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**San Diego Association of Governments
COASTAL CACTUS WREN HABITAT ENHANCEMENT/RESTORATION PROJECT
Final Report**

Project Period: September 2013 – September 30, 2016

SANDAG Contract Number: 5001766

Executive Summary

This report documents TransNet Environmental Mitigation Program (EMP) funded enhancement/restoration activities at the Otay Water District San Miguel Habitat Management Area (HMA) Coastal Cactus Wren (*Campylorhynchus brunneicapillus sandiegensis*) Habitat Enhancement/Restoration Project (Project). Coastal cactus wren is a species evaluated by the Management Strategic Plan for Conserved Lands in Western San Diego County (MSP). Successful implementation of this restoration project would help achieve the MSP's management goals for this species. Restoration would be accomplished by creating cactus dominated Diegan coastal sage scrub habitat at the project site, and aid in the overall recovery of the coastal cactus wren by creating a corridor of suitable habitat between two major populations within the Otay River and Sweetwater River valleys. TransNet EMP funding for the project was initiated September 2013 and concluded September 2016.

As evaluated during the Year 3 annual assessment and final site visit, the coastal cactus wren restoration was successful, although well-established cactus-dominated coastal sage scrub that could support coastal cactus wren is expected five to seven years after planting (in an additional two to four years). Within the restoration areas, cactus has continued to grow, and native cover has increased. Non-native cover is dominated by non-native grasses, which are not expected to inhibit development of the desired community. Coastal cactus wren have not yet been observed in the restoration areas, but may use the restoration areas when cactus have become more established. Maintenance and monitoring of the coastal cactus wren restoration areas will continue as part of the long-term management of the HMA, which will help the project towards achieving its long-term goals. Additional recommendations are provided.

Project Background

Location

The Otay Water District San Miguel Habitat Management Area (HMA) is located within the District's 509-acre Wastewater Reclamation Use Area (Use Area) on property that was annexed into the City of Chula Vista in 1999 (Assessor's Parcel Number [APN] 595-040-01, -08, -03, -

04, -05, 585-140-21, and -14). It covers portions of Sections 23 and 26 of Township 17 South, Range 1 West of the San Bernardino Base and Meridian, U.S. Geological Survey (USGS) 7.5' Jamul Mountains, California Quadrangle (Figures 1 and 2). Locally, the HMA lies at the base of Mother Miguel and San Miguel Mountains just east of State Route 125. It is situated approximately 1.5 miles southeast of Sweetwater Reservoir and 1.5 miles northwest of the Upper Otay Reservoir. Access to the site is obtained from the Salt Creek Golf Course on Hunte Parkway. The 4.2-acre coastal cactus wren restoration project is located in the central portion of the HMA, west of the golf course (Figure 3).

The project is located in two restoration areas on either side of Rickey Pond, and within coastal sage scrub recovering from fire damage. The 2.72-acre western area (Area 1) is located on a steep ridgeline, sloping south to Rickey Pond (Figure 3). It is surrounded by coastal sage scrub and riparian areas along Rickey Pond. The 1.51-acre eastern area (Area 2) gently slopes upwards from riparian areas along Rickey Pond to non-native grassland to the east.

Management Strategic Plan

The Management Strategic Plan for Conserved Lands in Western San Diego County (MSP) was developed to identify conservation, management, and monitoring needs within conserved lands across western San Diego County. These identified needs assist with directing and evaluating the efficiency of TransNet Environmental Mitigation Program (EMP) funding. The Coastal Cactus Wren Habitat Enhancement/Restoration Project is located in the Janal Management Unit (Management Unit 3). The MSP provides regional and management unit goals for the coastal cactus wren, listed below.

Regional Management Goal for Coastal Cactus Wren: Protect and enhance suitable cactus scrub and coastal sage scrub habitat within and between the recently identified coastal cactus wren genetic clusters to increase the effective occurrence size to a sustainable level (e.g. 50/500...), provide habitat connections to allow for movement within genetic clusters and potentially between the San Diego/El Cajon and Otay genetic clusters, and prioritize management in areas with low predation pressures to provide for coastal cactus wren persistence in the strategic plan area over the long-term (>100 years).

Management Unit 3 Goal for Coastal Cactus Wren: Protect and enhance suitable cactus scrub and coastal sage scrub habitat within the Otay River and San Diego/El Cajon genetic clusters to expand the occurrences to a sustainable effective size to avoid inbreeding..., enhance habitat connectivity throughout the Otay River Valley, and potentially connect this occurrence to the San Diego/El Cajon genetic cluster (depending on the results of the in-progress study on historic genetic structure) to provide for coastal cactus wren persistence in the strategic plan area over the long-term (>100 years).

The Coastal Cactus Wren Habitat Enhancement/Restoration Project is intended to create nesting and wintering habitat for the coastal cactus wren, enhance native habitat that has been degraded due to fire, and aid in the overall recovery of the coastal cactus wren by creating a corridor of

suitable habitat between two major populations within the Otay River and Sweetwater River valleys. The project is located roughly between the Otay and San Diego genetic clusters (Barr et al 2013).

Restoration would be accomplished by planting approximately 4.2 acres of coast cholla (*Cylindropuntia prolifera*) dominated coastal sage scrub in order to create habitat for the coastal cactus wren. Coast cholla (and other cactus) cuttings would be planted at two separate sites within the HMA that are within close proximity to one another and broadcasting coastal sage scrub seed among the planted coast cholla cacti. Restoration would also include quarterly maintenance (i.e., weeding), monitoring, annual assessment, reporting, and restoration signage.

Project Goals

The project goals were to create nesting and wintering habitat for the coastal cactus wren, enhance native habitat that has been degraded due to fire, and aid in the overall recovery of the coastal cactus wren by creating a corridor of suitable habitat between two major populations within the Otay River and Sweetwater River valleys. Success for the project would include well-established coast cholla and Diegan coastal sage scrub within the restoration site (i.e. annual increase in plant height of coast cholla and coastal sage scrub shrub species, increase in native species coverage, and the replacement of all dead cacti within the project site). The ultimate success, which would be expected five to seven years after planting, would include cactus that has reached an average height of three feet and supports a viable population of two or more pairs of coastal cactus wren.

Work Performed by Task

Task 1- Procure Cuttings and Site Preparation

Budget: \$17,321 (from grant agreement)

Spent: \$16,379.42

Match for Task: \$1,599.54 (in addition to Spent amount)

Merkel & Associates (M&A) restoration crews began site preparation on September 3, 2013. Hand tools were used to clear overgrown weeds. No herbicide was used at this time. M&A crews began salvaging cactus cuttings/plants on September 4, 2013. Cholla plants were obtained from three areas: the Eastern Grassland Restoration Area of the HMA, along Proctor Valley Road, and at Rice Canyon. In November 2013, an additional 1,700 cacti were collected from the Rice Canyon cactus donor site. The cactus cuttings/plants were stock piled in small groupings adjacent to the planting areas. Full plants were planted directly into the ground, while cuttings were left to callous for a few days to over a week. In addition, native seed that was collected from the HMA in August 2013 and included flat-top buckwheat (*Eriogonum fasciculatum*) and San Diego County viguiera (*Viguiera laciniata*).

Task 2- Planting Site

Budget: \$23,491 (from grant agreement)

Spent: \$19,304.56 (does not include matching funds portion)

Match for Task: \$1,885.20

Installation of the Coastal Cactus Wren Habitat Enhancement/Restoration project was completed in November 2013. M&A installed approximately 8,350 coast cholla in two restoration areas (i.e., Area 1 and Area 2 with 2,050 cacti and 6,300 cacti, respectively) over approximately 4.2 acres (Figure 3). An average of 1,974 cuttings per acre was ultimately planted. Plantings were installed on 2- to 3-foot centers throughout the restoration site. Most of the planting occurred during September and October 2013. During this time, M&A also hand broadcasted native seed (collected from the HMA) over bare ground throughout Areas 1 and 2. The seed was spread with the anticipation of upcoming rain; however, rain totals were minimal and evidence of seed germination was delayed.

Task 3- Site Maintenance

Budget: \$23,320 (from grant agreement)

Spent: \$8,670.87 (does not include matching funds portion)

Match for Task: \$856.38

Maintenance of the restoration areas was conducted quarterly or more often, as needed. M&A conducted the initial maintenance visits in Year 1. HELIX Environmental Planning, Inc, (HELIX) conducted the remainder of the maintenance. In Year 1, maintenance efforts included replanting uprooted cactus and removing non-native species from the coastal cactus wren habitat enhancement/restoration project area. In Years 2 and 3, maintenance focused on treating emerging non-native species with herbicide. Maintenance services were conducted within budget.

Invasive species are expected to continue to germinate within and spread into the restoration areas, and additional maintenance efforts would be required to exclude these species. Restoration Area 2 may also benefit from future dethatching of non-native grasses, as non-native grasses have been more abundant in this area. In addition, a native herbaceous seed mix may be applied to help compete with the anticipated emergence of weeds.

Task 4- Annual Monitoring

Budget: \$5,013 (from grant agreement)

Spent: \$3,922.83 (does not include matching funds portion)

Match for Task: \$392.61

Qualitative monitoring was conducted quarterly for approximately 3 years and incorporated into the regular HMA monitoring. Annual, quantitative monitoring (consisting of data collection from established transects and photo documentation) occurred during the third quarter of each year. Data was collected at six permanent transects, each 25 meters in length. Merkel conducted the first annual monitoring in Year 1. HELIX conducted the remainder of the monitoring. The last

annual monitoring was conducted on March 15, 2016. Results of the quantitative annual monitoring are provided below, and representative photos are provided (Attachment 1). Any biological issues observed during monitoring visits were addressed by the maintenance crew during maintenance visits. Monitoring services were conducted within budget.

ANNUAL MONITORING RESULTS			
Measurement	Year 1	Year 2	Year 3
Average Cactus Height (inches)	9.4	12.5	15.9
Percent Native Cover	40.7	38.0	53.3
Percent Non-native Cover	28.3	53.7	32.7
Percent Total Vegetative Cover	65.3	76.7	75.7

As evaluated during the final monitoring visit, coast cholla plantings, San Diego barrel cactus (*Ferocactus viridescens*), and coastal prickly pear (*Opuntia littoralis*) appear healthy and continue to establish. The coast cholla averaged approximately one and a half feet (18 inches) in height. Cactus mortality was not noted during the site visit. Native shrubs within the restoration area(s) include California sagebrush (*Artemisia californica*), buckwheat (*Eriogonum fasciculatum*), San Diego sunflower (*Bahiopsis laciniata*), deerweed (*Acmispon glaber*), chaparral mallow (*Malacothamnus fasciculatus*), laurel sumac (*Malosma laurina*), lemonadeberry (*Rhus integrifolia*), scrub oak (*Quercus berberidifolia*), white sage (*Salvia apiana*), and spiny redberry (*Rhamnus crocea*). Non-native cover primarily comprised dead non-native grasses. Small patches of dry/dead foxtail chess (*Bromus madritensis*) were present in Area 1, primarily on the lower slopes. In most of Area 2, non-native grasses had turned to dead standing biomass approximately 1 foot in height. Excluding the previous season’s dead biomass, non-native species cover was minimal (less than 1 percent) within Areas 1 and 2. An abundance of broad-leaved seedlings were emerging in both areas. Most of these are expected to be filaree (*Erodium* spp.), a non-native herbaceous species common throughout the HMA and adjacent NWR. Wildlife observations included 1 mammal (desert cottontail), 4 bird species (California quail, northern mockingbird, Bewick’s wren, and coastal California gnatcatcher), and 4 invertebrates (Behr’s metalmark, tarantula hawk, garden spider, and fly). There was no detection of coastal cactus wren; this species has not been observed in restoration areas to date.

Task 5- Reports

Budget: \$15,876 (from grant)

Spent: \$11,387.98 (does not include matching funds portion)

Match for Task: \$1,239.32

Reporting including preparation of three quarterly monitoring progress reports and one annual report each year, summarizing maintenance and monitoring activities at each restoration area. Reports provided a brief summary of the overall condition of the restoration sites. In addition,

this final report was prepared at the conclusion of the TransNet EMP funding. The reporting was completed within budget; however, the public outreach component went over budget by 1 percent.

Task 6- Public Outreach

Budget: \$600 (from grant)

Spent: \$606.76 (does not include matching funds portion)

Match for Task: \$59.24

Public outreach involved the installation of 6, 12” x 18” restoration signs posted along the restoration boundaries. The signs were printed on aluminum composite and designed to describe the purpose of restoration, and included an image of the coastal cactus wren as well as logos for SANDAG and Otay Water District. The public outreach task went over budget by 1 percent.

Task 7- Administrative

Budget: \$3,219 (from grant)

Spent: \$1,677.25 (does not include matching funds portion)

Match for Task: \$171.50

Administrative tasks included project coordination efforts and management, and in particular, budget review and invoice preparations that reported the funding break down for each task by year. Invoices were submitted quarterly to SANDAG with the progress reports. Administrative tasks were completed within budget.

Conclusions

The Coastal Cactus Wren Habitat Enhancement/Restoration Project is on track to meet project goals. The ultimate success, which would be expected five to seven years after planting, would include cactus that has reached an average height of three feet and supports a viable population of two or more pairs of coastal cactus wren. At the start of fourth year after planting, coast cholla are approximately one and a half feet in height and continue to grow. These and other cactus species are healthy. Cacti are expected to continue to establish and eventually provide desirable coastal cactus wren habitat. No coastal cactus wren have been observed in the restoration area to date. It is hoped that cactus wren will use the restoration areas as cactus matures. Should coastal cactus wren use these areas, the project will have contributed to the conservation of a MSP species. Invasive species have been removed for the duration of the project, reducing the amount of seed in the seed bank in these areas. Non-native grasses are not expected to interfere with cactus establishment. As this area is on target to meet its long-term goals, the project is considered a success.

Although TransNet EMP funding for the project concluded September 2016, maintenance and monitoring of cactus wren habitat restoration areas will continue as part of the long-term

management throughout the HMA. Regular weeding should help the restoration areas continue to establish into the desired habitat. Additional maintenance efforts that may promote the establishment of cactus wren habitat include dethatching non-native grasses in Area 2 as non-native grasses have been more abundant in this area, and application of a native herbaceous seed mix to help compete with the anticipated emergence of weeds.

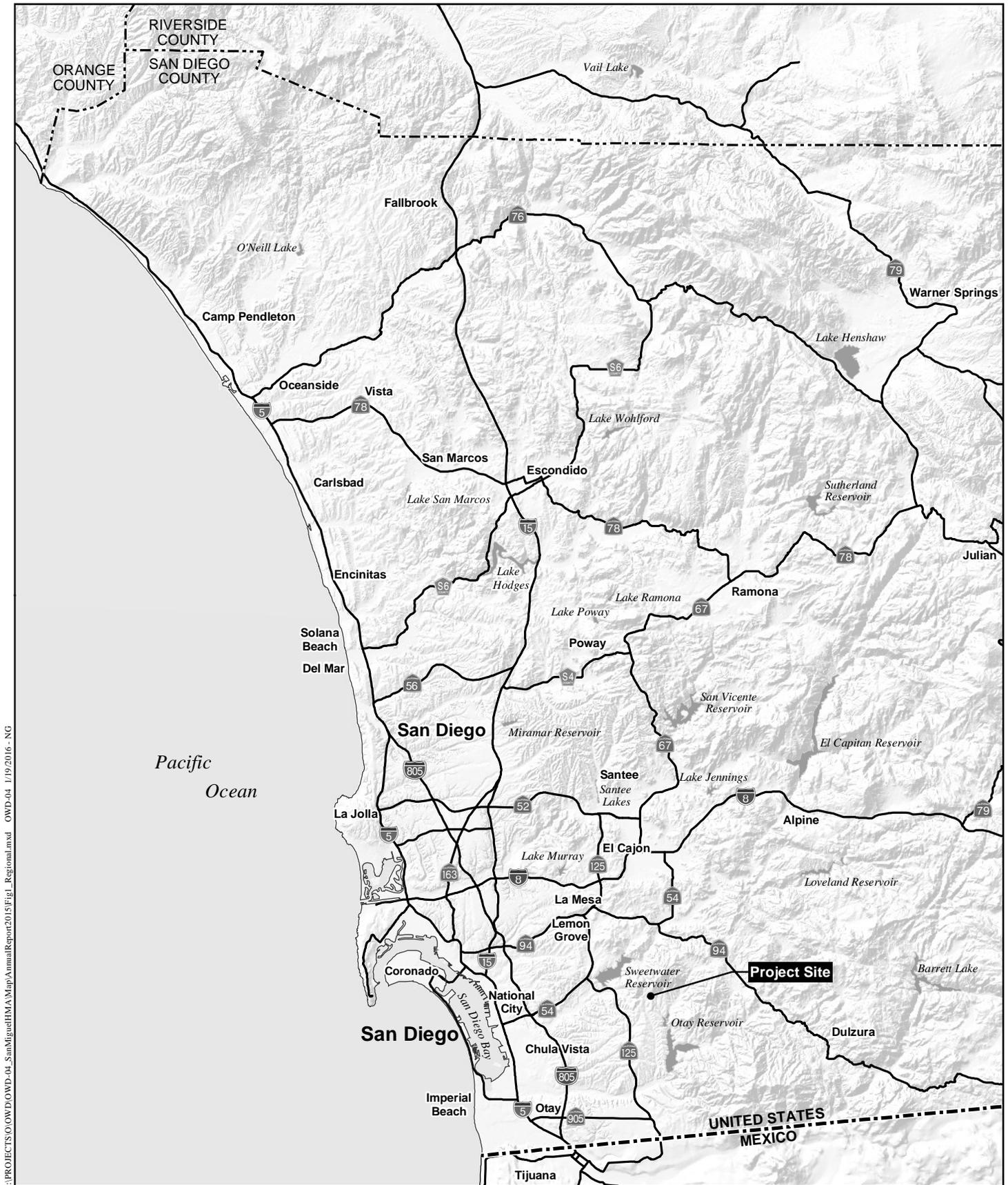
Attachments:

Figure 1. Regional Location Map

Figure 2. USGS Topography (Project Vicinity)

Figure 3. Cactus Wren Habitat Restoration Areas

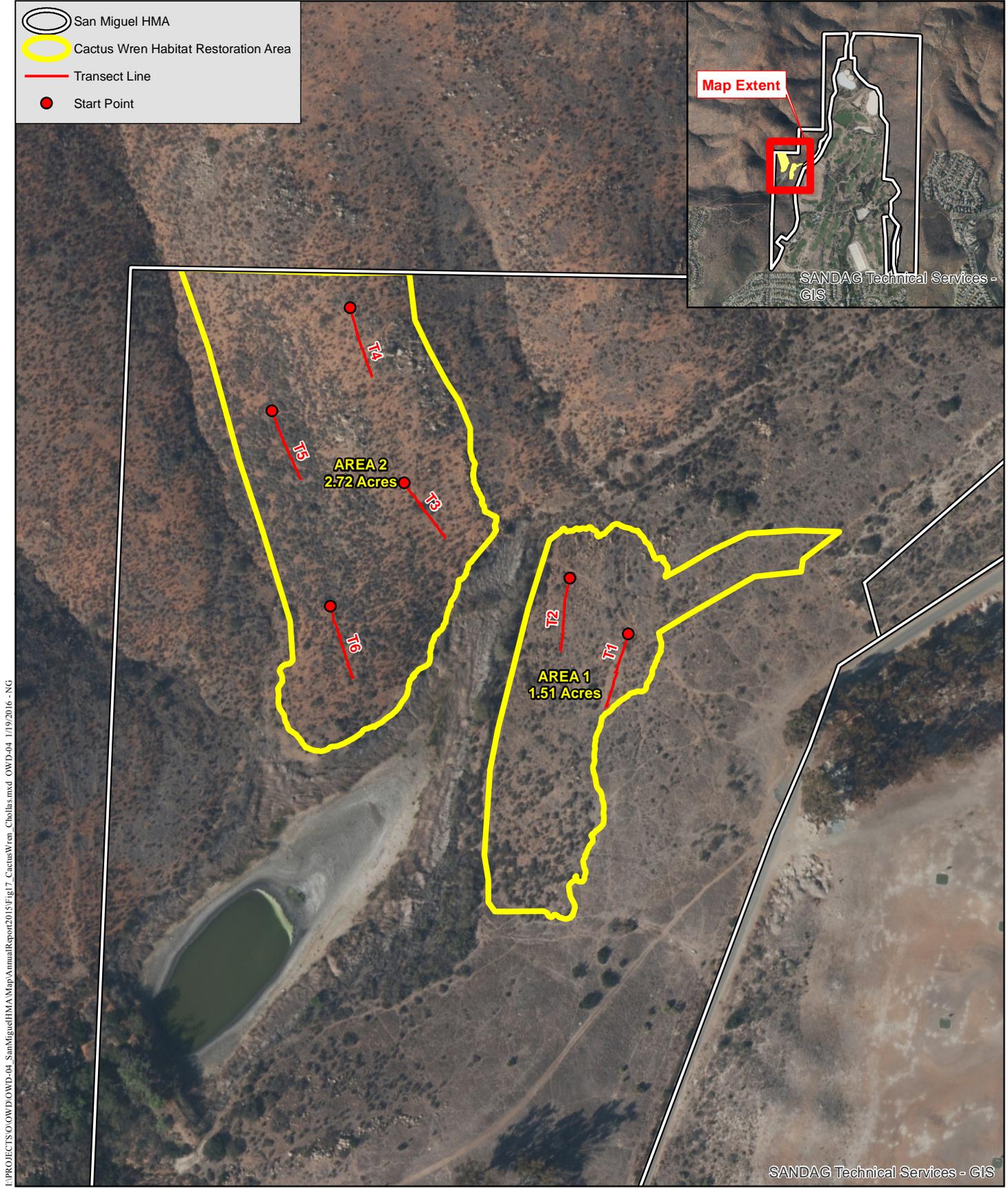
Attachment 1. Representative Photographs



Regional Location Map

2015 ANNUAL REPORT FOR THE SAN MIGUEL HABITAT MANAGEMENT AREA

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Cactus Wren Habitat Restoration Areas

SAN MIGUEL HABITAT MANAGEMENT AREA

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TASK 2 - ANNUAL ASSESSMENT



Area 1: Transect 1 on 3/31/14 (left) and 3/15/16 (right).



Area 1: Transect 2 on 3/31/14 (left) and 3/15/16 (right).

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Year 4/final Report/Att 1 Photo pages

Representative Photographs
COASTAL CACTUS WREN HABITAT ENHANCEMENT/
RESTORATION PROJECT

Attachment 1



Area 2: Transect 3 on 3/31/14 (left) and 3/15/16 (right).



Area 2: Transect 4 on 3/31/14 (left) and 3/15/16 (right).



Area 2: Transect 5 on 3/31/14 (left) and 3/15/16 (right).



Area 2: Transect 6 on 3/31/14 (left) and 3/15/16 (right).

TASK 2 - MONITORING



Coast cholla on 3/31/14 (left) and 9/23/16 (right).



Area 1: Looking north at restoration sign on 9/23/16.



Area 1: Looking south at restoration sign on 9/23/16.



Area 2: Looking southwest at northern restoration sign on 9/23/16.



Area 2: Looking west at southern restoration sign on 9/23/16.



Area 1: View to the west from Area 2 on 9/23/16.



Area 1: View to the south from top of Area 1 on 9/23/16.



Area 2: View to the southeast from Area 1 on 9/23/16.



Area 2: View to the south from inside Area 2 on 9/23/16.

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