SALT CREEK COASTAL CACTUS WREN HABITAT RESTORATION PROJECT
2ND ANNUAL MONITORING REPORT

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SALT CREEK COASTAL CACTUS WREN HABITAT RESTORATION PROJECT
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Merkel & Associates, Inc.

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SUMMARY

Merkel & Associates, Inc. (M&A) has conducted the second annual monitoring assessment for the Salt Creek Coastal Cactus Wren Habitat Restoration Project. Quantitative monitoring was performed on May 10, 2011 (bird survey) and August 17, 2011 (vegetation survey). Information from qualitative assessments of the site was obtained in April, July, and October of 2011 and is provided with this report (Appendix 3).

Avian point counts and vegetation coverage/cactus height was acquired and analyzed for 6 pre-established monitoring stations. These monitoring stations include 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 previously observed (Stations 5 and 6). The purpose of this report is to provide information in regards to changes in habitat and avian use over time (approximately 5 years) at each of the monitoring stations. This report serves as the second annual report of a 5-year monitoring program.

On August 17, 2011, the vegetation along permanent six 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 42.0 percent. This is an increase from 2010, which revealed an average total native cover of 26.0 percent. Native plant species included coast cholla, coastal sagebrush (*Artemisia californica*), San Diego sunflower (*Viguiera laciniata*), and fascicled tarplant (*Deinandra fasciculata*). No non-native species were recorded within the transects. Bare ground averaged 58.0 percent cover. The average coast cholla cactus height within restored areas was 16.4 inches. This is an increase of 1.8 inches from 2010 when the average height was recorded as 14.6 inches. The increase in native cover and cactus height is attributable to on-going maintenance including hand watering of cactus within the restoration areas. Transects in areas occupied by coastal cactus wren revealed an average total native vegetative cover of 70.0 percent comprised of coast cholla, flat-top buckwheat (*Eriogonum fasciculatum)*, and fascicled tarplant. Non-native species averaged 12.0 percent and bare ground averaged 18.0 percent. The average height of coast cholla within cactus wren occupied habitat was 45.9 inches.

Avian point counts were conducted on May 10, 2011. Coastal cactus wrens were located within Stations 1 through 5 and were suspected of nesting; however, only one nest was located and that was in Station 5. Stations 1 and 2 (i.e., the restoration sites) and Station 3 had the highest diversity of species and the highest count of individuals. The greater number of individuals counted at Stations 1 and 2 (restoration sites) are still due to high counts of disturbance-related avian species including mourning dove (*Zenaida macroura*), house finch (*Carpodacus mexicanus*), and lesser goldfinch (*Spinus psaltria*). Also more ground species including mourning dove, California quail (*Callipepla californica*), and California towhee (*Pipilo crissalis*) were observed in these areas likely due to the lack of vegetation which normally shields these species from view.

INTRODUCTION

PROJECT BACKGROUND

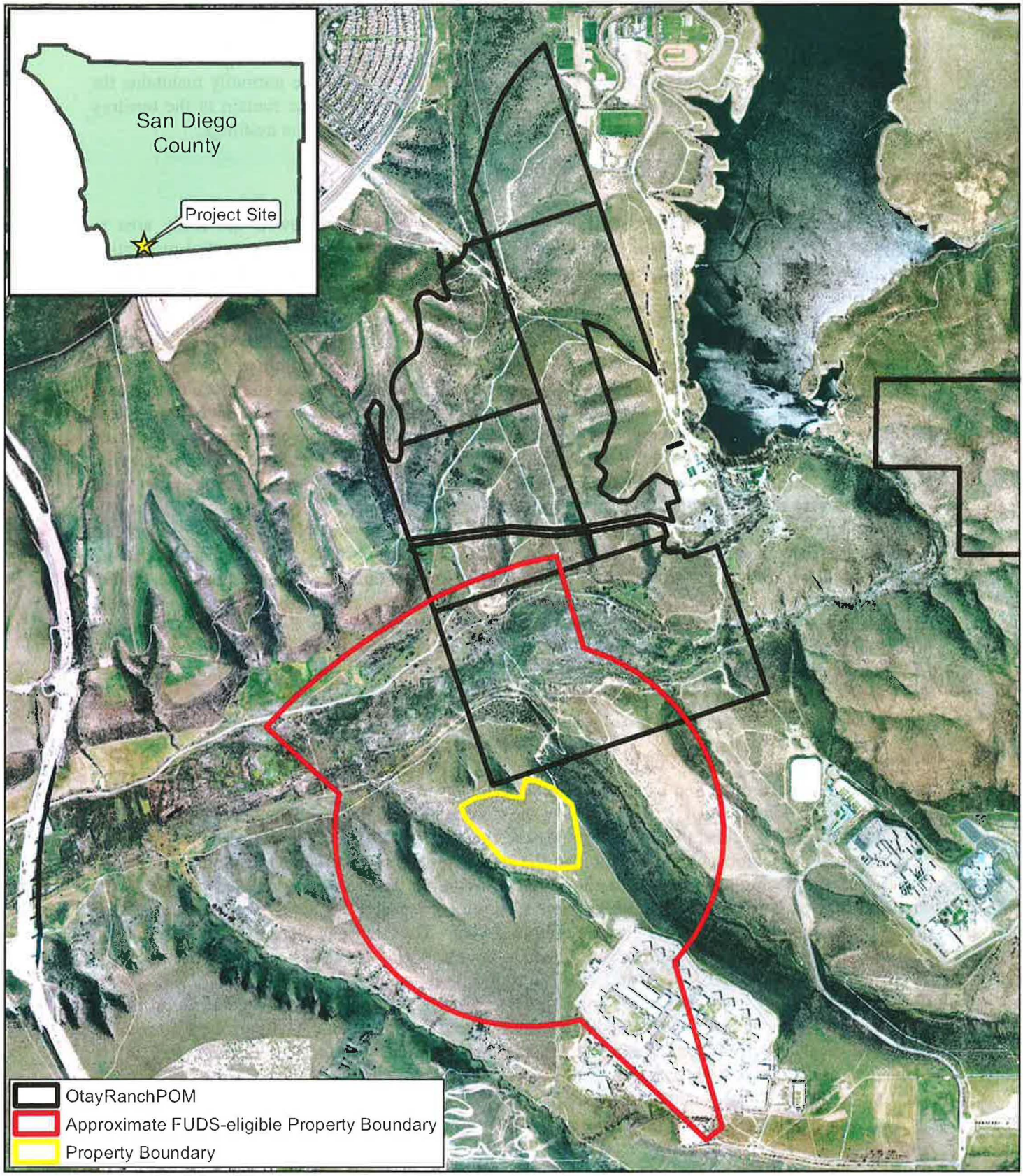
The southern portion of Salt Creek is managed jointly by the County of San Diego and the City of Chula Vista as the Otay Ranch Preserve Owner Manager (POM). Salt Creek has experienced the loss and degradation of coastal cactus wren (*Camplyorhynchus brunneicapillus*) habitat due to previous grazing, illegal off-road vehicle use, illegal dumping, an 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.

It should be noted that the San Diego Field Station of the USGS Western Ecological Research Center conducted field studies of the coastal cactus wren (*Campylorhynchus brunneicapillus*) during the 2011 spring season 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.

CACTUS WREN BREEDING BIOLOGY

The coastal cactus wren 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.



Salt Creek Coastal Cactus Wren Habitat Restoration Project

Vicinity/Boundary Map

Figure 1

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). 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 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

In 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 5 and 6) (Figure 2). A GPS unit with sub-meter accuracy was used to document the location of each monitoring station for relocation in subsequent years.

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 2nd year vegetation monitoring survey on August 17, 2011 (Table 1).

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).

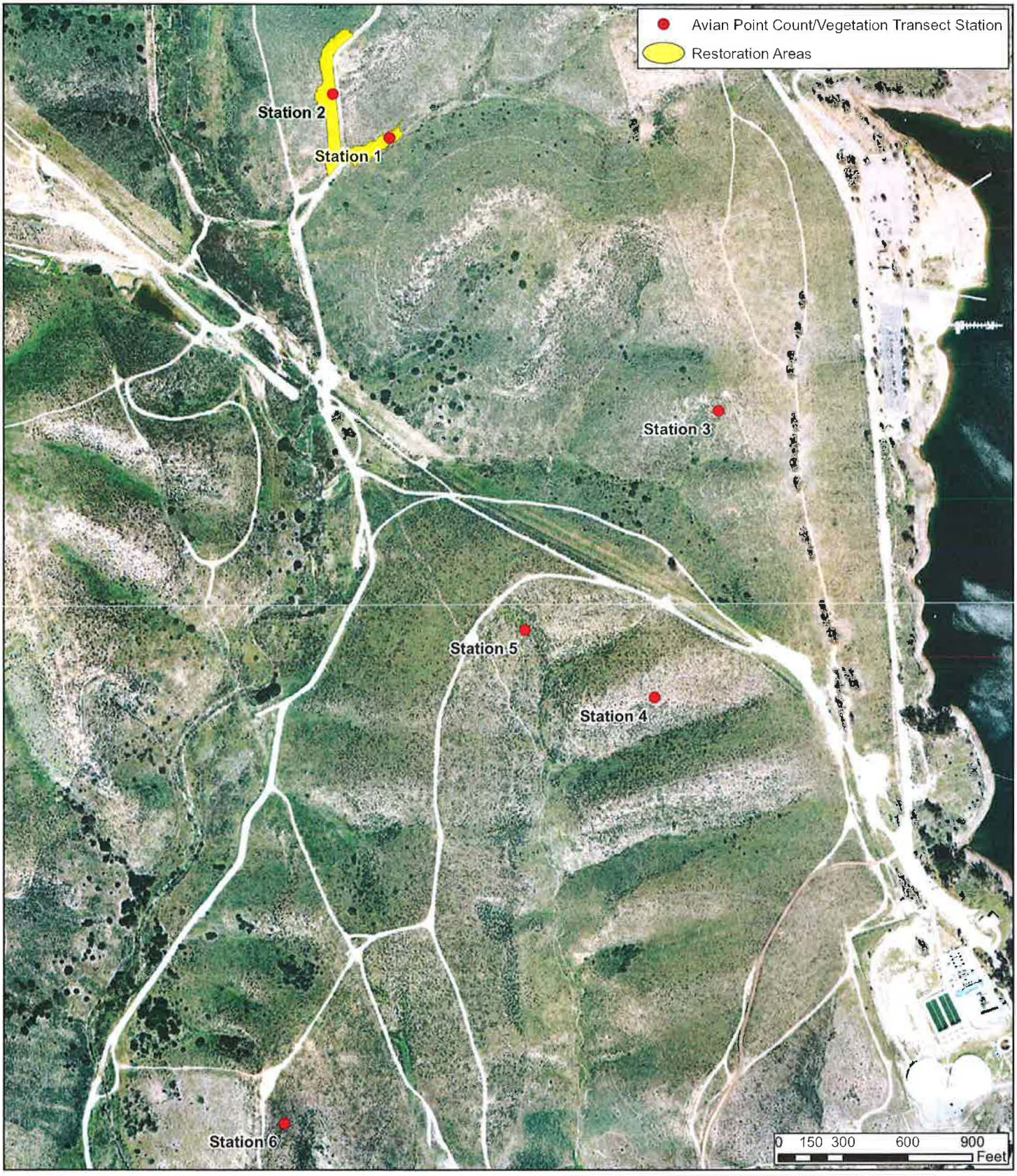
AVIAN POINT COUNTS

M&A biologist, Bonnie L. Peterson, collected point count information on May 10, 2011 between sunrise and 1130 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. Two complete counts were done at each station. 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
10 May 2011	0610-1132	Weather: 35%-20% cc Wind: 1 –1 BS Temperature: 53°-68° F	Bonnie L. Peterson	Avian Point Count Monitoring
17 August 2011	0930-1330	Weather: 0%-0% cc Wind: 1 BS Temperature: 72°-71° F	Kyle L. Ince	Vegetation Monitoring

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



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Salt Creek Coastal Cactus Wren Habitat Restoration Project

Point Count Stations and Restoration Areas

Figure 2

RESULTS

VEGETATION

Restoration Areas

The 1.0-acre restoration site exhibited 56.0 percent vegetative cover (without overlap). Native species provided 52.0 percent cover and included coast cholla, coastal sagebrush, and San Diego sunflower (*Viguiera laciniata*), with cover values of 32.0, 20.0, and 4.0 percent, respectively. No non-native plants were intercepted by the transect. Bare ground comprised 48.0 percent of the transect. The average height of coast cholla along this transect was 18.5 inches (1.5 feet).

The 0.4-acre restoration site exhibited 32.0 percent vegetative cover (without overlap), which was comprised of 20.0 percent coast cholla and 12.0 percent fascicled tarplant (*Deinandra fasciculata*). No non-native species were recorded within the transect. Bare ground comprised 68.0 percent of the transect. The average height of coast cholla along this transect was 14.3 inches (1.2 feet).

Occupied Cactus Wren Habitat

Average vegetative cover for occupied cactus wren habitat was 82.0 percent (without overlap). Native species provided 82.0 percent cover and included coast cholla, flat-top buckwheat, and fascicled tarplant with average cover values of 34.0, 34.0 and 2.0 percent, respectively. Non-native species occur within the understory and tocalote (*Centaurea melitensis*), with an average cover values of 12.0 percent. The average bare ground cover for these two transects was 18.0 percent. The average height of coast cholla was 45.9 inches (3.8 feet).

Suitable but Non-occupied Cactus Wren Habitat

Average vegetative cover for suitable but non-occupied cactus wren habitat was 90.0 percent (without overlap). Native species provided 78.0 percent cover and included flat-top buckwheat, coast cholla, and San Diego sunflower with average cover values of 60.0, 16.0, and 2.0 percent, respectively. Non-native species included red brome (*Bromus madritensis* ssp. *rubens*), slender wild oat (*Avena barbata*), and tocalote with average cover values of 26.0 and 2.0 percent, respectively. The average bare ground cover for these two transects was 10.0 percent. The average height of coast cholla was 37.5 inches (3.1 feet).

AVIAN POINT COUNTS

All results from the point count survey in 2011 are recorded in Table 2. In general there was an increase in both species diversity and density at all point count stations from 2010 to 2011, with the exception of Station 6.

Restoration Areas

Cactus wren were observed within the vicinity of the restoration areas and were recorded at both Station 1 and Station 2. The wren at Station 1 was very quiet and only observed once calling within 50 meters of the station point. It was assumed that he was paired and may have been nest building or caring for young adjacent to the restoration area. At Station 2, two cactus wren were heard at a distance greater than 50 meters from the restoration site.

There was an active red-tailed hawk (*Buteo jamaicensis*) nest to the west of Station 2 in a tall eucalyptus tree. One male least Bell's vireo (*Vireo bellii pusillus*), two common yellowthroat (*Geothlypis trichas*), and a yellow-breasted chat (*Icteria virens*) were heard singing in the riparian habitat. Both restoration sites had a high number of individuals (33 and 28, respectively) and species (12 and 11, respectively) compared to the other point count stations.

Table 2. Birds Observed During May 2011 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	
Bewick's Wren	*Thryomanes bewickii*	1					
Bushtit	*Psaltriparus minimus*				1		
California Gnatcatcher	*Polioptila californica californica*	1		1	1	1	
California Towhee	*Pipilo crissalis*	4		3	1	2	3
California Quail	*Callipepla californica*	8	8	3	4	1	3
California Thrasher	*Toxostoma redivivum*	2	1	1			2
Cactus Wren	***Campylorhynchus brunneicapillus***	1	2	2	1	3	
Common Raven	*Corvus corax*	1					1
Common Yellowthroat	*Geothlypis trichas*		2				
Greater Roadrunner	*Geococcyx californianus*		1			1	
House Finch	*Carpodacus mexicanus*	4		6	3		2
Least Bell's Vireo	*Vireo bellii pusillus*		1				
Lesser Goldfinch	*Spinus psaltria*	4	3	5	2	2	
Mourning Dove	*Zenaida macroura*	3	6	7			
Northern Mockingbird	*Mimus polyglottos*	2	1	3	1	1	1
Rufous-crowned Sparrow	*Aimophila ruficeps canescens*			1			
Red-tailed Hawk	*Buteo jamaicensis*						
Western Gull	*Larus occidentalis*			1			
Wrentit	*Chamaea fasciata*	2		1		1	
Yellow-breasted Chat	*Icteria virens*		1				
Total Number of Birds		**33**	**28**	**34**	**15**	**14**	**12**
Total Number of Species		**12**	**11**	**12**	**9**	**10**	**6**
Additional Species (includes flyovers)							
American Crow	*Corvus brachyrhynchos*			6			
Anna's Hummingbird	*Calypte anna*	1					
Cliff Swallow	*Petrochelidon pyrrhonota*		2				
Common Raven	*Corvus corax*		2		2	1	1
Red-tailed Hawk	*Buteo jamaicensis*		2	1			
Horned Lark	*Eremophila alpestris*					4	

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

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. They were foraging and moving together and therefore it was assumed that they were not nesting at

the time of our visit. There was one cactus wren observed at Station 4 within 50 meters of the point count station.

Of interest at Station 3 was a rufous-crowned sparrow (*Aimophila ruficeps canescens*) just outside the park boundary. It was staying in the same general area and may have a nest at this locale. Station 3 had the highest density count (34 individuals) and also had high diversity (12 species).

Suitable but Non-occupied Cactus Wren Habitat

Station 5 is located in a stand of coast cholla with Diegan coastal sage scrub. A pair of cactus wren were observed during the surveys and a nest was being constructed close to the point count station. A third cactus wren was heard greater than 50 meters to the west. No cactus wren were observed at Station 6. Four horned larks (*Eremophila alpestris*) were observed on the road near Station 5 and a greater roadrunner (*Geococcyx californianus*) was observed near the station. Station 6 had the lowest number of species (6) and the lowest number of individuals (12).

QUANTITATIVE AND QUALITATIVE ANALYSIS

Native vegetative cover and cactus height has increased at both restoration areas since last year. The average native vegetative growth for both restoration sites has increased from 26.0 percent in 2010 to 42.0 percent in 2011. Overall average cactus height has increased from 14.6 inches in 2010 to 16.4 inches in 2011. Figures 3 and 4 depict this increase in coverage and height, respectively. Both figures also depict vegetative cover and height for areas with known cactus wren populations and areas that appear suitable for cactus wren, but no birds have been observed. The relative increase in vegetative cover and cactus height at the restoration sites is likely due to on-going maintenance including periodic hand watering of cactus.

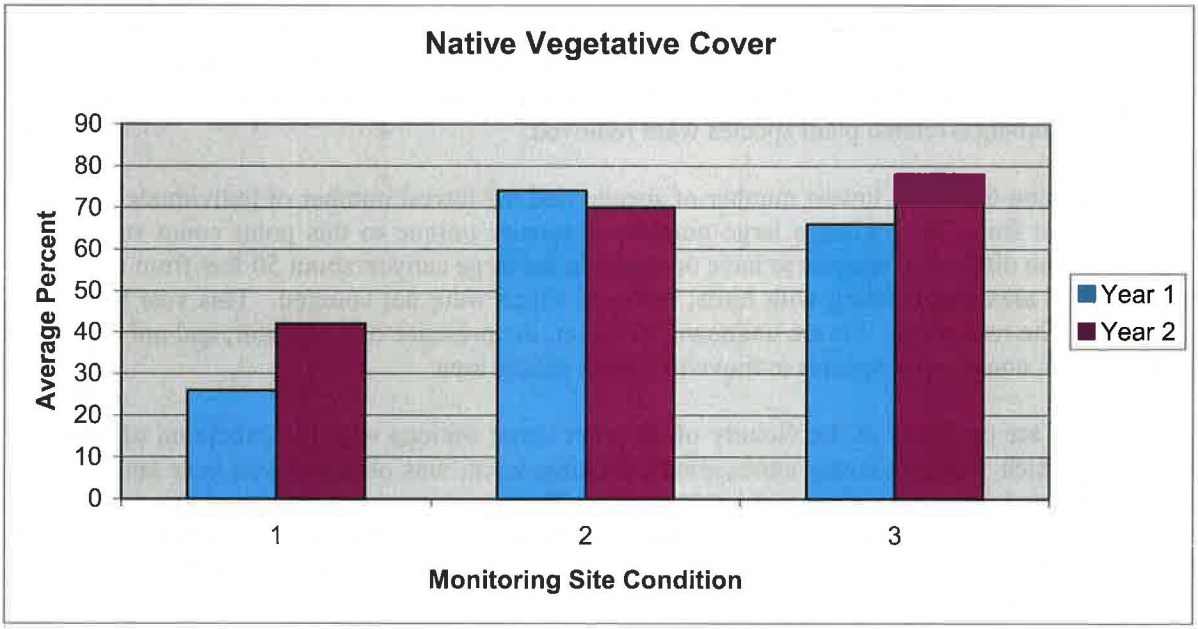

Figure 3. Year 1 and Year 2 Average Percent Cover of Native Vegetation for Three Studied Site Conditions. Site Condition 1 = Restoration Areas, Site Condition 2 = Areas Recorded as Occupied by Cactus Wren, Site Condition 3 = Areas Suitable but Non-occupied by Cactus Wren.

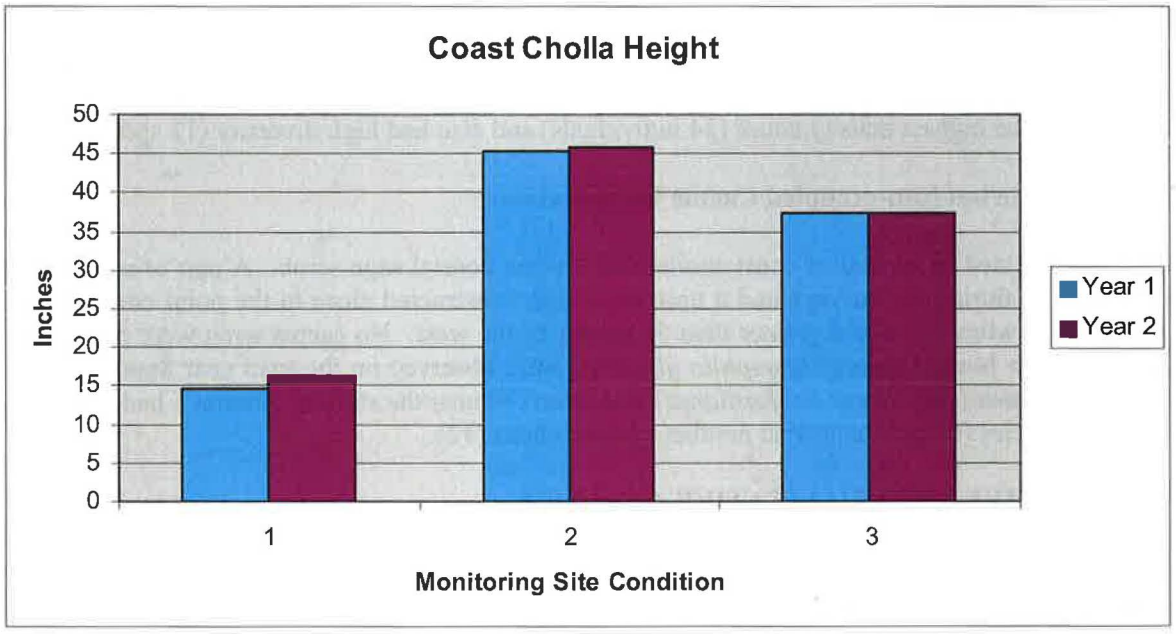

Figure 4. Year 1 and Year 2 Coast Cholla Height for Three Studied Site Conditions. Site Condition 1 = Restoration Areas, Site Condition 2 = Occupied Cactus Wren Area, Site Condition 3 = Suitable but Non-occupied Cactus Wren Area.

The largest changes in avian counts were observed at Station 2 (restoration site) and Station 6 (non-occupied cactus wren site). Although Station 2 had a high count of avian species and diversity, this was largely due to higher counts of disturbance-related avian species compared to other stations. In 2010, this station was occupied by a large number of foraging European starlings (*Sturnus vulgaris*) and brown-headed cowbirds (*Molothrus ater*). In 2011, neither of these species were recorded from the point count station. This may have been due to the decrease in forage available for these species once the disturbance-related plant species were removed.

In 2011, Station 6 had the lowest number of species and the lowest number of individuals. This was very different from 2010 when a large number of species unique to this point count station were observed. The difference appears to have occurred in the large canyon about 50 feet from the station. In 2010, this area was teaming with birds; many of which were not counted. This year the canyon was quiet. The reasons for this are unknown; however, the presence of a predator, and not the quality of the habitat, could cause species to move to a more secure area.

Cactus wren are currently in the vicinity of all point count stations with the exception of Station 6. Station 5, which was previously unoccupied by cactus wren, was occupied this year and an active nest was located adjacent to the point count station. There were some vegetative changes noted near this station in 2011 and the most noteworthy was the increase in flat-top buckwheat. Due to the heavy rains during the winter there was an increase in vegetative cover, which may have offered the cactus wren more cover.

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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*)		20.0				
Laciniate Spineflower (*Chorizanthe fimbriata* var. *laciniata*)						
Nievitas Cryptantha (*Cryptantha intermedia*)						
Coast Cholla (*Cylindropuntia prolifera*)	20.0	32.0	52.0	16.0	28.0	4.0
Fascicled Tarplant (*Deinandra fasciculatum*)	12.0		4.0			
Flat-top Buckwheat (*Eriogonum fasciculatum* var. *fasciculatum*)			24.0	24.0	48.0	72.0
Slender Wild Oat (*Avena barbata*)*		4.0				4.0
Soft Chess (*Bromus hordeaceus*)*						4.0
Red Brome (*Bromus madritensis* ssp. *rubens*)*					4.0	48.0
Tocalote (*Centaurea melitensis*)*			12.0	12.0		
Bare Ground	68.0	48.0	8.0	28.0	20.0	
Total Percent Vegetative Cover (with overlap)	32.0	56.0	92.0	72.0	80.0	132.0
Total Percent Vegetative Cover (without overlap)	32.0	52.0	92.0	72.0	80.0	100.0
Total Percent Native Vegetative Cover (with overlap)	32.0	56.0	80.0	60.0	76.0	80.0
Total Percent Native Vegetative Cover (without overlap)	32.0	52.0	80.0	60.0	76.0	80.0
Total Percent Non-native Vegetative Cover (without overlap)	0.0	0.0	12.0	12.0	4.0	52.0

* 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

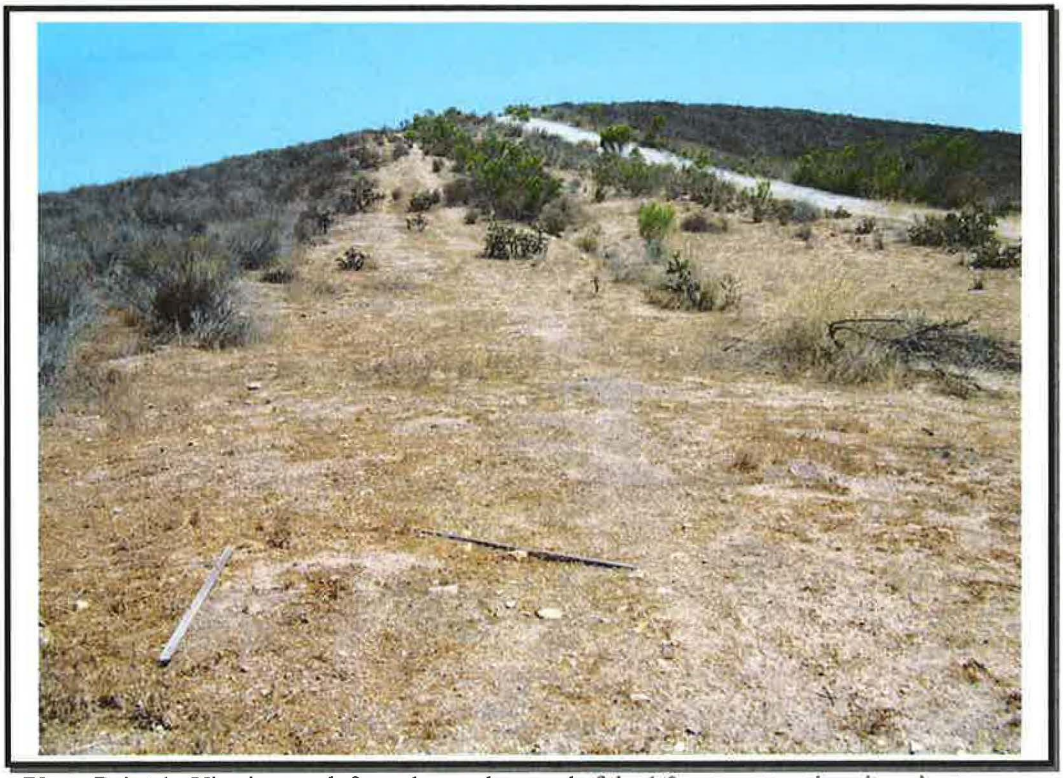

Photo Point 1. Viewing north from the southern end of the 1.0-acre restoration site prior to planting.

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.

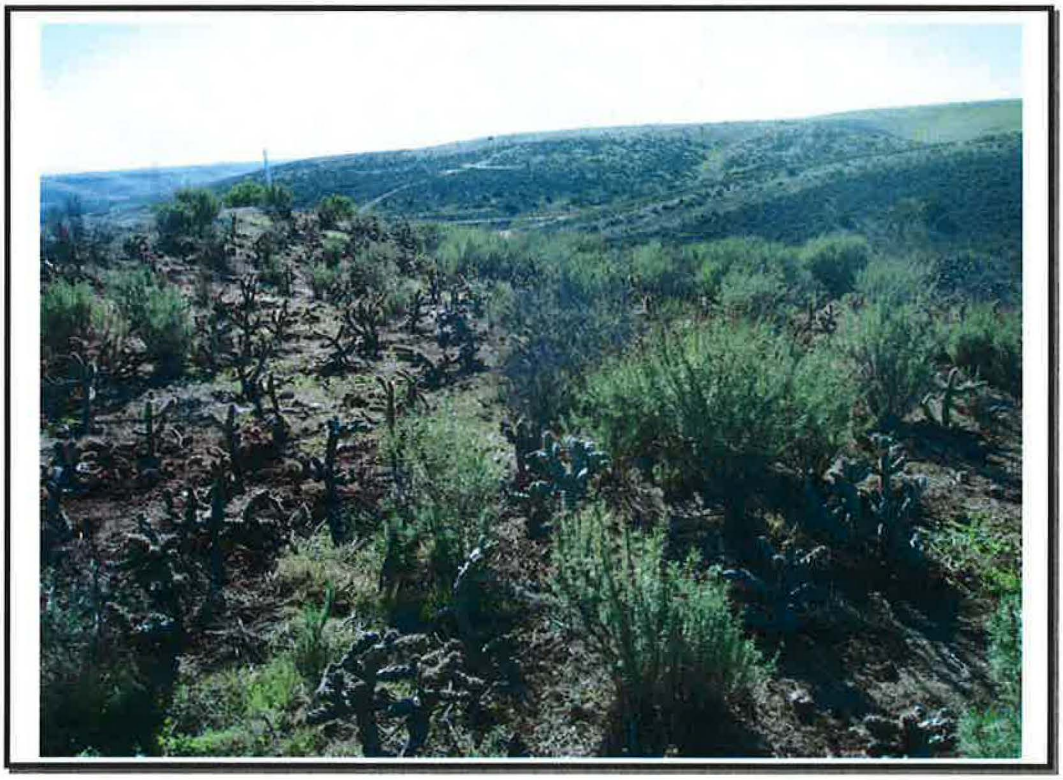

Photo Point 6. Viewing southwest at the northern portion of the 1.0-acre restoration site.

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 August 17, 2011.

Photo Point 10. Viewing south at Transect 2 (1.0 acre restoration site). Photo taken August 17, 2011.

Photo Point 11. Viewing southwest at Transect 3 (cactus wren occupied habitat). Photo taken August 17, 2011.

Photo Point 12. Viewing southwest at Transect 4 (cactus wren occupied habitat). Photo taken August 17, 2011.

Photo Point 13. Viewing northwest at Transect 5 (presumed suitable and now occupied cactus wren habitat). Photo taken August 17, 2011.

Photo Point 14. Viewing southwest at Transect 6 (presumed suitable but unoccupied cactus wren habitat). Photo taken August 17, 2011.

APPENDIX 3. QUARTERLY MONITORING REPORTS

Merkel & Associates, Inc.
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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.

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July 11, 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, 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 of the Salt Creek Coastal Cactus Wren Habitat Enhancement/Restoration Project. I visited the site on July 6, 2011. Both the 1.0-acre and 0.4-acre areas looked to be in good condition. Nearly all of the observed cacti looked healthy, and several were flowering. The coastal sagebrush (*Artemisia californica*) plants that were introduced from seed last fall have noticeably grown since my last visit. This was especially evident at the 0.4-acre site. Weed growth was relatively minimal. Weed abatement activities have significantly reduced most weeds, especially white-stem filaree (*Erodium moschatum*) at the 0.4-acre site. Other weeds including tocalote (*Centaurea melitensis*) and short-pod mustard (*Hirschfeldia incana*) occasionally occur. Weed abatement will focus on promoting the growth of naturally recruited native seedlings.

In March, Bonnie Peterson conducted the 2nd year's point count bird studies at the site. The results of this study will be provided in the annual report following the vegetation monitoring work that will occur during the fall. 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 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.

Photo Point 5. Coastal sagebrush (*Artemisia californica*) seedlings at 0.4-acre site.

Photo Point 6. Planted coast cholla (*Cylindropuntia prolifera*) in flower.

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October 31, 2011
M&A #09-048-01

Ms. Cheryl Goddard
Department of Parks and Recreation
County of San Diego
5500 Overland Ave, Suite 410
San Diego, CA 92123

Re: Year 2, 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 of the Salt Creek Coastal Cactus Wren Habitat Enhancement/Restoration Project. I visited the site on October 14, 2011. Both the 1.0-acre and 0.4-acre areas continue to thrive. Nearly all of the observed cacti looked healthy. Weed growth was relatively minimal and was represented by scattered occurrences of tocalote (*Centaurea melitensis*) and short-pod mustard (*Hirschfeldia incana*). A woodrat nest that is presumably occupied by the sensitive San Diego desert woodrat (*Neotoma lepida intermedia*) was observed in a cactus patch at the 1.0-acre site.

Each cactus was watered during the first week of August. The next scheduled watering will occur in November unless a significant rainfall event occurs. Quantitative vegetative monitoring was also conducted in August. Results from this survey revealed an average increase in cactus height for restoration areas. Average cactus height has increased 1.8 inches from last year. These studies also revealed an increase in native vegetative cover from last year's measurements. Average native vegetative cover has increased in restoration areas from 26.0 percent to 42.0 percent. This information will be provided in the forthcoming annual monitoring report.

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 from 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. Coast cholla (*Cylindropuntia prolifera*) patch with a woodrat nest, presumably occupied by a San Diego desert woodrat (*Neotoma lepida intermedia*).