RECON

An Employee-Owned Company

July 29, 2015

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

Reference: Year 3 Final Annual Report for the Otay Ranch Coastal Cactus Wren Habitat Restoration and Enhancement Program (SANDAG Grant Number 5001970; RECON Number 6649)

1.0 Introduction

This third and final annual report provides background information and summarizes the tasks performed during the third year (July 1, 2014 to June 30, 2015) of the coastal cactus wren (*Campylorhynchus brunneicapillus*) habitat restoration and enhancement program located within the Otay Ranch Preserve. Four quarterly reports for year 3 were prepared and submitted by RECON. Information from those reports is summarized below. This final annual report also summarizes the results of the focused coastal cactus wren surveys that were conducted in spring 2015 at the treatment sites, as well as the results of the relevé vegetation surveys.

The target areas for restoration/enhancement within Salt Creek are all located within the Otay Ranch Preserve (Figures 1–2; see Attachment 1 for all figures and photographs). Overall, the Otay Ranch Preserve currently contains 3,216 acres of preserve land established to create an open space system that will protect natural resources and provide a series of interconnected viable habitats to protect Multiple Species Conservation Program (MSCP) covered species and regional wildlife corridors.

Sensitive habitat communities identified within the Preserve include maritime succulent scrub, coastal sage scrub, valley needlegrass grassland, non-native grassland, southern willow scrub, freshwater marsh, cismontane alkali marsh, and Baccharis floodplain scrub. Sensitive species observed on-site include coastal California gnatcatcher (*Polioptila californica californica*), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), San Diego black-tailed jackrabbit (*Lepus californicus bennettii*), coast horned lizard (*Phrynosoma blainvillii*), variegated dudleya (*Dudleya variegata*), San Diego barrel cactus (*Ferocactus viridescens*), and snake cholla (*Cylindropuntia californica* var. *californica*).

2.0 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 in 2003), the San Pasqual Valley (Witch Fire in 2007), and the Otay–Sweetwater region, which includes the San Diego National Wildlife Refuge (Harris Fire in 2007). This recent trend of 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.

Coast cholla (*Cylindropuntia prolifera*) die-off has likely contributed to a decrease in suitable habitat for coastal cactus wren and the observed population declines. In the Otay Ranch Preserve, coast cholla patches have declined in the last 10 to 15 years due to competition for water resources with weeds and native shrubs. Cactus wrens typically forage on the ground, and thick weed cover can prevent the wrens from finding their prey. In addition, the below-average rainfall during most of the last decade has caused many patches of coast cholla to suffer or die from severe drought stress. The drought conditions have also likely decreased the availability of insect prey for foraging wrens.

Coastal cactus wren surveys performed in 2010 by the Otay Ranch Preserve Steward/Biologist detected 4 pairs, 2 solitary individuals, and 36 nests within Salt Creek. Incidental sightings of coastal cactus wren made on other surveys added an additional 5 pairs and 9 solitary individuals (RECON 2011). One of the pairs was detected with a third—juvenile—wren, indicating a possible family unit.

Salt Creek is identified in the Otay Ranch Resource Management Plan (RMP) as an avian corridor for coastal cactus wren and coastal California gnatcatcher, providing north/south movement from the Otay river valley. Salt Creek connects with the Otay river valley just west of the Lower Otay Reservoir. This corridor system provides a critical linkage to several MSCP designated biological core areas, including the Otay River, Wolf Canyon, Otay Lakes, Otay Mountain (with connections east toward Tecate Peak), the Jamul Mountains, San Miguel Mountain, and the upper Sweetwater River. The Salt Creek area has also been identified as a high priority location for conducting habitat restoration and enhancement for cactus wrens in the South San Diego County Coastal Cactus Wren Habitat Conservation and Management Plan (The Nature Conservancy 2015).

3.0 Project Goals and Habitat Restoration Methods

- Restore/enhance approximately 15 acres of degraded habitat for coastal cactus wrens within Salt Creek.
- Reduce the risk of cactus wren habitat loss from fires.
- Reduce weed infestation.
- Remove invasive seed sources that can migrate to adjacent sensitive habitat areas.
- Benefit other Covered Species by reducing weed competition.
- Revitalize an existing avian wildlife corridor by establishing complementary coastal cactus wren projects in the vicinity (i.e., County of San Diego).

4.0 Year 3 Tasks Performed from July 2014 to June 2015

4.1 Implementation Summary

In August 2012, RECON biologists Anna Bennett and Mark Dodero located and mapped the proposed coast cholla planting areas at Salt Creek (Figure 3). Cactus wren nests had been previously observed in the vicinity of the project site in an existing coast cholla patch at the eastern edge of treatment area 5 (see Figure 3). The selection of the proposed planting areas was intended to mimic the south-facing coast cholla-dominated slopes found farther west in the Otay Valley.

Approximately 15 acres of potential planting area were identified in six habitat patches. The sites selected generally have a southern exposure and range from southwest to south and southeast (Photograph 1). Existing low-density coast cholla was present in these areas, and this enhancement program is intended to create much larger coast cholla patches that will be more attractive to cactus wrens. The areas selected for restoration and enhancement were generally the least weedy available sites with natural openings between existing shrubs.

Once the restoration/enhancement sites were selected and prior to implementation, permanent photo points were established. Planting of coast cholla and shore cactus (*Opuntia littoralis*) occurred in the fall of 2012. Blue elderberry (*Sambucus nigra* ssp. *caerulea*; previously known as Mexican elderberry [*Sambucus mexicana*]) was grown from seed at the RECON Native Plants Nursery for outplanting in the second year of the project.

4.2 Monitoring Methods

Bird Surveys (Task 2f)

A spring survey was conducted at the six restoration areas by RECON biologist Mandy Weston for the coastal cactus wren on April 27, 2015 in order to detect the current status of this species. Survey methods included walking through the designated areas at a slow pace, listening and looking for bird activity for approximately 20 to 25 minutes per area. All wildlife detected either visually or by call during the survey or incidentally were noted and listed in Attachment 2. The results of these surveys are summarized below in Section 4.6, Year 3 Cactus Wren Survey Results.

Vegetation Sampling (Tasks 2e, g)

Vegetation patch sampling was done using the relevé method. All plant species occurring in each patch were recorded, and the cover of each species was estimated. Each of the six vegetation treatment areas was sampled by RECON biologist Anna Bennett on April 1, 7, and 13, 2015. Each vegetation stand was photographed from the same location as in Year 1. The results of the vegetation sampling efforts are presented in Section 4.6, Year 3 Vegetation Sampling, and the plant species list is presented in Attachment 3.

4.3 2014–15 Rainfall Summary

Between July 1, 2014 and June 30, 2015, rainfall at Brown Field, the closest reporting station, was 7.27 inches (Table 1), which was below normal (the average annual rainfall in Chula Vista is approximately 10 inches).

The early portion of the rainy season (October and November) was below normal. Heavy rainfall in December resulted in germination of annual weed species; however, by late February, annual weeds had begun to desiccate due to above-average temperatures and below-average rainfall in January and February. Average monthly maximum temperature data are presented in Table 2. On March 1 and 2, a rainfall event occurred that provided 1.49 inches of precipitation. In the weeks that followed, a flush of newly germinated annual weeds were observed as well as the rejuvenation of annual weeds that had germinated after the rainfall events in December.

TABLE 1
JULY 2014 THROUGH JUNE 2015 RAINFALL COMPARED TO NORMAL RAINFALL

Month	2014 Precipitation (inches)[1]	Normal Rainfall: Precipitation (inches)[2]	Difference (inches)
July	0.06	0.03	+0.03
August	0.02	0.01	+0.01
September	0.02	0.14	-0.12
October	0.00	0.53	-0.53
November	0.29	0.91	-0.62
December	3.05	1.43	+1.62
Total	*3.44*	*3.05*	*+0.39*
Month	2015 Precipitation (inches)[1]	Normal Rainfall: Precipitation (inches)[2]	Difference (inches)
January	0.36	1.94	-1.58
February	0.35	2.30	-1.96
March	1.49	1.69	-0.20
April	0.25	0.69	-0.44
May	1.37	0.09	+1.28
June	0.01	0.07	-0.06
Total	*3.83*	*6.78*	*-2.95*
GRAND TOTAL	**7.27**	**9.83**	**-2.56**

[1]SOURCE: National Oceanic and Atmospheric Administration 2015a – Brown Field Station.
[2]SOURCE: National Oceanic and Atmospheric Administration 2015b – Chula Vista

TABLE 2
JULY 2014 THROUGH JUNE 2015 AVERAGE TEMPERATURES

Month	2014 Average Maximum Temperature (°F)[1]	Average Maximum Temperature (°F)[2]: 1981-2010	Difference (°F)
July	80.2	75.9	+4.3
August	81.7	77.8	+3.9
September	84.1	78.0	+6.1
October	80.9	75.7	+5.2
November	76.2	71.8	+4.4
December	67.1	67.4	-0.3
Month	**2015 Average Maximum Temperature (°F)[1]**	**Average Maximum Temperature (°F)[2]: 1981–2010**	**Difference (°F)**
January	70.7	68.5	+2.2
February	73.1	68.1	+5.0
March	76.8	68.1	+8.7
April	73.6	69.4	+4.2
May	68.8	70.1	-1.3
June	76.3	72.0	+4.3

[1]SOURCE: National Oceanic and Atmospheric Administration 2015a – Brown Field Station.
[2]SOURCE: National Oceanic and Atmospheric Administration 2015b – Chula Vista
°F = degrees Fahrenheit

4.4 Blue (Mexican) Elderberry Planting (Tasks 1c, d, and f)

Twenty-five blue elderberry plants that were grown from seed at RECON Native Plants, Inc. were transported to High Tech Middle Chula Vista on October 24, 2013. The 25 blue elderberry plants were provided to the students as a way to introduce them to an important native food plant used by coastal cactus wren. These plants did not fair favorably for unknown reasons and the mortality rate was high; however, an additional 80 blue elderberry plants propagated at RECON Native Plants nursery were planted within the preserve.

The 80 blue elderberry from the nursery were outplanted on February 22, 2014 (see Figure 3). To give the blue elderberry the best chance of survivorship*,* they were planted adjacent to Salt Creek where better moisture conditions exist. A hole was excavated to accommodate the plants grown in one-gallon containers. A basin was created around each hole to allow for the plants to be watered (Photograph 2). Within a few days of being planted, herbivory was observed on some of the newly planted blue elderberry so dead branches were collected and placed around the plants to provide both a level of protection from herbivores, as well as to act as a mulch to reduce water loss from the soil. Through the spring and early summer the plants were watered periodically during dry periods to increase survivorship.

In Year 3, RECON biologists qualitatively monitored the health of the 80 blue elderberry. Evidence of herbivory (chewed leaves) was observed on some of the elderberry, but many of the plants have recovered and have grown new shoots (Photograph 3). In general, most of the elderberry plants have increased in size since being planted.

In August 2014, October 2014, and July 2015, as part of the elderberry maintenance program all of the elderberry plants were watered by hand. The plants were watered to increase the chances of survivorship during the dry conditions. In fall 2014, a few plants appeared to be drought stressed and were lacking green leaves. Watering of the elderberry ceased in November 2014 after rains fell. The plants were watered again in July 2015. The growth of the planted blue elderberry was positive, aided by periodic watering (Photograph 4). Many of the plants flowered and set fruit in their third season (Photograph 5). Photographs 6 and 7 show representative growth of the elderberry from planting in February 2014 to June 2015. Even though drought conditions prevailed during that period, the occasional hand-watering efforts helped the plants survivorship and growth. A survivorship count of the elderberry in June 2015 indicated that 59 of the 80 plants had survived a 74 percent survivorship rate.

4.5 Maintenance

Weed Control (Task 1e)

Heavy rains in December 2014 germinated weeds, and herbicide treatment began in January 2015 and continued into February and again in July (Photographs 8-10). The crew treated non-native plant species within the restoration area with glyphosate herbicide. Weeds were also controlled around the elderberry plants that were installed in February 2014. In the immediate vicinity of the elderberry hand tools were used to clear weeds prior to spraying (Photograph 11). Spraying was done to prevent weeds from flowering and setting seeds. Non-native species that were controlled included filaree (*Erodium* spp.), tocalote (*Centaurea melitensis*), short-pod mustard (*Hirschfeldia incana*), slender wild oat (*Avena barbata*), and other annual grasses such as 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.

4.6 Monitoring Results

Year 3 Cactus Wren Survey

In spring 2015, 37 species of birds were detected within the six restoration areas during the coastal cactus wren survey. The following species of birds were the most commonly observed (in descending order) during the spring 2015 survey. All wildlife detected either visually or by call during the survey were noted and are listed in Attachment 2. No coastal cactus wren were detected during this survey.

- California towhee (*Pipilo crissalis*)
- southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)
- wrentit (*Chamaea fasciata henshawi*)
- mourning dove (*Zenaida macroura*)
- lesser goldfinch (*Carduelis psaltria hesperophilus*)
- house finch (*Carpodacus mexicanus frontalis*)
- spotted towhee (*Pipilo maculatus*)

Year 3 Vegetation Sampling

Attachment 3 lists the plant species observed at the six vegetation treatment areas. The following results are from the six relevé locations:

- Average coast cholla height:
  - Less than 1 foot: 96.17 percent
  - Between 1 and 3 feet in height: 3.83 percent
  - Over 3 feet in height: less than 1 percent
- Average total cover (shrub and herbaceous): 37.15 percent
- Average bare ground: 62.85 percent
- Average total cover of coast cholla: 0.87 percent
- Average percent coast cholla cover out of the total cover: 2.46 percent
- A total of 69 plant species were recorded at the relevé locations: 52 native species and 17 non-native species.
- Average non-native cover: 2.11 percent
- Average non-native cover out of the total cover: 5.70 percent

4.7 Previous Reporting

Quarterly Reports (Task 3a)

Quarterly reports that summarized ongoing tasks for the project were submitted in December 2014 (Quarterly Report I), March 2015 (Quarterly Report II), April 2015 (Quarterly Report III), and July 2015 (Quarterly Report IV). An additional Statement of Services summary report will be submitted in August 2015.

5.0 Discussion

5.1 Weed Control

Because of intensive maintenance efforts, weed cover at the restoration and enhancement sites was low across the six sites and averaged approximately 2.5 percent. Out of the total vegetation cover (native and non-native) non-native species constituted less than 6 percent absolute cover. Spray visits were effective at controlling weed growth. Spraying was focused around the planted coast cholla patches, but all areas within the six restoration and enhancement sites were treated. Photographs 12-15 show the reduction of weed cover from 2013 to 2015 at the restoration sites. By controlling non-native weeds, more water becomes available for the rooted cactus cuttings. Photographs 16-19 show the growth of selected cholla patches between 2013/2014 and spring of 2015.

5.2 Cactus and Other Plant Growth

After the December rains, the cactus cuttings could be seen to swell with water (Photograph 20) . Native annuals germinated from the December rains (Photograph 21) and some species began flowering early in January 2015 (Photograph 22). Conditions were very dry during January and February 2015 which caused many native plants to start wilting. Photographs 23 and 24 are repeat photos that show shrub die-off from the severe drought conditions during the three-year project from 2013 to 2015.

Heavier rains that occurred in early March allowed the coast cholla and shore cactus cuttings to imbibe water and show new growth (Photographs 25-34). Dry and warmer weather returned in late March through April. The dry conditions limited the expansion of the new cactus shoots during that time period. Later, three rain events occurred in May, which is unusual, but this allowed the cholla and shore cactus to extend their new shoots. Photographs 35-38 show the growth of selected cholla patches between December 2012 and April 2015.

Other species of cactus and succulents that are present on the slopes and that benefit from the weeding program include: narrow endemic snake cholla (*Cylindropuntia californica* var. *californica*), narrow endemic variegated dudleya, MSCP covered coast barrel cactus (Photographs 39-41),

5.3 Cactus Wren and Other Wildlife Use

No coastal cactus wrens or nests were detected during the spring 2015 surveys. Cactus wren nests had been incidentally observed in the vicinity of the project during 2009 (see Figure 3). Other sensitive bird species that were recorded during the survey and/or incidentally, included the coastal California gnatcatcher and southern California rufous-crowned sparrow that were both observed at three locations (Figure 4). Other commonly encountered species that forage in and around the edges of the enhancement sites included the California towhee, house finch, and mourning dove.

Reptiles observed in the cactus wren restoration and enhancement sites include the common western fence lizard (*Sceloporus occidentalis*). Sensitive reptile species also observed include the MSCP covered Belding's orange-throated whiptail (*Aspidoscelis hyperythra beldingi*).

Mammal species that were detected at the restoration and enhancement sites include the California ground squirrel (*Spermophilus beecheyi*), desert cottontail (*Sylvilagus audubonii*), coyote (*Canis latrans*), and San Diego black-tailed jackrabbit. The San Diego black-tailed jackrabbit is a California Department of Fish and Wildlife Species of Special Concern.

6.0 Public Outreach/Awareness—High Tech Middle Chula Vista

In the first year of the restoration project, approximately 120 coast cholla cuttings were transported to High Tech Middle Chula Vista and were planted in one-gallon pots by the students (Photograph 42). These coast cholla cuttings were grown to a larger size to provide nesting-sized coast cholla for the cactus wren population at Salt Creek.

In fall 2014, RECON biologists selected a suitable planting location for the coast cholla cuttings that were being cared for by the students at High Tech Middle Chula Vista. The site was visited and delineated with flagging (see

Figure 3). Additionally in October, the RECON restoration crew dug holes for the potted cholla cuttings to be planted into. The holes were dug in the area previously selected by the biologists. Soil from each of the holes was left at the edge of the holes, so that the students could use it to backfill during planting.

In November 2014, prior to planting, the biologists removed loose segments of cholla from the potted plants. The cuttings were placed in a bucket and set aside for the students to plant into the Preserve. The biologists delivered the potted cholla to the Preserve prior to the student field trips.

As part of the scope of work for the cactus wren grant, RECON biologists conducted nature walk field trips to the Salt Creek portion of the Otay Ranch Preserve for Ms. Ann McAfee's two seventh grade classes at High Tech Middle Chula Vista in November (provided by RECON without compensation). Approximately 50 students participated in the field trips over two days.

The field trips focused on educating the students about sensitive species in the Preserve. Topics of discussion during the field trips included general ecology and natural history of the native habitats and species present in the Preserve, as well as the management challenges that invasive species cause.

During the field trips, the biologists also supervised the students as they planted 109 potted cholla into the Preserve (Photographs 43-48). The cholla planting component of the field trip allowed the students to take an active role in the habitat restoration project. As mentioned previously, the cholla cuttings had been planted in one-gallon pots by previous seventh grade students in spring 2013. The cholla cuttings were grown to a larger size to provide nesting sized cholla for the cactus wren population at Salt Creek. After the cholla were planted, RECON biologists continued to qualitatively monitor the health of the plants through the 2015 growing season (Photographs 49 and 50).

7.0 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 may slowly encroach on the treatment areas. Native shrub species such as California buckwheat (*Eriogonum fasciculatum*), lemonadeberry (*Rhus integrifolia*), California sagebrush (*Artemisia californica*), and jojoba (*Simmondsia chinensis*) may require cutting and 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.

Monitoring of coastal cactus wren populations in Salt Creek parcels of the Otay Ranch 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 Otay Ranch Preserve annual report list of sensitive species.

If you have any questions regarding the coastal cactus wren habitat restoration and enhancement program, please do not hesitate to contact me at 619-308-9333 x 115 or mdodero@reconenvironmental.com

Sincerely,

Mark W. Dodero

Mark Dodero
Senior Biologist

MWD:sh

Attachments

8.0 References Cited

National Oceanic and Atmospheric Administration (NOAA)

2015a National Weather Service Forecast Office. Brown Field, California. http://www.wrh.noaa.gov/sgx/obs/rtp/brown.html. Accessed on July 22.

2015b Data Tools: 1981-2010 Normals for Chula Vista, California. http://www.ncdc.noaa.gov/cdo-web/datatools/normals Accessed July 27.

The Nature Conservancy (in collaboration with the San Diego Management and Monitoring Program)

2015 South San Diego County Coastal Cactus Wren (*Campylorhynchus brunneicapillus*) Habitat Conservation and Management Plan. Prepared for the San Diego Association of Governments. June 18.

RECON Environmental, Inc.

2011 2009–2010 Annual Report for Otay Ranch Preserve - Salt Creek and San Ysidro Parcels. March 11.

9.0 Contributors to this Report

RECON biologists that conducted field surveys, analyzed data, and provided photos for the report include Anna Bennett, Mandy Weston, and Mark Dodero. Thanks in particular to Ann McAfee (seventh grade teacher at High Tech Middle Chula Vista) for providing photos of the students during coast cholla planting activities (Photographs 43 through 48) and to the seventh grade students at High Tech Middle Chula Vista for participating enthusiastically in the habitat restoration program.

ATTACHMENTS

ATTACHMENT 1

Figures and Photographs

Otay Ranch Preserve: Salt Creek Parcels

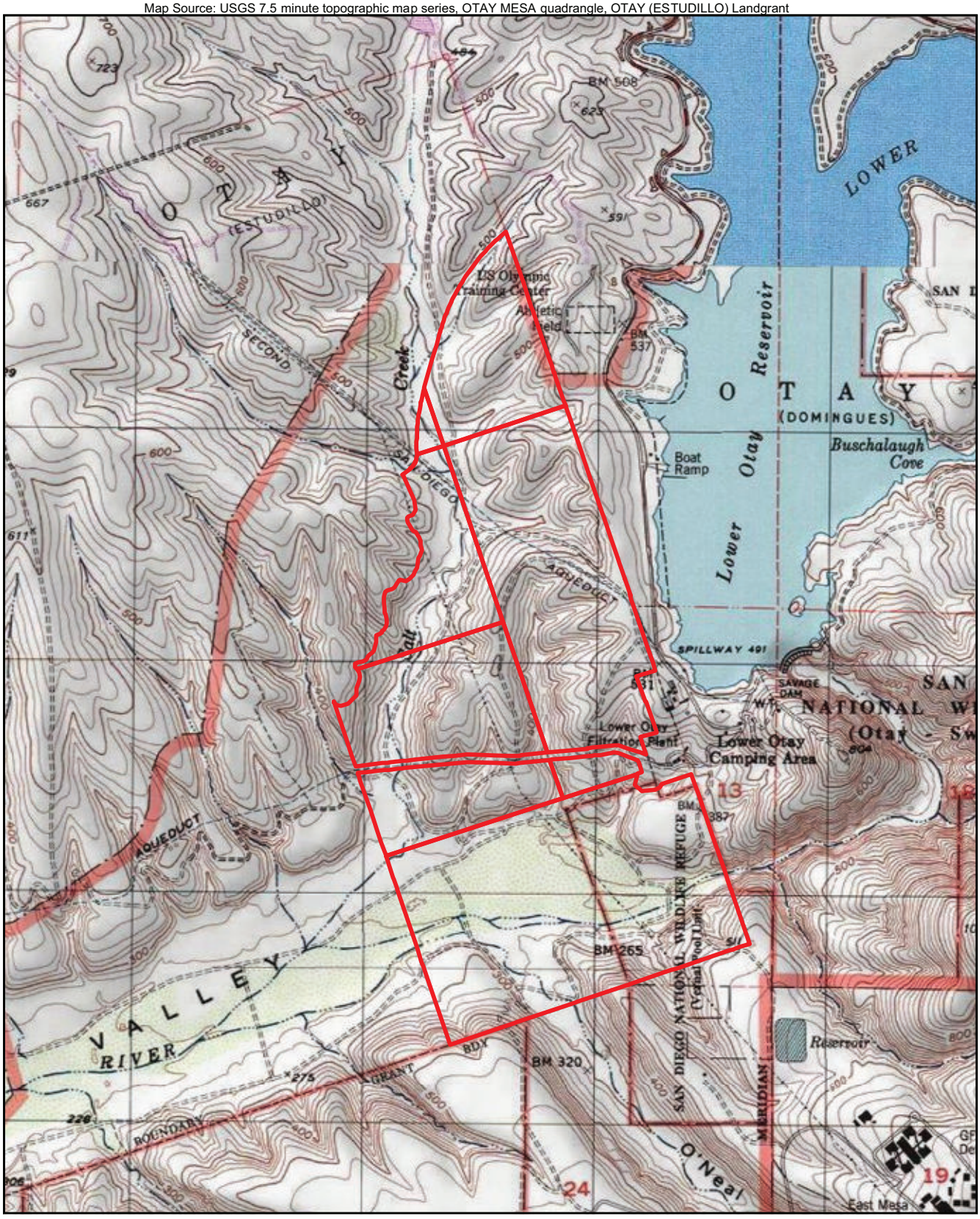
FIGURE 1

Regional Location

RECON

M:\JOBS4\6649\common_gis\Fig1_CACW_yr3.mxd 7/24/2015 ccn

Map Source: USGS 7.5 minute topographic map series, OTAY MESA quadrangle, OTAY (ESTUDILLO) Landgrant



0 Feet 2,000

Otay Ranch Preserve: Salt Creek Parcels

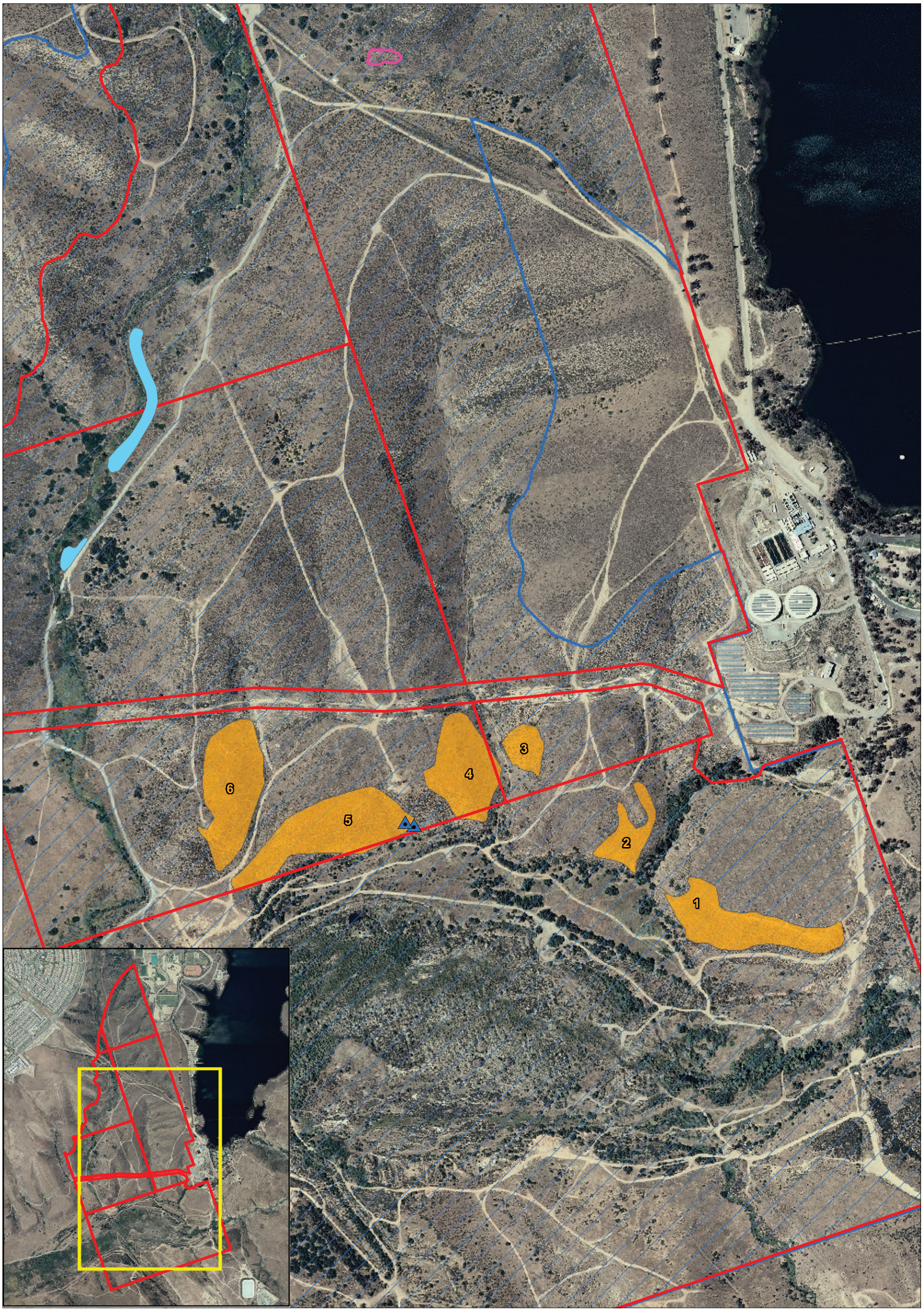
FIGURE 2

Project Location on USGS Map

RECON

M:\JOBS4\6649\common_gis\Fig2_CACW_yr3.mxd 7/24/2015 ccn

Image source: SanGIS (flown May 2012)



Preserve Boundary

City of Chula Vista MSCP

Blue Elderberry Planting Area

Cactus Wren Habitat Restoration Area

Cactus Wren Habitat Restoration Area: High Tech Middle Chula Vista

Sensitive Wildlife Species

Coastal Cactus Wren (*Campylorhynchus brunneicapillus*) Nests, Observed in 2009

0 Feet 500

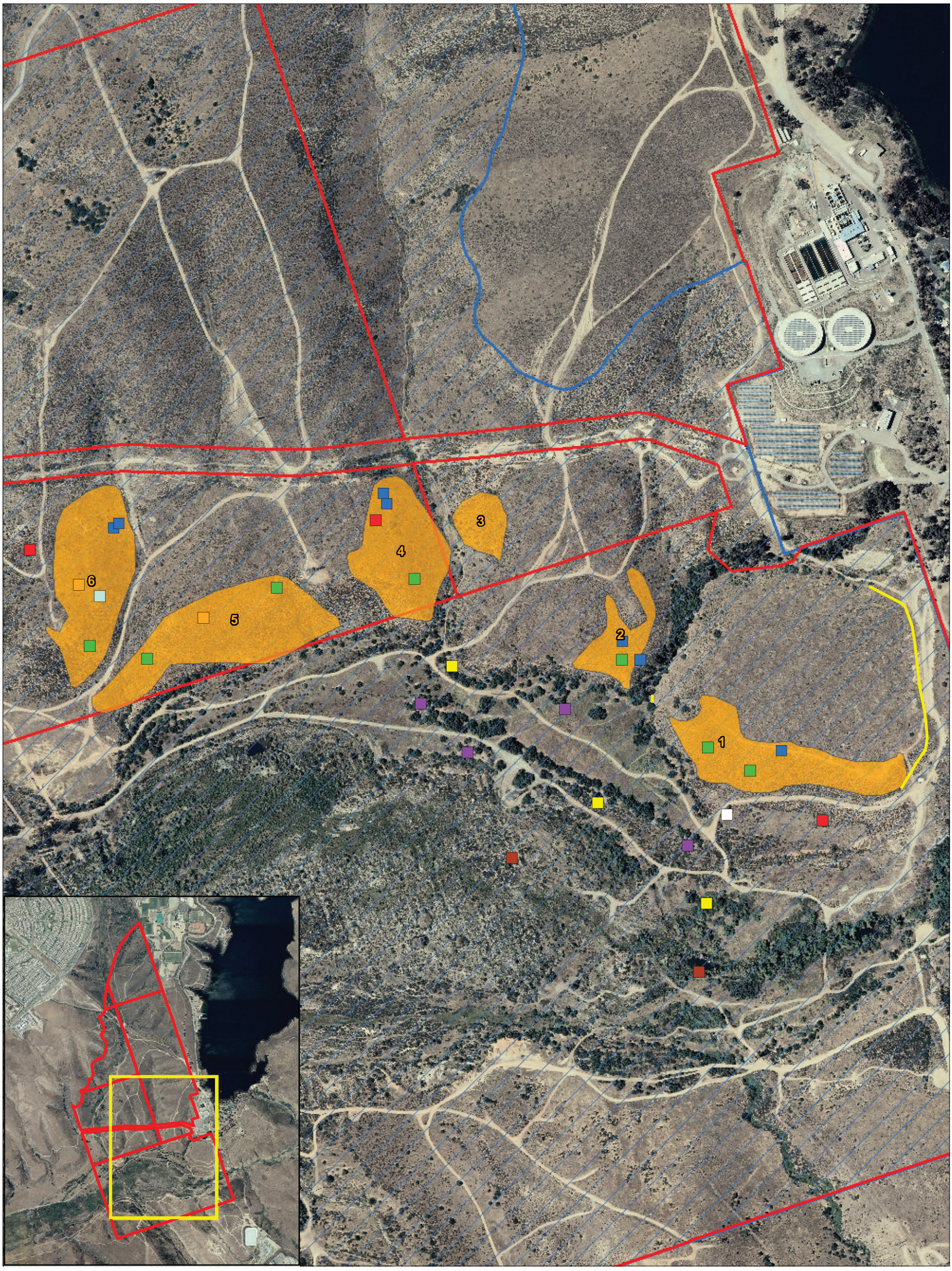
FIGURE 3

Cactus Wren Habitat Restoration and Enhancement Locations

RECON

M:\JOBS4\6649\common_gis\Fig3_CACW_yr3.mxd 7/24/2015 ccn

Image source: SanGIS (flown May 2012)



Preserve Boundary
City of Chula Vista MSCP
Fencing Installed February 2013
Cactus Wren Habitat Restoration Area

Sensitive Wildlife Observations
American Kestrel
Belding's Orange-throated Whiptail
Coastal California Gnatcatcher
Least Bell's Vireo
Red-shouldered Hawk
Red-tailed Hawk
San Diego Black-tailed Jackrabbit
Southern California Rufous-crowned Sparrow
Yellow-breasted Chat

FIGURE 4

Locations of Sensitive Species

RECON

M:\JOBS4\6649\common_gis\Fig4_CACW_yr3.mxd 7/27/2015 ccn

PHOTOGRAPH 1
View Looking West from Restoration Site 1, Prior to Implementation

PHOTOGRAPH 2
Blue Elderberry Being Planted by RECON Crew

PHOTOGRAPH 3
Blue Elderberry Growing, December 2014

PHOTOGRAPH 4
RECON Crew Using Buckets for Watering Blue Elderberry

PHOTOGRAPH 5
Flowering and Fruiting Blue Elderberry

PHOTOGRAPH 6
Blue Elderberry After Planting, February 2014

PHOTOGRAPH 7
Elderberry at the Same Location, June 2015

PHOTOGRAPH 8
Recon Crew Treating Non-natives, January 2015

PHOTOGRAPH 9
RECON Crews Spraying Non-natives, February 2015

PHOTOGRAPH 10
RECON Crews Spraying Non-natives, July 2015

PHOTOGRAPH 11
RECON Crews Using Hand Tools to Remove Weeds Around Elderberry

PHOTOGRAPH 12
Relevé Stand 4, May 2013

PHOTOGRAPH 13
Relevé Stand 4 Same Location Showing
Decreased Weed Cover, April 2015

PHOTOGRAPH 14
Relevé Stand 4, May 2013

PHOTOGRAPH 15
Relevé Stand 4 Same Location Showing
Decreased Weed Cover, April 2015

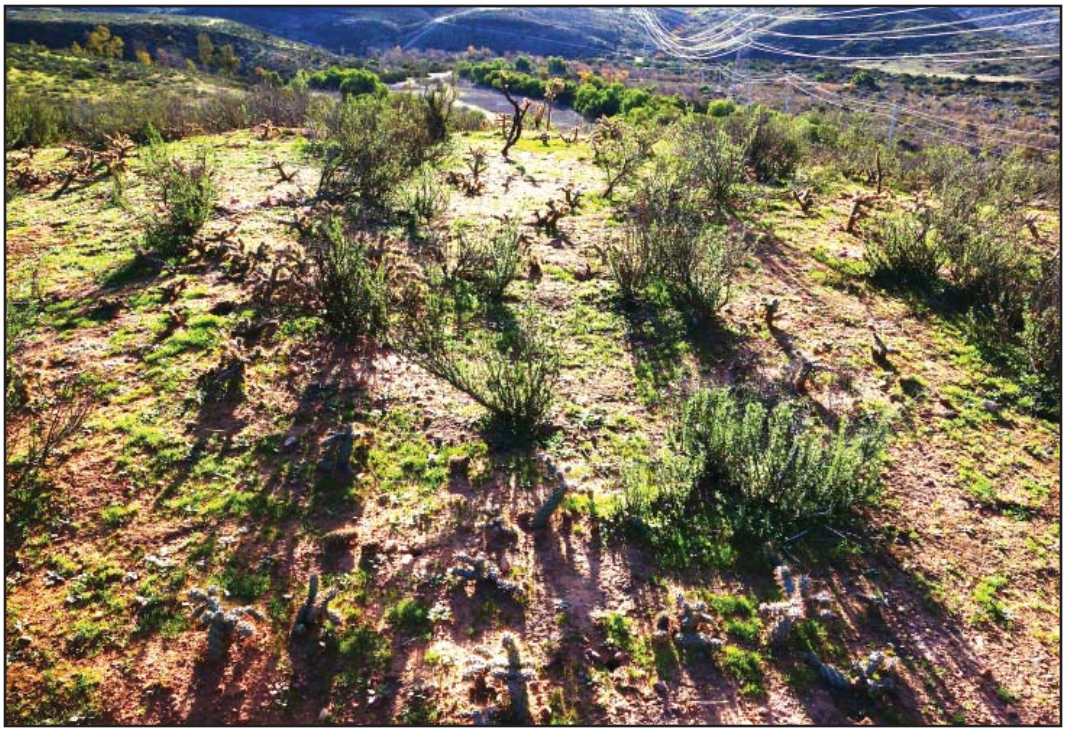
PHOTOGRAPH 16
Relevé Stand 5, May 2014

PHOTOGRAPH 17
Relevé Stand 5, April 2015

PHOTOGRAPH 18
Relevé Stand 5, May 2013

PHOTOGRAPH 19
Relevé Stand 5, April 2015

PHOTOGRAPH 20
Shore Cactus After Imbibing Water



PHOTOGRAPH 21
Coast Cholla and Native Annuals after Heavy December Rainfall

PHOTOGRAPH 22
Popcorn Flower (*Plagiobothrys* sp.)

PHOTOGRAPH 23
Native Shrub View, May 2013

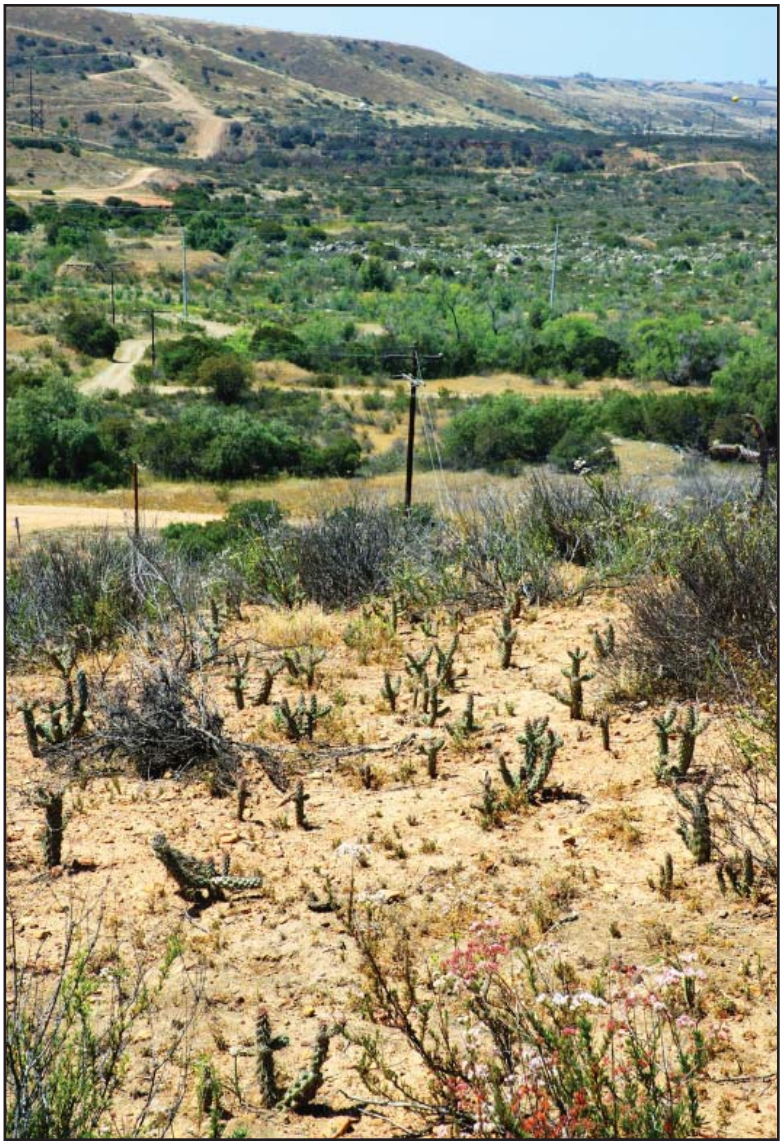
PHOTOGRAPH 24
Same Location, Native Shrubs Dead From Drought, April 2015

PHOTOGRAPH 25
Coast Cholla with New Growth

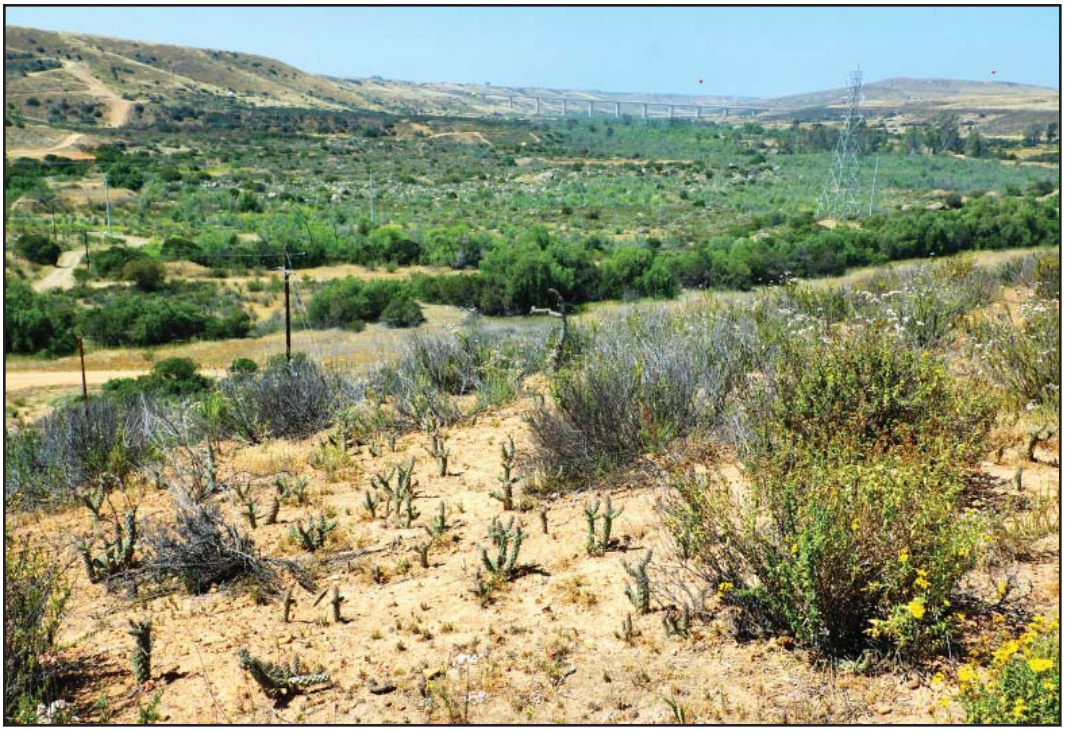
PHOTOGRAPH 26
Shore Cactus with New Growth

PHOTOGRAPH 27
Coast Cholla Patch in Area 1

PHOTOGRAPH 28
Coast Cholla Cuttings In Road Closure Area 1



PHOTOGRAPH 29
Coast Cholla Patch in Area 1



PHOTOGRAPH 30
Coast Cholla Patch in Area 1

PHOTOGRAPH 31
Coast Cholla Patch in Area 1

PHOTOGRAPH 32
Coast Cholla Patch in Area 1

PHOTOGRAPH 33
Coast Cholla Patch in Area 5

PHOTOGRAPH 34
Larger Transplanted Cholla Provide
Potential Wren Nesting Sites in Area 6

PHOTOGRAPH 35
Coast Cholla Patch Area 6, December 2012

PHOTOGRAPH 36
Same Location, Coast Cholla Patch Area 6, June 2015

PHOTOGRAPH 37
Coast Cholla Patch Area 5, December 2012

PHOTOGRAPH 38
Same Location, Coast Cholla Patch Area 5, June 2015

PHOTOGRAPH 39
Healthy Snake Cholla Benefits from the Weeding Program

PHOTOGRAPH 40
Variegated Dudleya Growing in Area 5

PHOTOGRAPH 41
Coast Barrel Cactus Also Benefits from the Weeding Program

PHOTOGRAPH 42
Propagated Coast Cholla at High Tech Middle School

PHOTOGRAPH 43
High Tech Middle School Students
Preparing to Plant Cholla, November 2014

PHOTOGRAPH 44
Student with Cholla Ready for Planting

PHOTOGRAPH 45
Student with Cholla in the Ground

PHOTOGRAPH 46
Students Placing Coast Cholla in the Planting Hole

PHOTOGRAPH 47
RECON Biologist Anna Bennett and
City of Chula Vista's Glen Laube Planting Cholla

PHOTOGRAPH 48
High Tech Middle Student Carrying Cholla

PHOTOGRAPH 49
Coast Cholla Planted by Students
Showing New Growth, May 2015

PHOTOGRAPH 50
Coast Cholla Planted by Students
Showing New Growth, May 2015

ATTACHMENT 2

Wildlife Species Observed/Detected

Attachment 2 Wildlife Species Observed/Detected Incidentally and During the Spring 2015 Cactus Wren Survey at the Otay Ranch Cactus Wren Habitat Restoration and Enhancement Site				
Scientific Name	Common Name	Treatment Area Number	On-site Abundance/ Seasonality (Birds Only)	Evidence of Occurrence
INVERTEBRATES (Nomenclature from Eriksen and Belk 1999; Milne and Milne 1980; Mattoni 1990; and Opler and Wright 1999)				
APIDAE	**HONEY BEES**			
Apis sp.	honey bee	2-3, 6		O
HESPERIIDAE	**SKIPPERS**			
Erynnis funeralis	funereal duskywing	6		O
PIERIDAE	**WHITES & SULPHURS**			
Pontia protodice	common or checkered white	1-6		O
LYCAENIDAE	**BLUES, COPPERS, & HAIRSTREAKS**			
Leptotes marina	marine blue	4-6		O
RIODINIDAE	**METALMARKS**			
Apodemia virgulti	Behr's metalmark	1, 4-5		O
NYMPHALIDAE	**BRUSH-FOOTED BUTTERFLIES**			
Vanessa cardui	painted lady	2		O
REPTILES (Nomenclature from Crother 2001 and Crother et al. 2003)				
PHRYNOSOMATIDAE	**SPINY LIZARDS**			
Sceloporus occidentalis	western fence lizard	4, 6		O
TEIIDAE	**WHIPTAIL LIZARDS**			
Aspidoscelis hyperythra beldingi	Belding's orange-throated whiptail	5-6		O
BIRDS (Nomenclature from American Ornithologists' Union 1998 and Unitt 2004)				
ANATIDAE	**DUCKS, GEESE, & SWANS**			
Anas platyrhynchos platyrhynchos	mallard	1 (FO)	C / Y	FO
ODONTOPHORIDAE	**NEW WORLD QUAIL**			
Callipepla californica californica	California quail	1-3, 6	C / Y	V
ACCIPITRIDAE	**HAWKS, KITES, & EAGLES**			
Buteo jamaicensis	red-tailed hawk	1, 4, 6	C / Y	O
Buteo lineatus elegans	red-shouldered hawk	2-3	F / Y	V

Attachment 2 Wildlife Species Observed/Detected Incidentally and During the Spring 2015 Cactus Wren Survey at the Otay Ranch Cactus Wren Habitat Restoration and Enhancement Site				
Scientific Name	Common Name	Treatment Area Number	On-site Abundance/ Seasonality (Birds Only)	Evidence of Occurrence
FALCONIDAE	**FALCONS & CARACARAS**			
Falco sparverius sparverius	American kestrel	1	F / Y	O
COLUMBIDAE	**PIGEONS & DOVES**			
Zenaida asiatica mearnsi	white-winged dove (I)	6	U / Y	V
Zenaida macroura marginella	mourning dove	1-2, 6	C / Y	O
APODIDAE	**SWIFTS**			
Aeronautes saxatalis	white-throated swift	1-2	C / Y	O
TROCHILIDAE	**HUMMINGBIRDS**			
Calypte anna	Anna's hummingbird	1-2, 4, 6	C / Y	O
Calypte costae	Costa's hummingbird	1	F / S	V
PICIDAE	**WOODPECKERS & SAPSUCKERS**			
Picoides nuttallii	Nuttall's woodpecker	1-2, 5	F / Y	V
TYRANNIDAE	**TYRANT FLYCATCHERS**			
Empidonax difficilis	Pacific-slope flycatcher	1-2	F / S	V
Tyrannus vociferans vociferans	Cassin's kingbird	1, 3	C / Y	O
VIREONIDAE	**VIREOS**			
Vireo bellii pusillus	least Bell's vireo	1-4	U / S	V
CORVIDAE	**CROWS, JAYS, & MAGPIES**			
Corvus corax clarionensis	common raven	1, 3-6	C / Y	O
HIRUNDINIDAE	**SWALLOWS**			
Petrochelidon pyrrhonota tachina	cliff swallow	1-6	C / S	O
AEGITHALIDAE	**BUSHTIT**			
Psaltriparus minimus minimus	bushtit	1, 3-4	F / Y	V
TROGLODYTIDAE	**WRENS**			
Thryomanes bewickii	Bewick's wren	2, 5	F / Y	V
Troglodytes aedon parkmanii	house wren	1-2	F / Y	V

Attachment 2 Wildlife Species Observed/Detected Incidentally and During the Spring 2015 Cactus Wren Survey at the Otay Ranch Cactus Wren Habitat Restoration and Enhancement Site				
Scientific Name	Common Name	Treatment Area Number	On-site Abundance/ Seasonality (Birds Only)	Evidence of Occurrence
SYLVIIDAE	**GNATCATCHERS**			
Polioptila caerulea	blue-gray gnatcatcher	1-3	F / Y	V
Polioptila californica californica	coastal California gnatcatcher	2	F / Y	O
TIMALIIDAE	**BABBLERS**			
Chamaea fasciata henshawi	wrentit	1, 3, 6	C / Y	V
MIMIDAE	**MOCKINGBIRDS & THRASHERS**			
Mimus polyglottos polyglottos	northern mockingbird	1-5	C / Y	O
Toxostoma redivivum redivivum	California thrasher	4	F / Y	O
PTILOGONATIDAE	**SILKY FLYCATCHERS**			
Phainopepla nitens lepida	phainopepla	1, 4	F / Y	V
PARULIDAE	**WOOD WARBLERS**			
Dendroica petechia	yellow warbler	1	F / S	V
Geothlypis trichas	common yellowthroat	5	C / Y	V
Icteria virens auricollis	yellow-breasted chat	1-3	U / Y	V
THRAUPIDAE	**TANAGERS**			
Piranga ludoviciana	western tanager	1, 4	U / M	O
EMBERIZIDAE	**EMBERIZIDS**			
Aimophila ruficeps canescens	southern California rufous-crowned sparrow	1-2, 4-6	C / Y	O
Melospiza melodia	song sparrow	1, 3, 5	C / Y	V
Pipilo crissalis	California towhee	1-6	C / Y	O
Pipilo maculatus	spotted towhee	1-2, 4, 6	C / Y	O
CARDINALIDAE	**CARDINALS & GROSBEAKS**			
Passerina caerulea salicaria	blue grosbeak	1-2	F / S	O
Pheucticus melanocephalus maculatus	black-headed grosbeak	3, 5-6	F / S	V
FRINGILLIDAE	**FINCHES**			
Carduelis psaltria hesperophilus	lesser goldfinch	1-3, 5-6	C / Y	O
Carpodacus mexicanus frontalis	house finch	1-2, 6	C / Y	O

Attachment 2
Wildlife Species Observed/Detected Incidentally and During the Spring 2015 Cactus Wren Survey at the Otay Ranch Cactus Wren Habitat Restoration and Enhancement Site

Scientific Name	Common Name	Treatment Area Number	On-site Abundance/ Seasonality (Birds Only)	Evidence of Occurrence
MAMMALS (Nomenclature from Baker et al. 2003)				
LEPORIDAE	**RABBITS & HARES**			
Lepus californicus bennettii	San Diego black-tailed jackrabbit	6		O
Sylvilagus audubonii	desert cottontail	1-2, 4-6		S
SCIURIDAE	**SQUIRRELS & CHIPMUNKS**			
Spermophilus beecheyi	California ground squirrel	2-6		B
CANIDAE	**CANIDS**			
Canis latrans	coyote	1, 4		S

(I) = Introduced species

ABUNDANCE (birds only; based on Garrett and Dunn 1981)
C = Common to abundant; almost always encountered in proper habitat, usually in moderate to large numbers
F = Fairly common; usually encountered in proper habitat, generally not in large numbers
U = Uncommon; occurs in small numbers or only locally

SEASONALITY (birds only)
A = Accidental; species not known to occur under normal conditions; may be an off-course migrant
M = Migrant; uses site for brief periods of time, primarily during spring and fall months
S = Spring/summer resident; probable breeder on-site or in vicinity
T = Transient; uses site regularly but unlikely to breed on-site
V = Rare vagrant
W = Winter visitor; does not breed locally
Y = Year-round resident; probable breeder on-site or in vicinity

EVIDENCE OF OCCURRENCE
B = Burrow
C = Carcass/remains
D = Den site
O = Observed
S = Scat
T = Track
V = Vocalization

ATTACHMENT 3

Plant Species Observed

Attachment 3 Plant Species Observed Within the Otay Ranch Cactus Wren Habitat Restoration and Enhancement Site			
Scientific Name	Common Name	Treatment Area Number	Origin
LYCOPODS			
SELAGINELLACEAE	**SPIKE-MOSS FAMILY**		
Selaginella bigelovii Underw.	Bigelow's spike-moss	1-6	N
Selaginella cinerascens A.A. Eaton	ashy spike-moss	1-6	N
ANGIOSPERMS: MONOCOTS			
AGAVACEAE	**AGAVE FAMILY**		
Chlorogalum parviflorum S. Watson	small-flower soap-plant, amole	1-6	N
IRIDACEAE	**IRIS FAMILY**		
Sisyrinchium bellum S. Watson	western blue-eyed grass	6	N
LILIACEAE	**LILY FAMILY**		
Calochortus splendens Benth.	splendid mariposa lily	1-6	N
POACEAE (GRAMINEAE)	**GRASS FAMILY**		
Aristida purpurea Nutt.	three-awn	1-4, 6	N
Avena barbata Pott ex Link	slender wild oat	1, 3-6	I
Avena fatua L.	wild oat	2	I
Brachypodium distachyon (L.) P. Beauv.	purple falsebrome	4	I
Bromus hordeaceus L.	soft chess	1-3, 5-6	I
Bromus madritensis L. ssp. *rubens* (L.) Husn.	red brome	1-6	I
Festuca [=*Vulpia*] *myuros* L.	rattail sixweeks grass	2-4, 6	I
Festuca perennis (L.) Columbus & J.P. Sm. [=*Lolium multiflorum* and *Lolium perenne*]	rye grass	3	I
Lamarckia aurea (L.) Moench	golden-top	1-2, 6	I
Muhlenbergia microsperma (DC.) Kunth	littleseed muhly	3, 5-6	N
Schismus barbatus (L.) Thell.	Mediterranean schismus	1, 4, 6	I
Stipa [=*Nassella*] sp.	needle grass	1, 4-5	N
Stipa [=*Nassella*] *cernua* Stebbins & Love	nodding needle grass	1	N
Stipa [=*Achnatherum*] *diegoensis* Swallen	San Diego needle grass	1-2	N
Stipa [=*Nassella*] *lepida* Hitchc.	foothill needle grass	6	N
Stipa [=*Nassella*] *pulchra* Hitchc.	purple needle grass	1, 3	N
THEMIDACEAE	**BRODIAEA FAMILY**		
Dichelostemma capitatum (Benth.) Alph. Wood	blue dicks	1-6	N

Attachment 3 Plant Species Observed Within the Otay Ranch Cactus Wren Habitat Restoration and Enhancement Site			
Scientific Name	Common Name	Treatment Area Number	Origin
ANGIOSPERMS: DICOTS			
AIZOACEAE	**FIG-MARIGOLD FAMILY**		
Mesembryanthemum nodiflorum L.	slender-leaved iceplant	1	I
ANACARDIACEAE	**SUMAC OR CASHEW FAMILY**		
Malosma laurina Nutt. ex Abrams	laurel sumac	1-2, 4-6	N
Rhus integrifolia (Nutt.) Benth. & Hook. f. ex Rothr.	lemonade berry	5	N
APIACEAE (UMBELLIFERAE)	**CARROT FAMILY**		
Apiastrum angustifolium Nutt.	mock-parsley	6	N
Daucus pusillus Michx.	rattlesnake weed	1, 3-6	N
ASTERACEAE	**SUNFLOWER FAMILY**		
Artemisia californica Less.	California sagebrush	1-6	N
Baccharis sarothroides A. Gray	broom baccharis	5-6	N
Bahiopsis [=*Viguiera*] *laciniata* (A. Gray) E.E. Schilling & Panero	San Diego viguiera, San Diego County viguiera	1-6	N
Centaurea melitensis L.	tocalote, Maltese star-thistle	1-6	I
Deinandra [=*Hemizonia*] *fasciculata* (DC.) Greene	fascicled tarweed, golden tarplant	1-6	N
Gutierrezia sp.	matchweed	5-6	N
Isocoma menziesii (Hook. & Arn.) G.L. Nesom var. *decumbens* (Greene) G.L. Nesom	decumbent goldenbush	1, 4, 6	N
Lasthenia gracilis (DC.) Greene [*L. californica* Lindley, misapplied in San Diego County]	common goldfields	1-6	N
Logfia [=*Filago*] *gallica* (L.) Coss. & Germ.	daggerleaf cottonrose	1	I
Osmadenia tenella Nutt.	osmadenia	1, 3, 5	N
BORAGINACEAE	**BORAGE FAMILY**		
Cryptantha sp.	cryptantha	1-5	N
Harpagonella palmeri A. Gray	Palmer's grapplinghook	1	N
BRASSICACEAE (CRUCIFERAE)	**MUSTARD FAMILY**		
Hirschfeldia incana (L.) Lagr.-Fossat	short-pod mustard	3, 6	I
Lepidium nitidum Nutt.	shining peppergrass	1-6	N
CACTACEAE	**CACTUS FAMILY**		
Cylindropuntia [=*Opuntia*] *prolifera* (Engelm.) F.M. Knuth	coast cholla	1-6	N
Ferocactus viridescens (Torr. & A. Gray) Britton & Rose	San Diego barrel cactus, coast barrel cactus*	1, 3-6	N

Attachment 3 Plant Species Observed Within the Otay Ranch Cactus Wren Habitat Restoration and Enhancement Site			
Scientific Name	Common Name	Treatment Area Number	Origin
Mammillaria dioica K. Brandegee	fish-hook cactus	4-6	N
Opuntia littoralis (Engelm.) Cockerell.	coast prickly-pear, shore cactus	1-2, 5-6	N
CARYOPHYLLACEAE	**PINK FAMILY**		
Silene gallica L.	small-flower catchfly, windmill pink	1-3, 5-6	I
CHENOPODIACEAE	**GOOSEFOOT FAMILY**		
Atriplex pacifica A. Nelson	south coast saltscale, south coast saltbush*	1	N
Salsola tragus L.	Russian thistle, tumbleweed	4-5	I
CLEOMACEAE	**SPIDERFLOWER FAMILY**		
Peritoma [=*Isomeris*] *arborea* (Nutt.) H. H. Iltis	bladderpod	1, 5	N
CONVOLVULACEAE	**MORNING-GLORY FAMILY**		
Calystegia macrostegia (Greene) Brummitt	morning-glory	1, 6	N
Cuscuta sp.	dodder	1	N
CRASSULACEAE	**STONECROP FAMILY**		
Crassula connata (Ruiz & Pav.) A. Berger	pygmy-weed	1-6	N
Dudleya pulverulenta (Nutt.) Britton & Rose	chalk lettuce, chalk dudleya	1-2	N
Dudleya variegata (S. Watson) Moran	variegated dudleya	5	N
EUPHORBIACEAE	**SPURGE FAMILY**		
Croton [=*Eremocarpus*] *setiger* Hook.	turkey-mullein, dove weed	1, 6	N
FABACEAE (LEGUMINOSAE)	**LEGUME FAMILY**		
Acmispon glaber (Vogel) Brouillet [=*Lotus scoparius*]	deerweed, California broom	1, 4-6	N
Acmispon maritimus (Torr. & A. Gray) D.D. Sokoloff var. *maritimus* [=*Lotus salsuginosus* var. *salsuginosus*]	alkali lotus	2, 5	N
Acmispon micranthus (Torr. & A. Gray) Brouillet [=*Lotus hamatus*]	grab lotus	3-6	N
Lupinus concinnus J. Agardh	bajada lupine	1-2, 5	N
GERANIACEAE	**GERANIUM FAMILY**		
Erodium botrys (Cav.) Bertol.	long-beak filaree	1-2, 4-6	I
Erodium cicutarium (L.) L'Hér. ex Aiton	redstem filaree	1, 3-6	I
NYCTAGINACEAE	**FOUR O'CLOCK FAMILY**		
Mirabilis laevis [=*Mirabilis californica*] (Benth.) Curran var. *crassifolia* (Choisy) Spellenb.	wishbone bush	1-2, 5-6	N

Attachment 3 Plant Species Observed Within the Otay Ranch Cactus Wren Habitat Restoration and Enhancement Site			
Scientific Name	Common Name	Treatment Area Number	Origin
PAPAVERACEAE	**POPPY FAMILY**		
Eschscholzia californica Cham.	California poppy	1-3	N
PLANTAGINACEAE	**PLANTAIN FAMILY**		
Plantago erecta E. Morris	dot-seed plantain	1-3, 5-6	N
POLEMONIACEAE	**PHLOX FAMILY**		
Gilia sp.	gilia	1	N
Linanthus dianthiflorus (Benth.) Greene	farinose ground pink	1, 6	N
POLYGONACEAE	**BUCKWHEAT FAMILY**		
Chorizanthe fimbriata Nutt.	fringed spineflower	4	N
Eriogonum fasciculatum Benth.	California buckwheat	1-6	N
SIMMONDSIACEAE	**JOJOBA FAMILY**		
Simmondsia chinensis (Link) C.K. Schneid.	jojoba, goatnut	1-6	N

Notes: Scientific and common names were primarily derived from the Jepson Online Interchange (University of California 2013). In instances where common names were not provided in this resource, common names were obtained from Rebman and Simpson (2006). Additional common names were obtained from the USDA maintained database (USDA 2013) or the Sunset Western Garden Book (Brenzel 2001) for ornamental/horticultural plants. Common names denoted with * are from County of San Diego 2010.

ORIGIN
N = Native to locality
I = Introduced species from outside locality

References Cited:
Brenzel, K. N. 2001. *Sunset Western Garden Book*. Sunset Publishing. Menlo Park, California.

California, University of. 2013. *The Jepson Online Interchange: California Floristics*. Berkeley: The Regents of the University of California. Accessed from http://ucjeps.berkeley.edu/interchange.html.

Rebman, J. P., and M. G. Simpson. 2006. Checklist of the Vascular Plants of San Diego County, 4th edition. San Diego Natural History Museum.

San Diego, County of. 2010. Guidelines for Determining Significance and Report Format and Content Requirements. Biological Resources. Land Use and Environmental Group. Department of Planning and Land Use. Department of Public Works. Fourth Revision. September 15.

United States Department of Agriculture (USDA). 2013. Plants Database. Accessed from http://plants.usda.gov.