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August 27, 2014

Mr. Glen Laube
City of Chula Vista
Planning and Building Department
276 Fourth Avenue, MS P-101
Chula Vista, CA 91910

Reference: Year 5 Final Annual Report for the Central City Preserve Coastal Cactus Wren Habitat Restoration and Enhancement Program, City of Chula Vista (SANDAG Grant Number 5001130; RECON Number 5296)

Dear Mr. Laube:

Introduction

This fifth annual report provides background information and summarizes the tasks performed during the fifth and final year (August 2013 through July 2014) of the coastal cactus wren (*Campylorhynchus brunneicapillus*) habitat restoration and enhancement program in the Chula Vista Central City Preserve. Three quarterly reports have previously been prepared by RECON in 2014. Information from those reports is summarized below for tasks completed between August 1, 2013 and July 31, 2014. This annual report also summarizes the results of the of the bird point count monitoring as well as relevé vegetation surveys that were conducted in spring 2014 at the treatment sites.

The Central City Preserve is in the central portion of the city of Chula Vista, east of Interstate 805, south of State Route 54 and Bonita Road, and north of Otay Lakes Road (Figure 1; see Attachment 1 for all figures and photographs). The Central City Preserve covers approximately 1,350 acres and is subdivided further into four Preserve Management Areas (PMAs) for data management purposes and for the development of the Area Specific Management Directives that were prepared in 2004 (Figure 2). Each PMA consists of a number of open space areas, referred to as subunits, which are surrounded by residential development. Each of these subunits was assigned a number to organize and distinguish each distinct survey area (Figure 3). Restoration and enhancement work was performed in PMA 1 subunits 1–2a, 1-2b, and 1–1a (Figure 4).

During the first year of the project (August 2009–July 2010), a total of approximately 5.75 acres of shrub were thinned around existing coast cholla (*Cylindropuntia prolifera*) patches. Approximately 2.48 acres of dried weedy areas were also dethatched using weed whips. Coast cholla cuttings were planted in all of the dethatched areas, around existing cholla patches to increase cholla density and within existing openings in coastal sage scrub (approximately 0.81 acre), for a total of approximately 9.04 acres of treated area.

Coastal Cactus Wren Status and Conservation

Populations of the coastal cactus wren are in decline throughout much of southern California, including San Diego County. Over the last decade, large, intense fires have damaged coastal cactus wren habitat in the Lake Jennings area (Cedar Fire, 2003), the San Pasqual Valley (Witch

Fire, 2007) and the Otay–Sweetwater Region, which includes the San Diego National Wildlife Refuge (Harris Fire, 2007). This recent trend of coastal cactus wren population decline has been observed in other regions of southern California. Regional recovery efforts for coastal populations of cactus wrens are intended to stabilize and eventually increase population sizes.

In the Central City Preserve, coast cholla patches have declined in the last 10–15 years due to competition with weeds and large shrubs such as lemonadeberry (*Rhus integrifolia*). Coastal cactus wrens often forage on the ground, and cactus habitats with dense weeds are not conducive for this behavior. Weeding programs, such as the one implemented for this project, improve habitat quality for the coastal cactus wren.

In addition to weed invasion and dense shrub growth, the below-average rainfall during most of the last decade has caused many patches of coast cholla to suffer from severe drought stress or die. This coast cholla die-off has likely caused a decrease in suitable habitat for coastal cactus wren that has contributed to the observed population declines.

Project Goals and Habitat Restoration Methods

- Increase coast cholla patch sizes and density within portions of the Central City Preserve to benefit populations of coastal cactus wrens.
- Restore and enhance patches of coast cholla in a distribution pattern that facilitates dispersal of coastal cactus wrens between areas of suitable habitat within PMA 1.
- Reduce native and non-native fuels proactively in the immediate vicinity of nesting-sized coast cholla patches to decrease the risk of catastrophic fires that could eliminate coastal cactus wren habitat.
- Restore habitat for coastal cactus wrens and other City of Chula Vista Multiple Species Conservation Program (MSCP) covered species, including coastal California gnatcatcher (*Poliophtila californica californica*) and Belding's orange-throated whiptail (*Aspidoscelis hyperythra beldingi*), in areas currently dominated by weeds.
- Restore and enhance coastal cactus wren habitat through the selective thinning and removal of lemonadeberry, other native shrubs, and exotic annuals that are directly competing with coast cholla to the detriment of coastal cactus wren populations.

2013–14 Rainfall Summary and Ecological Effects

Between July 1, 2013 and June 30, 2014, rainfall in Chula Vista (4.26 inches) was well below normal (which is approximately 10 inches) (Table 1). Rains began in October when just over one inch of rain fell at the Chula Vista reporting station. Rains in November were below normal, with dry conditions continuing in December, January, and most of February. One heavy rain event did occur between February 27 and March 2, 2014, when 1.49 inches of rain fell. Drier than normal conditions returned after early March and persisted the rest of the season.

TABLE 1
SUMMARY OF RAINFALL DATA BY MONTH
AT CHULA VISTA
JULY 1, 2013 - JUNE 30, 2014

| Month | Monthly Rainfall (inches) |
|----------------------------|------------------------------|
| July | 0.01 |
| August | 0.00 |
| September | 0.00 |
| October | 1.07 |
| November | 0.14 |
| December | 0.52 |
| January | 0.07 |
| February | 0.90 |
| March | 1.22 |
| April | 0.33 |
| May | 0.00 |
| June | 0.00 |
| TOTAL PRECIPITATION | 4.26 inches |

Year 5 Tasks Performed August 2013 through July 2014

Maintenance

Weed Control

Early rains in October caused the germination of redstem filaree (*Erodium cicutarium*) in small numbers, but the cool dry weather through late February limited their growth. As mentioned above, heavier rain occurred in late February and early March, which caused additional weeds to germinate.

Annual weeds were sprayed by RECON crews beginning in April and continuing in May 2014 to prevent them from flowering and setting seeds (Photographs 1 and 2). Glyphosate was used to control non-native annuals in planting areas. Non-native species that were controlled included tocalote (*Centaurea melitensis*), short-pod mustard (*Hirschfeldia incana*), redstem filaree, and annual grasses such as Mediterranean schismus (*Schismus barbatus*) and red brome (*Bromus madritensis* ssp. *rubens*). Herbicide was applied by licensed applicators under the supervision of RECON Field Crew Director Ruth Vallejo, who is a certified Pest Control Advisor.

In addition to mustards and other annual weeds, a small population of hollow-stem asphodel (*Asphodelus fistulosus*; California Invasive Plant Council ranked moderate alert) was also controlled at one of restoration areas in Rice Canyon. The plants were growing along the access road that runs the length of the canyon. Since the plants were not yet in flower, RECON maintenance crews used shovels to uproot the plants and then dry them in the sun. This third year of treatment of hollow-stem asphodel will reduce the chance that this weed will invade the surrounding coastal cactus wren habitat.

Shrub and Cactus Maintenance

In previously cleared patches, small shrub seedlings were also sprayed with herbicide to prevent them from growing large and competing with the coast cholla and shore cactus (*Opuntia littoralis*). The openings created by the thinning program have significantly increased potential open-ground foraging areas for the coastal cactus wren. Broom baccharis (*Baccharis sarothroides*) seedlings that had germinated in the restoration sites were also sprayed by the RECON crews beginning in February 2014 (Photographs 3 and 4). This shrub control program will reduce the long-term vegetation maintenance around nesting-sized cactus patches.

Monitoring

Vegetation Sampling Methods

Vegetation patch sampling was done using the relevé method. Treated vegetation patches greater than 0.10 acre were sampled. All plant species occurring in each patch were recorded, and the cover of each species was estimated. A total of 26 vegetation treatment areas were sampled by RECON biologist Anna Bennett between April and May 2014. Twenty of the vegetation study plots are located at shrub thinning sites, and six are located at weed dethatching areas. The results of the vegetation sampling efforts are presented in the Year 5 Vegetation Sampling Results section below.

Bird Point Count Methods

Repeat bird point counts were conducted by RECON biologists Beth Procsal and Erin Buxton at 25 stations. One previously established point count station was eliminated, as no restoration work has occurred there. In fall 2009, point count locations were recorded using a handheld global positioning system unit so that the points could be relocated each year for repeat surveys. During May 2014, RECON biologists surveyed for 10 minutes at each point location and recorded birds that were detected either visually or by call. The results of the bird point count data are summarized below in the Year 5 Bird Count Results section.

Year 5 Vegetation Sampling Results

Attachment 2 lists the species observed at the shrub thinning areas in and around Rice Canyon. Attachment 3 lists the species observed at the weed dethatching areas in and around Rice Canyon. Plant nomenclature is from: University of California 2013, and Rebman and Simpson 2006.

The following results are from the 20 relevé shrub thinning locations:

- The average coast cholla height at the shrub thinning plots was:
 - Coast cholla less than 1 foot: 5.2%
 - Coast cholla between 1 and 3 feet in height: 15.6%
 - Coast cholla over 3 feet in height: 79.2%
- Average total cover (shrub and herbaceous): 24.2%
- Average bare ground: 75.8%
- Average total cover of coast cholla: 22.4%
- Average percent coast cholla cover out of the total cover: 92.7%
- A total of 57 plant species were recorded at the shrub thinning locations: 46 native species and 11 non-native species
- Average non-native cover: 0.0%
- Average non-native cover out of the total cover: 0.4%

The following results are from the six relevé dethatching locations:

- Average coast cholla height at the weed dethatching locations:
 - Coast cholla less than 1 foot: 22.7%
 - Coast cholla between 1 and 3 feet in height: 56.8%
 - Coast cholla over 3 feet in height: 21.3%
- Average total cover (shrub & herbaceous): 18.4%
- Average bare ground: 81.6%
- Average total cover of coast cholla: 17.2%
- Average percent coast cholla cover out of total cover: 92.9%
- A total of 32 plant species were recorded in the dethatching areas: 26 native and 6 non-native species
- Average total non-native cover: 0.0%
- Average non-native cover out of total cover: 0.2%

Year 5 Bird Point Count Results

In spring 2014, 28 species of birds were detected during the point count monitoring surveys compared to 23 species during the spring 2013, 24 species during the spring of 2012, 23 species during the spring 2011 point counts, 14 species during the spring 2010 counts, and 15 species in August 2009. No coastal cactus wren or active wren nests were detected during the 2014 surveys. Additionally, there were no coastal cactus wren mortalities. The following species of birds were the 10 most commonly observed (in descending order) during the spring 2014 point counts:

- California quail (*Callipepla californica californica*)
- Anna's hummingbird (*Calypte anna*)
- Wrentit (*Chamaea fasciata henshawi*)
- Lesser goldfinch (*Spinus* [= *Carduelis*] *psaltria hesperophilus*)
- House finch (*Haemorhous* [= *Carpodacus*] *mexicanus frontalis*)
- Song sparrow (*Melospiza melodia*)
- Northern mockingbird (*Mimus polyglottos polyglottos*)
- Mourning dove (*Zenaida macroura marginella*)
- Spotted towhee (*Pipilo maculatus*)
- Cliff swallow (*Petrochelidon pyrrhonota tachina*)

Discussion

Weed Control Results

Due to the continued maintenance efforts, weed cover at the shrub thinning and dethatching sites remained low in spring 2014. The average absolute non-native cover at the shrub thinning sites was 0.0 percent in 2014. The relative cover of non-natives at the shrub thinning sites also remained very low at 0.4 percent in 2014.

At the dethatching sites, average absolute non-native cover was 0.0 percent in 2014. The relative cover of non-natives at the dethatching sites also remained very low at 0.2 percent in 2014. These numbers indicate that weed control efforts have been successful and are maintaining low levels of non-native cover.

Cactus and Other Native Plant Growth

Even though rainfall was well below normal during the 2013–14 season, cactus cuttings and existing coast cholla patches continued to expand in size during Year 5 (Photographs 5–7). As weed cover and competition have been reduced, more water has become available for native plant growth. The positive effects of this additional water are reflected in the large number of new coast cholla and prickly pear stems that have appeared each year on the cuttings originally planted in 2009. This new growth is particularly evident at the weed dethatching areas. Coast cholla, prickly pear, and cuttings planted in 2009 flower each year and are being visited by pollinators such as honey bees (Photographs 8–11). Pollinated cactus flowers are producing numerous fruits that provide potential food for coastal cactus wrens and other wildlife. Over time, the dethatching areas will fill in with dense coast cholla and prickly pear that will benefit the coastal cactus wren by providing additional nesting areas.

Quantitative data show that the cover of coast cholla at the shrub thinning sites increased about 8 percent since 2010, while the average cover of coast cholla at the dethatching sites increased about 14 percent. The most noticeable change in the coast cholla at the dethatching areas was the increase in height of the plants. The percentage of coast cholla that were one to three feet tall increased from just 4 percent in 2010 to nearly 57 percent in 2014. The percentage of coast cholla over three feet tall increased from 5 percent in 2010 to over 21 percent in 2014. Also, the average cover of coast cholla relative to the total plant cover at the dethatching sites increased from 50 percent in 2010 to over 92.9 percent in 2014. Photographs 12a,b–18a,b depict the changes in

health, size, and cover of coast cholla patches that were formerly dominated by non-native mustards or native shrubs. The dethatch and subsequent weed control program have dramatically improved the growing conditions of the coast cholla.

As part of the maintenance program, small amounts of native annual seed were collected and redistributed in dethatching areas that have had little native annual cover. Photograph 19 shows one of the dethatching areas in the spring of 2014 after it was seeded with native annuals. Photograph 20 is a close-up of *Cryptantha* spp. growing at one of the dethatch sites. The increased native annual cover will support a greater diversity of invertebrate species (Photograph 21), which will in turn provide potential food sources for coastal cactus wrens that often forage near or on the ground. Other succulent species found in the shrub thinning areas include chalk dudleya (*Dudleya pulverulenta*), fish hook cactus (*Mammillaria dioica*), and Mojave yucca (*Yucca schidigera*) (Photograph 22).

Coastal Cactus Wren and Other Wildlife Use

No coastal cactus wrens or active wren nests were observed during 2014, but another sensitive bird species, coastal California gnatcatcher (Photograph 23), was observed at nine locations (Figure 5). Another sensitive species, the southwestern willow flycatcher (*Empidonax traillii extimus*; federally and state endangered; MSCP covered), was observed in the riparian area at Rice Canyon. Two southwestern willow flycatchers were detected, with one observed singing and a second bird singing in response. All observations of California Department of Fish and Wildlife (CDFW) listed species and CDFW species of special concern are being reported to CDFW. Other commonly encountered species that forage in and nest in the coast chollas and around the edges of the enhancement sites included California quail, Anna's hummingbird, and wrentit.

Several species of reptiles commonly use the coastal cactus wren restoration and enhancement sites, including the common western fence lizard (*Sceloporus occidentalis*), southern alligator lizard (*Elgaria multicarinata*), and California kingsnake (*Lampropeltis getula californiae*). Sensitive reptile species also observed include the MSCP-covered Belding's orange-throated whiptail (*Aspidoscelis hyperythra beldingi*; Photograph 24), which was observed at six locations (see Figure 5).

Mammal species that were detected at the restoration and enhancement sites include desert cottontail rabbits (*Sylvilagus audubonii*) and the nests of the San Diego desert woodrat (*Neotoma lepida intermedia*; a California Department of Fish and Wildlife Species of Special Concern (two nests), which collects cactus spines to build its nest at the base of the coast cholla (see Figure 5).

Long-term Maintenance Recommendations

Recommended long-term management activities include weed control through spraying of non-native annuals such as mustards, filaree, tocalote and grasses, using a glyphosate-based product. Over the long term, shrubs will slowly encroach on the shrub thinning patches and dethatch sites. Lemonadeberry is the most competitive of the native shrubs that should be monitored for encroachment into the treatments sites. Other native shrub species such as California sagebrush (*Artemisia californica*) and jojoba (*Simmondsia chinensis*) may also require herbicide treatment.

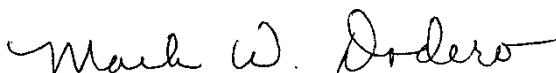
Small shrub seedlings such as California sagebrush and jojoba can be treated with a glyphosate-based product, while larger shrubs such as lemonadeberry and larger jojoba plants, can be treated with Garlon (active ingredient: Triclopyr). Long-term control of weeds and shrubs around coast cholla habitat patches will reduce the risk of catastrophic fires that have the potential to cause the loss of coastal cactus wren habitat. These management recommendations are consistent with the Area-Specific Management Directives (ASMD) for Preserve Management Area 1 that includes Rice and surrounding canyons where this grant work was performed (RECON 2004).

Mr. Glen Laube
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As called for in the ASMD for PMA 1, monitoring of coastal cactus wren populations in the Chula Vista Central City Preserve can be accomplished by qualified biologists when they are working in the preserve. Incidental observations of coastal cactus wrens should be mapped and reported in the annual report list of sensitive species.

If you have any questions regarding the coastal cactus wren habitat restoration and enhancement program, do not hesitate to call.

Sincerely,



Mark Dodero
Senior Biologist

MWD:eab:sh

Enclosures

References Cited

California, University of

2013 The Jepson Online Interchange. Accessed August 2013 from
<http://ucjeps.berkeley.edu/interchange.html>.

Rebman, John P. and Michael G. Simpson

2006 Checklist of the Vascular Plants of San Diego County, 4th edition. San Diego Natural History Museum.

RECON

2004 Chula Vista Central City Preserve Area Specific Management Directives (ASMDs) for Preserve Management Area 1 (PMA 1), City of Chula Vista. April 26.

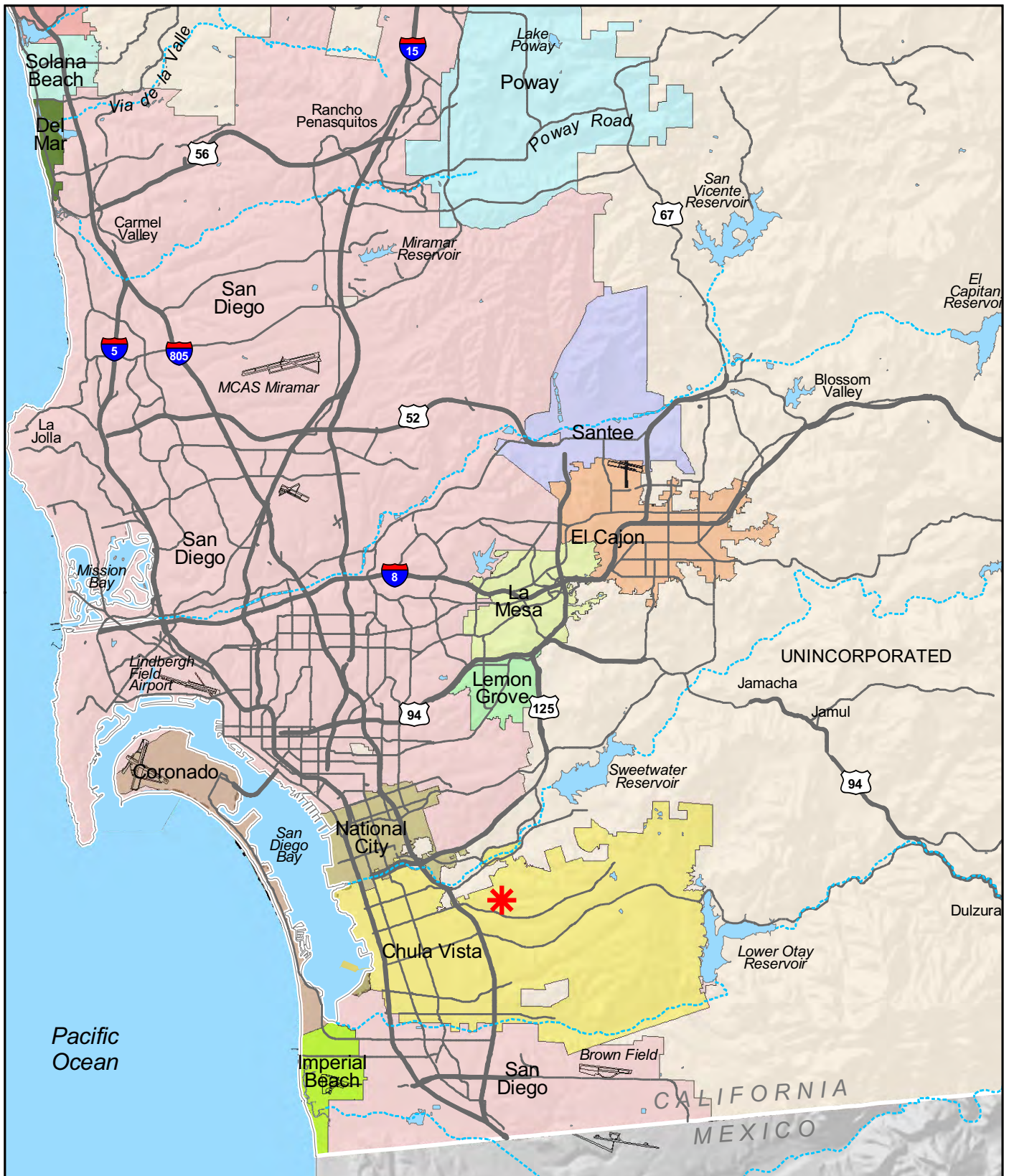
Contributors to this Report

RECON biologists that conducted field surveys, supervised the maintenance crews, and analyzed data included Anna Bennett, Beth Procsal, Erin Buxton, and Cailin O'Meara.

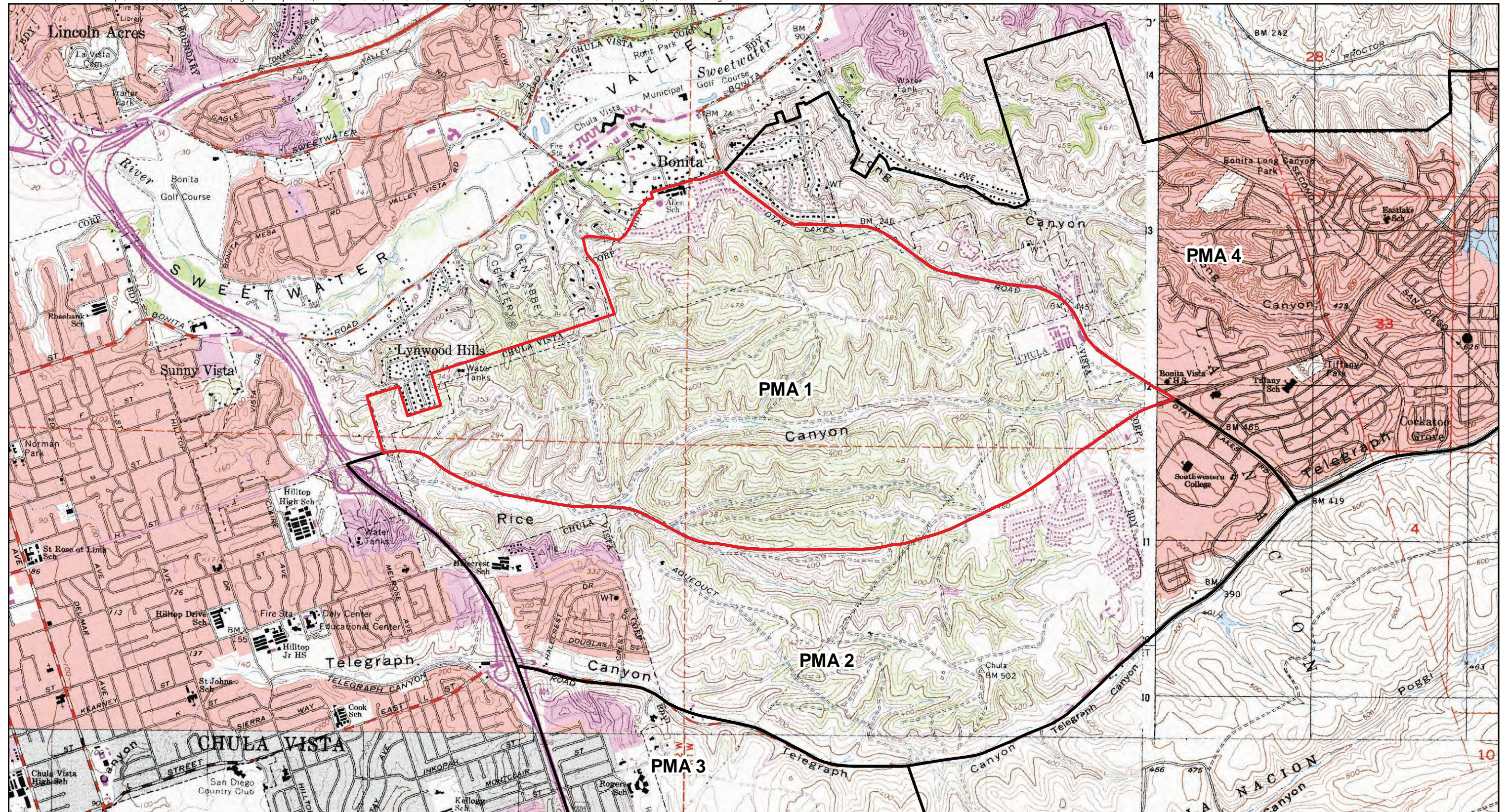
ATTACHMENTS

ATTACHMENT 1

Figures and Photographs

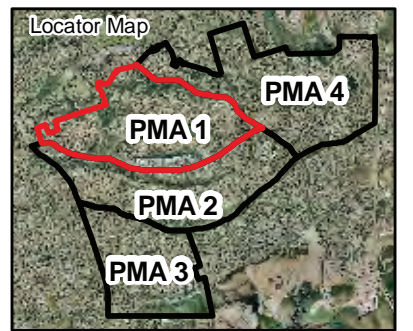


 Project Location



Preserve Management Areas

- PMA 1
- Other PMAs



Preserve Management Areas




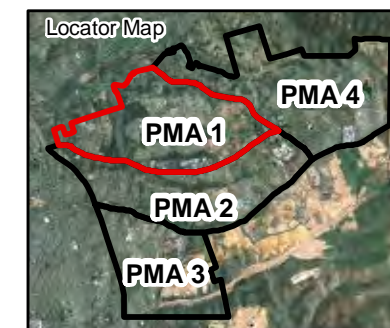
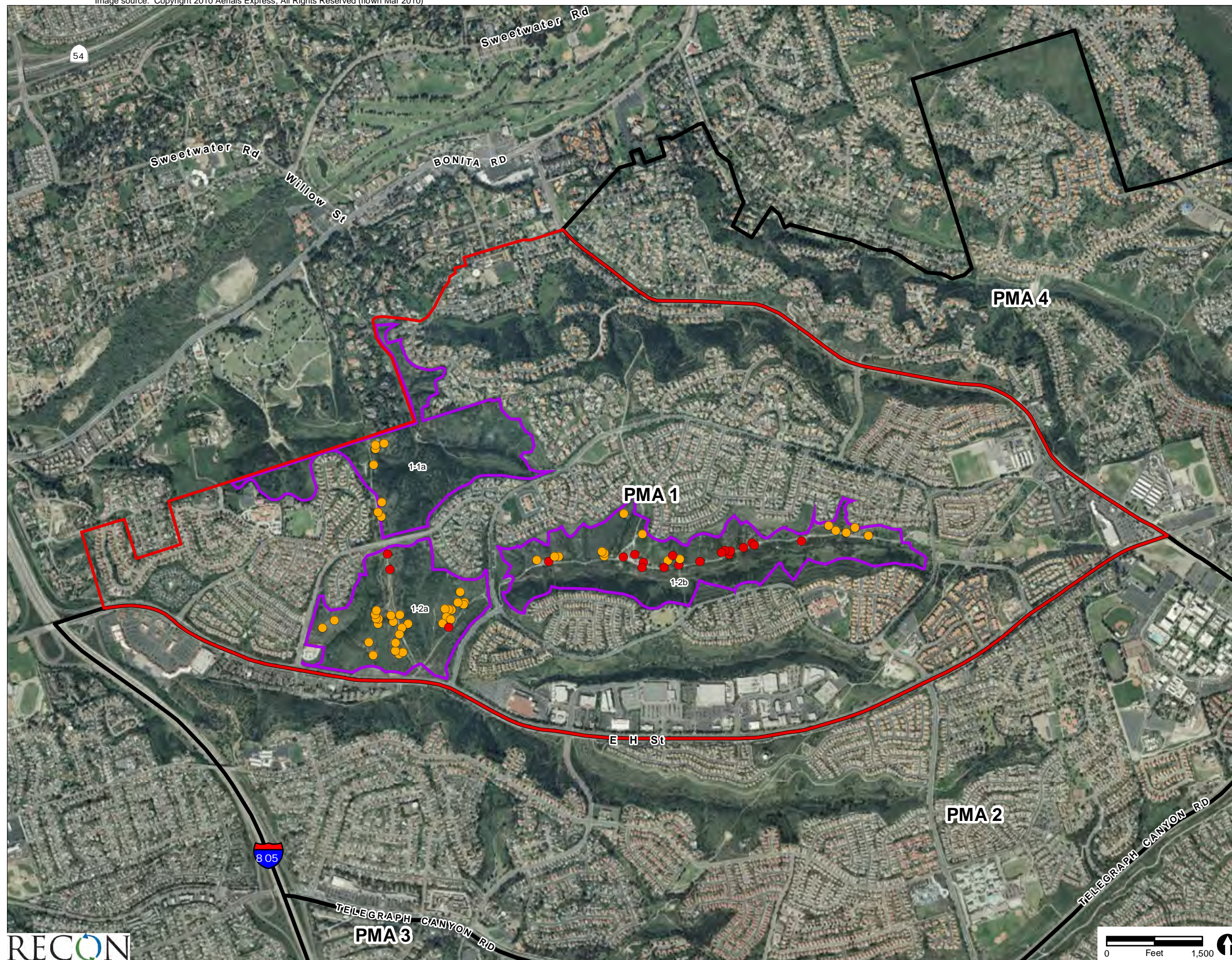
-  PMA 1
-  Other PMAs
-  PMA Subunits

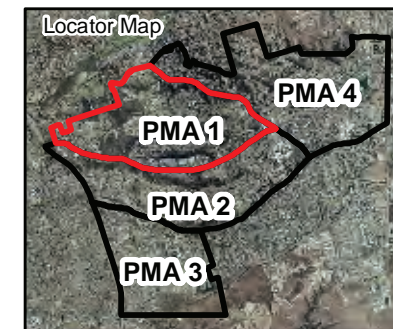
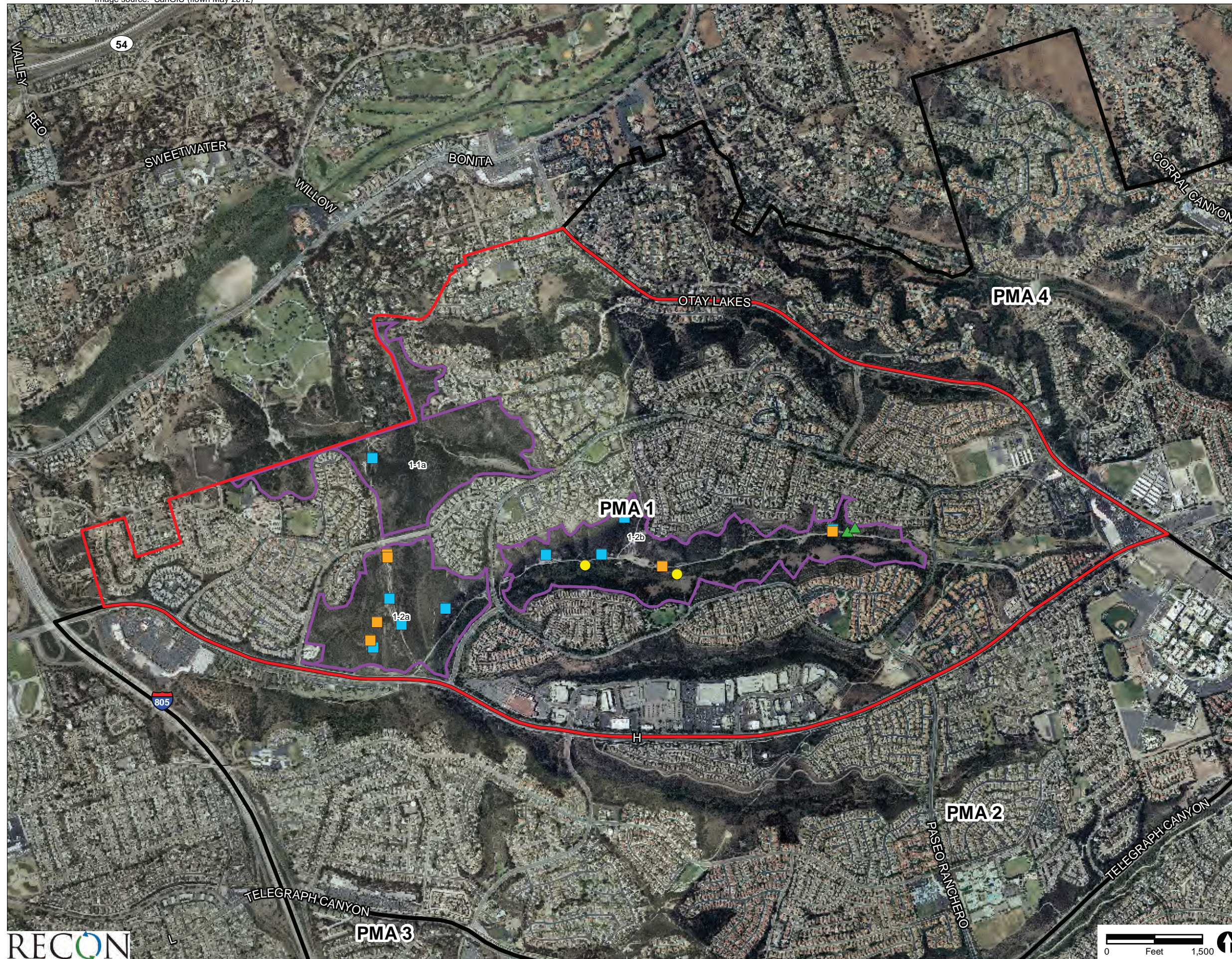
FIGURE 3
Preserve Management Subunits
Selected for Restoration



Preserve Management Areas

- PMA 1
- Other PMAs
- PMA Subunits
- Dethatch Areas
- Cut Areas

FIGURE 4
Cactus Wren Habitat Restoration
and Enhancement Locations



Preserve Management Areas

- PMA 1
- Other PMAs
- PMA Subunits
- Coastal California Gnatcatcher
- Belding's Orange-throated Whiptail
- ▲ San Diego Desert Woodrat
- Southwestern Willow Flycatcher

FIGURE 5
Locations of Sensitive
Species in 2014



PHOTOGRAPH 1
RECON Crew Spraying Non-natives



PHOTOGRAPH 2
RECON Crew Spraying Non-natives



PHOTOGRAPH 3
RECON Crew Spraying Broom Baccharis



PHOTOGRAPH 4
Broom Baccharis Immediately After Spraying



PHOTOGRAPH 5
Cactus Patch at Dethatch Area, Rice Canyon



PHOTOGRAPH 6
Cactus Patch at Dethatch Area, Rice Canyon



PHOTOGRAPH 7
Cactus Patch at Dethatch Area, Rice Canyon



PHOTOGRAPH 8
Coast Cholla Flowering at the Restoration Site



PHOTOGRAPH 9
Coast Cholla Flowers



PHOTOGRAPH 10
Shore Cactus Flowering in Rice Canyon



PHOTOGRAPH 11
Honey Bees Visiting Shore Cactus Flower



PHOTOGRAPH 12a
Dethatch Area in October 2010



PHOTOGRAPH 12b
Same Dethatch Area in May 2014



PHOTOGRAPH 13a
Shrub-thinning Area Prior to Implementation September 2009



PHOTOGRAPH 13b
Same Shrub-thinning Area in May 2014



PHOTOGRAPH 14a
Dethatch Area Prior to Implementation 2008



PHOTOGRAPH 14b
Same Dethatch Area, May 2014



PHOTOGRAPH 15a
Dethatch Area in Rice Canyon Prior to Implementation 2008



PHOTOGRAPH 15b
Same Dethatch Area in Rice Canyon, May 2014



PHOTOGRAPH 16a
Area of Dying Cholla Prior to Implementation, 2009



PHOTOGRAPH 16b
Same Area of Recovering Cholla, May 2014



PHOTOGRAPH 17a
Dethatch Area in Rice Canyon After Weeds Were Cut, Fall 2009



PHOTOGRAPH 17b
Same Dethatch Area in Rice Canyon, May 2014



PHOTOGRAPH 18a
Large Dethatch Area in Rice Canyon After Weeds Were Cut, Fall 2009



PHOTOGRAPH 18b
Same Dethatch Area in Rice Canyon, May 2014



PHOTOGRAPH 19
Hand-seeded *Cryptantha* spp.
Growing in a Dethatch Area



PHOTOGRAPH 20
Closeup of *Crypthantha* spp. Growing in a Dethatch Area



PHOTOGRAPH 21
Orb Weaver Spider



PHOTOGRAPH 22
Mojave Yucca Flowering in Rice Canyon



PHOTOGRAPH 23
Coastal California Gnatcatcher In Rice Canyon



PHOTOGRAPH 24
Orange-throated Whiptail Foraging in a Shrub Cut Patch

ATTACHMENT 2

Plant Species Observed at Shrub Thinning Patches in 2014

ATTACHMENT 2
PLANT SPECIES OBSERVED AT SHRUB THINNING PATCHES IN 2014

| Scientific Name | Common Name | Origin |
|---|---|--------|
| LYCOPODS | | |
| SELAGINELLACEAE | | |
| <i>*Selaginella cinerascens</i> A.A. Eaton | SPIKE-MOSS FAMILY ashy spike-moss | N |
| ANGIOSPERMS: MONOCOTS | | |
| AGAVACEAE | | |
| <i>Chlorogalum parviflorum</i> S. Watson | AGAVE FAMILY small-flower soap-plant, amole | N |
| <i>Yucca schidigera</i> Ortgies | Mojave yucca | N |
| ASPHODELACEAE | | |
| <i>Asphodelus fistulosus</i> L. | ASPHODEL FAMILY hollow-stem asphodel | I |
| POACEAE (GRAMINEAE) | | |
| <i>Bromus madritensis</i> L. ssp. <i>rubens</i> (L.) Husn. | GRASS FAMILY red brome | I |
| <i>Melica imperfecta</i> Trin. | little California melica | N |
| <i>Schismus barbatus</i> (L.) Thell. | Mediterranean schismus | I |
| <i>Stipa</i> [=Nassella] <i>lepida</i> Hitchc. | foothill needle grass | N |
| ANGIOSPERMS: DICOTS | | |
| ANACARDIACEAE | | |
| <i>Rhus integrifolia</i> (Nutt.) Benth. & Hook. f. ex Rothr. | SUMAC OR CASHEW FAMILY lemonade berry | N |
| APIACEAE (UMBELLIFERAE) | | |
| <i>Apiastrum angustifolium</i> Nutt. | CARROT FAMILY mock-parsley | N |
| <i>Daucus pusillus</i> Michx. | rattlesnake weed | N |
| ASTERACEAE | | |
| <i>Artemisia californica</i> Less. | SUNFLOWER FAMILY California sagebrush | N |
| <i>Baccharis pilularis</i> DC. | chaparral broom, coyote brush | N |
| <i>Baccharis sarothroides</i> A. Gray | broom baccharis | N |
| <i>*Bahioopsis</i> [=Viguiera] <i>laciniata</i> (A. Gray) E.E. Schilling & Panero | San Diego viguiera | N |
| <i>Centaurea melitensis</i> L. | tocalote, Maltese star-thistle | I |
| <i>Cotula australis</i> (Sieber ex Spreng.) Hook. f. | Australian cotula | I |
| <i>Deinandra</i> [=Hemizonia] <i>fasciculata</i> (DC.) Greene | fascicled tarweed, golden tarplant | N |
| <i>Encelia californica</i> Nutt. | California encelia | N |
| <i>Lactuca serriola</i> L. | prickly lettuce | I |
| <i>Pseudognaphalium biolettii</i> Anderb. [=Gnaphalium <i>bicolor</i>] | bicolor cudweed | N |
| <i>Pseudognaphalium</i> [=Gnaphalium] <i>californicum</i> (DC.) Anderb. | California everlasting, green everlasting | N |
| <i>Sonchus asper</i> (L.) Hill ssp. <i>asper</i> | prickly sow thistle | I |

ATTACHMENT 2
PLANT SPECIES OBSERVED AT SHRUB THINNING PATCHES IN 2014
(continued)

| Scientific Name | Common Name | Origin |
|--|-------------------------------------|--------|
| BORAGINACEAE | BORAGE FAMILY | |
| <i>Cryptantha</i> sp. | cryptantha | N |
| <i>Cryptantha clevelandii</i> Greene | Cleveland's cryptantha | N |
| <i>Emmenanthe penduliflora</i> Benth. | whispering bells | N |
| <i>Pholistoma racemosum</i> (Nutt. ex A. Gray) Constance | San Diego fiesta flower, pholistoma | N |
| BRASSICACEAE (CRUCIFERAE) | MUSTARD FAMILY | |
| <i>Hirschfeldia incana</i> (L.) Lagr.-Fossat | short-pod mustard | I |
| CACTACEAE | CACTUS FAMILY | |
| * <i>Cylindropuntia californica</i> (Torr. & A. Gray) F.M. Knuth var. <i>californica</i> | snake cholla | N |
| <i>Cylindropuntia</i> [= <i>Opuntia</i>] <i>prolifera</i> (Engelm.) F.M. Knuth | coast cholla | N |
| * <i>Ferocactus viridescens</i> (Torr. & A. Gray) Britton & Rose | San Diego barrel cactus | N |
| <i>Mammillaria dioica</i> K. Brandegee | fish-hook cactus | N |
| <i>Opuntia littoralis</i> (Engelm.) Cockerell. | coast prickly-pear, shore cactus | N |
| CHENOPODIACEAE | GOOSEFOOT FAMILY | |
| <i>Atriplex canescens</i> (Pursh) Nutt. | four-wing saltbush, shad-scale | N |
| <i>Salsola tragus</i> L. | Russian thistle, tumbleweed | I |
| CISTACEAE | ROCK-ROSE FAMILY | |
| <i>Crocanthemum</i> [= <i>Helianthemum</i>] <i>scoparium</i> Nutt. Millsp. | peak rush-rose | N |
| CLEOMACEAE | SPIDERFLOWER FAMILY | |
| <i>Peritoma</i> [= <i>Isomeris</i>] <i>arborea</i> (Nutt.) H. H. Iltis | bladderpod | N |
| CRASSULACEAE | STONECROP FAMILY | |
| <i>Dudleya pulverulenta</i> (Nutt.) Britton & Rose | chalk lettuce, chalk dudleya | N |
| CUCURBITACEAE | GOURD FAMILY | |
| <i>Marah macrocarpa</i> (Greene) Greene | wild cucumber | N |
| EUPHORBIACEAE | SPURGE FAMILY | |
| <i>Euphorbia</i> [= <i>Chamaesyce</i>] <i>polycarpa</i> Benth. | smallseed sandmat | N |
| <i>Stillingia linearifolia</i> S. Watson | linear-leaf stillingia | N |
| FABACEAE (LEGUMINOSAE) | LEGUME FAMILY | |
| <i>Astragalus trichopodus</i> (Nutt.) A. Gray var. <i>lonchus</i> (M.E. Jones) Barneby | ocean locoweed | N |
| GERANIACEAE | GERANIUM FAMILY | |
| <i>Erodium cicutarium</i> (L.) L'Hér. ex Aiton | redstem filaree | I |
| MALVACEAE | MALLOW FAMILY | |
| <i>Malacothamnus</i> sp. | bush-mallow | N |

ATTACHMENT 2
PLANT SPECIES OBSERVED AT SHRUB THINNING PATCHES IN 2014
(continued)

| Scientific Name | Common Name | Origin |
|--|--|--------|
| MYRSINACEAE | MYRSINE FAMILY | |
| <i>Anagallis arvensis</i> L. | scarlet pimpernel, poor-man's weatherglass | I |
| NYCTAGINACEAE | FOUR O'CLOCK FAMILY | |
| <i>Mirabilis laevis</i> [= <i>Mirabilis californica</i>] (Benth.) Curran var. <i>crassifolia</i> (Choisy) Spellenb. | wishbone bush | N |
| ONAGRACEAE | EVENING-PRIMROSE FAMILY | |
| <i>Eulobus californicus</i> Torr. & A. Gray [= <i>Camissonia californica</i>] | false-mustard | N |
| PHRYMACEAE [= SCROPHULARIACEAE] | HOPSEED FAMILY | |
| <i>Mimulus aurantiacus</i> Curtis | bush monkey-flower | N |
| PLANTAGINACEAE | PLANTAIN FAMILY | |
| <i>Antirrhinum nuttallianum</i> Benth. ex A. DC. | Nuttall's snapdragon | N |
| POLEMONIACEAE | PHLOX FAMILY | |
| <i>Eriastrum sapphirinum</i> (Eastw.) H. Mason. | sapphire woolly-star | N |
| POLYGONACEAE | BUCKWHEAT FAMILY | |
| <i>Eriogonum fasciculatum</i> Benth. | California buckwheat | N |
| <i>Pterostegia drymarioides</i> Fisch. & C.A. Mey. | California thread-stem, granny's hairnet | N |
| SIMMONDSIACEAE | JOJOBA FAMILY | |
| <i>Simmondsia chinensis</i> (Link) C.K. Schneid. | jojoba, goatnut | N |
| SOLANACEAE | NIGHTSHADE FAMILY | |
| <i>Nicotiana clevelandii</i> A. Gray | Cleveland's tobacco | N |
| <i>Physalis crassifolia</i> Benth. | Greene's ground-cherry | N |
| <i>Solanum americanum</i> Mill. | white nightshade | N |
| URTICACEAE | NETTLE FAMILY | |
| <i>Parietaria hespera</i> Hinton var. <i>californica</i> Hinton | California pellitory | N |

Nomenclature from:

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Rebman, John P., and Michael G. Simpson

2006 Checklist of the Vascular Plants of San Diego County, 4th edition. San Diego Natural History Museum.

ORIGIN

N = Native to locality

I = Introduced species from outside locality

* = Sensitive plant species

ATTACHMENT 3

Plant Species Observed at Dethatch Patches in 2014

ATTACHMENT 3
PLANT SPECIES OBSERVED AT DETHATCH PATCHES IN 2014

| Scientific Name | Common Name | Origin |
|--|---------------------------------------|--------|
| LYCOPODS | | |
| SELAGINELLACEAE | SPIKE-MOSS FAMILY | |
| * <i>Selaginella cinerascens</i> A.A. Eaton | ashy spike-moss | N |
| ANGIOSPERMS: MONOCOTS | | |
| AGAVACEAE | AGAVE FAMILY | |
| <i>Yucca schidigera</i> Ortgies | Mojave yucca | N |
| POACEAE (GRAMINEAE) | GRASS FAMILY | |
| <i>Stipa [=Nassella] lepida</i> Hitchc. | foothill needle grass | N |
| THEMIDACEAE | BRODIAEA FAMILY | |
| <i>Dichelostemma capitatum</i> (Benth.) Alph. Wood | blue dicks | N |
| ANGIOSPERMS: DICOTS | | |
| ANACARDIACEAE | SUMAC OR CASHEW FAMILY | |
| <i>Rhus integrifolia</i> (Nutt.) Benth. & Hook. f. ex Rothr. | lemonade berry | N |
| ASTERACEAE | SUNFLOWER FAMILY | |
| <i>Artemisia californica</i> Less. | California sagebrush | N |
| <i>Baccharis pilularis</i> DC. | chaparral broom, coyote brush | N |
| <i>Baccharis salicifolia</i> (Ruiz & Pav.) Pers. ssp. <i>salicifolia</i> | mule fat, seep-willow | N |
| <i>Baccharis sarothroides</i> A. Gray | broom baccharis | N |
| <i>Centaurea melitensis</i> L. | tocalote, Maltese star-thistle | I |
| <i>Deinandra [=Hemizonia] fasciculata</i> (DC.) Greene | fascicled tarweed, golden tarplant | N |
| <i>Encelia californica</i> Nutt. | California encelia | N |
| <i>Lactuca serriola</i> L. | prickly lettuce | I |
| <i>Laennecia [=Conyza] coulteri</i> A. Gray G.L. Nesom | Coulter's horseweed | N |
| <i>Sonchus asper</i> (L.) Hill ssp. <i>asper</i> | prickly sow thistle | I |
| BORAGINACEAE | BORAGE FAMILY | |
| <i>Amsinckia menziesii</i> (Lehm.) A. Nelson & J.F. Macbr. | rancher's fireweed | N |
| <i>Cryptantha</i> sp. | cryptantha | N |
| <i>Cryptantha clevelandii</i> Greene | Cleveland's cryptantha | N |
| <i>Eucrypta chrysanthemifolia</i> (Benth.) Greene | Eucrypta | N |
| <i>Heliotropium curassavicum</i> L. var. <i>oculatum</i> (A. Heller) I. M. Johnst. ex Tidestr. | seaside heliotrope, alkali heliotrope | N |
| BRASSICACEAE (CRUCIFERAE) | MUSTARD FAMILY | |
| <i>Hirschfeldia incana</i> (L.) Lagr.-Fossat | short-pod mustard | I |

ATTACHMENT 3
PLANT SPECIES OBSERVED AT DETHATCH PATCHES IN 2014
(continued)

| Scientific Name | Common Name | Origin |
|--|----------------------------------|--------|
| CACTACEAE | CACTUS FAMILY | |
| <i>Cylindropuntia</i> [= <i>Opuntia</i>] <i>prolifera</i> (Engelm.) F.M. Knuth | coast cholla | N |
| * <i>Ferocactus viridescens</i> (Torr. & A. Gray) Britton & Rose | San Diego barrel cactus | N |
| <i>Opuntia littoralis</i> (Engelm.) Cockerell. | coast prickly-pear, shore cactus | N |
| CHENOPODIACEAE | GOOSEFOOT FAMILY | |
| * <i>Atriplex pacifica</i> A. Nelson | south coast saltscall | N |
| CLEOMACEAE | SPIDERFLOWER FAMILY | |
| <i>Peritoma</i> [= <i>Isomeris</i>] <i>arborea</i> (Nutt.) H. H. Iltis | bladderpod | N |
| EUPHORBIACEAE | SPURGE FAMILY | |
| <i>Euphorbia</i> [= <i>Chamaesyce</i>] <i>maculata</i> L. | spotted spurge | I |
| <i>Euphorbia</i> [= <i>Chamaesyce</i>] <i>polycarpa</i> Benth. | smallseed sandmat | N |
| FABACEAE (LEGUMINOSAE) | LEGUME FAMILY | |
| <i>Astragalus trichopodus</i> (Nutt.) A. Gray var. <i>lonchus</i> (M.E. Jones) Barneby | ocean locoweed | N |
| GERANIACEAE | GERANIUM FAMILY | |
| <i>Erodium cicutarium</i> (L.) L'Hér. ex Aiton | redstem filaree | I |
| SIMMONDSIACEAE | JOJOBA FAMILY | |
| <i>Simmondsia chinensis</i> (Link) C.K. Schneid. | jojoba, goatnut | N |
| SOLANACEAE | NIGHTSHADE FAMILY | |
| <i>Datura wrightii</i> Regel | western Jimson weed | N |

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