SALT CREEK COASTAL CACTUS WREN HABITAT RESTORATION PROJECT
1ST ANNUAL MONITORING REPORT

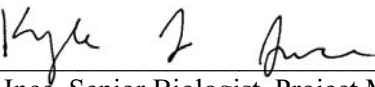
Prepared for:

County of San Diego
Parks and Recreation Department
9150 Chesapeake Drive, Suite 200
San Diego, CA 92123
Attention: Ms. Cheryl Goddard
Phone: (858) 966-1374

Prepared by:

Merkel & Associates, Inc.
5434 Ruffin Road
San Diego, California 92123
Contact: Mr. Kyle L. Ince
Phone: (858) 560-5465
Fax: (858) 560-7779

January 2011



Kyle L. Incé, Senior Biologist, Project Manager

Bonnie L. Peterson, Senior Biologist

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

SALT CREEK COASTAL CACTUS WREN HABITAT RESTORATION PROJECT 1ST ANNUAL MONITORING REPORT

Merkel & Associates, Inc.
January 2011

SUMMARY

Merkel & Associates, Inc. (M&A) conducted the first annual monitoring assessment for the Salt Creek Coastal Cactus Wren Habitat Restoration Project. Quantitative monitoring was performed on May 3, May 4, September 9, and September 10, 2010. Information from qualitative assessments of the site was obtained in June, August, and October of 2010 and is also provided in this report.

A total of 6 monitoring stations were established within the study area. Avian point counts and vegetation coverage/cactus height was acquired and analyzed for each of these monitoring stations. The locations of monitoring stations were selected to determine changes in habitat use over time for two restored areas (Stations 1 and 2), two areas that have had previous records of coastal cactus wren (*Camplyorhynchus brunneicapillus*) occupation (Stations 3 and 4), and two areas that were assumed to be suitable for cactus wren occupation but no wrens have been observed (Stations 5 and 6). One of the primary purposes of this first annual report is to provide baseline information from which future monitoring events can be compared. Monitoring is expected to occur for an additional 4 years.

On September 9 and September 10, 2010, the vegetation along permanent 25-meter long transects was analyzed, and plant coverage was determined using a point-intercept method. In addition, the heights of 10 coast cholla (*Cylindropuntia prolifera*) were measured along each transect. Transects within restored areas revealed an average total native vegetative cover of 26.0 percent. Native plant species included coast cholla, coastal sagebrush (*Artemisia californica*), and fascicled tarplant (*Deinandra fasciculata*). Non-native species averaged 4.0 percent cover and bare ground averaged 70.0 percent cover. The average coast cholla cactus height within restored areas was 14.6 inches. Transects in areas occupied by coastal cactus wren revealed an average total native vegetative cover of 74.0 percent comprised of coast cholla, flat-top buckwheat, and fascicled tarplant. Non-native species averaged 12.0 percent and bare ground averaged 20.0 percent. The average height of coast cholla within cactus wren occupied habitat was 45.3 inches.

Avian point counts were conducted on May 3 and May 4, 2010. Coastal cactus wren were located within Stations 1 through 4 as predicted and were confirmed nesting at Station 4 and immediately adjacent to the restoration site within Station 1. Stations 1, 2, and 6 had the highest diversity of species and the highest count of individuals. Avian species diversity and abundance was greatest at Stations 1, 2, and 6. Stations 1 and 2 (restoration sites) contained higher counts of disturbance-related avian species compared to other stations. Station 6 includes a canyon with more diverse Diegan coastal sage scrub and was occupied by a greater number of sage scrub adapted avian species.

INTRODUCTION

PROJECT BACKGROUND

The southern portion of Salt Creek is managed jointly by the County of San Diego and the City of Chula Vista as the Otay Ranch Preserve Owner Manager (POM). Salt Creek has experienced the loss and degradation of coastal cactus wren (*Camplyorhynchus brunneicapillus*) habitat due to previous grazing, illegal off-road vehicle use, illegal dumping, increase in invasive plants, drought, and direct competition with non-native plants for light and water. Salt Creek previously supported core regional populations of California gnatcatcher (*Polioptilla californica californica*), coastal cactus wren, and coast barrel cactus (*Ferocactus viridescens* var. *viridescens*) as identified in the Multiple Species Conservation Program (MSCP) (Salt Creek Preserve Analysis, Ogden, 1999). In 1996, MSCP GIS data indicated 55 point observations of cactus wren. By 2001, wren locations had declined from 55 to 17 (Dudek and Associates 2001). The purpose of this restoration program is to enhance and expand extant coastal cactus wren habitat within the POM managed lands in the Salt Creek area outside of known formerly used defense (FUD) lands (Figure 1) referred to hereafter as the study area.

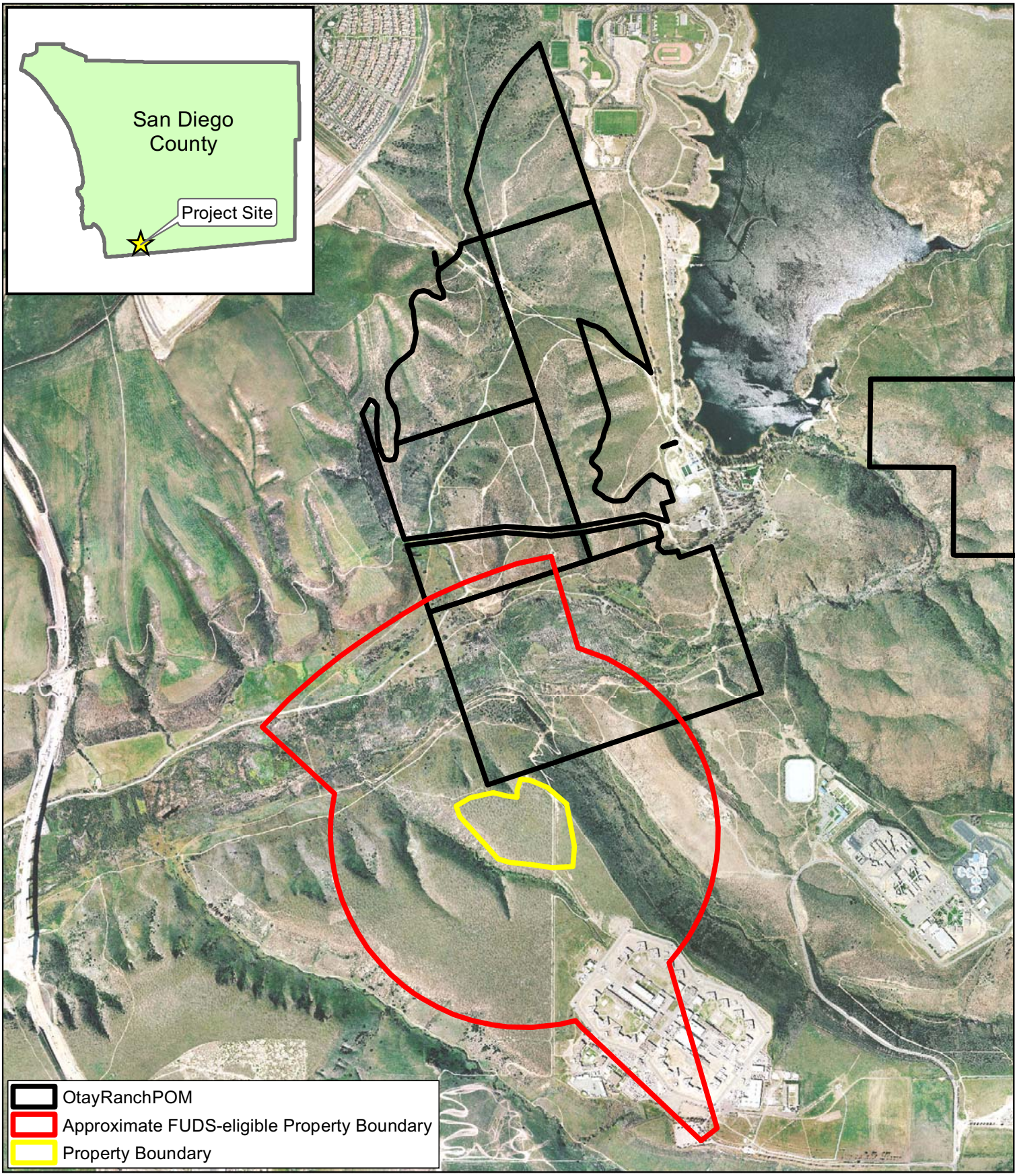
CACTUS WREN BREEDING BIOLOGY

The coastal cactus wren (*Campylorhynchus brunneicapillus*) is a federal Candidate 2 Species and a State Species of Special Concern. It occurs along the coastal slope in Ventura, San Bernardino, Los Angeles, Orange, and San Diego Counties as well as Baja California (Solek and Szijj, 2004). The San Diego cactus wren is a subspecies with a more limited range of southern Orange County, San Diego County, and Baja California. The San Diego cactus wren occurs on south and west facing slopes below 1,000 feet elevation. Their territory size ranges from 0.8 to 2.0 ha in size and occurs in cactus dominated coastal sage scrub where the cactus is greater than 1 meter in height. In San Diego the cactus wren is found to nest in coast cholla (*Cylindropuntia prolifera*) and prickly pear (*Opuntia littoralis*). It is a year-round resident and will have multiple nests for both nesting and roosting. The presence of a nest is not evidence of a nesting pair as old nests are often rehabilitated and new nests can be built just for roosting.

The cactus wren is an insectivore, gleening insects from the ground and from vegetation. Cactus wren breeding season is between February 15th and August 15th. The male normally maintains the territorial defense while the female incubates the nest. Juveniles will often remain in the territory even after a new nest is created and aid with territorial defense and feeding the nestlings.

RESTORATION IMPLEMENTATION

During the late summer of 2009, Merkel & Associates biologists reviewed the study area to determine potential areas for cactus salvage and restoration activities. Several potential restoration areas were identified and then presented to Cheryl Goddard and Megan Hamilton of the County's Department of Parks and Recreation during a site meeting on August 13, 2009. Of the site's reviewed, three were mapped and forwarded by the County to the City of Chula Vista for review and comment. Of these three, the City approved a 1.0-acre area, which occurs on land that was previously disturbed for the construction of a lateral sewer line leading from the Arco Olympic Training Center (Figure 2).



Salt Creek Coastal Cactus Wren Habitat Restoration Project

Vicinity/Boundary Map

Figure 1

Merkel & Associates restoration crews salvaged cactus cuttings/plants from November 30, 2009 through December 11, 2009. Cuttings and plants were obtained throughout the POM managed salt creek area within locations that were recorded to be outside occupied cactus wren (*Campylorhynchus brunneicapillus*) habitat. An effort was made to obtain cuttings from outside lateral branches in order to avoid reducing the height of affected plants and reduce the potential for nesting by cactus wren. An attempt was also made to reduce each plant by no more than 5 percent of its total cover. The cactus cuttings/plants were stockpiled in small groupings throughout the 1.0-acre planting area and were left to callus from December 12, 2009 to January 6, 2010. Planting occurred from January 6 through January 14, 2010. Plantings were installed on 2 to 3-foot centers throughout the restoration site. An estimated seven to ten thousand cactus plantings were installed. Native seed collected from the nearby area (i.e., southeast Chula Vista) was hand broadcasted over the site on January 14, 2010, just prior to a significant rainstorm event. Seed included approximately 15.0 lbs. of flat-top buckwheat (*Eriogonum fasciculatum)* and 10.0 lbs. of a mixture of California sagebrush (*Artemisia californica*), San Diego County viguiera (*Viguiera laciniata*), coastal deerweed (*Lotus scoparius*), and San Diego bursage (*Ambrosia chenopodiifolia*).

Following this planting effort, Merkel & Associates discovered a similar but smaller nearby area which had also been disturbed by the aforementioned sewer construction project (i.e., staging area and access road). Subsequent to approval from the County of San Diego and the City of Chula Vista, planting at this 0.4-acre disturbed area commenced on April 29, 2010. Approximately 500 cuttings were obtained from unoccupied habitat within the area. Cuttings were allowed to callous for a period of two weeks and were then planted in mid-May. All planting (and salvaging) ceased when a cactus wren established a nest immediately adjacent to this planting area. Cactus wren nestlings were observed during a previous (early June) monitoring visit. The nestlings were not present during a July 26, 2010 visit of the site, and were presumed to have fledged.

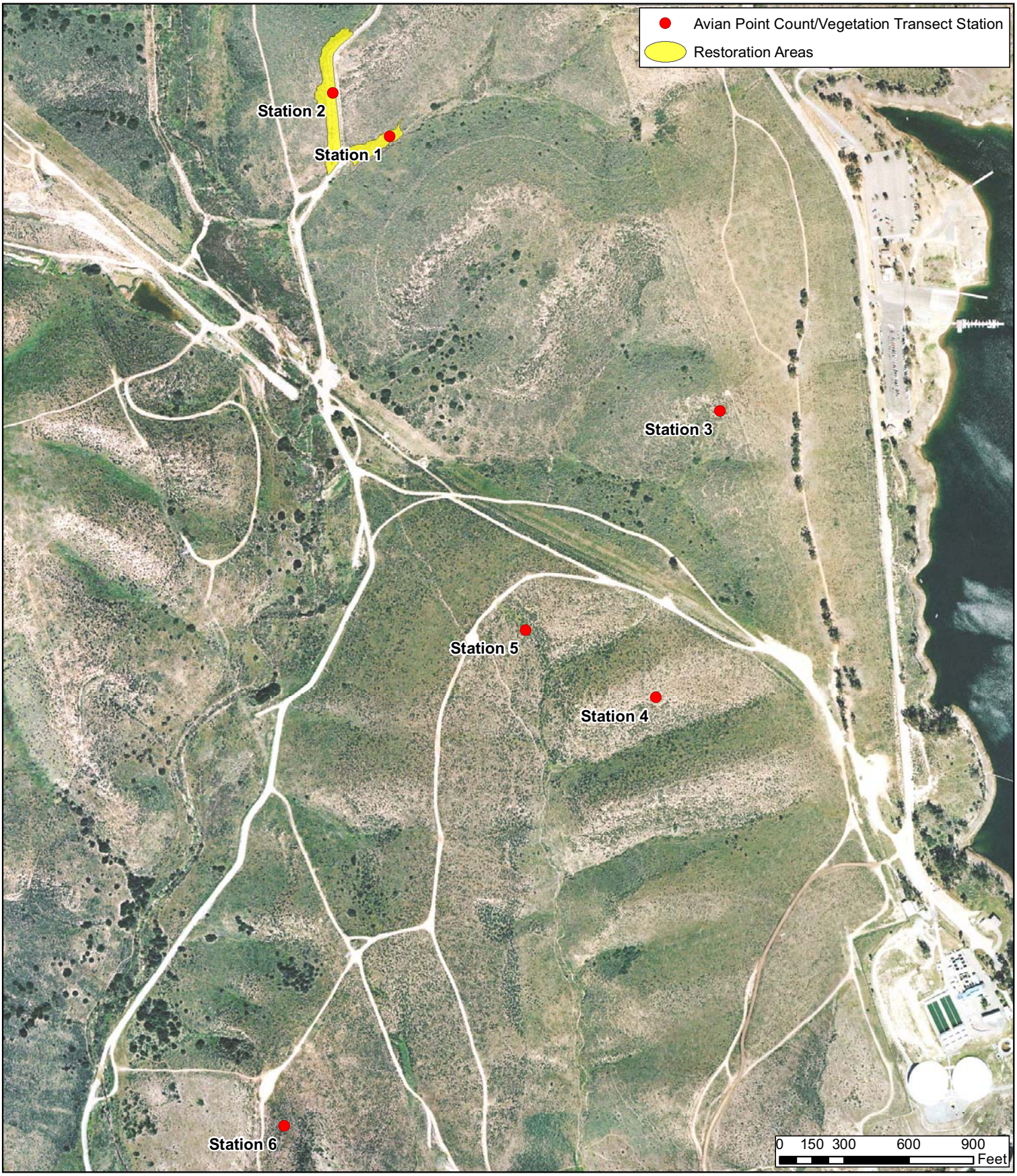
Restoration activities resumed from August 16 to August 18, 2010 with the salvage of an estimated 1,300 to 1,500 cuttings from unoccupied habitat throughout the study area. Cuttings were allowed to callus and then were planted within the 0.4-acre area from September 8 through September 10, 2010. Cactus were planted on approximately 3-foot centers. An estimated total of 1,500 to 2,000 cactus were planted within the 0.4 acre planting area.

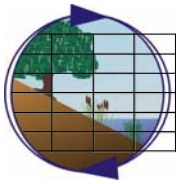
METHODS

On May 3, and May 4, 2010 a total of 6 monitoring stations were established within the study area; one was established at each of the two restoration sites (Station 1 and 2), two were established in areas that have had previous records of cactus wren occupation (Station 3 and 4), and two were established in areas that were presumed to be suitable for coastal cactus wren occupation but did not support cactus wrens (Station 4 and 5) (Figure 2). A GPS unit with sub-meter accuracy was used to document the location of each monitoring station.

VEGETATION

A total of six transects, each 25 meters in length, were established at each of the monitoring stations. The beginning and end of each transect was staked for use throughout the 5-year monitoring period. A GPS unit with sub-meter accuracy was used to record the locations of these stakes. M&A biologist Kyle L. Ince conducted the vegetation monitoring survey on September 9 and September 10, 2010 (Table 1).





N
W E
S

Salt Creek Coastal Cactus Wren Habitat Restoration Project

Point Count Stations and Restoration Areas

Figure 2

A point-intercept method was used to determine total plant cover, percent cover of each species, and percent cover of bare ground for each of the six transects (Appendix 1). Plant cover was recorded at intervals of one meter along the tape, providing a total of 25 point intercepts per transect. Because the point-intercept method takes species overlap (absolute cover) into account, percent cover may exceed one hundred percent. Total vegetative cover without overlap (relative cover) was also calculated. In addition, the height of 10 randomly selected coast cholla adjacent to each transect was measured using a tape measure. Photographs were taken from the beginning of each transect (Appendix 2).

AVIAN POINT COUNTS

M&A biologist, Bonnie L. Peterson, collected point count information on May 3 and May 4, 2010 between sunrise and 1000 hours, when the majority of avian species are most vocal. Methods for obtaining and recording information followed a standardized format for point counts (Ralph et al 1995). Data collected included all birds heard or observed between 0-3 minutes, 3-5 minutes and those heard or observed between 5-10 minutes for a total of 10 minutes per point count station. Bird distance estimates of less than or equal to 50 meters, greater than 50 meters, and flyovers were also recorded for each observation. Following each point count period, Ms. Peterson remained in the area for 5 to 20 minutes to record any additional avian information as well as any information on the cactus wren including the number of pairs, location for nests, etc. All observed cactus wren territories and nests were mapped using a GPS unit with sub-meter accuracy. The following table provides dates, survey times, and weather conditions recorded during the avian monitoring events.

Table 1. **Summary of Survey Dates, Times, Conditions, and Biologists**

Dates	Time	Conditions (start-end)	Biologist	Task
3 May 2010	0723-1036	Weather: 0%-0% cc Wind: 2 BS Temperature: 53°-72° F	Bonnie L. Peterson	Avian Point Count Monitoring
4 May 2010	0639-0853	Weather: 0%-0% cc Wind: 2 BS Temperature: 52°-63° F	Bonnie L. Peterson	Avian Point Count Monitoring
9 September 2010	1430-1630	Weather: 0%-0% cc Wind: 1 BS Temperature: 72°-71° F	Kyle L. Ince	Vegetation Monitoring
10 September 2010	0900-1230	Weather: 0-0% cc Wind: 1 BS Temperature: 68°-72° F	Kyle L. Ince	Vegetation Monitoring

cc=cloud cover; BS=Beaufort Scale; F = Fahrenheit

RESULTS

VEGETATION

Restoration Areas

The 1.0-acre restoration site exhibited 48.0 percent vegetative cover (relative cover). Native species provided 26.0 percent cover and included coast cholla, fascicled tarplant (*Deinandra fasciculata*), and coastal sagebrush with cover values of 20.0, 12.0, and 8.0 percent, respectively. The non-native tocalote (*Centaurea melitensis*) exhibited 8.0 percent cover on the transect. Bare ground comprised 52.0 percent of the transect. The average height of coast cholla along this transect was 16.0 inches.

The 0.4 acre restoration site exhibited 12.0 percent vegetative cover (relative cover) which was comprised of 8.0 percent coast cholla and 4.0 percent fascicled tarplant. No non-native species were recorded within the transect. Bare ground comprised 88.0 percent of the transect. The average height of coast cholla along this transect was 13.2 inches.

Occupied Cactus Wren Habitat

Average vegetative cover for occupied cactus wren habitat was 80.0 percent (relative cover). Native species provided 74.0 percent cover and included coast cholla, flat-top buckwheat, and nievitas cryptantha (*Cryptantha intermedia*) with average cover values of 34.0, 32.0 and 4.0 percent, respectively. Non-native species included understory annual species such as red brome (*Bromus madritensis* ssp. *rubens*), soft chess (*Bromus hordeaceus*), and tocalote, each with average cover values of 4.0 percent. The average bare ground cover for these two transects was 20.0 percent. The average height of coast cholla was 45.3 inches.

Suitable but Non-occupied Cactus Wren Habitat

Average vegetative cover for suitable but non-occupied cactus wren habitat was 96.0 percent (relative cover). Native species provided 66.0 percent cover and included flat-top buckwheat, coast cholla, and fascicled tarplant with average cover values of 42.0, 20.0, and 6.0 percent, respectively. Non-native species included red brome, slender wild oat (*Avena barbata*), and tocalote with average cover values of 52.0, 2.0, and 2.0 percent, respectively. The average bare ground cover for these two transects was 4.0 percent. The average height of coast cholla was 37.4 inches (3.1 feet).

AVIAN POINT COUNTS

All results from the point count survey are recorded in Table 2.

Restoration Areas

Cactus wren were observed at both Station 1 and Station 2 within the restoration areas. Station 1 had an active nest almost adjacent to the point count station and just outside of the restoration area. At Station 2 the observed cactus wren was only detected on one survey and was greater than 50 meters from the restoration site. Station 2 was also occupied by a large number of foraging European starlings (*Sturnus vulgaris*), including one carrying nesting material indicating that they are nesting in the vicinity. Brown-headed cowbirds (*Molothrus ater*) were also observed foraging near Station 2, which is just up hill from a patch of willow riparian habitat. One male least Bell's vireo (*Vireo bellii pusillus*) was heard singing in the riparian habitat. Both restoration sites had the highest number of individuals (23 and 26, respectively) and species (11) compared to the other point count stations. Some of these species are disturbance related and may decrease in numbers as the habitat improves.

Occupied Cactus Wren Habitat

Station 3 is excellent cactus wren habitat with several 4.5 to 5 feet tall coast cholla and Mexican elderberry (*Sambucus mexicana*) nearby. Two coastal cactus wren were observed at this station. No nests were recorded but they were assumed to be nesting. Station 4 also had a nesting cactus wren that was observed removing a fecal sac from an active nest. The location of the nest was recorded. Also of interest were a number of lark sparrows (*Chondestes grammacus*).

Table 2. Birds Observed During May 2010 Avian Point Counts at Salt Creek

SPECIES		Station 1	Station 2	Station 3	Station 4	Station 5	Station 6
American Crow	*Corvus brachyrhynchos*			1			
Anna's Hummingbird	*Calypte anna*			1		1	
Brown-headed Cowbird	*Molothrus ater*		5				
Blue Grosbeak	*Passerina caerulea*		1				
Bushtit	*Psaltriparus minimus*						2
California Gnatcatcher	*Polioptila californica californica*	1				3	
California Towhee	*Pipilo crissalis*	4	1	3	2		3
California Quail	*Callipepla californica*	3	5	4		1	3
California Thrasher	*Toxostoma redivivum*		1				2
Cactus Wren	***Campylorhynchus brunneicapillus***	**2**	**1**	**3**	**1**		
Common Raven	*Corvus corax*	1		1		1	1
European Starling	*Sturnus vulgaris*	4	6				
House Finch	*Carpodacus mexicanus*						1
Lark Sparrow	*Chondestes grammacus*				3		
Lazuli Bunting	*Passerina amoena*						2
Least Bell's Vireo	*Vireo bellii pusillus*		1				
Lesser Goldfinch	*Spinus psaltria*	2	2	1	2	2	1
Mourning Dove	*Zenaida macroura*	3	1	8	1		
Northern Mockingbird	*Mimus polyglottos*	1	2	3	1		
Song Sparrow	*Melospiza melodia*						1
Spotted Towhee	*Pipilo maculates*	1					
Wilson's Warbler	*Wilsonia pusilla*	1					
Wrentit	*Chamaea fasciata*						3
Additional Species (includes flyovers)							
Northern Harrier	*Circus cyaneus*						1
Greater Roadrunner	*Geococcyx californianus*				1		
California Gnatcatcher	*Polioptila californica californica*				1		
Horned Lark	*Eremophila alpestris*					2	
Total Number of Birds		**23**	**26**	**25**	**12**	**10**	**20**
Total Number of Species		**11**	**11**	**9**	**7**	**6**	**11**

Stations 1 & 2 – Restoration Areas
Stations 3 & 4 – Recorded as Occupied Cactus Wren Habitat
Stations 5 & 6 –Suitable but Non-occupied Cactus Wren Habitat

Suitable but Non-occupied Cactus Wren Habitat

Station 5 is located in a stand of coast cholla with Diegan coastal sage scrub. No cactus wren were observed during the surveys; however, several coastal California gnatcatchers (*Polioptila californica californica*) occupied the site and were most likely nesting. A horned lark (*Eremophila alpestris*) and one fledgling were observed on the road nearby. This point count station had the lowest number of species (6) and the lowest number of individuals (10). Station 6 was difficult to survey due to a large canyon within 50 feet of the station. Birds were observed moving in the tall shrubs but were not singing and could not be identified and therefore were not recorded. The entire site is dominated by Diegan coastal sage scrub with only small patches of coast cholla. Of interest at this site were California thrasher (*Toxostoma redivivum*), lazuli bunting (*Passerina amoena*), wrentit (*Chamaea fasciata*), and northern harrier (*Circus cyaneus*). This was a relatively diverse (11 species) site with higher counts of sage scrub related avian species. Cactus wren was not observed at this station.

QUANTITATIVE AND QUALITATIVE ANALYSIS

The primary goal of this initial monitoring event was to provide baseline information from which subsequent collected data can be compared. Especially relevant to this study will be the comparison of vegetative cover and bird usage of the restoration sites with habitat that is occupied by coastal cactus wren. The restoration areas currently provide an average cover of 26.0 percent native species including 14.0 percent cover from coast cholla. Occupied habitat exhibits a 74.0 percent average cover from native species including 32.0 percent cover from coast cholla. At present, avian abundance and diversity are greatest within the restoration areas however this is primarily due to the presence of disturbance associated avian species such as brown-headed cowbird and European starling. These numbers are expected to change as the restoration sites further develop with native vegetation. Upcoming surveys will further analyze the relationship between vegetative cover/development with bird usage.

REFERENCES

Ralph, C. J., J. R. Sauer, S. Droege, technical editors. 1995. Monitoring Bird Populations by Point Counts. Gen. Tech. Rep. PSW-GTR-149. Albany, CA. Pacific Southwest Research Station, U.S. Forest Service, Department of Agriculture. 187 pp.

Solek, C. and L. Szijj. 2004. Cactus Wren (*Campylorhynchus brunneicapillus*). *In* The Coastal Scrub and Chaparral Bird Conservation Plan: a strategy for protecting and managing coastal scrub and chaparral habitats and associated birds in California. California Partners in Flight. http://www.prbo.org/calpif/htmldocs/scrub.html

APPENDIX 1. TRANSECT SAMPLING DATA

Monitoring Results

Plant Species	Percent Cover					
	Transect 1	Transect 2	Transect 3	Transect 4	Transect 5	Transect 6
Coastal Sagebrush (*Artemisia californica*)		8.0				
Laciniate Spineflower (*Chorizanthe fimbriata* var. *laciniata)*				8.0		
Nievitas Cryptantha (*Cryptantha intermedia*)			8.0			
Coast Cholla (*Cylindropuntia prolifera*)	8.0	20.0	48.0	20.0	36.0	4.0
Fascicled Tarplant (*Deinandra fasciculatum*)	4.0	12.0		8.0		12.0
Flat-top Buckwheat (*Eriogonum fasciculatum* var. *fasciculatum*)			32.0	32.0	28.0	56.0
Slender Wild Oat (*Avena barbata*)*						4.0
Soft Chess (*Bromus hordeaceus*)*				8.0		
Red Brome (*Bromus madritensis* ssp. *rubens*)*			8.0		28.0	76.0
Tocalote (*Centaurea melitensis*)*		8.0		8.0		4.0
Bare Ground	88.0	52.0	24.0	16.0	8.0	0.0
Total Percent Vegetative Cover (with overlap)	12.0	48.0	96.0	96.0	92.0	156.0
Total Percent Vegetative Cover (without overlap)	12.0	48.0	76.0	84.0	92.0	100.0
Total Percent Native Vegetative Cover (with overlap)	12.0	40.0	88.0	88.0	64.0	72.0
Total Percent Native Vegetative Cover (without overlap)	12.0	40.0	80.0	68.0	64.0	68.0
Total Percent Non-native Vegetative Cover (without overlap)	0.0	8.0	8.0	16.0	28.0	84.0

* Non-native Species

	Restoration Sites no previous known CAWR nesting
	Previous records of CAWR nesting
	Suitable habitat for CAWR but not a recorded nesting site

APPENDIX 2. TRANSECT PHOTOGRAPHS

Photo Point 1. Viewing north from the southern end of the 1.0-acre restoration site prior to planting.

Photo Point 2. Viewing south at the southern half of the 1.0-acre restoration site prior to planting.

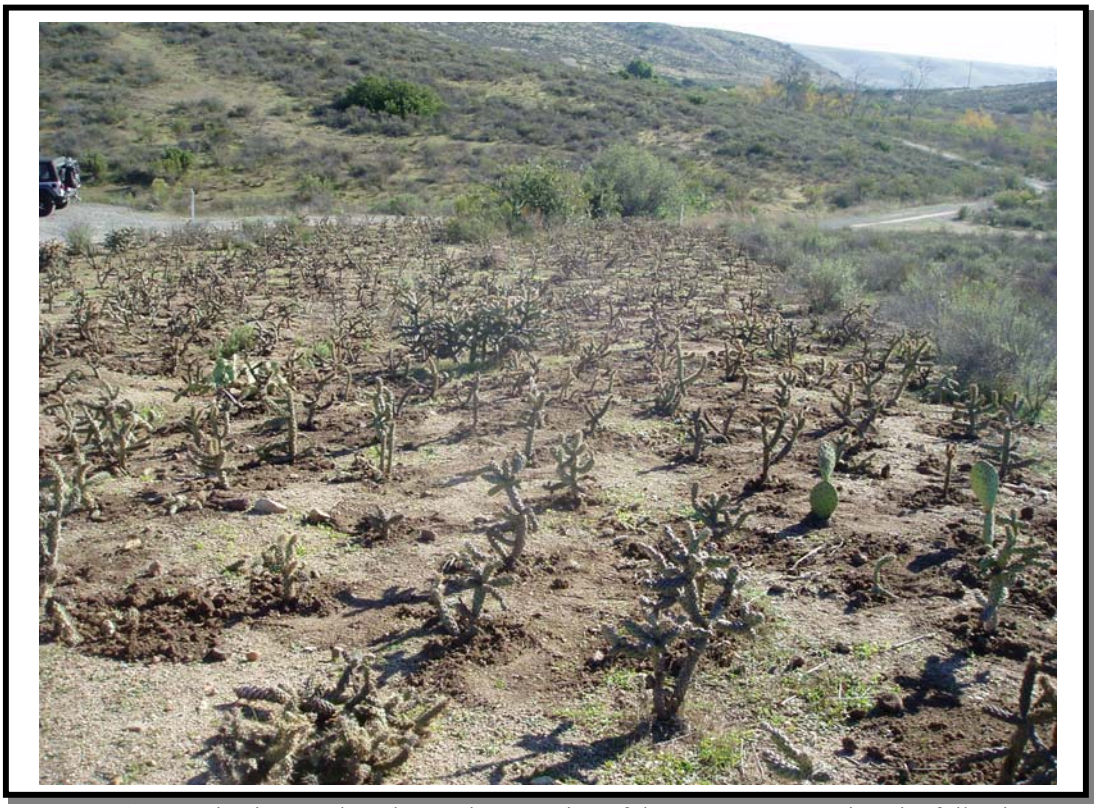


Photo Point 3. Viewing south at the southern portion of the 1.0-acre restoration site following planting.

Photo Point 4. Viewing south near the northern end of the 1.0-acre restoration site following planting.

Photo Point 5. Habitat restoration crews planting cactus at the 1.0-acre restoration site.

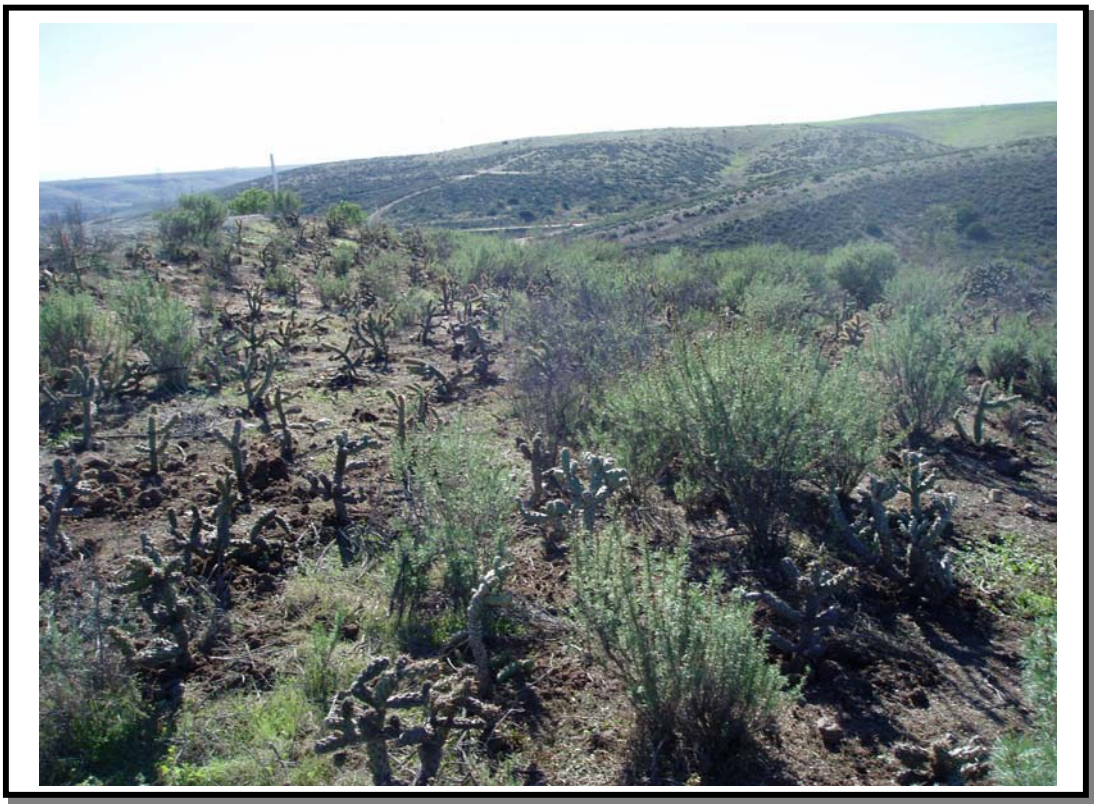


Photo Point 6. Viewing southwest at the northern portion of the 1.0-acre restoration site.

Photo Point 7. Viewing south from the northern end of the 1.0-acre restoration site. Photo taken on May 24, 2010.

Photo Point 8. Viewing northeast at the 0.4-acre restoration site following initial planting. Photo taken September 9, 2010.

Photo Point 9. Viewing west at Transect 1 (0.4 acre restoration site). Photo taken September 9, 2010.

Photo Point 10. Viewing south at Transect 2 (1.0 acre restoration site). Photo taken September 9, 2010.

Photo Point 11. Viewing southwest at Transect 3 (cactus wren occupied habitat). Photo taken September 10, 2010.

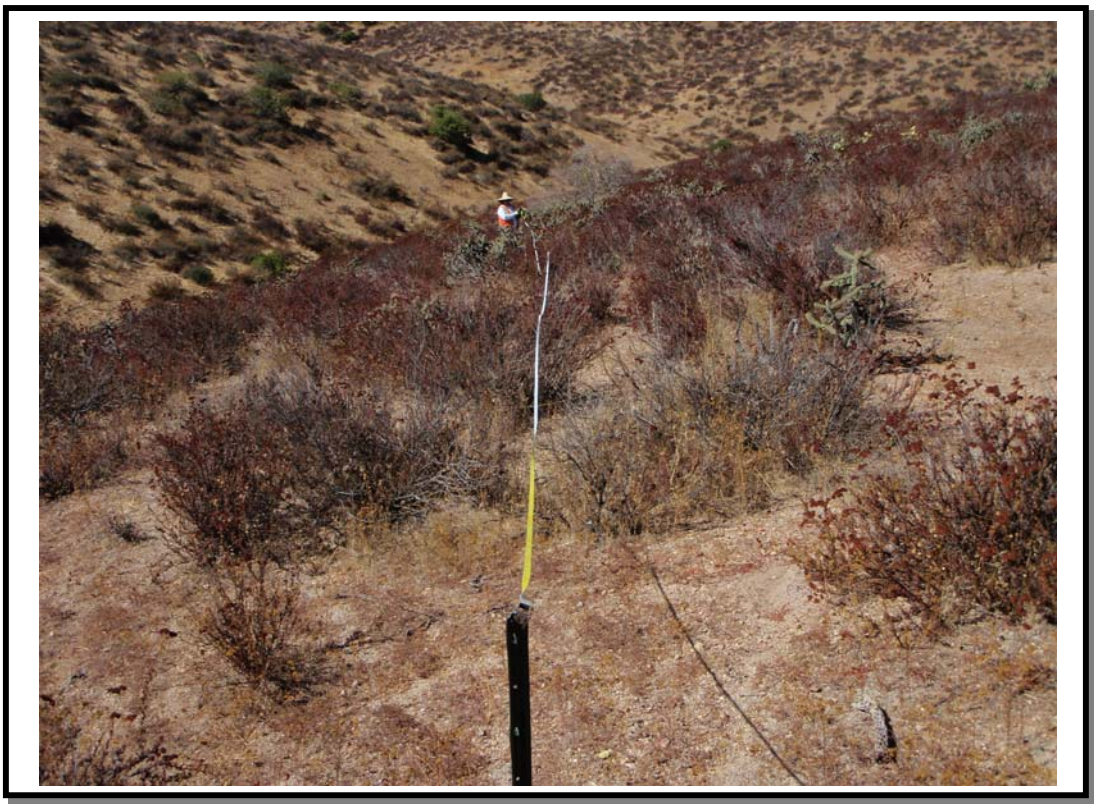


Photo Point 12. Viewing southwest at Transect 4 (cactus wren occupied habitat). Photo taken September 10, 2010.

Photo Point 13. Viewing northwest at Transect 5 (presumed suitable but unoccupied cactus wren habitat). Photo taken September 10, 2010.

Photo Point 14. Viewing southwest at Transect 6 (presumed suitable but unoccupied cactus wren habitat). Photo taken September 10, 2010.

APPENDIX 3. QUARTERLY MONITORING REPORTS

Merkel & Associates, Inc.
5434 Ruffin Road, San Diego, CA 92123
Tel: 858/560-5465 • Fax: 858/560-7779
e-mail: associates@merkelinc.com

June 11, 2010
M&A #09-048-01

Ms. Cheryl Goddard
Department of Parks and Recreation
County of San Diego
9150 Chesapeake Drive, Suite 200
San Diego, CA 92123

Re: Quarterly Progress Report for the Salt Creek Coastal Cactus Wren Habitat Enhancement/Restoration Project

Dear Cheryl:

The purpose of this letter is to provide you with a progress report to document enhancement/restoration activities at the Salt Creek Coastal Cactus Wren Habitat Enhancement/Restoration Project.

Merkel & Associates restoration crews salvaged cactus cuttings/plants from November 30, 2009 through December 11, 2009. Cuttings and plants were obtained throughout the POM managed salt creek area within locations that were known to be outside occupied cactus wren habitat. The cactus cuttings/plants were stock pilled in small groupings throughout an approximately 1.0-acre planting area and were left to callous from December 12, 2009 to January 6, 2010. Planting occurred from January 6 through January 14, 2010. Plantings were installed on 2- to 3-foot centers throughout the restoration site. An estimated seven to ten thousand cactus plantings were installed. Native seed collected from the nearby area (i.e., southeast Chula Vista) was hand broadcasted over the site on January 14, 2010, just prior to a significant rainstorm event. Seed included approximately 15.0 lbs. of flat-top buckwheat (*Eriogonum fasciculatum)* and 10.0 lbs. of a mixture of California sagebrush (*Artemisia californica*), San Diego County viguiera (*Viguiera laciniata*), coastal deerweed (*Lotus scoparius*), and San Diego bursage (*Ambrosia chenopodiifolia*).

Following approval from the City of Chula Vista and the County, planting at an adjacent 0.4-acre disturbed area commenced on April 29, 2010. Approximately 500 cuttings were obtained from unoccupied habitat within the area. Cuttings were allowed to callous for a period of two weeks and were then planted in mid-May. All planting (and salvaging) ceased when a cactus wren established a nest immediately adjacent to this planting area. Cactus wren chicks were observed in this nest during a recent monitoring visit.

Periodic hand weeding has occurred at the 1.0-acre site since its installation. Weeds have included mostly tocalote (*Centaurea melitensis*) and short-pod mustard (*Hirschfeldia incana*). Species that were introduced from the seed mix, including California sagebrush and San Diego bursage, were observed within the restoration area. Other native species such as fascicled tarplant (*Deinandra fasciculata*) and laciniate spineflower (*Chorizanthe fimbriata* ssp. *laciniata*) have naturally recruited

to the site. Most all the plantings look healthy and many have new vegetative growth. Hand weeding will continue to occur as needed to establish the cactus. Additional salvage and planting within the 0.4-acre area will occur during the Fall following the breeding season.

I have attached photos of the restoration sites for your review. Please contact me with any questions.

Sincerely,

Kyle L. Ince
Project Biologist

PHOTO PAGES

Photo Point 1. Viewing north from the southern end of the 1.0-acre restoration site prior to planting.

Photo Point 2. Viewing south at the southern half of the 1.0-acre restoration site prior to planting.

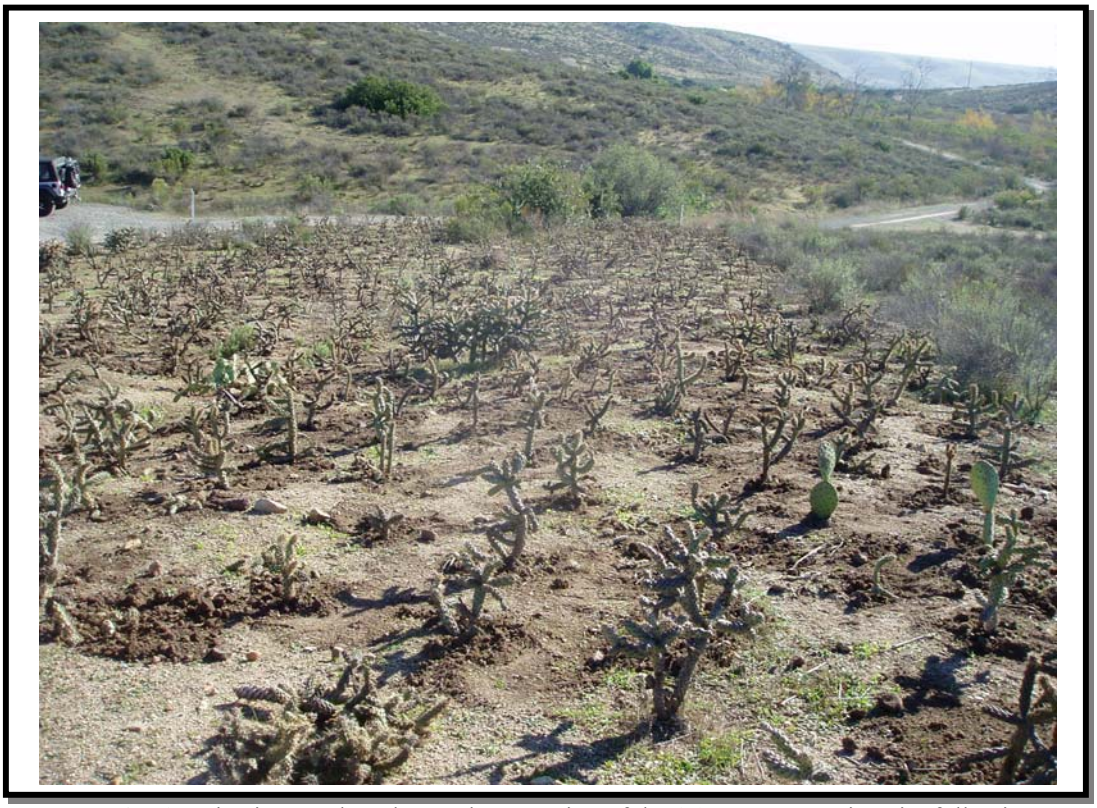


Photo Point 3. Viewing south at the southern portion of the 1.0-acre restoration site following planting.

Photo Point 4. Viewing south at the northern half of the 1.0-acre restoration site following planting.

Photo Point 5. Habitat restoration crews planting cactus at the 1.0-acre restoration site.

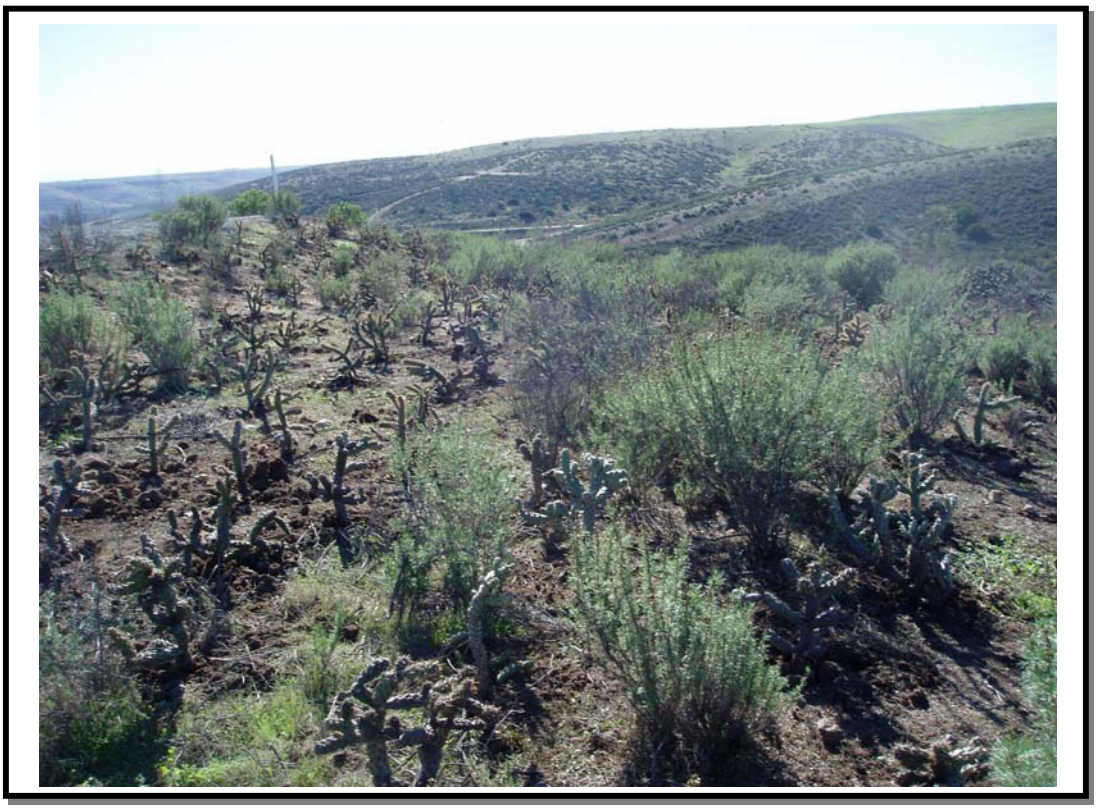


Photo Point 6. Viewing southwest at the northern portion of the 1.0-acre restoration site.

Photo Point 7. Viewing south from the northern end of the 1.0-acre restoration site. Photo taken on May 24, 2010.

Photo Point 8. Viewing northeast at the eastern portion of the 0.4-acre restoration site following initial planting.

Merkel & Associates, Inc.
5434 Ruffin Road, San Diego, CA 92123
Tel: 858/560-5465 • Fax: 858/560-7779
e-mail: associates@merkelinc.com

August 4, 2010
M&A #09-048-01

Ms. Cheryl Goddard
Department of Parks and Recreation
County of San Diego
9150 Chesapeake Drive, Suite 200
San Diego, CA 92123

Re: 2nd Quarterly Progress Report for the Salt Creek Coastal Cactus Wren Habitat Enhancement/Restoration Project

Dear Cheryl:

The purpose of this letter is to provide you with a progress report to document enhancement/restoration activities at the Salt Creek Coastal Cactus Wren Habitat Enhancement/Restoration Project.

BACKGROUND

Merkel & Associates restoration crews salvaged cactus cuttings/plants from November 30, 2009 through December 11, 2009. Cuttings and plants were obtained throughout the POM managed salt creek area within locations that were known to be outside occupied cactus wren (*Campylorhynchus brunneicapillus*) habitat. The cactus cuttings/plants were stock pilled in small groupings throughout an approximately 1.0-acre planting area and were left to callous from December 12, 2009 to January 6, 2010. Planting occurred from January 6 through January 14, 2010. Plantings were installed on 2- to 3-foot centers throughout the restoration site. An estimated seven to ten thousand cactus plantings were installed. Native seed collected from the nearby area (i.e., southeast Chula Vista) was hand broadcasted over the site on January 14, 2010, just prior to a significant rainstorm event. Seed included approximately 15.0 lbs. of flat-top buckwheat (*Eriogonum fasciculatum)* and 10.0 lbs. of a mixture of California sagebrush (*Artemisia californica*), San Diego County viguiera (*Viguiera laciniata*), coastal deerweed (*Lotus scoparius*), and San Diego bursage (*Ambrosia chenopodiifolia*).

Following approval from the City of Chula Vista and the County of San Diego, planting at an adjacent 0.4-acre disturbed area (i.e., staging area and access road) commenced on April 29, 2010. Approximately 500 cuttings were obtained from unoccupied habitat within the area. Cuttings were allowed to callous for a period of two weeks and were then planted in mid-May. All planting (and salvaging) ceased when a cactus wren established a nest immediately adjacent to this planting area. Cactus wren chicks were observed in this nest during an early June monitoring visit. The chicks were not present during the most recent review of the site on July 26, 2010.

2ND QUARTER MONITORING

Both the 1.0-acre and 0.4-acre sites continue to thrive. Nearly all of the planted cacti appear to be healthy, and new growth was noted on many of the plants. Periodic weeding since the last report has significantly reduced weed growth. Remaining weed growth was limited to only a few scattered

patches of non-native species such as tocalote (*Centaurea melitensis*), short-pod mustard (*Hirschfeldia incana*), and vinegar weed (*Trichostema lanceolatum)*. Native recruits to the site included mostly annual species such as fascicled tarplant (*Deinandra fasciculata*) and laciniate spineflower (*Chorizanthe fimbriata* ssp. *laciniata*), which had mostly withered by the late July monitoring event. Hand weeding will continue to occur as needed to establish the cacti. Hand watering using backpack sprayers will also occur periodically to simulate summer rainstorm events and expedite growth. Additional salvage and planting within the 0.4-acre area will occur during the Fall season following the breeding season.

Our crews had noticed that vehicles had impacted a few of the cacti planted within the 0.4 acre area. A few large rocks and a rope barrier with an attached "no trespassing" sign were installed at the entrance of the site to discourage further damage to the restoration effort.

I have attached photos from my July 26th visit for your review. Please contact me with any questions.

Sincerely,

Kyle L. Ince
Project Biologist

PHOTO PAGES

Photo Point 1. Viewing north from the southern end of the 1.0-acre restoration site.

Photo Point 2. Coast cholla (*Opuntia prolifera*) with new growth.

Photo Point 3. Viewing north from the mid point of the 1.0-acre restoration site.

Photo Point 4. Viewing south near the northern end of the 1.0-acre restoration site.

Photo Point 5. "No Trespassing" sign posted at the entrance of the 0.4-acre restoration site.

Photo Point 6. Viewing northeast at the eastern end of the 0.4-acre restoration site.

Merkel & Associates, Inc.
5434 Ruffin Road, San Diego, CA 92123
Tel: 858/560-5465 • Fax: 858/560-7779
e-mail: associates@merkelinc.com

November 3, 2010
M&A #09-048-01

Ms. Cheryl Goddard
Department of Parks and Recreation
County of San Diego
9150 Chesapeake Drive, Suite 200
San Diego, CA 92123

Re: 3rd Quarterly Progress Report for the Salt Creek Coastal Cactus Wren Habitat Enhancement/Restoration Project

Dear Cheryl:

The purpose of this letter is to provide you with a progress report to document enhancement/restoration activities at the Salt Creek Coastal Cactus Wren Habitat Enhancement/Restoration Project.

BACKGROUND

Merkel & Associates restoration crews salvaged cactus cuttings/plants from November 30, 2009 through December 11, 2009. Cuttings and plants were obtained throughout the POM managed salt creek area within locations that were known to be outside occupied cactus wren (*Campylorhynchus brunneicapillus*) habitat. The cactus cuttings/plants were stockpiled in small groupings throughout an approximately 1.0-acre planting area and were left to callous from December 12, 2009 to January 6, 2010. Planting occurred from January 6 through January 14, 2010. Plantings were installed on 2- to 3-foot centers throughout the restoration site. An estimated seven to ten thousand cactus plantings were installed. Native seed collected from the nearby area (i.e., southeast Chula Vista) was hand broadcasted over the site on January 14, 2010, just prior to a significant rainstorm event. Seed included approximately 15.0 lbs. of flat-top buckwheat (*Eriogonum fasciculatum)* and 10.0 lbs. of a mixture of California sagebrush (*Artemisia californica*), San Diego County viguiera (*Viguiera laciniata*), coastal deerweed (*Lotus scoparius*), and San Diego bursage (*Ambrosia chenopodiifolia*).

Following approval from the City of Chula Vista and the County of San Diego, planting at an adjacent 0.4-acre disturbed area (i.e., staging area and access road) commenced on April 29, 2010. Approximately 500 cuttings were obtained from unoccupied habitat within the area. Cuttings were allowed to callous for a period of two weeks and were then planted in mid-May. All planting (and salvaging) ceased when a cactus wren established a nest immediately adjacent to this planting area. Cactus wren chicks were observed in this nest during an early June monitoring visit. The chicks were not present during a July 26, 2010 visit of the site.

Restoration activities resumed from August 16 to August 18, 2010 with the salvage of an estimated 1,500 cuttings from unoccupied habitat throughout the study area. Cuttings were allowed to callus and then were planted within the 0.4-acre area from September 8 through September 10, 2010. Cactus were planted on 3- to 4-foot centers. An estimated total of 1,500 to 2,000 cactus were planted within the 0.4-acre planting area.

3RD QUARTER MONITORING

The site was last visited on October 28, 2010. Both the 1.0-acre and 0.4-acre areas continue to thrive. The cacti appear to have benefited from the recent rain events. Nearly all the observed cacti look healthy as evidenced by their green stems. The rain has stimulated the growth of weeds such as short-pod mustard (*Hirschfeldia incana*). Most weed growth is less than one-inch tall. No native seedlings were observed during the site visit. Herbicide will be carefully applied to the weed growth in such a way that target vegetation is avoided.

The rope barrier with the attached "no trespassing sign" that was installed last spring at the entrance to the 0.4-acre area, appears to have been effective. No damage to this area was evident during the recent site visit (see attached photos). Please contact me with any questions.

Sincerely,

Kyle L. Ince
Project Biologist

PHOTO PAGES

Photo Point 1. Viewing north from the southern end of the 1.0-acre restoration site.

Photo Point 2. Viewing south near the northern end of the 1.0-acre restoration site.

Photo Point 3. Viewing east from the western end of the 0.4-acre restoration site.

Photo Point 4. Viewing west from the eastern end of the 0.4-acre restoration site.

Merkel & Associates, Inc.
5434 Ruffin Road, San Diego, CA 92123
Tel: 858/560-5465 • Fax: 858/560-7779
e-mail: associates@merkelinc.com

April 27, 2011
M&A #09-048-01

Ms. Cheryl Goddard
Department of Parks and Recreation
County of San Diego
9150 Chesapeake Drive, Suite 200
San Diego, CA 92123

Re: Year 2 (2011) 1st Quarterly Progress Report for the Salt Creek Coastal Cactus Wren Habitat Enhancement/Restoration Project

Dear Cheryl:

The purpose of this letter is to provide you with a progress report to document enhancement/restoration activities at the Salt Creek Coastal Cactus Wren Habitat Enhancement/Restoration Project. I visited the site on March 31, 2011. Both the 1.0-acre and 0.4-acre areas continue to thrive. The cacti appear to have benefited from the above average rainfall experienced this winter/spring season. Nearly all the observed cacti look healthy, as evidenced by their green stems. In addition, new stem growth was observed on many of the cacti. There were several young California sagebrush (*Artemisia californica*) noted at both sites, which likely originated from seed that was sowed last fall. Weed growth was abundant at the 0.4-acre site. White-stem filaree (*Erodium moschatum*) was the most abundant non-native species followed by fewer numbers of tocalote (*Centaurea melitensis*) and short-pod mustard (*Hirschfeldia incana*). Most weed growth is less than two inches tall and does not seem to be having a significant negative affect on the cacti. Weed growth was less at the 1.0-acre site, especially near the northern end where native shrub species have filled in the gaps between cacti. Weed abatement will focus on promoting the growth of establishing native seedlings.

It should be noted that the San Diego Field Station of the USGS Western Ecological Research Center is conducting field studies of the coastal Cactus Wren this spring in cooperation with the US Fish and Wildlife Service. The goal of this study is 1) to evaluate the degree of genetic connectivity among Cactus Wren populations in San Diego County and 2) to study fledgling dispersal. The results will provide information on Cactus Wren dispersal capabilities, genetic variability, and gene flow among populations that can be used to inform decisions regarding current and future needs for maintaining viable Cactus Wren populations in coastal California.

The US Fish and Wildlife service is currently mapping the cactus across San Diego County, after which they will conduct presence/absence surveys. They will then let USGS know when they find an occupied patch so that USGS may monitor nesting activities, with the goal of banding the nestlings for their dispersal study and to collect genetic samples for their genetic connectivity study. Surveys will be conducted between March 2011 and March 2012 by USGS employees and possibly some private volunteers, and will entail walking around or through the scrub during the morning hours to search for birds and nests and to collect genetic samples. Their work will be confined entirely to the upland scrub habitat within the preserve, and they will not be entering any other part of the property.

I have attached photos of the restoration areas for your review. If you have any questions, please do not hesitate to contact me at Kince@merkelinc.com or (858) 560-5465.

Sincerely,

Kyle L. Ince
Project Biologist

Photo Point 1. Viewing north from the southern end of the 1.0-acre restoration site.

Photo Point 2. Viewing south near midway point of the 1.0-acre restoration site.

Photo Point 3. Viewing east from the western end of the 0.4-acre restoration site.

Photo Point 4. Viewing west from the eastern end of the 0.4-acre restoration site.

Photo Point 5. Sage brush (*Artemisia californica*) surrounded by non-native white-stem filaree (*Erodium moschatum*).

Photo Point 6. Coast cholla (*Cylindropuntia prolifera*) with new growth.