

**Carlsbad Oaks North
Habitat Conservation Area**
(CNLM No: S034)

Annual Report
October 2009 - September 2010

Prepared for:

U.S. Fish and Wildlife Service

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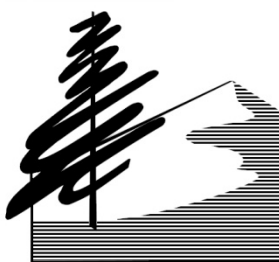
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I. Introduction

This report summarizes the management activities performed by the Center for Natural Lands Management (Center, CNLM) at the Carlsbad Oaks North Habitat Conservation Area (HCA) during the management year beginning on October 1, 2009, and ending on September 30, 2010. The management items discussed below have been developed from the guidelines for goals and objectives set forth in Carlsbad Oaks North Annual Work Plan (CNLM 2009) and the Carlsbad Oaks North Habitat Conservation Area Preserve Management Plan (PMP) dated January 2005 (Tierra Data 2005).

The HCA is comprised of four non-contiguous units separated north-south by the new extension of Faraday Avenue and east-west by the new extension of El Fuerte Avenue which ties into Faraday Avenue near the center of the HCA. The HCA is located in the east central portion of Carlsbad, northeast of the intersection of El Camino Real and Palomar Airport Roads (Figures 1 and 2).

The HCA covers 326 acres, of which 108.4 acres are located within a conservation easement (CE) on lands owned by the County of San Diego. The CE was transferred to the Center in November of 2005. The Center received funds to manage the CE portion in May of 2006 at which time management activities commenced. The Center received fee title for the remaining 219.6 acres from the previous owner, Techbilt Construction Corporation (Techbilt), the developer of the Carlsbad Oaks North Business Park, in March of 2007. This HCA is to be managed for the purpose of preserving sensitive biological resources and to meet the City's obligation to their Habitat Management Plan (HMP), and north San Diego County's Multiple Habitat Conservation Program (MHCP).

Management includes installing and maintaining fences and gates (capital improvements), biological surveys, habitat maintenance and restoration, public services, and reporting. Each of these activities and their fiscal year results are summarized below and fully described within this report.

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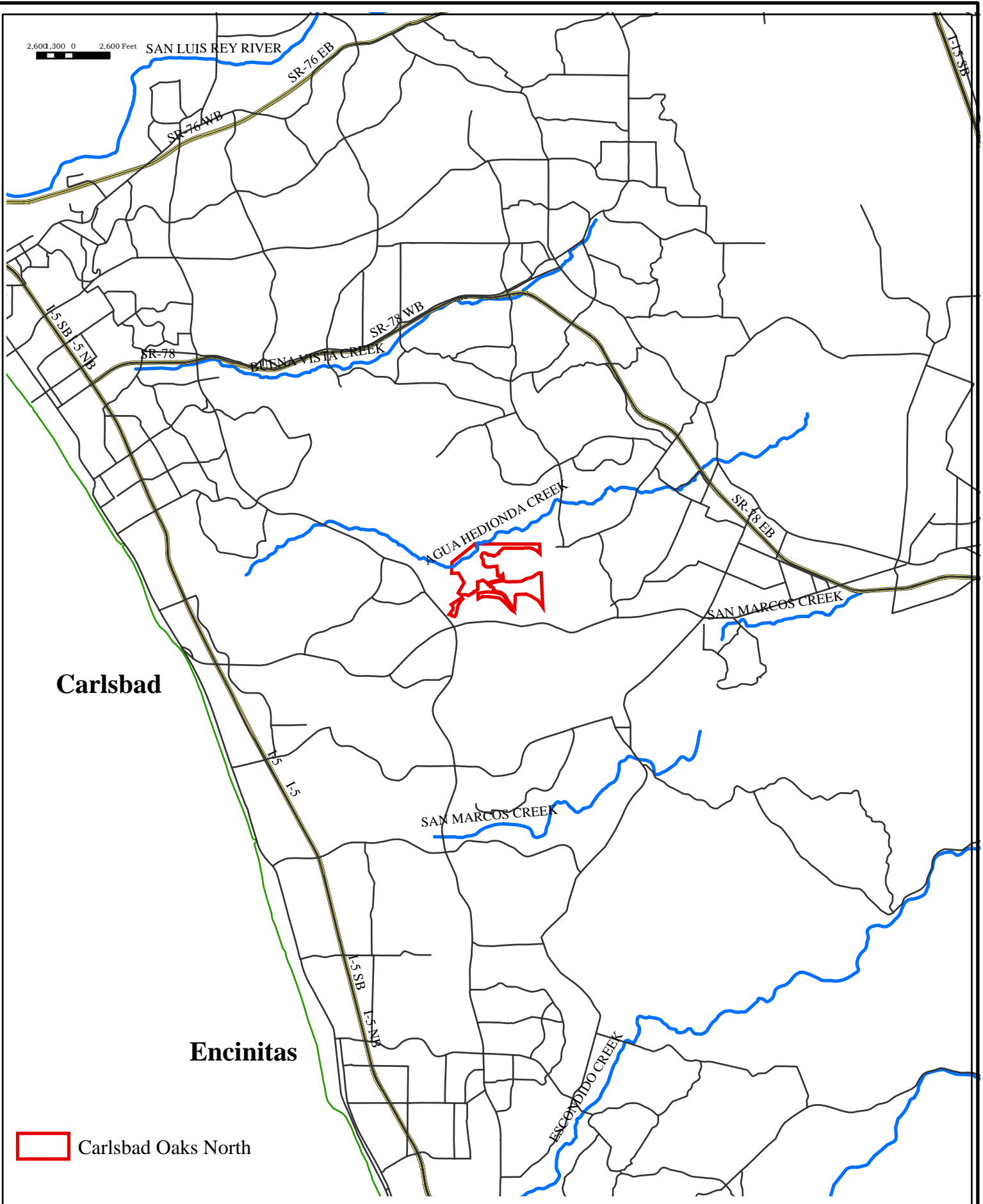


Figure 1
Preserve Vicinity
Carlsbad Oaks North Habitat Conservation Area - Carlsbad, CA



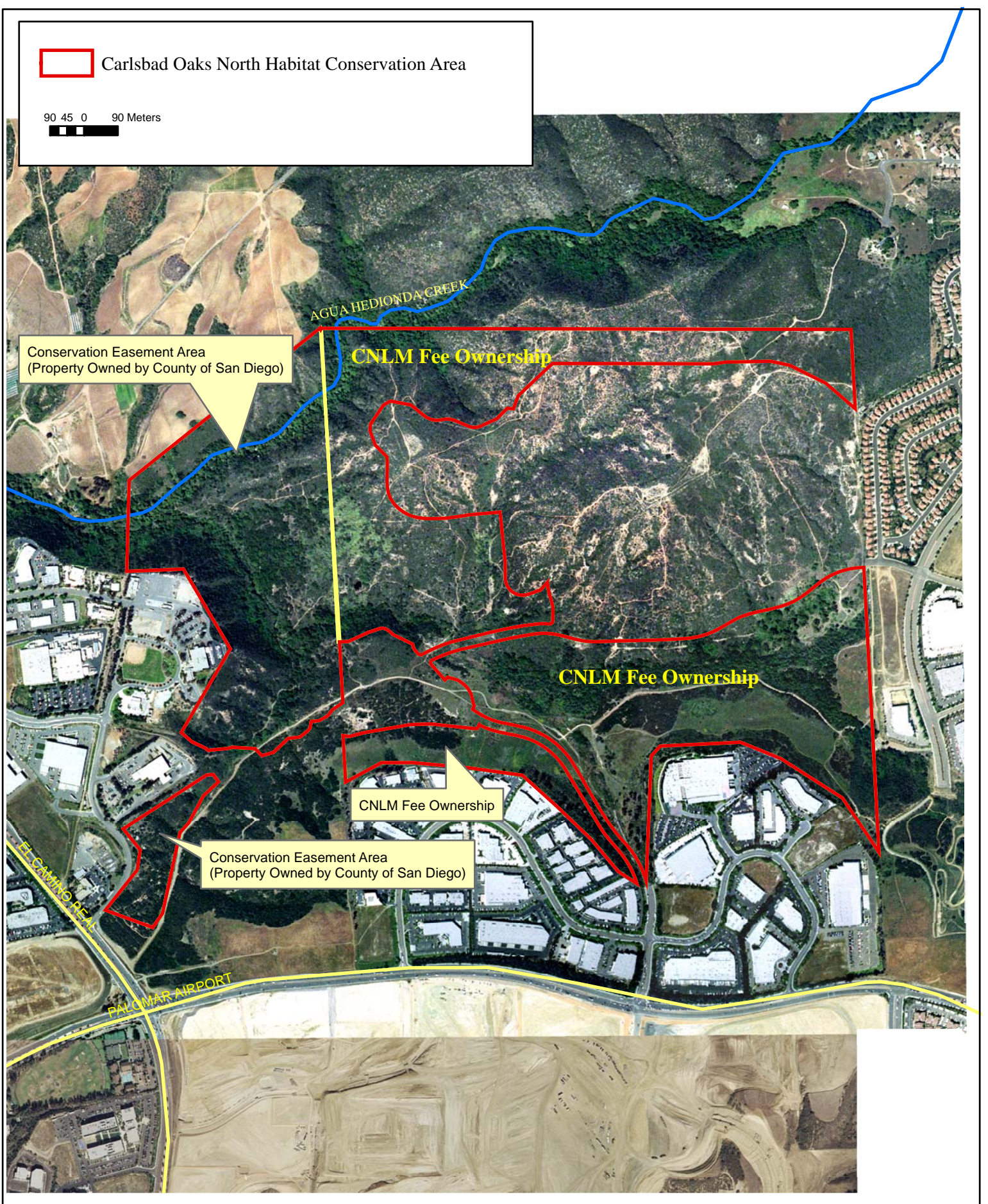


Figure 2
Preserve Location
 Carlsbad Oaks North Habitat Conservation Area - Carlsbad, CA



Activity Summary

- Sections of the illegally constructed “flightline” trails were blocked with vegetation
- Barbless barbed wire was installed along the path on the eastern side of the HCA
- Updated signage was installed
- Wildlife movement was documented using wildlife cameras. A coyote (*Canis latrans*) was photographed using the undercrossing at Faraday Avenue
- Three pair coastal California gnatcatcher (*Polioptila californica californica*) were observed
- The vegetative cover was assessed within the San Diego thornmint (*Acanthomintha ilicifolia*) population
- The vegetative cover was assessed within the largest thread-leaved brodiaea (*Brodiaea filifolia*) population
- Six previously known populations of thread-leaved brodiaea, one previously unknown location, and one location not found since 2000 were mapped and counted
- Rare plants were mapped
- CSS study plots were monitored
- A coast live oak (*Quercus agrifolia*) woodland study was conducted
- The base of the previously impacted thread-leaved brodiaea population was fortified with sandbags in order to stop erosive processes
- Pampas grass (*Cortaderia selloana*), Canary Island date palm (*Phoenix canariensis*), artichoke thistle (*Cynara cardunculus*), iceplant (*Carpobrotus edulis*) and onion weed (*Asphodelus fistulosus*), African fountain grass (*Pennisetum sataceum*), black mustard (*Brassica nigra*), poison hemlock (*Conium maculatum*), sweet fennel (*Foeniculum vulgare*), saltcedar (*Tamarix ramosissima*), and Mediterranean canary grass (*Phalaris canariensis*) were treated or removed
- A nature hike was led
- Routine patrols were conducted
- A CE compliance visit and report were completed

II. Capital Improvements

We installed approximately 20 signs along the City multi-use trail that follows from the southeast corner of the HCA to its junction with El Fuerte Avenue. We also replaced some signage along Faraday Ave, and the eastern access points to reflect the proper restrictions and prohibitions that should border public access points.

Another strand of two-strand “barbless” barbed wire was placed in areas that previously had only two strands installed. The fencing was placed along areas of the trail to block areas within the HCA that would be prone to trespass. We are planning on removing the orange construction fencing over the next couple of years, as budget allows.

III. Biological Surveys

Biological surveys commenced in the spring of 2006. The HMP (Tierra Data, 2005) outlines the goals of biological monitoring. The general goals of the monitoring activities are to: 1) collect baseline data and 2) begin to develop population trend data on individual species and for certain taxonomic groups and the vegetation community.

Biological surveys are described below by the following categories: reptiles and amphibians, mammal, birds, insects, plants and vegetation communities. A discussion of the biological surveys completed during the fiscal year are described below under each appropriate category.

1. Reptiles and Amphibians

Reptiles and amphibians were noted anecdotally during surveys for other taxa, and during regular patrols and maintenance activities. Species detected during the year include American bullfrog (*Rana catesbeiana*), striped racer (*Masticophis lateralis*), southern Pacific rattlesnake (*Crotalus viridis*) western fence lizards (*Sceloporus occidentalis*) and side-blotched lizards (*Uta stansburiana*).

2. Mammals

Mammal monitoring activities were first undertaken for this HCA in March of 2007 using wildlife cameras (Figure 3). Our goal is to understand and study trends in wildlife movement at “pinch point” locations and potential movement corridor locations within the HCA. The Center wishes to understand general trends in species movement throughout the HCA, and wants to know whether corridors (such as the wildlife crossing under Faraday Avenue) are being used. With further information about animal usage patterns, we will be more able to focus our efforts on discouraging public usage in these animal movement and foraging areas, as per the PMP (Tierra Data, 2005). Additionally, The MHCP Management and Monitoring Plan (MHCP, 2003) identifies several areas outside this HCA which are important in maintaining animal linkage, and the hope is that by identifying potential corridors along the HCA edges, these data can be of use to public agencies in future planning and monitoring outside of the HCA.

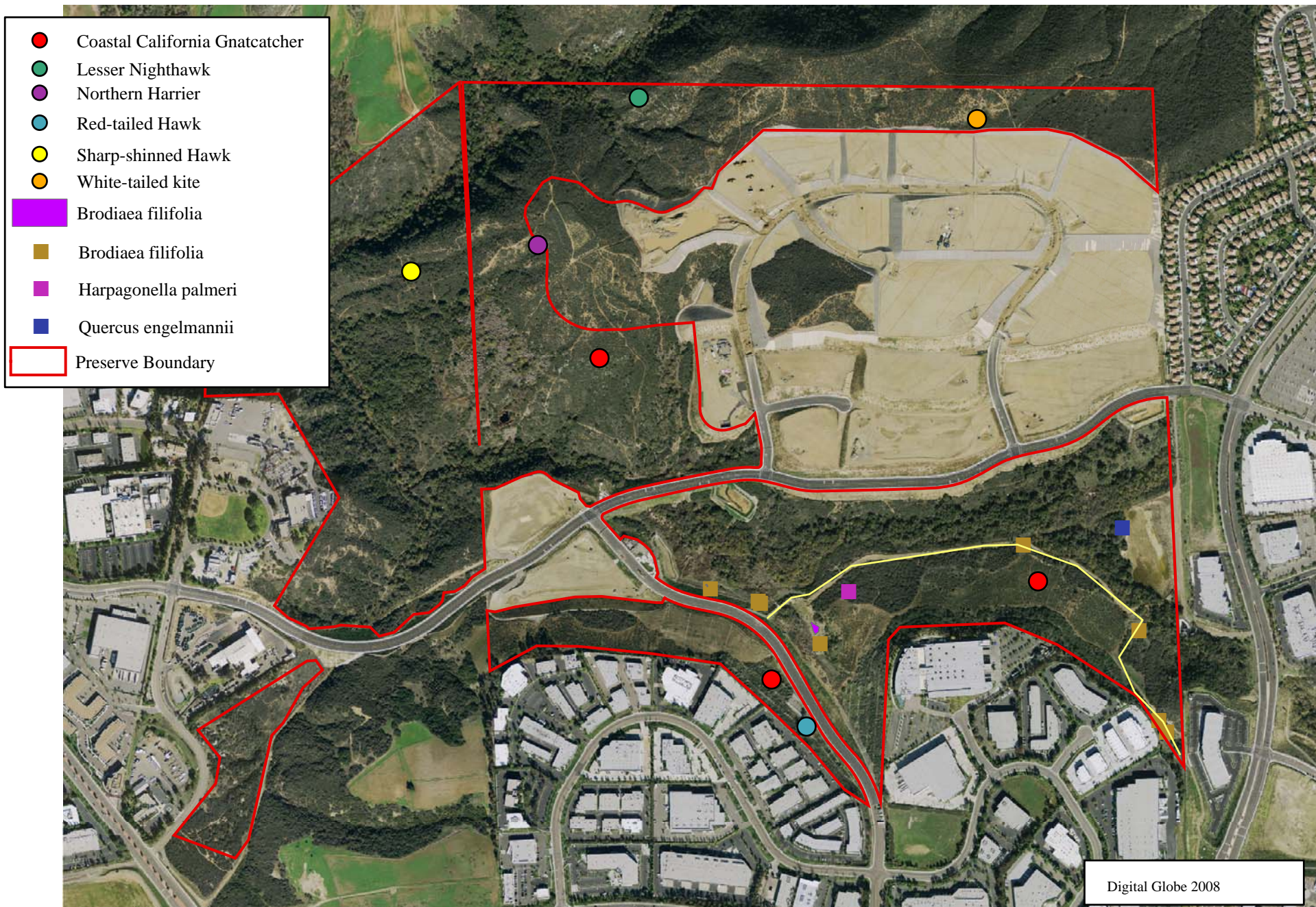


Figure 3.
 Sensitive Plant and Animal Locations-2010
 Carlsbad Oaks North Habitat Conservation Area - Carlsbad, CA



We used a Cuddeback® Digital Scouting Camera, which utilizes a motion sensor device, and a flash for nighttime photos. The Cuddeback cameras record date and time of the movement taken by a picture, allowing us to understand animal usage in any given month. We only monitored the wildlife undercrossing along Faraday Ave. this year, and did not perform as much photo-monitoring as desired. Among three monitoring periods during the summer of 2010 we found only one coyote (*Canis latrans*) using the area adjacent to the crossing.

The following list details the locations and dates of each wildlife camera site monitored this management year.

Ø CNLM Reference # LM 7

- Ø October 22 – November 10 2009: North side of wildlife crossing at Faraday Ave. Location did not yield any photos for this period
- Ø July 15 – August 4 2010: South side of wildlife crossing at Faraday Ave. Location did not yield any photos for this period
- Ø August 11 – September 10 2010: south side of wildlife crossing at Faraday Ave., nearby La Mirada Creek. Location yielded one coyote photo.

Although the Faraday Avenue undercrossing has been monitored six different times during the past several years, no animal other than a coyote has been observed using the wildlife crossing. Tracks suggest that mule deer (*Odocoileus hemionius*) use the entirety of the HCA, but no tracks of mule deer have been found in the undercrossing.

Other mammals observed during patrols included cottontail rabbit (*Sylvilagus audubonii*), and California ground squirrels (*Spermophilus beecheyi*). Bobcat (*Lynx rufus californicus*) feces was observed near the junction of La Mirada and Agua Hedionda Creeks.

3. Birds

One pair of nesting red tailed hawks (*Buteo jamaicensi*) was noted this year while carrying out biological monitoring activities. The pair was observed nesting in the Eucalyptus along El Fuerte Street, where they have been nesting for the past three years. A flock of cedar waxwings (*Bombycila cedrorum*) was observed during winter, and a belted kingfisher (*Ceryle alcyon*) was observed foraging during late summer 2010. Large owls have been repeatedly observed in live oak woodland throughout the HCA this year. One observation involved a pair. Since they are not observed until flying away, there has been no positive identification of specific identity.

Surveys for coastal California gnatcatchers were conducted this management year, during the months of March and April on five separate days (Table 1). Survey procedure generally followed the USFWS accepted protocol for conducting gnatcatcher surveys. Surveys were conducted by Mr. Patrick McConnell, who holds an independent USFWS Section 10a “take” permit (162656-1) authorizing for such surveys. Three pair of gnatcatchers were observed during these surveys (Figure 4).

Table 1. Survey dates, times and weather conditions.

Date (2010)	Time	Weather	Type of Survey
March, 15	7:10 -11:40 am	51-75 F; calm; mostly clear	CAGN
March 22	7:24 -11:40 am	58-69 F; moderate breezes, clear	CAGN
March 31	9:30 -11:15 am	58-68 F; breezy; partly cloudy	CAGN
April 8	10:35- 1200 pm	75 - 76 F; calm; clear	CAGN
April 16	8:30 - 1215 pm	68 - 70 F; cloudy; moderate breezes	CAGN

4. Insects

Incidental noting of butterflies takes place during patrol and surveys for other taxa. This will eventually lead to a better understanding of total butterfly diversity and use patterns on the HCA. This year Mormon metalmarks (*Apodemia mormo*), western painted ladies (*Vanessa carye*), ringlets (*Coenonympha tullia*), mourning cloak (*Nymphalis antiopa*), an unidentified blue (*Plebejus* sp.), a grey hairstreak (*Strymon melinus*) and monarchs (*Danaus plexippus*) were noted.

5. Plants and Vegetation Communities

- a. San Diego Thornmint** The San Diego thornmint population was quantified On April 30, 2010 . 648 plants were counted, most with flowers. The fact that most plants were either flowering or beginning senescence suggested that the date of visit was optimal for carrying out direct counts. Cover estimates were also taken of all species present on April 16, 2010. Species diversity was also noted per quadrat.

In 2007, a comprehensive cover estimation procedure was devised and carried out that involved the use of ½ by 1 meter subplots. A rectangular boundary was permanently marked outside of the entire population by placing 4 pieces of rebar. Five subplots were placed in stratified random locations along meter tape that was set up running lengthwise from one to ten meters. The plot locations were stratified to ensure random placement in at least one of each area of the rectangle. A random number table was used to determine which quadrant of the short axis to sample from, and which distance along the long axis to sample from in each case. The side of the transect tape to place the subplot was determined using the flip of a coin. Subplots were constructed of pvc and thin wire at 1 dm intervals wound through either side of the subplot. This accounted for 36 readings per subplot. It was later determined that four to five subplots were sufficient to capture precise cover estimates (Appendix 1, Figure 1). Care was taken to avoid standing or kneeling in areas immediately adjacent to San Diego thornmint. Standing cover was estimated as any plant alive during the current season being directly under where the two wire segments crossed. Ground cover (edaphic) was estimated in the same manner, but consisted of either dead matter that was lying on the ground, or bare ground. This method has been in use since spring of 2007.

Appendix 1 includes graphics that detail relative percent contribution to cover grouped by origin, and average cover values grouped by origin and habit, as well as a summary of yearly counts in Figure 2 (of the appendix).

Figure 2 (of the appendix) reflects the relative contribution to cover by natives and non-natives from 2007 through 2010 among the thornmint population. Figure 3 (of the appendix) illustrates the contribution to cover by both non-native grasses and forbs. Appendix 1 figure 4 would suggest that there is a direct linear, causal relationship between rainfall and thornmint production, were it not for the 2008 counts. Strangely, as Figures 2 and 5 (of the appendix) reveal, even though the highest overall native cover among all four years was during 2008, the lowest thornmint count took place that year. Other sites (Rancho La Costa HCA, Manchester HCA) yielded the same (strikingly similar) pattern, with 2008 being far below 2009 and 2010 in counts, even though the rainfall of that year fell fairly steadily from late November 2008 through February of 2009, and accumulated almost equal amounts to 2010 (as measured at Mclellan-Palomar Airport).

Plentiful early-season rainfall is suspected to influence exotic weed cover, and Figure 5 of Appendix 1 agrees with this expectation. Note how the highest count is coincident with the year where plentiful rainfall took place during the winter months. We will investigate high and low temperature averages by month during next management year, and determine if temperature variation has an influence on thornmint production.

The purpose of the yearly assessments is to inform management decisions, such as potentially trimming exotic seed heads prior to maturation. While this may appear to be a universally accepted population maintenance step, the Center will first investigate the yearly variations in thornmint counts and cover, and compare these parameters with non-native cover. It may be advisable to weed whip seed heads as they occur above the thornmint inflorescences, since this may not directly affect the success of seed-set, but this should only occur following habitat assessments.

- b. Thread-leaved brodiaea surveys** Vegetative counts of thread-leaved brodiaea (*Brodiaea filifolia*) occurred this year in all known locations. One new location was found that was previously unknown, and one flowering individual was found that had not been found since 2000. The majority of these counted were vegetative, and not flowering.

A record amount of thread-leaved brodiaea were counted in almost all locations this management year, and all were mapped with this updated information (Figure 3).

- c. Thread-leaved brodiaea habitat assessment** The habitat assessment method we used for thread-leaved brodiaea is virtually identical to that carried out for the thornmint population. However, this population is more spread out. After delineating the boundaries and dividing the population up into equal sized squares, it was decided that six subplots would cover the population adequately for sampling purposes. Cover estimation was performed as in San Diego thornmint description (above), and six subplots at 36 points each were randomly placed in a stratified arrangement. All species present in each subplot were noted for the purpose of gathering species richness information.

Figure 1 of Appendix 2 highlights the relative contributions to cover among native and non-native plants at the study site. As Figures 1 and 2 suggest, the native cover is low at this site, and the non-native cover is very high. The overwhelming amount of non-native cover this management year is purple false-brome (*Brachypodium distachyon*), an aggressive non-native grass that does very well in clay soils. This is quite different from 2009 (Appendix 2, Figure 1). This management year, although purple false-brome has much the same coverage as 2009, bristly ox-tongue (*Picris echioides*) is much lower in coverage than during 2009. A more disparate change is seen among the native plants, even though total native cover remains much the same as in 2009. We see no “hits” of small-flowered morning glory (*Convolvulus simulans*) during 2009, but it is the dominant native plant throughout the macroplot during 2010. Finally, the amount of bare ground is substantially less than in 2009 (Appendix 2, Figure 3). The site was treated chemically by Helix (Environmental Planning Inc.) crews in 2007, and they may have also removed litter. It was treated to reduce non-native grasses, and this alone may have reduced thatch cover since 2007. Regardless, it appears that thatch production is on the increase, and this may explain why we see less non-native forb cover in 2010.

- d. **Other Sensitive Plant Species** More Palmer’s grapplehook (*Haplogonella palmeri*) were found this management year (Figure 3). More mapping efforts (such as finishing the Nuttall’s scrub oak *Quercus dumosa* and summer holly *Comarostaphylis diversifolia* ssp. *diversifolia* mapping) could not be completed as scheduled.
- e. **Coast Live Oak Woodland Monitoring** Entire limbs and sections of adult trees along La Mirada Creek have been senescing since at least late 2007. In a few instances, entire trees have split in half down the center of the trunk, or fallen over completely. One of these instances was caught on wildlife camera in 2008. If some irreversible die-off is taking place, we wish to attain some measure of species richness, vegetative cover, and coast live oak density within this forest while this is taking place. We set up and carried out two plots during the summer of 2010. For techniques and rationale, see Appendix 3. Data have been post-processed and filed appropriately. No analyses or graphics were created for this endeavor.
- f. **CSS Monitoring** We set up six long-term monitoring plots throughout suitable habitat in the HCA. Three of these were measured this management year, and three were measured in 2009. We have stratified the monitoring of CSS by general aspect, such that we attempt to sample southerly facing slopes and northerly facing slopes each year to account for yearly variation in rainfall and temperatures. See the annual work plan (CNLM 2008) for detailed rationale and methodology.

IV. Habitat Maintenance and Restoration

Habitat restoration and maintenance goals include erosion control and removing nonnative plants from the HCA. For the most part, the HCA is in great condition and has good native coverage.

1. Erosion control at brodiaea impact area Just prior to the winter rains, approximately 35 sand bags were placed at the foot of the slope containing the impacted thread-leaved brodiaea population. Erosion was beginning to decay the hanging edge of this hillside that was created when the sewage pipeline right-of-way was installed.

2. Seep area along Orion Ave Perennially moist soils have been damaging previously established southern maritime chaparral vegetation for at least three years. This vegetation was composed of a mixture of coast scrub oak (*Quercus dumosa*), summer holly (*Comarostaphylis diversifolia* var. *diversifolia*), chamise (*Adenostoma fasciculatum*), and Eastwood Manzanita (*Arctostaphylos glandulosa* ssp. *glandulosa*). The perimeter was mapped in 2008, and again in 2010 (see CNLM 2008), the boundary being a line walked with sub-meter accuracy GPS where all standing perennial vegetation had been killed. The total area affected (here counted as completely dead shrubs with little to no recruitment) has not grown, but some has been replaced by wetland vegetation since 2008.

3. Trail rehabilitation We spent a day blocking unwanted trails and motorcycle access in the County portion of the HCA during the winter 2010. Trails were already growing in, but motorcycle and mountain biking activity was noticed during late 2009. We tied vegetation together using bailing wire and anchored much of the vegetation to living shrub limbs wherever possible, and usually at pinch-points that were difficult to find alternate paths around. Runners have not been seen since 2008, and mountain bikers have not been observed since summer of 2009, although tracks are seen throughout the site where blockage hasn't taken place. As of summer 2010, these blocked trails had not been re-opened.

4. General treatments For three management years, we have been attempting to allow native plants to re-establish clay soils nearby the southwest corner of the HCA. We have been accomplishing this through a combination of mechanical and herbicide application.

5. Targeted weed treatments The Center tracks the presence and location of weeds in the Wetland Enhancement Area (WEA, see Merkel and Assoc. 2004), and has been directing some treatment efforts through Techbilt's weed treatment contractor RECON Environmental, Inc. See Table 2 below for a complete list and description of plants which may threaten the function of the HCA.

- a. Pampas grass** Pampas grass continues to establish and flower throughout the wet areas of the HCA, including the WAE. We have spent considerable portions of the budget since assuming management of this area on treating or supervising the treatment of Pampas grass. This year, in addition to the WEA, we treated the full length of La Mirada Creek for Pampas grass. In the WAE we killed about 100 small and flowering Pampas that restoration crews (Recon Environmental Inc.) are missing.

We have been working with San Elijo Lagoon Foundation's Carlsbad Watershed Network in identifying areas adjacent to the HCA that are being mismanaged and are in need of Pampas removal. This management year, they have treated Pampas along ravines in the County property south of Faraday Avenue, the Upper Deck property above and to the east of El Fuerte Avenue, as well as west of El Fuerte Avenue in one

parcel. Other treatment locations are awaiting approval from the owners. We treated several large Pampas near the northwestern corner of the HCA after receiving permission from the owner of the business to do so.

- b. Palms** One large Canary Island date palm (*Phoenix canariensis*) was treated by crews on the eastern edge of the HCA, and another was treated by crews along Agua Hedionda Creek. We also treated one small date palm along the middle of La Mirada Cr.
- c. African fountain grass** This prolific weed has shown up in every corner of the HCA. We mapped some newfound stands of African fountain grass and treated approximately two dozen at two localities. The largest newfound stand is in the central-eastern portion of the HCA, and will be treated during the winter of 2011.
- d. Onionweed** 2010 was the third consecutive year we have contracted the treatment of Onionweed. This weed is still fairly common along the slopes either side of El Fuerte Avenue. We spent one contractor day (4 man crew) treating this weed during the late winter.
- e. Artichoke thistle** We contracted the treatment of artichoke thistle this management year, along the eastern edge of the southwestern parcel. Crews also treated a stand of iceplant inside the seepage area in this parcel.

V. Public Service

Public service activities have included patrolling in an attempt to control dumping and associated vandalism, homeless encampments, and illegal access. In addition, public services include trash removal and talking with neighboring businesses regarding trash along the HCA edges.

The entire area has been used illegally for many years by mountain bikers, who not only created jumps, bridges, and many miles of trails, but also posted the site on web pages, and even conducted training exercises on the property (bikers called this area “Flightline”). The bikers were disappointed when the Carlsbad Oaks North development commenced, which resulted in a loss of much of their biking routes. As a result, some bikers started to create new biking routes late in 2005 to early 2006 that started at the Safety Center and went down-hill to the main valley. All new trail activity was within the County-owned portions of the HCA. Prohibitive fencing had been placed at the entry from uphill, and at the downhill portion. As of fall 2007, most biking activity had ceased, and this remains the case and we are happy to report that most of the trail has overgrown. Signs of dog walking and mountain biking continue to be noticed, however. The small park area set up northeast of the intersection of Faraday and El Fuerte Avenues is a source of trash, which includes dozens of bags filled with dog feces that have been thrown downhill into dense chaparral.

Table 2. Threats to HCA habitat integrity

Threat	Locations	Size or Severity	Actions 2009-2010 Management Year	Planned Actions
Weeds				
Pampas grass H (R)	South slopes, Upper Deck property, recruits continually from airborne seed, presently throughout HCA wetland areas.	Estimated at several hundred individuals	Agua Hedionda Creek cleared of Pampas. La Mirada Cr. cleared. Eastern section of WEA cleared (60 treated), portions of main WEA treated (40 mostly large)	Inflorescence removal by HCA Manager during fall 2010.
Saltcedar H (R)	Drainage along El Fuerte, south of intersection Faraday and El Fuerte Pops up in all wet localities	Perhaps 15 plants	Treated 14 small and re-sprouting saltcedar along the two unnamed tributaries that follow north into La Mirada Cr..	Will track re-sprouting
African fountain grass M (CSS)	All areas	Populations and individuals discovered regularly	Treated near northern boundary, near center of HCA, mapped a couple along eastern peninsula	Search and destroy
Big periwinkle (<i>Vinca major</i>) M (R)	Two stands in Agua Hedionda Cr.	Small	Notified Carlsbad Watershed Network of need to treat*	Will check status of stands
Shamel ash (<i>Fraxinus Uhdei</i>) (R)	Along Agua Hedionda Cr.	Dozens	Notified Carlsbad Watershed Network of need to treat	Will check status of stands
Castor bean L (R)	La Mirada Cr.	Hundreds	Treated small stand eastern side La Mirada Cr.	May treat, budget permitting
Fennel H (G, CSS, R, F)	South of Faraday, disturbed areas, grassland	Largely contained, though hundreds remain	Stand sprayed near City of Vista sewage alignment on large County parcel	May treat early spring 2011
Onion weed M (G, CSS)	Fill slopes above El Fuerte	Thousands	Treated by crews 2008, 2009, 2010	Will continue contracting crews to eliminate plant from HCA
Artichoke thistle M (G, CSS)	Southwestern 18 acre parcel along Orion Ave.	Persistent population, estimated at 250	Treated by contractors winter 2010	Continue contracting treatment until eradicated
Tree tobacco M (CSS, R)	Southwestern 18 acre parcel along Orion Ave. Many in disturbed slopes along Faraday Ave.	Hundreds	None treated	None planned
Bermuda buttercup M (G, R)	Benches above La Mirada Cr.	Hundreds	Appears contained	Will keep contained
Florist's smilax (<i>Asparagus asparagoides</i>) M (R)	La Mirada Cr.	One plant mapped	Killed Spring 2009	Will search for new arrivals
Mediterranean canary grass (<i>Phalaris canariensis</i>) (R)	Tributary to La Mirada Cr., in riparian transition	Dozens	Killed most Spring 2010	Will attempt to eradicate spring 2011
Purple falsebrome (<i>Brachypodium distachyon</i>) (G, F)	Encroaching thornmint population, throughout all grasslands south of La Mirada Cr., and east of El	Prolific	Hand-pulled hundreds from within and surrounding thornmint population following census activity	Will continue removal with hopes of removing it from the hillside altogether

	Fuerte Road			
Threat	Locations	Size or Severity	Actions 2009-2010 Management Year	Planned Actions
Rose clover (<i>Trifolium hirtum</i>) M (G)	Down-slope from El Fuerte Avenue, inside lens supporting thread-leaved brodiaea	One plant found	Pulled and identified plant	Well seek to eradicate if present
Drainage	Southwestern 18 acre parcel along Orion Ave.,	Seep ½ acre estimate kill area	Re-mapped	Map Spring or summer 2011
Itinerants	Southwestern 18 acre parcel along Orion Ave.	One	None found 2009-200	Frequent patrol, posting, and removal. Work with Carlsbad Police in arresting returning itinerants

H, M, L refer to California Invasive Plant Council rankings, and potential severity of plants, if present. H=high, M=moderate, L=limited

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

Letters in parentheses represent what habitats these invasive plants threaten: G=native grassland, R=riparian, CSS=coastal sage scrub, F=native forb vegetation associations

*Carlsbad Watershed Network traveled downstream the entire length of Agua Hedionda Cr. and presumably took care of these species as part of their grant activities

Patrols were carried out at least 3-4 times per month. During each visit surveys were made for illegal activities, trash was picked up, and nonnative, invasive plants were killed. We continued to block the trails and create obstructions to travel along unwanted trails in the hopes that these trails will re-vegetate.

Nature hike We led a publicized nature hike at the peak of spring 2010. Eleven people were in attendance, and we gathered contact information from several of these citizens to help us remove problematic weeds like Saharan mustard (*Brassica tournefortii*) and purple false-brome. We also led a brief nature walk prior to a City-led trail work day. Over 20 people attended and helped remove orange environmental fencing and maintained a short stretch of trail.

VI. Reporting

Reporting includes all data analysis, GIS and remote sensing, regional coordination, photo documentation activities, budget and financial status. Data that have been entered by CNLM include plant and animal survey data. CNLM has received and digitized (GIS) all CE and fee boundaries, and vegetation communities and sensitive species from previous biotechnical reports of the properties.

1. CE Compliance monitoring A CE compliance report for the County owned portion of the HCA was drafted late in the management year (See Appendix 4). The CE compliance binder contains Carlsbad Oaks North CE baseline documentation (including photo viewpoints) and CE monitoring procedures. If a CE violation occurs, the baseline documentation, and subsequent yearly documentation provide the necessary evidence to prove that violation and win resolution. The monitoring policy included in the CE binder was designed to standardize the Center's monitoring of CE properties. It ensures that all CE properties are being managed appropriately while ensuring continuity amongst Center staff.

2. Annual report: This report represents the fourth annual report for the entire HCA. The next annual report will be produced at the end of the upcoming management year, and be made available no later than mid-December 2011.

3. Annual work plan: An annual work plan for the 2011-2012 management year will be provided to the wildlife agencies and City of Carlsbad in December of 2011.

4. Management Plan: It has been five years since the creation of the initial management plan for this HCA (Tierra Data 2005). A new five-year management plan will be developed during the 2010-2011 management year, and have budgeted a sufficient amount to at least finish a rough draft by late summer 2011.

5. Budget/Financials: The total budget spent during this fiscal year was \$29,543 of a planned budget of \$32,332. The total management funds available as of September 30, 2010 is \$1,051,261 (Table 3).

Table 3. Endowment Status

Inception Date	Original Endowment	Endowment as of 9/30/10	Total Preserve Funds	Inflation Adjusted Endowment as of 9/30/10
3/2006	\$1,020,311	\$1,051,261	\$1,051,261	\$1,078,156

VII. Summary and Discussion

Management continues to be successful by protecting it from human encroachment, building baseline biological data, and developing a better understanding of the HCA and its regional context. Management in next year will continue in a similar fashion as this year. A detailed work plan for the next fiscal year has been developed for this purpose.

VIII. References

- CNLM 2009. Carlsbad Oaks North Habitat Conservation Area (S034) Annual Work Plan 2009-10. December 2009.
- CNLM 2008. Carlsbad Oaks North Habitat Conservation Area (S034) Annual Report 2007-8. December 2008.
- Merkel and Associates. 2004. Wetland Mitigation Plan Faraday Avenue Extension, South Agua Hedionda Sewer Interceptor, and Carlsbad Oaks North Business Park. May 2004.
- Multiple Habitat Conservation Program (MHCP). 2003. MHCP Biological Monitoring and Management Plan Volume III. California Department of Fish and Game, U.S. Fish and Wildlife Service, and Conservation Biology Institute. March 2003.
- Tierra Data Inc. 2005. City of Carlsbad Preserve Management Plan (PMP) for Carlsbad Oaks North Habitat Conservation Area. January 2005

IX. Appendices

Appendix 1. San Diego Thornmint study 2007-2010

Appendix 2. Thread-leaved brodiaea study 2010

Appendix 3. Coast Live Oak Woodland Study Methods and Rational

Appendix 4. CE Documentation Report 2009-2010

Appendix 1. San Diego Thornmint Study 2007-2010

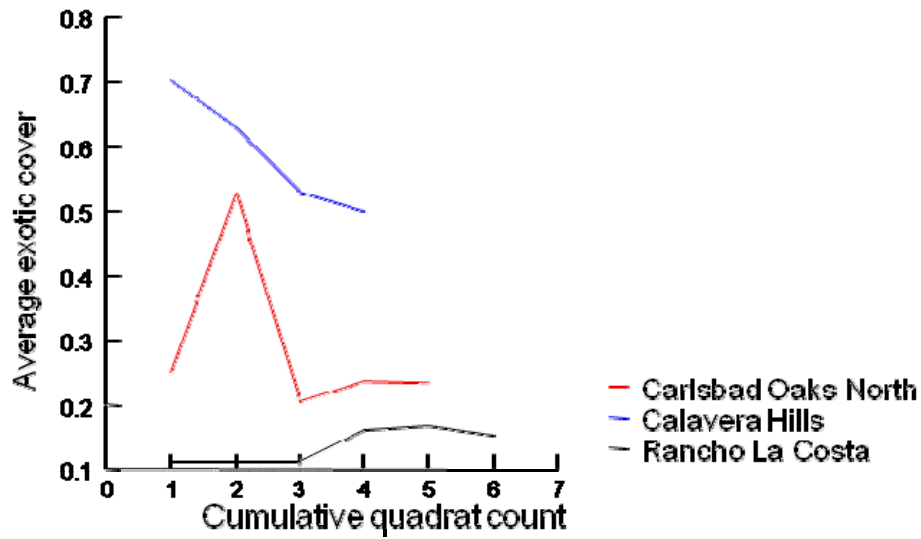


Figure 1. Average exotic cover during spring 2009, as a function of cumulative quadrat cover estimates. Each average was added to the next quadrat average and re-averaged for estimates of a running grand average, represented in the above line chart above each count on the explanatory axis.

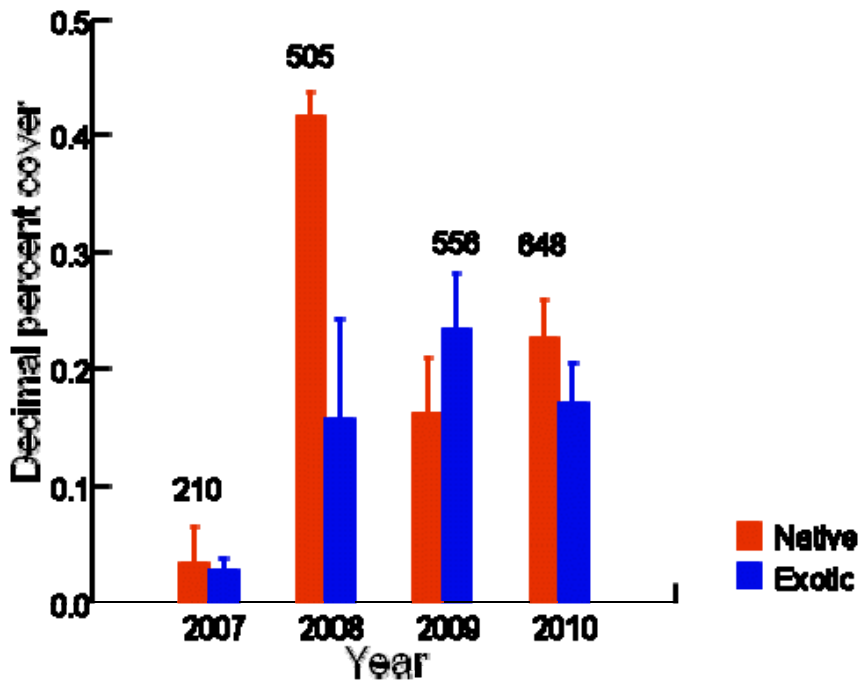


Figure 2. Mean cover (\pm 1 s.e.) at Carlsbad Oaks North San Diego thornmint population grouped by plant origin. Numbers atop each year category represent total counts of thornmint for that year.

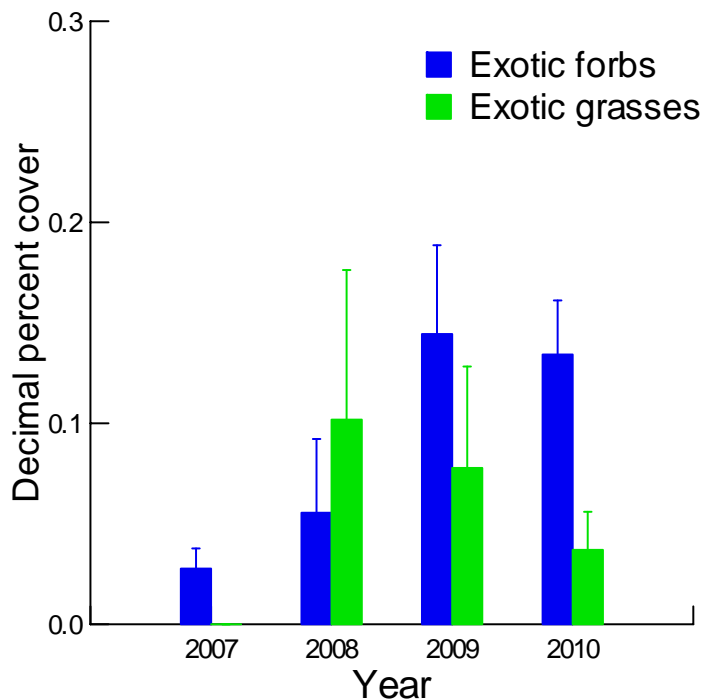


Figure 3. Mean cover (\pm 1 s.e.) of exotic plants at Carlsbad Oaks North San Diego thornmint population grouped by plant origin and habit.

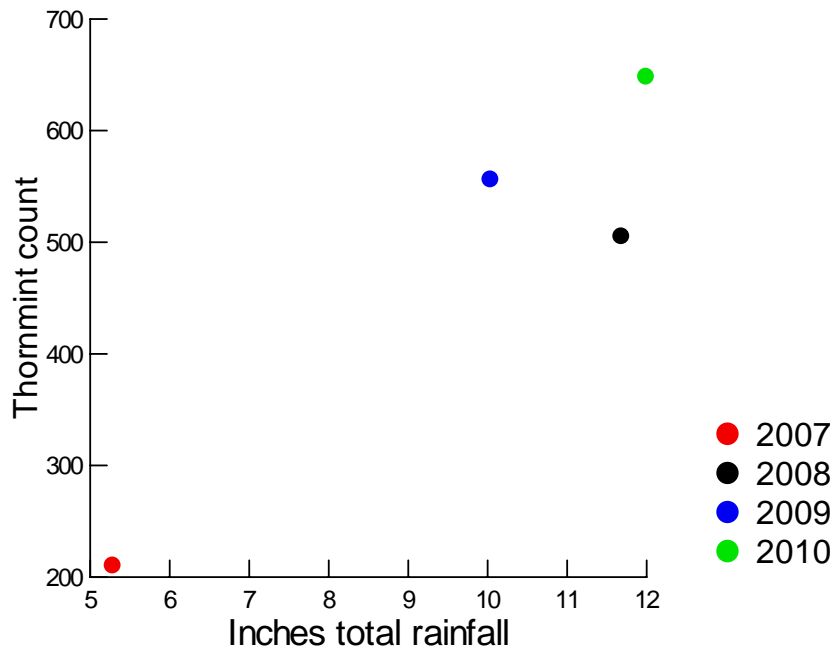


Figure 4. Scatterplot of annual San Diego thornmint counts as a response to total annual rainfall. Years are tabulated by beginning and end of rainfall season. For example, 2007 begins October 1, 2006 and ends Sept. 30, 2007. Rainfall data taken at McClellan-Palomar Airport weather station.

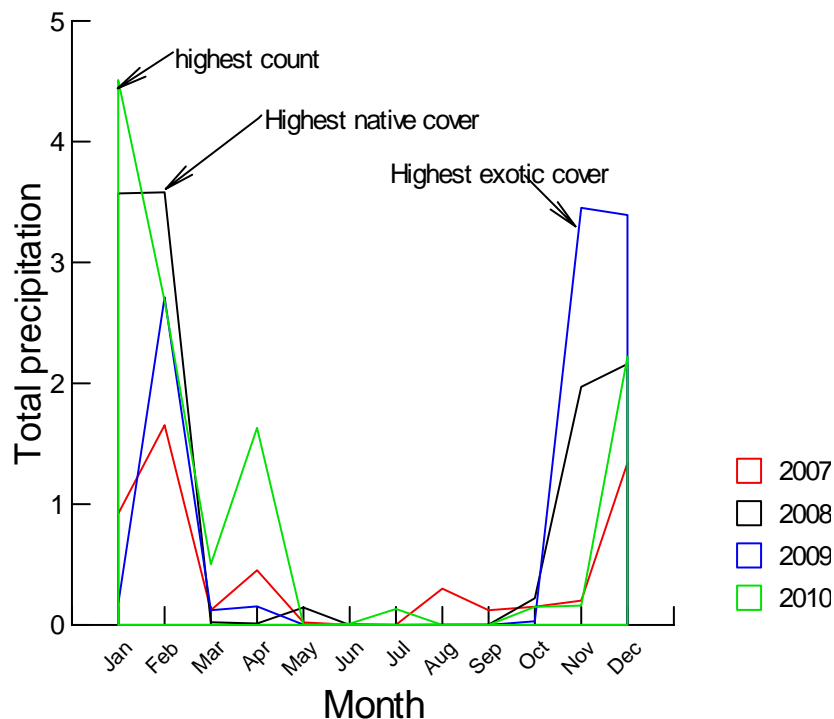


Figure 5. Profile plot of total precipitation by month for four rainfall seasons in which San Diego thornmint counts and habitat assessments (cover) have been Accomplished at Carlsbad Oaks North. Rainfall data taken at McClellan-Palomar Airport weather station.

Appendix 2. Thread-leaved brodiaea study 2009-2010

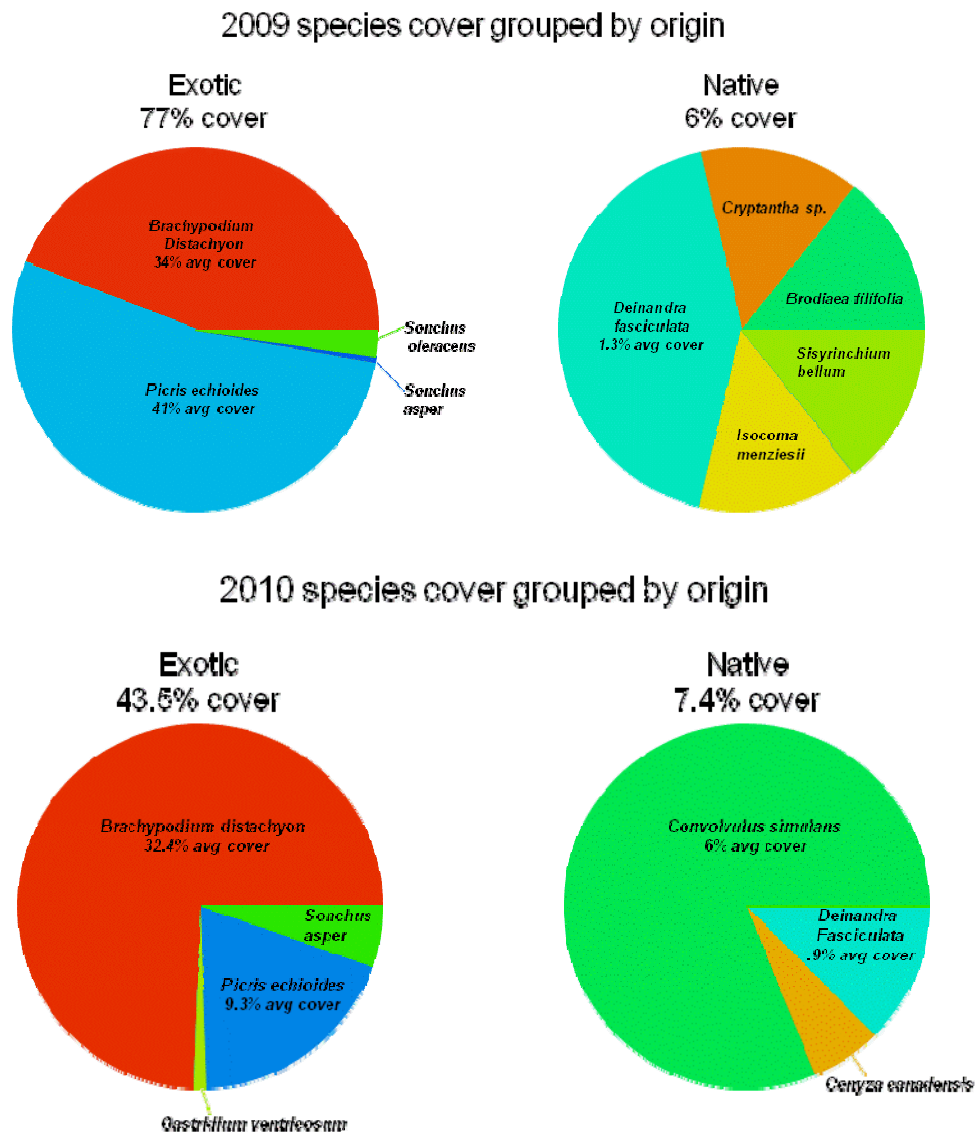


Figure 1. Relative contribution by species to cover estimates grouped by origin at Carlsbad Oaks North thread-leaved brodiaea study population

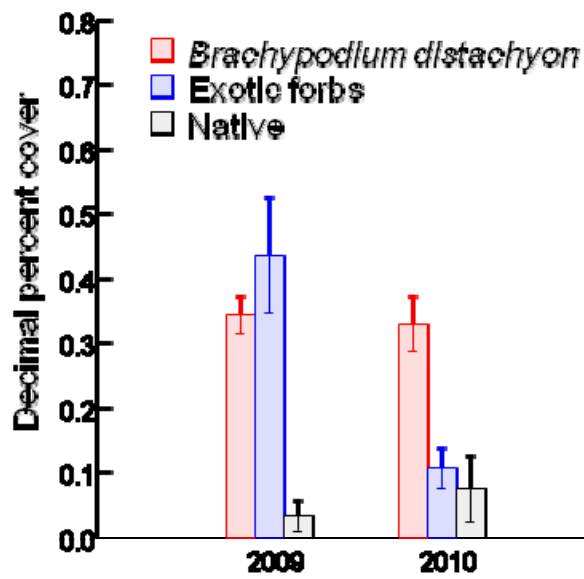


Figure 2. Average percent cover (\pm 1 s.e.) at Carlsbad Oaks North thread-leaved brodiaea study population. N = 6 Subplots, each containing 36 points for a total of 210 points.

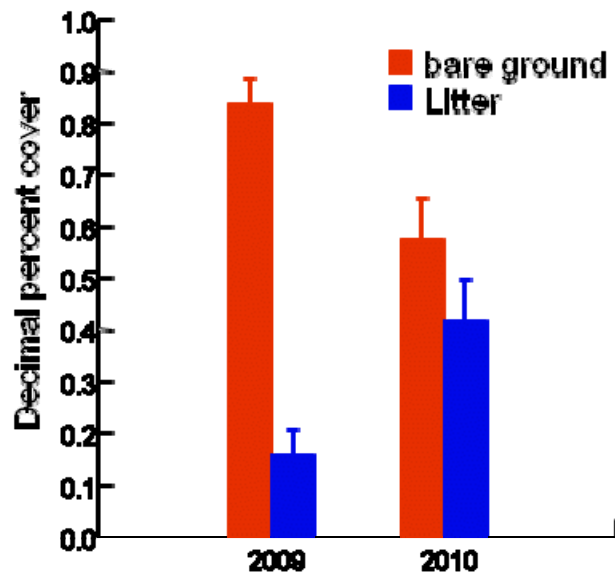


Figure 3. Average (\pm 1 s.e.) edaphic cover grouped by year.

Appendix 3. Coast Live Oak Study

Coast Live Oak Monitoring at Carlsbad Oaks North (S034)

Background

This monitoring protocol attempts to develop a precise baseline on the physical condition of the coast live oak woodlands present at Carlsbad Oaks North Habitat Conservation Area (HCA). The guidelines set forth in the City of Carlsbad Preserve Management Plan (PMP) for oak woodlands (Tierra Data 2005) only stipulate that condition and degree of habitat disturbance will be recorded. Although California Native Plant (CNPS) Vegetation Releve's can be employed as baseline measures, the recent observed decline in coast live oak (*Quercus agrifolia*) canopy coverage lead CNLM to conclude that changes in composition, density, and canopy coverage can and should be tracked over broad time-scales by using repeatable measures that minimize potential error between measurers. Two CNPS Rapid Assessments were performed on coast live oak woodland on La Mirada Creek in 2008 nearby the monitoring plots, and these can be used for additional evidence of change in composition and cover over time. A less intensive method of assessing forest health is currently being developed by the City of Carlsbad Preserve Steward (TAIC), and will include assessments of insect damage, among other things.

Methods

Plots were determined purposefully, based on the presence of a high canopy that shades much of the woodland floor. The plots are circular whereby all measures must fall within 25 meters of the center of the plot. Three different attributes are taken inside each 25 meter radius plot, and each will be explained in detail below:

1. Canopy, understory plant, and edaphic percent ? cover
2. Oak diameter at breast height (dbh)
3. Total species richness within the circle

Percent Cover

Percent cover is collected based on point-intercept methodology. A thin metal dowel and a meter tape are used to collect cover estimates. Each understory plant that this dowel vertically intersects at each 1-meter interval along the meter tape is entered into a spreadsheet as a hit. Meter tapes are set outward from the center point (center point can be marked by installing a piece of rebar, marked with a sub-meter GPS unit) in the four cardinal directions of north, east, south, and west. Each transect is 25 meters in length. One or more species are recorded per 1-meter interval beginning at 1 meter for a total of 25 points per transect and 100 points for all four transects. A hit is recorded in the spreadsheet as the species that is intersecting the dowel and more than one species can be intersected at each point. If an oak is in the understory and within the plot and is incident with the dowel, then its presence is recorded in the notes column of the spreadsheet. This is to keep changes in canopy cover in oaks separate from changes in understory cover, so that if canopy cover decreases, the data will show this change accurately, and not merely include an increased understory response of oak recruits as the oak canopy change. Diameter at Breast Height (dbh) measures (described below) should also help reveal a shift from canopy to understory cover of oaks if drastic change does take place due to disease or windfall. In addition to collecting plant species hits at each 1-meter interval along the 25 meter

tape, edaphic cover (i.e., litter, bare ground, deadfall) is also recorded, but in a separate column. Edaphic cover is summarized separately from live plant cover, but the divisor is also 100 for the 100 total points making up the plot. Deadfall is defined here as fallen limbs and/or attached stems and leaves in excess of approximately 3 centimeter (cm) diameter.

At each 1-meter interval along the 25-meter tape, a densitometer is used to estimate canopy cover within the plot. The canopy cover data are recorded in the same column of the spreadsheet as understory plants, as the species that is intersecting the cross-hairs of the densitometer. This is almost invariably coast live oak. Total percent cover can be over 100 percent, since there tends to be much overlap in aerial cover inside the woodland.

DBH

Starting at true north, each oak encountered first as one travels clockwise from the plot center point is measured using a dbh tape measure. If a dbh tape is not used, diameter can easily be converted from circumference measures using a standard tape measure. Trees not measuring 6 centimeters diameter or over do not get measured. If more than one trunk arises within one meter of another trunk, the trunk with the widest diameter is measured. Although this is not ideal, it cuts down on time considerably, and helps keep order in which tree gets measured next as one travels clockwise from the center point. Additionally, if more than one trunk arises from a common trunk below breast height, the widest diameter trunk is measured at breast height. Ensure to note whether the data collector is entering measures in fractions of a meter or in centimeters.

Species richness

Those species present inside each circular plot in addition to those incident with the transect line are recorded in a separate column. Species composition is expected to change over time considerably, especially if broad changes in canopy cover take place, and if changes in moisture availability take place.

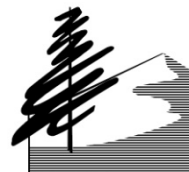
Rational

It is expected that the data generated by this methodology will not need to be measured again until it is perceived that a change in density, canopy coverage, and/or species composition is apparent. The dual measures of tree dbh and canopy cover may be useful in elucidating a change in size class as more mature trees disappear due to any number or combination of causes. Two plots were measured in 2010, and two are expected to be measured in 2011.

We are considering changes in methodology such as using forestry prisms, or a cheaper hand-made alternative that can mostly remove the need for tape measures. The understory cover is very dense, however, and thus a tape measure will still be needed for determining whether some trees are inside or outside of the plot. The clockwise measures beginning at true north, from the plot center point should simplify data collection, since trees don't need to be marked. We are considering whether to follow the direction and order regimen, since there will be variability among observers from one measuring instance to the next. The only conceivable reason we can

devise for following an order in dbh collection such as this is so that double measuring is less likely within each stand.

Appendix 4. CE Compliance Monitoring 2009-2010



EASEMENT COMPLIANCE MONITORING REPORT

Date of Site Visit: October 22, 2010

Observer (e.g., Name of preserve manager): Patrick McConnell (Initials: PM)

If this is the only (annual) visit, were Easement Documents read before site visit? YES

Preserve Name: Carlsbad Oaks North Habitat Conservation Area CODE#: S034

Specify which area surveyed (if not entire Preserve): Accessible areas only.

COMPLIANCE

<u>Requirements and Compliance Checklist</u>	<u>Compliance (Yes/No/NA)</u>
<u>Specific Findings (for each Lot):</u> 209-050-25-00 (Portion south of Faraday Avenue) 209-050-25-00 (Portion north of Faraday Avenue)	No ¹ Yes
1. Does the Preserve appear to be adequately protected from general access and active use by owners or others?	Yes
2. If 'No' to #1, does it appear that the Conservation Values are, nevertheless, still protected (or not impacted)?	
3. Does the Preserve appear to be free of debris, fill materials, lawn clippings, oil, or trash of any kind?	No ²
4. Does the Preserve fencing appear to be intact and in good condition?	Yes
5. Does the Preserve appear to be free of any prohibited activities including grading or alteration, domestic landscaping, irrigation, or storage?	Yes ³
6. Does the Preserve appear to be free of any prohibited improvements, including accessory structures, roads, utility lines, benches, equipment storage, swimming pools, dams or ponds, excavation, or fill?	Yes
7. Does the Preserve appear to be free of any trails, picnic areas, or other recreation-related development except as allowed in designated areas?	Yes
8. Does the Preserve appear to be free of any disturbance or biological problems noticed? (if 'No', see notes)	No ⁴
9. Does the Preserve appear to be free of any prohibited plants? (if 'No', see notes)	No ⁵

ADDITIONAL NOTES: (e.g. change in invasive species, potential violations, other changes since last visit, etc.)
Include explanation of any "No" response in table above.

1. Rock climbing activity in this parcel is down from previous management years, but it still takes place, and the traffic beneath and surrounding the climbing areas has enhanced erosion in some locations. Two areas

have been noted that are referred to as “dead zones.” These areas, one which is quite large and has been mapped yearly since 2009, and another much smaller and nearby, have dead chaparral snags and are being recruited by forbs, grasses, and wetland vegetation. On the southeastern area of this parcel south of Faraday Avenue, many of the manzanita (*Arctostaphylos glandulosa* ssp. *glandulosa*) have died, and those alive appear to be suffering from a disease. While we are powerless to do anything about the disease, we need to meet with the City of Carlsbad to find funds for a solution to fix the seepage that is damaging the southern maritime chaparral.

Another apparent condition that is worsening in the southern section is erosion, and the erosion that would be a natural process is enhanced by the flashy nature of the runoff that enters the Preserve, and is the fault of development in general. The solution for this too should be sought from the City of Carlsbad. We will pursue both solutions this management year.

2. Trash and helium balloons blow in regularly and are removed as encountered. Another source of trash is by way of the streams that enter the property from the east and south. All streams carry plastic and metal debris into the Preserve, and most of these eventually find their way to the ocean during heavy rains. With the regular weed treatment load we face, and with other monitoring obligations, regular trash removal from the streams is not practical, nor is it needed for the health of the Preserve.
3. We spent considerable effort blocking old trails during the 2009-2010 management year, and this appears to have eliminated motorcycle use. Mountain bike tracks are still noted on some trails, but this too is much diminished from previous management years. We will continue blocking trails on the north side of Faraday Avenue, as the need arises.
4. American bullfrogs (*Rana catesbeiana*) are present in one or both of the ponds that are situated on the springs north of Faraday Avenue. This would be a problem were there sensitive aquatic animals known to occur in the ponds, but none have been identified existing in either pond, and thus the bullfrogs are not removed. See 1 above for disturbance to vegetation due to erosion and seepage.
5. Pampas grass (*Cortaderia selloana*) is a perennial threat to the conservation values of the Preserve, but these are regularly sought out and destroyed. The amount of Pampas grass has been drastically reduced since the properties were brought under active conservation in 2006. African fountain grass (*Pennisetum sataceum*) is regularly found in the Preserve and is treated with herbicides when found. Purple false-brome (*Brachypodium distachyon*) is a threat to clay lens endemics such as San Diego thornmint (*Acanthomintha ilicifolia*), but is being removed on a yearly basis to keep it from entering where thornmint occurs. Overall, the Preserve is in excellent condition with respect to weeds.

1. Is grazing used as a management tool?

NO

If ‘yes’, provide comments on number and type (cattle, sheep, goats) of livestock present, general location of livestock, and RDM estimate (and method):

2. Are wetlands part of the Conservation Values for this Preserve?

YES

If ‘yes’, provide comments on the condition of wetlands.

All wetlands are in excellent condition, with the exception of erosion processes along the stream that feeds La Mirada Creek from the south. Numbers 1, 2, 4, and 5 above discuss the issues that face wetland habitat in the Preserve. The area surrounding the springs north of Faraday Avenue contains freshwater marsh habitat that is

untrammeled, and mostly free of any weeds whatsoever. All streams that enter and exit the Preserve are travelled on a yearly basis to remove establishing weeds and to note disturbances.

3. Were pictures taken? (Required at least once annually)?

YES

Identify photos:

Erosion southern parcel 2010.jpg
Erosion 2 southern parcel 2010.jpg
Trampling southern parcel 2010.jpg
Deadzone 2 southern parcel 2010.jpg
Photo viewpoint 12 2010.jpg
Photo viewpoint 25 2010.jpg
Photo viewpoint 26 2010.jpg
Photo viewpoint 28 2010.jpg
Photo viewpoint 29 2010.jpg

2010 Monitoring photos can be found at:

D:\CNLM San Diego\San Diego Preserves\Carlsbad Oaks North\CE binder compliance\2010 photos

Follow up needed? No

Assigned to: _____

Date: _____

Initial Action taken: _____

Date: _____

Final Action taken: _____

Date: _____

Observer/Preserve Manager Signature: _____

Markus Spiegelberg for Patrick McNamee 11/01/10
Markus Spiegelberg



Figure 1. 2009 below, and 2010 (above) photos of the smaller dead zone noted in 2009 CE Compliance report



Figure 2. Erosion on (left) and erosion plus trampling (right) 90 degree pivot south from left figure, both taken October 2010.



Figure 3. Erosion nearby both figures 1 and 2