

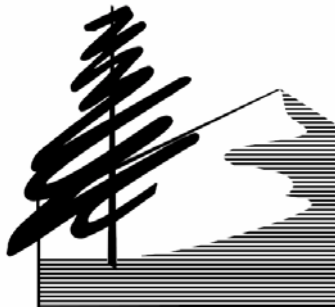
**Habitat Management Plan  
for the  
Kelly Ranch Habitat Conservation Area  
(2008 -2013)  
(S024)**

**A Dedicated Natural Open Space System Set Aside as part  
of the Kelly Ranch Development**

*Prepared for:*

City of Carlsbad  
U.S. Fish and Wildlife Service  
California Department of Fish and Game

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## **I. INTRODUCTION**

### **A. Purpose of Inclusion of the Preserve in Carlsbad Habitat Management Plan**

The City of Carlsbad has an obligation to protect and enhance wildlife values under their sub-area Habitat Management Plan (HMP) and implementing agreement (City of Carlsbad, 2004). As part of the development permits of the Kelly Ranch Development in Carlsbad, California, Kelly Land Company was required to secure and endow a natural land management organization to manage the site's natural open space in perpetuity. Kelly Land Company received development permits from various governmental organizations, including the California Coastal Commission (CCC, 2001), City of Carlsbad (Planning Commission, 2001), and U.S. Fish and Wildlife Service (USFWS, 2000), which stipulate conservation requirements and any future alterations to the natural open space areas.

The United States Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), and other organizations, maintain that merely setting lands aside and preventing development is not sufficient to preserve and protect biological integrity. Identifying the critical ecological processes and elements that need protection, then planning, budgeting and funding for sustaining these processes and elements in perpetuity, is the essence of long-term land protection. The Center for Natural Lands Management (CNLM or Center) accepted management responsibility for the Kelly Ranch Habitat Conservation Area (HCA or Preserve) through a Management and Funding Agreement dated November 15, 2001. To further protect the conservation values on the Preserve, and to provide for third-party beneficiaries, a conservation easement (CE) in favor of CNLM was also conveyed. On February 1, 2002, both roles—that of Preserve management and CE compliance monitoring—were funded through an endowment.

### **B. Kelly Ranch Habitat Conservation Area Background**

The Preserve was set aside to protect some of the last remaining stands of habitat left in Carlsbad, and to create additional open space to connect adjacent dedicated open space in the vicinity, such as Macario Canyon to the south and Batiquitos Lagoon to the west.

The limits of the HCA (Figures 1 and 2) have been approved by the USFWS and the CDFG with the primary goal of protecting habitat of the federally listed coastal California gnatcatcher (*Poliophtila californica californica*), as well as other sensitive plant and wildlife species, and sensitive vegetation communities.

### **C. Purpose of this Management Plan**

This plan guides management of habitats, species, and programs of the Kelly Ranch HCA to protect the conservation values described in the City of Carlsbad's sub-area HMP and implementing agreement (City of Carlsbad, 2004). This document is to provide a comprehensive, cost-effective management plan that states the information, management, and funding requirements necessary to ensure an ecologically sustainable conservation area, to guide public uses, operations and maintenance of, and methods to implement

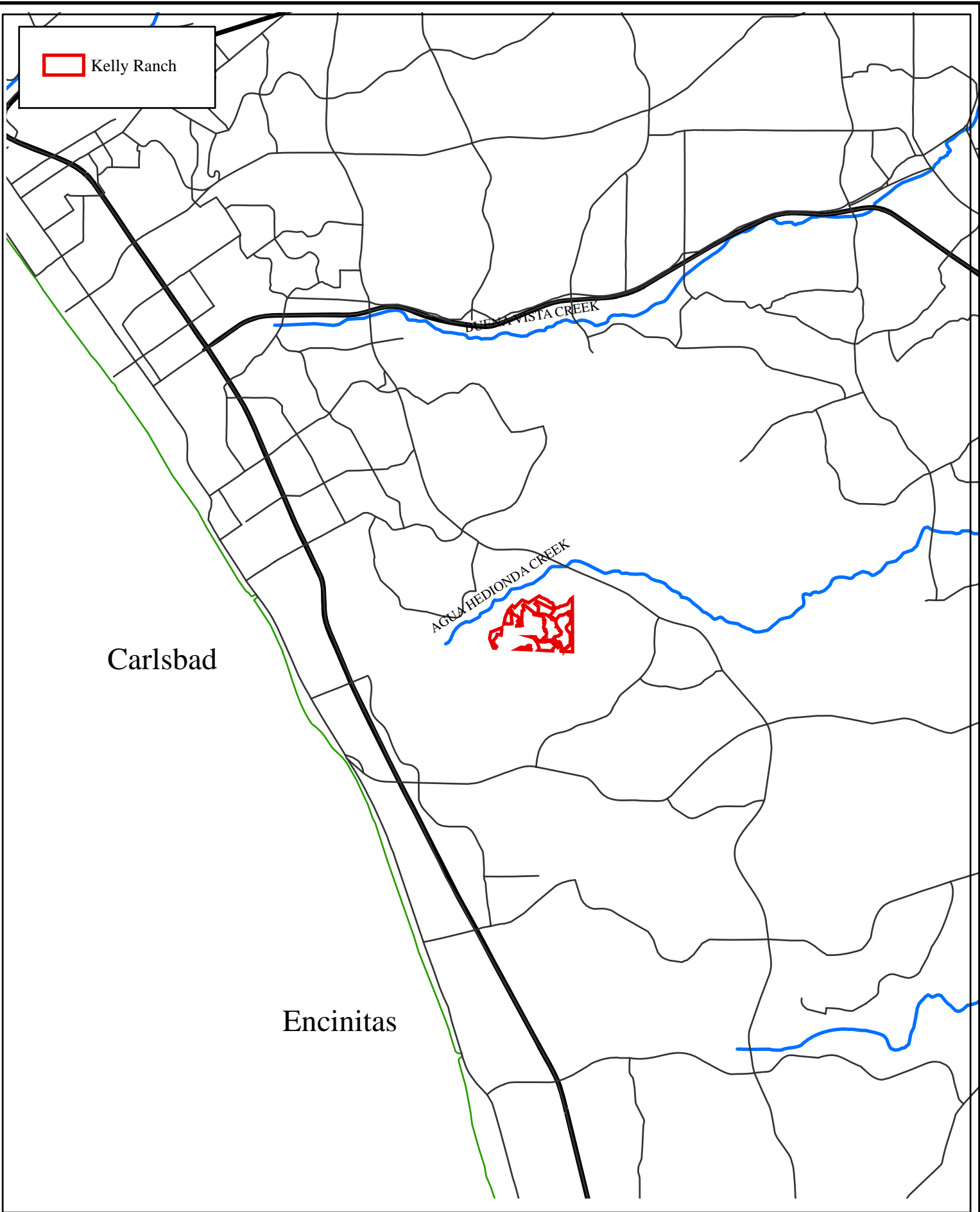


Figure 1  
Preserve Vicinity  
Kelly Ranch Habitat Conservation Area - Carlsbad, CA







Figure 2  
Preserve Location  
Kelly Ranch Habitat Conservation Area - Carlsbad, CA



clearly stated management goals. This plan describes the Preserve's resources and characteristics and provides a brief overview of general tenets of conservation biology for natural areas management as it applies to this Preserve. This plan follows guidelines and management practices deemed acceptable by the Center and the City of Carlsbad's Open Space Management Plan (OSMP), and follows the guidelines of the Multiple Habitat Conservation Program Biological Monitoring and Management Plan (CBI, 2003). This plan, covering the period 2008-2013, is the second management plan for this preserve, the first being written by CNLM in November 2002.

## **II. PROPERTY DESCRIPTION**

### **A. Geographical Setting**

The Preserve is located approximately one-to-two miles inland and lies at the east end of Batiquitos Lagoon. Roads near the Preserve include Cannon Road along the western boundary and Faraday Avenue near its southern boundary. The Preserve is not one unit, but is made of multiple parcels varying in size from a few acres to approximately 15 acres that are located within the housing development of Kelly Ranch and surrounding communities (see Figure 2). The Preserve's topography varies among parcels and ranges from 50 to 200 feet above mean sea level (Figure 3). Steep slopes characterize the northern and eastern parcels, and gentle slopes characterize the remaining parcels. Most of the area in the Preserve and adjacent land was formerly known as Evans Point.

### **B. Geology and Soils**

Surficial rock units on-site consist of a thin cap of an unnamed river terrace deposit. Soil types at higher elevations are primarily Linda Vista Formation, a red-brown marine terrace deposit. This formation overlies the Santiago Formation, the principal bedrock unit on-site (Hinshaw, 1999). Surficial deposits consist of alluvium and colluvium. Alluvium is stream-deposited sediment, occurring along creeks and in the bottom of gullies. Colluvium is an accumulation of topsoil caused by a combination of deep weathering and downhill creep.

### **C. Historic Land Use**

Prior to the site being dedicated for protection, most of the area around this Preserve, including areas directly adjacent, was farmed for many years. However, most of the slopes and bluffs that make up the Preserve were not cleared, and the habitat was in a natural state with little disturbance. Some areas of the Preserve were graded to accommodate development. These areas were later revegetated with native plants and are in the last few years of a restoration program (Planning Systems, 2001).

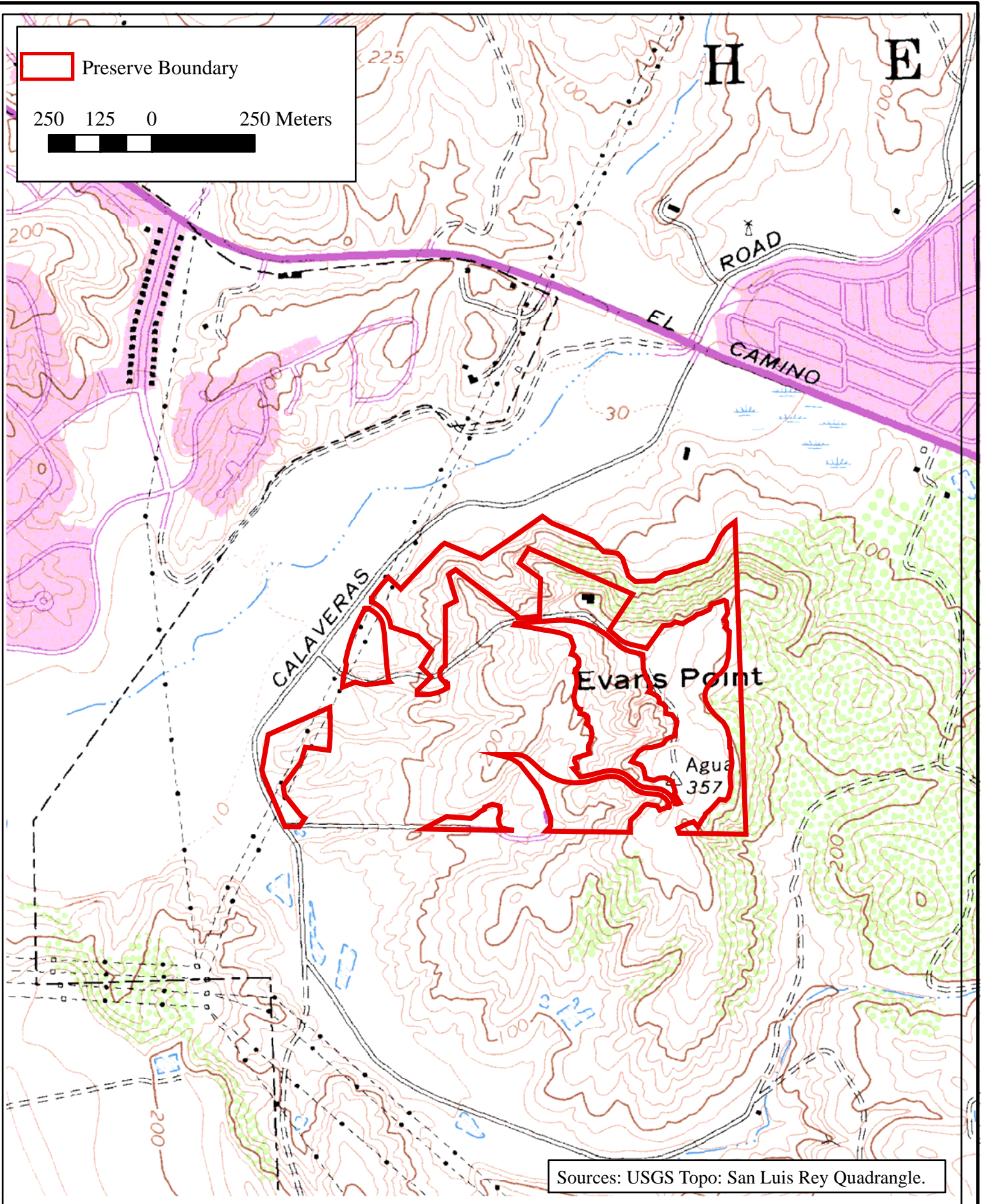


Figure 3. Topography  
Kelly Ranch Habitat Conservation Area - Carlsbad, California





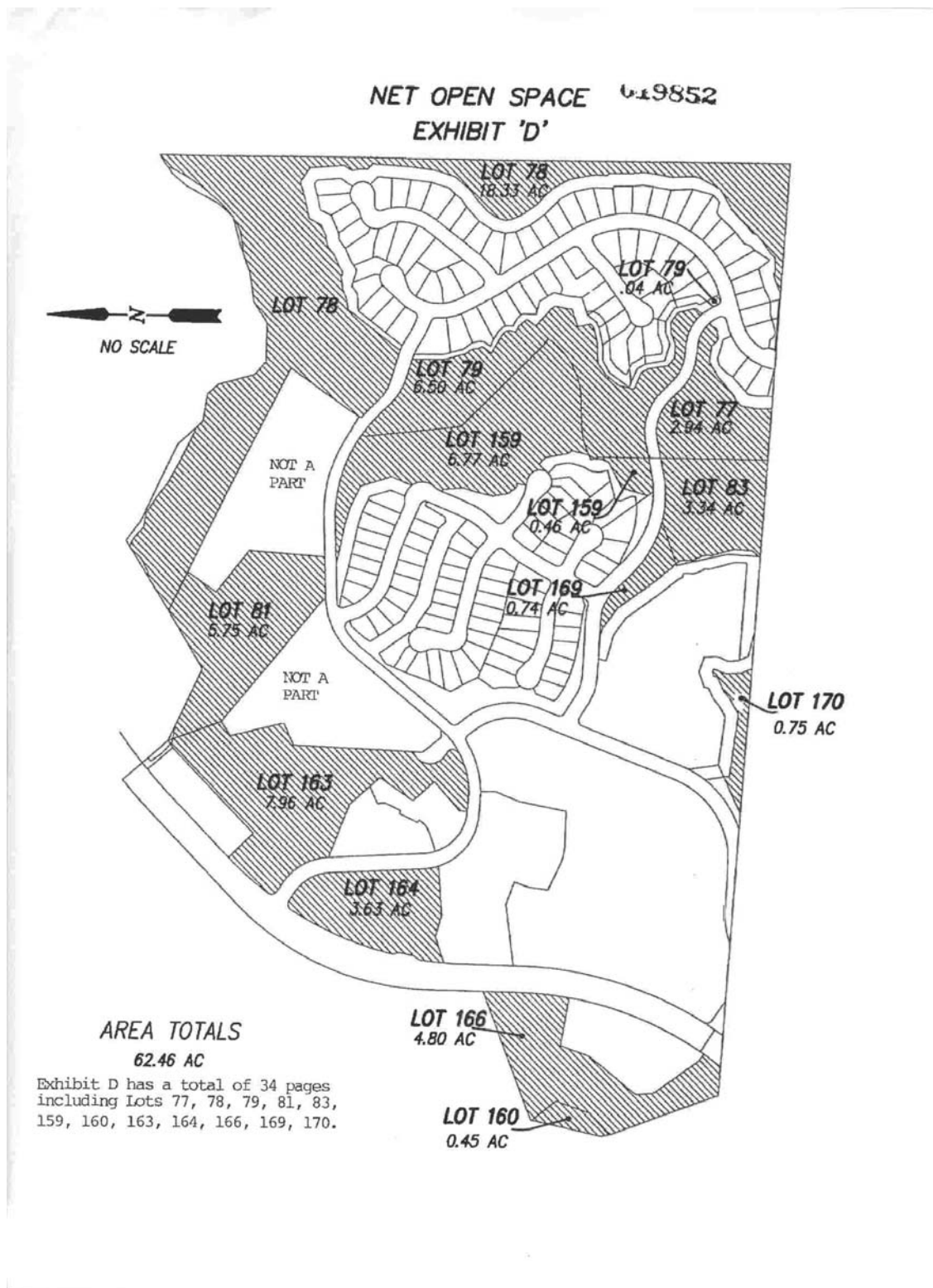


Figure 4. Legal Description (Plat) of CE (hatched areas)



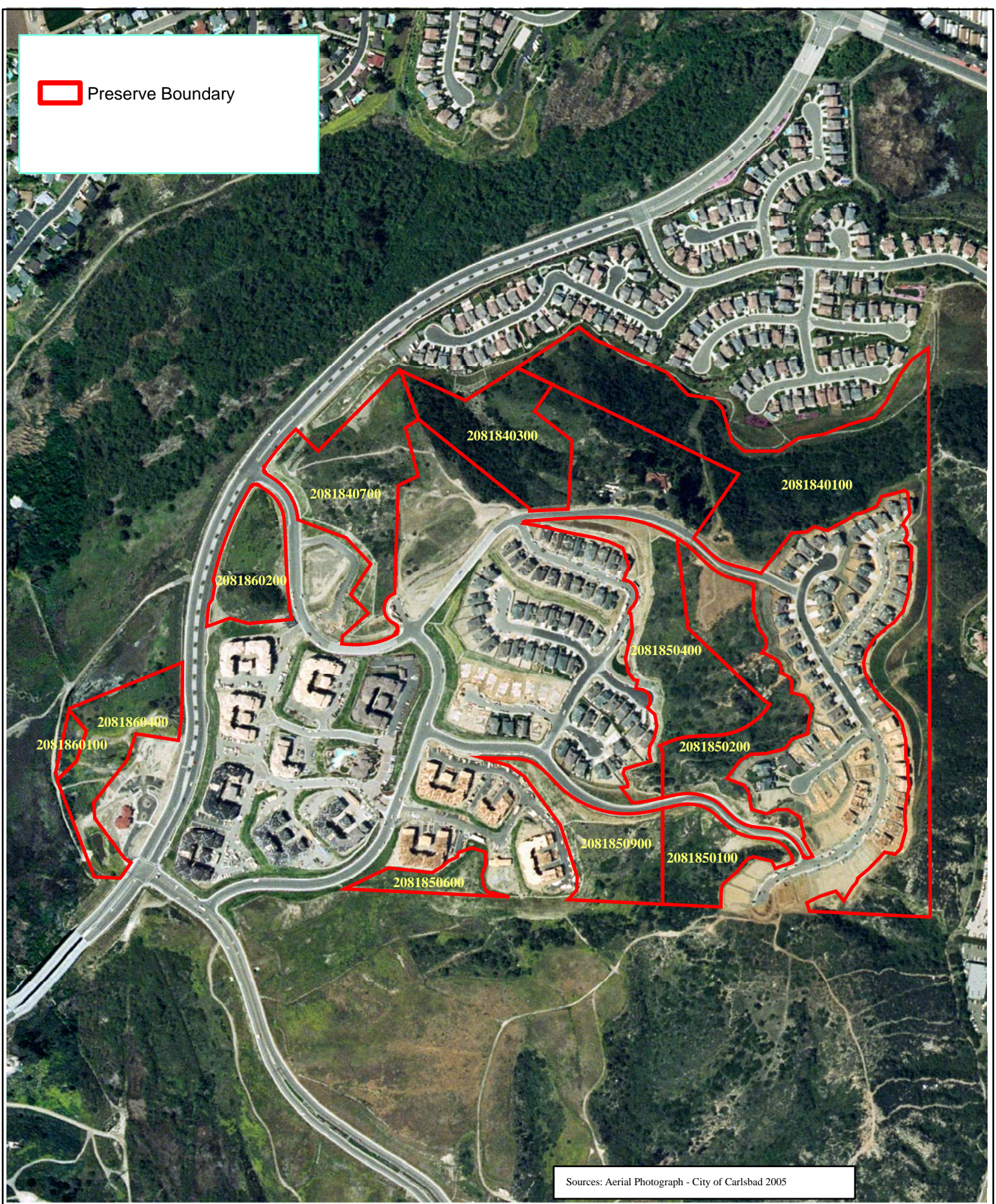


Figure 5  
Assessor Parcel Numbers  
Kelly Ranch Habitat Conservation Area - Carlsbad, CA





## D. Ownership and Legal Description

CNLM's conservation easement (CE) covers approximately 63 acres that are owned by several entities, primarily home owners associations (HOA) (Figures 4 & 5 and Table 1).

Table 1. Ownership information

<b>Assessor Parcel Number</b>	<b>Current Owner (as of October 2007)</b>
208-186-04 and -01	Kelly Land Company/Hillman Properties
208-184-01, -03, -07	Heron/Spyglass Hills HOA
208-185-01, -02, -03, -04, -08, 09	Heron/Spyglass Hills HOA
208-186 -02	Heron/Spyglass Hills HOA
208-185-06	Shea Homes Limited Partnership

The CE does not cover the entire areas of most parcels (see Figure 4). The CE boundary does not include fuel modification zones, or other common areas that the Center does not manage. Therefore, the CE is anywhere from 10 to 30 feet away from existing backyard fences where there are HOA-maintained areas.

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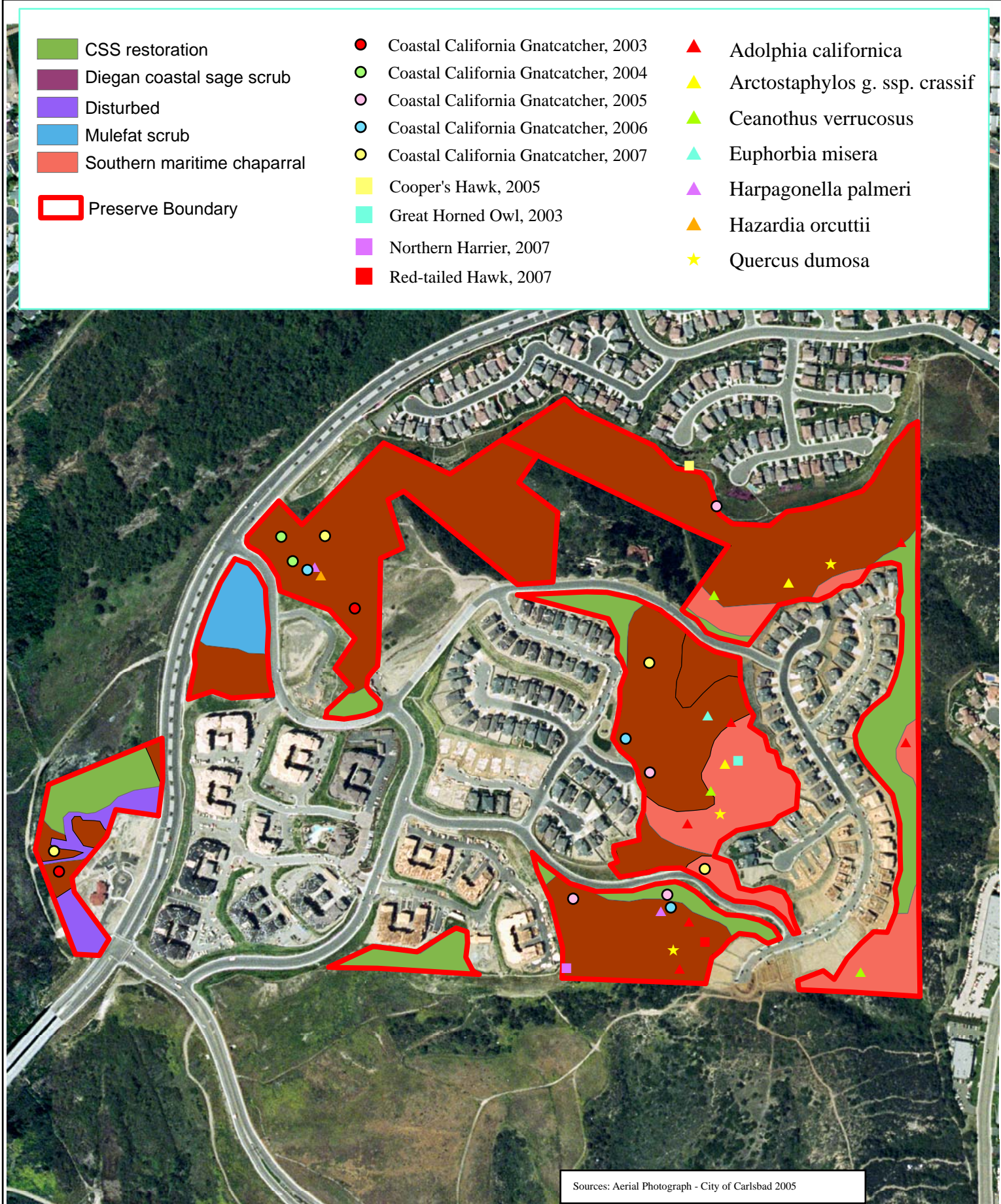
### **E. Conservation Easement Compliance**

As with most CEs, the Kelly Ranch CE provides a list of permitted and prohibited uses of the land. One of CNLM's responsibilities is to monitor the Preserve and ensure that the owners are not violating the conditions of the CE. CNLM has generated a draft CE compliance monitoring standard which outlines a series of activities that managers must follow to ensure compliance. The CE for this Preserve does not stipulate a frequency for these compliance visits (e.g., once per year, every other year, etc). The CNLM standard for such situations is to conduct a compliance monitoring visit once per year. The visit includes filling out forms, taking photographs and updating a CE compliance "binder" for the site. The binder, which includes guidelines, site photos, and other information, is under a separate cover from this management plan.

## **III. HABITAT AND SPECIES DESCRIPTION**

### **A. Vegetation Communities**

The vegetation communities found at the Preserve (Figure 6) are predominantly Diegan coastal sage scrub (CSS) and southern maritime chaparral (SMC), with small patches of native grasslands (as described by Merkel & Assoc., 1998).



**Figure 6**  
**Vegetation Types and Sensitive Species**  
 Kelly Ranch Habitat Conservation Area - Carlsbad, CA



Co-dominant plant species of the CSS community include California sage (*Artemisia californica*), California encelia (*Encelia californica*), flat topped buckwheat (*Eriogonum fasciculatum*), coast monkey flower (*Mimulus aurentiacus* var. *puniceus*), lemonade berry (*Rhus integrifolia*), and bladderpod (*Isomeris arborea*), with localized abundance of coast cholla (*Cylindropuntia prolifera*).

The southern maritime chaparral consists primarily of wart-stemmed ceonothus (*Ceanothus verrucosus*), chamise (*Adenostoma fasciculatum*), white sage (*Salvia melifera*), and heaths (*Xylococcus* and *Arctostaphylos* spp.).

Grassland, though limited in extent, is composed of two species of needle grass (*Nassella* spp.), coast range melic (*Melica imperfecta*), and little-seed muhly (*Muhlenbergia microsperma*), and contains Palmer's grapplehook (*Harpagonella palmeri*). The parcels located west of Cannon have less than 0.1 acre of disturbed area, which represent utility roads. Some of the drainages have been historically occupied with dense groves of non-native tree tobacco (*Nicotiana glauca*), which have now been mostly removed, and the slopes contain a moderate amount of the non-native sweet fennel (*Foeniculum vulgare*). Vegetation community types and acreages found at the Preserve are described in Table 2.

**Table 2. Vegetation Communities found at the Preserve**

Vegetation Community	Total Area (acres)
Diegan Coastal Sage Scrub	49
Southern Maritime Chaparral	7
Disturbed	4
Native Grassland	1
Nonnative Grassland	2
Total	63

## **B. Plant Species**

1. Plant Species. Initial plant surveys were conducted in 1998 (Merkel & Assoc., 1998, Appendix 1). The property that included developed lands initially contained at least 276 species, 85 of which are not native to the area (31% exotics). Additional surveys of sensitive species (distributions and counts) were conducted by CNLM in 2003, and again in 2005, though no additional sensitive species were found beyond those documented in 1998.

2. Sensitive Plant Species. Eleven sensitive species were initially found on the property (Merkel and Associates 1998; Table 3 and Figure 6). The site may contain some individuals of the federally listed endangered Del Mar manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*), but the individuals identified in the pre-construction report mention that it is likely the unlisted Zaca Lake manzanita (*A.g.* ssp. *zacaensis*; Merkel & Assoc., 1998). The identity of these plants remains to be verified (see section V). Aside



from a transplanted population of the California threatened Orcutt's hazardia (*Hazardia orcuttii*), there are presumably no other state- or federally-listed plants on the property; however, there are several California Native Plant Society (CNPS) listed sensitive plants throughout the property, and a few of these are listed under the North County Multiple Habitat Conservation Program (MHCP) (Table 3). Two of the species originally listed by the CNPS as rare have since been de-listed—the prostrate spineflower (*Chorizanthe procumbens*) and the ashy spike moss (*Selaginella cinerascens*). Hence, although we may continue to incidentally monitor these two species, they have been removed from the list of sensitive plants for the Preserve (Table 3).

### **C. Animal Species**

Appendix 2 provides a list of animal species that have been observed on site by CNLM and those listed in the Kelly Ranch biotechnical reports (Merkel & Assoc., 1998).

Sensitive animal species which were observed on the Preserve during initial surveys of the property by Merkel & Associates include (but are not limited to) the coastal California gnatcatcher, orange-throat whiptail (*Cnemidophorus hyperythrus beldingi*), and southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*) (Table 4). USFWS protocol surveys of Pacific Pocket Mouse (*Perognathus longimembris pacificus*) were conducted in 1998, but none were captured (SJM, 1998). Sensitive species observed by CNLM are described in the following sections.

#### Birds

Aside from protocol surveys for coastal California gnatcatchers that have taken place every field season since CNLM started management, no focused or USFWS protocol-level surveys were conducted by CNLM for other animals. However, there are no other species on the Preserve that require protocol surveys. Incidental surveys have continued since 2002, however, and GPS positions are taken when sightings of sensitive species are encountered (summarized in Table 4).

The coastal California gnatcatcher is the only federally listed species (Threatened) on the Preserve. Prior to grading, the Kelly Ranch and Cannon Road development areas had approximately four gnatcatcher “use areas”. Two of these were to be impacted by road construction, leaving two gnatcatcher pair to be conserved by the Preserve. The most recent gnatcatcher surveys (2007) revealed a count of four pairs.

Since assuming management, CNLM staff has observed several sensitive bird species utilizing or passing through the Preserve. Among these have been the Northern Harrier and Cooper's hawk (*Accipiter cooperii*)—both CDFG species of special concern—and the state protected white-tailed kite. The MHCP listed Southern California rufous-crowned sparrow was observed by Merkel & Associates during 1998 surveys, but has not been observed by CNLM.

## Reptiles and amphibians

Reptile and amphibian species observed and documented to occur in the Preserve by CNLM staff include western fence lizards (*Sceloporus occidentalis*), side-blotched lizards (*Uta stansburiana*), coastal whiptail (*Aspidoscelis tigris stejnegeri*), southwestern pacific rattlesnake (*Crotalus ruber*), and Pacific tree frog (*Pseudacris regilla*). Several occurrences of the MHCP listed orange-throat whiptail had been documented by Merkel & Associates during 1998 surveys, but have not been observed by CNLM.

## Mammals

Mammals observed and documented to occur in the Preserve by CNLM staff include cottontail rabbit (*Sylvilagus audubonii*), California ground squirrel (*Spermophilus beecheyi*), and coyote (*Canis latrans*). Indirect evidence of other animal occupancy suggests raccoon (*Procyon lotor* tracks) and wood rats (*Neotoma* spp.).

### **D. Fire History**

The site fire history is not known at this time, and no reported fires were recorded in the California Department of Forestry Database. No evidence of recent fire on the Preserve has been observed.

### **E. Threats**

The primary direct threat to the Preserve stems from the initial fragmentation of the Preserve into isolated and semi-isolated units that came about through permanent impacts like housing and roads. This direct threat (fragmentation of once contiguous habitat) will inevitably create secondary threats to species viability including, but not limited to: loss of genetic diversity due to loss of landscape connectivity, increase of exotic species density due to the increase of edge habitat (see below), noise from roads and housing interfering with mating activities, non-natural fire return interval (see below), vandalism, trampling, poaching, and erosion. Climate change is a direct threat, which will likely tilt competition in favor of certain exotic species, accelerate certain secondary threats like fire return interval, and decrease seedling survival (because of increased moisture stress) leading to decreased survival of native species. While it is not possible to stop or prevent climate change or the initial constraints imposed by development, it is possible to reduce, or mitigate many of the secondary effects through adaptive management (see section IV.E). The Center considers all of these threats as part of its management and monitoring program.

## Nonnative Plant Species

Nonnative plant species, including nonnative grasses (*Bromus* spp., *Melinis repens*), tree tobacco, sweet fennel, tocalote (*Centaurea melitensis*), and mustards compromise much of the interstices between native shrubs. The majority of these nonnative plant species are growing in the coastal sage scrub and in the native grasslands that occur within the Preserve.

Other nonnative species, such as tamarisk (*Tamarix* spp), pampas grass (*Cortideria* spp.), and other “zero tolerance” species, have been largely contained on the property within the first five years of CNLM management. Section IV.C provides details of our nonnative plant control objectives for the next five years.

**Table 3. Sensitive Plants on the Preserve**

Name and Sensitivity	Description of occurrence by year and source			
	1998 (Merkel & Associates)	2003 (CNLM)	2005 (CNLM)	2007 (CNLM)
California adolphia ( <i>Adolphia californica</i> ) CNPS List 2.1	“Several hundred”	24		
Del Mar manzanita ( <i>Arctostaphylos glandulosa</i> ssp. <i>crassifolia</i> ) FE, CNPS List 1B.1, MHCP.	29 (Probably spp. <i>zacaensis</i> )	<50 Located in dense habitat and difficult to count		
Wart-stemmed ceanothus ( <i>Ceanothus verrucosus</i> ) CNPS List 2.2, MHCP	“In the hundreds”	9		
Small-flowered microseris ( <i>Microseris douglasii</i> var. <i>platycarpa</i> ) CNPS List 4.2	20	Not found, probably impacted by development	Not found	
Western dicondra ( <i>Dicondra occidentalis</i> ) CNPS List 4.2	Unknown	Common	Several populations found	
Palmer’s grapplinghook ( <i>Harpagonella palmeri</i> ) CNPS List 4.2	???	Approximately 400	Over 100 individuals	
Orcutt’s hazardia ( <i>Hazardia orcuttii</i> ) CT,CNPS list 1B.1 MHCP	None	20 (Transplanted from the Manchester Habitat Conservation Area)	100 planted in 2004 Approximately 100 counted	106 adults, 3 seedlings counted in 2007
Nuttal’s scrub oak ( <i>Quercus dumosa</i> ) MHCP, CNPS List 1B.1	??? (“Lightly scattered”)	Common		
Cliff spurge ( <i>Euphorbia misera</i> ) MHCP, CNPS List 2.2	“One thicket”	3	Not found	11 individuals found

\* FE= Federally listed endangered; CT= California threatened; MHCP= Multiple Habitat Conservation Program Covered Species; CNPS= California Native Plant Society; ???= no initial count made during planning process.



**Table 4. Sensitive Animal Species Observed**

<b>Species (Listing Status)*</b>	<b>Occurrence (from Merkel &amp; Assoc., 1998)</b>	<b>CNLM observations 2002-2007</b>
Orange-throat whiptail <i>Cnemidophorus hyperythrus beldingi</i> (MHCP)	"Several occurrences"	Not observed
Cooper's hawk <i>Accipiter cooperii</i> (CDFG MHCP)		Observed during most years
White-tailed kite <i>Elanus leucurus</i> (CDFG)	Previously seen foraging, non-nesting	Not observed
Northern harrier <i>Circus cyaneus</i> (CDFG SSC)	Previously seen foraging, non-nesting	1 observed in 2007
California horned lark <i>Eremophila alpestris actia</i> (CDFG SSC)	"Flock" observed	Not observed
Loggerhead Shrike <i>Lanius ludocisianus</i> (CDFG SSC)	Observed	Not observed
Southern California rufous-crowned sparrow <i>Aimophila ruficeps canescens</i> (MHCP)	Observed	Not observed
Coastal California gnatcatcher <i>Polioptila californica californica</i> (MHCP)	2 pairs in Preserve area	2-4 pairs (4 pair in 2007)
San Diego black-tailed jackrabbit <i>Lepus californicus bennettii</i> (CDFG SSC)	Observed	Not observed
Northwestern San Diego pocket mouse <i>Chaetodipus fallax fallax</i> (CDFG SSC)	Observed during trapping studies	Not observed, but no trapping has occurred

\*FT= Federally listed threatened; CDFG=Fully protected, Special animal; CDFG SSC= Species of special concern; MHCP=Species covered by the Multiple Habitat Conservation Program.

## Fire Ecology and Management

The issue (or threat) of main concern is that the fire regime in the Preserve will no longer follow natural fire cycles which will possibly lead to an altered habitat structure and loss of plant and animal diversity. Recently, many new roads, buildings and houses have been built that subsequently created habitat fragments that make it unlikely that the Preserve will have a complete burn in the future. Also, although most natural fires occur in summer and fall, ignitions may now occur at all times of the year because of the proximity to urban areas and the possibility of human-caused ignition. Lastly, because the City of Carlsbad's fire department's policy in the area is to suppress all fires as soon as possible, it is unlikely that fires will consume large areas all at one time.

### **IV. Ecological Models, Management Goals and Objectives, and Adaptive Management**

Descriptive ecological models are valuable tools to identify assumptions about how a particular habitat/landscape/species responds to natural and artificial perturbations. While the models reflect current knowledge, they are meant to be modified over time as our knowledge of, and experience with, particular habitat or species increases. Models represent an assumption about how a particular habitat/landscape will respond to management practices and thus provide a rationale for the implementation of particular management technologies. The model also represents a testable hypothesis for inclusion in an adaptive management scenario.

Center staff have created a threats model, primarily based on threats to communities and species, that will guide Preserve monitoring and management over the next several years.

CNLM has conducted various "baseline" monitoring activities and other management tasks since 2002. These have included bird, reptile and amphibian and plant surveys and mapping, as well as habitat assessments. Management has included removing nonnative plants and other activities that help us protect and enhance the property. We have learned that the site supports a wide variety of plants and animals in a high quality habitat. We have also been able to protect and enhance sensitive wildlife species. Likewise, we have observed the impacts of people, including dumping and the planting of nonnative invasive plant species adjacent to the preserve area. All of these lessons and observations also guide our management and monitoring decisions.

#### **A. Ecological Models**

##### General Coastal Sage Scrub Threats Model

The threats model for the Preserve (Figure 7) is based on the ecology of its primary natural community, Diegan coastal sage scrub (DCSS). DCSS is a fire-adapted vegetation community with fires occurring naturally, but most severely under the extreme Santa Ana heat and winds of late summer and fall. During these conditions, there would

generally be a “complete burn” where all above-ground vegetation within the fire’s path would be consumed. After such a fire, herbaceous plants, which are known to compete vigorously with natives after fires, would dominate the landscape for a few years. Over time (3-5 years), the shrub lands would regain their dominance, and after 7-10 years a mature assemblage of plants and wildlife would again be found on site.

It is likely that patches of habitat will burn, but that the entire Preserve will not burn at once. The Preserve is expected to burn from fire naturally and possibly by inadvertent or criminal anthropogenic ignition, but is expected to recover naturally. Management protocols will include monitoring and observing habitat recovery following any fires to ensure that the native plant species dominate the Preserve and that non-native plant species do not take over. Although most of the Preserve is in very good shape and of high quality, encroachment of non-native plants species is apparent in many areas.

Active fire management through prescribed burns will not be a management option because of the close proximity to residential homes.

As per the model, there are also other threats to the preserve other than just an altered fire regime and threat of habitat conversion (see Section III.E). These include threats posed by human encroachment and from nonnative animals that have been introduced into California. Therefore, management strategies will be implemented that combine the knowledge of the natural ecological characteristics and parameters of Diegan coastal sage scrub and southern maritime chaparral with the challenges posed by the threats to the Preserve’s integrity.

## **B. Biological Goals**

The following biological management goals are based on MHCP and OSMP compliance monitoring requirements, CNLM monitoring and management requirements, and the threats models described in Section IV.A. The goals are set out to learn more about the Preserve and its resources and to direct management actions.

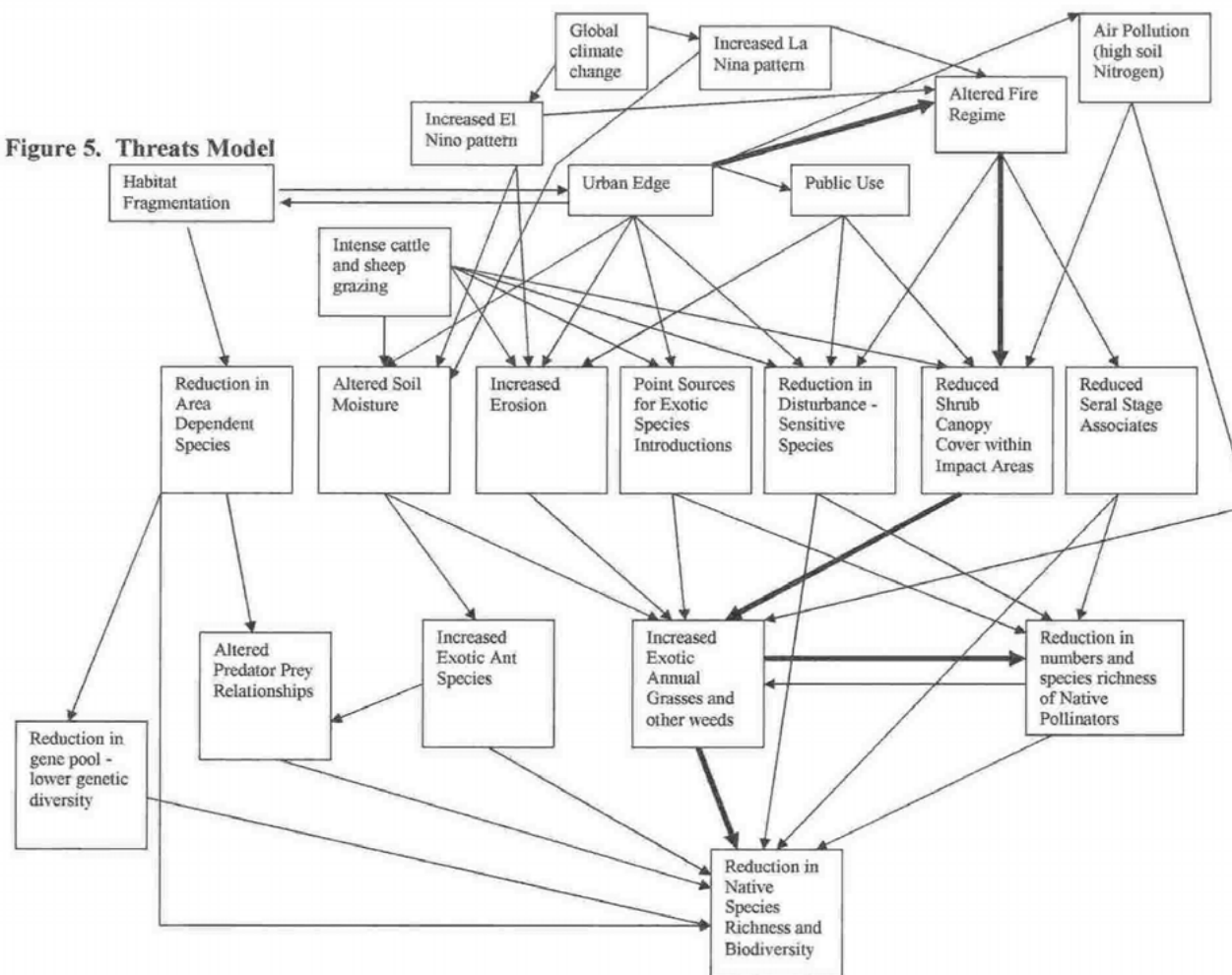
These goals are consistent with the MHCP Management and Monitoring Plan (CBI, 2003), the City of Carlsbad’s Open Space Management Plan (TAIC, 2004) and the Habitat Management Plan for the Kelly Ranch Preserve (CNLM, 2002). Since Preserve inception, the Center has been collecting baseline data on plants, animals and vegetation communities. The results of these monitoring activities have resulted in generating the specific goals listed below. It should be noted that not all baseline data collection activities have been completed.

The following is a list of general biological and conservation goals for the Preserve:

- Conserve the full range of vegetation communities native to the property.
- Conserve areas of habitat capable of supporting management focus species in perpetuity.
- Minimize the impacts of exotic species invasions, both plant and animal, on the Preserve.



**Figure 5. Threats Model**



- Conserve and enhance (if necessary) populations of management focus species.

The following sections define management objectives based on the above goals for specific vegetation communities and specific animal and plants for the next five years of management. See Section V for details on specific biological monitoring activities to achieve these objectives.

### **B.1. Vegetation Associations**

Objective 1. Manage the coastal sage scrub, southern maritime chaparral, and grassland vegetation communities to provide suitable habitat for the coastal California gnatcatcher and other MHCP covered species found at the Preserve. Ensure that the acreage of these vegetation types is not impacted or decreased (Note: much of the coastal sage scrub is within inaccessible terrain, so our management efforts will have to focus on accessible areas only).

### **B.2. Sensitive Plants**

Objective 1. Protect and maintain existing populations of Orcutt's hazardia.

Objective 2. Protect and maintain existing populations of Palmer's grapplinghook, western dicandra, and any other rare non-woody plants, that may be present. Protect the habitat in which these plants occur.

Objective 3. Protect and maintain existing populations of Del Mar manzanita, California adolphia, wart-stemmed ceanothus, scrub oak, and cliff spurge. Protect the habitat in which these plants occur.

### **B.3. Sensitive Animals**

Objective 1. Protect and maintain suitable habitat for the coastal California gnatcatcher (CAGN) and rufous-crowned sparrow (RCSP).

Objective 2. Protect and maintain suitable habitat for orange-throated whiptail and other sensitive species.

## **C. Habitat Maintenance Goals**

Habitat maintenance includes tasks such as erosion control, trash removal, and non-native plant removal.

**Goal.** Reduce the negative impact of erosion, trash dumping and nonnative plants on the Preserve.

Objective 1. Work with the HOA to reduce or eliminate erosion control problems that result from home-owner and HOA activities.

All erosion control issues are the responsibility of the property owners, an agreement of management terms negotiated between the Center and Kelly Land Company (and therefore, inherited by its successors and assigns).

At this time, a few erosion problems have been identified on the Preserve. Of main concern is the erosion on the north side of Tolkien Way. The HOA has installed some basic erosion control measures, but CNLM has determined that more is needed. CNLM is working with the HOA on this issue.

There are other erosion control issues on HOA managed land immediately adjacent to our properties. CNLM has contacted the HOA and their property manager to educate them about this issue and to provide suggestions and solutions to the problems. Most of these issues are along the eastern edges of the central parcels of the Preserve where neighbors are overwatering their slopes, or the HOA has planted nonnative ice plant (*Carpobrotus edulis*).

Erosion problems will likely continue to arise from neighborhood land use-activities, such as the planting of erosion-causing plants like ice-plant, or the over-watering of yards.

Task 1. Identify erosion control problems and notify HOA.

Method: The Center will identify and map erosion problems and suggest methodologies to minimize erosion problems to the underlying property owners (HOA's). The Center will continue to work with the HOA and educate homeowners about their responsibilities to stay within the framework of the Conservation Covenants and Restrictions of their respective properties.

Objective 2. Reduce the level of trash on the Preserve.

Historically, much of the area adjacent to the Preserve was in agricultural operation, with the Preserve and surrounding edge-habitat occupied by migrant workers. Over the years, CNLM has been removing agricultural debris, as well as the refuse left behind by many years of migrant worker occupation, but we continue to locate piles of debris and refuse as it is uncovered by rain and erosion.

Task 1. Remove trash as it is located.

Method: During each visit the Preserve will be surveyed for illegal activities, and trash will be removed.

Objective 3. Prevent the invasion of new nonnative plant species and control and reduce the coverage of nonnative plants that currently exists on the Preserve.

Non-native plants are probably the biggest challenge to our management and will be for many years to come. The Center categorizes non-native plants into “zero” tolerance species and “moderate” tolerance species. Management will include removing non-native plant species which are found to be invading the site. The following species observed in the Preserve are considered “zero tolerance” and require complete removal if possible: acacia trees (*Acacia* spp.), iceplant, Eucalyptus (*Eucalyptus* spp.), Myoporum trees (*Myoporum laetum*), fountain grass (*Pennisetum sataceum*), fennel, castor bean (*Ricinus communis*), tamarisk (*Tamarix* spp.), Saharan mustard (*Brassica tournefortii*), and pampas grass (*Cortaderia* spp.).

Moderate tolerance species observed at the Preserve include but are not limited to filaree (*Erodium* spp.), annual grasses (*Bromus* spp. *Avena* spp.) and black mustard.

We will remove all zero tolerance species and will develop thresholds (i.e. acceptable percent cover) for moderate tolerance species.

Task 1. Regularly inspect the Preserve for exotics and control non-native plant species putting highest priority on zero tolerance species.

Method: The Center will continue to patrol the preserve 3-4 times per month. During each visit, in addition to Goal 3 below, zero tolerance non-native plants will be controlled. Usually, this control is accomplished through the use of herbicides such as Roundup Pro®, or AquaMaster®, both of which are manufactured by Monsanto Inc. Tree tobacco, Myoporum, Eucalyptus, and other non-native trees are typically either stump-painted with pure concentrate of Roundup, or holes are drilled and the holes are filled with the concentrate. Pampus grass is sprayed with 2-4 percent by volume dilution of Roundup Pro® with water, as are many other weeds in the preserve. When the exotic plants are nearby or growing in wet soil or waterways, AquaMaster® is applied.

#### **D. Public Use Goals**

At most CNLM preserves where there is public access, public use includes passive recreation, such as hiking, or scientific research or other activities that are appropriate to and compatible with the purposes for which the area is being managed. The Preserve, with proper stewardship, is a significant amenity to the surrounding community and has been used historically by many people.

This preserve is composed of several rather small, and steep-sloped fragments that do not allow for the construction and maintenance of any trails and the public is not allowed on any part of the Preserve, except for the small trail that leads off of Hemmingway. This trail is approximately 100 feet long and has a bench and kiosk at the end of it. The trail and the kiosk are maintained by the HOA. The Center has added information in this kiosk about the Preserve, its resources, and the Center.

The Center recognizes that informing and educating the surrounding community of the Preserve value as open space and wildlife habitat will be essential to protecting the



resources at the Preserve. There will be continued misuse and degradation without community support.

**Goal.** Reduce the negative impacts of the public through education about the Preserve.

The Center will continue to control unwanted public use such as unwanted trail creation, disposal of yard or landscaping waste, dumping of trash, and vandalism. The Center will also continue to maintain posting and signage at the Preserve with signs that define permitted and non-permitted activities, enforce access restrictions, monitor kiosk maintenance needs, and habitat degradation. Additionally, the Center will continue to work with homeowners and the HOA in fostering respect for the natural processes, and in involving concerned individuals in keeping their adjacent wild-lands free of harmful activities. We will make our best effort to involve interested individuals in maintenance or monitoring activities wherever feasible. This will ensure that additional eyes and ears are active at the inception of a harmful activity or concern.

Objective 1. Educate the surrounding neighbors and HOA contacts of the importance of the Preserve and to minimize unwanted activities.

Task 1. Develop outreach materials and maintain HOA contacts.

Method: CNLM will develop a annual brochure or newsletter that summarizes the Preserve resources and importance to the area, provides educational information that helps protect the Preserve and enlists public support. CNLM staff will maintain contact with the HOA board members and the HOA's property manager.

Task 2. Minimize the impact of dumping and illegal access.

Method: The Center will patrol the Preserve two to four times per month to pick up trash, fix and maintain signs, talk to neighbors and look for problems and issues.

## **E. Adaptive Management**

Management of dynamic systems requires a similarly dynamic management structure, that is, capable of appropriate response in the context of perpetual change. Natural areas that are managed for conservation objectives are subject to a suite of changing conditions from the biological (e.g., normal population dynamics, climate change) to the legal (e.g., resident species being down-listed, de-listed, or listed) to the social (e.g., increasing pressures for recreational use). Adaptive management was a concept developed in response to these challenges and was defined as the systematic acquisition and application of reliable information to improve management over time (Wilhere, 2002).

CNLM's interpretation of adaptive management embraces not only new scientific information but the possibility of new management objectives. As examples, new objectives could be the result of a change in the legal status of resident species, the need to consider a different restoration goal for the preserve because of changing climatic

conditions, or a change in the preserve context whereby it either became connected with other preserves and acquired a ‘metapreserve’ context or became increasingly fragmented and isolated, undermining some original management objectives.

Our vision and application of adaptive management continue to grow with the maturity and experience of the organization. At present, adaptive management is expressed and served by the following conditions:

- (1) Analysis and interpretation of information gathered from site and interpreted at a spatial scale that is appropriate for the site and the species: Mandatory (i.e., regulatory agency) monitoring is supplemented with additional data collection and framed appropriately such that meaningful information is gained on resident species. As appropriate for the spatial scale of the species’ range, additional information from beyond the preserve may be used for interpretation. Similarly, the time scales of the species-lifespan, breeding cycles, etc.-help to determine how long information must be collected before it is biologically meaningful and can be interpreted for management purposes.
- (2) Appropriate management structure: We require that management plans for each preserve be updated every five years. This provides an opportunity and prompt to consider the management trajectory and review relevant information.
- (3) Staff selection: Preserve managers are selected who have a strong background in biological sciences, are comfortable in searching scientific literature and conducting scientifically rigorous field studies, and who have the ability to interact appropriately with the research community for management support.
- (4) Sound record-keeping: Just as adaptation in the evolutionary sense depends on inheritance from one generation to another of the trait of interest, so too adaptive management relies on a strong institutional memory that transcends individual managers.
- (5) Developing longterm relationships with researchers: The expertise needed to guide conservation-directed management is multi-disciplinary and best served by a team approach. Preserve managers accommodate requests from researchers to use the preserves for onsite research projects, barring any significant risks to native species and the environment. They also invest in relationships with the research community as an ongoing source of support for decision-making.
- (5) Management stability: One of the preconditions identified by Lee (1993) for genuine adaptive management is sufficient (institutional) stability to measure longterm outcomes. CNLM’s agreements for preserve responsibility-whether pertaining to ownership, management, or conservation easement compliance (or a combination)-are in effect in perpetuity. This provides the necessary stability and timeframe for effective adaptive management.

The following section is based on research and monitoring activities that occurred in the previous five years and guide our adaptive management approach.

## V. Biological Monitoring and Management Strategies

The following sections detail management and monitoring strategies that will be employed to attain each goal set out in Section IVB. Table 5 outlines the Biological monitoring timeline that the Center is striving to attain during the 2008-2013 time period.

**Table 5. Biological Monitoring Timeline**

	2008	2009	2010	2011	2012	2013
Vegetation mapping			X			
Sensitive Plant Habitat Assessments		X		X		TBD
Coastal California gnatcatcher surveys			X			X
Sensitive Plants	See Table 6	See Table 6	See Table 6	See Table 6	See Table 6	See Table 6

\*Sensitive plant habitat assessments will take place the year following mapping providing suitable rainfall

Focus in the next five years will be on mapping and censusing the localities of sensitive plants throughout the preserve, while incidentally noting the locations and abundance of sensitive animals while plant surveys, vegetation mapping, patrol, and maintenance efforts are underway. The hope is that by maintaining viable habitat, the animal populations will flourish. Unfortunately, the steep-sided, inaccessible nature of this patch-work preserve, and its small acreage, doesn't allow for comprehensive mammalian or herpetological inventories that would be needed for population-type monitoring activities and hence, longterm studies. In addition, this Preserve does not support "populations" of any species, but rather smaller sub-populations which complicates long term studies because larger areas, outside the Preserve, would need to be included.

The following biological monitoring tasks have been planned for the period between 2008 and 2013, are based on the biological goals and objectives set out in Section IV.B in this document, and the CSS Threats Model:

### A. Vegetation Associations

Objective 1. Manage the coastal sage scrub, southern maritime chaparral, and grassland vegetation communities to provide suitable habitat for the coastal California gnatcatcher and other MHCP covered species found at the Preserve. Ensure that the acreage of these vegetation types is not impacted or decreased (Note: much of the coastal sage scrub is within inaccessible terrain, so our management efforts will have to focus on accessible areas only).

Over a long time-span, changes in shrub or herb dominance may take place that would be imperceptible to an individual on routine patrol or in the pursuance of maintenance activities. Much of the property within the Preserve is either impenetrable, too steep-sided for entry and localized monitoring, or too easily disturbed by foot traffic to make transect methodology useful. The following Releve' methodology will ensure that the most objective available method of native and exotic plant structure and composition can be determined given the previously explained restrictions.

Task 1. Estimate the structure and composition of the dominant vegetation communities.

Method: A CNPS Rapid Assessment protocol was modified and used on irregular polygons as per the Releve' Protocol in July of 2005, and our intention is to repeat the Releve' protocol again in the summer of 2010 (Table 4, Vegetation mapping). The CNPS recommended Releve' methodology can be located at:

([http://www.cnps.org/vegetation/pdf/releve\\_protocol.pdf](http://www.cnps.org/vegetation/pdf/releve_protocol.pdf))

With the data retrieved from the standardized California Native Plant Society Releve' Field forms (latest revised on 02 April, 2004), percent cover by species can then be attributed to the plant association, or polygon from which the cover and height values were estimated. These data can then be accessed and updated on a regular interval to inform the land manager of any changes in structure or composition that may be taking place due to competition with weeds, dominance by particular native species resulting in an increasingly monotypic stand, plant disease, or a growing decadence within an aging canopy. These data can also be helpful in tracking landscape response to unexpected fire events.

## **B. Sensitive Plants**

Sensitive plants will be managed and monitored as described in the following sections and timetable (Table 6).

Objective 1. Protect and maintain existing populations of Orcutt's hazardia.

Task 1. Protect existing populations of Orcutt's hazardia, continue to track transplant survival and seedling recruitment.

Method: As with previous years, individuals that were transplanted will continue to be counted yearly, and seedlings will be flagged and counted yearly. The recruitment and survival of recruits will continue to be quantified on a yearly basis until the population is deemed self-sustaining. Seedling emergence will be investigated as a possible correlate of nearby recorded rainfall amounts.



**Table 6. Sensitive Plant Monitoring Timeline**

<b>Plant Species</b>	<b>Monitoring timetable</b>	<b>Next survey</b>	<b>Subsequent survey</b>
California adolphia	Every 5 years	2008	2013
Del Mar manzanita (if ssp. Crassifolia)	Every 3 years	2008	2011
Wart-stemmed ceanothus	Every 5 years	2008	2013
Small-flowered microseris	Every 3 years	2008	2011
Western dichondra	Every 3 years	2008	2011
Palmer's grapplinghook	Every year	2008	2009
Nuttall's scrub oak	Every 5 years	2008	2013
Cliff spurge	Every 3 years	2010	2013
Orcutt's hazardia	Every year	2008	2009

Objective 2. Protect and maintain existing populations of Palmer's grapplinghook, western dicondra, and any other rare non-woody plants, that may be present. Protect the habitat in which these plants occur.

The non-woody rare plant populations present at the preserve are expected to exhibit population fluctuations dependent upon rainfall amounts and are also expected to be in competition with other annuals, including annual exotic grasses and forbs. These species will be monitored on a yearly basis.

This objective requires two distinct phases. We must first get an accurate accounting of location and distribution, and then investigate whether changes in density or abundance of exotics or non-focal natives are impeding the survival or reproduction of the rare plants.

**Task 1. Map existing populations**

Method: The boundaries of each species will be established annually (or as necessary) with the aid of a sub-meter accurate geographic positioning system. Direct counts will take place during mapping efforts, and these will also be entered into the GIS database.

**Task 2. Assess each population and their habitat**

Method: Where feasible, permanent macroplots will be set up within these sensitive vegetation coverages, and percent cover by species will be estimated using rectangular point-intercept subplots placed in a stratified random manner. These subplots will be numerous enough to provide scientifically defensible information regarding the population trends of focal species as well as weeds and other native species. These data will inform management decisions including whether localized weed treatments are needed in order to keep populations viable into the future.

Objective 3. Protect and maintain existing populations of Del Mar manzanita, California adolphia, wart-stemmed ceanothus, scrub oak, and cliff spurge. Protect the habitat in which these plants occur.

Many rare woody shrubs at this preserve are typically located in steep, densely vegetated terrain, and access will be difficult in many areas. As with the previous objective, this objective will necessarily include two separate efforts, with mapping followed by population assessment and habitat assessment.

#### Task 1. Map existing populations

Method: The boundaries will be established during each of these 3 or 5-year return intervals (Table 5) with the aid of a sub-meter precision geographic positioning system. Direct counts will take place during mapping efforts, and these will also be entered into the GIS database.

#### Task 2. Assess each population and their habitat

Method: After performing a focused mapping effort and census of each rare perennial species (2008), populations that are accessible will be chosen at random for detailed, long-term study that will include estimates of cover by species, disease, foliar damage, age, stand decadence, shrub survival, stump sprouting, and seedling recruitment.

Where feasible, permanent study plots will be set up within sensitive shrub coverages. Once study plots are established, general assessments of stand health will be noted. Counts of living shrubs will take place, as well as visual estimates of percent of total canopy that is not supporting live, photosynthetic tissue (percent decadence). The presence of rust or insect borne disease will be noted, if present. The degree of any infestations will be noted as an estimated percent of foliar damage over the entire stand. Estimates of cover by all species will be taken inside study plots. Recruitment of seedlings may be difficult to assess for most species due to the potential confusion among stump-sprouting or laterally rooting clones, and seedlings. Nevertheless, a count of all sprouts may be helpful to long-term management as older, mature shrubs may begin to senesce. A within-canopy percent foliar cover will be visually estimated, and the count of surviving adult shrubs may reveal population decline; that would be useful for informing management decisions that could enable genetic continuity through propagation.

### **C. Sensitive Animals**

Fulfilling our goals and objectives set out in our Habitat Maintenance and Public Services Sections (Sections IV,C and D) will ensure that we are protecting and maintaining suitable habitat for sensitive wildlife species. In addition to those objectives, CNLM will survey for sensitive wildlife species from time to time to determine whether our habitat

protection and maintenance activities result in site occupation of sensitive wildlife species.

Objective 1. Protect and maintain suitable habitat for the coastal California gnatcatcher (CAGN) and rufous-crowned sparrow (RCSP).

The Center has conducted yearly surveys for the coastal California gnatcatcher since 2003. We are now switching from yearly surveys to a 3-year cycle of surveys (Table 4), with the next survey planned in 2010. We feel that annual surveys are no needed at this time as the CAGN habitat is of high quality and we have minimized most of the threats to this vegetation community. Protocol surveys include listing all bird species observed while conducting gnatcatcher surveys, and thus a historic detail of bird species presence will continue to inform management decisions.

Task 1. Census coastal California gnatcatchers every three years.

Method: Focused surveys for gnatcatchers will follow current USFWS protocols (with the only deviation being the number of visits, which may be reduced to two versus three survey days, as three is not always necessary), which include three (3) visits separated by at least 7 days within the breeding season. All gnatcatchers and their status (paired, single male, etc) will be noted and mapped, as will any Southern California rufous-crowned sparrows observed while conducting gnatcatcher surveys.

Objective 2. Protect and maintain suitable habitat for orange-throated whiptail and other sensitive species.

Task 1. Note and map orange-throated whiptail and other sensitive species occurrences.

Method: Focused surveys will not take place for the MHCP listed orange-throat whiptail and rufous-crowned sparrow. As stated earlier, we feel the best way to protect these species on the property is to protect and monitor existing habitat. The property is too small to support “populations” of these species, or collecting meaningful population-type data would be too expensive. However, the presence of these and other state and federal listed animal species of concern observed while conducting other monitoring, patrolling, or maintenance activities will be mapped, and included in annual reports.

## **VI. Funding**

Preserve management was funded by an endowment set aside by the Kelly Land Company. The Center received a total endowment of \$296,125 in March of 2002. The endowment as of November 30, 2007 was \$437,679. The inflation-adjusted amount (November, 2007) is \$359,639, which shows that our endowment has kept up with inflation and is not wasting. This endowment generates approximately \$15,000 to \$17,000 of income per year (using a 4.5% capitalization rate). Other funding mechanisms

could include volunteerism, public and private donations, or grants from public agencies or environmental foundations.

## **VII. Reporting and Facility Maintenance**

### **A. Annual Reports and Work Plans**

An annual management and monitoring report and a work plan to cover the subsequent fiscal year will be filed with the City of Carlsbad, the City's Preserve Steward, USFWS and the CDFG by December 15 of each year. Reporting will include:

1. An accounting of funds expended in the management of the Property in the previous year and the status of the endowment.
2. A general description of the status of biological resources on the Property.
3. Biological monitoring results (sensitive species mapped on aerial photographs or vegetation maps).
4. A description of management actions taken on the Property.
5. A description of problems, if any, encountered in managing the Property.
6. A description of management actions the Center expects to undertake in the coming year.

### **B. Management Plans**

Management plans outline the primary goals of preserve management, the management techniques employed, funding mechanisms and budgets, and preserve manager qualifications. Although the City of Carlsbad's Open Space Management Plan calls for Preserve-specific management plans (termed "Area Specific Management Plan's) to be completed every three (3) years, the current annual budget does not provide for this frequency. We also don't feel it is necessary for such a small site. This document will suffice as the second five-year management plan and will be updated in 2013.

### **C. Data**

Various data collected during the year will be entered into MSAccess or MSExcel and/or GIS databases for long-term storage and use. These data will be filed on the Center's server and managed as part of their database. In addition, the Center will submit all GIS layers, such as project boundaries, vegetation, and sensitive species, each year to the City of Carlsbad, the City's Preserve Steward and the wildlife agencies included within the sites annual report.

### **D. Operations**

The Center for Natural Lands Management's main office is in Fallbrook, California (215 West Ash Street, Fallbrook CA 92028; Phone: 760.731.7790). The San Diego field office is based in San Diego (4367 Coronado Ave, San Diego, CA 92107. 619.295.4953). The main office is responsible for field office oversight, fund



management, accounting, and employee benefits and payments. The field office is responsible for the day-to-day management of the Preserve, generating reports and plans, and providing information to the main office for review and long-term filing.

#### **E. Staffing**

The Executive Director of the Center is Sherry Teresa. The Director of Conservation Science is Dr. Deborah Rogers. The San Diego County Area Manager is Markus Spiegelberg. Patrick McConnell is the Preserve Manager. Mr. Spiegelberg's and Mr. McConnell's education and experience are described in Appendix C. Ms. Jessie Vinje, Preserve Manager for the Center, assisted in preparing this management plan, but is generally not involved in this preserve's management.

#### **VIII. References**

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- CNLM 2002. Habitat Management Plan for the Kelly Ranch Habitat Conservation Area. November 2002.
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SJM Biological Consultants. 1998. Report of a trapping survey for Pacific Pocket Mice (*Perognathus longimembris pacificus*) on the 200-acre Kelly Ranch Property. City of Carlsbad, California. December 3, 1998.

Technology Associates International Corporation (TAIC). 2004. City of Carlsbad Open Space Management Plan. May 2004.

U.S. Fish and Wildlife Service, 2000. Biological/Conference Opinion for U.S. Army Corps of Engineers Pre-construction Notification for No. 98-2019900-RLK (Kelly Ranch Core Property), City of Carlsbad, San Diego County, California (1-6-00-FW-21). September 13, 2000.

Wilhere, G.F. 2002. Adaptive management in habitat conservation plans. *Con Bio* 16(1):20-29.

## **APPENDICES**

## Appendix A. Plant Species Observed

Species	Common Name	Status
<i>Acacia</i> spp.*	Acacias	
<i>Achnatherum coronatum</i>	Giant needlegrass	
<i>Acourtia microcephala</i>	Sacapellote	
<i>Adenostoma fasciculatum</i>	Chamise	
<i>Adolphia californica</i>	California spinebush	CNPS 2.1
<i>Agave americana</i> *	American Agave	
<i>Allium praecox</i>	Early onion	
<i>Amaranthus blitoides</i> *	Prostrate amaranth	
<i>Ambrosia psilostachya</i>	Western ragweed	
<i>Amsinkia menziesii</i>	Fiddleneck	
<i>Anagalis arvensis</i> *	Scarlet Pimpernel	
<i>Antirrhinum nuttallianum</i>	Nuttall's snapdragon	
<i>Apiastrum angustifolium</i>	Mock Parsley	
<i>Apium graveolens</i> *	Celery	
<i>Arctostaphylos glandulosa</i> ssp. <i>crassifolia</i>	Del Mar manzanita	CNPS 1B.1, FE
<i>Artemisia californica</i>	Coastal sagebrush	
<i>Artemisia douglasiana</i>	Mugwort	
<i>Artemisia dracunculus</i>	Tarragon	
<i>Atriplex lentiformis</i>	Quail saltbush	
<i>Atriplex pacifica</i>	Pacific saltbush	CNPS 1B.2
<i>Atriplex semibaccata</i> *	Australian saltbush	
<i>Avena</i> spp.*	Wild oats	
<i>Baccharis pilularis</i>	Coyote bush	
<i>Baccharis salicifolia</i>	Mule fat	
<i>Baccharis sarothroides</i>	Broom Baccharis	
<i>Bloomeria crocea</i>	Common goldenstar	
<i>Bothriochloa barbinodis</i>	Plumed beardgrass	
<i>Brassica nigra</i> *	Black mustard	
<i>Brickellia californica</i>	California Brickellbush	
<i>Bromus diandrus</i> *	Ripgut grass	
<i>Bromus hordeaceus</i> *	Soft chess	
<i>Bromus madritensis</i> ssp. <i>rubens</i> *	Foxtail chess	
<i>Calandrinia ciliata</i>	Red maids	
<i>Calochortus concolor</i>	Golden-bowl mariposa	
<i>Calochortus splendens</i>	Splendid mariposa	
<i>Calystegia macrostegia</i>	Morning-glory	
<i>Camissonia bistora</i>	California sun cup	
<i>Cardionema ramosissimum</i>	Tread lightly	
<i>Carex triquetra</i>	Triangular-fruit sedge	
<i>Carpobrotus edulis</i> *	Sea-fig	
<i>Castilleja exserta</i>	Purple owl's clover	



Species	Common Name	Status
<i>Castilleja foliolosa</i>	Woolly Indian paintbrush	
<i>Ceanothus verrucosus</i>	Wart-stemmed Ceanothus	CNPS 2.2, FSC
<i>Centaureum venustum</i> *	Canchalagua	
<i>Cerastium glomeratum</i> *	Mouse-ear chickweed	
<i>Chamaesyce polycarpa</i>	Small-seed sandmat	
<i>Chamomilla suaveolens</i> *	Pineapple weed	
<i>Chenopodium murale</i> *	Nettle-leaf goosefoot	
<i>Chlorogalum parviflorum</i>	Small-flower soap plant	
<i>Chorizanthe fimbriata</i>	Fringed spineflower	
<i>Chorizanthe procumbens</i>	Prostrate spineflower	
<i>Chrysanthemum coronarium</i> *	Chrysanthemum	
<i>Clarkia purpurea</i> ssp. <i>viminea</i>	Large Clarkia	
<i>Claytonia perfoliata</i>	Miner's lettuce	
<i>Clematis pauciflora</i>	Ropevine	
<i>Cneoridium dumosum</i>	Spice bush	
<i>Convulvulus arvensis</i> *	Bindweed	
<i>Convulvulus simulans</i>	Clay bindweed	CNPS 4.2
<i>Conyza canadensis</i> *	Horseweed	
<i>Cordylanthus rigidus</i>	Dark-tip bird's-beak	
<i>Cortaderia jubata</i> *	Pampass grass	
<i>Cotula coronopifolia</i> *	Brass-buttons	
<i>Crassula connata</i>	Pygmy weed	
<i>Cressa truxillensis</i>	Alkali weed	
<i>Cryptantha intermedia</i>	Porcorn flower	
<i>Cucurbita foetidissima</i>	Calabazilla	
<i>Cuscuta californica</i>	Dodder	
<i>Cynodon dactylon</i> *	Bermuda grass	
<i>Daucus pusillus</i>	Rattlesnake weed	
<i>Delphinium parryi</i> ssp. <i>parryi</i>	Parry's larkspur	
<i>Dichelostemma capitatum</i>	Blue dicks	
<i>Dichondra occidentalis</i>	Western Dichondra	CNPS 4.2
<i>Distichlis spicata</i>	Saltgrass	
<i>Dodecatheon clevelandii</i>	Shooting star	
<i>Dudleya edulis</i>	Lady-fingers	
<i>Dudleya lanceolata</i>	Coastal Dudleya	
<i>Dudleya pulverulenta</i>	Chalk Dudleya	
<i>Echium</i> sp.*	Echium	
<i>Encelia californica</i>	California Encelia	
<i>Epilobium canum</i>	California Fuchsia	
<i>Eremocarpus setigerus</i>	Doveweed	
<i>Eriodictyon crassifolium</i>	Thick-leaved Yerba Santa	
<i>Eriogonum elongatum</i>	Tall buckwheat	
<i>Eriogonum fasciculatum</i>	Flat-top buckwheat	

Species	Common Name	Status
<i>Eriophyllum confertiflorum</i>	Long-stem golden-yarrow	
<i>Erodium cicutarium</i> *	Red-stem filaree	
<i>Erodium moschatum</i> *	White-stem filaree	
<i>Eschscholzia californica</i>	California poppy	
<i>Eucalyptus</i> spp.*	Eucalyptus species	
<i>Euphorbia misera</i>	Cliff spurge	CNPS 2.2
<i>Filago californica</i>	California Filago	
<i>Filago gallica</i> *	Narrow-leaf Filago	
<i>Foeniculum vulgare</i> *	Sweet Fennel	
<i>Galium angustifolium</i>	Narrow-leaved bedstraw	
<i>Gastridium ventricosum</i> *	Nit grass	
<i>Gnaphalium bicolor</i>	Bicolor cudweed	
<i>Gnaphalium californicum</i>	California everlasting	
<i>Gnaphalium palustre</i>	Everlasting	
<i>Grindelia camporum</i>	Gumplant	
<i>Gutierrezia sarothrae</i>	Matchweed	
<i>Harpagonella palmeri</i>	Palmer's grappling hook	CNPS 4.2
<i>Hazardia orcuttii</i>	Orcut's goldenbush	CNPS 1B.1, ST, FSC
<i>Hazardia squarrosa</i>	Saw-toothed goldenbush	
<i>Hedypnois cretica</i> *	Crete Hedypnois	
<i>Helianthemum scoparium</i> *	Rush-rose	
<i>Heliotropium curassavicum</i>	Salt heliotrope	
<i>Hemizonia fasciculata</i>	San Diego tarplant	
<i>Heteromeles arbutifolia</i>	Toyon	
<i>Heterotheca grandiflora</i>	Telegraph weed	
<i>Hypochaeris glabra</i> *	Smooth cat's-ear	
<i>Hirschfeldia incana</i> *	Shortpod mustard	
<i>Hordeum murinum</i> *	Wild barley	
<i>Isocoma menziesii</i>	Goldenbush	
<i>Isomeris arborea</i>	Bladderpod	
<i>Jepsonia parryi</i>	Coast Jepsonia	
<i>Juncus bufonius</i>	Toad rush	
<i>Keckiella cordifolia</i>	Climbing bush Pestemon	
<i>Lactuca serriola</i> *	Wild lettuce	
<i>Lamarckia aurea</i> *	Goldentop	
<i>Lasthenia glabrata</i> [californica]	Common goldfields	
<i>Lathyrus laetiflorus</i>	San Diego sweet pea	
<i>Layia playglossa</i>	Common tidy-tips	
<i>Lepidium lasiocarpum</i>	Sand peppergrass	
<i>Lessingia filaginifolia</i> var. <i>filaginifolia</i>	San Diego sand-aster	
<i>Leymus condensatus</i>	Giant wild rye	
<i>Linanthus dianthiflorus</i>	Ground pink	
<i>Linaria canadensis</i>	Blue toadflax	
<i>Lolium</i> spp.*	Ryegrass	

Species	Common Name	Status
<i>Lomatium dasycarpum</i>	Woolly-fruit Lomatium	
<i>Lonicera subspicata</i>	San Diego honeysuckle	
<i>Lotus hamatus</i>	Grab lotus	
<i>Lotus scoparius</i>	Deerweed	
<i>Lupinus bicolor</i>	Bicolored lupine	
<i>Lupinus concinnus</i>	Bajada lupine	
<i>Lupinus hirsutissimus</i>	Stinging lupine	
<i>Lupinus truncatus</i>	Collar lupine	
<i>Lycium andersonii</i>	Waterjacket	
<i>Lycium californicum</i>	California desert-thorn	
<i>Lythrum hyssopifolium</i> *	Grass poly	
<i>Malacothamnus fasciculatus</i>	Bushmallow	
<i>Malosma laurina</i>	Laurel sumac	
<i>Malva parviflora</i> *	Cheeseweed	
<i>Mammillaria dioica</i>	Fish-hook cactus	
<i>Marah macrocarpus</i>	Wild-cucumber	
<i>Marrubium vulgare</i> *	Horehound	
<i>Matricaria matricarioides</i> *	Pineapple weed	
<i>Medicago polymorpha</i> *	Bur-clover	
<i>Melica imperfecta</i>	Coast range melic	
<i>Melilotus albus</i> *	White sweetclover	
<i>Melilotus indica</i> *	Yellow sweet clover	
<i>Mesembryanthemum crystallinum</i> *	Crystalline iceplant	
<i>Mesembryanthemum nodiflorum</i> *	Slender-leaved iceplant	
<i>Mimulus aurantiacus</i>	Coast monkey flower	
<i>Mirabilis californica</i>	Coastal wishbone plant	
<i>Muhlenbergia microsperma</i>	Littleseed muhly	
<i>Nasella pulchra</i>	Purple needlegrass	
<i>Navarretia hamata</i>	Skunkweed	
<i>Nicotiana glauca</i> *	Tree Tobacco	
<i>Opuntia ficus-indica</i> *	Indian-fig	
<i>Opuntia littoralis</i>	Coastal prickly-pear	
<i>Opuntia prolifera</i>	Cholla	
<i>Osmadenia tenella</i>	Osmadenia	
<i>Oxalis albicans</i>	California wood-sorrel	
<i>Pellaea mucronata</i>	Bird's foot cliff-brake	
<i>Pentachaeta aurea</i>	Golden-rayed Pentachaeta	
<i>Pentagramma triangularis</i> ssp. <i>triangularis</i>	Goldenback fern	
<i>Pentagramma triangularis</i> ssp. <i>viscosa</i>	Silverback fern	
<i>Phacelia cicutaria</i>	Caterpillar Phacelia	
<i>Pholistoma auritum</i>	Fiesta flower	
<i>Picris echioides</i> *	Bristly ox-tongue	
<i>Pinus torreyana</i>	Torrey pine	CNPS 1B.2, FSC
<i>Plagiobothrys acanthocarpus</i>	Adobe popcornflower	

Species	Common Name	Status
<i>Plantago erecta</i>	Dot-seed plantain	
<i>Platanus racemosa</i>	California sycamore	
<i>Platystemon californicus</i>	Cream cups	
<i>Pluchea odorata</i>	Salt marsh fleabane	
<i>Polygonum arenastrum</i> *	Common knotweed	
<i>Polypodium californicum</i>	California polypody	
<i>Polypogon</i> spp.*	Beard grass	
<i>Prunus ilicifolia</i>	Holly-leaved cherry	
<i>Pterostegia drymarioides</i>	Granny's hairnet	
<i>Quercus agrifolia</i>	Coast live oak	
<i>Quercus berberidifolia</i>	Inland scrub oak	
<i>Quercus dumosa</i>	Nuttall's Scrub Oak	1B.1
<i>Rafinesquia californica</i>	California chicory	
<i>Rhamnus crocea</i>	Spiny redberry	
<i>Rhamnus ilicifolia</i>	Holly-leaf redberry	
<i>Rhaphanus sativa</i> *	Wild radish	
<i>Rhus integrifolia</i>	Lemonade-berry	
<i>Ribes speciosum</i>	Fuchsia-flowered gooseberry	
<i>Rorippa nasturtium-aquaticum</i> *	Water-cress	
<i>Rumex crispus</i> *	Curly dock	
<i>Sarcocornia pacifica</i> [ <i>Salicornia virginica</i> ]	Pacific pickleweed	
<i>Salsola tragus</i> *	Tumbleweed	
<i>Salvia apiana</i>	White sage	
<i>Salvia columbariae</i>	Chia	
<i>Salvia mellifera</i>	Black sage	
<i>Sambucus mexicana</i>	Blue elderberry	
<i>Schinus molle</i> *	Peruvian pepper tree	
<i>Schismus barbatus</i> *	Mediterranean Schismus	
<i>Scrophularia californica</i>	California figwort	
<i>Selaginella bigelovii</i>	Bigelow's spike-moss	
<i>Selaginella cinerascens</i>	Ashy spike-moss	
<i>Senecio vulgaris</i> *	Common groundsel	
<i>Sidalcea malvaeflora</i>	Checker-bloom	
<i>Silene gallica</i> *	Common catchfly	
<i>Silene laciniata</i>	Fringed Indian pink	
<i>Silybum marianum</i> *	Milk-thistle	
<i>Sisymbrium irio</i> *	London rocket	
<i>Sisyrinchium bellum</i>	Blue-eyed-grass	
<i>Solanum douglasii</i>	Douglas' nightshade	
<i>Sonchus oleraceus</i> *	Common sow-thistle	
<i>Spergula arvensis</i> *	Stickwort starwort	
<i>Spergularia macrotheca</i>	Sticky sand-spurry	
<i>Stachys ajugoides</i>	Hedge nettle	
<i>Stephanomeria diegensis</i>	San Diego wreath-plant	

Species	Common Name	Status
<i>Stylocline gnaphalioides</i>	Everlasting nest-straw	
<i>Toxicodendron diversilobium</i>	Poison oak	
<i>Trichostema lanceolatum</i>	Vinegar weed	
<i>Uropappus lindleyi</i>	Silver puffs	
<i>Urtica urens</i> *	Dwarf nettle	
<i>Vicia ludoviciana</i> *	Deerpea vetch	
<i>Vulpia myuros</i> *	Foxtail fescue	
<i>Xanthium strumarium</i> *	Cocklebur	
<i>Xylococcus bicolor</i>	Mission manzanita	
<i>Yucca schidigera</i>	Mojave Yucca	
<i>Hesperoyucca [Yucca] whipplei</i>	Our lord's candle	

The symbol \* denotes non-native plants

CNPS: California Native Plant Society ranking system.

- 1B. Rare or Endangered in California and elsewhere
- 2. Rare or Endangered in California, more common elsewhere
- 3. Plants for which more information is needed. CNPS review list
- 4. Plants of limited distribution. CNPS watch list.
- .1 Seriously endangered in California
- .2 Fairly endangered in California
- .3 Not very endangered in California

FE: Federal Endangered

FSC: Federal Species of Concern

ST: State Threatened

## Appendix B. Animal Species Observed

Species	Common Name	Status
Birds		
<i>Corvus brachyrhynchos</i>	American crow	
<i>Falco sparverius</i>	American kestrel	
<i>Calypte anna</i>	Anna's hummingbird	
<i>Myiarchus cinerascens</i>	Ash-throated flycatcher	
<i>Thryomanes bewickii</i>	Bewick's wren	
<i>Sayornis nigricans</i>	Black phoebe	
<i>Poliophtila caerulea</i>	Blue-gray gnatcatcher	
<i>Molothrus ater</i>	Brown-headed cowbird	
<i>Psaltiriparus minimus</i>	Bushtit	
<i>Poliophtila californica californica</i>	California gnatcatcher	SSC, FT
<i>Toxostoma redivivum</i>	California thrasher	
<i>Pipilo crissalis</i>	California towhee	
<i>Petrochelidon pyrrhonota</i>	Cliff swallow	
<i>Corvus corax</i>	Common raven	
<i>Geothlypis trichas</i>	Common yellowthroat	
<i>Accipiter cooperii</i>	Cooper's hawk	SSC
<i>Calypte costae</i>	Costa's hummingbird	
<i>Bubo virginianus</i>	Great horned owl	
<i>Icterus cucullatus</i>	Hooded oriole	
<i>Carpodacus mexicanus</i>	House finch	
<i>Troglodytes aedon</i>	House wren	
<i>Charidrius vociferus</i>	Killdeer	
<i>Carduelis psaltria</i>	Lesser goldfinch	
<i>Zenaida macroura</i>	Mourning dove	
<i>Circus cyaneus</i>	Northern Harrier	SSC
<i>Mimus polyglottos</i>	Northern Mockingbird	
<i>Stelgidopteryx serripennis</i>	Northern rough-winged swallow	
<i>Picoides nuttallii</i>	Nuttall's woodpecker	
<i>Vermivora celata</i>	Orange-crowned warbler	
<i>Buteo jamaicensis</i>	Red-tailed hawk	
<i>Agelaius phoeniceus</i>	Red-winged blackbird	
<i>Sayornis saya</i>	Say's phoebe	
<i>Melospiza melodia</i>	Song sparrow	
<i>Pipilo maculatus</i>	Spotted towhee	
<i>Aphelocoma californica</i>	Western scrub-jay	
<i>Zonotrichia leucophrys</i>	White-crowned sparrow	
<i>Chamaea fasciata</i>	Wrentit	



Species	Common Name	Status
Mammals		
<i>Spermophilus beecheyi nudipes</i>	California ground squirrel	
<i>Canis latrans</i>	Coyote	
<i>Sylvilagus auduboni</i>	Desert (Audubon) cottontail	
<i>Procyon lotor</i>	Raccoon	
<i>Chaetodipus fallax fallax</i>	San Diego Pocket Mouse	
<i>Peromyscus californicus</i>	California mice	
<i>P. eremicus</i>	Cactus mice	
<i>Neotoma fuscipes</i>	Dusky-footed woodrat	
<i>N. lepida intermedia</i>	San Diego desert woodrat	
<i>Reithrodontomys megalotis</i>	Western harvest mouse	
Reptiles and Amphibians		
<i>Elgaria multicarinata webbi</i>	San Diego alligator lizard	
<i>Sceloporus occidentalis biseriatus</i>	San Joaquin fence lizard	
<i>Uta stansburiana</i>	Side blotched lizard	
<i>Aspidoscelis tigris stejnegeri</i>	Coastal whiptail lizard	
<i>Sceloporus occidentalis</i>	Western fence lizard	
<i>Crotalus ruber</i>	Southern pacific rattlesnake	
<i>Cnemidophorus hyperythrus beldingi</i>	Orange-throated whiptail	
<i>Pseudacris regilla</i>	Pacific treefrog	
Insects		
<i>Vanessa cardui</i>	Painted lady	
<i>Plebejus acmon</i>	Acmon blue	
<i>Apodemia virgulti</i>	Behr's metalmark	

SSC = State Species of Concern

FT = Federally Threatened

## **Appendix C. Staff Qualifications**

# **Patrick McConnell**

## **Botanist, Preserve Manager**

### ***Professional summary***

Mr. McConnell has over 8 years experience in field biology, primarily in the subject area of plant ecology. He has been involved in numerous survey efforts for state and federally listed plant species in a variety of settings. He has lead monitoring efforts in many southern California ecosystems, including: coastal sage scrub, chaparral, mountain, riparian, and desert habitats. Mr. McConnell has been instrumental in the design and setup of experimental efforts involving manipulation of habitat variables related to the success of the federally endangered willow monardella (*Monardella linoides* ssp. *vimineaa*) and the federally threatened thread leaved brodiaea (*Brodiaea filifolia*). His experience incorporates current research and knowledge of long term monitoring methodology. Mr. McConnell has experience with vegetation cover analyses using point intercept, subplots, line intercept, and rapid assessments. He has been involved with plant restoration in coastal and desert areas of California, and has a strong background in pollinator biology.

### ***Professional qualifications***

Certifications/Permits

OSHA 40-Hour Hazardous Material Operations and Emergency Response Training  
(29 CFR 1910.120), initial certification 2005

CDFG Amended Scientific Collecting Permit (SCP) # SC 8543

CDFG Rare, Threatened and Endangered Plant Voucher Collecting Permit # 07007

### ***Education***

MS, Biology, Emphasis in Ecology, San Diego State University, San Diego, CA, May 2006

BS, Biology, Emphasis in Ecology, San Diego State University, San Diego, CA, Dec 1999

Additional training

Attended the California Anostracan and Notostracan Identification Class, completed practical exam August 2005

### ***Memberships***

California Native Plant Society: An active participant in the Vegetation Committee of the San Diego Chapter of the CNPS

## **Summary of core skills**

### **Areas of expertise**

- Invertebrate biology
- Biological monitoring
- Botanical surveys
- Rare plant surveys and botanical studies
- Native plant community restoration
- Habitat restoration and conservation planning
- Reporting, mapping, and assessment of plant communities, habitats, and wetlands
- Aerial photo interpretation of land use on natural resources in non-urban areas
- Geographic Information Systems (GIS)

### **Conservation biology/habitat management**

As a Preserve Manager, Mr. McConnell manages 5 preserves, totaling 924 acres. Aside from the general duties of a preserve manager, his management has involved rare plant monitoring, vegetation assessments using line and subplot point-intercept, rapid assessments, rare plant mapping, and study plot design and setup.

At AMEC in 2005, Mr. McConnell took a lead role in drafting the Cocklebur Mesa Ecosystem Conservation and Enhancement Plan for Marine Corps Base Camp Pendleton. An expert at plant taxonomy and habitat evaluation, he has aided in a number of habitat assessments and plans for private interests and municipalities.

### **Botany/plant ecology**

Mr. McConnell has been heavily relied upon as a taxonomist for the task of building plant species lists for several positions, and dozens of projects in his career thus far. His experience incorporates current research and knowledge of long term monitoring methodology, and sampling design strategies. He has lead plant monitoring and censusing efforts in many southern California ecosystems, including: coastal sage scrub, chaparral, montane, riparian, and desert habitats. Mr. McConnell can design a properly conceived, and practically implemented monitoring effort that will generate sound, scientifically rigorous data. He is also actively involved with the San Diego Natural History Museum's Plant Atlas Project, and the Vegetation Committee of the CNPS.

### **Restoration ecology**

Mr. McConnell has managed several projects involving habitat management, enhancement, and restoration, and has several years of background employment to bring to his current position managing preserves for the Center.

### **Plant community/habitat mapping and assessment**

Mr. McConnell maps vegetation communities for small scale as well as regional mapping efforts using on-site aerial photo interpretation, and a well developed knowledge of vegetation associations.

## General ecology

Mr. McConnell has been helpful in the design and setup of experimental efforts involving manipulation of habitat variables related to the success of the federally endangered willowy monardella, thread leaved brodiaea, and the quino checkerspot butterfly. Mr. McConnell completed an M.S. in Biology at San Diego State University that involved research into species-environment interactions, publication of a thesis, coursework in systematics, ecology, and evolution, and public seminars in proposal and defense of his thesis work.

Mr. McConnell also has many additional skills to bring to the employer, such as experience with performing rapid assessments of plant communities, a strong background in pollinator biology, insect taxonomy, and in the use of insects as indicators of habitat integrity. Mr. McConnell is well grounded in statistics, with a firm grasp of study design and data collection protocols that lead to sound results in any scientific endeavor.

## **Details by project**

### **December 2006 – Present:**

**Preserve Manager, Center for Natural Lands Management, San Diego County, CA.** Since beginning work with the Center in December 2006, Mr. McConnell has been involved with all aspects of preserve management, and is solely responsible for the day to day management of 5 preserves. Mr. McConnell has participated in the annual presence/absence surveys of the federally threatened coastal California gnatcatcher (*Poliioptila californica californica*). Additionally, he has begun yearly habitat evaluation and population estimates of the federally threatened San Diego thornmint (*Acanthomintha ilicifolia*), and thread-leaved brodiaea (*Brodiaea filifolia*). Baseline surveys and mapping of other State and CNPS listed species are currently underway in two of the preserves.

### **February 2005 – 2006 AMEC Earth and Environmental**

**Endangered Willowy Monardella Habitat Enhancement, MCAS Miramar, San Diego, CA.** Project botanist for this enhancement project with the overall goal to protect existing populations of the federally endangered willowy monardella (*Monardella viminea*) and improve current habitat conditions so that these populations can expand. Mr. McConnell developed the population assessment, and carried out population counts, as well as ground and live cover estimates by species for all patches where willowy monardella is extant. Upon summarizing population status throughout Miramar, he performed an analysis of population status from previous counts, and statistical evaluation of factors responsible for population declines. Upon reaching conclusions as to the threats present, Mr. McConnell wrote the technical portions of the document describing the scientifically defensible methods for a population enhancement experiment. This enhancement design was approved by MCAS Miramar, and is currently underway.

**Cocklebur Mesa Vernal Pool Conservation Plan, Marine Corps Base, Camp Pendleton, Land Management Branch, San Diego, CA.** Ecologist/botanist on this

vernal pool conservation plan project involving vernal pool assessment, fairy shrimp surveys, rare plant surveys, development of conservation/restoration priorities, and implementation of restoration/enhancement in the vernal pool and upland habitat. Responsible for collection, organization, and presentation of data and current knowledge relating to the ecology of vernal pool, coastal sage scrub, grassland, riparian, marsh, and beach plant communities at Cocklebur Mesa. As the primary author of the Cocklebur Mesa Ecosystem Conservation and Enhancement Plan, he incorporated the majority of long-term monitoring and management strategies for the Mesa. As a result of gathering available literature relating to managing and enhancing vernal pools, Mr. McConnell has become quite knowledgeable of the ecology of, and long-term management strategies for vernal pool habitats. Research for suggested management actions included correspondence with local experts at San Diego State University, and the U.S. Fish and Wildlife Service in Carlsbad.

**Camp Pendleton Pipeline Restoration Project, Kinder Morgan Energy Partners, L.P., MCB Camp Pendleton, CA.** Biologist on 26-mile pipeline restoration project. Mr. McConnell monitored restoration progress in habitats representing coastal sage scrub, wetland, riparian scrub, riparian woodland, freshwater seep, oak woodland, sycamore grassland, and native grassland. Project also included mitigation for impacts to the federally threatened thread-leaved brodiaea populations along the pipeline. Responsible for qualitatively, and quantitatively monitoring these habitats during the last season of required reporting, helped in the production of the final report to Base, and the U.S. Fish and Wildlife Service. Drafted a suggested alternative mitigation for the thread-leaved brodiaea populations impacted by the construction of this pipeline. Research for this report involved current and past work with the restoration of this species, and suggesting alternative research that would serve to increase understanding of the species' ecology.

**Camp Pendleton Chappo Post Fire Weed Management Project, MCB Camp Pendleton Environmental Security, Land Management Branch, Camp Pendleton, CA.** Biologist as part of team responsible for monitoring the species diversity and vegetative cover of plants throughout a weed dominated post-fire landscape (137 acre site), and incorporating this information, directed the contractor to focus various weed management strategies where most appropriate. Other objectives included monitoring native plant recovery and tracking costs to determine efficient management techniques, qualitatively mapping exotic weed communities and quantitatively monitoring vegetation responses.

**Antelope Renewables Project (Phase II), Southern California Edison, Los Angeles, Riverside, and San Bernardino Counties, CA.** Botanist for general corridor level biological surveys along approximately 73 miles of high-voltage transmission line right-of-way (ROW). The project included the tear-down and rebuild of transmission lines primarily within existing ROWs. Provided a technical report that served as the basis for the biological portions of the corresponding Proponent's Environmental Assessment.

**Biological and Botanical Resources Assessments, Southern California Edison, Riverside County, CA.** Biologist/botanist for biological and botanical resources



assessments for the proposed Valley-Ivyglen Transmission Line and Fogerty Substation. Documented the biological resources associated with construction of a new 115kV transmission line. Conducted biological habitat assessment surveys for sensitive plant species within 11 potential land parcels which provided an overview of existing and potential sensitive plant resources within the project area. Evaluated consistency with the MSHCP, and determined what focused sensitive species surveys or wetland/jurisdictional waters delineation would be necessary for further project review.

**February – June 2005 San Diego State University Foundation Resource Assessment Program.**

Responsible for surveying and building a species list for the newly acquired San Felipe Wildlife Management Area in eastern San Diego County. One of three botanists involved with building a species list, and mapping the distribution and abundance of state and CNPS listed rare plants throughout this area. Also aided the Dept. of Fish and Game in mapping vegetation assemblages using CNPS rapid assessment criteria.

**1999 – 2005 San Diego State University Foundation**

Worked part-time for Dr. Kathy Williams, mostly identifying arthropods, and performing rare plant pollinator surveys (See publications). Involved with setting up landscape scale experimental plots using manipulation of herbicides in controlling non-native grasses and forbs, and in botanical monitoring. This work concerned the recovery of the Quino checkerspot butterfly's host plant, *Plantago erecta* in an area where this plant had become uncommon due to the intrusion of non-natives.

Performed pollinator surveys for Dr. Ellen Bauder in a comparison of the common fasciated tarplant and the federally threatened Otay tarplant pollinator assemblages. This work included notation of habits while visiting, pollen presence/absence, and identification to family and/or genus (Ecology and Management of *Deinandra conjugens* (D. D. Keck) B. G. Baldwin (Otay tarplant) Contract # FG 8058 HP).

**2004 Environmental Careers Organization**

Performed wide-scale surveys for the Federally threatened Peirson's milkvetch (*Astragalus magdalenae* var. *peirsonii*) and other rare plants in the Algodones Dunes of Imperial County, California, as contracted under the supervision the Bureau of Land Management, El Centro Office.

***Employment history***

Oct 2007 – Present	Preserve Manager, Center for Natural Lands Management
2006 – Sept 2007	Assistant Preserve Manager, Center for Natural Lands Management
2005 – 2006	Botanist/Plant Ecologist, AMEC Earth and Environmental, Inc.
2005	Botanist, San Diego State University Foundation, Resource Assessment Program

1999 – 2005	Biologist/Research Assistant, San Diego State University Foundation, Dr. Kathy Williams
2004	Plant Ecologist, Environmental Careers Organization, under contract with Bureau of Land Management, Algodones Dunes, CA
2003 – 2004	Restoration Ecologist, San Diego State University Foundation, Soil Ecology and Restoration Group
2000 – 2002	Teaching Assistant, Biostatistics, San Diego State University
1999 – 2003	Research Assistant, San Diego State University Foundation, Paul Zeddler's Systems Ecology Lab
1995 – 1999	Work Study, Veterans Administration, San Diego
1990 – 1994	Personnelman Third Class, U.S. Navy

### ***Presentations/publications***

McConnell, P. O. 2006. Effects of herbivory by *Opsiurus stactogalus* Fieber and edaphic factors on growth and resource allocation in *Tamarix*. M.S. Thesis, San Diego State University.

Williams, K. S., Bailey, D. C., and P. McConnell. 2005. Potential pollinators of rare plants, *Downingia concolor* ssp. *brevior*, *Limnanthes gracilis* ssp. *parishii*, *Horkelia clevelandii*, and *Delphinium hesperium* ssp. *cuyamaca*. Technical report to California Dept. of State Parks and Recreation. Standard Agreement # C0243013.

McConnell, P., and K. Williams. 2000. Beetle diversity among sites along the San Pedro River, Arizona. San Diego State University College of Sciences Undergraduate Research Symposium.

# MARKUS SPIEGELBERG

## AREA MANAGER, ECOLOGIST, WILDLIFE BIOLOGIST

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**Education/** Master of Science, Biology, San Diego State University, 1997  
**Certifications** *Thesis:* Extra-pair paternity in least Bell's vireo  
Bachelor of Arts, Environmental Science, University of California, Berkeley, 1990  
*Thesis:* Sediment survey in the Montclair Park Pond

**Permits** U.S. Fish and Wildlife Service Permit #PRT-787924 for California gnatcatcher, southwestern willow flycatcher (survey and nest monitor), and least Bell's vireo (nest monitoring), and remove cowbird eggs and chicks from these species. Permitted to trap San Bernadino kangaroo rat  
U.S. Fish and Wildlife Service Permit #PRT-787924 to survey for quino checkerspot butterfly  
California Department of Fish and Game Scientific Collector's Permit (#801082) covering herp pit-arrays, small mammal trapping and cowbird egg and chick removal  
Memorandum of Understanding with the California Department of Fish and Game for California gnatcatcher, least Bell's vireo, and willow flycatcher to nest monitor and remove cowbird eggs and chicks

**Experience** 17 years of experience

### **Center for Natural Lands Management**

1999-present, Preserve Manager and San Diego Area Manager  
I oversee and participate in management activities of 3,500 acres of dedicated natural open space located in San Diego County. I work with several endangered plant and animal species, develop and implement research programs and activities, and remove non-native plants and animals. I produce management plans, annual reports, work plans and budgets. I supervise 3 employees.

### **Center for Natural Lands Management**

March 2002-March 2003, Southern California Regional Director  
Oversight of CNLM preserve management in western Riverside County which included over 20 preserves and 5 employees.

### **RECON Environmental Inc.**

1997-1999, Ecologist, Wildlife Biologist, Consultant  
Worked as a biological consultant. Surveyed and monitored sensitive wildlife species and consulted with land owners and federal and state agencies.

### **MS Biological Services**

1996-1999, Independent Wildlife Biologist

**San Diego State University, Department of Biology**

1995-1996, Wildlife Biologist

Research on least Bell's vireo including surveys, nest monitoring, mist netting, DNA fingerprinting, and data analysis.

**University of California, Riverside**

1996, Wildlife Biologist

Small mammal trapping in the spring and fall at Torrey Pines State Park, Pauma Valley, Point Loma, Sweetwater Preserve, and San Pasqual.

**California Department of Transportation, District 11**

1992-1995 and 1996-1997, Contract Ecologist

**San Diego State University, Department of Biology**

1995, Teaching Assistant

**BioSystems Analysis, Inc.**

1992, Intern

**Parks and Recreation, Oakland**

1989-1990, Environmental Technician

**CNLM  
Management  
Plans**

2005-2010 Management Plan for the Rancho La Costa Habitat Conservation Area

Habitat Management Plan for the La Costa Villages Preserve

2005-2010 Management Plan for the Manchester Habitat Conservation Area

2005-2010 Management Plan for the Woodridge Habitat Conservation Area

2000-2004 Management Plan for the Woodridge Habitat Conservation Area

2001-2004 Management Plan for the Wilmont Habitat Conservation Area

2002-2005 Preliminary Management Plan for the Morro Hills Preserve

2002-2006 Management Plan for the Kelly Ranch Preserve

**Sensitive  
Species  
Focused  
Surveys and  
Reports**

Participated in surveys of over 1,000 vernal pools for San Diego fairy shrimp, Riverside fairy shrimp and versatile fairy shrimp at U.S. Marine Base, Camp Pendleton, San Diego

Murphy Canyon/Chollas Heights naval family housing vernal pool preserve fairy shrimp surveys

1998 and 1999 field surveys and progress reports for the coastal California gnatcatcher on-site monitoring study for the Rancho del Rey SPA III development in Chula Vista

## **Research Projects**

Del Mar sand aster directed survey (Caltrans District 11)  
California gnatcatcher surveys for Interstate 5/805 widening (Caltrans District 11)  
Light-footed clapper rail surveys in Peñasquitos Lagoon (Caltrans District 11)  
California gnatcatcher surveys at selected potential Caltrans mitigation sites such as Lawrence Canyon, Pilgrim Creek, Blue Sky Ranch, Willow Glen, and Lake Hodges in addition to numerous other smaller sites within the Poway, Oceanside, and Fallbrook areas (Caltrans District 11)  
Coastal cactus wren territory mapping and surveys for interchange improvements at State Route 54 and Briarwood Drive and Sweetwater Road (Caltrans District 11)  
Currently conducting several research projects on CNLM lands in San Diego County. Research includes studying the effects of fragmentation on bird and small mammal populations. Also includes a study of the reproductive success of least Bell's vireo in small, fragmented patches of willow woodland.  
Work Plan for Effects of Noise on Least Bell's Vireo at MCAS Pendleton (co-author)  
Work Plan for Effects of Noise on Coastal California Gnatcatcher at MCAS Miramar (co-author)  
Field Surveys and First-Year Study Report of the Effects of Noise on Least Bell's Vireo at MCAS Camp Pendleton  
Field Surveys and First-Year Study Report of the Effects of Noise on Coastal California Gnatcatcher at MCAS Miramar

## **Habitat Restoration Plans and Monitoring Programs**

Bonita Road Mitigation Site, Caltrans  
First Annual Report for Bonita Road Mitigation Site, Caltrans

## **Selected Projects**

### **Biological Resources Inventory and Analysis Reports**

Otay Water District Pointe Reservoirs, City of Chula Vista  
Mission Trails Business Park, City of San Diego  
Sunwest II, City of Oceanside  
Beyer Hills, City of San Diego  
Sorrento Pointe, City of San Diego  
Biological Assessment: Oceanside Detention Basins, City of Oceanside  
Intersection 606 and Rigsbee Parcel, City of San Diego  
Shaw and Lorenz Parcels, City of San Diego  
Gildred Property, San Diego County  
East J Street School Site, City of Chula Vista  
Brandywine Site, City of Chula Vista  
Interstate 15 Widening at Pomerado, Caltrans  
I-15/Balboa Pipe Realignment, Caltrans  
SR-67 Pavement Overlays, Caltrans

**Publications** Sediment Survey in the Montclair Park Pond. In *Conservation and Restoration in San Francisco California*, edited by D. Sloan. U.C. Berkeley. 1990.

An Investigation of Extra-pair Paternity in Least Bell's Vireo, *Vireo bellii pusillus*.  
Master's Thesis. San Diego State University.

**Workshops  
and  
Symposiums** Cuyamacca Fire Conference, 2004. Effects of the Cedar Fire in San Diego on the  
conifer forests of Cuyamacca State Park.

Wildlife Society Symposium 2002, Riverside, California  
Declining Reptiles and Amphibians, Parts 1 & 2, San Diego Natural History  
Museum, 1997, 1998  
Participant in the Avifauna Workshop for the Coachella Valley MSHCP, 1997,  
and General Planning Meeting, 1998  
Least Bell's vireo and southwestern willow flycatcher recovery meetings, 1995-  
1998  
Fifth Mountain Lion Workshop, 1996  
Willow Flycatcher Workshop, San Diego Natural History Museum, 1996  
Calgnat '95, symposium on the biology of the California gnatcatcher, 1995  
Exotic Pest Plant Symposium, 1994  
Bird Banding Workshop, Inyo County, 1993

**Grants and  
Fellowships** Sigma Xi National Chapter, 1995  
Sigma Xi San Diego Chapter, 1996