 and 2002) pursuant to monitoring and management goals set forth in the South County MSCP.

1.1.1 Monitoring and Management Goals

The main goal for regular biological monitoring is to collect data to detect long-term population trends, changes in habitat quality, species composition and biological diversity, and to guide adaptive management for the Preserve. A range of different biological goals and management priorities were identified in the Preserve's ASMD (Helix Environmental 2004a). The priority designation recognizes the fact that many of the directives cannot be immediately implemented and assists in decisions to prioritize limited Preserve management funds.

1.1.2 Monitoring Strategies and Protocols

South County MSCP monitoring and management guidelines, originally developed in 1996, are current being revised as new scientific data become available. In 2001, Conservation Biology Institute (CBI) reviewed the South County MSCP Biological Monitoring Plan (Ogden 1996) in 2001 and provided a *Status Summary of Biological Monitoring Protocols for the MSCP* (CBI 2001) that included recommendations to refine the monitoring protocols. Subsequently, San Diego State University researchers (Regan et al. 2006) prioritized monitoring of MSCP-covered species by risk factors and threat

levels and recommended monitoring for specific high priority species and habitat associations. The authors provide a detailed threat analysis of each covered species in risk groups 1 through 3 and list the types of threats per each species and the habitat associations most susceptible to threats.

Comprehensive monitoring strategies are currently being re-evaluated on a regional scale in San Diego County through the San Diego Association of Government's (SANDAG) Environmental Mitigation Program (EMP), a transportation tax-funded (TransNet) environmental conservation program that includes funding for conservation land acquisitions and management programs. This program oversees and collaborates with land managers. Regional monitoring protocols have been developed for some MSCP-covered species, including the coastal California gnatcatcher (*Polioptila californica californica*). Elements of the South County MSCP Biological Monitoring Plan are currently being revised by participating agencies and include revisions to rare plant (McEachern et al. 2007) and species-specific animal (USFWS 2008) monitoring protocols. In addition, San Diego State University (SDSU) has developed protocols for and obtained preliminary results of their three-year South County MSCP habitat and vegetation monitoring pilot study, including methods to reduce data variability for habitat and plant species monitoring due to collection techniques and different group observers (Deutschman and Strahm 2009 a/b; Deutschman et al. 2008).

Preserve-level monitoring guidelines have not yet been developed, mainly because each South County MSCP preserve has a set of different monitoring objectives. Until more specific protocols are available through the EMP (in progress), the scope of the monitoring efforts on the Preserve will be guided by the following documents:

- San Diego MSCP Subarea Plan (City of San Diego 1997);
- Table 3-5, Species Evaluated for Coverage, of the County MSCP Subarea Plan (County of San Diego 1998);
- MSCP Biological Monitoring Plan (Ogden 1996)[1];
- Status Summary of Biological Monitoring Protocols for the MSCP (CBI 2001);
- San Diego Multiple Species Conservation Program Covered Species Prioritization (Regan et al. 2006);
- Draft monitoring protocols and monitoring protocol revisions developed by
    - U.S. Geological Survey for plants (McEachern et al. 2007);
    - San Diego State University for vegetation communities and habitats (Deutschman et al. 2008, 2009a/b); and

[1] Document outdated and, therefore, used as limited reference where appropriate.

- USFWS San Diego Multiple Species Conservation Program, Animal Monitoring Protocols (USFWS 2008).

1.2 Study Area Description

1.2.1 Project Location and Site Description

The Preserve is located in the County's Ramona Community Planning Area in central San Diego County, east of State Route (SR) 67 and south of SR 78 (Figure 1), south of the community of Ramona, east of the communities of Rosemont and Irvings Crest, and west of the San Diego Country Estates. The Preserve is located in Township 13 and 14 South, Range 1 East on the San Bernardino Meridian U.S. Geological Survey Ramona, San Vicente Reservoir, El Cajon Mountain, and San Pasqual quadrangles (Figure 2). The Preserve covers approximately 728 acres and is made up of six parcels (Assessor's Parcel Numbers 285-060-26, 285-070-25, 328-010-01, 285-071-04, 285-081-01, and 285-070-30). The irregularly shaped property straddles San Vicente Road, which runs through the property in a generally northwest/southeast direction (Figure 3).

The Preserve is characterized by a series of hilltops and ridges and a central undulating plain. Elevation ranges from approximately 1,150 feet above mean sea level (AMSL) in the south to approximately 1,670 feet AMSL on the peak on the southern side. Undeveloped land surrounds the Preserve on most sides, except to the north where a farmstead is situated (Figure 3). A private agricultural property is located in the middle section of the Preserve. In addition, three SDG&E powerline easements run across the site, and three paved roadways (San Vicente Road, Chuck Wagon Road, and Deviney Lane) are partially on site.

Canyons and ridges similar to those on the Preserve surround the property. Daney Canyon lies to the west of the property encompassing the Santa Maria Creek Aqueduct. Further west lie rural residential developments. San Vicente Creek lies to the south of the property flowing from northeast to southwest into the San Vicente Reservoir. The Barona Indian Reservation lies to the south and southeast of the property and Rancho Cañada de San Vicente (formerly Monte Vista Ranch) CDFG managed property to the south.

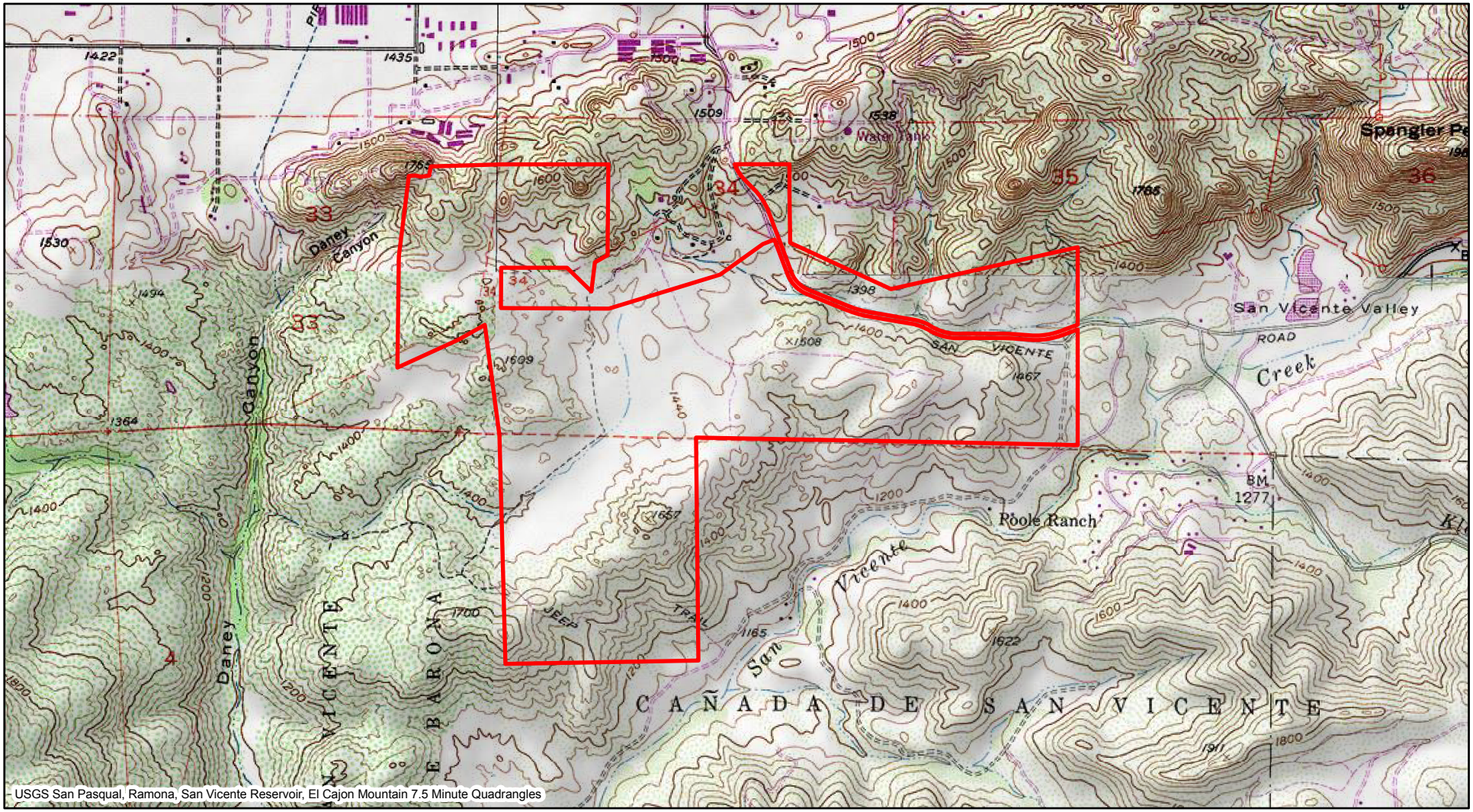
MSCP Year 2009 Monitoring
Barnett Ranch

Regional Location Map

Figure 1

File: T:\projects\DPR_MSCPMonitoring\plots\Barnett\Barnett Figures\Regional Location Portrait.mxd

Date: Dec 02, 2009



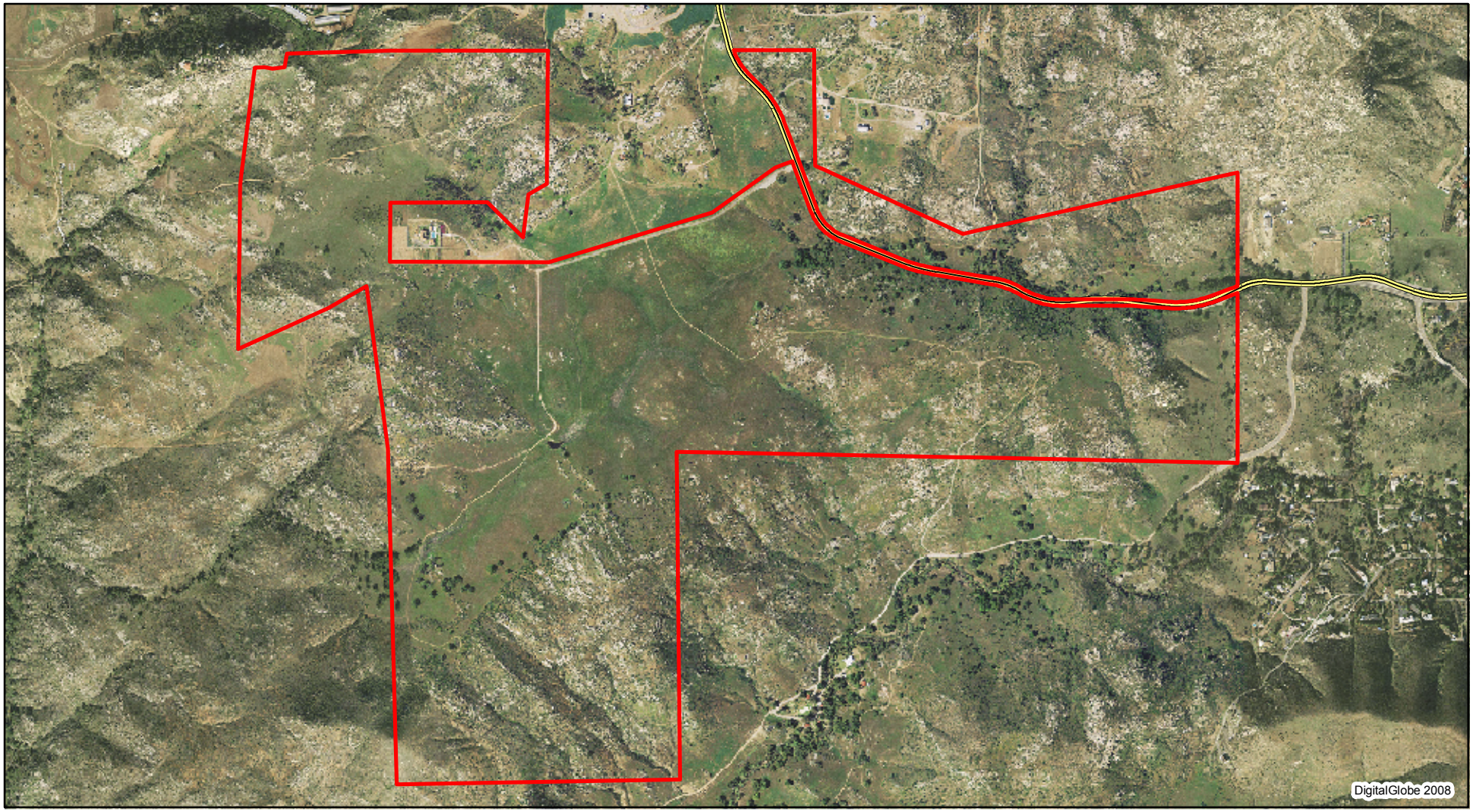
MSCP Year 2009 Monitoring
Barnett Ranch

USGS Topographic Quadrangles

Figure 2

File: T:\projects\DPR_MSCPMonitoring\plots\Barnett\Barnett Figures\BioMonitoringReport\USGS.mxd

Date: Jan 05, 2010



Legend
Preserve Boundary

Basemap Legend
San Vicente Road

N

Feet
0 1,360

MSCP Year 2009 Monitoring
Barnett Ranch

Site Map

Figure 3

File: T:\projects\DPR_MSCPMonitoring\plots\Barnett\Barnett Figures\BioMonitoringReport\Site Map.mxd

Date: Jan 06, 2010

1.2.2 MSCP Context

A majority of the Preserve is located within the South County MSCP Subarea Plan, Unincorporated Land in Metro-Lakeside-Jamul Segment (County of San Diego 1998), and the eastern portion is considered Pre-Approved Mitigation Area (PAMA). The northeastern portion is identified in the Draft North County MSCP area as Baseline Preserve (Figure 4). The Preserve is managed under the South County MSCP.

No specific management directives are formulated in the South County MSCP that apply specifically to the Preserve. However, the Preserve is considered part of the Central Poway/San Vicente Reservoir/North Poway MSCP designated Core Area. According to the South County MSCP, Core Areas are defined as generally supporting a high concentration of sensitive biological resources which, if lost or fragmented, could not be replaced or mitigated elsewhere. The Preserve provides an important open space linkage to the East Ramona and Ramona Grasslands cores, as identified in the Draft North County MSCP (County of San Diego 2009).

1.2.3 Physical Characteristics

Soils

The baseline report for the Preserve (Helix 2004b) contains detailed information on soils found within the Preserve. According to the U. S. Department of Agriculture, National Resources Conservation Service, Web Soil Survey (Bowman 1973), twelve soils types are found on the Preserve and are depicted on Figure 5.

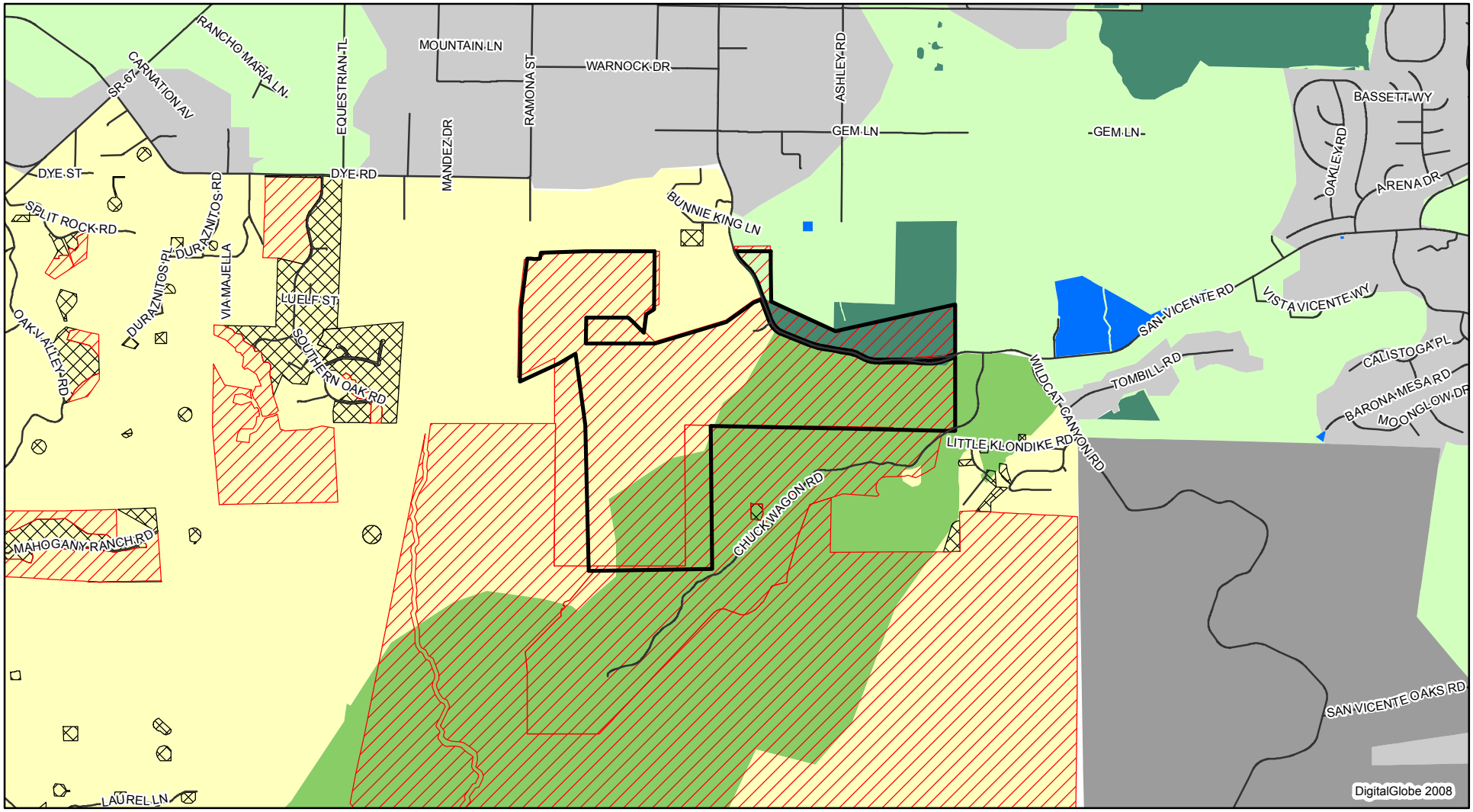
Climate

The Preserve lies well inland from coastal lands described as Semi-arid Steppe and exhibits a warm-summer Mediterranean climate according to the Koppen Classification System[2] (Pryde 2004). Late night and early morning low clouds are less frequent than on the coast. Daytime temperatures average 90 degrees Fahrenheit during the month of July and average 36 degrees Fahrenheit nightly during the month of January. Precipitation for nearby Ramona averages 15 inches per year.

Fire Cycles

Wildfire is a natural disturbance cycle which has historically shaped the Preserve's surrounding region. Some plant species found in local vegetation communities have

[2] 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.



Legend

MSCP North-Designations (Draft)
- Preserve Areas
- Pre-Approved Mitigation Area (PAMA)
- Outside Pre-Approved Mitigation Area (PAMA)
- Special Districts
- Tribal Lands

MSCP South-Designations
- Pre-Approved Mitigation Area (PAMA)
- Unincorporated Land in Metro-Lakeside-Jamul Segment

Habitrak*
- Gain
- Loss

Basemap Legend
- Preserve Boundary

N

Feet

0 3,125

* Habitrak boundaries based on SanGIS parcel boundaries, which have not been adjusted to match the surveyed Barnett Ranch preserve boundary.

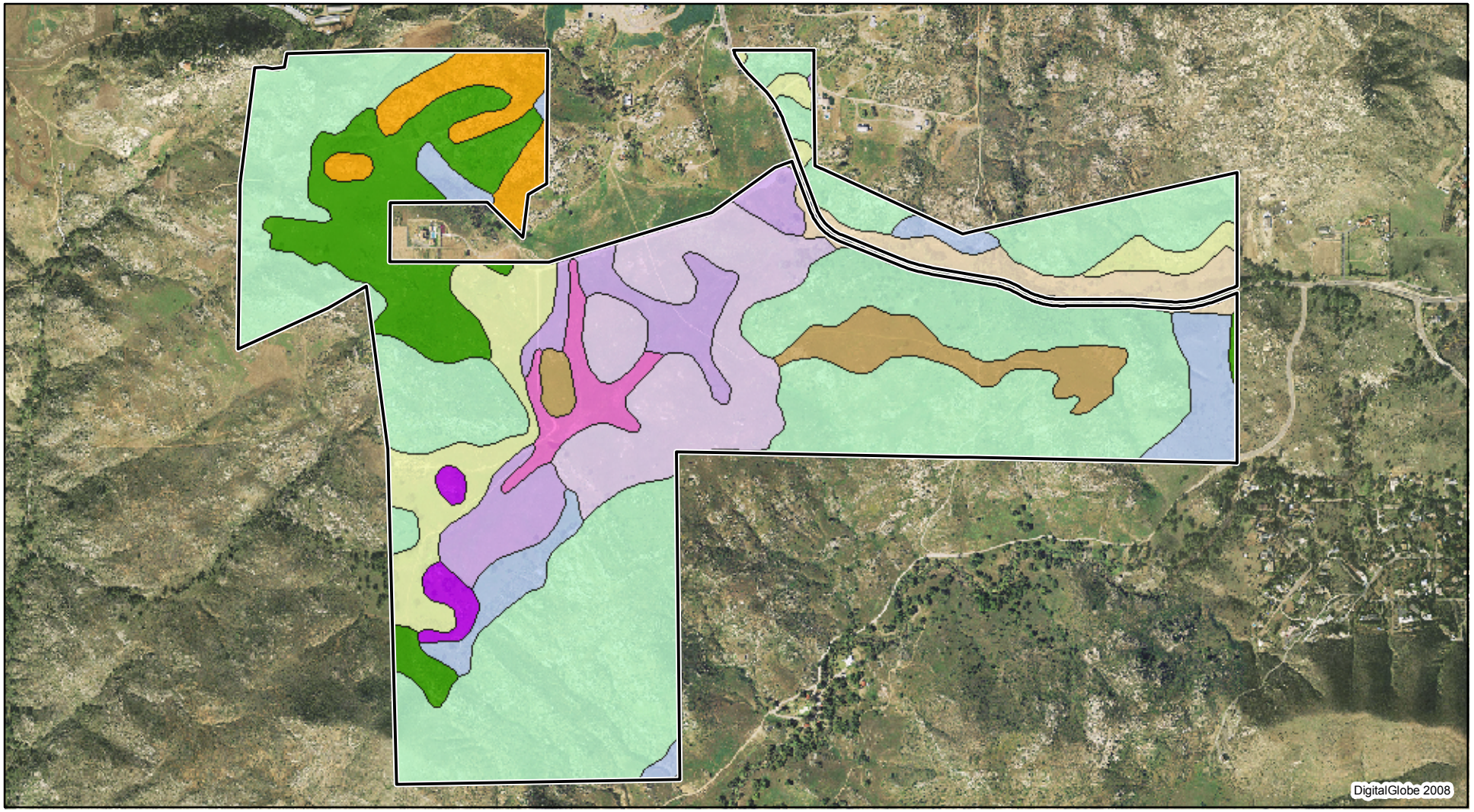
MSCP Year 2009 Monitoring
Barnett Ranch

MSCP Designations and Adjacent Conserved Lands

Figure 4

File: T:\projects\DPR_MSCPMonitoring\plots\Barnett\Barnett Figures\BioMonitoringReport\MSCP.mxd

Date: Mar 12, 2010



Legend

- AcG, Acid igneous rock land
- CmrG, Cieneba very rocky coarse sandy loam, 30 to 75 percent slopes
- FaC, Fallbrook sandy loam, 5 to 9 percent slopes
- FeC, Fallbrook rocky sandy loam, 5 to 9 percent slopes
- FeE, Fallbrook rocky sandy loam, 9 to 30 percent slopes
- GrB, Greenfield sandy loam, 2 to 5 percent slopes
- GrC, Greenfield sandy loam, 5 to 9 percent slopes
- GrD, Greenfield sandy loam, 9 to 15 percent slopes
- PeA, Placentia sandy loam, 0 to 2 percent slopes
- VaA, Visalia sandy loam, 0 to 2 percent slopes
- VvD, Vista rocky coarse sandy loam, 5 to 15 percent slopes

Source: Natural Resources Conservation Service 2002

Basemap Legend

- Preserve Boundary

N

Feet

0 1,360

MSCP Year 2009 Monitoring
Barnett Ranch

Soils

Figure 5

File: T:\projects\DPR_MSCPMonitoring\plots\Barnett\Barnett Figures\BioMonitoringReport\Soils.mxd

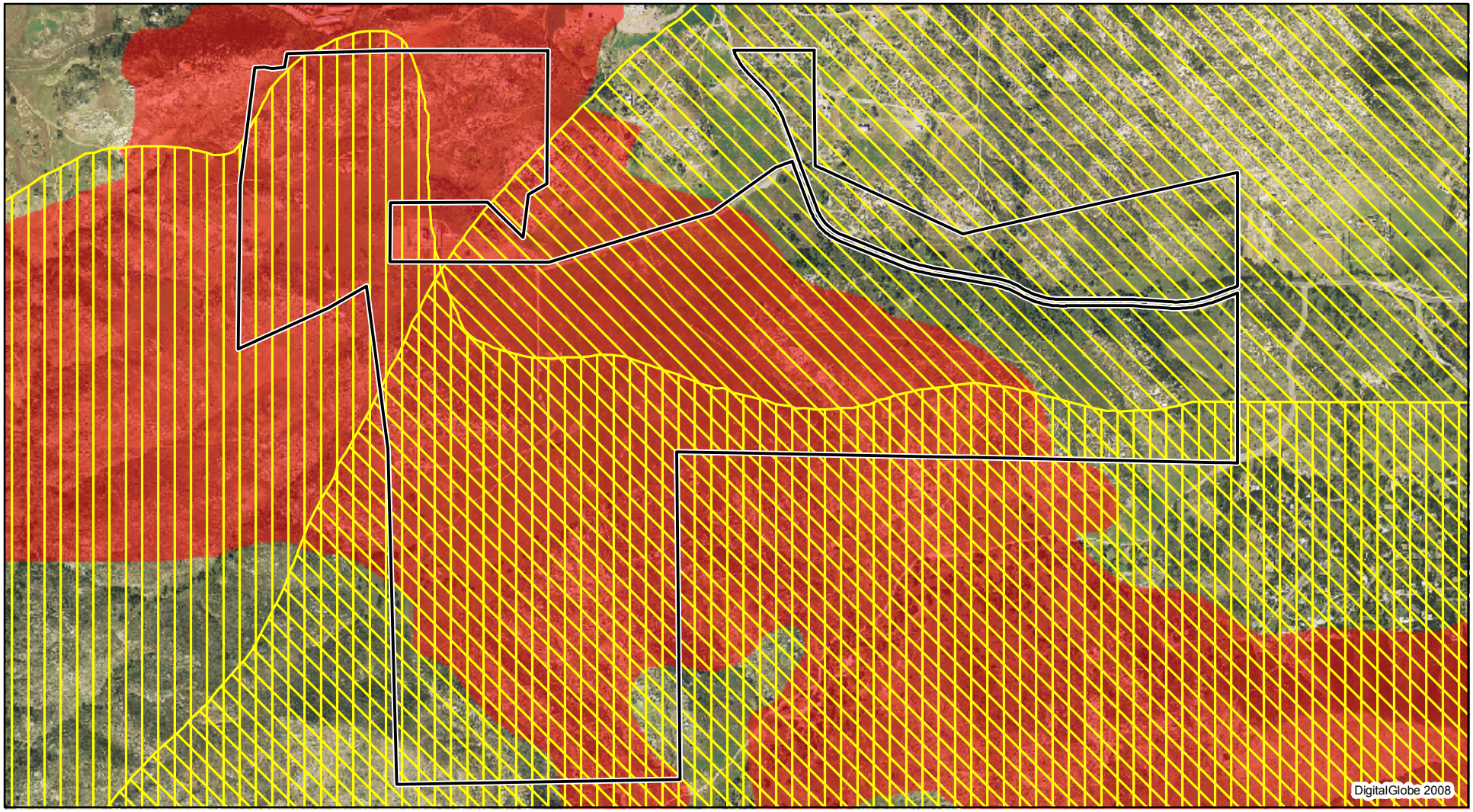
Date: Jan 25, 2010

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 natural wildfires is not well known because the return cycle has increased in recent years. The majority (99 percent) of the recent firestorms in San Diego have been human-caused. In addition, the sources of wildfires have shifted over time, and the effects (including size and intensity) of these fires have been compounded by drought and Santa Ana wind conditions.

The Preserve was burned entirely in the 2003 Cedar Fire. Baseline surveys were performed by Helix in 2001 and 2003 and monitoring surveys were performed in 2009; therefore, significant changes to the vegetation community composition and natural resources distribution on the Preserve are expected due to the effects of fire recovery. Historic fires have burned the majority of the Preserve at several occasions in the last century (Figure 6). The earliest recorded fire occurred in 1913 and 15 years later in 1928, a large area burned overlapping some areas charred in 1913 resulting in nearly the entire Preserve being affected by fire. In 1978, a large portion of the Preserve burned in the Dye Fire (California Department of Forestry 2008). Due to its location in the urban wildland interface, the Preserve has historically been affected by fires at a relatively frequent rate.

Hydrology

Creeks and waters are scarce on the Preserve. A 0.03-acre pond used in the past as a cattle stock pond is located near the center of the Preserve (Figure 3) and is of biological importance as habitat for amphibians and wildlife as a water source. Klondike Creek, a shallow, ephemeral drainage lined with oaks and willows, flows from west to east across the northeastern portion of the Preserve. A tributary to Daney Canyon Creek leaves the pond toward the west. All creeks on the Preserve ultimately flow into San Vicente Creek and into the Santa Maria Creek Aqueduct to the southwest.



MSCP Year 2009 Monitoring
Barnett Ranch

Fire History

Figure 6

File: T:\projects\DPR_MSCPMonitoring\plots\Barnett\Barnett Figures\BioMonitoringReport\Fire History.mxd

Date: Jan 05, 2010

This page intentionally left blank

2.0 SURVEY METHODS

Prior to conducting biological field surveys, potentially occurring sensitive biological resources were identified through a review of the following GIS databases: California Natural Diversity Database (CNDDB), California Native Plant Society (CNPS) Inventory of Rare and Endangered Vascular Plants (CNPS 2009), San Diego Natural History Museum (SDNHM) Plant, Bird, and Mammal Atlas databases and San Diego Bird Atlas (Unitt 2004), SDNHM Herbarium database, SDNHM field guide to reptiles and amphibians (SDNHM 2008), and the 2009 U.S. Fish and Wildlife Service species occurrence database. Background documents including the Preserve ASMD (Helix 2004a) and the Biological Resources Report (Helix 2004b) were also reviewed prior to the onset of monitoring surveys.

Monitoring field surveys were conducted using protocols developed specifically for monitoring MSCP habitats and species, as indicated below. Most of the protocols have been designed for regional monitoring purposes and are still in the pilot program testing phase; some have been adapted from the regional to the preserve-level scale; others have been developed for species-specific presence/absence survey purposes. Sampling design for the Year 2009 monitoring effort followed these protocols to the extent feasible. All species observed during monitoring surveys were recorded and are listed in Appendix A.

It should be noted that the official Preserve boundary was not available at the onset of 2009 monitoring surveys. Monitoring stations were located in the field using the SanGIS parcel layer as a guide, which was found to be inaccurate. The Preserve boundary was finalized in December 2009 and mapped monitoring data were adjusted to this boundary accordingly. However, some monitoring locations (specifically for habitat and corridor monitoring) were located west of the official Preserve boundary (see also discussion in sections 3.2 and 5.1.2). This does not affect the analysis of monitoring data; however, the monitoring stations will need to be moved inside the Preserve boundary for the next round of monitoring surveys to remain on County property.

2.1 Vegetation Communities and Habitats

2.1.1 Vegetation Communities Mapping

In April of 2009, TAIC biologists conducted vegetation mapping of the entire Preserve (Table 1). Prior to going out into the field, GIS data from previous vegetation mapping conducted by Helix Environmental 2001 (Helix 2004b) were reviewed. This mapping was conducted prior to the 2003 Cedar fire, which burned the entire Preserve. The vegetation boundaries were placed on a field map, which consisted of a 200-scale (1" = 200') 2008 color

aerial photograph, and revised in the office according to the digital signature of the vegetation. The field map was then used in the field to remap (field-truth) the vegetation communities throughout the Preserve, pursuant to the most current vegetation mapping guidelines published by the County of San Diego. Mapping was conducted within the Preserve boundary plus 100 feet outside of the Preserve boundary. The presence or absence, and/or level of dominance of indicator plant species were used to confirm the vegetation type.

Table 1. Vegetation Mapping and Habitat Monitoring Schedule

Vegetation Mapping		Habitat Monitoring	
Date	Biologists*	Date	Biologists*
April 23 April 28	RH, JF, DL, GR RH, MR	May 18-20, 2009	RR, MM

* RH – Rosanne Humphrey; JF – Julie Fontaine; DL – Derek Langsford; GR – Geoff Rogers; MR – Mark Roll; MM – Margie Mulligan.

The natural vegetation community classification used in this report follows Oberbauer (2005) modified Holland (1986) Vegetation Classification System, which was also used for the 2001 baseline surveys (Helix 2004b). The regional vegetation classification system is currently being updated by SANDAG to more closely follow the Keeler-Wolf (CDFG, Sawyer, Keeler-Wolf 1995) vegetation classification system. Eventually, the vegetation mapping of the Preserve will be updated to this new classification once it has been adopted by the County of San Diego.

While updating vegetation communities, biologists also collected the following information:

- Mapped and recorded areas that should be flagged for management, including areas with significant infestations of non-native species, erosion, unauthorized public access issues, trash and dumping, etc.;
- Mapped and recorded any sign and tracks of wildlife to identify prominent corridors;
- Noted any observed wildlife and wildlife sign, mapped locations of sensitive species;
- Looked at landscape level wildlife movement opportunities (identified riparian corridors, areas with cover, bedding down areas, etc.);
- Assessed habitat quality for MSCP-covered birds;
- Qualitatively assessed the suitability of habitat for Quino checkerspot butterfly (*Euphydrias editha quino*), and mapped occurrences of host plants;

- Mapped incidental observations of raptor nests and recorded raptor nesting behavior (specifically northern harrier and golden eagle);
- Identified opportunities/locations for vegetation transect locations (habitat monitoring);
- Verified that previous herpetological array locations were appropriate;
- Noted post-fire habitat conditions and fire recovery.

2.1.2 Habitat Monitoring

Selecting Monitoring Locations

The overall goal of the habitat monitoring program is to identify trends in habitat condition that may require active management. Trends will be determined by detecting changes in habitat condition over time and comparing them to baseline conditions. Habitat condition will be assessed by measuring *species richness* (the number of species in a given area), and *cover* (percentage of an area covered by a given plant species) of invasive grasses and forbs relative to native shrubs.

The vegetation monitoring was conducted pursuant to the draft protocol identified in pilot vegetation monitoring studies conducted by SDSU for the California Department of Fish and Game (CDFG) and SANDAG (Deutschman et al. 2008; Deutschman and Strahm 2009a and 2009b).

A total of 12 permanent monitoring stations (plots) were selected randomly within each mapped vegetation community category and pursuant to a select list of restricted randomization criteria (e.g., random plot locations that must meet specific criteria, including accessibility and percent slope) as described below. The number of stations was chosen in an attempt to balance funding availability with broad coverage of vegetation types and geography within the Preserve. Selection criteria are as follows:

- Not less than 30 meters or greater than 300 meters from trails, developed, or disturbed areas
- Slopes not greater than 40 percent
- A selection of plots within each major habitat type
  - Chaparral (3 plots)
  - Coastal sage scrub (3 plots)
  - Non-native grassland (3 plots)
  - Ecotones (3 plots)
    - Chaparral/coastal sage scrub transition (1 plot)
    - Non-native grassland/coastal sage scrub (2 plots)

Survey Methods

Quadrats and point intercepts were surveyed between May 18 – 20, 2009 along a 50-meter transect at each plot (Figure 7). Each of the two methods captures different components of the vegetation community (Deutschman et al. 2008). The quadrat method is best suited for capturing small plants, plants that are rare or that have low cover, and overall species richness; however, it is time-consuming and inferior when recording large plants (Deutschman and Strahm 2009a). The point intercept method, which is less time consuming, works well for large and small plants, abundant species, and estimating cover. It does not work well for capturing rare or low cover plants.

Quadrats

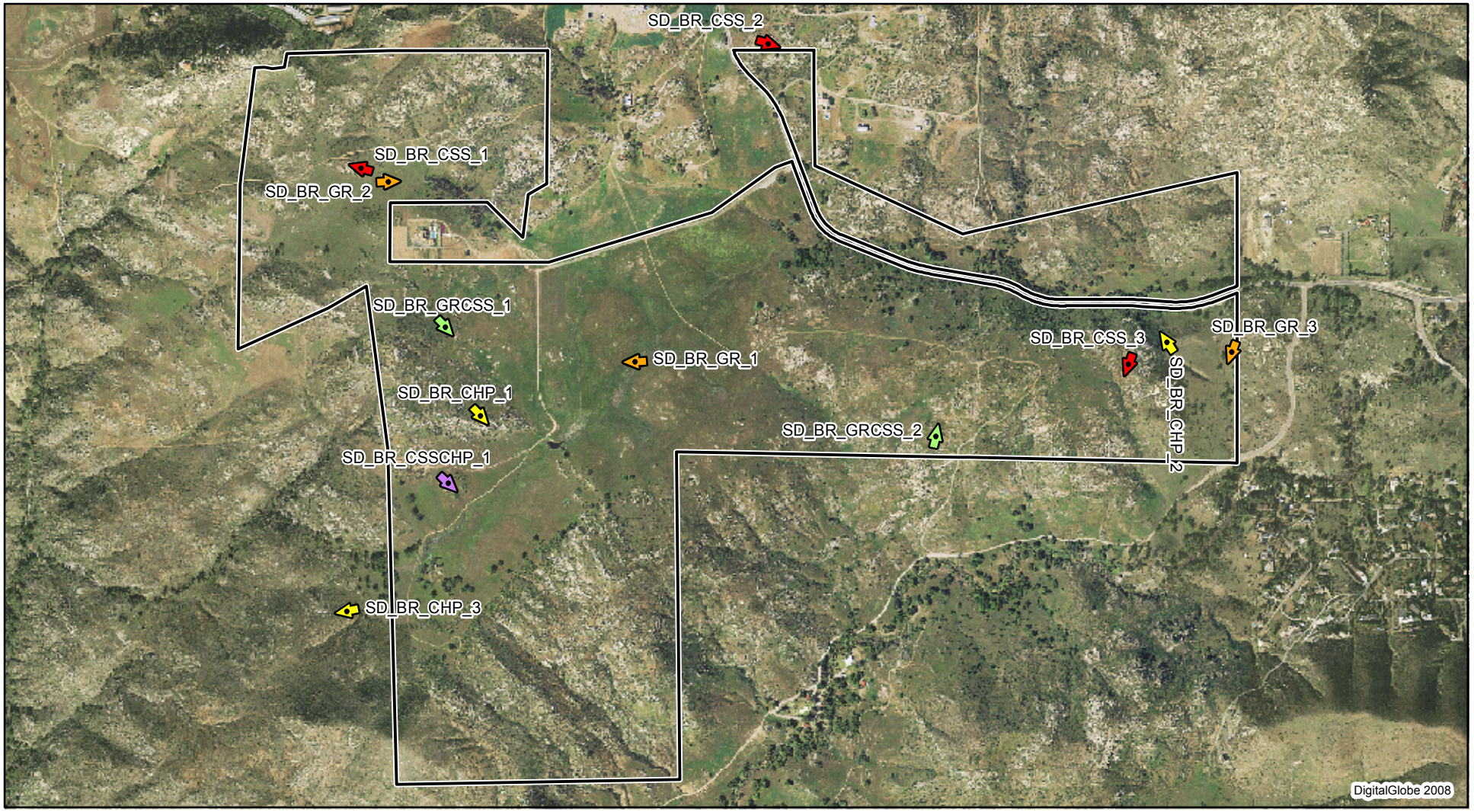
Quadrat measurements were taken every five meters on alternating sides from meter five to 50. Two measurements were taken within each quadrat: (a) absolute percent ground cover, not to exceed 100 percent; and (b) relative cover by plant species, which could exceed 100 percent for overlapping plants. Ground cover classes included litter, bare, rock, vegetation or stem, cryptobiotic crust, and moss. Unknown plant species were collected and labeled with the date, plot number, and a unique number. Collected specimens were later identified using the Jepson Manual (J.C. Hickman ed., 1993), Flora of North America (1993), the most up-to-date literature, and the synoptic collection at the San Diego Natural History Museum Herbarium.

Point Intercept

The point intercept method was used along the same 50-meter transect. A ½ inch wooden dowel, one meter long, was placed perpendicular to the ground at every meter on the left side (facing the end point) starting at one meter and ending at 50 meters. Two measurements were taken at each meter: (a) ground cover type, as described above, and (b) species touching the dowel. Abundance was not recorded. For all plants with canopies that exceeded the height of the dowel (including trees and shrubs), presence or absence was estimated by extending an imaginary vertical line from the dowel toward the canopy; if the canopy touched the imaginary line, presence was established.

Area Search

In addition to conducting the quantitative methods described above, the area was assessed visually to make a qualitative assessment of habitat condition, and to record native or sensitive species that were not included in the quadrats or point intercept.



MSCP Year 2009 Monitoring
Barnett Ranch

Habitat Monitoring Plot Locations

Figure 7

File: T:\projects\DPR_MSCPMonitoring\plots\Barnett\Barnett Figures\BioMonitoringReport\Vegetation Monitoring Locations.mxd

Date: Mar 12, 2010

2.2 Plants

2.2.1 Rare Plant Monitoring

Felt-leaved monardella (*Monardella hypoleuca* ssp. *lanata*) was the only MSCP-covered species (Risk Group 3, County List A) found within the Preserve during baseline biological surveys conducted by Helix Environmental Planning in 2001 (Helix 2004b). A single individual was observed in 2001 at the eastern edge of the property in coastal sage scrub habitat. A 2009 habitat monitoring transect (SD_BR_CHP_2) was located in the area of the 2001 species observation (Figure 7). However, this species was not observed during the 2009 vegetation mapping or habitat monitoring surveys. Therefore, rare plant monitoring was not conducted in 2009.

2.3 Wildlife

2.3.1 Herpetofauna

Herpetological monitoring was conducted at the Preserve from May through July 2009 (Table 2). Pitfall trap arrays have been widely used to obtain data on amphibians and reptiles throughout southern California (Fisher & Case 2000). The following methods and survey protocol has been derived and modified from Fisher et al. (2008).

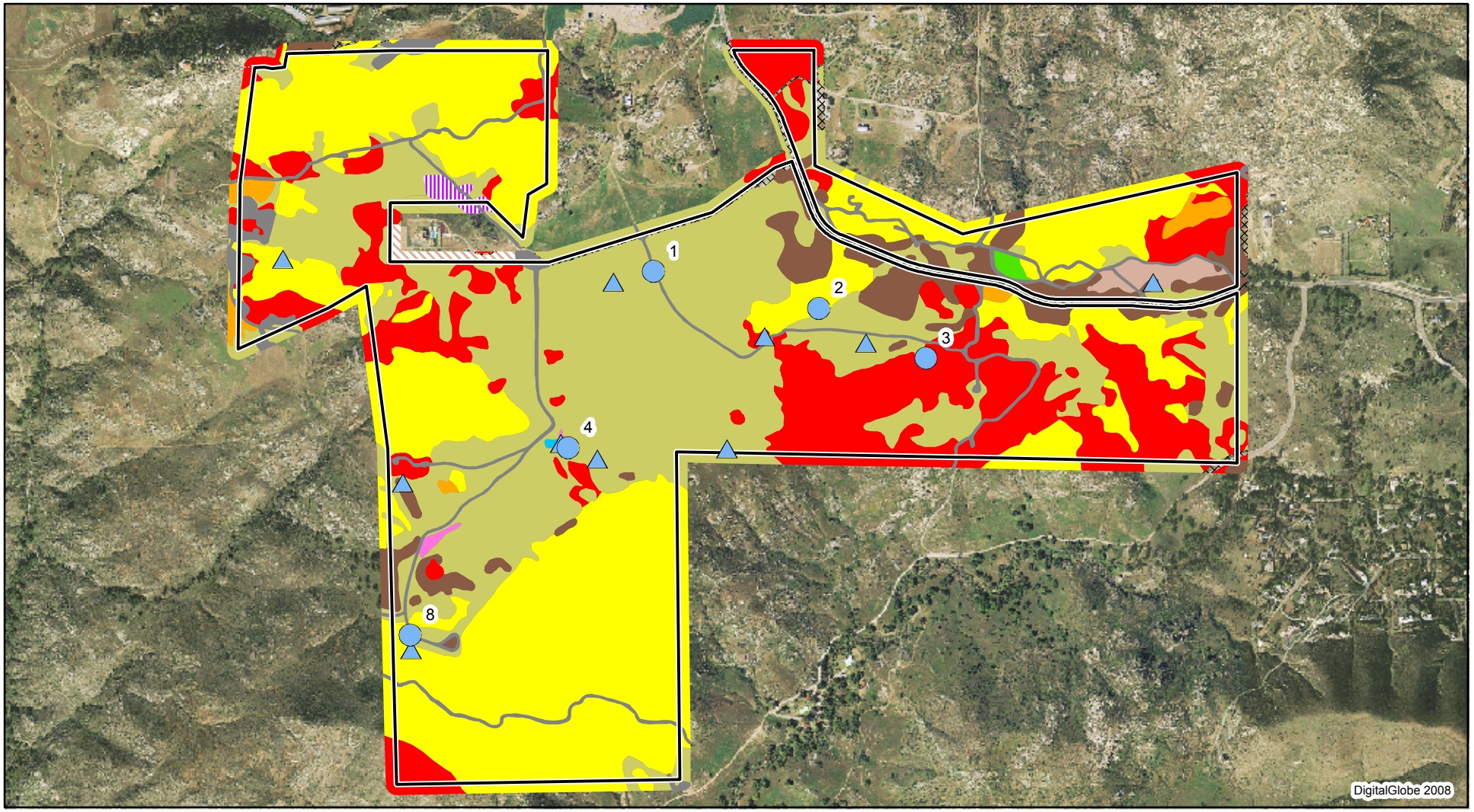
Table 2. Herpetofauna Survey Schedule

Survey Session	Principal Investigator	Dates
1	Brad Hollingsworth	May 5 – May 8, 2009
2	Brad Hollingsworth	June 9 – June 12, 2009
3	Brad Hollingsworth	July 14 – July 17, 2009

Selecting Monitoring Locations

There are ten previously identified and surveyed pitfall array locations on the Preserve (Helix 2004a), five of which were surveyed during the monitoring in 2009 (Figure 8). TAIC confirmed through field reconnaissance during pitfall construction that these previous survey locations were placed in representative areas within the Preserve to fully capture the diversity of the herpetofauna, including rock outcroppings and ravines. All arrays were re-marked using GIS technologies and the locations mapped (Figure 8).

The arrays were reconstructed in habitats representative of the Preserve, in the same or close to the same locations as previously identified. Two of the five arrays (#2 and #8)



MSCP Year 2009 Monitoring
Barnett Ranch

Herpetological Array Locations

Figure 8

File: T:\projects\DPR_MSCPMonitoring\plots\Barnett\Barnett Figures\BioMonitoringReport\Pitfall Array.mxd

Date: Mar 12, 2010

are located in undisturbed chaparral, two (#1 and #4) are located in areas previously grazed and currently covered in grasses, and one (#3) is located in coastal sage scrub.

Survey Methods

Each pitfall arrayed consist of four five-gallon buckets and three 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. 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 captured animals from the heat of the sun.

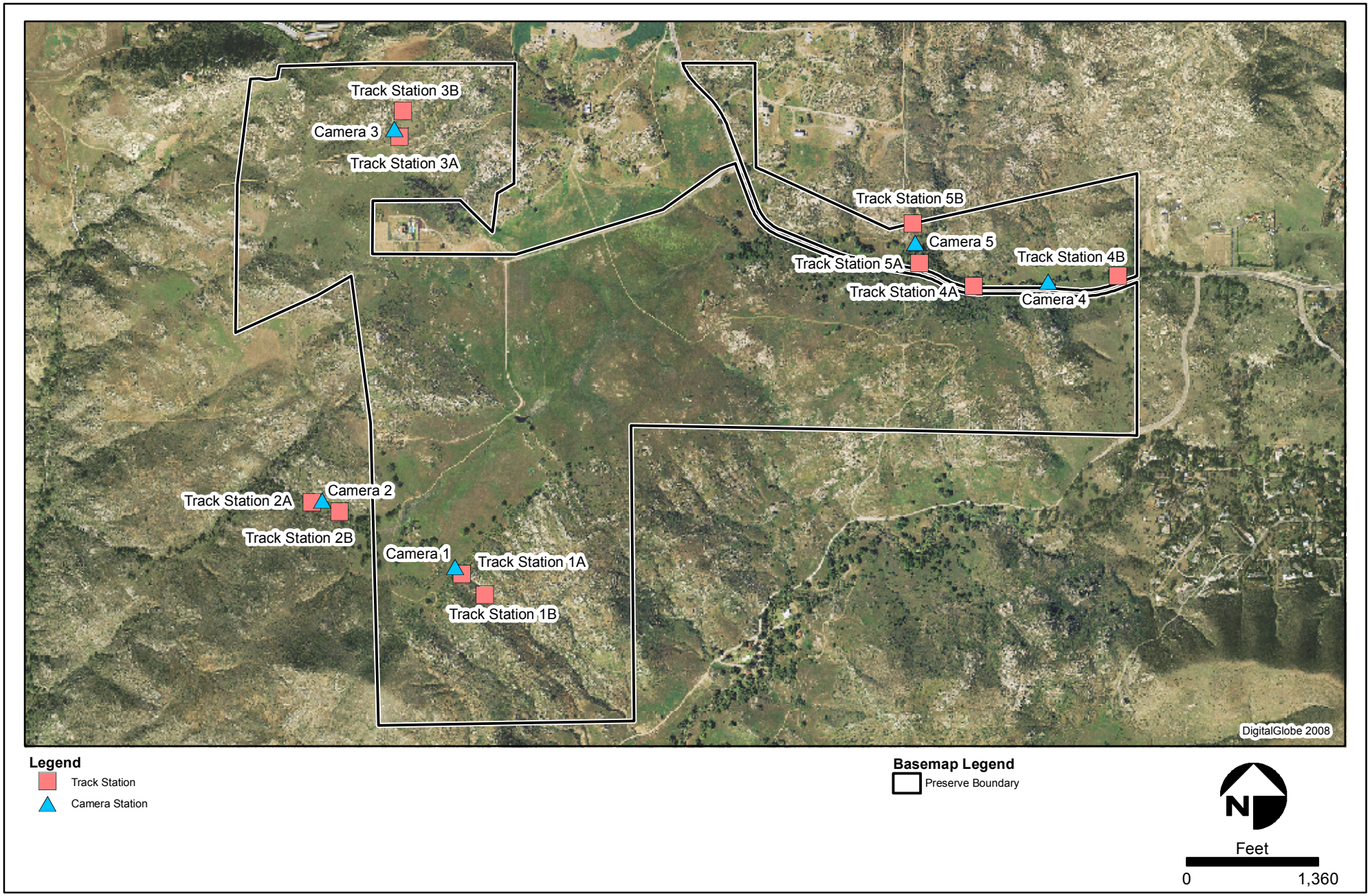
Arrays were installed during the week of April 23, 2009. Reptiles and amphibians were captured May through July, the period when most of the species are above ground and active (Table 2). The herpetological surveys consisted of three five-day sampling sessions. Traps were opened on day one and checked every morning for four consecutive mornings (Tuesday – Friday). All vertebrates captured in the pitfalls and box funnel traps were recorded using a Personal Data Assistant (PDA).

Mark/re-capture methods were used for monitoring purposes. All herpetofauna, except turtles and very small salamander species, were toe-clipped following methods outlined in Fisher et al. (2008). All limbless reptiles were scale-clipped following methods outlined in Fisher et al. (2008). Marking was used for identification purposes. Re-captured individuals were recorded with their unique toe-clip or scale-clip code, while new captures received a unique toe-clip or scale-clip number. Toe-clip and scale-clip numbers were tracked on a clip chart to prevent two animals from receiving identical numbers. Toes essential to the animal's survival (i.e., accelerator toes of lizards, thumbs of frogs and toads) were not clipped. Venomous snakes, blind snakes, and legless lizards were not scale-clipped.

2.4 Wildlife Linkages and Corridors

Wildlife movement/corridor monitoring was conducted at the Preserve once in May, June, and September 2009 (Table 3). All survey locations were mapped using GIS technologies (Figure 9).

The wildlife movement/corridor surveys for the Preserve used methods developed to be consistent, as feasible and applicable, with the Preserve ASMD (Helix 2004a), status summary of monitoring protocols (CBI 2001), and published survey methods (Wilson 1996, Cutler and Swann 1999).



MSCP Year 2009 Monitoring
Barnett Ranch

Wildlife Movement Monitoring Locations

Figure 9

File: T:\projects\DPR_MSCPMonitoring\plots\Barnett\Barnett Figures\BioMonitoringReport\Corridor Monitoring.mxd

Date: Mar 12, 2010

Table 3. Wildlife Corridor Monitoring Survey Schedule

Survey Session	Principal Investigator	Dates
1	Scott Tremor	May 28 - May 31, 2009
2	Scott Tremor	June 15 - June 19, 2009
3	Scott Tremor	Sept 8 - Sept. 12, 2009

No conclusive wildlife movement data are known for the Preserve; therefore, the methods described herein are designed to gather an understanding of the large mammal use of the Preserve and whether or not the Preserve is part of a sub-regional or regional wildlife movement corridor.

Comprehensive vegetation communities and wildlife mapping was performed on the entire Preserve in 2009; during this survey effort, any wildlife-related observations, including tracks and other sign, were recorded. Subsequently, a site visit was conducted on May 7, 2009, to collect landscape-level information necessary to develop monitoring protocols and identify suitable monitoring station locations on the Preserve. Data collected included current and historic land use, topography, wildlife habitats, and any deer and carnivore sign. Tracking station/camera surveys were conducted to understand habitat suitability and occupancy by the MSCP-covered mule deer (*Odocoileus hemionus*) (observed in the Preserve during baseline surveys) and other large mammals such as coyote (*Canis latrans*) and bobcat (*Lynx rufus*) as well as collect wildlife movement and connectivity information. A combination of un-baited motion-sensing cameras and track plots were used; un-baited plots aid in corridor detection and avoid drawing an animal to a site that they are otherwise not likely to use. Motion-sensing cameras (Wilson et al. 1996) are an effective method to assess presence of medium to large mammals and answer important research questions about population dynamics (Cutler and Swann 1999). Three cameras were placed in representative areas where tracks and sign have been detected during the previous surveys (Helix 2004b) and in potential wildlife corridors and high use areas (e.g., near water sources, drainages, ridgelines, etc.). Two cameras were placed along the creek in the north-eastern portion of the Preserve to detect potential wildlife movement along this corridor. Each camera station was combined with two track plots within a 200-meter line transect. One camera and its two track plots are considered one survey plot. Plots were distributed throughout the Preserve in order to record medium-to-large mammals and yield data on their movement patterns. Given the public use of the Preserve, all track plots were set off main trails so they were not easily visible. However, a few cameras were placed adjacent to trails to detect the potential use of the trail as a wildlife movement corridor. A total of five plots were checked every day for three consecutive days, and the species visiting them identified by their tracks (remote camera photos are included in Appendix D).

3.0 RESULTS

3.1 Vegetation Communities Mapping

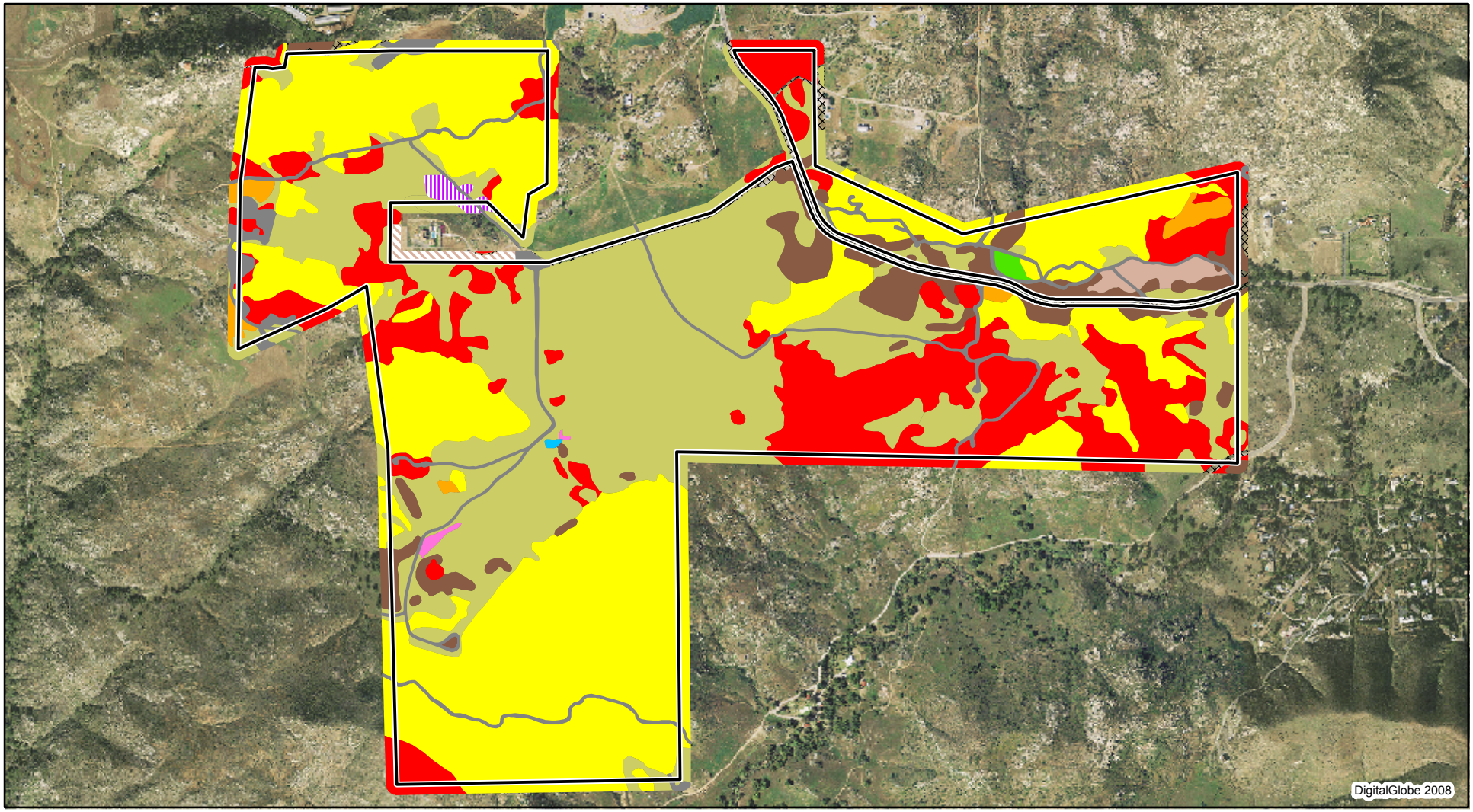
Thirteen vegetation communities were mapped within the Preserve during the 2009 surveys (Table 4; Figure 10). The Preserve is dominated by non-native grasslands on the flatter areas and southern mixed chaparral on north and south-facing slopes in the west and northeast of the Preserve. A few small patches of Diegan coastal sage scrub occur scattered throughout the Preserve with more extensive patches predominant in the east on the mostly south-facing slopes, over the ridge south of San Vicente Road. Coastal sage-chaparral scrub transitions (ecotones) occur in a few places in the west, south, and northeast.

Table 4. Vegetation Communities within the Preserve

Vegetation Community[1]	Acres[2]
RIPARIAN/WETLAND COMMUNITIES	
Freshwater Seep (45400)	0.9
Southern Coast Live Oak Riparian Forest (61310)	1.4
Freshwater (13140)	0.3
UPLAND COMMUNITIES	
Diegan Coastal Sage Scrub (32500)	124.7
Coastal Sage-Chaparral Scrub Transition (37G00)	5.6
Southern Mixed Chaparral (37120)	272.4
Non-native grassland (42200)	251.6
Non-native grassland - Broadleaf Dominated (42210)	5.2
Coast Live Oak Woodland (71160)	38.2
Eucalyptus Woodland (11100)	2.1
Disturbed Habitat (11300)	4.1
Urban/Developed (12000)	1.1
Subtotal Vegetation	**707.6**
TRAILS	
Disturbed Habitat (dirt roads) – authorized trail	3.3
Disturbed Habitat (dirt roads) – unofficial trail	6.0
Urban/Developed (paved road, staging area) - authorized	1.7
Subtotal Trails	**11.0**
TOTAL	**718.6**

[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.



Source: Technology Associates 2009.

MSCP Year 2009 Monitoring
Barnett Ranch

Vegetation Communities

Figure 10

File: T:\projects\DPR_MSCPMonitoring\plots\Barnett\Barnett Figures\BioMonitoringReport\Vegetation.mxd

Date: Mar 12, 2010

In the lower elevations of the Preserve along San Vicente Road and in the southeast are significant stands of coast live oak woodland associated with drainages in those areas. Along the San Vicente Road drainage, a mature stand of southern coast live oak riparian forest is located in one portion of the drainage. In some locations southern coast live oak riparian forests may intergrade with coast live oak woodlands depending on conditions.

In addition to the natural communities within the Preserve, the site contains many human-altered habitats. Disturbed habitats which occur within the Preserve include unpaved trails and other largely unvegetated areas and areas of soil disturbance. Other developed areas occur within the Preserve including the paved road from San Vicente Road and the hiking staging area just off San Vicente Road. Even agriculture has been extended into the Preserve, both south of the house that is surrounded by the Preserve, and in the far west where clearing, disking and grazing have impinged on the Preserve. Descriptions of each vegetation community provided in the text below describe in more detail the effects of the 2003 fire on vegetation community growth and distribution.

Diegan Coastal Sage Scrub (32500)

As described by Holland (1986), Diegan coastal sage scrub is a community dominated by drought deciduous soft-woody sub-shrub taxa frequently found on arid or steep sites. Diegan coastal sage scrub frequently intergrades with chaparral communities such as southern mixed chaparral at higher elevations. On the Preserve, patches of Diegan coastal sage scrub are scattered throughout the Preserve only being predominant in the east, south of San Vicente Road. This community is dominated by coastal sagebrush (*Artemisia californica*) and coastal buckwheat (*Eriogonum fasciculatum*), and laurel sumac (*Malosma laurina*) in some areas. Diegan coastal sage scrub comprises 124.7 acres of the Preserve.

The Preserve's Diegan sage scrub is struggling to recover from the 2003 Cedar Fire. In most areas, previously dense stands lack diversity; are uniformly of deer weed (*Lotus scoparius*), buckwheat or laurel sumac; are open; and often infested with non-native annual grasses, mainly bromes (*Bromus* spp.). The degree of infestation varies, but approaches 50% of cover in most areas. Some areas, previously mapped as Diegan coastal sage scrub, have seen type conversion to non-native grassland. In these areas, most, if not all, sage scrub species have been eliminated, including several small patches that were previously within non-native grassland. Other areas, specifically in the southwestern portion of the site, were previously mapped as fingers of coastal sage scrub interwoven with chaparral habitat. When TAIC biologists visited the site in 2009, the area was dominated by non-native forbs and grasses with scattered, intermixed native shrubs, including coastal sagebrush, chamise (*Adenostoma fasciculatum*), laurel sumac, and deerweed. This was true for the entire area except for the far west near the oak woodland, which had a healthy stand of chaparral and much lower

incidence of invasives. Clear vegetation communities boundaries were not identifiable in the field or on 2008 aerial photographs. As such, the habitat was mapped as southern mixed chaparral due to the presence of chamise, which is indicative of southern mixed chaparral; the other dominant shrub species in this area are components of both coastal sage scrub and chaparral habitats. This is not necessarily an indication that the coastal sage scrub habitat converted to chaparral. Rather, it is an indication that the habitat was so impacted by fire that it was difficult to exactly delineate vegetation community boundaries in 2009.

Coastal Sage-Chaparral Scrub Transition (37G00)

Coastal sage-chaparral scrub is a mixture of sclerophyllous chaparral shrubs and drought-deciduous sage scrub species regarded as an ecotone (transition) between two vegetation communities. This singular community contains floristic elements of both communities including coastal sagebrush, coastal buckwheat, laurel sumac, chamise (*Adenostoma fasciculatum*), a hybrid scrub oak (*Quercus* x *acutidens*), and ceanothus (*Ceanothus* spp.), all of which are found on site. Additional species on site include white sage (*Salvia apiana*), chia (*Salvia columbariae*), and chaparral mallow (*Malacothamnus fasciculatus*). Patches of coastal sage-chaparral scrub are distributed within the northwestern and northeastern portions of the property. In some areas the habitat appears to have been type converted to non-native grassland. Coastal sage-chaparral scrub on site totals 5.6 acres.

Southern Mixed Chaparral (37120)

As described by Holland (1986), southern mixed chaparral is a dense, relatively short, shrub-dominated community widely distributed on arid landscapes in coastal southern California. This is the most common vegetation type on site, covering most of the ridges and hilltops in the west of the Preserve and much of the slopes in the northeastern and southern portion of the site. Like all vegetation communities in the Preserve, it is recovering from the Cedar Fire; but unlike the coastal sage scrub much of the chaparral has resisted invasion or type conversion by annual grasses, especially in the central western portion of the Preserve. Other areas show fairly extensive invasion (see comments, above, regarding fire recovery in previously mapped coastal sage scrub habitat). Chamise is the most prevalent species growing as resprouts from burls and seedlings after the fire of 2003; however, other species that coexist with chamise onsite include Ramona ceanothus (*Ceanothus tomentosus*), black sage (*Salvia mellifera*), mission manzanita (*Xylococcus bicolor*), chaparral whitethorn (*Ceanothus leucodermis*), laurel sumac, yellow bush penstemon (*Keckiella antirrhinoides* var. *antirrhinoides*), peak rush-rose (*Helianthemum scoparium*), deerweed, and hybrid scrub oak (*Quercus* x *acutidens*). An herbaceous layer is still present in more open areas which include typical fire-following species. Southern mixed chaparral covers 272.4 acres on the Preserve.

Non-Native Grasslands (42200)

Non-native grassland is a community with a variable cover of introduced grasses that can include species of showy-flowered, non-native and native, annual forbs. Introduction of exotic grasses in California, due to grazing and agricultural practices coupled with severe droughts, and more recently development, has contributed to the spread of non-grasslands in San Diego County. Regardless of species composition, all grasslands throughout the County serve as valuable raptor foraging habitat. Grasslands dominate the flatter central portions of the site, the valley floors in the southeast and north of San Vicente Road, and in swaths in the previously grazed areas in the northwest and southeast of the site.

Dominant species in the grasslands on site include red brome (*Bromus rubens*), ripgut grass (*Bromus diandrus*), oats (*Avena* sp.), and filaree (*Erodium* spp.). As a result, the habitat is generally less than ideal for rodents and thus raptor foraging. Rock outcroppings scattered through the grasslands provide conditions that are highly suitable to colonies of ground squirrels. The relative cover of filaree, annual grasses, and forbs varies throughout the site.

It is evident that one effect of the 2003 Cedar Fire is the expansion of non-native grasses into areas that once supported native habitat, contributing a significant percentage of cover, and in some cases completely replacing native species. For example, several areas of the central grassland valley were previously mapped by Helix Environmental as wildflower field in 2001 due to the prevalence of fascicled tarplant (*Deinandra fasciculata*) (Helix 2004b). However, in 2009, these areas showed little evidence of forb growth and were mapped as part of the non-native grassland area. The expansion of non-native grassland and the loss of native habitats reflect a loss of biodiversity resulting from the 2003 fire. A total of 251.6 acres of non-native grassland occur on site.

Non-Native Grasslands – broadleaf dominated (42210)

This vegetation community is a subset of non-native grassland which is typically dominated (i.e., with greater than 50% vegetative cover) by one or several non-native invasive broadleaf species. Sites supporting this variant of non-native grassland have been disturbed and have a nearby broadleaf weed seed source that results in the establishment of extensive and persistently dominant broadleaf species. Common broadleaf dominants are black mustard (*Brassica nigra*), short-pod mustard (*Hirschfeldia incana*), tocalote (*Centaurea melitensis*), fennel (*Foeniculum vulgare*) as well as other non-native, invasive broadleaf species. This community has become increasingly common in coastal areas. On site, this community occupies the flats north of Klondike Creek (located in northeastern area of Preserve) and is dominated by winter vetch (*Vicia villosa*) which sprawls over non-native grasses mainly

consisting of bromes (*Bromus* spp.) and wild oats (*Avena* spp.). A total of 5.2 acres of non-native grassland-broadleaf dominated vegetation occurs on site.

Freshwater Seep (45400)

Freshwater seeps are made up of mostly perennial herbs, especially sedges (*Carex* spp.), rushes (*Juncus* spp.), and grasses; e.g., deergrass (*Muhlenbergia rigens*), usually forming complete cover, growing throughout the year in areas with mild winters. Seeps are permanently moist or have wet soil and are often associated with grasslands or meadows. They are scattered through most regions of California, most commonly in grassland habitats. Throughout San Diego County they are usually small in extent and typically part of narrow drainages or at springs. The on-site freshwater seeps occur in the western portion of the site. The larger seep is in the lowest elevations of the grassland in the southwest of the Preserve, along the unnamed drainage that enters the large patch of coast live oak. The smaller patch occurs upslope of the small pond in the central-eastern portion of the Preserve. Freshwater seep totals 0.9 acres and was not severely affected by the Cedar Fire.

Southern Coast Live Oak Riparian Forest (61310)

As described by Holland (1986), southern coast live oak riparian forest is a locally dense riparian forest dominated by coast live oak (*Quercus agrifolia* var. *agrifolia*) that occurs on fine-grained alluvial soils on the floodplains along large streams in the canyons and valleys of coastal southern California. Associated species found on site include Engelmann oak (*Quercus engelmannii*), delicate clarkia (*Clarkia delicata*), California fuchsia (*Epilobium canum*), and poison oak (*Toxicodendron diversilobum*). Southern coast live oak riparian forest occurs as a single patch of habitat in the northeastern portion of the project site, north of San Vicente Road. The 2001 mapping showed a second patch of this community upstream from the extant southern coast live oak riparian forest. This patch suffered significant tree loss during the Cedar Fire such that the portion south of San Vicente road is now non-native grassland and to the north of the road it is open coast live oak woodland rather than riparian forest. Southern coast live oak riparian forest now totals 1.4 acres in the Preserve.

Freshwater (13140)

Open water habitat includes lakes, ponds, or other bodies of water that do not support emergent plant cover. Open water is present in the pond near the center of the Preserve created by an earthen berm that was placed across an ephemeral drainage feature. The pond supports some wetland vegetation around its edge and is used by amphibians for reproduction and by snakes, such as the two-striped garter snake, that prey on the

tadpoles. It also provides a water source for larger mammals and birds where little free water exists after winter rains ease. The pond totals 0.3 acre.

Coast Live Oak Woodland (71160)

Coast live oak woodland is a large, closed-canopy woodland community found predominantly on north-facing slopes and shaded ravines dominated by coast live oak. Coast live oak woodland is characterized by poor understory that includes toyon (*Heteromeles arbutifolia*), currant (*Ribes* sp.), poison oak, and laurel sumac (*Malosma laurina*) but generally has low species diversity. Per current County mapping guidelines, individual oaks were not mapped. Within the Preserve, coast live oak woodland occurs scattered along San Vicente Road in the northeast portion of the site. It also occurs along the southern and western edge of the grassland in the southwest of the Preserve. A large patch goes off site in this area. Coast live oaks were reduced in number by the Cedar Fire. Mature oaks were lost in the southwest of the Preserve and in the canyons leading north of the east-west drainage along San Vicente Road. On the north-facing slopes above San Vicente Road, oaks were lost and oak canopy was significantly reduced by the Cedar Fire, thus likely excluding shade–preferring species. Some of those trees are recovering but now are part of an open woodland as opposed to the dense woodland that was present before the Cedar Fire. A total of 38.2 acres of this community occur on the Preserve.

Eucalyptus Woodland (79100)

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

Within the Preserve, eucalyptus woodland occurs as a stand northeast of the in-holding home in the northeastern portion of the Preserve, primarily on a northeast-facing slope. The trees burned in the 2003 fire and lost much of their upper canopy; however, they have recovered enough such that a red-tailed hawk (*Buteo jamaicensis*) was nesting in one of trees. A total of 2.1 acres of eucalyptus woodland occurs within the Preserve boundary.

Disturbed Habitat (11300)

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

Mostly, disturbed habitat within the Preserve was comprised of well worn unvegetated trails represented by the Preserve's official trail system, some unofficial trails, and unpaved roads that service SDG&E power poles; however, disturbed habitat was also observed to be present in the northwest of the Preserve in areas where the adjacent farmer has encroached on the preserve, having disked the land and allowed cattle to graze. The disturbance does not extend further into the preserve because of wire fencing. A total of 13.4 acres of disturbed habitat occurs within the Preserve, including 9.3 acres of authorized and unofficial trails.

Urban/Developed (12000)

Urban/developed areas are found where habitat has been altered by human activities to a state beyond the potential for recovery to a natural state. In general, free standing structures and surrounding areas that are paved, armored, or landscaped are considered developed. On the Preserve, developed land is represented by the paved road that extends into the Preserve from San Vicente Road. A total of 2.8 acres of urban/developed land occurs within the Preserve, including 1.7 acres of paved road/staging area.

3.2 Habitat Monitoring

The following section details the results of habitat monitoring surveys pursuant data analysis methods recommended in the SDSU MSCP habitat monitoring pilot studies (Deutchman et al. 2009a). A list of species encountered at each transect is included in Appendix B.

3.2.1 Species Richness

Species richness was determined by using the point intercept method, as described in Section 2.2. Based on these data, a total of 89 plant species were recorded within the 12 monitoring stations (Figure 7) that were established to represent non-native grassland, coastal sage scrub, southern mixed chaparral, coastal sage scrub/southern mixed chaparral ecotone, and

grassland/coastal sage scrub ecotone throughout the Preserve. Of the total, 60 species (67%) were native, consisting of 1 tree, 13 shrubs, 43 forbs, and 3 grasses; 25 were non-native (28%), consisting of 1 shrub, 14 forbs, and 10 grasses; and 4 could not be identified due to the lateness of the season and dormant condition of the plants (Table 5).

Table 5. Species Richness by Vegetation Community and Functional Group

Habitats (# Plots)[1]	All Species[2]	Native Species				Non-Native Species			
		Trees	Shrubs	Forbs	Grasses	Trees	Shrubs	Forbs	Grasses
Entire Site	89	1	13	44	2	0	1	14	10
CHP (3 plots)	55	0	12	28	2	0	1	6	4
CSS (3 plots)	39	0	7	17	1	0	1	7	6
CSS/CHP (1 plot)	18	0	3	5	0	0	1	3	6
GR (3 plots)	33	1	1	11	0	0	1	9	8
GR/CSS (2 plots)	26	0	1	13	1	0	1	4	6

[1] CHP – chaparral; CSS – coastal sage scrub; GR – grassland.

[2]Four plants were unidentified and could not be classified into a functional group

Southern mixed chaparral showed the highest species richness (55 species), followed by coastal sage scrub (39 species), non-native grassland (33 species), grassland/coastal sage scrub ecotone (26 species), and chaparral/coastal sage scrub ecotone (18 species). The differences in species richness could be due, in part, to the number of plots representing each vegetation community (e.g., more plots result in higher number of species that are detected). Communities with the highest overall species richness generally had a higher percentage of native species relative to non-native species. For example, 76% of the species found in chaparral habitat were native, as compared to 64% in coastal sage scrub, 39% in non-native grassland, 58% in grassland/coastal sage scrub, and 44% in chaparral/coastal sage scrub.

3.2.2 Percent Cover

Percent cover was determined by using the quadrat method, described in Section 2.1.2. The results of this analysis illustrate the high level of habitat degradation within the Preserve, presumably due to a long history of grazing and the effects of the 2003 Cedar Fire, which burned the entire site in October of 2003, after baseline surveys had been completed. Table 6 shows the average percent cover of the most dominant species throughout the Preserve (all plots combined), and within each habitat type. Overall, the most abundant species in the Preserve were invasive non-native grasses and forbs, including long-beak filaree (*Erodium botrys*), two species of brome grasses (*Bromus rubens* and *Bromus diandrus*), and short-pod mustard. Other dominant non-native species included soft chess (*Bromus hordeaceus*), and

tocalote. Dominant native shrubs included deerweed in chaparral and coastal sage scrub communities, chamise in chaparral, and laurel sumac in coastal sage scrub.

Table 6. Average Percent Cover of Species Overall and by Habitat Type

Habitat (# plots)[1]	Dominant species	Average % Cover	Habitat (# plots)[1]	Dominant species	Average % Cover
All Habitats (12)	*Erodium botrys* *Bromus rubens* *Bromus diandrus* *Hirschfeldia incana*	31.0 26.3 21.8 14.3	CSS/CHP (1)	*Erodium botrys* *Bromus diandrus* *Bromus rubens* *Bromus hordeaceus/* *Hirschfeldia incana*	42.0 30.0 26.0 12.0 12.0
CHP (3)	*Bromus rubens* *Lotus scoparius* *Erodium botrys* *Adenostoma fasciculatum*	35.3 30.0 27.3 17.3	GR (3)	*Bromus diandrus* *Erodium botrys* *Hirschfeldia incana* *Bromus hordeaceus*	65.3 27.3 20.0 18.7
CSS (3)	*Bromus rubens* *Centaurea melitensis* *Malosma laurina* *Lotus scoparius*	22.0 18.7 18.7 16.7	GR/CSS (2)	*Erodium botrys* *Bromus rubens* *Hirschfeldia incana* *Bromus hordeaceus*	66.0 39.0 29.0 20.0

When species are combined into functional groups (Table 7), a similar pattern emerges. Non-native forbs and grasses are a dominant component of all habitat types. In addition, native shrubs and forbs make up a substantial portion of the overall cover within coastal sage scrub (47.3% and 24.7% cover respectively), and are even more abundant within chaparral (74.7% and 34.7% cover). Note that absolute cover of individual species was recorded, and therefore, it is possible to have over 100% cover for a given functional group due to the overlapping of plants in the field.

Table 7. Average Percent Cover by Vegetation Community and Functional Group

Habitats (# Plots)[1]	% Cover Native Species[2]				% Cover Non-Native Species[2]			
	Trees	Shrubs	Forbs	Grasses	Trees	Shrubs	Forbs	Grasses
CHP (3 plots)	0	74.7	34.7	4.6	0	0	32	53.3
CSS (3 plots)	0	47.3	24.7	0	0	0	44.7	32
CSS/CHP (1 plot)	0	16	12	0	0	0	54	70
GR (3 plots)	15.3	0.7	10	0	0	0	53.3	109.3
GR/CSS (2 plots)	0	3	10	2	0	0	103	98

[1] CHP – chaparral; CSS – coastal sage scrub; GR – grassland.

[2] Due to overlap of cover of individual species, it is possible to have greater than 100% cover for a given functional group

3.2.3 Dominant Species by Vegetation Community

As discussed above, chaparral has the greatest amount of native species cover and the highest number of species overall. This supports the results of the qualitative visual assessment, which suggests that much of the chaparral habitat, especially in areas far away from the non-native grassland on the valley floor, are recovering from the 2003 Cedar Fire relatively well as compared to coastal sage scrub habitat.

Although coastal sage scrub had the second highest percent cover of native species (72%), non-native forbs and grasses were even more abundant (76.7% cover). The majority of understory plants consisted of non-native grasses, short-pod mustard, and tocalote. The dominant shrubs in this community were deerweed and laurel sumac, both of which tend to become established after fires. Coastal buckwheat and coastal sagebrush, which are indicator species of this habitat type, were in such low abundance that one transect completely missed both of these species and another transect included only 2% cover of sagebrush in a single quadrat (there were no "hits" of either species at the point intercept). Native species observed along the habitat monitoring transects include yellow pincushion (*Chaenactis glabruscula* var. *gabruscula*), coastal wishbone plant (*Mirabilis laevis* var. *crassifolia*), stinging lupine (*Lupinus hirsutissimus*), Parry's larkspur (*Delphinium parryi* ssp. *parryi*), and golden yarrow (*Eriophyllum confertiflorum* var. *confertiflorum*).

A single monitoring station was placed in coastal sage scrub/chaparral transition habitat. As expected, the native species within and around the monitoring station included those generally associated with chaparral, such as scrub oak (*Quercus* x *acutidens*) and sugarbush (*Rhus ovata*); species associated with coastal sage scrub, such as coastal buckwheat and coastal sagebrush; and species that occur in both habitats, such as showy penstemon (*Penstemon spectabilis* var. *spectabilis*), California bee plant (*Scrophularia californica*), coastal wishbone plant, laurel sumac, and deerweed. Quantitative data and qualitative visual observation of this vegetation community suggests that it is not recovering well after the 2003 Cedar Fire. The plant diversity at this monitoring station was low (18 species were recorded); the understory was dominated by non-native forbs (54% cover) and grasses (70% cover); and overall cover of native shrubs and forbs was relatively low (16% and 12% cover, respectively).

A total of 33 species were recorded at the monitoring stations in the grassland community. No native grassland exists on the Preserve; therefore, all of the monitoring stations were placed in the non-native grassland community. This community consisted mostly of non-native forbs and grasses (17 species) and native forbs (11 species), and was dominated by ripgut grass, long-beak filaree, short-pod mustard and soft chess with little else. These species were so abundant that they tended to form a thick mat through which native species would have difficulty becoming established. The few observed native species included four-spot clarkia (*Clarkia purpurea* ssp. *quadrivulnera*), rattlesnake weed (*Daucus pusillus*), and a fairly large

number of Indian milkweed (*Asclepias eriocarpa*). Curly dock (*Rumex crispus*), a non-native species, and western ragweed (*Ambrosia psilostachya*), a native species, were found in wetter areas. In addition, one of the monitoring transects included isolated coast live oak trees.

Much of the scrub plant communities on the Preserve have been type converted to non-native grassland since the 2003 Cedar Fire. Two monitoring stations were placed in grassland/coastal sage scrub ecotone areas to monitor the progression of post-fire habitat recovery. Although this vegetation type is not included in the Oberbauer/Holland classification system (Oberbauer 2005), these areas were mapped to inform management of the Preserve. A total of 26 species were recorded, 42 percent of which were non-native species. These areas had the highest cover of non-natives (103% cover of non-native forbs, and 98% cover of non-native grasses) and only 15% cover of natives (shrubs, forbs, and grasses combined).

3.3 Plant Monitoring

A total of 273 plant species were observed by Helix during pre-Cedar Fire vegetation mapping and general botanical and rare plant surveys conducted in 2001 (Helix 2004b). A total of four sensitive species were observed, including one individual felt-leaved monardella plant, delicate clarkia (*Clarkia delicata*), San Diego sunflower (*Bahiopsis* [*Viguiera*] *laciniata*), and Engelmann oak (*Quercus engelmannii*). Felt-leaved monardella is the only species that is covered by the South County MSCP and therefore targeted for monitoring. This species was not observed in 2009, possibly an effect of the 2003 Cedar Fire. Engelmann oaks could not be confirmed during the 2009 vegetation communities mapping surveys, because most of the oaks were burned by the 2003 Cedar Fire. Small patches of delicate clarkia were observed in 2009. The species occurred in significantly reduced quantities in 2009 compared with 2001. San Diego sunflower had been observed in 2001 associated with a pad graded in the west central portion of the Preserve. The species was likely from a seed mix applied to stabilize the slopes around the pad as this plant did not occur elsewhere on or around the Preserve and is far from the nearest known population. The species was not observed in 2009.

3.4 Wildlife Monitoring

3.4.1 Herpetofauna

Species Observed in 2009

The herpetological sampling on the Preserve resulted in 15 different species recorded (Table 8), including the following four species of special concern: coast horned lizard (or San Diego horned lizard; *Phrynosoma coronatum*), orange-throated whiptail (*Aspidoscelis hyperythrus*), western skink (*Plestiodon skiltonianus*), and two-striped garter snake (*Thamnophis hammondii*). Coast horned lizard and orange-throated whiptail are South County MSCP covered species. Seven snake species were trapped, including the more secretive California

Table 8. Herpetological Pitfall Array Survey Results

Array	Habitat	Species (*Latin*/English)													
		Aspidoscelis hyperythra Orange-Throated Whiptail			*Aspidoscelis tigris* Western Whiptail			*Crotalus viridis* Western Rattlesnake	*Hypsiglena torquata* Nightsnake	*Lampropeltis getula* California Kingsnake	*Masticophis lateralis* Striped Racer		*Phrynosoma coronatum* Coast Horned Lizard		
		May	June	July	May	June	July	May	June	June	May	July	May	June	July
8	CHP				2		1				1		1	1	1
4	NNG								1	1					
1	NNG						1								
2	CHP			2		1	1				2				
3	CSS	2	1	2				1				1			
Subtotal		*2*	*1*	*6*	*2*	*1*	*3*	*1*	*1*	*1*	*3*	*1*	*1*	*1*	*1*
Total		**9**			**6**			**1**	**1**	**1**	**4**		**3**		

Array	Habitat	Species (*Latin*/English)													
		Pituophis catenifer Gopher Snake	*Plestiodon skiltonianus* Western Skink		*Pseudacris regilla* Pacific Treefrog	*Sceloporus occidentalis* Western Fence Lizard			*Sceloporus orcuttii* Granite Spiny Lizard	*Tantilla planiceps* California Black-Headed Snake	*Thamnophis hammondii* Two-Striped Garter Snake		*Uta stansburiana* Side-Blotched Lizard		
		June	May	July	July	May	June	July	May	May	May	June	May	June	July
8	CHP					2	3						1		1
4	NNG		1		1	4	1		1		1	1			1
1	NNG	1													3
2	CHP							1							
3	CSS			2			1			1			2	1	1
Subtotal		*1*	*1*	*2*	*1*	*6*	*4*	*1*	*1*	*1*	*1*	*1*	*3*	*1*	*6*
Total		**1**	**3**		**1**	**11**			**1**	**1**	**2**		**10**		

black-headed snake (*Tantilla planiceps*) and desert night snake (*Hypsiglena torquata*). Detailed survey results are included in Appendix C.

Species Potentially Occurring

Some herpetological species are expected from the Preserve, and were detected during baseline surveys in 2003, but not in 2009. Although not observed in the 2009 pitfall/funnel traps, southwestern speckled rattlesnake (*Crotalus mitchellii*) potentially occurs on the Preserve, hence the name "Rattlesnake Trail"; the species has been observed by County of San Diego Parks Ranger Melinda Taini (pers. comm., 2009). Western and red diamond rattlesnakes were observed during pitfall array surveys in 2003. California alligator lizard (*Elgaria multicarinata*) was observed during baseline surveys but not trapped in 2009. Granite night lizard (*Xantusia henshawi),* California legless lizard (*Anniella pulchra*), and desert banded gecko (*Coleonyx variegates*) are potentially present, but are generally infrequently trapped using pitfall trapping arrays; granite night lizard and California legless lizard were observed in 2003. Expected on the Preserve and observed during the 2003 baseline surveys, but not trapped in 2009, were the following snakes: western coachwhip (*Masticophis flagellum),* rosy boa (*Lichanura trivirgata)*, and red diamond rattlesnake (*Crotalus ruber).*

Regarding amphibians, California (western) toad (*Bufo[Anaxyrus] boreas*) is abundant in nearby localities and was observed during baseline surveys, but not trapped due to lack of rain during trapping sessions. Salamander species are potentially present but not trapped; Pacific slender salamander (*Batrachoseps pacificus*) was trapped during baseline surveys. Lack of a sampling period during a rain event leaves the possibility that this species is present on the Preserve.

3.4.2 Birds

Avian species detected during vegetation communities and wildlife reconnaissance surveys on 23 April 2009 included 34 species, all of which are expected in the area. Notable sightings included a single golden eagle (*Aquila chrysaetos*) in flight over the Preserve (a golden eagle was also detected on a camera during wildlife corridor surveys, see Section 3.5), up to five western bluebirds (*Sialia mexicana*), and a rufous-crowned sparrow (*Aimophila ruficeps*). Golden eagle is a South County MSCP covered species as well as federally protected under both the Migratory Bird Treaty and the Bald and Golden Eagle Protection Act. The Preserve contains open grasslands which are used for foraging by this species. Historically, golden eagles have nested in nearby Kimball Valley and on the Palisades rock formation west of County managed Dos Picos Park. Other large raptors

such as red-tailed hawk (*Buteo jamaicensis*) also use the Preserve; two active nests of this species were found along the northern boundary of the Preserve.

Scattered coast live oaks among the grasslands and coastal sage scrub within the Preserve provide ideal habitat for the western bluebird, another South County MSCP covered species. The rufous-crowned sparrow has lost considerable coastal sage scrub habitat to development and in addition to being a South County MSCP covered species is also a State of California Watch List Species.

3.4.3 Mammals

The South County MSCP covered mule deer was observed during baseline surveys, but presence was not confirmed during 2009 corridor monitoring surveys, possible due to the elimination of vegetative cover by the 2003 Cedar Fire. Mammals observed during the 2009 wildlife corridor study are detailed in the section below.

3.5 Wildlife Corridor Monitoring

The wildlife corridor monitoring results of 2009 are similar to the data collected during the baseline surveys (Helix 2004a and b). The methods in the baseline surveys included attractants to camera and track stations, methods that are more suitable to wildlife inventory data collection than wildlife corridor identification (see Section 2.4). The 2009 survey used unbaited stations to monitor existing movement corridors rather than attracting wildlife to the areas that they would otherwise not use. Therefore, 2009 data cannot be directly compared to 2003 data.

Mammal Species Observed

Eight mammal species were detected through camera and track stations (Appendix D); cameras also detected non-mammal species, such as a golden eagle (Appendix D, photos). All species detected were expected for the Preserve and none are considered South County MSCP covered species or listed by the state or federal government as threatened or endangered. California ground squirrel (*Spermophilus beecheyi*) and rabbits of the genus *Sylvilagus* were the most common species detected.

Brush rabbit (*Sylvilagus bachmani*) was detected by visual encounter at plot 1. This species prefers thick chaparral which can be found on the perimeter of the Preserve. When encountered they usually retreat into the chaparral quickly and are, therefore, often not detected. Pictures from the camera stations are not easily discernible (Appendix D; photos of rabbits are usually secured at night and are, therefore, black and white, which

makes identification difficult; there are subtle differences between this species and the desert cottontail (*Sylvilagus audubonii*)).

Desert cottontail (*Sylvilagus audubonii*) was often seen during wildlife reconnaissance, vegetation communities mapping and wildlife corridor surveys; the species was also captured on camera and positively identified four times. This ubiquitous species is expected to persist throughout the Preserve.

California ground squirrel was observed throughout the Preserve and in very high density. There were five detections on camera and 21 detections at the track stations.

Kangaroo rat (*Dipodomys* sp.) was captured on camera on at least one occasion. Based on data from the Preserve baseline surveys (Helix 2004b) it is assumed that the Preserve is inhabited by Dulzura kangaroo rat (*Dipodomys simulans)* rather than Stephens' kangaroo rat (*Dipodomys stephensi*).

Striped skunk (*Mephitis mephitis)* was only detected during spring surveys by remote cameras. This species prefers more complex habitat and should be more common at the Preserve.

Coyote and gray fox (*Urocyon cinereoargenteus*) were detected by camera and track stations. Both canids are common in the region and the habitat in this area should support significant populations of each species. However, the number of detections was minimal and smaller than expected for this type of open space.

Bobcat was detected during 2 of the 3 surveys via track stations. Availability of water limits their distribution and abundance. Bobcat prefer habitat with structure. Much of the Preserve consists of non-native grassland and does not support habitat for resident populations.

Mammal Species Potentially Occurring

The fact that the following species were detected during the baseline surveys but not in 2009 does not indicate that these species are absent from the Preserve, but is rather a result of a different study focus (wildlife corridor monitoring versus wildlife inventory data collection). Future mammal monitoring studies will give a better indication of the state of the mammal population on the Preserve.

The sensitive San Diego black-tailed jackrabbit (*Lepus californicus bennettii*) is believed to be in decline. Few recent data are known for the Ramona area. This animal lives entirely above ground and is therefore susceptible to wildfire. Raccoon (*Procyon lotor*) is mostly associated with water. The 2009 survey cameras were not run during the winter and all water sources were dry by mid summer and during the 2009 surveys. No tracks were detected in 2009. This species probably travels the main drainages throughout the wetter parts of the year. Only three major populations of ringtail (*Bassariscus astutus*) persist in San Diego. The population nearest the coast is centered around Mt. Woodson and the Barona Indian Reservation. Marginal habitat exists in the southwestern edge of the property where there is a deep drainage and rock outcroppings.

Southern mule deer were not detected during the 2009 surveys through the camera/tracks stations, nor were they detected through visual observation, track, or scat. Mule deer were observed during baseline surveys (Helix 2004b). The South County MSCP covered mule deer is currently known to occur nearby in the Cleveland National Forest, Boulder Oaks Preserve, San Vicente Highlands, lands surrounding the San Vicente Reservoir, and Barona Indian Reservation. The lack of year-round water may influence resident populations of this species.

This page intentionally left blank.

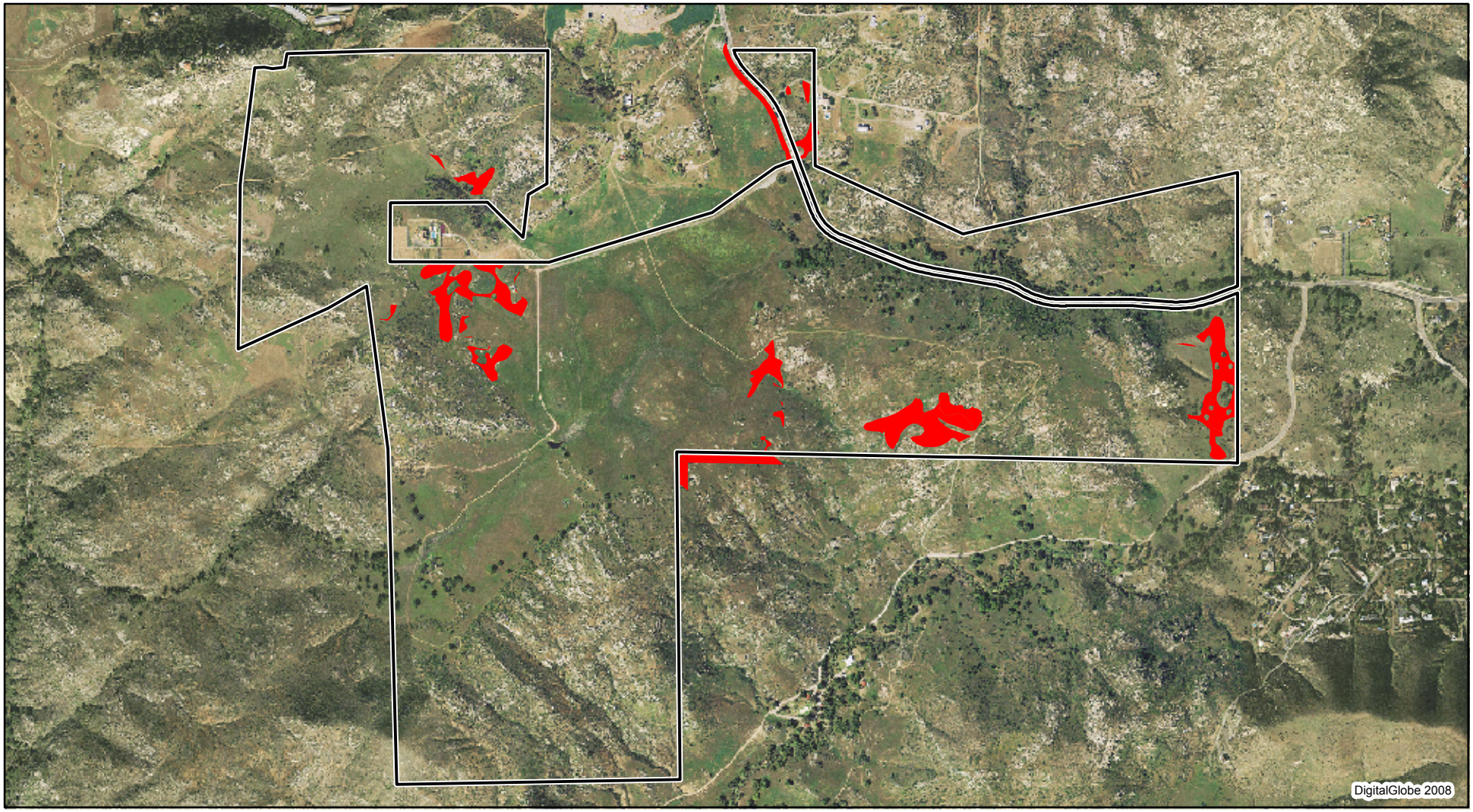
4.0 CONCLUSIONS

Specific evaluation criteria for coverage of species in the County's MSCP Subarea Plan (County 1998) are listed in Table 3-5 of the Subarea Plan and include recommendations for management and monitoring. These management and monitoring goals apply to all County-owned preserves within which South County MSCP covered species occur. More specific goals for the Preserve have been identified in the Preserve ASMD. No MSCP-covered plants occur on the Preserve; vegetation community and habitat and species-specific goals for animal species are addressed in the sections below.

4.1 Vegetation Communities and Habitats

The 2009 vegetation mapping varies from the baseline mapping conducted in 2001; this is due to (a) different mapping approaches and, and (b) significant changes in the habitat due to the 2003 Cedar Fire. For example, (1) the 2001 mapping occurred at a finer scale to provide a detailed baseline, whereas the 2009 mapping was performed to map significant changes to the baseline and (2) the 2001 mapping included mapping of individual oak trees, whereas the 2009 mapping occurred at a broader scale, mapping groups of trees into a single polygon.

The baseline mapping occurred between the years 2001 and 2003, prior to the 2003 Cedar Fire. Despite six winters and growing seasons since the fire, many vegetation communities are still recovering, some are intergrading, and others have been fully converted to different habitat types. In some cases it was very difficult to distinguish the underlying habitat due to the degree of degradation and invasion of non-native species, and the absence of indicator species. This was particularly the case when mapping the relatively abundant ecotones on the Preserve. Ecotones represent habitat types where indicators from different habitats merge, often (but not always) signaling potential conversion from one habitat type to another. Differences in habitat types since the baseline mapping are illustrated in Figure 11. These differences could be due to observer differences between the 2001 versus 2009 surveys, but it is more likely that they represent actual vegetation community changes as a result of fire recovery. For example, non-native grasslands dominate the Preserve. While this is largely due to historic grazing pressures (overgrazing), there is indication that non-native grasslands have expanded into coastal sage scrub vegetation communities post-fire. The non-native grasslands on the Preserve are dominated by exotic species, some of which are invasive. For example, filaree and mustards occur frequently on the Preserve. These invasive species are known to outcompete native species and are difficult and expensive to eradicate.



MSCP Year 2009 Monitoring
Barnett Ranch

Changes in Vegetation Communities between 2001 and 2009

Figure 11

File: T:\projects\DPR_MSCPMonitoring\plots\Barnett\Barnett Figures\BioMonitoringReport\Vegetation Change Detection.mxd

Date: Jan 09, 2010

The Preserve consists of a relatively high number of ecotones due to the historic agricultural land uses on the Preserve and edge effects from surrounding development. Habitat conversions are often a result of fire effects. During the 2009 habitat monitoring and vegetation communities mapping surveys, it was often difficult to distinguish type converted grassland communities (i.e., coastal sage scrub or chaparral that have been converted to non-native grassland) from highly degraded scrub habitat (i.e., non-native grassland/scrub ecotone). However, based on qualitative visual observation and comparisons with the baseline survey data (Helix 2004b), it was generally determined that areas dominated by non-native grasses and forbs with less than 15 percent cover of native chaparral or coastal sage scrub species were classified as type converted scrub habitat (i.e., non-native grassland previously mapped as scrub); areas with 15 to 30 percent cover of native scrub species were mapped as coastal sage scrub or chaparral, but attributed as grassland/scrub ecotone in the GIS database; and areas with greater than 30 percent native scrub species were classified as coastal sage scrub or chaparral, but not otherwise attributed in the database. Continued monitoring of the vegetation monitoring plots over time will indicate vegetation recovery rates and type conversion status on the Preserve.

4.2 Plants

Rare plant surveys for MSCP-covered species were not conducted during the 2009 monitoring surveys because the only MSCP-covered species, felt-leaved monardella, was not observed. Recommendations for future plant monitoring on the Preserve are detailed in Chapter 5 of this report.

4.3 Wildlife

4.3.1 Herpetofauna

The relatively brief herpetological sampling period produced a high diversity in low abundance of reptile species. Abundance of species may be related to the sampling duration, and higher abundance may result from longer sampling. It may also be related to the historic land use of grazing and slow recovery from recent firestorms.

Coast horned lizards have a documented low capture rate in pitfall traps. The three captures in Array #1 represent three different individuals, including a hatchling, demonstrating that this section of undisturbed chaparral is suitable habitat for this species to breed. Array #1 is located on a hillside in dense chaparral and doesn't have the invasion of grasses that are common on the Preserve.

Despite being located in a disturbed area, Array #4 is near a stand of coast live oak, rocky outcrop, and the old cattle stock pond. It had one of the highest capture rates of the five

arrays on the Preserve. Along with two-striped garter snake, the manmade pond was filled with Pacific tree frog (*Pseudacris regilla*) tadpoles in June, which were mostly transformed in July. This species likely serves as the food source for the garter snake.

Orange-throated whiptail and coast horned lizard, both covered species under the South County MSCP and on County List Group 2, occur on the Preserve. While the conservation goal of preserving large tracts of lands with habitat for these species has been fulfilled with the acquisition of the Preserve, additional management measures are necessary to manage onsite habitats specifically from the effects of recent wildfires (specifically the 2003 Cedar Fire). Specific management recommendations are detailed in Chapter 5, and include habitat restoration and Argentine ant control to increase the food sources for the coast horned lizard. Management of edge effects and human intrusion has been identified in Table 3-5 of the MSCP Subarea Plan as a specific management goal for these species. The Preserve does not currently experience significant recreational pressure; however, edge effects occur from unauthorized trail and off-road vehicle use as well as agricultural land use at the private property straddling the Preserve (see Section 5.7).

4.3.2 Birds

The Preserve contains limited diversity of habitats (see Sections 3.2 and 4.1) and, thus, there is a limited amount of habitat for a large diversity of native birds. The 34 species detected can be considered typical for the area in the spring and included migrants as well as nesting species. Post-fire recovery toward a pre-fire condition of coastal sage scrub dominance is questionable at this time, as there is evidence on the Preserve that coastal sage scrub habitat is type converting to non-native grassland at higher rates than other habitats on the Preserve. Therefore, there is a chance that bird diversity will not recover to historic levels in the short term or without active management such as restoration. Management recommendations to fulfill the County's MSCP management obligations as identified in Table 3-5 of the MSCP Subarea Plan include restoration of habitats affected by wildfires (including oak woodlands to restore Cooper's hawk habitat). The western bluebird's coverage conditions have been fulfilled by providing tracts of habitat through the acquisition of the Preserve. Habitat for the rufous-crowned sparrow has been somewhat depleted by the 2003 Cedar Fire. Loss of coastal sage scrub from type conversions may negatively affect this species more than the wildfire and continued monitoring is recommended. Golden eagles do not nest on the Preserve, but continued monitoring is recommended specifically prior to any new trail construction. However, no new trail construction is anticipated at this time.

Of the MSCP-covered birds, typically the rufous-crowned sparrow nests in coastal sage scrub, especially on slopes. Coastal sage scrub has been mostly affected by the 2003 Cedar Fire and type conversion of this habitat to non-native grassland may be occurring on the Preserve. The western bluebird nests in oak cavities where trees are scattered across more open habitat. Cooper's hawk (*Accipiter cooperii*) generally nests in denser oak woodland than is found on the Preserve but may forage for small birds within the Preserve. Most of these habitats were affected by the 2003 Cedar Fire.

Golden eagles continue to use the Preserve for foraging. The species has been incidentally observed during the baseline surveys and was recorded on camera during the 2009 wildlife corridor survey, but according to regional raptor monitoring data (David Bittner, unpubl. data) golden eagles do not nest on the Preserve. The Preserve provides adequate foraging habitat for the golden eagle and other raptors and it appears that the prey base has recovered from the 2003 Cedar Fire. Wildlife corridor surveys in 2009 concluded that the ground squirrel population on the Preserve was high, indicating that raptors and other predators are not maintaining the ground squirrel population at equilibrium. The lack of perches, cover and available water for wildlife may contribute to this problem.

4.3.3 Wildlife Corridors

Based on the results of the 2009 non-baited wildlife corridor study, the Preserve's mammal population is less abundant and diverse than would be expected for this region. The small amount of mammals generally detected during this study lead to the conclusion that the effects of the 2003 Cedar Fire and associated habitat conversion, as well as the large amount of structurally homogeneous non-native grasslands, result in a lack of cover needed by mammals to safely migrate across this site. This is specifically true for such large mammals as mountain lion, deer, coyote, gray fox, and bobcat. None of these mammals was found on the site in 2009.

Mammal diversity and abundance are poor at the Preserve. Carnivore sign (tracks, scat, etc.) were not commonly observed during reconnaissance surveys, although prey species, mainly the California ground squirrel, are plentiful. There appears to be some disruption in predator populations. There may be a variety of possible scenarios that could decrease predator populations, including the lack of year-round water that could discourage mammalian predators from regularly visiting the site; or intentional predator control by adjacent land owners. Deer typically respond well to the stages of fire recovery; however, their recovery may occur at a slower pace during drought years. Deer secure some metabolic water through the vegetation they consume. However, as discussed above, the vegetation on the Preserve during this stage of the California drought may

have less water content. This combined with the lack of year-round water on the Preserve and the effects of the 2003 Cedar Fire on the vegetative cover and canopy on the site, may explain the lack of deer sign detection. Sightings of coyote and mule deer are common on the Cañada de San Vicente property (formerly Monte Vista Ranch), adjacent to the Preserve. This CDFG Ecological Reserve features springs that support these populations throughout the year (Karen Miner, pers. comm. 2009).

Several animal species detected in 2003 were not detected in 2009. This is partly due to the type of detection methods used; while the 2003 methods were designed to capture a general mammal inventory, the 2009 surveys focused on the detection of wildlife movement. The methods for wildlife corridor monitoring disallow attracting species to each plot by using artificial scent lures.

Surveys conducted in 2001 and 2003 for the 2004 Baseline Report (Helix 2004b) were performed prior to the 2003 Cedar Fire, which burned the entire Preserve. The 2009 survey still found evidence of slow fire recovery in the form of vegetation community ecotones (between non-native grassland, coastal sage scrub, and chaparral habitats) and possible type conversions (from coastal sage scrub to non-native grassland). A lack of habitat diversity and floral diversity as a result of the 2003 Cedar Fire could also contribute to the poor mammal diversity and abundance on the Preserve.

The 2009 wildlife corridor surveys do not confirm that the Preserve is part of a corridor. The South County MSCP identified regional San Vicente corridor may extend south of the Preserve along the CDFG managed Cañada de San Vicente property, where deer and coyote are regularly sighted.

Specific management recommendations to meet species coverage and management criteria identified in Table 3-5 of the MSCP Subarea Plan are detailed in Chapter 5, including restoration of cover and distribution of wildlife guzzlers to facilitate wildlife movement and monitoring coordinating with neighboring preserves.

5.0 MANAGEMENT RECOMMENDATIONS

The following sections describe management and monitoring recommendations for the Preserve. Some of these recommendations would require additional funding for pilot studies necessary to collect adaptive management data. Funding may be available through local assistance grants from CDFG and EMP grants from SANDAG, and coordination with academic institutions (incl. master thesis/dissertation research and other academic grants). When applying for funding, care must be taken to properly evaluate sampling design, including adequate sampling size and allocation of sampling effort (McDonald 2002). In the future, sufficient funding should be allocated to hypothesis formulation for each monitoring target, the implementation of statistically robust sampling design (including spatial and temporal variance), data quality and statistical power at the start of each monitoring effort (Legg and Nagy 2005).

5.1 Vegetation Communities and Habitats

As documented in this report, the Preserve has experienced potential long-term effects from the 2003 Cedar Fire, which burned the entire Preserve. While not enough data are available at this time to identify a measurable trend, evidence suggests that habitat type conversions may be occurring in select locations, specifically affecting coastal sage scrub habitats. Non-native habitats (specifically non-native grasslands, but also non-native grass and forb understory in native scrub habitats) dominate the Preserve. As a result, the species diversity and richness of South County MSCP covered species is moderate to low. Over time, continued vegetation monitoring will help determine if, and how well, the habitat is recovering from fire (see long-term management questions below).

Active and adaptive management will be necessary to return the Preserve to pre-fire conditions and avert a trend toward habitat conversions of native scrub to non-native grassland habitats. These measures include active habitat restoration, intensive invasive species control and fire recovery studies. Studies are currently ongoing by SDNHM and USGS to study the effects of the 2003 and 2007 major wildfires in San Diego County on vegetation and wildlife. Continued monitoring of the habitat monitoring locations (specifically in the ecotonal habitats) on the Preserve will show whether there is a measurable trend toward type conversions due to wildfire effects. The County may also chose to collaborate with the fire recovery study effort by offering the Preserve as a study site.

5.1.1 Long-Term Monitoring Approach

In order to design an affective monitoring program for the Preserve to specifically understand post-fire recovery and a possible trend toward habitat conversions, it is recommended that future monitoring studies on the Preserve should be designed to answer the following questions specific to the Preserve:

1. Is post-fire habitat recovering over time?

   Recovery can be defined as:

   - increase in species richness, especially native species
   - increase in cover of native shrubs, and/or
   - decrease in cover of non-native forbs and non-native grasses

2. Does one habitat type (e.g., chaparral) appear to be recovering more quickly than another (e.g., coastal sage scrub)? The above variables can be used to answer this question.
3. Are there areas of permanent type conversion to non-native grassland?

   - Do non-grassland monitoring plots show increasing cover of non-native forbs and grasses and decreasing cover (<15%) of native shrubs and forbs?
   - Does subsequent vegetation mapping show type converted areas reverting back to coastal sage scrub habitat (see Figure 11)?

4. Will non-native grassland/costal sage scrub transitions revert back to coastal sage scrub (e.g., will future monitoring show >15% and an increasing trend of native shrubs and forbs)?
5. Will chaparral/coastal sage scrub transitional habitat revert to chaparral, coastal sage scrub, or stay as ecotone?

More intensive studies as prescribed by the MSCP monitoring requirements will be necessary to fully understand the fire recovery trend on the Preserve. As discussed in Section 1.1.2 in this report, MSCP monitoring methods are currently being revised to include habitat trend monitoring that would be useful to understand fire recovery. We recommend that habitat monitoring be conducted in the transitional areas and ecotones and at the edges of the non-native grasslands in addition to monitoring locations established for MSCP-level Preserve monitoring. DPR should apply for monitoring grants (e.g., through local assistance programs from CDFG and the SANDAG EMP) that would fund more intense annual habitat monitoring for the next five years to answer fire recovery questions. In addition, DPR should also conduct an inventory of coast live and

Engelmann oaks in the Preserve to monitor (1) oak recovery from the 2003 Cedar Fire and (2) for signs of gold spotted oak borer (GSOB). Although the Preserve is not within an area of known GSOB colonization yet, it is within striking range. If the GSOB has been found on the Preserve, DPR should coordinate with SDSU, who is working with the Nature Reserve of Orange County to develop an oak monitoring protocol.

5.1.2 Long-Term Habitat Monitoring Program Design

The following recommendations are specific to informing long-term habitat monitoring design for the Preserve.

- **Timing of the surveys.** In order to take full advantage of the range of spring-blooming forbs, habitat monitoring surveys should occur in April. DPR should continue to coordinate survey methods and schedule with regional habitat monitoring surveys.
- **Reducing quadrat sampling in grasslands**. Plant communities with low overall species diversity, low native species cover, and low plot to plot variability (e.g., non-native grassland habitat) could be monitored with less plots/community or by using only the point-intercept method (Spring Strahm pers. comm. 2009). Quadrats are very time intensive and may not provide much additional information. In the future, it is recommended that (a) the number of grassland plots be reduced, or (b) quadrats not be used to monitor grasslands. However, one or two additional years of monitoring should be conducted before this decision is made.
- **Monitoring frequency.** The timing and amount of rainfall can dramatically affect the lifecycle in plants, especially in annual species. Blooms and vegetative structures are important in species detection and identification. Therefore, monitoring should be conducted often enough to capture this natural background variation. On the other hand, shrub and tree species tend to change little over time, and too-frequent monitoring may not be cost effective. However, if monitoring is too infrequent, it may take decades before enough data are collected to detect trends. It is therefore recommended to conduct annual monitoring for the first three years and long-term monitoring every three years thereafter. If long-term monitoring falls on a drought year, monitoring can be deferred for another year or two. However, no more than five years should pass without monitoring.
- **Sampling design**. Capturing spatial and temporal variance in habitats is important to monitor long-term habitat trends (Larsen et al. 2001; Urquhart and Kincaid 2006). When conducting regular habitat monitoring surveys at the Preserve, develop a sampling design that employs a combination of rotating and fixed panel designs. Fixed panels or sentinel plots (stationary plots) capture temporal variations, whereas rotating panels capture spatial changes. The

sampling design for the Preserve should incorporate both methods, in which rotating plots should be monitored more frequently (e.g., annually) and sentinel plots less often (e.g., every three to five years). Specifically, during the second monitoring year, none of the habitat monitoring plots surveyed in 2009 should be revisited; rather, new plots should be located to capture spatial variability of the Preserve's habitats (including edge effects). However, a statistically robust number of stationary plots from this complete sample should be revisited every five to ten years to capture changes over time. The sampling design for the Preserve should be developed prior to the next habitat monitoring visit. At this time, stations CHP-3 should be moved eastward within the Preserve boundary.

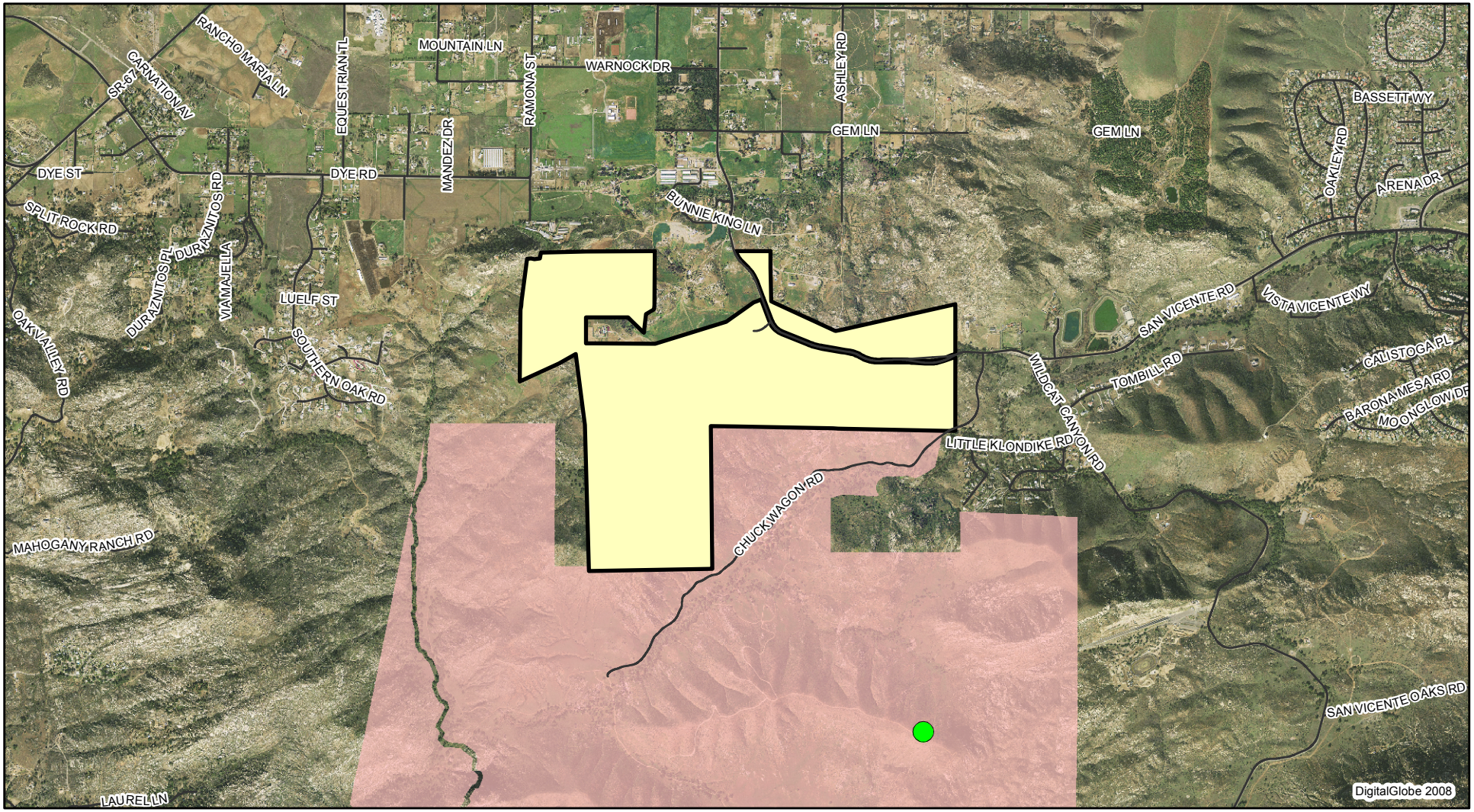
- **Feedback loop.** In coordination with SDSU's refinement of the regional MSCP habitat monitoring protocols, develop feedback loops to inform adaptive management, including criteria that trigger specific management actions and prioritization tools to focus resources on habitat restoration.

5.2 Plants

Only one South County MSCP-covered species (felt-leaved monardella) has been observed on the Preserve. Because only a single individual was observed in 2001, and none were observed in 2009, rare plant monitoring is not necessary at this time, as it would not be an effective use of limited monitoring funds. However, continued habitat monitoring and incidental plant observations should be conducted in the area of the 2001 felt-leaved monardella occurrence.

Delicate clarkia may have been affected by the 2003 Cedar Fire. The plant was the most prevalent sensitive plant on the Preserve in 2001 and has since been raised to CNPS List 1B.2 status. Although the plant is not covered by the South County MSCP, it should be included in future habitat monitoring to monitor the fire recovery trend specifically to delicate clarkia.

Some dwarf plantain (*Plantago erecta*), the host plant for larval development of the federally endangered Quino checkerspot butterfly, was observed in 2009 in the northeastern portion of the Preserve, in the same area where it was observed in 2001. While it did not appear that conditions for the host plant or butterfly had improved, the 2003 Cedar Fire created open habitats suitable to the species. Therefore, a focused reevaluation might be warranted to evaluate other potentially suitable areas on the Preserve. Quino has historically occurred in the area. The most recent sighting occurred on March 26, 2009 adjacent to the Preserve on Rancho La Cañada de San Vicente Ecological Reserve owned and managed by CDFG. (USFWS 2009; Erik LaCoste, pers. comm.). The Quino individual was recorded along a ridgeline in the middle of a slightly overgrown old dirt road adjacent to suitable Quino habitat to the south that exhibited nectar sources and dwarf plantain (Figure 12).



* Source: Erik La Coste, March 2009

MSCP Year 2009 Monitoring
Barnett Ranch

Quino Checkerspot Butterfly Occurrence in the Vicinity of Barnett Ranch

Figure 12

File: T:\projects\DPR_MSCPMonitoring\plots\Barnett\Barnett Figures\BioMonitoringReport\Quino Location.mxd

Date: Mar 24, 2010

5.3 Wildlife

Wildlife surveys conducted in 2009 do not represent the full spectrum of South County MSCP wildlife monitoring surveys. Additional animal surveys should be conducted according to the MSCP risk group classifications (Regan 2006) as funding becomes available. No Risk 1 species are known from the Preserve. However, the Quino checkerspot butterfly has been reported from adjacent preserves; the species is not currently covered by the South County MSCP (adding this species to the South County MSCP is currently being evaluated) and is, therefore, not assigned a risk group factor, but the species is federally listed as endangered and considered a regionally important species for conservation and should, therefore, be included in future monitoring studies. Risk 2 species observed on the Preserve include the golden eagle, which warrants focused monitoring as discussed below in Section 5.3.2. Several Risk 3 species occur or could potentially occur on the Preserve, including orange-throated whiptail, San Diego horned lizard, southern mule deer, and mountain lion. Monitoring recommendations are discussed below in Section 5.6. Although wildlife movement surveys conducted for the Preserve in 2009 did not identify a conclusive movement corridor on the Preserve, it is recommended that the County participate in regional wildlife movement studies, if feasible, to ensure that South County MSCP-covered species are adequately conserved.

5.3.1 Herpetofauna

Herpetological array monitoring should continue on the Preserve for the first five monitoring years (five surveys every 3-5 years), following the latest updated MSCP monitoring protocol (protocols are currently being revised), to collect a thorough baseline of the Preserve's herpetofauna. However, we recommend that additional funding should be made available to facilitate more sampling events per monitoring year. This allows for potentially reflecting more accurately the diversity and richness of the Preserve's herpetofauna as well as capturing species that are more active during the wet season (e.g., amphibians such as the western spadefoot). After data collection from five monitoring years, the data analysis may show that monitoring frequency may be reduced.

To facilitate the conservation of the coast horned lizard on the Preserve, the County should consider implementing an ant study to determine whether exotic Argentine ants negatively affect the native ant population on the Preserve, which is an important food source for the lizard. Coordination with regional ant study efforts is recommended; funding may be available through SANDAG's EMP program.

According to the DPR park staff (Melinda Taini, pers. comm., 2009) the pond on the Preserve dries seasonally, which may explain the lack of aquatic vegetation and bull frogs (*Rana catesbeiana*). Although the earthen embankment of the pond may restrict the creek, it is recommended to not remove the embankment in order to maintain the pond as habitat for the two-striped garter snake and other aquatic species, as well as a water source for wildlife. According to Ms. Taini, the pond often overflows the embankment during flood events and continues filling the ephemeral creek downstream, thereby maintaining the stream ecosystem.

5.3.2 Birds

Exclusion of fire is essential to avoid possible elimination of oak trees and type conversion of remaining native habitat to non-native grassland and to maintain native habitats for MSCP-covered bird species. Non-native grassland onsite is assumed to provide limited small-mammal foraging for larger raptors which frequently fly miles to forage. Thus, retention and restoration of coastal sage scrub must take priority. The eucalyptus woodland along the northern boundary of the Preserve should also be retained as it provides nesting habitat for red-tailed hawk and other raptor species, and potentially for songbirds such as western and Cassin's kingbirds (*Tyrannus verticalis* and *vociferans*).

DPR should coordinate with regional raptor monitoring efforts conduced by Wildlife Research Center (WRI) in Ramona and with other preserve managers in the region (e.g., CDFG) to monitor the regional golden eagle population and to ensure that adequate foraging habitat is provided on the Preserve.

5.4 Non-Native Invasive Species Removal and Control

Much of the Preserve is dominated by non-native and invasive plant species. Specifically non-native grasses have encroached on native scrub habitats (particularly coastal sage scrub) and have out-competed native species. While non-native species occurred prior to the 2003 Cedar Fire, the post-fire spread of invasive species has been documented in the Preserve ASMD (Helix 2004a) and the 2009 monitoring studies. Tables 5-7 show that non-native grass or forb species are very common throughout the Preserve (moderate species richness, and a small number of species showing high average cover), suggesting that these are highly invasive species that should be targeted for management. Targeted species include long-beak filaree, ripgut brome, red brome, soft chess, and short-pod mustard.

While a significant portion of the Preserve was occupied by invasive species in 2009, the monitoring studies were not specific enough to formulate an invasive species eradication program for the Preserve. Due to the alarming abundance of invasive species, we recommend that a focused invasive species survey be conducted on the Preserve to identify the level of invasion, type and location of invasive species, and target species for removal per the priority list published by the California Integrated Pest Council (Cal-IPC 2006). Herbicide testing has been performed since February 2009 on the Preserve as part of a graduate project of the University of California, Riverside (UCR), overseen by University of California (UC) Davis' extension (Carl Bell, pers. comm). The studies will be ongoing until 2011 and results are not yet available. The objective of the study is to determine whether the herbicide Fusillade® kills *Erodium* ssp., and at what rate of application. So far, recommended label applications of Fusillade® seem ineffective. We recommend that a specific invasive species removal program be developed and implemented/tested soon based on measures outlined in the ASMD.

We also recommend that DPR initiate a pilot program to test whether low-intensity managed grazing on the Preserve would contain the spread of invasive species and maintain the non-native grasslands in the center of the Preserve at a state that would provide foraging habitat for raptors and other wildlife. Managed grazing has shown beneficial at controlling the spread of invasive species in California grasslands (Marty 2005). A grazing management plan should be developed for the Preserve including identification of management units with livestock grazing limits per each unit and provisions to move livestock between management units without affecting native scrub habitats. Livestock grazing for the purpose of vegetation management should be closely monitored to avoid overgrazing. Livestock trails should be kept at a minimum by placing supplemental feed and water along established trails. Water troughs for livestock may also fulfill a dual function as wildlife guzzlers. We also recommend that managed grazing of the Preserve replace fire management practices using prescribed burns until fire recovery can be documented for all habitats on the Preserve.

5.5 Restoration Opportunities

As identified in the Preserve ASMD, restoration on the Preserve is considered high priority specifically relative to restoring and maintaining functioning habitats for MSCP-covered species. The ASMD acknowledges that recovery from the 2003 Cedar Fire will occur in several stages. While type conversion was addressed in the ASMD as a possibility, fire recovery of the Preserve was anticipated. However, it is evident from 2009 monitoring surveys that type conversions from scrub habitats to non-native grasslands and areas dominated by invasive plant species may be occurring, and that fire

recovery is not evident in some areas six years post-fire. Further monitoring surveys will more clearly highlight this trend; however, actions to counter these effects are recommended sooner than later to curtail type conversions and weed infestations before they become too costly to control.

We recommend that a focused restoration study be conducted in all ecotones and areas identified for possible type conversion (Figure 11) and along the edges of non-native grasslands. The focus of this study should be to identify where restoration would benefit habitat recovery and how restoration would be accomplished to return habitats to pre-fire scrub habitat conditions (see baseline survey results, Helix 2004b). Historical aerial photographs should also be consulted to make informed decisions about habitat conditions. Replenishment of the seed bank affected by the 2003 Cedar Fire should be accomplished by seeding native species that occur in adequately functioning habitats on the Preserve or in adjacent open space preserves (use modified methods identified for habitat monitoring in this study to collect species inventory and cover/density).

Local seed collection is recommended. In order to establish a more mature age structure in otherwise homogeneous habitats, some container planting may be appropriate. Restoration should be accomplished to enhance habitats that are in decline or show indications of type conversion by removing invasive species and reseeding with the appropriate (coastal sage scrub or chaparral) seed mix containing perennial and annual habitat components. Restoration should also be considered at grassland edges where there is evidence that non-native grasslands are expanding into historic scrub habitats. Restoration should be performed by a qualified restoration ecologist with documented experience in native habitat restoration, per requirements set forth in the ASMD.

Engelmann oaks on the Preserve have also been affected by the 2003 Cedar Fire; however, a quantification of the extent was not the focus of the 2009 monitoring surveys. If funding allows, DPR should conduct a focused oak inventory on the Preserve specifically noting fire recovery and the need for oak restoration. Restoration of oak woodlands requires specialized techniques and should be accomplished by experienced personnel. The oak inventory will also provide an opportunity to monitor for GSOB.

5.6 Wildlife Linkages and Corridors

Limited water sources on the Preserve seem to be affecting the abundance of mammals on the Preserve. The seasonal streams were dry by the time the May 2009 wildlife corridor surveys occurred and the pond on the Preserve also dries during the summer months. DPR should maintain the pond and establish wildlife guzzlers adjacent to the streams to provide water throughout the year. Monitoring and refilling the pond as necessary would help maintain resident populations of mammals as well as other wildlife. Relining the pond may be cost-prohibitive and also may attract bullfrogs from known

locations in the vicinity. Bullfrogs can be detrimental to native aquatic ecosystems and pose an expensive management problem. Therefore, it is recommended that the pond be kept ephemeral to discourage bullfrogs, but to fill the pond as needed (e.g., by water truck) to provide a reliable water source for wildlife.

The California ground squirrel population is abnormally high; local predators do not seem to keep up with the high densities of this species. Populations may be reduced by establishing raptor perch poles in areas of high density. This is an inexpensive method of reducing ground squirrel populations and also provides more foraging opportunities for such species as the golden eagle and other sensitive raptor species.

Kangaroo rats were detected through the motion sensor camera stations. The previous baseline surveys identified these as the Dulzura kangaroo rat (*Dipodomys simulans*). There is sufficient suitable habitat on this Preserve to support Stephens' kangaroo rat (*Dipodomys stephensi*). Expansion of nearby populations may occur over time; therefore, periodic surveys should occur at the Preserve (e.g., burrow reconnaissance and trapping surveys every five years).

Continued monitoring of mammals and wildlife movement through strategically placed camera/track stations should provide sufficient data to better understand wildlife movement at the Preserve. Station #2 should be moved from the Cañada de San Vicente CDFG managed property eastward back to the Preserve for the next wildlife monitoring session. Scent stations in the center of the Preserve should be considered as these would only attract animals already on the Preserve and would provide a valuable method to collect mammal census data on the Preserve, which can be tracked over time to monitor fire recovery and mammalian species diversity.

Wildlife movement monitoring should not be conducted in isolation of surrounding open space preserves. Wildlife movement occurs in a linear fashion and spans an entire region; therefore, measuring the success of wildlife movement cannot be done in isolation of the entire landscape. Regional wildlife movement monitoring is currently being planned through the EMP program. The County should consider collaborating with this effort (through offering that monitoring stations be located on the Preserve or that genetic data be collected from species encountered on the Preserve).

5.7 Additional Management Recommendations

5.7.1 Public Access

Generally, public access on the trail system did not pose a management concern at the time of the 2009 surveys. Trails and the staging area were maintained and in good condition. However, off-road activity was observed during the 2009 wildlife corridor surveys. The activity was visually observed at the northwestern edge of the Preserve and photos were captured of a quad traveling near an SDG&E access road north of San Vicente Road and just east of the large metal power pole. Tracks were also found in tall dry brush in that area presenting a high risk for potential wildfire. Wildlife movement may be deterred by the noise created by off-road activity. Increased enforcement, access control, and improved signage may regulate this activity.

Horsemen were seen riding throughout the Preserve with their dogs off leash. Domestic dogs are known to harass or kill wildlife including the black-tailed jackrabbit. Additional signage should be posted at the Preserve stating the "Dogs on Leash At All Times" County ordinance.

5.7.2 Other

At the time of the 2009 monitoring surveys, erosion, trash, encampments, or fencing do not seem to pose major management problems at the Preserve. Frequent DPR park staff patrols are recommend to curb unauthorized trail use and closely collaborate with the private property in the northwestern area of the Preserve to reduce overall edge effects from agricultural activities, such as the spread of polluted run-off and invasive plant material on the Preserve.

This page intentionally left blank.

6.0 REFERENCES

Cited References

Bowman R. H. 1973. Soil survey of San Diego Area, California. USDA. Soil Conservation Service, Washington, DC.

Cal-IPC. 2006. California Invasive Plant Inventory. California Invasive Plant Council. February 2006. Updates on http://www.cal-ipc.org/ip/.

California Department of Forestry and Fire Protection, Fire Perimeter Data, GIS Database of CDF. 2008.

California Native Plant Society (CNPS). 2009. Inventory of Rare and Endangered Plants (online edition, v7-09d). California Native Plant Society. Sacramento, CA. Accessed on Mon, Nov. 23, 2009 from http://www.cnps.org/inventory.

City of San Diego. 1997. Multiple Species Conservation Program – MSCP Plan. August 1997.

Conservation Biology Institute (CBI). 2001. Status summary of biological monitoring plans for the Multiple Species Conservation Program (MSCP), San Diego, California. Prepared for the City of San Diego and California Department of Fish and Game. 40 pp.

County of San Diego. 1998. Final South-County MSCP Subarea Plan. San Diego, California, March 1998.

County of San Diego. 2009. Draft North County MSCP. Prepared by the County of San Diego. September 2009.

Cutler, T. L. and D. E. Swann. 1999. Using remote photography in wildlife ecology: a review. Wildlife Society Bulletin 27:571–581.

Deutschman, D., and S. Strahm. 2009a. Improving Statistical Sampling and Vegetation Monitoring for the San Diego MSCP. Final Report. Prepared for the San Diego Association of Governments, contract 5001033 (January 2009).

Deutschman, D., and S. Strahm. 2009b. Improving Statistical Sampling and Vegetation Monitoring for the NROC Reserves in Orange County: Year 2. Prepared for the Nature Reserves of Orange County (NROC), Addendum #1 to Research Agreement #07-03 (January 2009).

Deutschman, D., S. Strahm, D. Bailey, J. Franklin, and R. Lewison. 2008. Using Variance Components Analysis to Improve Vegetation Monitoring for the San Diego Multiple Species Conservation Program (MSCP). Final Report for the Local Assistance Grant #P0685105. Prepared for California Department of Fish and Game (February 2008).

Fisher, R.N. and T.J. Case. 2000. Distribution of the herpetofauna of southern California with reference to elevation effects. *In* J.E. Keeley, M. Baer-Keeley, and C.J. Fotheringham, eds. 2nd Interface between ecology and land development in California. U.S. Geological Survey Open File Report 00-62.

Fisher, R.N.; Stokes, Drew; Rochester, Carlton; Brehme, Cheryl; Hathaway, Stacie; and Case, Ted. 2008. Herpetological monitoring using a pitfall trapping design in southern California: U.S. Geological Survey Techniques and Methods 2-A5, 44 p.

Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 12+ vols. New York and Oxford.

Helix Environmental Planning, Inc (Helix). 2004a. Barnett Ranch Open Space Preserve Area Specific Management Directives. Prepared for County of San Diego Department of Parks and Recreation (April 9, 2004).

____ 2004b. Barnett Ranch Open Space Preserve Biological Resources Report. Prepared for County of San Diego Department of Parks and Recreation (January 30, 2004).

Hickman J.C. (ed.) 1993. The Jepson Manual: higher plants in California. Berkeley, CA: University of California Press. 1400 pp.

Holland R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Nongame-Heritage Program, State of California, Department of Fish and Game, Sacramento, 157 pp.

Larsen D. R., Kincaid T. M., Jacobs S. E., Urquhart N. S. 2001. Designs for Evaluating Local and Regional Scale Trends. Bioscience. December 2001. 51, 12, pg. 1069.

Legg C. J., Nagy L. 2005. Why most conservation monitoring is, but need not be, a waste of time. Journal of Environmental Management 78 (2006). pp. 194-199.

Marty J. 2005. Effects of Cattle Grazing on Diversity in Ephemeral Wetlands. Conservation Biology. 2005. 19:5. Pgs. 1626-1632.

McDonald, T. 2002. Review of Environmental Monitoring Methods: Sampling Designs. Environmental Monitoring and Assessments. 85:277-292. 2003. Kluwer Academic Publishers.

McEachern, K., b. Pavlik, J. Rebman, and R. Sutter. 2007. San Diego Multiple Species Conservation Program (MSCP) Rare Plant Monitoring Review and Revision. Western Ecological Research Center, U.S. Geological Survey (USGS). Scientific Investigations Report 2007-5016.

Oberbauer, T. 2005. Terrestrial Vegetation Communities in San Diego County Based on Holland's Descriptions. San Diego Association of Governments, San Diego, California. 6 pp.

Ogden Environmental and Energy Services. 1996. Biological Monitoring Plan for the Multiple Species Conservation Program. Prepared for the City of San Diego, California Department of Fish and Game and U.S. Fish and Wildlife Service. Apr 1996.

Pryde, P.R. 2004. San Diego: An Introduction to the Region. Fourth edition. Dept of Geography, San Diego State University. Sunbelt Publications, Inc./ Pearson Custom Publishing.

Regan H. M., Hierl A. M, Franklin J., Deutschman D. H. 2006. San Diego Multiple Species Conservation Program Covered Species Prioritization. Prepared for the California Department of Fish and Game; Local Assistance Grant #P0450009. Jan 2006.

San Diego Natural History Museum (SDNHM). 2008. Field Guide: Reptiles and Amphibians. Available from: http://www.sdnhm.org/fieldguide/herps/index.html.

San Diego State University (SDSU). In progress. Final vegetation community monitoring recommendations for the San Diego Multiple Species Conservation Program.

Sawyer J.O and T. Keeler-Wolf. 1995. A Manual of California Vegetation. California Native Plant Society.

Unitt, P. 2004. San Diego County bird atlas. San Diego Society of Natural History Proceeding 39.

Urquhart N. S., Kinkaid T. M. 2006. Designs for Detecting Trend from Repeated Surveys of Ecological Resources. Journal of Agricultural, Biological, and Environmental Statistics, Vol. 4. No. 3, Sampling over Time. December 1999; pp. 404-414.

U.S. Department of Agriculture, Natural Resources Conservation Service, Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm. Accessed 30 Sept 2009.

U.S Fish and Wildlife Service (USFWS). 2008. Draft San Diego Multiple Species Conservation Program Animal Monitoring Protocols. Prepared for the City of San Diego Department of City Planning and Community Investment.

____.2009. Quino Checkerspot Regional Monitoring Website: http://www.fws.gov/Carlsbad/TEspecies/Documents/QuinoDocuments/2009MonRef/Quino_2009_Ref_Info.html.

Wilson, D., Cole, F., Nichols, J., Rudran, R., and Foster, M., Ed. (1996). Measuring and Monitoring Biological Diversity: Standard Methods for Mammals. Washington, D.C., Smithsonian Institution Press.

Personal Communications

Carl Bell. University of California Davis Extension. E-mail communication about experimental herbicide treatment. 2009.

David Bittner. Wildlife Research Institute (WRI). San Diego County raptor inventory and hawk watch. Unpublished data, including several newspaper articles.

Erik LaCoste. Wildlife Biologist. E-mail communication about Quino checkerspot butterfly sighting at La Cañada de San Vicente record.

Karen Miner. California Department of Fish and Game. Personal communication with San Diego Natural History Museum survey biologists, 2009.

Spring Strahm, 2009. San Diego State University. Personal Communication about habitat monitoring protocols for grasslands.

Melinda Taini. County Ranger, San Diego County Department of Parks and Recreation. Personal communication with San Diego Natural History Museum survey biologists, 2009.

This page intentionally left blank.

Appendix A: Complete Species Compendium

This page intentionally left blank.

Inventory of Plants and Animals Observed at Barnett Ranch Open Space Preserve during 2009 Surveys

Scientific Name	Common Name	Status[1]	Covered by MSCP	County Species List
PLANTS				
MONOCOTS				
AGAVACEAE (Agave Family)				
Hesperoyucca whipplei	Our Lord's Candle	--/--/--	No	
POACEAE (Grass Family)				
**Avena barbata*	Slender Oat	--/--/--	No	
**Avena fatua*	Wild Oat	--/--/--	No	
**Bromus diandrus*	Ripgut Grass	--/--/--	No	
**Bromus hordeaceus*	Soft Chess	--/--/--	No	
**Bromus rubens*	Red Brome	--/--/--	No	
**Hordeum murinum*	Barley	--/--/--	No	
**Lamarckia aurea*	Goldentop	--/--/--	No	
**Lolium multiflorum*	Italian Rygrass	--/--/--	No	
Melica imperfecta	Coast Range Melic	--/--/--	No	
**Schismus barbatus*	Mediterranean Schismus	--/--/--	No	
Vulpia microstachys	Native Fescue	--/--/--	No	
**Vulpia myuros*	Hairy Rat-Tail Fescue	--/--/--	No	
THEMIDACEAE (Brodiaea Family)				
Dichelostemma capitatum	Wild Hyacinth	--/--/--	No	
DICOTS				
AMARANTHACEAE (Amaranth Family)				
Chenopodium californicum	California Goosefoot	--/--/--	No	
ANACARDIACEAE (Sumac Family)				
Malosma laurina	Laurel Sumac	--/--/--	No	
Rhus ovata	Sugar Bush	--/--/--	No	
APIACEAE (Carrot Family)				
Daucus pusillus	Rattlesnake Weed	--/--/--	No	
APOCYNACEAE (Dogbane Family)				
Asclepias eriocarpa	Indian Milkweed	--/--/--	No	
ASTERACEAE (Sunflower Family)				
Ambrosia psilostachya	Western Ragweed	--/--/--	No	
Artemisia californica	Coastal Sagebrush	--/--/--	No	
Chaenactis glabriuscula var. *glabriuscula*	Yellow Pincushion	--/--/--	No	
**Centauria melitensis*	Tocalote	--/--/--	No	
Conyza sp.	Fleabane	--/--/--	No	
Erigeron foliosus var. *foliosus*	Leafy Daisy	--/--/--	No	
Eriophyllum confertiflorum var. *confertiflorum*	Long-Stem Golden-Yarrow	--/--/--	No	
**Filago gallica*	Narrow-Leaf Filago	--/--/--	No	
Filago sp.	Filago	--/--/--	No	
Hazardia squarrosa	Saw-Toothed Goldenbush	--/--/--	No	
**Hypochaeris glabra*	Smooth Cat's Ear	--/--/--	No	
**Lactuca serriola*	Prickly lettuce	--/--/--	No	

Scientific Name	Common Name	Status[1]	Covered by MSCP	County Species List
Lasthenia sp.	Goldfields	--/--/--	No	
**Sonchus oleraceus*	Common Sow Thistle	--/--/--	No	
Stephanomeria sp.	Wreath-Plant	--/--/--	No	
Stylocline gnaphaloides	Everlasting Nest-Straw	--/--/--	No	
BORAGINACEAE (Borage Family)				
Cryptantha muricata	Prickly Cryptantha	--/--/--	No	
Cryptantha sp.	Cryptantha	--/--/--	No	
BRASSICACEAE (Mustard Family)				
**Hirschfeldia incana*	Short-Pod Mustard	--/--/--	No	
CARYOPHYLLACEAE (Pink Family)				
**Cerastium glomeratum*	Mouse-Ear Chickweed	--/--/--	No	
**Silene gallica*	Common Catchfly	--/--/--	No	
CISTACEAE Rock-Rose Family Family)				
Helianthemum scoparium	Peak Rush-Rose	--/--/--	No	
CONVOLVULACEAE (Morning-Glory Family)				
**Convolvulus arvensis*	Field Bindweed	--/--/--	No	
CRASSULACEAE (Stonecrop Family)				
Crassula connata	Pygmyweed	--/--/--	No	
CUCURBITACEAE (Gourd Family)				
Marah macrocarpus	Wild-Cucumber	--/--/--	No	
ERICACEAE (Heath Family)				
Xylococcus bicolor	Mission Manzanita	--/--/--	No	
EUPHORBIACEAE (Spurge Family)				
Chamaesyce sp.	Spurge	--/--/--	No	
Croton setigerus	Doveweed	--/--/--	No	
FABACEAE (Legume Family)				
Lotus hamatus	Grab Lotus	--/--/--	No	
Lotus purshianus var. *purshianus*	Spanish-Clover	--/--/--	No	
Lotus scoparius	Deerweed	--/--/--	No	
Lupinus bicolor	Miniature Lupine	--/--/--	No	
Lupinus hirsutissimus	Stinging Lupine	--/--/--	No	
Trifolium sp.	Clover	--/--/--	No	
**Vicia villosa*	Winter Vetch	--/--/--	No	
FAGACEAE (Oak Family)				
Quercus agrifolia	Coast Live Oak	--/--/--	No	
Quercus ×acutidens	Scrub Oak	--/--/--	No	
GENTIANACEAE (Gentian Family)				
Centaurium venustum	Canchalagua	--/--/--	No	
GERANIACEAE (Geranium Family)				
**Erodium botrys*	Long-Beak Filaree	--/--/--	No	

Scientific Name	Common Name	Status[1]	Covered by MSCP	County Species List
HYDROPHYLLACEAE (Waterleaf Family)				
Emmenanthe penduliflora var. *penduliflora*	Whispering Bells	--/--/--	No	
Eucrypta chrysanthemifolia	Common Eucrypta	--/--/--	No	
Phacelia sp.	Phacelia	--/--/--	No	
MYRTACEAE (Myrtle Family)				
**Eucalyptus* sp.	Eucalyptus	--/--/--	No	
NYCTAGINACEAE (Four O'clock Family)				
Mirabilis laevis var. *crassifolia*	Coastal Wishbone Plant	--/--/--	No	
OROBANCHACEAE (Broom-Rape Family)				
Cordylanthus rigidus ssp. *setigerus*	Dark-Tip Bird's Beak	--/--/--	No	
PLANTAGINACEAE (Plantain Family)				
Antirrhinum nuttallianum	Nuttall's Snapdragon	--/--/--	No	
Keckiella antirrhinoides	Yellow Bush Penstemon	--/--/--	No	
Plantago erecta	Dot-Seed Plantain	--/--/--	No	
POLEMONACEAE (Phlox Family)				
Gilia sp.	Gilia	--/--/--	No	
Navarretia hamata	Hooked Skunkweed	--/--/--	No	
POLYGONACEAE (Buckwheat Family)				
Eriogonum fasciculatum	Coast Buckwheat	--/--/--	No	
Pterostegia drymarioides	Granny's Hairnet	--/--/--	No	
**Rumex crispus*	Curly Dock	--/--/--	No	
PRIMULACEAE (Primrose Family)				
**Anagallis arvensis*	Scarlet Pimpernel	--/--/--	No	
RHAMNACEAE (Buckthorn Family)				
Rhamnus ilicifolia	Holly-Leaf Redberry	--/--/--	No	
ROSACEAE (Rose Family)				
Adenostoma fasciculatum	Chamise	--/--/--	No	
RUBIACEAE (Madder or Coffee Family)				
Galium angustifolium	Narrow-Leaf Bedstraw	--/--/--	No	
SALICACEAE (Willow Family)				
Salix sp.	Willow	--/--/--	No	
SCROPHULARIACEAE (Broomrape Family)				
Scrophularia californica	California Figwort	--/--/--	No	
SOLANACEAE (Nightshade Family)				
Solanum douglasii	Douglas' Nightshade	--/--/--	No	

Scientific Name	Common Name	Status[1]	Covered by MSCP	County Species List
ANIMALS				
INVERTEBRATES				
INSECTA (Insects)				
HYMENOPTERA (Ants, wasps, bees)				
Formicidae (Ants)				
Pogonomyrmex sp.	Harvester ant	--/--	No	
LEPIDOPTERA (Butterflies)				
Papilionidae (Swallowtails and Birdwings)				
Papilio eurymedon	Pale Swallowtail	--/--	No	
Pieridae (Whites)				
Anthocharis sara	Sara's Orangetip	--/--	No	
VERTEBRATES				
AMPHIBIA (Amphibians)				
ANURA (Frogs and Toads)				
Hylidae (Tree frogs and relatives)				
Pseudacris regilla	Pacific Tree Frog	--/--	No	
REPTILIA (Reptiles)				
SQUAMATA (Lizards and Snakes)				
Phrynosomatidae (Spiny lizards and relatives)				
Phrynosoma coronatum	**Coast Horned Lizard**	**--/SSC**	**Yes**	**Group 2**
Sceloporus occidentalis	Western Fence Lizard	--/--/	No	
Sceloporus orcuttii	Granite Spiny Lizard	--/--	No	
Uta stansburiana	Side-Blotched Lizard	--/--	No	
Scincidae (Skinks)				
Plestiodon skiltonianus interparietalis	**Coronado Skink**	**--/SSC**	**No**	**Group 2**
Teiidae (Whiptails and relatives)				
Aspidoscelis hyperythrus	**Orange-Throated Whiptail**	**--/SSC**	**Yes**	**Group 2**
Aspidoscelis tigris	WesternWhiptail	--/--	No	Group 2
Colubridae (Colubrids)				
Hypsiglena torquata	Night Snake	--/--	No	
Lampropeltis getula	Common Kingsnake	--/--	No	
Masticophis lateralis	California Whipsnake	--/--	No	
Pituophis catenifer	Gopher Snake	--/--	No	
Tantilla planiceps	California Black-Headed Snake	--/--	No	
Thamnophis hammondii	**Two-Striped Garter Snake**	**--/SSC**	**No**	**Group 1**

Scientific Name	Common Name	Status[1]	Covered by MSCP	County Species List
Viperidae (Vipers)				
Crotalus viridis	Western Rattlesnake	--/--	No	
AVES (Birds)				
GALLIFORMES (Gallinaceous Birds)				
Odontophoridae (New World Quail)				
Callipepla californica	California Quail	--/--	No	
CICONIIFORMES (Herons, Storks, New World Vultures, Ibises, and relatives)				
Cathartidae (New World Vultures)				
Cathartes aura	Turkey Vulture	--/--	No	
FALCONIFORMES (Diurnal Birds of Prey)				
Accipitridae (Hawks, Kites, Eagles, and Harriers)				
Aquila chrysaetos	**Golden Eagle**	**BEPA/FP**	**Yes**	**Group 1**
Buteo jamaicensis	Red-tailed Hawk	--/--	No	
Falconidae (Caracaras and Falcons)				
Falco sparverius	American Kestrel	--/--	No	
COLUMBIFORMES (Pigeons and Doves)				
Columbidae (Pigeons and Doves)				
Zenaida macroura	Mourning Dove	--/--	No	
CUCULIFORMES (Cuckoos and relatives)				
Trochilidae (Hummingbirds)				
Calypte anna	Anna's Hummingbird	--/--	No	
Calypte costae	Costa's Hummingbird	--/--	No	
PICIFORMES (Woodpeckers and relatives)				
Picidae (Woodpeckers and Wrynecks)				
Picoides nuttallii	Nuttall's Woodpecker	--/--	No	
PASSERIFORMES (Perching Birds)				
Tyrannidae (Tyrant Flycatchers)				
Myiarchus cinerascens	Ash-throated Flycatcher	--/--	No	
Tyrannus vociferans	Cassin's Kingbird	--/--	No	
Tyrannus verticalis	Western Kingbird	--/--	No	
Corvidae (Jays, Magpies, and Crows)				
Aphelocoma californica	Western Scrub-Jay	--/--	No	
Corvus brachyrhynchos	American Crow	--/--	No	
Corvus corax	Common Raven	--/--	No	
Hirundinidae (Swallows)				
Petrochelidon pyrrhonota	Cliff Swallow	--/--	No	
Aegithalidae (Bushtit)				

Scientific Name	Common Name	Status[1]	Covered by MSCP	County Species List
Psaltriparus minimus	Bushtit	--/--	No	
Troglodytidae (Wrens)				
Catherpes mexicanus	Canyon Wren	--/--	No	
Turdidae (Thrushes)				
Sialia mexicana	**Western Bluebird**	**--/--**	**Yes**	**Group 2**
Mimidae (Mockingbirds and Thrashers)				
Mimus polyglottos	Northern Mockingbird	--/--	No	
Ptilopgonatidae (Silky Flycatchers)				
Phainopepla nitens	Phaenopepla	--/--	No	
Sturnidae (Starlings & Allies)				
**Sturnus vulgaris*	European Starling	--/--	No	
Emberizidae (Emberizids)				
Aimophila ruficeps canescens	**Rufous-crowned Sparrow**	**--/SSC**	**Yes**	**Group 1**
Chondestes grammacus	Lark Sparrow	--/--	No	
Passerina amoena	Lazuli Bunting	--/--	No	
Pipilo maculatus	Spotted Towhee	--/--	No	
Pipilo crissalis	California Towhee	--/--	No	
Sturnella neglecta	Western Meadowlark	--/--	No	
Zonotrichia leucophrys	White-Crowned Sparrow	--/--	No	
Cardinalidae (Tanagers, Cardinals, Grosbeaks & Allies)				
Passerina caerulea	Blue Grosbeak	--/--	No	
Icteridae (Blackbirds, Orioles & Allies)				
Icterus bullockii	Bullock's Oriole	--/--	No	
Fringillidae (Cardueline Finches)				
Carpodacus mexicanus	House Finch	--/--	No	
Spinus psaltria	Lesser Goldfinch	--/--	No	
MAMMALIA (Mammals)				
LAGOMORPHA (Pikas, Rabitts and Hares)				
Leporidae (Rabbits and Hares)				
Sylvilagus audubonii	Desert Cottontail	--/--	No	
Sylvilagus bachmani	Brush Rabbit	--/--	No	
RODENTIA (Squirrels, Rats, Mice, and relatives)				
Geomyidae (Pocket Gophers)				
Thomomys bottae	Botta's Pocket Gopher	--/--	No	
Heteromyidae (Pocket Mice and Kangaroo Rats)				
Dipodomys sp.	Kangaroo Rat	--/--	No	
Spermophilus beecheyi	California Ground Squirrel	--/--	No	
CARNIVORA (Carnivores)				

Scientific Name	Common Name	Status[1]	Covered by MSCP	County Species List
Canidae (Wolves, Foxes, Jackals, Coyotes)				
Canis latrans	Coyote	--/--	No	
Urocyon cinereoargenteus	Gray Fox	--/--	No	
Mustelidae (Weasels)				
Mephitis mephitis	Striped Skunk	--/--	No	
Felidae (Cats)				
Lynx rufus	Bobcat	--/--	No	

[1] Status: Federal: FE –federally endangered, FT – federally threatened, BEPA – Bald Eagle Protection Act
State: SE – state endangered, ST – state threatened, FP – fully protected, SSC – species of special concern.
CNPS Listing: List 1A – 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 (a review list); List 4 – plants of limited distribution (a watch list).

***** Non-native Species

Sensitive species in boldface

This page intentionally left blank.

Appendix B: Plant Species Identified at Vegetation Monitoring Plots

This page intentionally left blank.

Plant Species Identified at Vegetation Monitoring Plots

Plot Name	Species	Method[1]
SD_BR_CHP_1	*Adenostoma fasciculatum*	QD, TX
	Avena barbata	TX
	Avena sp.	QD, TX
	Bromus diandrus	TX
	Bromus hordeaceus	QD, TX
	Bromus rubens	QD, TX
	Camissonia sp.	QD
	Centaurea melitensis	QD, TX
	Centaurium venustum	QD
	Clarkia purpurea	QD, TX
	Cryptantha sp.	QD, TX
	Cynodon dactylon	TX
	Daucus pusillus	QD, TX
	Emmenanthe penduliflora	QD
	Erigeron foliosus	QD
	Eriogonum fasciculatum	QD, TX
	Erodium botrys	QD, TX
	Filago gallica	QD
	Galium angustifolium	QD
	Helianthemum scoparium	QD, TX
	Hesperoyucca whipplei	TX
	Hypochaeris glabra	QD, TX
	Lotus scoparius	QD, TX
	Marah macrocarpus	QD
	Mirabilis laevis	QD
	Navarretia hamata	QD
	Ricinus communis	QD
	Silene gallica	QD
	unknown	QD
	Vulpia myuros	QD, TX
SD_BR_CHP_2	*Adenostoma fasciculatum*	QD, TX
	Artemisia californica	QD
	Bromus hordeaceus	QD, TX
	Bromus rubens	QD, TX
	Camissonia sp.	QD
	Centaurium venustum	QD
	Chaenactis glabriuscula	QD, TX
	Clarkia sp.	QD, TX
	Crassula connata	QD
	Cryptantha sp.	QD, TX
	Daucus pusillus	QD, TX
	Dichelostemma capitatum	QD
	Eriogonum sp.	QD
	Erodium botrys	QD, TX
	Eucrypta chrysanthemifolia	QD
	Filago gallica	QD
	Galium porrigens	QD, TX
	Gilia sp.	QD, TX
	Hazardia squarrosa	TX
	Hirschfeldia incana	QD, TX
	Hypochaeris glabra	QD, TX
	Keckiella antirrhinoides	QD, TX
	Lactuca serriola	QD
	Lasthenia gracilis	QD
	Lotus scoparius	QD, TX
	Lupinus bicolor	QD, TX
	Marah macrocarpus	QD, TX
	Mirabilis laevis	QD
	Paeonia californica	QD
	Phacelia cicutaria	QD
	Quercus xacutidens	QD, TX
	Rhus ovata	QD, TX
SD_BR_CHP_2 *continued*	*Ricinus communis*	QD
	Sonchus oleraceus	TX
	Vulpia myuros	QD, TX
SD_BR_CHP_3	*Adenostoma fasciculatum*	QD, TX
	Artemisia californica	QD, TX
	Bromus hordeaceus	TX
	Bromus rubens	QD, TX
	Ceanothus leucodermis	QD, TX
	Centaurea melitensis	QD
	Chamaesyce sp.	QD
	Cryptantha sp.	QD, TX
	Daucus pusillus	QD, TX
	Delphinium parryi	QD
	Eriophyllum confertiflorum	QD, TX
	Filago gallica	QD, TX
	Galium angustifolium	QD, TX
	Hazardia squarrosa	QD, TX
	Helianthemum scoparium	TX
	Hypochaeris glabra	QD, TX
	Lotus scoparius	QD, TX
	Malosma laurina	QD, TX
	Marah macrocarpus	QD, TX
	Melica imperfecta	QD, TX
	Mirabilis laevis	QD
	Paeonia californica	QD
	Pterostegia drymarioides	TX
	Ricinus communis	QD
	Scirpus californicus	QD, TX
	Solanum douglasii	QD, TX
	Thalictrum fendleri	QD, TX
	Vulpia myuros	QD, TX
	Xylococcus bicolor	QD, TX
SD_BR_CSS_1	*Artemisia californica*	QD
	Avena barbata	QD
	Bromus diandrus	QD, TX
	Bromus hordeaceus	QD, TX
	Bromus rubens	QD, TX
	Centaurea melitensis	QD, TX
	Chaenactis glabriuscula	QD
	Cryptantha sp.	QD
	Daucus pusillus	QD
	Erodium botrys	QD, TX
	Eucrypta chrysanthemifolia	QD
	Filago gallica	TX
	Galium angustifolium	QD
	Gilia sp.	QD
	Hazardia squarrosa	QD
	Hirschfeldia incana	QD, TX
	Lotus scoparius	QD, TX
	Malosma laurina	QD, TX
	Marah macrocarpus	QD, TX
	Mirabilis laevis	QD, TX
	Phacelia sp.	TX
	Ricinus communis	QD
	Scirpus californicus	QD
	Sonchus oleraceus	QD
	Vulpia myuros	QD
SD_BR_CSS_2	*Adenostoma fasciculatum*	QD, TX
	Bromus diandrus	TX
	Bromus hordeaceus	QD
	Bromus rubens	QD, TX
	Camissonia sp.	QD

[1] TX = transects; QD = quadrats

Plant Species Identified at Vegetation Monitoring Plots

Plot Name	Species	Method[1]
SD_BR_CSS_2	*Centaurea melitensis*	QD, TX
continued	*Cercocarpus minutiflorus*	QD
	Chaenactis glabriuscula	QD, TX
	Crassula connata	QD
	Cryptantha sp.	QD, TX
	Eriogonum fasciculatum	TX
	Erodium sp.	QD, TX
	Gilia sp.	QD
	Hirschfeldia incana	QD, TX
	Lamarchia aurea	QD
	Lotus scoparius	QD, TX
	Lupinus hirsutissimus	QD
	Malosma laurina	QD, TX
	Marah macrocarpus	QD
	Mirabilis laevis	QD
	Phacelia cicutaria	QD
	Pterostegia drymarioides	QD, TX
	Ricinus communis	QD
	Scirpus californicus	QD
	Stephanomeria sp.	QD
	Vulpia myuros	QD
SD_BR_CSS_3	*Artemisia californica*	QD, TX
	Bromus diandrus	QD, TX
	Bromus hordeaceus	QD, TX
	Bromus rubens	QD, TX
	Centaurea melitensis	QD
	Cerastium glomeratum	QD
	Chaenactis glabriuscula	QD, TX
	Chamaesyce polycarpa	QD
	Crassula connata	QD, TX
	Cryptantha sp.	QD, TX
	Daucus pusillus	QD
	Deinandra fasciculata	QD
	Eriogonum fasciculatum	QD, TX
	Erodium botrys	QD, TX
	Filago gallica	QD, TX
	Gilia sp.	QD
	Hirschfeldia incana	QD, TX
	Hypochaeris glabra	QD, TX
	Lotus scoparius	QD, TX
	Malosma laurina	QD, TX
	Mirabilis laevis	QD, TX
	Ricinus communis	QD
	Vulpia myuros	QD, TX
SD_BR_CSSCHP_1	*Antirrhinum nuttallianum*	QD
	Bromus diandrus	QD, TX
	Bromus hordeaceus	QD, TX
	Bromus rubens	QD, TX
	Carduus pycnocephalus	QD
	Chenopodium californicum	QD, TX
	Cryptantha sp.	QD, TX
	Daucus pusillus	QD
	Erodium botrys	QD, TX
	Hirschfeldia incana	QD, TX
	Hordeum murinum	QD, TX
	Lamarchia aurea	QD
	Lotus scoparius	QD, TX
	Malosma laurina	QD, TX
	Marah macrocarpus	TX
	Mirabilis laevis	QD
	Quercus xacutidens	QD, TX

Plot Name	Species	Method[1]
SD_BR_CSSCHP_1	*Ricinus communis*	QD
continued	*Vulpia myuros*	QD
SD_BR_GR_1	*Ambrosia psilostachya*	QD, TX
	Avena barbata	TX
	Bromus diandrus	QD, TX
	Bromus hordeaceus	QD, TX
	Bromus rubens	TX
	Cerastium glomeratum	TX
	Convolvulus arvensis	QD
	Erodium botrys	QD, TX
	Hordeum murinum	QD, TX
	Lactuca serriola	QD, TX
	Lolium multiflorum	QD, TX
	Lotus persianus	QD, TX
	Mirabilis laevis	QD
	Ricinus communis	QD
	Rumex crispus	QD, TX
	unknown and uncollected	QD
SD_BR_GR_2	*Ambrosia psilostachya*	QD, TX
	Anagalis arvensis	QD
	Asclepias eriocarpa	QD
	Avena barbata	QD, TX
	Bromus diandrus	QD, TX
	Bromus hordeaceus	QD, TX
	Bromus rubens	QD, TX
	Calyptridium monandrum	QD
	Cerastium glomeratum	QD
	Clarkia purpurea	TX
	Croton setigerus	QD
	Erodium botrys	QD
	Erodium botrys	QD, TX
	Hirschfeldia incana	QD, TX
	Lactuca serriola	QD
	Lotus persianus	QD, TX
	Lupinus bicolor	QD
	Mirabilis laevis	QD
	Ricinus communis	QD
	Silene gallica	QD, TX
	Trifolium sp.	QD, TX
	Vicia sp.	QD, TX
	Vulpia myuros	QD, TX
SD_BR_GR_3	*Bromus diandrus*	QD, TX
	Bromus hordeaceus	QD, TX
	Bromus rubens	QD, TX
	Camissonia sp.	QD, TX
	Clarkia purpurea	QD
	Croton setigerus	QD
	Daucus pusillus	QD, TX
	Eriogonum fasciculatum	QD, TX
	Erodium botrys	QD, TX
	Filago gallica	QD
	Hirschfeldia incana	QD, TX
	Mirabilis laevis	QD
	Quercus agrifolia	QD, TX
	Ricinus communis	QD
	Schismus barbatus	QD
	Vulpia myuros	TX
SD_BR_GRCSS_1	*Avena barbata*	TX
	Bromus diandrus	QD, TX
	Bromus hordeaceus	QD, TX
	Bromus rubens	QD, TX

[1] TX = transects; QD = quadrats

Plant Species Identified at Vegetation Monitoring Plots

Plot Name	Species	Method[1]
SD_BR_GRCSS_1	*Clarkia purpurea*	QD
continued	*Croton setigerus*	QD, TX
	Erodium botrys	QD, TX
	Filago gallica	QD
	Hirschfeldia incana	QD, TX
	Lotus hamatus	QD
	Lotus persianus	QD
	Lotus scoparius	TX
	Mirabilis laevis	QD
	Ricinus communis	QD
	Vulpia myuros	QD, TX
SD_BR_GRCSS_2	*Artemisia californica*	QD, TX
	Avena barbata	QD, TX
	Bromus diandrus	QD, TX
	Bromus hordeaceus	QD, TX
	Bromus rubens	QD, TX
	Camissonia sp.	TX
	Centaurea melitensis	QD, TX
	Chaenactis artemisiifolia	QD
	Chamaesyce polycarpa	QD
	Crassula connata	QD
	Cryptantha sp.	QD
	Dichelostemma capitatum	QD
	Ehrharta calycina	TX
	Erodium botrys	QD, TX
	Hirschfeldia incana	QD, TX
	Hypochaeris glabra	QD
	Lamarchia aurea	QD
	Lotus scoparius	TX
	Lupinus hirsutissimus	QD, TX
	Mirabilis laevis	QD, TX
	Ricinus communis	QD
	Stephanomeria sp.	TX
	Stylocline gnaphalioides	QD
	Vulpia microstachys	QD, TX
	Vulpia myuros	TX

[1] TX = transects; QD = quadrats

This page intentionally left blank.

Appendix C: Pitfall Array Data

This page intentionally left blank.

Collector	Date	Time	Array	Bucket	Type	Species	CommonName	ScientificName	Clip	Age	WtG	MinWt	MaxWt	LnMm	MinLn	MaxLn	Sex	Recap
BH	7/15/2009	7:49 AM	2	1B	Lizard	ASHY	Orange-Throated Whiptail	Aspidoscelis hyperythrus	3	A	6.0			62			M	N
MRO	5/8/2009	8:03 AM	3	ST-2	Lizard	ASHY	Orange-Throated Lizard	Aspidoscelis hyperythrus	0	A	0.0	0.1	12.0	0	22	77	F	N
BH	6/9/2009	8:04 AM	3	ST-3	Lizard	ASHY	Orange-Throated Whiptail	Aspidoscelis hyperythrus	51	A	5			58			M	N
BH, MT	7/16/2009	8:35 AM	2	1B	Lizard	ASHY	Orange-Throated Whiptail	Aspidoscelis hyperythrus	4	A	5.0			58			F	N
BH	7/17/2009	8:36 AM	3	2B	Lizard	ASHY	Orange-Throated Whiptail	Aspidoscelis hyperythrus	13	A	5.5			62			F	N
BH, MT	7/16/2009	8:44 AM	3	ST-3	Lizard	ASHY	Orange-Throated Whiptail	Aspidoscelis hyperythrus	5	A	6.5			60			M	N
MRO	5/7/2009		3		Lizard	ASHY	Orange-Throated Whiptail	Aspidoscelis hyperythrus	1									N
BH	7/14/2009	6:19 AM	2	1B	Lizard	ASTI	Western Whiptail	Aspidoscelis tigris	10	A	36.0			110			F	N
BH, MT	7/16/2009	7:00 AM	8	3B	Lizard	ASTI	Western Whiptail	Aspidoscelis tigris	11	A	17.5			84			M	N
MRO	5/5/2009	7:15 AM	8	2B	Lizard	ASTI	Western Whiptail	Aspidoscelis tigris	1	A	31.0	0.5	50.0	95	20	120	U	N
MRO	5/5/2009	7:25 AM	8	ST-3	Lizard	ASTI	Western Whiptail	Aspidoscelis tigris	2	A	14.0	0.5	50.0	69	20	120	U	N
BH	7/15/2009	7:38 AM	1	ST-1	Lizard	ASTI	Western Whiptail	Aspidoscelis tigris	3	A	28.0			95			M	N
BH	6/12/2009	8:20 AM	2	1B	Lizard	ASTI	Western Whiptail	Aspidoscelis tigris	10	A	31.5			99			M	N
MRO	5/7/2009				Lizard	ASTI	Western Whiptail	Aspidoscelis tigris	3									N
MRO	5/7/2009				Lizard	ASTI	Western Whiptail	Aspidoscelis tigris	4									N
MRO	5/7/2009				Lizard	ASTI	Western Whiptail	Aspidoscelis tigris	5									N
BH	6/10/2009	7:08 AM	2	ST-3	Mouse/Rat	CHFA	San Diego Pocket Mouse	Chaetodipus fallax		A							M	
BH	6/10/2009	7:18 AM	3	ST-1	Mouse/Rat	CHFA	San Diego Pocket Mouse	Chaetodipus fallax		A							M	
BH, MT	7/16/2009	8:30 AM	2	ST-3	Mouse/Rat	CHFA	San Diego Pocket Mouse	Chaetodipus fallax		SA							U	
BH	7/17/2009	8:45 AM	3	ST-1	Mouse/Rat	CHFA	San Diego Pocket Mouse	Chaetodipus fallax		A							M	
MRO	5/5/2009	9:19 AM	3	ST-1	Snake	CRVI	Western Rattlesnake	Crotalus viridis	0	A	0.0			0			U	N
BH	6/10/2009	6:40 AM	4	ST-3	Snake	HYTO	Desert Nightsnake	Hypsiglena torquata	10	A	11			291			F	N
BH	6/10/2009	6:30 AM	4	ST-3	Snake	LAGE	California Kingsnake	Lampropeltis getula	10	SA	24			535			F	N
MRO	5/5/2009	7:45 AM	8	ST-2	Snake	MALA	California Whipsnake	Masticophis lateralis	330	A	60.0	3.0	350.0	610	130	1250	U	N
MRO	5/6/2009	7:54 AM	2	ST-2	Snake	MALA	California Whipsnake	Masticophis lateralis	340	A	140.0	3.0	350.0	940	130	1250	U	N
BH	7/17/2009	8:45 AM	3	ST-1	Snake	MALA	Striped Racer	Masticophis lateralis	3	SA	145.0			320			U	N
MRO	5/5/2009	9:01 AM	2	ST-1	Snake	MALA	California Whipsnake	Masticophis lateralis	440	A	110.0	3.0	350.0	800	130	1250	U	N
MRO	5/7/2009		2	ST-2	Mouse/Rat	PEER	Cactus Mouse	Peromyscus eremicus	0	A							U	U
BH	6/9/2009	7:01 AM	4	ST-3	Mouse/Rat	PEMA	Deer Mouse	Peromyscus maniculatus		A							M	
MRO	5/5/2009	7:42 AM	8	C	Mouse/Rat	PEMA	Deer Mouse	Peromyscus maniculatus	0	A		0.0	4000.0				U	U
BH	6/9/2009	6:24 AM	8	C	Lizard	PHCO	Coast Horned Lizard	Phrynosoma coronatum	1	A	33			76			M	N
BH	7/17/2009	6:30 AM	8	C	Lizard	PHCO	Coast Horned Lizard	Phrynosoma coronatum	2	J	1			26			U	N
MRO	5/7/2009		8		Lizard	PHCO	Coast Horned Lizard	Phrynosoma coronatum	1	J								N
BH	6/11/2009	5:20 AM	1	ST-2	Snake	PICA	Gopher Snake	Pituophis catenifer	10	A	125			790			M	N
BH	7/14/2009	6:35 AM	3	2B	Lizard	PLSK	Western Skink	Plestiodon skiltonianus	2	SA	4.5			55			U	N
MRO	5/5/2009	8:05 AM	4	C	Lizard	PLSK	Western Skink	Plestiodon skiltonianus	1	A	4.0	0.1	25.0	49	5	80	U	N
BH, MT	7/16/2009	8:40 AM	3	3B	Lizard	PLSK	Western Skink	Plestiodon skiltonianus	1	A	5.0			61			U	N
BH	7/14/2009	5:37 AM	4	2B	Frog	PSRE	Pacific Treefrog	Pseudacris regilla	1	A	0.5			19			U	N
BH	6/10/2009	6:02 AM	8	1B	Lizard	SCOC	Western Fence Lizard	Sceloporus occidentalis	52	A	12			65			M	N
BH	6/10/2009	6:12 AM	8	3B	Lizard	SCOC	Western Fence Lizard	Sceloporus occidentalis	53	A	10			64			F	N
MRO	5/8/2009	7:01 AM	4	ST-2	Lizard	SCOC	Western Fence Lizard	Sceloporus occidentalis	4	A	12.0	0.1	25.0	60	10	90	M	N
BH	6/12/2009	7:07 AM	8	1B	Lizard	SCOC	Western Fence Lizard	Sceloporus occidentalis	4	A	13			69			F	N
BH	6/9/2009	7:08 AM	4	ST-2	Lizard	SCOC	Western Fence Lizard	Sceloporus occidentalis	50	A	10.5			65			M	N

Collector	Date	Time	Array	Bucket	Type	Species	CommonName	ScientificName	Clip	Age	WtG	MinWt	MaxWt	LnMm	MinLn	MaxLn	Sex	Recap
MRO	5/6/2009	7:13 AM	8	ST-1	Lizard	SCOC	Western Fence Lizard	Sceloporus occidentalis	0	A	0.0	0.1	25.0	0	10	90	U	U
MRO	5/6/2009	7:26 AM	4	C	Lizard	SCOC	Western Fence Lizard	Sceloporus occidentalis	3	A	9.0	0.1	25.0	58	10	90	M	N
MRO	5/5/2009	7:28 AM	8	3B	Lizard	SCOC	Western Fence Lizard	Sceloporus occidentalis	1	A	6.0	0.1	25.0	47	10	90	F	N
BH	6/10/2009	7:29 AM	3	ST-1	Lizard	SCOC	Western Fence Lizard	Sceloporus occidentalis	21	A	7			64			F	N
MRO	5/5/2009	8:01 AM	4	2B	Lizard	SCOC	Western Fence Lizard	Sceloporus occidentalis	2	A	9.0	0.1	25.0	59	10	90	M	N
BH	7/17/2009	8:11 AM	2	C	Lizard	SCOC	Western Fence Lizard	Sceloporus occidentalis	10	A	8.5			62			F	N
MRO	5/5/2009	8:32 AM	4	ST-2	Lizard	SCOR	Granite Spiny Lizard	Sceloporus orcutti	1	A	47.0	0.1	56.0	78	25	120	F	N
MRO	5/7/2009	8:11 AM	3	3B	Snake	TAPL	California Black-Headed Snake	Tantilla planiceps	0	A	0.0	0.5	8.5	0	100	320	U	N
BH	6/12/2009	7:42 AM	4	ST-1	Snake	THHA	Two-Striped Garter Snake	Thamnophis hammondii	10	A	42			460			M	N
MRO	5/5/2009	8:15 AM	4	ST-2	Snake	THHA	Two-Striped Garter Snake	Thamnophis hammondii	330	A	25.0	3.0	300.0	350	140	650	U	N
BH	7/17/2009	6:05 AM	8	C	Other Mammal	THBO	Botta's Pocket Gopher	Thomomys bottae		A							U	
MRO	5/6/2009	7:09 AM	8	C	Other Mammal	THBO	Botta's Pocket Gopher	Thomomys bottae	0	A		0.0	4000.0				U	U
MRO	5/6/2009	7:09 AM	8	C	Other Mammal	THBO	Botta's Pocket Gopher	Thomomys bottae	0	A		0.0	4000.0				U	U
BH	7/14/2009	6:34 AM	3	3B	Lizard	UTST	Side-Blotched Lizard	Uta stansburiana	2	A	4.0			46			F	N
MRO	5/8/2009	6:46 AM	8	C	Lizard	UTST	Side-Blotched Lizard	Uta stansburiana	20	A	4.3	0.1	10.0	48	10	65	M	N
BH, MT	7/16/2009	7:10 AM	8	3B	Lizard	UTST	Side-Blotched Lizard	Uta stansburiana	3	A	4.5			50			M	N
BH, MT	7/16/2009	7:30 AM	4	2B	Lizard	UTST	Side-Blotched Lizard	Uta stansburiana	4	SA	1.5			30			U	N
BH	7/17/2009	7:35 AM	1	3B	Lizard	UTST	Side-Blotched Lizard	Uta stansburiana	11	SA	1.5			32			U	N
MRO	5/8/2009	7:49 AM	3	C	Lizard	UTST	Side-Blotched Lizard	Uta stansburiana	1	A	3.0	0.1	10.0	42	10	65	F	Y
BH, MT	7/16/2009	7:55 AM	1	1B	Lizard	UTST	Side-Blotched Lizard	Uta stansburiana	5	SA	1.0			30			U	N
BH, MT	7/16/2009	8:10 AM	1	ST-1	Lizard	UTST	Side-Blotched Lizard	Uta stansburiana	10	A	4.5			50			M	N
BH	6/12/2009	8:48 AM	3	ST-2	Lizard	UTST	Side-Blotched Lizard	Uta stansburiana	10	A	3.75			50			M	N
MRO	5/7/2009		3		Lizard	UTST	Side-Blotched Lizard	Uta stansburiana	1									N

BH = Bradford Hollingsworth
MT = Melinda Taini
MS = Melissa Stepek
DM = Dana McLaughlin
MRO = Mark Roll

Appendix D: Wildlife Corridor Survey Data

This page intentionally left blank

Barnett Ranch Corridor Survey Results

Survey dates	Location	Plot #	Camera #	Species detected-camera station	Species detected-track station A	Species detected-track station B
May 28-31	turnaround	1	10	Lyru, Spbe, Syau	Spbe, Sy sp.	Sy sp.
May 28-31	oaks	2	4	none detected	Sy sp., Cala	Sy sp.
May 28-31	bees	3	5	Syau, Meme	Spbe	Spbe
May 28-31	gate	4	11	none detected	Spbe	Spbe
May 28-31	sdge	5	1	Cala, Spbe	Spbe, Sy sp., Cala	Spbe, Sy sp., Cala
June 15-19	turnaround	1	5	Syau, Spbe, Di sp..	Sy sp., Urci, Spbe	Sy sp., Spbe
June 15-19	oaks	2	11	Syau	Cala, Urci	Cala
June 15-19	bees	3	1	none detected	Spbe	Spbe
June 15-19	gate	4	10	none detected	Spbe	Spbe
June 15-19	sdge	5	4	none detected	Cala, Urci	Cala, Urci, Spbe
Sept 8-12	turnaround	1	4	Sy sp,	Spbe, Sysp.	Sy sp.
Sept 8-12	oaks	2	1	Cala, Aqch, Spbe, Urci	Cala, Urci	Cala
Sept 8-12	bees	3	10	Syau	Sy sp., Spbe	Spbe, Cala
Sept 8-12	gate	4	11	none detected	Spbe	Spbe, Cala
Sept 8-12	sdge	5	5	Cala, Lyru, Spbe	Cala, Lyru, Spbe	Cala, Lyru, Spbe

Lyru- *Lynx rufus*
Spbe- *Spermophilus beecheyi*
Cala- *Canis latrans*
Sy sp.- *Sylvilagus* sp. = *audubonii* or *bachmani*
Syau- *Sylvilagus adubonii*
Syba- *Sylvilagus bachmani*
Di sp.- *Dipodomys* sp.
Urci- *Urocyon cinereoargenteus*
Aqch- *Aquila chrysaetos*

Wildlife Corridor Monitoring Remote Camera Photos