

**Nature Reserve of Orange County:
Coastal Cactus Wren Survey and Monitoring for
Post-Translocation and Arthropod Foraging Studies in 2013**

Annual Report Prepared in Fulfillment of Reporting Requirements for the Memorandum of Understanding (MOU) between Dana Kamada and the California Department of Fish and Wildlife (CDFW) and

3rd Annual Report Prepared in Fulfillment of Reporting Requirements for the MOU between the Nature Reserve of Orange County (NROC) and the CDFW

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Introduction

Southern California supports both coastal and desert populations of the Cactus Wren (*Campylorhynchus brunneicapillus*). In coastal areas, Cactus Wrens are residents of coastal sage scrub plant communities with cholla and/or prickly-pear cactus tall enough (>1 m) to support and protect nests. Cactus Wrens were historically widespread and abundant in patchily distributed cactus scrub along the coastal slopes and interior valleys west of the Peninsular Mountains. A dramatic decline of coastal populations over the last few decades has made the species a focus of conservation efforts in southern California (Sauer et al. 1999; Proudfoot et al. 2000; Solek and Szijj 2004; Mitrovich and Hamilton 2007). The San Diego Cactus Wren is designated as a Species of Special Concern by the California Department of Fish and Wildlife (Unitt 2008) and coastal populations of Cactus Wrens are target species for the Natural Community Conservation Planning (NCCP) program. This report presents results of the survey for and monitoring of translocated wrens released at the coastal region of the Orange County NCCP and the monitoring of wrens at Foraging Study territories during 2013.

Over the past two decades, extensive urban development in coastal southern California has led to habitat loss and fragmentation resulting in small, isolated Cactus Wren populations. Dispersal between populations is constrained, increasing the potential for local extinction and limited recolonization. Recent catastrophic wildfires in southern California have burned large expanses of cactus scrub and impacted Cactus Wren populations. Wildfires can cause substantial mortality and lead to the temporary and even permanent loss of cactus scrub habitat. Following a wildfire, it can take many years for cactus to grow back to a size sufficient to support breeding Cactus Wrens (Proudfoot et al. 2000; Solek and Szijj 2004).

Status of Cactus Wrens in Orange County's Central and Coastal NCCP

The Cactus Wren is one of three Target Species conserved under Orange County's Central and Coastal NCCP (County of Orange 1996). The NCCP conserves 37,000 acres with multiple land owners/managers in a Coastal Reserve and a more inland Central Reserve (Figure 1). The Nature Reserve of Orange County (NROC) is responsible for monitoring and coordinating management of Orange County's Central and Coastal NCCP. When the NCCP was established in 1996, 67.5% of 994 Cactus Wren locations documented during 1992 surveys were conserved in the Reserve System. Since the NCCP was established, NROC has been monitoring Cactus Wren populations. Despite the extensive conservation effort, wrens have disappeared from much of their former habitat over the last two decades.

Large wildfires played a major role in this decline. In 1993, the Laguna Fire burned 75% of the ~17,000 acre Coastal Reserve. Surveys in the first year following the fire found the number of Cactus Wrens reduced to 28% of their pre-fire levels (Bontrager et al. 1995). Cactus Wren surveys and cactus scrub mapping in 2006 found 58% of burned cactus scrub remained unoccupied over 13 years after the fire; this was attributed to the small stature of recovering cactus. An analysis of cactus scrub habitat and Cactus Wren locations indicated an 87% decline in occupied habitat in the Coastal Reserve between 1993 and 2006 (Mitrovich and Hamilton

2007). In fall 2007, the Santiago Fire burned 75% of the Central Reserve, severely burning 1,059 acres (75%) of mapped cactus scrub (Leatherman BioConsulting 2009). Approximately 684 acres were considered potentially suitable for occupancy by Cactus Wrens and were surveyed. An estimated 67 territories remained in unburned and lightly burned cactus scrub, representing an 82% decline in Central Reserve territories relative to 2004 estimates.

While the Laguna Fire substantially impacted Cactus Wren populations in the Coastal Reserve, there has also been a considerable decline in local wren populations inhabiting unburned areas. Annual surveys conducted from 1999 to 2004 documented larger proportional reductions in Cactus Wren populations in unburned portions of the Coastal Reserve than in the ~20,000 acre Central Reserve (Hamilton 2004). In 2009 NROC initiated an intensive study of Cactus Wren reproduction, dispersal and survival to better understand factors contributing to their decline in unburned habitat (Preston and Kamada 2009, 2011, 2012, Kamada and Preston 2013). Based on this research and other studies (Atwood et al. 2002, Kamada 2008), a significant positive relationship between annual precipitation and productivity ($r = 0.72$, $p = 0.02$, $n = 10$) was identified for coastal Cactus Wren populations. Multiple years of drought during the last decade contributed to the decline of the coastal Cactus Wren. After the extreme drought of 2007, wrens disappeared from a number of sites within the Coastal Reserve. Productivity and rainfall was sufficient in 2009 and 2010 so that Cactus Wren populations began to increase and some sites unoccupied since 2007 were subsequently recolonized. In 2011, 2012, and 2013 productivity levels again fell, with the lack of observed recruitment into the Cactus Wren populations considered to be due to limited insect availability during nesting which is also known to be closely related to the timing and amount of seasonal precipitation (Preston and Kamada 2012). This relationship between precipitation and productivity highlights the importance of considering anticipated changes in climate patterns when making management plans to conserve fluctuating populations such as the Coastal Cactus Wren.

Since the formation of the NCCP/HCP Reserve System in 1996, natural habitats within the Coastal and Central Subregions have become more fragmented due to urban development and road construction and the distance that must be traveled between neighboring Cactus Wren populations in the Coastal Reserve and parts of the Central Reserve has increased. Cactus Wrens are considered to be relatively poor dispersers in landscapes fragmented by urbanization. Habitat fragmentation resulting from urban development makes it difficult for wrens to reach isolated habitat patches and reoccupy them after local extinction (Preston and Kamada 2011, 2012). We may now face a situation where there are infrequent long distance dispersals between isolated populations, while most juveniles remain at their natal site rather than risk the uncertainty of traveling long distances through unsuitable habitat. These factors also contribute to genetic isolation. Barr, Vandergast, and Kus (2012) genetic analysis of Cactus Wrens from the coastal and central NCCP regions found that the wren population in the coastal region is distinct from those in the central region. This suggests that the coastal population of wrens has been isolated from the central region since the construction of Interstate 5 and 405 freeways and subsequent development and becoming distinct through the process of genetic drift.

In addition to the increased fragmentation of habitats, due to fire and development, there is also a shortage of suitable habitat at and adjacent to existing populations, limiting opportunities for juvenile wrens to establish territories, obtain mates and recruit into the breeding population. Suitable habitat appeared to be limiting at all of our monitoring sites in 2011 and 2012. With the growth of local populations in 2009 and 2010, competition became intense for territories and mates. There were increased incidences of “floater” individuals remaining at the margin of occupied territories, and unable to establish territories or recruit into the breeding population further limiting the carrying capacity of the local populations of Cactus Wrens in the Coastal and Central Reserves.

NROC 2006 Cactus Wren Translocation from central Orange County to Upper Newport Bay

One management action to recover Coastal Reserve Cactus Wren populations is to salvage wrens from locations planned for development and translocate these individuals into suitable, unoccupied habitat. In the spring and summer of 2006, NROC accomplished the first-ever reported translocation of adult and juvenile Cactus Wrens. During this translocation effort, NROC staff and contracted biologists captured and moved 10 Cactus Wrens from a development site in central Orange County near Portola Springs to protected habitats in Upper Newport Bay, approximately 17 km west of the donor site (Figure 1), (Kamada and Mitrovich 2006). The Cactus Wrens involved with this translocation successfully established multiple territories at the receptor site immediately following their release. One of the originally translocated wrens and descendants of the translocated wrens still occupy the territories established in 2006, seven-years after the translocation. Also, a descendent of a translocated wren that had dispersed 10 km east on its own from Upper Newport Bay to a NCCP site in the City of Irvine was found during this 2013 survey.

NROC 2011 Cactus Wren Translocation from Lake Forest to James Dilley Preserve

In November 2011, NROC initiated a project to capture Cactus Wrens from a site being cleared of native vegetation and to translocate these individuals to the James Dilley Preserve Laguna Canyon, which is within Orange County's Coastal NCCP. In fall 2011, the City of Lake Forest was granted permission and the necessary permits to begin developing a 50-acre Sports Park at Glass Creek, near the intersection of El Toro and Portola Roads (Figure 1). The area to be developed supported approximately 43 acres of coastal sage scrub, including many acres of cactus scrub occupied by Cactus Wrens (ICF 2010). The Environmental Impact Report (EIR) recommended that NROC capture those Cactus Wrens that would be impacted by the development and move them to a new site with suitable habitat where they could become re-established. The translocation project objectives are:

Objective 1. To prevent the loss of Cactus Wrens to development and instead use these individuals to help recover Coastal Reserve populations.

Objective 2. To “seed” the receptor site with Cactus Wrens in order to increase the likelihood that other wrens successfully recruit into the breeding population.

Objective 3. To enhance connectivity between southern and northern Coastal Reserve Cactus Wren populations.

Objective 4. To increase gene flow and genetic diversity in isolated and small Coastal Reserve Cactus Wren populations.

UC Irvine and Irvine Ranch Conservancy Cactus Wren Arthropod Foraging Study

Arthropods are an important component of the wren diet during the breeding season and their abundance and diversity can be in part determined by community composition and habitat structure. During 2012 and 2013, Dr. Kailen Mooney and Dr. Kathleen Treseder of the Center for Environmental Biology (CEB) at the University of California Irvine and Dr. Jutta Burger from the Irvine Ranch Conservancy (IRC) are collaborating with NROC to study Cactus Wren foraging and productivity relative to arthropod richness and abundance on different plant species and substrates in coastal cactus scrub habitats. The CEB and IRC are the project leaders and are responsible for sampling plants and arthropods, analyzing the samples and all the data, as well as presenting, reporting, and publication of the results. NROC recorded Cactus Wren foraging behavior and monitored reproduction at selected territories with nesting pairs at the UC Irvine Ecological Preserve, Bommer Canyon, and Sand Canyon Reservoir sites (Figure 2 and Table 1) and submitted the data to CEB and IRC. The objective of the study is to determine the influence of arthropod abundance, community composition, and habitat structure on habitat quality for the Cactus Wren.

Post-Translocation Wren Monitoring Objectives and Tasks for 2013

1. Survey the Coastal NCCP reserve in order to locate and resight translocated wrens and their banded descendants.
2. Monitor translocated wrens that have been found during the above survey in order to determine their productivity for 2013.
3. Band and collect feather samples from nestlings or fledglings as opportunities arise.

Foraging Study 2013 Cactus Wren Objectives and Tasks for NROC

1. Survey territories at UC Irvine Ecological Preserve, Bommer Canyon, and Sand Canyon Reservoir sites that were sampled and monitored during 2012 for the Foraging Study in order to determine their occupational status in 2013.
2. Monitor wrens at occupied Foraging Study territories in order to determine their productivity for 2013 and also to record incidental foraging observations.
3. Collect wren fecal samples as opportunities arise during survey and monitoring visits, nest checks, and/or banding.

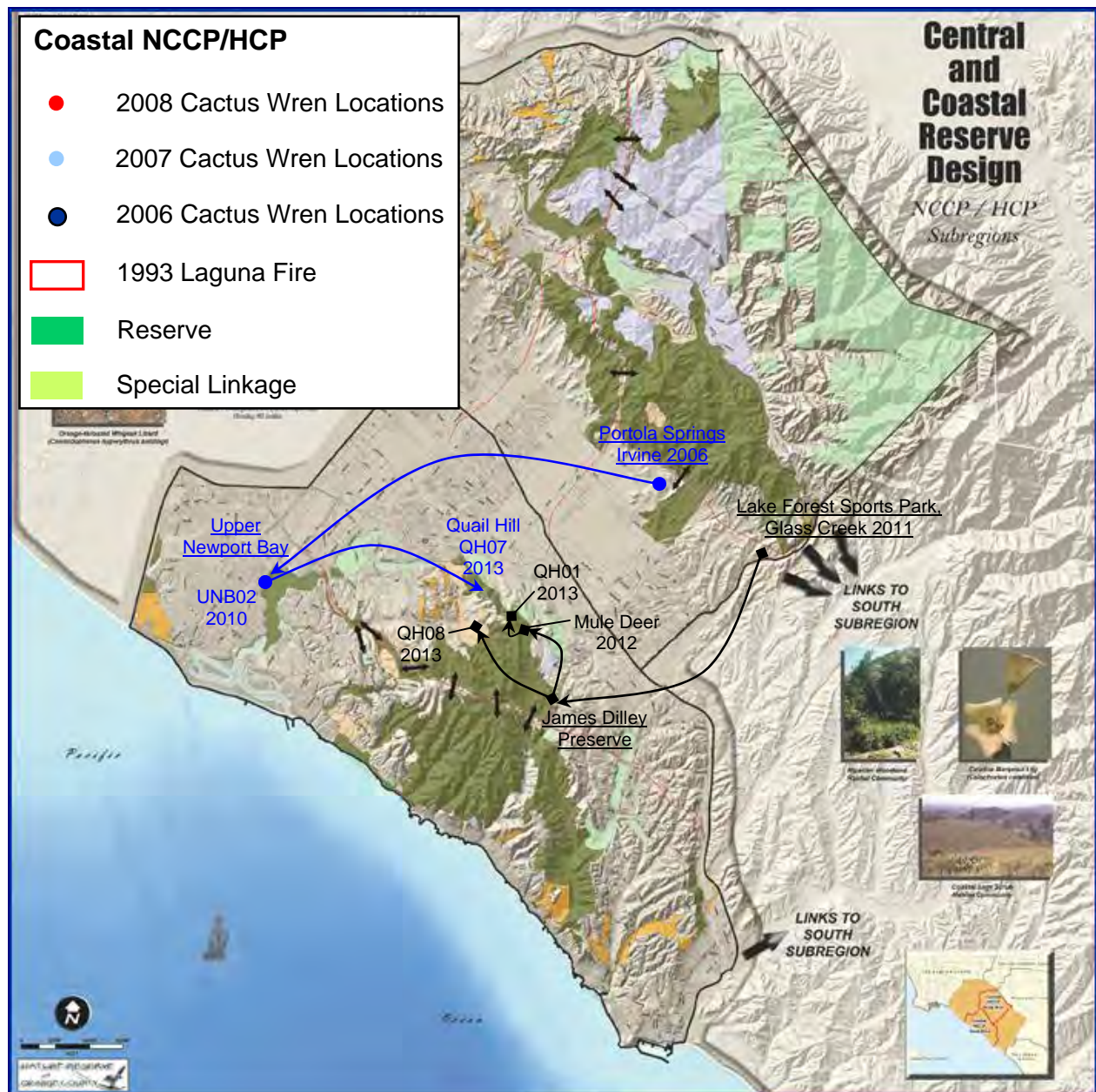


Figure 1. Cactus Wren Translocations from habitat near Orange County's Central Natural Community Conservation Plan (NCCP) region to the Coastal NCCP region conducted in 2006 and 2011 and subsequent dispersal resightings. Blue arrows indicate the 2006 relocation of wrens near the Portola Springs area to Upper Newport Bay (UNB). During 2010 a female descendant of a translocated pair attempted nesting then disappeared. In 2013, she was found successfully nesting at Quail Hill (territory QH07). Black arrows indicate the 2011 relocation of wrens from the Lake Forest Sports Park project site (formerly Glass Creek) to James Dilley Preserve (JD) in Laguna Beach. Within a month after relocation to JD, a male wren disappeared and was later found feeding nestlings at the Mule Deer site in 2012. During 2013, one of these nestlings successfully nested at QH01. Another translocated wren disappeared from JD in 2012 and was resighted paired with another wren at QH08 during 2013.

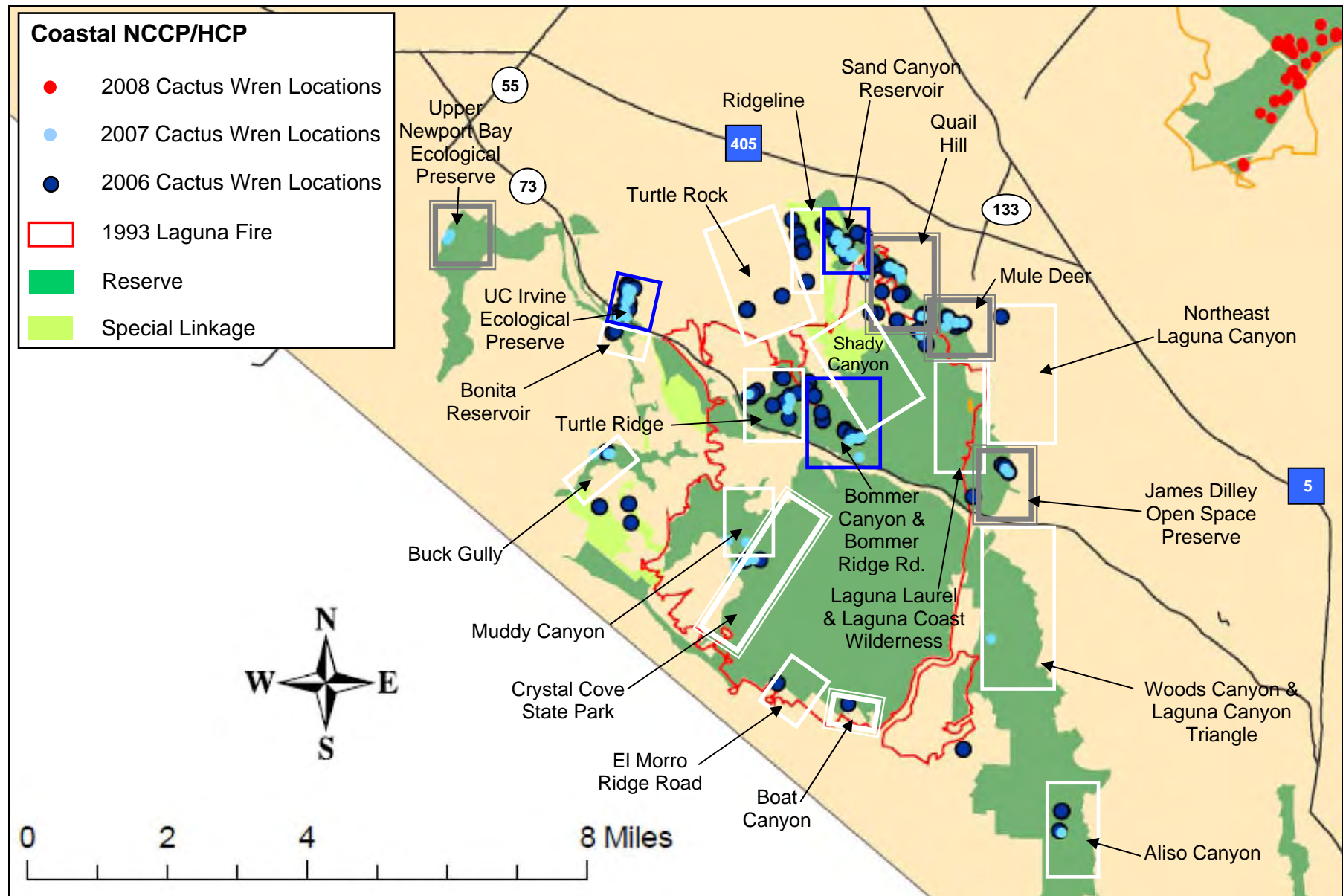


Figure 2. Boxes indicate sites surveyed for translocated Cactus Wrens in Orange County's Coastal Natural Community Conservation Plan (NCCP) region during 2013. White 1-lined boxes indicate sites where only surveys for banded birds were conducted and white 2-lined boxes indicate sites where limited monitoring and banding were conducted in addition to surveying. Grey 2-lined boxes indicate translocation release sites and/or sites where translocated wrens or their descendents were found during surveys and monitored. Blue boxes indicate Foraging Study sites that were surveyed and selected territories monitored.

Table 1. List of Foraging, Translocation and Survey sites in Nature Reserve of Orange County 2013 Cactus Wren Studies.

Coastal Sites	Code	Translocation Site	Foraging Site	Translocation Wren(s) Present	Comments
Aliso Canyon	AC				
Buck Gully	BG				
Boat Canyon	BTC				
Bommer Canyon	BMR		Y		
Bommer Ridge Road	BRR				
Bonita Reservoir	BRV				
Crystal Cove State Park	CCSP				
El Morro Ridge Road	ERR				
James Dilley	JD	Y		Y	2011 translocation release site
Laguna Canyon Triangle	LCT				
Laguna Coast Wilderness	LCW				
Laguna Laurel	LL				
Muddy Canyon	MCN				
Mule Deer	MD			Y	2011 translocated wren dispersed to this site.
NE Laguna Canyon	NELC				
Quail Hill	QH			Y	2011 translocated wren and offspring from the 2011 and 2006 translocations dispersed to this
Ridgeline Drive	RL				
Sand Canyon Reservoir	SCR		Y		
Shady Canyon	SHC				
Turtle Ridge	TRD				
Turtle Rock	TRK				
UC Irvine	UC		Y		
Upper Newport Bay	UNB	Y		Y	2006 translocation release site
Woods Canyon	WC				
<i>Other Locations</i>					
Calle Delgado*	CDG				Not NROC site, incidental observation in San Juan Capistrano.

Methods

For a description of the 2006 Translocation donor (central Orange Co. near Portola Springs) and receptor (Upper Newport Bay) sites and the methods used for and results of capture, banding, translocation and monitoring the wrens, please refer to the 2006 report by Kamada and Mitrovich. For a description of the 2011 Translocation donor (Lake Forest Sports Park) and receptor (James Dilley Preserve) sites and the methods for and results of supplemental feeding, capture, health exam, banding, translocation and monitor the wrens in 2011 and 2012, please refer to Preston 2012 and Mitrovich, Preston, and Kamada 2013 reports.

Post-Translocation Survey for Cactus Wrens 2013

The primary survey objective was to find translocated birds or their progeny that either still occupy the receptor sites or may have dispersed from these sites. We surveyed 24 sites at the NCCP Coastal Region during February to early August 2013 (Figure 2, Table 1, and Appendix Tables 1a & b). Upon encountering a Cactus Wren we would follow and observe it to determine and record its banding status and the UTM coordinates of its location. If the bird was banded we identified and recorded the band color combination. If necessary, we would return to the location multiple times in order to positively identify whether the bird is a translocated wren or a descendant of one. However, since the objective was to find translocated wrens, effort was focused on sites most likely to be occupied by wrens that may have dispersed from its receptor site. A site was not visited again once decided to be unlikely that translocated wrens were present. The survey method does not necessarily give an estimate of presence/absence or an assessment of the number of wrens at the Coastal Region, since some sites where no wrens have been detected over the past few years were not visited, some sites were only visited once or twice, and others were visited multiple times.

Monitoring reproduction of non-translocated wrens and assessing population numbers were not primary survey objectives, although if brood nests or fledglings were encountered, then the nesting stage was noted and nestling age of accessible nests checked at the appropriate time or fledglings counted. Only biologists possessing the appropriate permits to conduct nest checks, banding and feather sampling approached the nests. If the nesting wren pair had not been sufficiently sampled, then feather samples were collected from nestlings during banding for Amy Vandergast at U.S. Geological Survey. If a wren fecal sample was found, then it was collected and delivered to the Kailen Mooney lab at UC Irvine for later content analysis for the Arthropod Foraging Study.

Post-Translocation Monitoring of Cactus Wrens 2013

Translocated wrens or their progeny found during the survey were monitored for reproductive output, in order to document the impact of the translocated wrens on the Coastal Reserve wren population. Dana Kamada visited each territory weekly from February through the end of July to observe wren behavior in order to find brood nests and determine their nesting stages. Nest checks were conducted only as necessary to check nestling ages, nest fate and to determine the appropriate time to band nestlings, ideally around 7-9 days of age in terms of development (to a

certain degree, smaller clutches developed faster depending on food availability). Only biologists possessing the appropriate permits to conduct nest checks, banding and feather sampling approached the nests. Behaviors were noted during observation periods such as nest building, nest defense, courtship and copulation, female visits to the nest to incubate and brood, male and female trips to the nest with food, removal of fecal sacs, and care of young once they have fledged. Reproductive success was confirmed by searching for and counting the number of fledglings and recording their color band combinations during visits in the post-fledging period. By monitoring reproductive behavior throughout the breeding season, we were able to record nesting phenology, the number of broods, number of young fledged, and number of failed nesting attempts. For unsuccessful pairs, we attempted to identify the stage at which reproduction failed.

Foraging Study Cactus Wren Survey 2013

Mr. Kamada and Ms. Karly Moore conducted surveys at UC Irvine Ecological Preserve, Bommer Canyon, and Sand Canyon Reservoir prior to reproductive monitoring in order to determine the occupational and banding status of wrens at these sites for 2013. We surveyed all the cactus scrub at the sites for translocated wrens, but focused more effort at territories that were sampled and monitored during 2012 for the Foraging Study. Upon encountering a Cactus Wren at a Foraging Study territory we would follow and observe it to determine and record its banding status and the UTM coordinates of its location. We also noted its movement and behavior and interaction with other wrens to determine its territorial status (transient, floater, intruder, or territorial) and breeding status (single or paired). Territory structure at sites can be dynamic and territories during previous seasons may be found to have split or merged the next season depending on changes in occupancy by wrens, especially pairs.

Foraging Study Cactus Wren Monitoring 2013

During 2013, Karly Moore collected data on wren reproduction and foraging behavior in conjunction with arthropod sampling conducted by CEB and IRC. Ms. Moore is on Mr. Kamada's California Dept. of Fish & Wildlife Cactus Wren MOU List of Authorized Individuals to survey, check nests, collect feather samples and band wrens. Ms. Moore is also on Mr. Kamada's Banding permit to color band and collect feather samples from Cactus Wrens. From February through July, she visited selected territories at each site approximately once a week to find brood nests and determine their nesting stages. Nest checks were conducted only as necessary to check nestling ages, nest fate and to determine the appropriate time to band nestlings, ideally around 7-9 days of age in terms of development. Each bird's banding status, sex, and behavior were noted during observation periods such as nest building, nest defense, courtship and copulation, female visits to the nest to incubate and brood, male and female trips to the nest with food, removal of fecal sacs, and care of young once they have fledged. Reproductive success was confirmed by searching for and counting the number of fledglings and recording their color band combinations during visits in the post-fledging period. By monitoring reproductive behavior, we were able to record nesting phenology, the number of broods, number of young fledged, and number of failed nesting attempts. For unsuccessful pairs, we attempted to identify the stage at which reproduction failed. Any specific foraging

behavior seen during the observation period was recorded. If possible prey item size and identity were noted. Brood nests were monitored and the nestlings banded and feather sampled.

Fecal samples were opportunistically collected during banding, from the holding bags immediately after banding, from nest sites after the nestlings have fledged, or dropped by wrens while perched or in flight. If possible, the source of the sample was recorded as coming from male, female, or nestlings. Samples were placed in vials with 80% EtOH and submitted to the Kailen Mooney lab at UC Irvine to identify arthropod fragments in the fecal samples. IRC and CEB will present a more detailed account of their Foraging Study methods and results in future reports and publications.

Results

Field Effort

During 2013, we surveyed and/or monitored wrens at 24 NROC sites in the Coastal Reserve (Figure 2, Table 1, and Appendix Tables 1a & b). An additional incidental observation of a nesting pair at a non-NROC site in south Orange County was included in the tables and CNDDDB maps and forms. Appendix I - Table 1a and b lists the dates of field work, names of field personnel, and type of activity conducted at each site. In general, one person was responsible for surveying and/or monitoring each site. When needed, teams of two or three would visit to help locate and identify banded birds that were difficult to find or follow. A team of two or three was deployed to conduct mist netting and banding operations if needed.

Cactus Wrens Encountered at Survey and Monitoring Sites

Cactus Wrens were detected at 17 of the 24 Coastal Reserve sites that were surveyed during 2013. We encountered at least 105 wrens and approximately 39 territories at the 24 NROC study sites in the Coastal Reserve and one non-NROC territory in San Juan Capistrano that was visited during 2013 (Appendix I – Table 2). Of the 105 wrens, 33 (31%) were fledglings and 72 (69%) were adults. Locations of study sites and territories are shown in Figure 2 and Appendix II – Figures 1-11. During 2012, when more monitoring and genetic sampling were conducted, we observed 156 wrens and 36 territories at sites in the Coastal Reserve, where approximately 76 (48.7%) were nestlings or juveniles and 80 (51.3%) were adults.

The difference in the focus of survey and monitoring efforts between 2012 and 2013 makes it difficult to compare values from each year. In 2013, we were allowed access to NCCP land in the Shady Canyon Community that was not granted during previous years, so a few more territories and several more adults were found in 2013. In 2012, all sites were visited three times, where as in 2013 survey effort focused on occupied sites where translocated wrens may be likely to have dispersed. Also, in 2012 we were looking for adults and nestlings to genetically sample, where as in 2013 the scope of the project and budget focused most of our monitoring effort on translocated wrens and Foraging Study territories. So it was more likely for us to

encounter and follow-up on a number of nests during survey or sampling visits in 2012, thus the greater number of Hatch Year wrens encountered in 2012 than in 2013.

Resightings and Dispersals

In 2013, we resighted 68 color banded wrens, 28 of which were banded in 2013, so 40 were adults banded during previous years (Appendix I – Table 3). Banded birds were encountered at 15 of the 17 Coastal Reserve sites where wrens were observed. Of the 15 Coastal Reserve sites with banded birds, we resighted 11 adult banded wrens at Quail Hill (QH had an expanded survey area for 2013); 7 at Bommer Canyon (BMR); 4 each at Crystal Cove State Park (CCSP) and Upper Newport Bay (UNB); 3 each at Bommer Ridge Road (BRR), Mule Deer (MD), and UC Irvine (UC); 2 at James Dilley (JD); and 1 each at Aliso Canyon (AC), Boat Canyon (BTC), Buck Gully (BG), Muddy Canyon (MCN), Ridgeline (RL / RLSE), Sand Canyon Reservoir (SCR), and Shady Canyon (SHC) (Two wrens were observed at more than one site in 2013).

Twenty adult wrens were resighted at the same territory where they were banded (some of these birds were also seen at territories or sites different from their banding site in 2013), 9 were at the same site, but outside their banding territory, and 16 were seen at a site different from the one where they were banded (Appendix I – Tables 3 & 4, Figure 5e). We observed 9 banded wrens that immigrated from other sites into Quail Hill. Original sites of the wrens that immigrated into QH and approximate distances are: Mule Deer (0.7km), Sand Canyon Reservoir (1.4km), UC Irvine (5.4km), Crystal Cove State Park (7.3km), Upper Newport Bay (10.2km), and Boat Canyon (10.6km) (Figure 2 and Appendix I – Table 4). All other sites where dispersed wrens were resighted only had one or two immigrants (1 immigrant each at BTC, MCN, MD, RLSE, and SHC; 2 wrens at BRR). The distribution of the number of wrens that emigrated out from their natal and/or banding site across sites was relatively even: 3-4 from BMR; 2 each from CCSP, JD, MD and SCR; and 1 each from BTC, UC, and UNB. (Appendix I – Table 4). In 2013, we detected a high proportion (56%, n=16) of adult banded Cactus Wrens that have dispersed to other sites at the Quail Hill site (which includes the cactus scrub in the Shady Canyon Community). The natal/banding sites of the dispersed wrens at Quail Hill came from sites throughout the Coastal Reserve (Figure 2).

The average straight line dispersal distance, of the 22 wrens that were resighted away from their banding territory or location in 2013, is 2.44 km or a median distance of 0.86 km (Appendix I – Table 4). The shortest straight line dispersal distance is 0.19 km, when the translocated male wren at Mule Deer territory MD02 nested with the neighboring female at MD01 after his first clutch at MD02 fledged. The two longest straight line dispersal distances are 10.58 and 10.18 km, when a presumed female from Boat Canyon nested at Quail Hill (QH10) and a female from Upper Newport Bay successfully nested at QH07. However, the female that made a round trip of at least 11.6km from Bommer Canyon (BMR) to Crystal Cove State Park and back during 2012, dispersed from BMR to successfully nest at Boat Canyon in 2013, which is a straight line distance of 7.65km. This wren has traveled at least 19.25km dispersing between sites during 2012 and 2013.

Color Banding, Collection of Feather and Fecal Samples

A total of 693 Cactus Wrens (167 adults and 526 nestlings/fledglings/juveniles) have been banded with unique color bands since the study began in 2009. We banded 143 birds in 2009, 93 (65%) of which were nestlings, fledglings or juveniles (Preston and Kamada 2009). In 2010, we banded 185 birds, 170 (92%) of which were born in 2010 (Preston and Kamada 2011). In 2011 we banded 168 Cactus Wren, 147 (87.5%) of which were nestlings and fledglings (Preston and Kamada 2012). In 2012 we banded 154 Cactus Wren, 66 (42.9%) of which were nestlings or hatch year birds (Kamada and Preston 2013). In 2013, we banded 39 wrens, all of which were nestlings or fledglings (Appendix I – Table 5).

We recaptured two adult wrens, which were 2011 translocation birds, in 2013. One was an incidental recapture while attempting to capture fledglings. The other wren was recaptured in order to remove the metal Fish & Wildlife Service band that was constricting a swollen leg.

We did not collect any blood samples in 2013. However, growing contour (body) feathers were collected from 35 nestlings and delivered to Kelly Barr and Amy Vandergast at the USGS genetics lab in San Diego County to include with the regional analyses. This included feather samples collected from 13 nestlings that were progeny of the 2006 translocation of wrens to Upper Newport Bay and 5 of 8 nestlings that were progeny of the 2011 translocation of wrens to James Dilley Preserve (3 were in an inaccessible nest that fledged and dispersed before capture and banding). The remaining collected feathers were from sampling associated with the Foraging Study.

A total of 23 fecal samples were opportunistically collected either while banding, from what remained in the holding bag immediately after banding, encountered at nests during nest visits, or collected from the ground if a wren defecated while perched or flying. It was not always clear exactly which bird the sample was collected from, so it can only be estimated that samples were collected from 23 or fewer wrens. However, the samples were collected from 9 territories at 6 sites. All samples were submitted to the Kailen Mooney lab at UC Irvine to identify the arthropods in the samples.

Post-Translocation Monitoring of Cactus Wrens from Lake Forest to James Dilley Preserve – Summary of 2011 Results

Immediately following translocation of the Cactus Wrens from Glass Creek in Lake Forest, NROC biologists began routinely visiting the James Dilley Open Space Preserve to monitor the status of the birds and to provide supplemental food. In total, 31 visits were made to the receptor sight from November 19, 2011 through December 31, 2011 to monitor the activity of the translocated Cactus Wrens (Preston 2012).

Following translocation, three territories were established (JD01, JD02, and JD03) at the James Dilley Open Space Preserve (Figure 3). The GC05 pair (male:DB-LGMp [later re-banded in 2012 to DBM-GN], female:W-MpY) quickly resumed their pair bond following their release and established a territory (JD01) actively driving intruders out of the area. The pair frequently fed

at the two feeder stations located within their territory, obtaining mealworms from feeder trays, the ground, and cactus spines. They were also observed feeding on prickly pear fruits.

After some initial sorting between translocated Cactus Wrens, the male (Mp-KO) and female (DBLB-Mp) established a territory (JD02) adjacent to the JD01 pair on the opposite side of the ridge near the underground water reservoir. Similar to the JD01 pair, the JD02 pair actively drove intruders out of their territory and feed routinely at two feeding stations located within their territory.

The JD03 territory consisted of a single adult wren (Mp-RK) and two juveniles (MpK-W and P-KMp). These Cactus Wrens were released together following their capture at Glass Creek. The single adult (Mp-RK), a presumed female wren, built a nest in JD02 and was observed with the juveniles on several occasions. The juveniles frequently fed at the two feeder stations located within their territory. They also ranged widely to the west on the ridge above Laguna Lake. For the most part, the juveniles were not aggressive to the female or to each other.

Two birds were observed at the site through early December but then disappeared. A single adult male (KW-Mp) was released with DB-LGMp at the JD01 territory. Following their release DB-LGMp appeared to drive KW-Mp out of the territory. KW-Mp may have spent its time just west of the JD01 territory and south of the JD02 territory, as a bird was heard there several times but only seen once in early December. The other missing bird was the adult wren, KMp-K. This bird was quiet and secretive and frequently fed at the feeder stations in JD02 prior to the release of Mp-KO and DBLB-Mp, both of whom appeared to drive out KMp-K after moving into the area in early December.

Post-Translocation Monitoring of Cactus Wrens from Lake Forest to James Dilley Preserve – Summary of 2012 Results

In 2012, Dana Kamada, Karly Moore, and Milan Mitrovich surveyed and monitored the translocated Cactus Wrens at the James Dilley Preserve and neighboring sites. Regular supplemental feeding of the wrens continued from the date of release of the birds in 2011 through June of 2012. Although the mealworms were an attractive source of protein for the Cactus Wrens, the worms did not appear to be a significant portion of their diet. The wrens were routinely observed foraging on their own for insects in the cactus scrub and on the ripening fruits of the cactus during the extended periods of time when mealworms were not available.

The 2012 monitoring results organized by Cactus Wren territories and/or family groups are summarized in Appendix I - Table 6a as well as presented below.

In 2012, the JD01 pair of Cactus Wrens remained and nested at the James Dilley Preserve. The male, DBM-GN (formerly DB-LGMp), continued to be paired with the female, W-MpY, throughout the 2012 breeding season and they produced 2 fledglings (OMp-PO, MpP-RY). We waited to capture and band the young as fledglings, since the brood nest was not accessible.

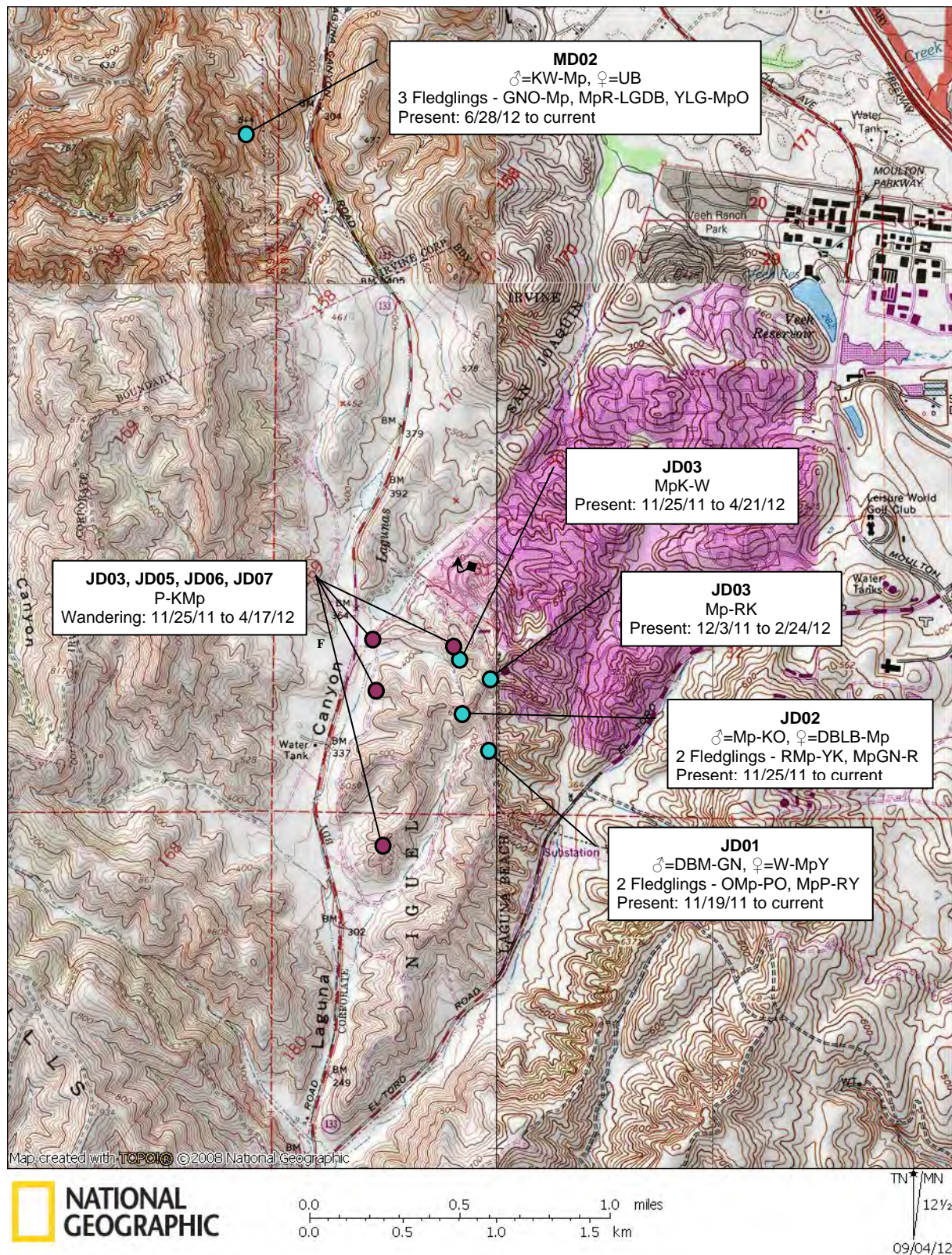


Figure 3. The 2012 locations of Cactus Wrens that were relocated to James Dilley Preserve in 2011. KW-Mp disappeared 12/4/11 then was re-sighted later at MD02. JD01 & JD02 pairs remained and nested at James Dilley. JD03 wrens stayed around feeding stations calling then disappeared. P-KMp was seen at various patches of cactus scrub calling then disappeared. Field visits 19 Nov. 2011 through September 2012

The adult male was also incidentally recaptured while we were mist netting for the fledglings. At this time the researchers noticed the anodized FWS band on the left leg was tight and the foot swollen. The bands were removed and a new band combination (DBM-GN) with a regular FWS band was put onto the right leg. This band rotated freely on the leg and the wren appeared in good condition after two months. Observations completed in July and August indicated that the adults and young still remained together and active within their territory in the James Dilley Preserve.

Similar to the JD01 pair of Cactus Wrens, the JD02 pair remained and nested at the James Dilley Preserve in 2012. The adult male wren (Mp-KO) continued to pair with the adult female (DBLB-Mp) and produced 2 fledglings (Rmp-YK and MpGN-R) in 2012. Their first brood nest failed, likely due to nest depredation. They produced two fledglings from their second nest attempt. The young were banded as nestlings. Both adults were observed feeding the two fledglings outside the nest as they foraged about the territory through to the end of July 2012.

Throughout the early part of 2012, the JD03 wrens generally stayed close to the feeding stations established at the north end of the James Dilley Preserve close to where the wrens were released in 2011 (Figure 3). Although observed often in early 2012, all three wrens eventually disappeared from the site.

The single adult wren at JD03, Mp-RK, was usually heard calling or seen nest building within 100 m to 150 m of its release location and would frequent a nearby feeding station from which it foraged when mealworms were made available. Although initially thought to be a female, the wren's persistent calling suggested that the wren was potentially a male. Mp-RK disappeared after February 24th and was not seen again in 2012.

The 2nd year wren, MpK-W at JD03, was frequently observed foraging and calling near another feeding station located near the wren's release point at the north end of the Preserve. Although MpK-W was typically found within 50 m of its release point, the young wren occasionally wandered up to 500 m away from where it was released, calling along the ridge that runs east and west through the Preserve. The wren was occasionally seen with its presumed sibling, P-KMp, foraging and nest building or fending it away from the feeding station. After April 21st, the wren was not detected the rest of 2012. However, it was resighted at another site in 2013.

Similar to its presumed sibling (MpK-W), the other 2nd year wren at JD03, P-KMp, was often seen calling at various unoccupied patches of cactus scrub in the north and west region of the Preserve (Figure 3) prior to disappearing after April 17th. The reason for the disappearance of all three wrens associated with the JD03 territory is not understood. It is possible that all three wrens were males and following a period of time (which was less for the single adult) in which they were all unsuccessful in attracting a mate to their respective territories, they decided to leave the Preserve. Although predation is always a possibility in explaining the disappearance of the missing wrens, the behavior of Mp-RK in the days prior to its disappearance suggest that the wren was beginning to evaluate alternative habitats adjoining the Preserve near where the

wren had been roosting. The disappearance of both 2nd year wrens in mid-April coincided with the height of breeding activities observed in both pairs of wrens at JD01 and JD02, which could suggest their similarly timed departures were related to their inability to secure mates. Also, one of the 2nd year wrens was resighted at another site in 2013 with what appeared to be a female wren.

With respect to the two missing Cactus Wrens from 2011, both wrens were not observed at the James Dilley Preserve in 2012. Although the adult wren, KMp-K, was observed foraging at feeding stations in 2011, it tended to be quiet and unresponsive to playback at its original territory at the Lake Forest site and at James Dilley Preserve, suggesting it might be a “floater”. A “floater” is a wren that is temporarily unable to hold a territory and is waiting for an opportunity to pair and establish a territory. Floaters can be extremely quiet and difficult to detect. This wren was not observed during 2013.

The other missing wren from 2011, KW-Mp, was only re-sighted once on December 4, 2011 following its release at James Dilley Preserve on November 19, 2011. Interestingly, KW-Mp was re-sighted on June 28, 2012, 3.6 km NNW of its last sighting in the James Dilley Preserve in a territory at the Mule Deer site (Figure 3) feeding nestlings with an unbanded female. On a subsequent visit on July 6th to the Mule Deer Site located at the north end of Laguna Canyon, the three nestlings being fed by KW-Mp were banded (GNO-Mp, MpR-LGDB, and YLG-MpO). On July 27th the three recently banded fledglings were seen being fed by KW-Mp and his mate, the unbanded female wren.

Although the exact route KW-Mp traveled between the release site at the James Dilley Preserve and the Mule Deer site is unknown, the most direct and probable route between the two sites overlaps an active Cactus Wren habitat linkage restoration project specifically designed by NROC and its partners to facilitate this type of dispersal between the James Dilley Preserve and active wren territories located in North Laguna Canyon. If the dispersing wren did use the linkage, it would be the first successful use of the linkage since its restoration began in 2009. The linkage was originally destroyed in the 1993 Laguna Fire and is important for connecting two the large blocks of cactus scrub habitat located on either ends of Laguna Canyon.

Post-Translocation Monitoring of Cactus Wrens – 2013 Results

In 2013, Dana Kamada surveyed for and monitored translocated Cactus Wrens at the Coastal Reserve. Survey sites or territories were visited until the banding status and/or color band combination of the wrens were identified. If a wren(s) was found to be a translocated bird or the progeny of one, the bird was monitored for the remainder of the 2013 nesting season. Translocation monitoring field work started 6 March and continued through to 24 July. Monitoring territories were visited once, occasionally twice, a week, depending on nesting status.

The 2013 monitoring results organized by Cactus Wren Territories and/or family groups are summarized in Tables 2a for the 2011 Translocation to James Dilley Preserve and Table 2b for the 2006 Translocation to Upper Newport Bay.

2013 Post-Translocation Monitoring Results for Wrens Translocated in 2011 to the James Dilley Preserve:

The wren pair that produced two fledglings at the James Dilley Preserve JD01 territory in 2012 (Figure 3) was also present at JD01 during 2013 (Appendix I – Table 6a and Appendix II – Figure 5). The adult male DB-HGN (formerly DBM-GN, formerly DB-LGMp) was still paired with the adult female, W-MpY, throughout the breeding season (Figure 4a & b). The fledglings from 2012 (OMp-PO, MpP-RY) were not observed during 2013. In 2013 the JD01 pair made two nest attempts, but the first clutch of eggs did not hatch and it is suspected that the second clutch was depredated. During 2012, the purple anodized FWS band on the male's left leg was tight (the anodizing layer had slightly decreased the inner diameter of the metal band) and the foot swollen. The bands were removed and a new band combination (DBM-GN) with a regular FWS band was put onto the right leg. This band rotated freely on the leg and the wren appeared in good condition after two months. On the first 2013 resighting of the male wren on March 6th, we noticed that the right foot was swollen and the regular FWS band was constricting the swollen right leg this time. This has been an unusual occurrence; since such an event has not been observed on any other Cactus Wren after banding over 700 wrens over the past two decades. We assumed the wren may be reacting to the metal FWS band, so decided to remove the FWS band. We planned a capture date and arrange for a veterinarian, Dr. Winston Vickers (who examined the wren during the translocation), to come out upon recapturing the wren. The male wren was recaptured on the 2nd attempt using baited Potter Traps on April 12th. However, by that time the wren had lost its right foot and the FWS band and the end of the right leg had healed over. The loss of the foot and healing over occurred rapidly, since the last observation of the male was only two days earlier on April 10th and it still had its right foot and FWS band at that time. Dr. Vickers did not make a visit when we captured the wren, since the wound had healed over and the bird was active and it was thought there was little that could be done for the wild bird. The two plastic bands were left on and a pink plastic band was added to the left leg and the bird was released after feeding it two mealworms. The male was able to forage for himself and gradually regained vigor to the point that the pair began to brood nest. Later, the male wren was building a roost nest while the female was incubating her second clutch.

No other wrens were observed at the James Dilley Preserve during 2013, including at the JD02 territory (Figure 3 and Appendix II – Figure 5) where, in 2012, the male wren (Mp-KO) and female (DBLB-Mp) produced 2 fledglings (RMp-YK and MpGN-R) (Appendix II – Table 6a). These birds were not observed during 2013.

In 2012, KW-Mp was observed at the Mule Deer site in the MD02 territory with an unbanded female where they eventually were feeding three fledglings (GNO-Mp, MpR-LGDB, and YLG-MpO) (Figure 1 & 3). KW-Mp was released at James Dilley Preserve on November 19, 2011 and resighted just once on December 4, 2011; it was later resighted 3.6 km NNW at MD02 on

Table 2a. 2013 Resightings of Cactus Wrens that are associated with the 2011 Translocation from Lake Forest Sports Park project site (formerly Glass Creek) to the James Dilley Preserve in Laguna Beach.

Color Bands* (RLeg-LL)	USFWS Band Number	Age Sex		Date	NAD83 UTM		Location	Territory	Breeding Status	Summary Observations
					Easting	Northing				
DBM-GN Changed to DB-HGN	178175994 Metal Band Removed	ATY	M	4/12/13	430328	3718352	James Dilley	JD01	Paired & Nesting	The wren's right leg and foot were swollen, so we recaptured the wren to remove the metal band. By the time the wren was recaptured, it lost it's foot and metal band. The end of the right leg was dry and scarred over. Since the wren appears to be reacting to the metal bands, so only a plastic color band was added, but no metal bands.
DB-HGN	No Metal Band	ATY	M	5/8/13	430328	3718352	James Dilley	JD01	Paired & Nesting	The wren appeared to gain strength and coping with missing it's right foot. The pair attempted two brood nests, but the eggs of the first nest did not hatch and the 2nd nest appeared to be depredated. The pair disappeared after the nest failed. This wren was last seen 6/11/13, missing it's DB band.
W-MpY	242111105	ATY	F	2013	430350	3718344	James Dilley	JD01	Paired & Nesting	Attempted two brood nests in 2013, but the clutch of eggs did not hatch and the 2nd clutch appeared to be depredated.
KW-Mp	242111103	ATY	M	6/28/12 to 5/29/13	429018	3721645	Mule Deer	MD02	Paired & Fledged Chicks	Paired with an unbanded female and produced 2 fledglings with his 1st clutch in 2012. 2nd clutch was later produced with the MD01 female.
UB		AHY	F	6/28/12 to 5/29/13	429006	3721661	Mule Deer	MD02	Paired & Fledged Chicks	UnBanded female wren, not a translocated bird, found feeding nestlings with KW-Mp when KW-Mp was initially resighted at Mule Deer on 6/28/12.
MpW-LBY	242111117	HY	U	4/24/13	429018	3721645	Mule Deer	MD02	Fledgling	Fledgling of KW-Mp and UB female last seen 6/4/13.
GNMp-W	242111118	HY	U	4/24/13	429018	3721645	Mule Deer	MD02	Fledgling	Fledgling of KW-Mp and UB female last seen 6/4/13.
KW-Mp	242111103	ATY	M	6/12/13	429077	3721824	Mule Deer	MD01	Paired & Fledged Chicks	This wren left M02 and produced a 2nd clutch of 3 fledglings with the MD01 female, MP-WR in 2012.
MP-WR	178175904	TY	F	6/12/13	429077	3721824	Mule Deer	MD01	Paired & Fledged Chicks	Non-translocated wren, banded at MD01 in 2011, paired with KW-Mp and produced a clutch of 3 fledglings.
UB		N	U	6/25/13	429077	3721824	Mule Deer	MD01	Fledgling	Fledgling of KW-Mp and MP-WR female last observed 7/15/13. Nest was not safely accessible and fledglings left MD02 earlier than expected, so were not banded.
UB		N	U	6/25/13	429077	3721824	Mule Deer	MD01	Fledgling	Fledgling of KW-Mp and MP-WR female last observed 7/15/13. Nest was not safely accessible and fledglings left MD02 earlier than expected, so were not banded.
UB		N	U	6/25/13	429077	3721824	Mule Deer	MD01	Fledgling	Fledgling of KW-Mp and MP-WR female last observed 7/15/13. Nest was not safely accessible and fledglings left MD02 earlier than expected, so were not banded.

Table 2a *continued* . 2013 Resightings of Cactus Wrens that are associated with the 2011 Translocation from Lake Forest Sports Park project site (formerly Glass Creek) to the James Dilley Preserve in Laguna Beach.

Color Bands* (RLeg-LL)	USFWS Band Number	Age	Sex	Date	NAD83 UTM		Location	Territory	Breeding Status	Summary Observations
YLG-MpO	242111116	SY	F	2013	428311	3721948	Quail Hill	QH01	Paired & Fledged Chicks	This wren was a fledgling of KW-Mp and an UB at Mule Deer (MD02) in 2012. In 2013, she was resighted at Quail Hill (QH01) paired with GN-MDB and produced 3 fledglings.
GN-MDB	178175999	SY	M	2013	428311	3721948	Quail Hill	QH01	Paired & Fledged Chicks	Non-translocated wren, banded at MD01 in 2012, paired with YLG-MpO and produced a clutch of 3 fledglings.
OO-RMp	242111119	N	U	5/5/13	428311	3721948	Quail Hill	QH01	Fledgling	Fledgling of YLG-MpO and GN-MDB male last seen 6/19/13. 3rd generation of a translocated wren, KW-Mp.
MpDB-LGW	242111120	N	U	5/5/13	428311	3721948	Quail Hill	QH01	Fledgling	Fledgling of YLG-MpO and GN-MDB male last seen 6/19/13. 3rd generation of a translocated wren, KW-Mp.
LGDB-KMp	242111121	N	U	5/5/13	428311	3721948	Quail Hill	QH01	Fledgling	Fledgling of YLG-MpO and GN-MDB male last seen 6/19/13. 3rd generation of a translocated wren, KW-Mp.
MpK-W	242111108	TY	M	4/18/13	427100	3721951	Quail Hill	QH08	Pair	This wren was last detected at James Dilley (JD03) 4/21/12. It was resighted at Quail Hill (QH08) with an adult unbanded wren in 2013. No brood nests were detected. Pair was last seen 5/9/13.
UB		AHY	F	4/18/13	427100	3721951	Quail Hill	QH08	Pair	Non-translocated wren foraging and displaying with MpK-W at QH08. It tended to be more secretive and was more interested in foraging. Pair last seen 5/9/13.

* Yellow - The wren dispersed from its release or natal site.

* Green - The wren is not likely to be a translocated bird.

Banding Code Definitions:Age Codes

AHY = After Hatch Year (adult)

ASY = After Second Year

ATY = After Third Year

HY = Hatch year (juvenile)

N = Nestling or Fledgling

SY = In Second Year (The Yr after HY)

TY = In Third Year (The 2nd Yr after HY)

U = Unknown Age (HY or AHY)

Sex Codes

F = Female

M = Male

U = Unknown

Color Band Codes (Right Leg-Left Leg)

DB = Dark blue

GN = Medium Green

K = Black

H = Hot Pink

LB = Light blue

LG = Light green

M = Metal USFWS band

Mp = Metal USFWS band anodized purple

O = Orange

P = Purple

R = Red

W = White

X = Missing color band

Y = Yellow

Table 2b. 2013 Resightings of Cactus Wrens that are associated with the 2006 Translocation from Portola Springs area near the central reserve to Upper Newport Bay in the coastal reserve.

Color Bands* (RLeg-LL)	USFWS Band Number	NAD83 UTM							Breeding Status	Summary Observations
		Age*	Sex	Date	Easting	Northing	Location	Territory		
LBP-M	168187767	4 yrs	F	2013	427578	3723083	Quail Hill	QH07	Dispersal Paired & Fledged Chicks	First resighting of a wren that dispersed from Upper Newport Bay. Fledgling of OM-LG and M-WO, who were originally translocated in 2006. LBP-M paired with an unbanded male at QH07 produced 3 Fledglings in 2013.
UB		AHY	M	2013	427578	3723083	Quail Hill	QH07	Paired & Fledged Chicks	LBP-M's mate. Unlikely to be a translocated wren.
LBLG-OM	233188331	N	U	6/5/13	427599	3723083	Quail Hill	QH07	Fledgling	Fledgling of LBP-M and UnBanded male.
WLB-MK	233188332	N	U	6/5/13	427599	3723083	Quail Hill	QH07	Fledgling	Fledgling of LBP-M and UnBanded male.
OM-YLB	233188333	N	U	6/5/13	427599	3723083	Quail Hill	QH07	Fledgling	Fledgling of LBP-M and UnBanded male.
W-MP	168187840	3 yrs	F	2013	417438	3723753	Upper Newport Bay	UNB01	Paired & Fledged Chicks	Paired with her father, OM-LG. Produced 4 fledglings 2013.
ØM-LG	168187706	8+ yrs	M	2013	417438	3723753	Upper Newport Bay	UNB01	Paired & Fledged Chicks	Missing Orange band. In 2013, paired with his daughter, W-MP from 2010. Produced 4 fledglings in 2013.
MK-PO	233188321	N	U	4/17/13	417475	3723774	Upper Newport Bay	UNB01	Nestling	Nestling of OM-LG and W-MP. Nest apparently depredated.
RM-GN	233188322	N	U	4/17/13	417475	3723774	Upper Newport Bay	UNB01	Nestling	Nestling of OM-LG and W-MP. Nest apparently depredated.
OP-MW	233188337	N	U	7/2/13	417438	3723753	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and W-MP. Last seen 7/17/13.
GN-MR	233188338	N	U	7/2/13	417438	3723753	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and W-MP. Last seen 7/17/13.
YK-MK	233188339	N	U	7/2/13	417438	3723753	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and W-MP. Last seen 7/17/13.
PK-OM	233188340	N	U	7/2/13	417438	3723753	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and W-MP. Last seen 7/17/13, not detected since then to date, 2013.
LG-MLB	178175671	3 yrs	F	2013	417353	3723327	Upper Newport Bay	UNB02	Paired and Nesting	Still paired with M-YDB. Two brood nests depredated and no fledglings produced in 2013.
M-YDB	168187841	3 yrs	M	2013	417353	3723327	Upper Newport Bay	UNB02	Paired and Nesting	Still paired with LG-MLB. Produced 2 fledglings in 2012. Two brood nests depredated and no fledglings produced in 2013.
OP-MK	233188326	N	U	5/13/13	417353	3723327	Upper Newport Bay	UNB02	Nestling	Nest apparently depredated.

Table 2b *continued* . 2013 Resightings of Cactus Wrens that are associated with the 2006 Translocation from Portola Springs area near the central reserve to Upper Newport Bay in the coastal reserve.

Color Bands* (RLeg-LL)	USFWS Band Number	Age*		Sex	Date	NAD83 UTM		Location	Territory	Breeding Status		Summary Observations
						Easting	Northing					
YGN-M	233188327	N	U		5/13/13	417353	3723327	Upper Newport Bay	UNB02	Nestling		Nest apparently depredated.
MR-LBDB	233188328	N	U		5/13/13	417353	3723327	Upper Newport Bay	UNB02	Nestling		Nest apparently depredated.
M-WGN	233188329	N	U		5/13/13	417353	3723327	Upper Newport Bay	UNB02	Nestling		Nest apparently depredated.

* Yellow - LBP-M dispersed from its natal site at Upper Newport Bay to Quail Hill.

* Green - The wren is not likely to be a translocated bird.

* Grey shade - Nest was depredated and the nestlings did not fledge.

Banding Code Definitions:

Age Codes

AHY = After Hatch Year (adult)

ASY = After Second Year

ATY = After Third Year

HY = Hatch year (juvenile)

N = Nestling or Fledgling

SY = In Second Year (The Yr after HY)

TY = In Third Year (The 2nd Yr after HY)

U = Unknown Age (HY or AHY)

3 yrs = Three years old

4 yrs = Four years old

8+ yrs = Eight or more years old

Sex Codes

F = Female

M = Male

U = Unknown

Color Band Codes (Right Leg-Left Leg)

DB = Dark blue

GN = Medium Green

K = Black

H = Hot Pink

LB = Light blue

LG = Light green

M = Metal USFWS band

Mp = Metal USFWS band anodized purple

O = Orange

P = Purple

R = Red

W = White

X = Missing color band

Y = Yellow

* Age code follows the above categories until known age is past TY (Third Year or ~2 years old), then the age of the bird is in years.

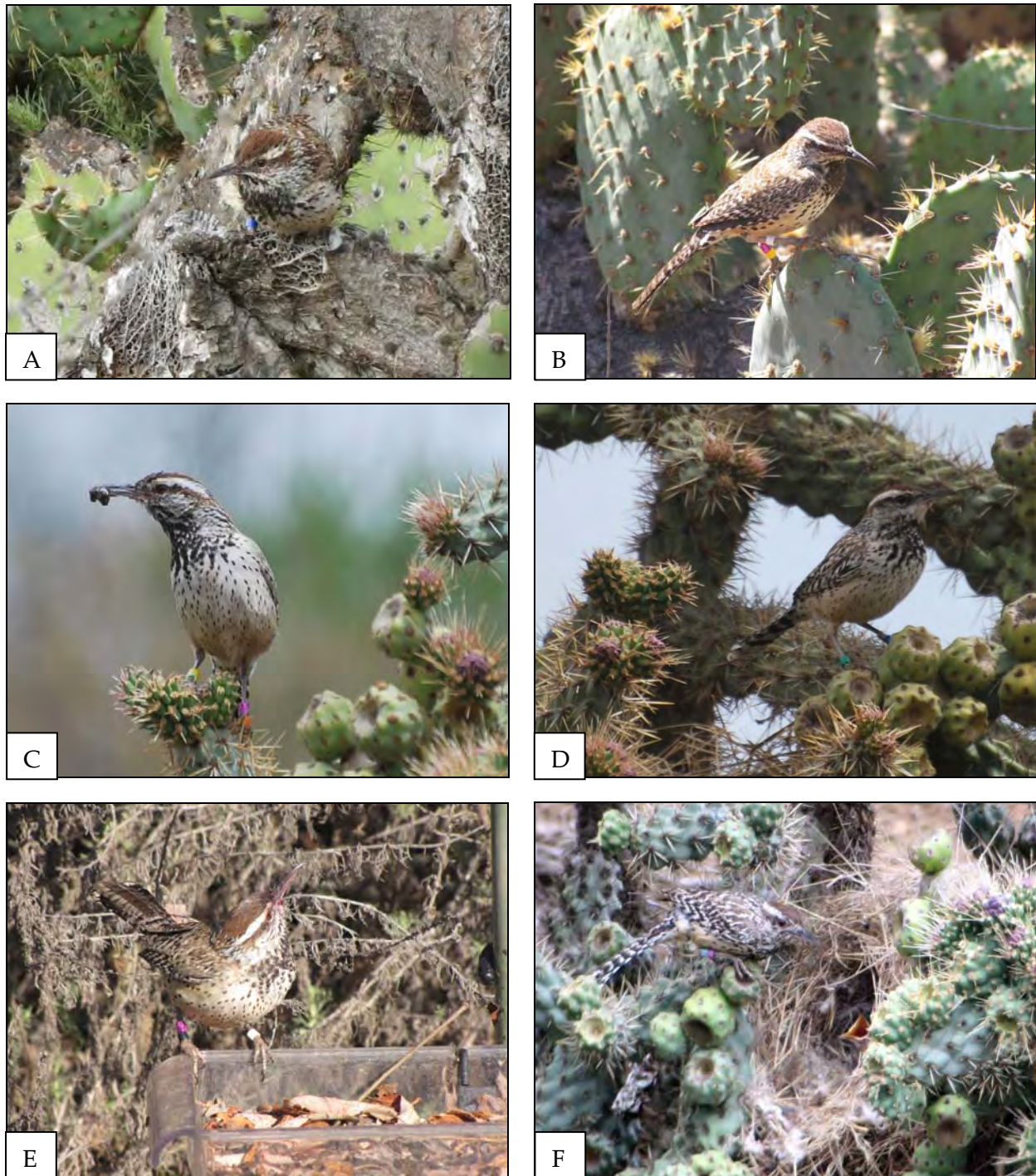


Figure 4. Photos of translocated Cactus Wrens or progeny that were resighted in 2013: A. James Dilley Preserve JD01 male, DB-HGN, after losing its right foot and during 1st nest attempt (Dana Kamada). B. JD01 female, W-MpY, (Feb 2012 photo by Karly Moore). C. Quail Hill QH01 female, YLG-MpO, from Mule Deer territory MD02 feeding nestlings (Dave Gibbs). D. QH01 non-translocated male wren, GN-MDB, from MD01 (Dave Gibbs). E. MpK-W at feeding station in JD03 during 2012 was later found at Quail Hill territory QH08 with and unbanded female in 2013. F. Quail Hill QH07 female, LBP-M, from Upper Newport Bay, feeding her 2nd clutch of nestlings (Dana Kamada).

June 28, 2012 (Appendix I – Table 6a). In 2013, the male, KW-Mp, was paired with an unbanded female at MD02 and they produced 2 fledglings (MpW-LBY, GNMp-W). About the time or soon after the nestlings at MD02 fledged, KW-Mp started a brood nest with the non-translocated female wren (MP-WR) at the neighboring territory, MD01 (Appendix II – Figure 6). The male wren continued feeding the MD02 fledglings for about 2-3 weeks, but then was first observed feeding the nestlings at MD01 on June 11th. KW-Mp was not observed back at MD02 once he started feeding the nestlings at MD01. KW-Mp and the MD01 female (MP-WR) produced 3 fledglings. The fledglings did not get banded because the nest was not accessible and the unbanded juvenals disappeared from the territory sooner than expected. One of KW-Mp's 2012 fledglings (YLG-MpO) was resighted in 2013, but the other two (GNO-Mp and MpR-LGDB) were not observed during the year.

On March 15, 2013, the 2nd year female wren, YLG-MpO (a 2nd generation bird of a translocated wren), was resighted 0.75km W of its 2012 natal territory MD02 in Mule Deer at the Quail Hill site in territory QH01 (Figure 1 & 4c, Appendix I – Table 4, Appendix II – Figure 7). The female was nest building with a non-translocated 2nd year male wren, GN-MDB, who hatched at MD01 in 2012 (Figure 4d). The pair nested once during 2013 and produced three fledglings (OO-RMp, MpDB-LGW, and LGDB-KMp).

On April 18, 2013, the 3rd year translocated male wren, MpK-W, was resighted 4.4 km NW from its release location at JD03 in the James Dilley Preserve at the Quail Hill site in territory QH08 (Figure 1, Appendix I – Table 4 and Appendix II – Figure 7). The male was paired with an unbanded female. Three suspected roost nests were found and they were observed foraging over a large area, but no brood nests were observed. The pair was last seen on May 9th. MpK-W was translocated to JD03 as a juvenal on November 25, 2011. The wren foraged and called near a feeding station, but was not seen after April 21, 2012 until it was resighted at Quail Hill in 2013 (Figure 3 and 4e and Appendix I – Table 6a).

The rest of the Cactus Wrens that were translocated to James Dilley Preserve in 2011, KMp-K, Mp-RK, and P-KMp, were not observed in 2013; along with the missing JD02 pair. Four of the originally translocated wrens were observed at James Dilley Preserve, Mule Deer, and Quail Hill. One 2nd generation female wren produced three fledglings at Quail Hill. Eight known fledglings were produced by the 2011 translocated wrens or their progeny in 2013 (Table 3a). Seven fledglings were known to be produced in 2012, so a total of 15 fledglings from the 2011 translocated wrens or their progeny are known to have been produced in the Coastal Reserve. All the wrens that were banded in relation to the Translocation to the James Dilley Preserve in 2011 are organized by territory and/or family group in Appendix I – Table 6a.

2013 Post-Translocation Monitoring Results for the Wrens Translocated in 2006 to Upper Newport Bay:

It was unexpected to encounter a Cactus Wren from Upper Newport Bay (UNB) 10 km away at Quail Hill (Figure 1), during surveys for wrens from the James Dilley Preserve in 2013. No

known wrens have been observed to have immigrated into or dispersed from UNB since the translocation of five adults and five fledglings to the unoccupied site in 2006, until 2013. In addition, the breeding pairs are now closely related family members, indicating that Upper Newport Bay is a highly isolated population (Appendix I – Table 6b). However, on April 11, 2013 a female wren, LBP-M, was resighted 10.2 km E of the UNB wren territories at the Quail Hill site in territory QH07 (Appendix I – Table 4 and Appendix II – Figure 7). The female was paired with an unbanded male and they had two brood nests. The first brood nest failed prior to estimated fledging of young and the second brood nest produced three fledglings (LBLG-OM, WLB-MK, and OM-YLB) (Table 2b and Figure 4f). In 2009, the LBP-M was banded in UNB01 as a fledgling of two originally translocated wrens, OM-LG male and M-WO female (Appendix I – Table 6b). In 2010, LBP-M attempted a nest with a male, P-MDG, at UNB02, but the nest was depredated and the male was missing. LBP-M was last seen at UNB02 on May 3, 2010. The female was next resighted at QH07 in 2013.

In 2013, after 7 years OM-LG male (missing the orange band) continues to be at UNB01 now paired with his fledgling from 2010, W-MP (Figure 5a & b, Appendix II – Figure 10). They had three brood nests, but only the third one was successful, producing 4 fledglings (OP-MW, GN-MR, YK-MK, and PK-OM) (Table 2b). OM-LG male was banded and translocated as a single adult in 2006, which would make him at least 8 years old in 2013 (Appendix I – Table 6b).

At territory UNB02, the male wren, M-YDB and female, LG-MLB attempted two brood nests in 2013, but both appear to have been depredated at the nestling stage (Figure 5c & d, Appendix II – Figure 10, and Table 2b). Both the male and female fledged from brood nests by OM-LG and M-WO (same pair that fledged LBP-M at QH07) at UNB01 in 2010. The female, LG-MLB, fledged from a nest earlier in 2010 than M-YDB and was observed giving food to M-YDB as a fledgling in 2010 (Appendix I – Table 6b).

In 2013, pairs related to the 2006 Cactus Wren Translocation to Upper Newport bay were at UNB01, UNB02, and QH07. UNB01 produced 4 fledglings and QH07 3 fledglings, so a total of seven fledglings were produced by 2006 translocated wrens or their progeny in 2013 (Table 3b). It is feasible that LBP-M at QH07 has been contributing to the genetic diversity of the Coastal Reserve wren population. All the wrens that were banded in relation to the Translocation to the Upper Newport Bay in 2006 are loosely organized by territory and/or family group in Appendix I – Table 6b. The pairing of close family members complicated the organizing of the UNB wrens into territory and/or family groups.

Arthropod Foraging Study

In 2012, Foraging observations of Cactus Wrens were conducted at selected territories with nesting Cactus Wrens at Bommer Canyon (BMR), Sand Canyon Reservoir (SCR), and UC Irvine Ecological Preserve (UC) (Table 4a and Figure 2). In 2012 and 2013, wren nests were also monitored at these territories and a summary of the 2012 and 2013 reproductive status of each territory where observations were conducted for the Arthropod study is shown in Table 4a & b. Student researchers from the Mooney lab at UCI sampled arthropods at these wren locations in

Table 3a. 2013 Reproductive Status of Cactus Wrens Translocated from Lake Forest to James Dilley Preserve in 2011 or their descendants. Green shaded wren band status indicates a non-translocated wren. * - Indicates a 2nd generation wren of a translocated bird.

Territory	Nest No.	Male Bands	Female Bands	NAD 83	NAD 83	Nest Fate	No. of Nest				
				UTM East	UTM North		Attempts	# Eggs	# Nestlings	# Fledglings	# Fls/Pr/Yr
James Dilley Preserve											
JD01	1	DB-HGN	W-MpY	430350	3718344	Abandoned: Infertile Eggs	2	3	0	0	0
	2	DB-HGN	W-MpY	430357	3718350	Depredated		?	0	0	
Mule Deer											
MD02	1	KW-Mp	UB	429018	3721645	Fledged	2	2	2	2	5
MD01	2	KW-Mp	MP-WR	429077	3721824	Fledged		?	?	3	
Quail Hill											
QH01	1	GN-MDB	YLG-MpO*	428311	3721948	Fledged	1	3+	3+	3	3
QH08		MpK-W	UB			No Brood Nests Detected	0				0

Table 3b. 2013 Reproductive Status of Cactus Wrens Translocated from Portola Springs, Irvine to Upper Newport Bay in 2006 or their descendants. Green shaded wren band status indicates a non-translocated wren. * - Indicates a 2nd generation wren of a translocated bird.

				NAD 83	NAD 83						
Territory	Nest No.	Male Bands	Female Bands	UTM East	UTM North	Nest Fate	No. of Nest Attempts	# Eggs	# Nestlings	# Fledglings	# Fls/Pr/Yr
Upper Newport Bay											
UNB01	1	OM-LG	W-MP*	417475	3723774	Depredated	3	2+	2+	0	4
	2	OM-LG	W-MP*	417429	3723723	Depredated		?	?	0	
	3	OM-LG	W-MP*	417438	3723753	Fledged		?	4+	4	
UNB02	1	M-YDB*	LG-MLB*	417353	3723327	Depredated	2	4+	4	0	0
	2	M-YDB*	LG-MLB*	417345	3723260	Depredated		1+	1+	0	
Quail Hill											
QH07	1	UB	LBP-M*	427578	3723083	Depredated	2	3+	3+	0	3
	2	UB	LBP-M*	427599	3723083	Fledged		3+	3	3	

Green - The wren is not likely to be a translocated bird.

Banding Code Definitions:Age Codes

AHY = After Hatch Year (adult)
 ASY = After Second Year
 ATY = After Third Year
 HY = Hatch year (juvenile)
 N = Nestling or Fledgling
 SY = In Second Year (The Yr after HY)
 TY = In Third Year (The 2nd Yr after HY)
 U = Unknown Age (HY or AHY)

Sex Codes

F = Female
 M = Male
 U = Unknown

Color Band Codes (Right Leg-Left Leg)

DB = Dark blue
 GN = Medium Green
 K = Black
 H = Hot Pink
 LB = Light blue
 LG = Light green
 M = Metal USFWS band
 Mp = Metal USFWS band anodized purple
 O = Orange
 P = Purple
 R = Red
 W = White
 X = Missing color band
 Y = Yellow

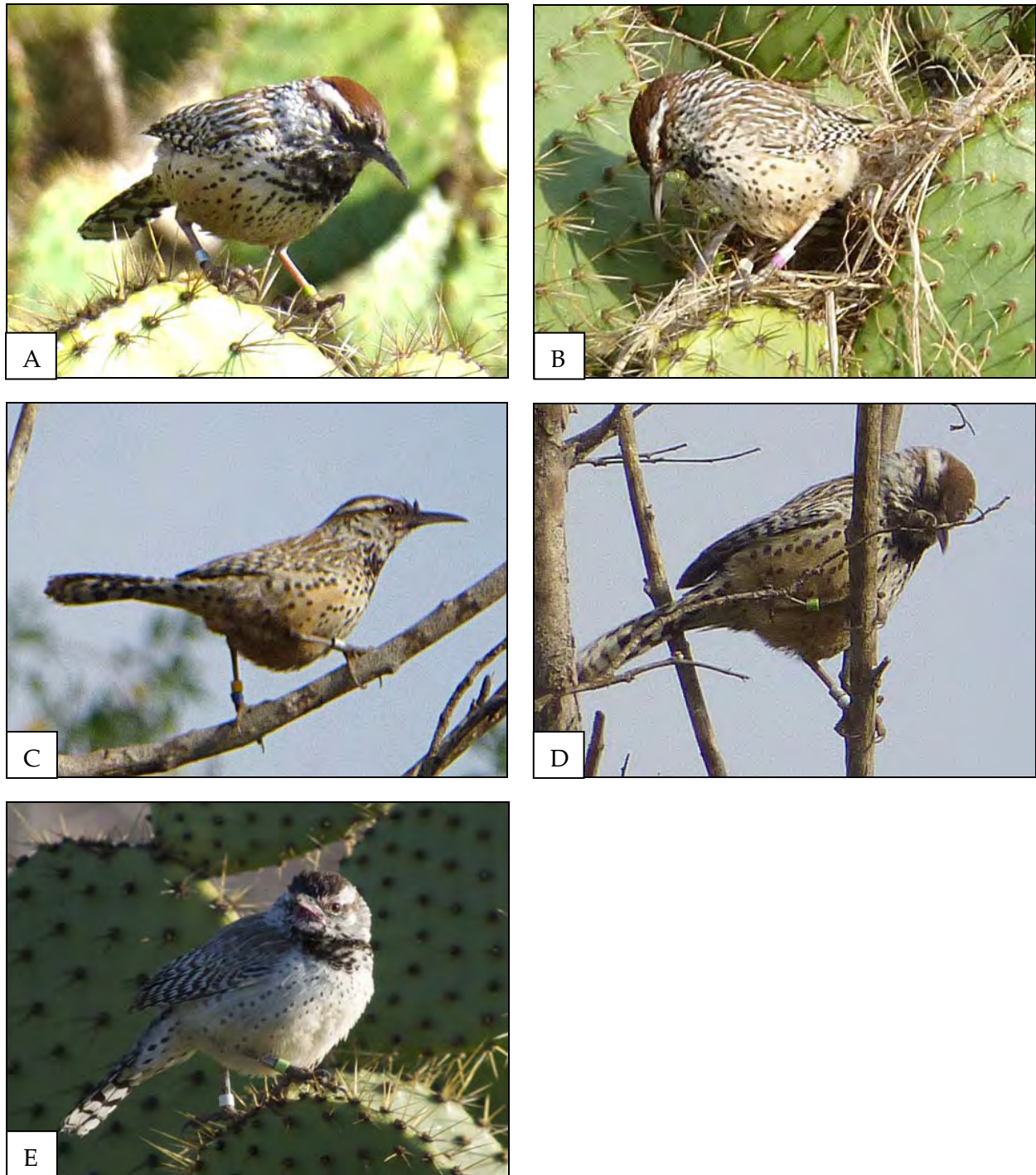


Figure 5. Photos A-D are of translocated Cactus Wrens or progeny that were resighted in 2013: A. Upper Newport Bay UNB01 male, Θ M-LG (missing orange band) (Peter Bryant). B. UNB01 female, W-MP, also was a 2010 fledgling of Θ M-LG (Peter Bryant). C. UNB02 male, M-YDB, fledged from UNB01 in 2010 (Peter Bryant). D. UNB02 female, LG-LBM, fledged from UNB01 in 2010 (Peter Bryant). E. MLG-W is not a translocated wren but a wren that dispersed from UC Irvine to Quail Hill; this photo was taken by Sandrine Biziaux at UC Irvine on February 2013. The wren was resighted 5.4 km to the E at Quail Hill QH09 on May 15, 2013.

conjunction with the wren monitoring. We also measured vegetation and ground cover composition and structure. Dr. Riley Pratt, from Irvine Ranch Conservancy and UCI, will seek correlations between cover elements and arthropod abundance, diversity, and composition, as well as variation in Cactus Wren foraging effort.

In 2012, there were 9 territories with 15 nest attempts and at least 22 fledglings were produced (Table 4a). In 2013, 4 or 5 of the 9 territories were occupied by territorial pairs with 8 nest attempts and 8 fledglings produced (Table 4b). At BMR brood nests were only found at one of the three monitoring territories, BMR04, and all three were depredated. At SCR there was only one of the two monitoring territories (SCR05) that was occupied by a pair. Their first nest was abandoned and even though the second nest started with 4 eggs, it only produced one fledgling. Only one of the four monitoring territories at UC Irvine had a breeding pair in 2013, but there were 3 successful nest attempts that produced 7 fledglings. UC Irvine shows a decline in nesting territories from 2011 to 2013. At UC Irvine, in 2009 there were 5 territories with nesting pairs, in 2010 - 6 territories, in 2011 - 5 territories, in 2012 - 4 territories, and in 2013 - 1 territory.

Although taking a census and monitoring territories in the entire Coastal Reserve was not part of the scope of the 2013 studies, there appeared to be a decline in the number of territories at most of the sites we did survey and/or monitor. There was an apparent decrease in breeding territory number between 2012 and 2013 at Bommer Canyon, Crystal Cove State Park, James Dilley, Ridgeline, Sand Canyon Reservoir, UC Irvine, and possibly Quail Hill. The pair number went from 2 to 1 at Mule Deer in 2013. Turtle Ridge appeared to have the same number of territories and Upper Newport Bay maintained two territories in 2013.

The chance of nest failure seemed higher in 2013 than in 2012. In 2013, 33 wren nests were encountered that we were aware of whether or not they fledged young. Of the 33 nests, 15 fledged young; this is a 45% success rate. In 2012, of 40 wren nests encountered where we knew the outcome, 31 fledged young; this is a 77% success rate. Also, among individual brood nests we were monitoring in 2013, there seemed to be fewer fledglings produced than the number of eggs laid or nestlings hatched, also called brood reduction. However, monitoring efforts were not as intensive in 2012 and 2013 as during previous seasons to determine levels of nest success and brood reduction sufficient enough to make significant comparisons. Drought, increased nest depredation, and disturbance or clearing of appreciably large areas of vegetation in the territories (at times during nesting) are possible inter-related factors contributing to the apparent decline of breeding Cactus Wren territories and productivity at the Coastal Reserve during 2013. These factors may be related to vegetation and ground cover composition and structure and their affect on the abundance of resources such as safe nest sites and arthropods.

Plant Community Composition

Appendix I –Table 7 lists the dominant plant communities at each site and dominant plant species within the Cactus Scrub vegetation at each site. Coastal Sage Scrub and Cactus Scrub were present at all the sites and similar dominant plant species were present in the Cactus Scrub

Table 4a. 2012 Reproductive Status of Cactus Wren Territories Monitored for the Irvine Ranch Conservancy (IRC)/ UC Irvine Center for Environmental Biology (CEB) Arthropod Foraging Study

Territory	NAD 83		NAD 83	Nest Fate	No. of Nest				
	Nest No.	UTM East	UTM North		Attempts	# Eggs	# Nestlings	# Fledglings	# Fls/Pr/Yr
Bommer Canyon									
BMR02	1	425855	3720054	Fledged	2		4	4	7
	2	425855	3720054	Fledged			3	3	
BMR04	1	425768	3720444	Depredated?	2	3	2	0	1
	2	425735	3720386	Fledged		2	1	1	
BMR05	1	426120	3719883	Fledged	1		4	3+	3+
Sand Canyon Reservoir									
SCR01	1	426255	3723834	Depredated?	2	4-5	4	0	0
	2	426256	3723825	Depredated?		3	2	0	
SCR05	1	426097	3724013	Fledged			2	2	2
UC Irvine									
UC03	1	421493	3722252	Depredated?/Abandoned?	1	4	1	0	0
UC04					Unk	0	0	0	0
UC05/06	1	421567	3722565	Depredated	2+	3	3	0	3-4
	2	421594	3722638	Fledged		4	4	3-4	
UC09/01/02	1	421445	3721789	Fledged	4	4	2	2	6-7
	2	421450	3721788	Depredated		4	0	0	
	3	421450	3721788	Fledged		3	2	1-2	
	4	421445	3721789	Fledged		3	3	3	

Table 4b. 2013 Reproductive Status of Cactus Wren Territories Monitored for the Irvine Ranch Conservancy (IRC)/ UC Irvine Center for Environmental Biology (CEB) Arthropod Foraging Study

Territory	Nest No.	NAD 83	NAD 83	Nest Fate	No. of Nest				
		UTM East	UTM North		Attempts	# Eggs	# Nestlings	# Fledglings	# Fls/Pr/Yr
<i>Bommer Canyon</i>									
BMR02		425855	3720053	No Brood Nests Detected	0				0
BMR04	1	425754	3720428	Depredated	3	3	1	0	0
	2	425804	3720390	Depredated		3	3	0	
	3	425706	3720505	Depredated		3	3	0	
BMR05		426111	3719930	No Brood Nests Detected	0				0
<i>Sand Canyon Reservoir</i>									
SCR01		426255	3723834	No Territorial Wrens	0				0
SCR05	1	426088	3724002	Abandoned	2	2	0	0	1
SCR05	2	426108	3724033	Fledged		4	1	1	
<i>UC Irvine</i>									
UC03		421493	3722252	Not Occupied by a Pair	0				0
UC04				Not Occupied by a Pair	0				0
UC05/06		421594	3722638	Not Occupied by a Pair	0				0
UC01	1	421371	3721880	Fledged	4	4	2	2	7
	2	421432	3721916	Fledged		4	3	2	
	3	421371	3721880	Depredated		3	0	0	
	4	421430	3721906	Fledged		3	3	3	

at each site. Vegetation density and structure appear to be the factors that varied between the sites. Bare ground and grassland were also important components of territories, particularly at Bommer Canyon, Bommer Ridge Road, Mule Deer, Quail Hill, Sand Canyon Reservoir, and UC Irvine Ecological Reserve.

Conclusions and Discussion

It would be useful to consider the outcomes of the 2006 and 2011 Cactus Wren Translocations and the possible factors that affected the outcomes. For both the 2006 and 2011 Translocations it appears that one or two years after release at the receptor sites only a few of the wrens or their off-spring remain at each of the sites. There were relatively few wrens translocated to the donor sites. Small founder populations are vulnerable to random events, such as predation and accidents, and to random demographic outcomes such as too few females.

In the case of the 2006 Translocation to Upper Newport Bay (UNB) we learn that there are at least two locations that have supported wren pairs the past seven years. As indicated by the pairing of family members and, finding just one wren that dispersed from UNB after five years of surveys and/or monitoring in the Coastal Reserve, the UNB site appears to be very isolated from the other sites in the Coastal Reserve for Cactus Wrens. UNB appears to be resource rich for wrens. The UNB01 territory has consistently produced fledglings each season and there have been numerous nest attempts at UNB02, but there also has been a high level of nest depredation at UNB02. The level of fledgling predation seems about normal, but the level of juvenal predation is difficult to determine since they may be missing because they departed from the site.

In the case of the 2011 Translocation to the James Dilley Preserve (JD) one pair remains in 2013. Initially, 2 pairs and 3 single wrens were maintaining territories at JD until April 2012, after which only the 2 pairs remained. We suspect the single wrens were all males and that they departed to find sites with female wrens. Two wrens from JD were found at other sites paired with females in 2012 and 2013. We did not have the opportunity to monitor and band wrens at the Lake Forest donor site during the nesting season prior to translocation, so we did not know the sex of the wrens that were translocated in late November 2011. At least 2 were females and 4 turned out to be males, and we suspect the other 3 were also males. So an uneven sex ratio in the group of wrens that were translocated may have contributed to lack of pairs forming at JD. From the translocated wrens we found at Mule Deer in 2012 and Quail Hill in 2013, the JD site is within dispersal capability to other sites at the Coastal Reserve. It was not unusual to have Cooper's Hawk, an avian predator, fly through or even perch in the territories of the two pairs at JD while we were monitoring in 2012. Also Western Scrub Jays, who depredate nests, were usually present in both territories during our observations. So predation may have contributed to the loss of wrens at JD. For the pairs, food resources did not appear to be a limiting factor, especially with a period of supplemental feeding. Even though they would come over to the feeding stations when we provided mealworms, the wrens typically went back to foraging for their own food after eating a few worms.

Adult and independent juvenal Cactus Wrens appear adaptive and robust enough to tolerate translocation. The factors that may limit the success of a translocation appear to be mostly external and centered mostly on the status of the chosen receptor site. Factors that may determine the success of a receptor site include:

- 1) The Cactus Wren carrying capacity of the receptor site at the time of the translocation.
- 2) Evenness of the sex ratio of the group of translocated wrens at the time of translocation.
- 3) The eventual survival and productivity of the wrens at the receptor site depends on a sufficient resource base, i.e. a diverse, good quality habitat, and moderately low intensity predation pressure on nests and young.
- 4) Level of linkage of the receptor site to other wren populations.

Outcome of Translocation Objectives as of 2013:

Objective 1. To prevent the loss of Cactus Wrens to development and instead use these individuals to help recover Coastal Reserve populations.

Even though the number of wrens at the UNB site has been low, the relatively consistent productivity would have contributed a large number of wrens to the Coastal Reserve; however, UNB appears to be highly isolated from the other coastal sites thus dampening the benefit of UNB's productivity. One 2nd generation female did disperse from UNB in 2010 and may have been producing fledglings in the Coastal Reserve since then, in addition to the 3 banded in 2013. In 2012, two pairs at JD produced 4 fledglings. At least two translocated wrens from the JD site are known to have dispersed to other Coastal Reserve sites and one of these wrens has produced 8 fledglings so far, one of which successfully fledged 3 wrens at another coastal site. The potential contribution the number of wrens to the Coastal Reserve results more from the productivity of a few exceptional individual wrens than from the number of wrens that were translocated.

Objective 2. To "seed" the receptor site with Cactus Wrens in order to increase the likelihood that other wrens successfully recruit into the breeding population.

Recruitment of other wrens into the receptor site is not known to have occurred at UNB because of its high degree of isolation from other coastal sites. Also the carrying capacity appears to be limited to two breeding territories. It's only been two year since wrens were translocated to JD which may not be enough time for recruitment. The likelihood of recruitment depends on the pool of floaters (wrens without territories) that are visiting or occupying the site, usually last year's fledglings. As mentioned above under Objective 1, the reverse is occurring and the translocated wrens and their progeny are recruiting into the Coastal Reserve population of breeding wrens.

Objective 3. To enhance connectivity between southern and northern Coastal Reserve Cactus Wren populations.

This has successfully occurred as the result of the translocations. From the observations collected to date, connectivity between the reserves has been accomplished, more so with the translocation to JD than to UNB.

Objective 4. To increase gene flow and genetic diversity in isolated and small Coastal Reserve Cactus Wren populations.

The objective to increase gene flow and genetic diversity in the Coastal Reserve wren populations has been shown to be successfully done with the dispersal and productivity of the JD male, KW-Mp, at Mule Deer and his 2012 fledgling at Quail Hill in 2013 and the dispersal and productivity of the UNB female, LBP-M, at Quail Hill.

The dispersal resightings from this year and observations from previous years (Preston and Kamada (2012) and Kamada and Preston (2013)) and the genetic analyses by Barr, et. al. (2012) of cactus wrens indicates that the birds in the Coastal Reserve are behaving as one population. Maintaining the integrity of linkages between sites and protecting the productive Cactus Wren source sites or individual territories will be critical for maintaining the presence of a viable population in the Coastal Reserve. It would also be important to carefully carry out maintenance or habitat improvement activities at linkages and sites occupied by wrens so not to negatively impact those birds. Monitoring of wrens at sites where maintenance or habitat improvement is being carried out can provide feedback and an opportunity to adjust restoration activities in order minimize impacts; as long as there is a willingness to modify methods and scheduling. To risk impacting a critical linkage or territory at a region where the habitat is highly fragmented could be taking the risk of causing a regional population collapse in the hope that a site will have better wren habitat in the future. Also, a key uncertainty is the level and duration of drought that the relatively small, isolated, and fragmented wren population in the Coastal Reserve can tolerate as the climate continues to shift. Dr. Kristine Preston's work with modeling climate and wren populations will help clarify some of the problems and possibly provide some target areas to manage in order to help the wren population in the Coastal Reserve be more robust in the face of a changing climate.

References

- Anderson, A.A. and A. Anderson. 1963a. Life history of the Cactus Wren. Pt. III: the nesting cycle. *Condor* 62:351-369.
- Anderson, A.A. and A. Anderson. 1963b. Life history of the Cactus Wren. Pt. VI: competition and survival. *Condor* 65:29-43.
- Anderson, A.A. and A. Anderson. 1973. *The Cactus Wren*. University of Arizona Press.
- Atwood, J.L., D.R. Bontrager, M. Fugagli, R. Hirsch, D. Kamada, M. Madden, C. Reynolds, S. Tsai, and P. Bowler. 2002. *Population Dynamics, Dispersal and Demography of California Gnatcatchers and Cactus Wrens in Coastal Southern California (1997 Progress Report)*. 42 pp + Appendices.
- Atwood, J.L. and S.B. Lerman. 2007. Geographic variation in Cactus Wren songs. *Western Birds* 38:29-46.
- Barr, K.R., Vandergast, A.G., and Kus, B.E. 2012. *Genetic Connectivity in the Coastal Cactus Wren*. U.S. Geological Survey, Reston, Virginia.
- Bolger, D.T., M.A. Patten, and D.C. Bostock. 2005. Avian reproductive failure in response to an extreme climatic event. *Oecologia* 142:398-406.
- Bontrager, D.R., R.A. Erickson, and R.A. Hamilton. 1995. Impacts of the October 1993 Laguna Canyon fire on California Gnatcatchers and Cactus Wrens. Pp. 69-76 in *Brushfires in California Wildlands: Ecology and Resource Management* (J.E. Keeley and T. Scott, eds.). International Association of Wildland Fire, Fairfield, WA.
- Bontrager, D.R. and A.L. Gorospe. 1995. *Movement and Dispersal of California Gnatcatchers and Cactus Wrens in the San Joaquin Hills, Orange County, California*. Prepared for Ed Almanza and Associates. January. 14 pp + Appendices.
- Boutin, S. 1990. Food supplementation experiments with terrestrial vertebrates: patterns problems and the future. *Canadian Journal of Zoology* 68:203-220.
- Busch, J.D., M. P. Miller, E.H. Paxton, M.K. Sogge, and P. Keim. 2000. Genetic variation in the endangered southwestern willow flycatcher. *Auk* 117(3):586-595.
- Clark, M.E. and T.E. Martin. 2007. Modeling tradeoffs in avian life history traits and consequences for population growth. *Ecological Modelling* 209:110-120.

County of Orange. 1996. *Natural Community Conservation Plan & Habitat Conservation Plan, County of Orange, Central & Coastal Subregion, Parts I & II: NCCP/HCP*. Prepared for County of Orange Environmental Management Agency by R.J. Meaded Consulting, Inc., July 17, 1996.

DeSante, D.F. and G.R. Geupel. 1987. Landbird productivity in central coastal California: the relationship to annual rainfall and a reproductive failure in 1986. *Condor* 89:636-653.

Grant, P.R., B.R. Grant, L.F. Keller, and K. Petren. 2000. Effects of El Nino events on Darwin's finch productivity. *Ecology* 81:2422-2457.

Gustafson, M.E. and J. Hildenbrand. 1998. *Bird Banding Laboratory Homepage*. U.S.G.S. Patuxent Wildlife Research Center, Laurel, MD.

Hamilton, R.A. 2003. *Target bird monitoring study: Nature reserve of Orange County, 2003*. Prepared for the Nature Reserve of Orange County, December 2, 2003. 53 pp + Appendices.

Hamilton, R.A. 2004. *Target bird monitoring study: Nature Reserve of Orange County, 2004*. Prepared for the Nature Reserve of Orange County, November 3, 2004. 62 pp. + Appendices.

Harmsworth Associates. 1999. *California Gnatcatcher and Coastal Cactus Wren Monitoring Report for the San Joaquin Hills Burn Area 1996-1998*. Final report prepared for the Transportation Corridor Agencies. January. 42 pp + Appendices.

ICF International. 2010. *City of Lake Forest Sports Park and Recreation Center Draft Environmental Impact Report*. Report SCH #2009061020 prepared for the City of Lake Forest, CA. December 2010.

Kamada, D. 2008. *Final Report: Cactus Wren (Campylorhynchus brunneicapillus) 2007 Telemetry Study and the 2007 Monitoring Results of the 2006 Cactus Wren Translocation Study in Orange County, California*. Report prepared for the California Department of Fish and Game and the Nature Reserve of Orange County. February 2008.

Kamada, D. and M.J. Mitrovich. 2006. *Results of the 2006 Cactus Wren (Campylorhynchus brunneicapillus) Translocation Study in Orange County, California*. Report prepared for the California Department of Fish and Game. December. 22 pp.

Kamada, D. and K.L. Preston. 2013. *Nature Reserve of Orange County: Coastal Cactus Wren Dispersal and Survival Surveys, Genetics & Parasite Sampling, and Arthropod Foraging Ecology in 2012*. Annual Report Prepared in Fulfillment of Reporting Requirements for the California Department of Fish and Wildlife. February 2013. 92 pp + Appendices.

Lack, D. 1954. *The Natural Regulation of Animal Numbers*. Oxford University Press, Oxford, U.K.

Leatherman Bioconsulting. 2009. *Central Reserve Cactus Wren Habitat Assessment and Survey, 2008*. Report prepared for the Nature Reserve of Orange County. February. 27 pp.

Martin, T.E. 1987. Food as a limiting factor on breeding birds: a life history perspective. *Annual Review of Ecology and Systematics* 18:453-487.

Martin, T.E. 1993. Nest predation among vegetation layers and habitat types: revising the dogmas. *American Naturalist* 141:897-913.

Marr, T.G. and R.J. Raitt. 1983. Annual variations in patterns of reproduction of the Cactus Wren (*Campylorhynchus brunneicapillus*). *Southwestern Naturalist* 28:149-156.

Mitrovich, M.J. and R.A. Hamilton. 2007. *Status of the Cactus Wren (Campylorhynchus brunneicapillus) within the Coastal Subregion of Orange County, California*. Report prepared for the Nature Reserve of Orange County, May 2007. 18 pp.

Mitrovich, M.J., K.L. Preston, and D. Kamada 2013. *Nature Reserve of Orange County: Translocation of San Diego Cactus Wren, a State Species of Special Concern*. Second Annual Report Prepared in Fulfillment of Reporting Requirements for the Memorandum of Understanding between the Nature Reserve of Orange County and California Department of Fish and Game. January 2013. 29 pp + Appendices.

Morrison, S.A. and D.T. Bolger. 2002. Variation in a sparrow's reproductive success with rainfall: food and predator-mediated processes. *Oecologia* 133:315-324.

Newton, I. 1998. *Population Limitation in Birds*. Academic Press, San Diego, California, USA.

Preston, K.L. 2012. *Nature Reserve of Orange County: Translocation of San Diego Cactus Wren, a State Species of Special Concern*. Annual Report Prepared for the California Department of Fish and Game. February 2012. 24 pp.

Preston, K.L. and D. Kamada. 2009. *Nature Reserve of Orange County Pilot Study: Monitoring Coastal Cactus Wren Reproduction, Dispersal and Survival*. Annual Report Prepared for California Department of Fish and Game. 25 pp + Appendices.

Preston, K.L. and D. Kamada. 2011. *Nature Reserve of Orange County: Monitoring Coastal Cactus Wren Reproduction, Dispersal and Survival in 2010*. Annual Report Prepared for California Department of Fish and Game LAG#PO982013. March 17, 2011. 45 pp + Appendices.

Preston, K.L. and D. Kamada. 2012. *Nature Reserve of Orange County: Monitoring Coastal Cactus Wren Reproduction, Dispersal and Survival in 2011*. Annual Report Prepared for California Department of Fish and Game LAG#PO982013. January 2012. 44 pp + Appendices.

Preston, K.L. and J.T. Rotenberry. 2006a. Independent effects of food and predator-mediated processes on annual fecundity in a songbird. *Ecology* 87:160-168.

Preston, K.L. and J.T. Rotenberry. 2006b. The role of food, nest predation, and climate in timing of Wrentit reproductive activities. *Condor* 108:832-841.

Proudfoot, G.A., D.A. Sherry, and S. Johnson. 2000. Cactus Wren (*Campylorhynchus brunneicapillus*). In *the Birds of North America*, No. 558 (A. Poole and G. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Rea, A.M. and K.L. Weaver. 1990. The taxonomy, distribution, and status of coastal California Cactus Wrens. *Western Birds* 21:81-126.

Ricklefs, R.E. 1969. An analysis of nesting mortality in birds. *Smithsonian Contributions to Zoology* 9:1-48.

Ricklefs, R.E. and F.R. Hainsworth. 1968. Temperature regulation in nestling Cactus Wrens: development of homeothermy. *Condor* 70:121-127.

Sauer, J.R., J.E. Hines, I. Thomas, J. Fallon, and G. Gough. 1999. *The North American Breeding Bird Survey, results and analysis 1966-1998*. Version 98.1, U.S. Geol. Surv. Patuxent Wildl. Res. Center, Laurel, MD.

Simons, L.S., and T.E. Martin. 1990. Food limitation of avian reproduction: an experiment with the Cactus Wren. *Ecology* 71:869-876.

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 sage scrub and chaparral habitats and associated birds in California*. California Partners in Flight. <http://www.prbo.org/calpif/htmldocs/scrub.html>.

Unitt, P. 2008. San Diego Cactus Wren. In *California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California*. W.D. Shuford and T. Gardali, Editors. Studies of Western Birds No. 1. Published by Western Field Ornithologists and California Department of Fish and Game.

Walters, Brianne L.; Whitaker, John O. Jr.; Gikas, Nicholas S.; and Wrenn, William J., "Host and Distribution Lists of Chiggers (Trombiculidae and Leeuwenhoekiidae), of North American Wild Vertebrates North of Mexico" (2011). *Faculty Publications from the Harold W. Manter Laboratory of Parasitology*. Paper 697. <http://digitalcommons.unl.edu/parasitologyfacpubs/697>

Appendix I - Table 1a. Dates of field work, names of field personnel, and type of field work conducted at Nature Reserve of Orange County 2013 Translocation Survey, Monitoring, and Foraging Study Sites.

[illegible]

Appendix I - Table 1a *continued* . Dates of field work, names of field personnel, and type of field work conducted at Nature Reserve of Orange County 2013 Translocation Survey, Monitoring, and Foraging Study Sites.

Date	Personel	Aliso Creek	Buck Gully	Bommer Canyon (Foraging Study Site)	Bommer Ridge Road	Bonita Reservoir	Boat Canyon	Crystal Cove SP	Calle Delgado ⁿ	El Morro Ridge Road	James Dilley (2011 Translocation Receptor Site)	Laguna Canyon Triangle	Laguna Coast Wilderness	Laguna Laurel
4/29/13	DK,KM			S, M, F								S	S	S
4/30/13	DK										S,M			
5/3/13	DK, KY								I					
5/8/13	DK,KM			S, M, F							M			
5/13/13	DK,KM,KY						S,M	S,M						
5/15/13	DK										M			
5/17/13	DK,KM,KY			S, M, F										
5/21/13	DK,KM	S					M							
5/22/13	DK, KY						M	M						
5/24/13	DK,KM			S, M, F							M			
5/28/13	DK, KY			S, M, F, B				M						
5/29/13	DK										M			
5/30/13	DK						B							
6/4/13	DK										M			
6/6/13	DK,KM,KY			S, M, F										
6/7/13	DK						M	M						
6/11/13	DK										M			
6/12/13	DK,KM			S, M, F										
6/13/13	DK			S										
6/18/13	DK										S,M			
6/20/13	DK, KY						M	S,M						
6/21/13	KM			S, M, F										
6/25/13	DK										S			
6/27/13	DK							M						
6/28/13	DK,KM,KY			S, M, F										
7/8/13	DK,KM			S, M, F							S			
7/9/13	DK						M							

Appendix I - Table 1a *continued* . Dates of field work, names of field personnel, and type of field work conducted at Nature Reserve of Orange County 2013 Translocation Survey, Monitoring, and Foraging Study Sites.

Date	Personel	Aliso Creek	Buck Gully	Bommer Canyon (Foraging Study Site)	Bommer Ridge Road	Bonita Reservoir	Boat Canyon	Crystal Cove SP	Calle Delgado ⁿ	El Morro Ridge Road	James Dilley (2011 Translocation Receptor Site)	Laguna Canyon Triangle	Laguna Coast Wilderness	Laguna Laurel
7/15/13	DK										S			
7/17/13	DK,KM,EC							B						
7/19/13	DK						M							

ⁿ

Calle Delgado is not a NROC study site, but there were incidental observations of a nesting pair of wrens at this location.

Personnel Codes

DK = Dana Kamada

KM = Karly Moore

MM = Milan Mitrovich

KY = Kathy Young (Volunteer)

EC = Erica Kagawa (Guest)

Personnel Activity Codes

B = Band and collect samples from wrens

F = Observe and record foraging behavior and monitor nesting for the IRC-NROC-UCI Cactus Wren foraging study

I = Incidental observation

M = Observe and/or check nest(s) to determine nesting stage or age of nestlings for banding and sampling

R = Recapture

S = Survey for Cactus Wrens to document translocated birds or their offspring and document banded birds.

Appendix I - Table 1b. Dates of field work, names of field personnel, and type of field work conducted at Nature Reserve of Orange County 2013 Translocation Survey, Monitoring, and Foraging Study Sites.

Date	Personel	Muddy Canyon	Mule Deer	NE	Quail Hill	Ridgeline	Sand Canyon	Shady Canyon	Turtle Ridge	Turtle Rock	Upper Newport		
				Laguna Canyon			Reservoir (Foraging Study Site)				UC Irvine (Foraging Study Site)	Bay (2006 Translocation Receptor Site)	Woods Canyon
2/14/13	KM										S		
3/11/13	DK										S,M,B		
3/15/13	DK,KM		S		S								
3/16/13	KM										M,F		
3/17/13	KM						S,M,F						
3/18/13	DK				S								
3/19/13	DK, KY							S				S,M	
3/20/13	DK					S							
3/21/13	DK												S
3/23/13	KM						M,F				S,M,F		
3/25/13	DK, KY	S										M	
3/27/13	DK					S							
3/28/13	DK								S				
3/30/13	KM						M,F				S,M,F		
4/2/13	DK									S			
4/3/13	DK		M		M								
4/4/13	DK				S								
4/5/13	KM						S,M,F				S,M,F		
4/9/13	DK											S,M	
4/10/13	DK		M		M								
4/11/13	DK				S,M								
4/12/13	DK,KM												
4/13/13	KM						M,F				S,M,F		
4/17/13	DK, KY		M		M							B,M	
4/18/13	DK				S,M								
4/21/13	KM						M,F				M,F		
4/22/13	DK				M								

Appendix I - Table 1b *continued* . Dates of field work, names of field personnel, and type of field work conducted at Nature Reserve of Orange County 2013 Translocation Survey, Monitoring, and Foraging Study Sites.

Date	Personel	Muddy Canyon	Mule Deer	NE Laguna Canyon	Quail Hill	Ridgeline	Sand Canyon Reservoir (Foraging Study Site)	Shady Canyon	Turtle Ridge	Turtle Rock	UC Irvine (Foraging Study Site)	Upper Newport	
												Bay (2006 Translocation Receptor Site)	Woods Canyon
4/24/13	DK		M,B		B,M								
4/25/13	DK							S					
4/26/13	DK				S								
4/28/13	KM										S,M,F,B		
4/29/13	DK,KM		M				M,F						
4/30/13	DK		M										
5/1/13	DK				M								
5/2/13	DK				M								
5/3/13	DK, KY											M	
5/5/13	DK				B					S			
5/8/13	DK,KM		M		S,M		S,M,F				M,F		
5/9/13	DK				S,M								
5/10/13	DK, KY					S	S					M	
5/13/13	DK,KM,KY										M,F	B	
5/14/13	KM						S,M,F	S					
5/15/13	DK		M		S,M								
5/16/13	DK				S,M								
5/17/13	DK,KM,KY			S							M,F	M	
5/20/13	DK								S				
5/21/13	DK,KM										S,F		
5/22/13	DK, KY											M	S
5/23/13	DK				S,M								
5/24/13	DK,KM						S,M,F				S,M,F		
5/28/13	DK, KY						S,M,F					M	
5/29/13	DK		M		M								
5/30/13	DK				S,M								
5/31/13	DK,MM							S					

Appendix I - Table 1b *continued* . Dates of field work, names of field personnel, and type of field work conducted at Nature Reserve of Orange County 2013 Translocation Survey, Monitoring, and Foraging Study Sites.

[illegible]

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M = Observe and/or check nest(s) to determine nesting stage or age of nestlings for banding and sampling

R = Recapture

S = Survey for Cactus Wrens to document translocated birds or their offspring and document banded birds.

Appendix I - Table 2. Number of territories and wrens observed at Translocation and Foraging Study sites during Nature Reserve of Orange County 2013 Cactus Wren Studies.

Site/Territory*	Age [†]	Sex	Bands*	NAD 83 UTM East	NAD 83 UTM North	No. of Observed Territories	No. Wrens Observed at Site	Comments
<i>Aliso Canyon</i>			Survey			2	2	
AC01	ATY	M	YLG-MLB	431604	3710573			
AC03	AHY	M	UB	431730	3710173			
<i>Buck Gully</i>			Survey			1	2	
BG01	ATY	M	PM-P	421038	3718787			
BG01	AHY	F	UB	421038	3718787			
<i>Bommer Canyon/ Bommer Ridge</i>			Survey		Foraging	7	15	Bommer Ridge was a survey site only
BMR01	TY	U	LB-MO	425381	3720140			
BMR01	AHY	U	LG-M	425381	3720140			
BMR01	N	U	UNK	425381	3720140			
BMR02	SY	M	<u>RLB-LBM</u>	425855	3720053			2012 BMR02; 2013 BMR02,BRR02
BMR02	AHY	F	UB	425855	3720054			
BMR02	3 yrs	F	<u>RDB-KM</u>	425859	3720050			Transient. 2011 BMR05; 2012 BMR01, CCSP02, BMR05; 2013 BMR02, BTC03/01
BMR03	AHY	M	UB	426468	3719395			
BMR03	TY	F	M-OP	426468	3719395			
BMR04	4+ yrs	M	W-OM	425754	3720428			
BMR04	AHY	F	UB	425754	3720428			
BMR04	N	U	YLG-RM	425754	3720428			Nest Depredated
BMR04	N	U	WY-LBM	425804	3720390			Nest Depredated
BMR04	N	U	RDB-MW	425804	3720390			Nest Depredated
BMR04	N	U	KM-DBY	425804	3720390			Nest Depredated
BMR05	3 yrs	M	(K)P-MLB	426089	3719984			
BMR05	AHY	F	UB	426089	3719984			
BMR06				425065	3720526			
BRR01	3 yrs	M	W-LBM	426777	3719168			
BRR01	4 yrs	F	MDB-O	426777	3719168			
BRR02	AHY	M?	<u>RLB-LBM</u>	426966	3719091			2012 BMR02; 2013 BMR02,BRR02; resighted back at BMR02
BRR02	SY	F?	UB	426966	3719091			
<i>Bonita Reservoir</i>			Survey			0	0	
BRV				421269	3721537			
<i>Boat Canyon</i>			Survey			1	3	
BTC03/01	AHY	M	UB	427144	3712507			
BTC03/01	3 yrs	F	<u>RDB-KM</u>	427144	3712507			2011 BMR05; 2012 BMR01, CCSP02, BMR05; 2013 BMR02, BTC03/01
BTC03/01	N	U	LGM-LGR	427144	3712507			

Appendix I - Table 2 *continued*. Number of territories and wrens observed during Translocation Survey and Foraging Study sites during Nature Reserve of Orange County 2013 Cactus Wren Studies.

Site/Territory*	Age [†]	Sex	Bands*	NAD 83 UTM East	NAD 83 UTM North	No. of Observed Territories	No. Wrens Observed at Site	Comments
<i>Crystal Cove State Park</i>			Survey			2	5	
CCSP01	TY	M	MLG-DBDB	424467	3716272			
CCSP01	TY	F	GN-MO	424467	3716272			
CCSP01	N	U	OO-WM	424464	3716269			
CCSP02	ATY	M	LGK-LGM	424316	3714328			
CCSP02	AHY	F	UB	424316	3714328			
CCSP04				424744	3716618			
<i>Calle Delgado</i>						1	2	Not a NROC site, Calle Delgado, SJC
CDG01	AHY	M	UB	439155	3704496			Incidental sighting
CDG01	AHY	F	UB	439155	3704496			Incidental sighting
<i>El Morro Ridge Road</i>			Survey			0	0	
ERR				425043	3713581			
<i>James Dilley Preserve</i>			Survey	ranslocation		1	2	
JD01	ATY	M	DB-HGN	430350	3718344			Wren Translocated from Lake Forest 2 in 2011
JD01	ATY	F	W-MpY	430350	3718344			Wren Translocated from Lake Forest 2 in 2011
<i>Laguna Canyon Triangle</i>			Survey			0	0	
LTC				429745	3716750			
<i>Laguna Coast Wilderness</i>			Survey			0	0	
LCW01				429208	3719606			
<i>Laguna Laurel</i>			Survey			0	0	
LL01				429002	3721016			
<i>Muddy Canyon</i>			Survey	ranslocation		2	3	Pair using MCN01 and 02 areas
MCN01/02	AHY	M	UB	423929	3716726			Pair using MCN01 and 02 areas
MCN01/02	AHY	F	UB	423929	3716726			
MCN04	SY	U	MK-WY	424073	3716300			
<i>Mule Deer</i>			Survey	ranslocation		2	9	
MD01	SY	M	WLB-MW	429069	3721826			This wren was replaced by MD02 male KW-Mp, who produced three fledglings with the MD01 female.
MD01	ATY	M	KW-Mp	429069	3721826			This wren replaced WLB-MW and produced 3 fledglings with the MD01 female.
MD01	TY	F	MP-WR	429069	3721826			
MD01	N	U	UB	429077	3721824			Offspring of 2011 translocated wren KW-Mp

Appendix I - Table 2 *continued*. Number of territories and wrens observed during Translocation Survey and Foraging Study sites during Nature Reserve of Orange County 2013 Cactus Wren Studies.

Site/Territory*	Age [†]	Sex	Bands*	NAD 83 UTM East	NAD 83 UTM North	No. of Observed Territories	No. Wrens Observed at Site	Comments
MD01	N	U	UB	429077	3721824			Offspring of 2011 translocated wren KW-Mp
MD01	N	U	UB	429077	3721824			Offspring of 2011 translocated wren KW-Mp
MD02	ASY	M	KW-Mp	429018	3721645			2011 Translocated wren that dispersed from James Dilley Preserve. In 2013, this wren switched to MD01 after 1st nest fledged at MD02 and had 3 more fledgings.
MD02	AHY	F	UB	429018	3721645			
MD02	N	U	MpW-LBY	429018	3721645			Descendant of a 2011 translocated wren
MD02	N	U	GNMp-W	429018	3721645			Descendant of a 2011 translocated wren
MD03				429272	3721847			
NE Laguna Canyon			Survey			0	0	
NELC				430367	3721274			Minimal intact cactus scrub in this area
Quail Hill			Survey	ranslocation		7	26	7-9 Territories
QH01	SY	M	GN-MDB	428311	3721948			
QH01	SY	F	YLG-MpO	428311	3721948			This wren fledged from KW-Mp nest at Mule Deer in 2012.
QH01	N	U	OO-RMp	428311	3721948			Third generation descendant of 2011 translocated wren KW-Mp at Mule Deer
QH01	N	U	MpDB-LGW	428311	3721948			Third generation descendant of 2011 translocated wren KW-Mp at Mule Deer
QH01	N	U	LGDB-KMp	428311	3721948			Third generation descendant of 2011 translocated wren KW-Mp at Mule Deer
QH02				427381	3722596			
QH03	3 yrs	M	OM-LBLB	428260	3722246			Nesting monitored to collect fecal samples
QH03	3 yrs	F	MP-WK	428260	3722246			
QH03	N	U	MLB-LGK	428260	3722246			
QH03	N	U	DBM-RLG	428260	3722246			
QH03	N	U	YY-OM	428260	3722246			
QH03	N	U	MGN-DB	428260	3722246			
QH03	N	U	KDB-PM	428260	3722246			
QH03	N	U	RR-RM	428260	3722246			
QH04	SY	M	PY-DBM	427684	3721758			
QH04	AHY	F	UB	427684	3721758			
QH05	AHY	U	UB	427581	3721685			Unknown if it was single or paired. May have been a transient or QH04 female.
QH06	SY	U	OK-MP	427822	3722797			Transient

Appendix I - Table 2 *continued*. Number of territories and wrens observed during Translocation Survey and Foraging Study sites during Nature Reserve of Orange County 2013 Cactus Wren Studies.

Site/Territory*	Age [†]	Sex	Bands*	NAD 83 UTM East	NAD 83 UTM North	No. of Observed Territories	No. Wrens Observed at Site	Comments
QH07	AHY	M	UB	427578	3723083			
QH07	4 yrs	F	LBP-M	427578	3723083			Banded as a fledgling at Upper Newport Bay (UNB01) in 2009 as a fledgling of wrens translocated from Portola in 2006. UNB01 Male OM-LG from Portola Pkwy/241 (434897, 3728213) and female from Irvine Blvd/Pusan Wy (434054, 3727289). In 2010 LBP-M was the territorial female at UNB02 then disappeared.
QH07	N	U	LBLG-OM	427599	3723083			Third generation descendant of 2006 translocated wrens, OM-LG and LBP-M at UNB01.
QH07	N	U	WLB-MK	427599	3723083			Third generation descendant of 2006 translocated wrens, OM-LG and LBP-M at UNB01.
QH07	N	U	OM-YLB	427599	3723083			Third generation descendant of 2006 translocated wrens, OM-LG and LBP-M at UNB01.
QH08	TY	M	MpK-W	427180	3722005			2011 translocated wren that dispersed from James Dilley, the release site in 2012. This is the 1st resighting after it disappeared in 2012.
QH08	AHY	F	UB	427180	3722005			
QH09	SY	M?	MLG-W	427017	3722884			This wren responded to the most to the playback and did most of the vocalizing.
QH09	SY	F?	KP-MK	427017	3722884			After the QH10 nest failed this bird was found here at QH09 with a different wren, MLG-W.
QH10	SY	M?	KP-MK	427202	3723183			After the pair's nest failed this bird was later resighted at QH09 with a different banded wren, MLG-W.
QH10	TY	F?	LBK-MO	427202	3723183			This wren remained at QH10 after the nest failed.
QH11				427810	3722942			No wrens detected at this area of cactus scrub near QH06.
Ridgeline			Survey			1	2	Not a NROC study site, incidental observation
RL01				425569	3723384			No wrens or nests detected
RL02				425538	3723593			No wrens detected, but there was an intact lined nest.
RLSE01	AHY	M	UB	425692	3722746			
RLSE01	3 yrs	F	Y-MLG	425692	3722746			

Appendix I - Table 2 *continued* . Number of territories and wrens observed during Translocation Survey and Foraging Study sites during Nature Reserve of Orange County 2013 Cactus Wren Studies.

Site/Territory*	Age [†]	Sex	Bands*	NAD 83 UTM East	NAD 83 UTM North	No. of Observed Territories	No. Wrens Observed at Site	Comments
<i>Sand Canyon Reservoir</i>			Survey		Foraging	3	8	
SCR01				426255	3723834			
SCR02				426498	3723413			
SCR03/02	AHY	M	UB	426542	3723581			
SCR03/02	AHY	F	UB	426542	3723581			
SCR04	AHY	M	UB	426811	3723291			
SCR04	AHY	F	UB	426811	3723291			
SCR05	AHY	M	UB	426108	3724033			
SCR05	AHY	F	UB	426108	3724033			
SCR05	N	U	OLG-MW	426108	3724033			
SCR05	SY	M	<u>KP-MK</u>	426108	3724033			Apparently this wren left QH09 and returned to its natal territor without it's new mate. Floater.
SCR06				425887	3724477			Nest present with pillow stuffing woven into it, but no wrens detected.
<i>Shady Canyon</i>			Survey			1	3	3 or more fledglings
SHC03	AHY	M	X-WM or X-MW	427285	3720972			Band missing from the right leg and White band has slipped over the metal band. Most likely from BMR02 or BMR04. Could be from UC01 or CCSP04.
SHC03	AHY	F	UB	427285	3720972			
SHC03	N	U	UNK	426987	3720992			
<i>Turtle Ridge</i>			Survey			3	6	
TRD01	AHY	M	UB	424263	3720155			
TRD01	AHY	F	UB	424263	3720155			
TRD02				424756	3719710			
TRD02				424756	3719710			
TRD03	AHY	M	UB	424640	3720087			
TRD03	AHY	F	UB	424640	3720087			
TRD04	AHY	M	UB	424428	3719862			
TRD04	AHY	F	UB	424428	3719862			
<i>Turtle Rock</i>			Survey			0	0	
TRK01				425122	3722405			
TRK02				424799	3722108			
TRK03				424324	3722032			
TRK04				424421	3721884			
TRK05				424658	3723558			

Appendix I - Table 2 *continued* . Number of territories and wrens observed during Translocation Survey and Foraging Study sites during Nature Reserve of Orange County 2013 Cactus Wren Studies.

Site/Territory*	Age [†]	Sex	Bands*	NAD 83 UTM East	NAD 83 UTM North	No. of Observed Territories	No. Wrens Observed at Site	Comments
<i>UC Irvine</i>			Survey		Foraging	2	11	Only one breeding territory in 2013 (UC01) and a floating adult female. The floating adult female replaced the UC01 female for the last brood nest of three fledglings.
UC01	3 yrs	M	OW-M	421371	3721880			2012 UC09 pair nesting in UC01 in 2013
UC01	4 yrs	F	R-MR	421371	3721880			2012 UC09 pair nesting in UC01 in 2013
UC01	N	U	<u>YM-LGP</u>	421371	3721880			
UC01	N	U	MO-WP	421371	3721880			
UC01	N	U	K-MLB	421432	3721916			Not resighted as a fledgling
UC01	N	U	RR-M	421432	3721916			
UC01	N	U	LGM-O	421432	3721916			
UC01	TY	F	LB-DBM	421430	3721906			Single at UC03/04/05/06, later replaced UC01 female R-MR for UC01NB4a nest.
UC01	N	U	MLG-R	421430	3721906			
UC01	N	U	M-LBK	421430	3721906			
UC01	N	U	W-MLB	421430	3721906			
UC03/04/05/06	TY	F	LB-DBM	421490	3722249			Single at UC03/04/05/06, later replaced UC01 female R-MR for UC01NB4a nest.
UC03/04/05/06	HY	U	<u>YM-LGP</u>	421500	3722289			Transient Juv from UC01 foraging in area
UC03/04/05/06	SY	M?	<u>MLG-W</u>					Seen later at QH09.
UC08				421646	3722091			
UC09				421445	3721789			
<i>Upper Newport Bay</i>			Survey	ranslocation		2	8	
UNB01	8+ yrs	M	(O)M-LG	417438	3723753			Translocated from Portola 2006. Released at UNB04. Dispersed to UNB01 2007.
UNB01	3 yrs	F	W-MP	417438	3723753			Inbreeding W-MP from (O)M-LG 2010 nest.
UNB01	N	U	MK-PO	417475	3723774			Nest UNB01NB1a depredated
UNB01	N	U	RM-GN	417475	3723774			Nest UNB01NB1a depredated
UNB01	N	U	OP-MW	417438	3723753			
UNB01	N	U	GN-MR	417438	3723753			
UNB01	N	U	YK-MK	417438	3723753			
UNB01	N	U	PK-OM	417438	3723753			
UNB02	3 yrs	M	M-YDB	417353	3723327			Inbreeding both from 2010 UNB01
UNB02	3 yrs	F	LG-MLB	417353	3723327			Inbreeding both from 2010 UNB01
UNB02	N	U	OP-MK	417353	3723327			Nest UNB02NB1a depredated
UNB02	N	U	YGN-M	417353	3723327			Nest UNB02NB1a depredated
UNB02	N	U	MR-LBDB	417353	3723327			Nest UNB02NB1a depredated
UNB02	N	U	M-WGN	417353	3723327			Nest UNB02NB1a depredated
UNB03				418194	3723957			
UNB04				417366	3723480			

Appendix I - Table 2 *continued*. Number of territories and wrens observed during Translocation Survey and Foraging Study sites during Nature Reserve of Orange County 2013 Cactus Wren Studies.

Site/Territory*	Age [†]	Sex	Bands*	NAD 83 UTM East	NAD 83 UTM North	No. of Observed Territories	No. Wrens Observed at Site	Comments
Wood Canyon			Survey			1	1	Territory appeared to be occupied by single male.
WC01/02	AHY	M	UB	429872	3714556			
WC03				430075	3714732			
Total No. Sites = 25			Total No. of Territories: 39			No. of Wrens detected: 105+		
No. of NROC Sites = 24			Total No. of NROC Territories: 38			No. of NROC Wrens detected: 103+		

* Purple Fill - A territory with wren(s) associated with the 2011 Translocation from Lake Forest; or a wren that was relocated from Lake Forest or is a descendant of a wren relocated from Lake Forest in 2011.

* Blue Fill - A territory with wren(s) associated with the 2006 Translocation from the Portola Springs area; or a wren that was relocated from Portola Springs or is a descendant of a wren relocated from Portola Springs in 2006.

* Grey Fill - Calle Delgado location is not associated with the NROC studies, but a location where nesting wrens were incidentally sighted.

Banding Code Definitions:

Age Codes

AHY = After Hatch Year (adult)

ASY = After Second Year

ATY = After Third Year

HY = Hatch year (juvenile)

N = Nestling or Fledgling

SY = In Second Year (The Yr after HY)

TY = In Third Year (The 2nd Yr after HY)

U = Unknown Age (HY or AHY)

3 yrs = Three years old

4 yrs = Four years old

4+ yrs = Four or more years old

8+ yrs = Eight or more years old

Sex Codes

F = Female

M = Male

U = Unknown

Color Band Codes (Right Leg-Left Leg)

DB = Dark blue

GN = Medium Green

K = Black

H = Hot Pink

LB = Light blue

LG = Light green

M = Metal USFWS band

Mp = Metal USFWS band anodized purple

O = Orange

P = Purple

R = Red

W = White

X = Missing color band

Y = Yellow

[†] Age code follows the above categories until known age is past TY (Third Year or ~2 years old), then the age of the bird is in years.

Appendix I - Table 3. Resightings of banded Cactus Wrens during the Nature Reserve of Orange County 2013 Cactus Wren Studies. (N=68)

Bands*	2013 Age [†]	Sex	2013 Site	2013 Territory	Obs. Territory UTM		Original (Banding) Site	Original (Banding) Territory	Dispersal	Home Terr UTM		Note
					NAD 83 East	NAD 83 North				NAD 83 East	NAD 83 North	
YLG-MLB	ATY	M	Aliso Canyon	AC01	431604	3710573	Same	AC01		431502	3710568	
LGM-LGR	HY	U	Boat Cyn	BTC03/01	426987	3712478	Same	BTC03/01		427144	3712507	
RDB-KM	3 yrs	F	Bommer Cyn	BMR02	425859	3720050	Same	BMR05	Y	425983	3719751	Last sighted in BMR05 in 2012; 1st sighted at BMR02 in 2013 . Distance is BMR05 to BMR02.
RDB-KM	3 yrs	F	Boat Cyn	BTC03/01	427144	3712507	Bommer Cyn	BMR05	Y	425859	3720050	In 2013 , 1st sighted at BMR02; later sighted and nesting at BTC03/01. Distance is BMR05 to BTC03/01 nest.
KP-MLB	3 yrs	M	Bommer Cyn	BMR05	426089	3719984	Same	BMR05		425983	3719751	K (black) band missing
LB-MO	TY	U	Bommer Cyn	BMR01	425381	3720140	Same	BMR01		425272	3720083	
LG-M	AHY	U	Bommer Cyn	BMR01	425381	3720140	Unknown	Unk	U			Color Band missing
M-OP	TY	F	Bommer Cyn	BMR03	426468	3719395	Same	BMR05	Y	426120	3719883	
RLB-LBM	SY	U	Bommer Cyn	BMR02	425867	3720083	Same	BMR02		425855	3720054	
RLB-LBM	SY	U	Bommer Ridge Rd.	BRR02	426966	3719091	Bommer Cyn	BMR02	Y	425855	3720054	2012 BMR02; 2013 1st sighted at BMR02, then at BRR02; May have been resighted back at BMR02.
W-OM	4+ yrs	M	Bommer Cyn	BMR04	425754	3720428	Same	BMR04		425735	3720386	KM saw it enter the nest of extended period to presumably incubate, so decided it is more likely a female.
MDB-O	4+ yrs	F	Bommer Ridge Rd.	BRR01	426790	3719159	Same	BRR01		426867	3719152	
W-LBM	3 yrs	M	Bommer Ridge Rd.	BRR01	426777	3719168	Bommer Cyn	BMR03	Y	426731	3718816	
PM-P	7+ yrs	M	Buck Gully	BG01	421039	3718792	Same	BG01		421188	3718706	
GN-MO	TY	F	Crystal Cove State Park	CCSP01	424467	3716272	Same	CCSP01		424466	3716263	
LGK-LGM	ATY	M	Crystal Cove State Park	CCSP02	424316	3714328	Same	CCSP02		424355	3714400	
MLG-DBDB	TY	M	Crystal Cove State Park	CCSP01	424467	3716272	Same	CCSP01		424466	3716263	
OO-WM	HY	U	Crystal Cove State Park	CCSP01	424464	3716269	Same	CCSP01		424464	3716269	
DB-HGN	ATY	M	James Dilley Reserve	JD01	430350	3718344	Same	GC02,JD01		430319	3718377	Wren translocated in 2011. Metal FWS Band removed due to swollen leg. Lost left foot.
W-MpY	ATY	F	James Dilley Reserve	JD01	430350	3718344	Same	GC02,JD01		430319	3718377	Wren translocated in 2011
MK-WY	SY	U	Muddy Canyon	MCN04	424073	3716300	Crystal Cove State Park	CCSP01	Y	424464	3716269	Appeared to be single
GNMp-W	N	U	Mule Deer	MD02	429018	3721645	Same	MD02		428872	3721669	2nd gen of a translocated wren

Appendix I - Table 3 *continued* . Resightings of banded Cactus Wrens during the Nature Reserve of Orange County 2013 Cactus Wren Studies. (N=68)

Bands*	2013 Age [†]	Sex	2013 Site	2013 Territory	Obs. Territory UTM		Original (Banding) Site	Original (Banding) Territory	Dispersal	Home Terr UTM		Note
					NAD 83 East	NAD 83 North				NAD 83 East	NAD 83 North	
KW-Mp	ATY	M	Mule Deer	MD02	429006	3721661	James Dilley Reserve	GC02,JD01	Y	430242	3718284	Wren translocated in 2011 from Glass Creek/Dilley. Disappeared from James Dilley 2011, the release site, found nesting at MD02 2012 & 2013. Distance is JD05 to MD02.
KW-Mp	ATY	M	Mule Deer	MD01	429077	3721824	James Dilley Reserve	GC02,JD01	Y	429018	3721645	Wren translocated in 2011 from Glass Creek/Dilley. It swithed to MD02 to mate and nest with MD01 female after his MD02 clutch fledged. Distance is MD02 to MD01
MpW-LBY	N	U	Mule Deer	MD02	429018	3721645	Same	MD02		428872	3721669	2nd gen of a translocated wren
MP-WR	TY	F	Mule Deer	MD01	429077	3721824	Same	MD01		429068	3721749	
WLB-MW	SY	M	Mule Deer	MD01	429069	3721826	Same	MD01		429074	3721826	After the 1st nest attempt this wren disappeared and the translocated male from MD02 KW-Mp took over the territory and nested with the MD01 female MP-WR.
DBM-RLG	N	U	Quail Hill	QH03	428260	3722246	Same	QH03		428314	3722236	
GN-MDB	SY	M	Quail Hill	QH01	428311	3721948	Mule Deer	MD01	Y	428989	3721893	
KDB-PM	N	U	Quail Hill	QH03	428224	3722244	Same	QH03		428269	3722251	
KP-MK	SY	M?	Quail Hill	QH10	427202	3723183	Sand Cyn Res.	SCR05	Y	426097	3724013	After the QH10 nest failed this bird was found at QH09 with a different wren, MLG-W. Distance is SCR05 to QH10.
KP-MK	SY	M?	Quail Hill	QH09	427017	3722884	Sand Cyn Res.	SCR05	Y	427202	3723183	After the QH10 nest failed this bird was found at QH09 with a different wren, MLG-W. Later KP-MK was resighted back at its natal territory SCR05. Distance is QH10 to QH09.
KP-MK	SY	M?	Sand Cyn Res.	SCR05/01	426108	3724033	Same	SCR05	Y	426097	3724013	This wren was 1st resighted at QH10 then QH09. Later it was resighted at its natal territor without it's new mate. Floater. Distance is QH09 back to SCR05.
LBK-MO	TY	F?	Quail Hill	QH10	427202	3723183	Boat Cyn	BTC01	Y	426708	3712613	
LBLG-OM	N	U	Quail Hill	QH07	427599	3723083	Same	QH07		427573	3723071	3rd gen of a translocated wren
LBP-M	4 yrs	F	Quail Hill	QH07	427578	3723083	Upper Newport Bay	UNB01	Y	417413	3723713	Banded at Upper Newport Bay (UNB01) in 2009 as a fledgling of wrens translocated from Portola in 2006. Parents at UNB01 are male OM-LG from Portola Pkwy/241 (434897, 3728213) and M-WO female from Irvine Blvd/Pusan Wy (434054, 3727289). In 2010 LBP-M was the territorial female at UNB02 then disappeared.

Appendix I - Table 3 *continued* . Resightings of banded Cactus Wrens during the Nature Reserve of Orange County 2013 Cactus Wren Studies. (N=68)

Bands*	2013 Age [†]	Sex	2013 Site	2013 Territory	Obs. Territory UTM		Original (Banding) Site	Original (Banding) Territory	Dispersal	Home Terr UTM		Note
					NAD 83 East	NAD 83 North				NAD 83 East	NAD 83 North	
LGDB-KMp	N	U	Quail Hill	QH01	428388	3722035	Same	QH01		428311	3721948	3rd gen of a translocated wren
MGN-DB	N	U	Quail Hill	QH03	428224	3722244	Same	QH03		428269	3722251	
MLB-LGK	N	U	Quail Hill	QH03	428314	3722236	Same	QH03		428260	3722246	
MLG-W	SY	U	Quail Hill	QH09	427017	3722884	UC Irvine	UC05/06	Y	421594	3722638	
MpDB-LGW	N	U	Quail Hill	QH01	428388	3722035	Same	QH01		428311	3721948	3rd gen of a translocated wren
MpK-W	TY	M	Quail Hill	QH08	427180	3722005	James Dilley Reserve	GC03/JD03	Y	430191	3718827	Translocated wren from Glass Creek to James Dilley Preserve in 2011. Disappeared from JD03 in 2012. Resighted at QH08 in 2013.
MP-WK	3 yrs	F	Quail Hill	QH03	428260	3722246	Same	QH03		428271	3722251	
OK-MP	SY	U	Quail Hill	QH06	427822	3722797	Crystal Cove State Park	CCSP01	Y	424464	3716269	Transient
OM-LBLB	3 yrs	M	Quail Hill	QH03	428260	3722246	Same	QH03		428373	3722255	
OM-YLB	N	U	Quail Hill	QH07	427599	3723083	Same	QH07		427573	3723071	3rd gen of a translocated wren
OO-RMp	N	U	Quail Hill	QH01	428388	3722035	Same	QH01		428311	3721948	3rd gen of a translocated wren
PY-DBM	TY	M	Quail Hill	QH04	427684	3721758	Same	QH03	Y	428373	3722255	
RR-RM	N	U	Quail Hill	QH03	428224	3722244	Same	QH03		428269	3722251	
WLB-MK	N	U	Quail Hill	QH07	427599	3723083	Same	QH07		427573	3723071	3rd gen of a translocated wren
YLG-MpO	SY	F	Quail Hill	QH01	428311	3721948	Mule Deer	MD02	Y	429006	3721661	2nd gen of a translocated wren
YY-OM	N	U	Quail Hill	QH03	428314	3722236	Same	QH03		428260	3722246	
Y-MLG	3 yrs	F?	Ridgeline SE	RLSE01	425692	3722746	Sand Cyn Res.	SCR04	Y	426684	3723297	
OLG-MW	N	U	Sand Cyn Res.	SCR05/01	426250	3723831	Same	SCR05/01		426108	3724033	
X-WM or X-MW	AHY	M	Shady Canyon	SHC03	427285	3720972	Bommer Cyn?	BMR	Y	425856	3720006	Band missing from the right leg and White band has slipped over the metal band. Most likely from BMR02 or BMR04. Could be from UC01 or CCSP04.
LB-DBM	TY	F	UC Irvine	UC03/04	421490	3722249	Same	UC04		421611	3722425	Single adult using the unoccupied territories.
LB-DBM	TY	F	UC Irvine	UC05/06	421594	3722638	Same	UC04		421611	3722425	Single adult using the unoccupied territories.
LB-DBM	TY	F	UC Irvine	UC01	421430	3721906	Same	UC04	Y	421611	3722425	Formerly single female replaced UC01 female (R-MR) and produced fledglings.
LGM-O	N	U	UC Irvine	UC01	421513	3721998	Same	UC01		421432	3721916	
M-LBK	N	U	UC Irvine	UC01	421476	3721999	Same	UC01		421430	3721906	
MLG-R	N	U	UC Irvine	UC01	421408	3721878	Same	UC01		421430	3721906	
MO-WP	N	U	UC Irvine	UC01	421475	3721994	Same	UC01		421371	3721880	
OW-M	3 yrs	M	UC Irvine	UC01	421371	3721880	Same	UC01		421376	3721863	
R-MR	4 yrs	F	UC Irvine	UC01	421371	3721880	Same	UC03	Y	421525	3722316	

Appendix I - Table 3 *continued* . Resightings of banded Cactus Wrens during the Nature Reserve of Orange County 2013 Cactus Wren Studies. (N=68)

Bands*	2013			2013 Territory	Obs. Territory UTM		Original (Banding) Site	Original (Banding) Territory	Dispersal	Home Terr UTM		Note
	Age [†]	Sex	2013 Site		NAD 83 East	NAD 83 North				NAD 83 East	NAD 83 North	
RR-M	N	U	UC Irvine	UC01	421396	3721910	Same	UC01		421432	3721916	
RR-M	HY	U	UC Irvine	UC06	421523	3722672	Same	UC01		421432	3721916	
W-MLB	N	U	UC Irvine	UC01	421385	3721990	Same	UC01		421430	3721906	
YM-LGP	N	U	UC Irvine	UC01	421420	3721952	Same	UC01		421371	3721880	
YM-LGP	HY	U	UC Irvine	UC03	421500	3722289	Same	UC01		421371	3721880	Transient HY foraging in area and wandering around the UCI site.
YM-LGP	HY	U	UC Irvine	UC05/06	421536	3722588	Same	UC01		421371	3721880	Transient HY foraging in area
GN-MR	N	U	Upper Newport Bay	UNB01	417496	3723796	Same	UNB01		417438	3723753	2nd gen of a translocated wren
LG-MLB	3 yrs	F	Upper Newport Bay	UNB02	417353	3723327	Same	UNB01	Y	417416	3723705	Inbreeding both from 2010 UNB01
M-YDB	3 yrs	M	Upper Newport Bay	UNB02	417353	3723327	Same	UNB01	Y	417416	3723705	Inbreeding both from 2010 UNB01
OM-LG	8+ yrs	M	Upper Newport Bay	UNB01	417438	3723753	Portola to UNB	PORT, UNB04	Y	418294	3723959	Translocated from Portola 2006. Released at UNB04. Dispersed to UNB01 2007. Orange band missing
OP-MW	N	U	Upper Newport Bay	UNB01	417496	3723796	Same	UNB01		417438	3723753	2nd gen of a translocated wren
PK-OM	N	U	Upper Newport Bay	UNB01	417496	3723796	Same	UNB01		417438	3723753	2nd gen of a translocated wren
W-MP	3 yrs	F	Upper Newport Bay	UNB01	417475	3723774	Same	UNB01		417448	3723777	Inbreeding W-MP from (O)M-LG 2010 nest.
YK-MK	HY	U	Upper Newport Bay	UNB01	417496	3723796	Same	UNB01		417438	3723753	2nd gen of a translocated wren

* Boxed in Duplicate Band Combination - A wren that was resighted at different territories and/or sites during 2013.

* Purple Fill - A wren associated with the 2011 Translocation from Lake Forest to James Dilley Preserve; either a wren that was relocated from Lake Forest or is a descendant of a wren relocated from Lake Forest in 2011.

* Blue Fill - A wren associated with the 2006 Translocation from the Portola Springs area to Upper Newport Bay; either a wren that was relocated from Portola or is a descendant of a wren relocated from Portola in 2006.

*Banding Code Definitions:*Age Codes

AHY = After Hatch Year (adult)
 ASY = After Second Year
 ATY = After Third Year
 HY = Hatch year (juvenile)
 N = Nestling or Fledgling
 SY = In Second Year (The Yr after HY)
 TY = In Third Year (The 2nd Yr after HY)
 U = Unknown Age (HY or AHY)

3 yrs = Three years old

4 yrs = Four years old

4+ yrs = Four or more years old

7+ Yrs = Seven or more years old

8+ yrs = Eight or more years old

[†] Age code follows the above categories until known age is past TY (Third Year or ~2 years old), then the age of the bird is in years.Sex Codes

F = Female
 M = Male
 U = Unknown

Color Band Codes (Right Leg-Left Leg)

DB = Dark blue
 H = Hot Pink
 GN = Medium Green
 K = Black
 LB = Light blue
 LG = Light green
 M = Metal USFWS band

Mp = Metal USFWS band anodized purple
 O = Orange
 P = Purple
 R = Red
 W = White
 X = Missing color band
 Y = Yellow

Appendix I - Table 4. Dispersal resightings of Cactus Wrens that were resighted away from their natal territories during the Nature Reserve of Orange County 2013 Cactus Wren Studies. (N=22)

Band Code*	Age Banded	Sex	Natal/Original (Banding) Site	Natal/Original (Banding) Territory	Date Last Seen at Original Territory	New 2013 Site	New 2013 Territory/ Location	Date First Seen at New Territory	2013 Age [†]	Straight Line Distance (km)	Breeding Status at 2013 Location	Comments
RDB-KM	SY	F	Bommer Cyn	BMR05	(3/29/12) seen at BMR05 again 7/5/12;	Bommer Cyn	BMR02	3/29/13	3 yrs	0.32	Transient	Last sighted in BMR05 in 2012; 1st sighted at BMR02 in 2013 . Distance is BMR05 to BMR02.
RDB-KM	SY	F	Bommer Cyn	BMR05		Boat Cyn	BTC03/01	5/13/13	3 yrs	7.65	Fledglings	In 2013 , 1st sighted at BMR02; later sighted and nesting at BTC03/01. Last seen feeding fledgling 6/7/13. Distance is BMR05 to BTC03/01 nest.
M-OP	N	F	Bommer Cyn	BMR05	10/24/11	Bommer Cyn	BMR03	12/21/11	TY	0.60	Pair	
RLB-LBM	N	U	Bommer Cyn	BMR02	3/15/13	Bommer Ridge Rd.	BRR02	4/15/13	SY	1.47	Pair	2012 BMR02; 2013 1st sighted at BMR02, then at BRR02; May have been resighted back at BMR02.
W-LBM	N	M	Bommer Cyn	BMR03	1/19/11	Bommer Ridge Rd.	BRR01	2/9/11	3 yrs	0.35	Pair	
MK-WY	HY	U	Crystal Cove State Park	CCSP01	7/18/12	Muddy Canyon	MCN04	6/20/13	SY	0.39	Single?	Appeared to be single
KW-Mp	AHY	M	Glass Creek/James Dilley Reserve	GC02,JD01	12/4/11 JD	Mule Deer	MD02	6/28/12	ATY	3.60	Fledglings	Tranlocated wren from Glass Creek to James Dilley Preserve, Laguna Cyn in 2011. Disappeared from James Dilley 2011, the release site, found nesting at MD02 2012 & 2013. Distance is JD05 to MD02.
KW-Mp	AHY	M	Glass Creek/James Dilley Reserve	GC02,JD01	Last seen at MD02 - 5/29/13	Mule Deer	MD01	6/12/13	ATY	0.19	Fledglings	Translocated wren from Glass Creek to James Dilley Preserve, Laguna Cyn in 2011. Moved from MD02 to mate and nest with MD01 female after his MD02 clutch fledged. Distance is MD02 to MD01.
GN-MDB	HY	M	Mule Deer	MD01	7/11/12	Quail Hill	QH01	7/27/13	SY	0.68	Fledglings	Feeding fledglings
KP-MK	N	M?	Sand Cyn Res.	SCR05	6/15/12. Returned 6/12/13	Quail Hill	QH10	4/26/13	SY	1.38	Nesting	After the QH10 nest failed this bird was found at QH09 with a different wren, MLG-W. Distance is SCR05 to QH10.
KP-MK	N	M?	Sand Cyn Res.	SCR05	6/15/12. Returned 6/12/13	Quail Hill	QH09	5/15/13	SY	0.35	Paired	After the QH10 nest failed this bird was found at QH09 with a different wren, MLG-W. Later KP-MK was resighted back at its natal territory SCR05. Distance is QH10 to QH09.

Appendix I - Table 4 *continued* . Dispersal resightings of Cactus Wrens that were resighted away from their natal territories during the Nature Reserve of Orange County 2013 Cactus Wren Studies.

Band Code*	Age Banded	Sex	Natal/Original (Banding) Site	Natal/Original (Banding) Territory	Date Last Seen at Original Territory	New 2013 Site	New 2013 Territory/ Location	Date First Seen at New Territory	2013 Age [†]	Straight Line Distance (km)	Breeding Status at 2013 Location	Comments
KP-MK	N	M?	Sand Cyn Res.	SCR05	6/15/12. Returned 6/12/13	Sand Cyn Res.	SCR05/01	Resighted at SCR05 6/12/13	SY	1.46	Intruder?	This wren was 1st resighted at QH10 then QH09. Later it was resighted at its natal territory without its new mate. Floater. Distance is QH09 back to SCR05.
LBK-MO	HY	F?	Boat Cyn	BTC01	7/22/11	Quail Hill	QH10	4/26/13	TY	10.58	Nesting	Nest Depredated?
LBP-M	HY	F	Upper Newport Bay	UNB01	4/27/09	Quail Hill	QH07	4/11/13	4 yrs	10.18	Fledglings	Banded at Upper Newport Bay (UNB01) in 2009 as a fledgling of wrens translocated from Portola in 2006. Parents at UNB01 are male OM-LG from Portola Pkwy/241 (434897, 3728213) and M-WO female from Irvine Blvd/Pusan Wy (434054, 3727289). In 2010 LBP-M was the territorial female at UNB02 then disappeared.
MLG-W	N	U	UC Irvine	UC05/06	2/14/13	Quail Hill	QH09	5/15/13	SY	5.43	Paired?	No resighted after 5/16/13
MpK-W	HY	M	Glass Creek/James Dilley Reserve	GC03/JD03	4/21/12	Quail Hill	QH08	4/18/13	TY	4.38	Paired	Translocated wren from Glass Creek to James Dilley Preserve, Laguna Cyn in 2011. Disappeared from JD03 in 2012.
OK-MP	HY	U	Crystal Cove State Park	CCSP01	7/24/12	Quail Hill	QH06	3/18/13	SY	7.34	Transient	
PY-DBM	N	M	Quail Hill	QH03	12/20/11	Quail Hill	QH04	5/9/12	TY	0.85	Pair	
YLG-MpO	N	F	Mule Deer	MD02	7/27/12	Quail Hill	QH01	4/17/13	SY	0.75	Fledglings	2nd gen of a translocated wren
Y-MLG	N	F?	Sand Cyn Res.	SCR04	7/8/10	Ridgeline SE	RLSE01	3/20/13	3 yrs	1.13	Pair	
X-WM or X-MW	U	M	Bommer Cyn?	BMR	2010-2012	Shady Canyon	SHC03	2013	AHY	1.72		Band missing from the right leg and White band has slipped over the metal band. Most likely from BMR02 or BMR04. Could be from UC01 or CCSP04.
LB-DBM	N	F	UC Irvine	UC04	6/30/11	UC Irvine	UC01	8/6/13	TY	0.55	Fledglings	Formerly single female replaced UC01 female (R-MR) and produced fledglings.
R-MR	N	F	UC Irvine	UC03	6/8/09	UC Irvine	UC01	1/4/11	4 yrs	0.46	Fledglings	

Appendix I - Table 4 *continued*. Dispersal resightings of Cactus Wrens that were resighted away from their natal territories during the Nature Reserve of Orange County 2013 Cactus Wren Studies.

Band Code*	Age Banded	Sex	Natal/Original (Banding) Site	Natal/Original (Banding) Territory	Date Last Seen at Original Territory	New 2013 Site	New 2013 Territory/Location	Date First Seen at New Territory	2013 Age [†]	Straight Line Distance (km)	Breeding Status at 2013 Location	Comments
LG-MLB	N	F	Upper Newport Bay	UNB01	1/8/10	Upper Newport Bay	UNB02	3/29/11	3 yrs	0.38	Nesting	Inbreeding, paired with sibling from 2010 UNB01. 2nd gen of a translocated wren
M-YDB	N	M	Upper Newport Bay	UNB01	12/28/10	Upper Newport Bay	UNB02		3 yrs	0.38	Nesting	Wren moved between the neighboring territories as a HY Juv. in 2010. Inbreeding, paired with sibling from 2010 UNB01. 2nd gen of a translocated wren.
(O)M-LG	AHY	M	Portola to UNB	PORT, UNB01	7/15/06	Upper Newport Bay	UNB01	5/15/07	8+ yrs	0.88	Fledglings	Translocated from Portola 2006. Released at UNB04. Dispersed to UNB01 2007. Orange band missing

* Boxed in Duplicate Band Combination - A wren that was resighted at different territories and/or sites during 2013.

* Purple Fill - A wren associated with the 2011 Translocation from Lake Forest to James Dilley Preserve; either a wren that was relocated from Lake Forest or is a descendant of a wren relocated from Lake Forest in 2011.

* Blue Fill - A wren associated with the 2006 Translocation from the Portola Springs area to Upper Newport Bay; either a wren that was relocated from Portola or is a descendant of a wren relocated from Portola in 2006.

Banding Code Definitions:

Age Codes

AHY = After Hatch Year (adult)

ASY = After Second Year

ATY = After Third Year

HY = Hatch year (juvenile)

N = Nestling or Fledgling

SY = In Second Year (The Yr after HY)

TY = In Third Year (The 2nd Yr after HY)

U = Unknown Age (HY or AHY)

3 yrs = Three years old

4 yrs = Four years old

4+ yrs = Four or more years old

7+ Yrs = Seven or more years old

8+ yrs = Eight or more years old

[†] Age code follows the above categories until known age is past TY (Third Year or ~2 years old), then the age of the bird is in years.

Sex Codes

F = Female

M = Male

U = Unknown

Color Band Codes (Right Leg-Left Leg)

DB = Dark blue

H = Hot Pink

GN = Medium Green

K = Black

LB = Light blue

LG = Light green

M = Metal USFWS band

Mp = Metal USFWS band anodized purple

O = Orange

P = Purple

R = Red

W = White

X = Missing color band

Y = Yellow

Appendix I - Table 5. Bander, Fish & Wildlife Service band number, date, territory code, color band code, age, sex, geographic coordinates, feather and toenail clip (blood) collection status for Cactus Wrens captured and banded by Nature Reserve of Orange County biologists in 2013. No toenail clips conducted.

Bander	USFWS Band*	Date	Location	Color Bands*	Age	Sex	Banding	NAD83 UTM		Pulp	Toenail
Initials	Number			(RLeg-LL)				Easting	Northing	Feather	Clip
DK	178175994	4/12/2013	JD01	DBM-GN	ATY	M	Removed [†]	430344	3718350		
DK	(178175994)	4/12/2013	JD02	DB-HGN	ATY	M	Change [†]	430344	3718350		
KM	233188251	4/21/13	BMR04	YLG-RM	N	U	New	425754	3720428	Y	
KM	233188252	4/28/13	UC01	K-MLB	N	U	New	421432	3721916	Y	
KM	233188253	4/28/2013	UC01	RR-M	N	U	New	421432	3721916	Y	
KM	233188254	4/28/2013	UC01	LGM-O	N	U	New	421432	3721916	Y	
KM	233188255	5/28/2013	BMR04	WY-LBM	N	U	New	425804	3720390	Y	
KM	233188256	5/28/2013	BMR04	RDB-MW	N	U	New	425804	3720390	Y	
KM	233188257	5/28/2013	BMR04	KM-DBY	N	U	New	425804	3720390	Y	
KM	233188258	6/3/2013	SCR05	OLG-MW	N	U	New	426108	3724033	Y	
KM	233188259	7/24/2013	UC01	MLG-R	N	U	New	421430	3721906		
KM	233188260	7/24/2013	UC01	M-LBK	N	U	New	421430	3721906		
KM	233188261	7/24/2013	UC01	W-MLB	N	U	New	421430	3721906		
DK	233188319	3/11/2013	UC01	YM-LGP	N	U	New	421371	3721880	Y	
DK	233188320	3/11/2013	UC01	MO-WP	N	U	New	421371	3721880	Y	
DK	233188321	4/17/2013	UNB01	MK-PO	N	U	New	417475	3723774	Y	
DK	233188322	4/17/2013	UNB01	RM-GN	N	U	New	417475	3723774	Y	
DK	233188323	4/24/2013	QH03	MLB-LGK	N	U	New	428260	3722246	Y	
DK	233188324	4/24/2013	QH03	DBM-RLG	N	U	New	428260	3722246	Y	
DK	233188325	4/24/2013	QH03	YY-OM	N	U	New	428260	3722246	Y	
DK	233188326	5/13/2013	UNB02	OP-MK	N	U	New	417353	3723327	Y	
DK	233188327	5/13/2013	UNB02	YGN-M	N	U	New	417353	3723327	Y	
DK	233188328	5/13/2013	UNB02	MR-LBDB	N	U	New	417353	3723327	Y	
DK	233188329	5/13/2013	UNB02	M-WGN	N	U	New	417353	3723327	Y	
DK	233188330	5/30/2013	BTC03	LGM-LGR	N	U	New	427144	3712507	Y	
DK	233188331	6/5/2013	QH07	LBLG-OM	N	U	New	427599	3723083	Y	
DK	233188332	6/5/2013	QH07	WLB-MK	N	U	New	427599	3723083	Y	
DK	233188333	6/5/2013	QH07	OM-YLB	N	U	New	427599	3723083	Y	
DK	233188334	6/18/2013	QH03	MGN-DB	N	U	New	428269	3722251	Y	
DK	233188335	6/18/2013	QH03	KDB-PM	N	U	New	428269	3722251	Y	
DK	233188336	6/18/2013	QH03	RR-RM	N	U	New	428269	3722251	Y	
DK	233188337	7/2/2013	UNB01	OP-MW	N	U	New	417438	3723753	Y	
DK	233188338	7/2/2013	UNB01	GN-MR	N	U	New	417438	3723753	Y	
DK	233188339	7/2/2013	UNB01	YK-MK	N	U	New	417438	3723753	Y	
DK	233188340	7/2/2013	UNB01	PK-OM	N	U	New	417438	3723753	Y	
DK	233188341	7/17/2013	CCSP01	OO-WM	HY	U	New	424464	3716269		
DK	242111103	7/24/2013	MD01	KW-Mp	ATY	M	Recapture	428989	3721893		
DK	242111117	4/24/2013	MD02	MpW-LBY	N	U	New	429018	3721645	Y	
DK	242111118	4/24/2013	MD02	GNMp-W	N	U	New	429018	3721645	Y	
DK	242111119	5/5/2013	QH01	OO-RMp	N	U	New	421311	3721948	Y	

Appendix I - Table 5 *continued* . Bander, Fish & Wildlife Service band number, date, territory code, color band code, age, sex, geographic coordinates, feather and toenail clip (blood) collection status for Cactus Wrens captured and banded by Nature Reserve of Orange County biologists in 2013. No toenail clips conducted.

Bander	USFWS		Location	Color		Age	Sex	Banding	NAD83 UTM		Pulp	Toenail
	Band*	Date		Bands*	(RLeg-LL)				Easting	Northing	Feather	Clip
DK	242111120	5/5/2013	QH01	MpDB-LGW		N	U	New	421311	3721948	Y	
DK	242111121	5/5/2013	QH01	LGDB-KMp		N	U	New	421311	3721948	Y	
†	The FWS metal band on DBM-GN was constricting this wren's swollen leg, so it was recaptured in order to remove the band. FWS metal band was replaced by a plastic color band only in order to identify the bird, DB-HGN. A metal band was not used since this bird appears to have a reaction associated with the metal bands.											
* Blue	Light Blue highlight indicates the bird was translocated from an area south of Highway 241 and Portola Parkway in Irvine, CA, to Upper Newport Bay during 2006 or the descendant of a 2006 translocated bird.											
* Purple	Purple highlight indicates the bird was translocated from Lake Forest Sports Park site to James Dilley Preserve in Laguna Beach, CA, during 2011 or the descendant of a 2011 translocated bird and the use of a purple anodized FWS band.											

Banding Code Definitions:

Bander Initials

DK = Dana Kamada

KM = Karly Moore

Location Codes

AC = Aliso Canyon, OC Parks

BG = Buck Gully, City of Newport Beach

BMR = Bommer Canyon, City of Irvine Open Space

BTC = Boat Canyon

BRR = Bommer Ridge Road, City of Irvine Open Space

BRV = Bonita Reservoir

CCSP = Crystal Cove State Park

CDG* = Calle Delgado, Not a NROC site

ERR = Emerald Ridge Road

JD = James Dilley Open Space Reserve

LCT = Laguna Canyon Triangle

LCW = Laguna Coast Wilderness, OC Parks

LL = Laguna Laurel

MCN = Muddy Canyon

MD = Mule Deer, City of Irvine Open Space

NELC = Northeast Laguna Canyon, City of Irvine

QH = Quail Hill, City of Irvine Open Space

RL = Ridgeline Drive

SCR = Sand Canyon Reservoir, City of Irvine Open Space

SHC = Shady Canyon

TRD = Turtle Ridge, City of Irvine

TRK = Turtle Rock

UC = University of California, Irvine Ecological Preserve

UNB = Upper Newport Bay

WC = Woods Canyon, OC Parks

Age Codes

AHY = After Hatch Year (adult)

ASY = After Second Year

ATY = After Third Year

HY = Hatch year (juvenile)

N = Nestling or Fledgling

SY = In Second Year (The Yr after HY)

TY = In Third Year (The 2nd Yr after HY)

U = Unknown Age (HY or AHY)

Sex Codes

F = Female

M = Male

U = Unknown

Color Band Codes (Right Leg-Left Leg)

DB = Dark blue

GN = Medium Green

H = Hot Pink

K = Black

LB = Light blue

LG = Light green

M = Metal USFWS band

Mp = Metal USFWS band anodized purple

O = Orange

P = Purple

R = Red

W = White

X = Missing color band

Y = Yellow

Table 6a. Cactus Wrens , from 2011 to 2013, that are associated with the 2011 Translocation from Lake Forest Sports Park project site (formerly Glass Creek) to the James Dilley Preserve in Laguna Beach.

Color Bands* (RLeg-LL)	USFWS Band Number	Age [†]	Sex	Date	NAD83 UTM		Location	Territory	Breeding Status	Summary Observations
Mp-KO	242111101	AHY	M	11/18/11	438823	3724746	Lake Forest Sports Park formerly Glass Creek	GC03	Pair?	We captured and banded this wren, but released it at its donor site territory since we did not capture the mate and considered it too late in the day to relocate it.
Mp-KO	242111101	AHY	M	11/25/11	438932	3724992	Lake Forest Sports Park formerly Glass Creek	GC03	Pair?	Recaptured this wren and relocated it to James Dilley Preserve.
Mp-KO	242111101	AHY	M	11/25/11	430167	3718516	James Dilley	JD02	Release	Released the wren at James Dilley Preserve.
Mp-KO	242111101	ASY	M	7/4/05	430184	3718533	James Dilley	JD02	Paired & Fledged Chicks	During 2012, this male wren paired with DBLB-Mp. Their 1st brood nest failed and their 2nd nest produced 2 fledglings. He used the feeding stations when we provided mealworms. Last seen 9/24/12, not detected in 2013.
DBLB-Mp	242111106	AHY	F	11/25/11	438932	3724992	Lake Forest Sports Park formerly Glass Creek	GC02	Pair?	Wren captured in Lake Forest and relocated to James Dilley Preserve the same day.
DBLB-Mp	242111106	ASY	F	7/4/05	430184	3718533	James Dilley	JD02	Paired & Fledged Chicks	This female wren paired with Mp-KO and produced 2 fledglings. She was more wary about using the feeding stations, but did approach to forage on meal worms. Last seen 7/31/12 feeding fledglings, not detected in 2013.
RMp-YK	242111112	HY	U	6/29/12	430184	3718533	James Dilley	JD02	Fledgling	Fledgling of Mp-KO and DBLB-Mp. Last seen 7/24/12, not detected in 2013.
MpGN-R	242111113	HY	U	6/29/12	430184	3718533	James Dilley	JD02	Fledgling	Fledgling of Mp-KO and DBLB-Mp. Last seen 7/24/12, not detected in 2013.
DB-LGMP	242111102	AHY	M	2011	438927	3725067	Lake Forest Sports Park formerly Glass	GC05	Pair	Wren captured in Lake Forest and relocated to James Dilley Preserve the same day.
DB-LGMP	242111102	ASY	M	11/22/11 to 6/29/12	430236	3718527	James Dilley	JD01	Paired & Fledged Chicks	This wren paired with W-MpY and they produced 2 fledglings. He readily accepted supplemental feeding when it was provided.

Table 6a *continued* . Cactus Wrens , from 2011 to 2013, that are associated with the 2011 Translocation from Lake Forest Sports Park project site (formerly Glass Creek) to the James Dilley Preserve in Laguna Beach.

Color Bands* (RLeg-LL)	USFWS Band Number	Age [†]	Sex	Date	NAD83 UTM		Location	Territory	Breeding Status	Summary Observations
DB-LGMP Changed to DBM-GN	242111102 Change to 178175994	ASY	M	6/29/12	430236	3718527	James Dilley	JD01	Paired & Fledged Chicks	We recaptured the wren while capturing the fledglings to band and sample and noticed the anodized FWS band on the left leg was tight and the foot swollen. The bands were removed and a new band combination with a regular FWS band was put onto the right leg. This band rotated freely on the leg and the wren appeared in good condition after two months.
DBM-GN Changed to DB-HGN	178175994 Metal Band Removed	ATY	M	4/12/13	430328	3718352	James Dilley	JD01	Nesting	The wren's right leg and foot were swollen, so we recaptured the wren to remove the metal band. By the time the wren was recaptured, it lost it's foot and metal band. The end of the right leg was dry and scarred over. Since the wren appears to be reacting to the metal bands, so only a plastic color band was added, but no metal bands.
DB-HGN	No Metal Band	ATY	M	5/8/13	430328	3718352	James Dilley	JD01	Nesting	The wren appeared to gain strength and coping with missing it's right foot. The pair attempted two brood nests, but the eggs of the first nest did not hatch and the 2nd nest appeared to be depredated. The pair disappeared after the nest failed. This wren was last seen 6/11/13, missing it's DB band.
W-MpY	242111105	AHY	F	11/22/11	438927	3725067	Lake Forest Sports Park formerly Glass Creek	GC05	Pair	Wren captured in Lake Forest and relocated to James Dilley Preserve the same day. Eventually re-paired with its suspected mate, at the time DB-LGMP.
W-MpY	242111105	ASY	F	2012	430352	3718347	James Dilley	JD01	Paired & Fledged Chicks	W-MpY and DB-LGMP produced 2 fledglings during 2012.
W-MpY	242111105	ATY	F	2013	430350	3718344	James Dilley	JD01	Nesting	Attempted two brood nests in 2013, but the clutch of eggs did not hatch and the 2nd clutch appeared to be depredated.
OMP-PO	242111110	HY	U	6/29/12	430319	3718377	James Dilley	JD01	Fledgling	Fledgling of DB-LGMP and W-MpY. Last seen 7/24/12, not detected in 2013.
MpP-RY	242111111	HY	U	6/29/12	430319	3718377	James Dilley	JD01	Fledgling	Fledgling of DB-LGMP and W-MpY. Last seen 7/24/12, not detected in 2013.

Table 6a *continued* . Cactus Wrens , from 2011 to 2013, that are associated with the 2011 Translocation from Lake Forest Sports Park project site (formerly Glass Creek) to the James Dilley Preserve in Laguna Beach.

Color Bands* (RLeg-LL)	USFWS Band Number	Age [†]	Sex	Date	NAD83 UTM		Location	Territory	Breeding Status	Summary Observations
KW-Mp	242111103	AHY	M	11/19/11	438986	3724977	Lake Forest Sports Park formerly Glass Creek	GC02	Pair?	Wren captured in Lake Forest and relocated to James Dilley Preserve the same day.
KW-Mp	242111103	AHY	M	12/4/11	430242	3718284	James Dilley	JD01	Unk	Last seen at JD 12/4/11. Not resighted until 6/28/12 at Mule Deer
KW-Mp	242111103	ASY	M	2012	429006	3721661	Mule Deer	MD02	Paired & Fledged Chicks	Paired with an unbanded female and produced 3 fledglings in 2012.
KW-Mp	242111103	ATY	M	6/28/12 to 5/29/13	429018	3721645	Mule Deer	MD02	Paired & Fledged Chicks	Paired with an unbanded female and produced 2 fledglings with his 1st clutch in 2012. 2nd clutch was later produced with the MD01 female.
KW-Mp	242111103	ATY	M	6/12/13	429077	3721824	Mule Deer	MD01	Paired & Fledged Chicks	This wren left M02 and produced a 2nd clutch of 3 fledglings with the MD01 female, MP-WR in 2012.
UB		AHY	F	2012	429006	3721661	Mule Deer	MD02	Paired & Fledged Chicks	Unbanded female wren, not a translocated bird, found feeding nestlings with KW-Mp when KW-Mp was initially resighted at Mule Deer on 6/28/12.
UB		AHY	F	6/28/12 to 5/29/13	429006	3721661	Mule Deer	MD02	Paired & Fledged Chicks	UnBanded female wren, not a translocated bird, found feeding nestlings with KW-Mp when KW-Mp was initially resighted at Mule Deer on 6/28/12.
MP-WR	178175904	TY	F	6/12/13	429077	3721824	Mule Deer	MD01	Paired & Fledged Chicks	Non-translocated wren, banded at MD01 in 2011, paired with KW-Mp and produced a clutch of 3 fledglings.
GNO-Mp	242111114	HY	U	7/6/12	429006	3721661	Mule Deer	MD02	Fledgling	Fledgling of KW-Mp and UB female last seen 7/27/12.
MpR-LGDB	242111115	HY	U	7/6/12	429006	3721661	Mule Deer	MD02	Fledgling	Fledgling of KW-Mp and UB female last seen 7/27/12.
YLG-MpO	242111116	HY	U	7/6/12	429006	3721661	Mule Deer	MD02	Fledgling	Fledgling of KW-Mp and UB female seen with nest mates on 7/27/12. This one was resighted later in 2013 feeding its own fledglings at Quail Hill.
MpW-LBY	242111117	HY	U	4/24/13	429018	3721645	Mule Deer	MD02	Fledgling	Fledgling of KW-Mp and UB female last seen 6/4/13.
GNMp-W	242111118	HY	U	4/24/13	429018	3721645	Mule Deer	MD02	Fledgling	Fledgling of KW-Mp and UB female last seen 6/4/13.

Table 6a *continued* . Cactus Wrens , from 2011 to 2013, that are associated with the 2011 Translocation from Lake Forest Sports Park project site (formerly Glass Creek) to the James Dilley Preserve in Laguna Beach.

Color Bands* (RLeg-LL)	USFWS Band Number	Age [†]	Sex	Date	NAD83 UTM		Location	Territory	Breeding Status	Summary Observations
UB		HY	U	6/25/13	429077	3721824	Mule Deer	MD01	Fledgling	Fledgling of KW-Mp and MP-WR female last observed 7/15/13. Nest was not safely accessible and fledglings left MD02 earlier than expected, so were not banded.
UB		HY	U	6/25/13	429077	3721824	Mule Deer	MD01	Fledgling	Fledgling of KW-Mp and MP-WR female last observed 7/15/13. Nest was not safely accessible and fledglings left MD02 earlier than expected, so were not banded.
UB		HY	U	6/25/13	429077	3721824	Mule Deer	MD01	Fledgling	Fledgling of KW-Mp and MP-WR female last observed 7/15/13. Nest was not safely accessible and fledglings left MD02 earlier than expected, so were not banded.
YLG-MpO	242111116	SY	F	2013	428311	3721948	Quail Hill	QH01	Paired & Fledged Chicks	This wren was a fledgling of KW-Mp and an UB at Mule Deer (MD02) in 2012. In 2013, she was resighted at Quail Hill (QH01) paired with GN-MDB and produced 3 fledglings.
GN-MDB	178175999	SY	M	2013	428311	3721948	Quail Hill	QH01	Paired & Fledged Chicks	Non-translocated wren, banded at MD01 in 2012, paired with YLG-MpO and produced a clutch of 3 fledglings.
OO-RMp	242111119	HY	U	5/5/13	428311	3721948	Quail Hill	QH01	Fledgling	Fledgling of YLG-MpO and GN-MDB male last seen 6/19/13. 3rd generation of a translocated wren, KW-Mp.
MpDB-LGW	242111120	HY	U	5/5/13	428311	3721948	Quail Hill	QH01	Fledgling	Fledgling of YLG-MpO and GN-MDB male last seen 6/19/13. 3rd generation of a translocated wren, KW-Mp.
LGDB-KMp	242111121	HY	U	5/5/13	428311	3721948	Quail Hill	QH01	Fledgling	Fledgling of YLG-MpO and GN-MDB male last seen 6/19/13. 3rd generation of a translocated wren, KW-Mp.
KMp-K	242111104	AHY	U	11/21/11	439331	3725075	Lake Forest Sports	GC04	Single?	Wren captured in Lake Forest and relocated to James Dilley Preserve the same day.
KMp-K	242111104	AHY	U	11/21/11	430328	3718352	James Dilley	JD01	Release	Released the wren at James Dilley Preserve.
KMp-K	242111104	AHY	U	11/27/11	430192	3718481	James Dilley	JD02	Single?	Building a roost nest.
KMp-K	242111104	AHY	U	12/7/11	430214	3718279	James Dilley	JD02	Single?	Last seen at the margins of JD02. Suspect it was pushed out of JD02 by Mp-KO and DBLB-Mp, who later nested there in 2012. KMp-K was not
Mp-RK	242111107	AHY	U	11/25/11	438810	3724745	Lake Forest Sports Park formerly Glass Creek	GC03	Unk	Wren captured in Lake Forest and relocated to James Dilley Preserve the same day.
Mp-RK	242111107	AHY	U	11/25/11	430167	3718516	James Dilley	JD03	Release	Released the wren at James Dilley Preserve.

Table 6a *continued* . Cactus Wrens , from 2011 to 2013, that are associated with the 2011 Translocation from Lake Forest Sports Park project site (formerly Glass Creek) to the James Dilley Preserve in Laguna Beach.

Color	USFWS	NAD83 UTM								
Bands*	Band	Breeding								
(RLeg-LL)	Number	Age [†]	Sex	Date	Easting	Northing	Location	Territory	Status	Summary Observations
Mp-RK	242111107	ASY	U	2/24/12	430310	3718735	James Dilley	JD03	Single	Last seen 2/24/12 near the feeding station where it was usually found calling or foraging. The wren was not resighted in 2013.
MpK-W	242111108	HY	U	11/25/11	438810	3724745	Lake Forest Sports Park formerly Glass Creek	GC03	Juvenal	Wren captured in Lake Forest and relocated to James Dilley Preserve the same day.
MpK-W	242111108	HY	U	11/25/11	430167	3718516	James Dilley	JD03	Release	Released the wren at James Dilley Preserve.
MpK-W	242111108	SY	U	4/21/12	430191	3718827	James Dilley	JD03	Single	This 2nd year wren was frequently observed foraging and calling near feeding station 5. We did not detect MpK-W after 4/21/12.
MpK-W	242111108	TY	M	4/18/13	427100	3721951	Quail Hill	QH08	Pair	This wren was resighted at Quail Hill (QH08) with an adult unbanded wren in 2013. No brood nests were detected. Pair was last seen 5/9/13.
UB		AHY	F	4/18/13	427100	3721951	Quail Hill	QH08	Pair	Non-translocated wren foraging and displaying with MpK-W at QH08. It tended to be more secretive and was more interested in foraging. Pair last seen 5/9/13.
P-KMp	242111109	HY	U	11/25/11	438810	3724745	Lake Forest Sports Park formerly Glass Creek	GC03	Juvenal	Wren captured in Lake Forest and relocated to James Dilley Preserve the same day.
P-KMp	242111109	HY	U	11/25/11	430167	3718516	James Dilley	JD03	Release	Released the wren at James Dilley Preserve.
P-KMp	242111109	SY	U	4/17/12	429675	3718641	James Dilley		Transient	This 2nd year wren was seen with its presumed sibling, MpK-W, near feeding station 5 until 1/20/12. Afterwards, it was seen calling at various unoccupied patches of cactus scrub through out James Dilley Preserve until 4/17/12; it has not been seen since then. The wren was not resighted in 2013.

* Yellow - YLG-MpO dispersed from its natal site at Mule Deer to Quail Hill.

* Green - The wren is not likely to be a translocated bird.

Table 6a *continued* . Cactus Wrens , from 2011 to 2013, that are associated with the 2011 Translocation from Lake Forest Sports Park project site (formerly Glass Creek) to the James Dilley Preserve in Laguna Beach.

Banding Code Definitions:

Age Codes

AHY = After Hatch Year (adult)

ASY = After Second Year

ATY = After Third Year

HY = Hatch year (juvenile)

N = Nestling or Fledgling

SY = In Second Year (The Yr after HY)

TY = In Third Year (The 2nd Yr after HY)

U = Unknown Age (HY or AHY)

Sex Codes

F = Female

M = Male

U = Unknown

Color Band Codes (Right Leg-Left Leg)

DB = Dark blue

GN = Medium Green

K = Black

H = Hot Pink

LB = Light blue

LG = Light green

M = Metal USFWS band

Mp = Metal USFWS band anodized purple

O = Orange

P = Purple

R = Red

W = White

X = Missing color band

Y = Yellow

† Age code follows the above categories until known age is past TY (Third Year or ~2 years old), then the age of the bird is in years.

Table 6b. Cactus Wrens, from 2006 to 2013, that are associated with the 2006 Translocation from Portola Springs area near the central reserve to Upper Newport Bay in the coastal reserve.

Color Bands (RLeg-LL)	USFWS Band Number	Age [†]	Sex	Date	NAD83 UTM		Location	Territory	Breeding Status	Summary Observations*
RM-R	168187702	HY	U	6/17/06	434068	3727316	Irvine Blvd	1	Fledgling	Fledgling of M-RW and M-WO.
RM-R	168187702	HY	U	6/17/06	417524	3723817	Upper Newport Bay	UNB01	Released Fledgling	Fledgling of M-RW and M-WO. Last observed on day of release, 6/17/06.
WM-W	168187703	HY	U	6/17/06	434068	3727316	Irvine Blvd	1	Fledgling	Fledgling of M-RW and M-WO.
WM-W	168187703	HY	U	6/17/06	417524	3723817	Upper Newport Bay	UNB01	Released Fledgling	Fledgling of M-RW and M-WO. Last observed on 7/10/06 when it was 43 days old. Appeared to be able to forage on its own.
M-RW	168187705	AHY	M	6/17/06	434068	3727316	Irvine Blvd	1	Paired & Fledged Chicks	Wren captured near Irvine Blvd and Pusan Way and relocated to Upper Newport Bay with family group the same day.
M-RW	168187705	AHY	M	6/17/06	417524	3723817	Upper Newport Bay	UNB01	Released Pair & Fledglings	The pair began to forage and feed their remaining fledgling, build roost nests, and engage in territorial defence behavior. This wren was last observed 7/17/06.
M-WO	168187704	AHY	F	6/17/06	434068	3727316	Irvine Blvd	1	Paired & Fledged Chicks	Wren captured near Irvine Blvd and Pusan Way and relocated to Upper Newport Bay with family group the same day. Paired with M-RW.
M-WO	168187704	AHY	F	6/17/06	417524	3723817	Upper Newport Bay	UNB01	Released Pair & Fledglings	The pair began to forage and feed their remaining fledgling, build roost nests, and engage in territorial defence behavior. This wren was last observed in 2006 on 7/10/06. Paired with M-RW
M-WO	168187704	AHY	F	2007	417475	3723784	Upper Newport Bay	UNB01	Paired & Fledged Chicks	In 2007, the wren's new mate was OM-LG . Produced at least one fledglings in 2007.
M-WO	168187704	ASY	F	2009	417413	3723713	Upper Newport Bay	UNB01	Paired & Fledged Chicks	No monitoring conducted during 2008. In 2009, still paired with OM-LG. Produced 6 fledglings in 2009.
M-WO	168187704	ATY	F	2010	417478	3723795	Upper Newport Bay	UNB01	Paired & Fledged Chicks	In 2010, still paired with OM-LG. Produced 9 fledglings in 2010.
X-M	168187721	HY	U	7/10/07	417458	3723775	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and M-WO. Last seen 8/29/2007, not detected since then to date, 2013.

Table 6b *continued*. Cactus Wrens, from 2006 to 2013, that are associated with the 2006 Translocation from Portola Springs area near the central reserve to Upper Newport Bay in the coastal reserve.

Color Bands (RLeg-LL)	USFWS Band Number	Age [†]	Sex	Date	NAD83 UTM		Location	Territory	Breeding Status	Summary Observations*
DBM-DB	168187766	HY	U	4/27/09	417413	3723713	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and M-WO. Last seen 4/27/09, not detected since then to date, 2013.
LBP-M	168187767	HY	U	4/27/09	417413	3723713	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and M-WO. Last seen 4/27/09, but resighted in 2010 and later in 2013.
LBP-M	168187767	SY	F	2010	417343	3723311	Upper Newport Bay	UNB02	Paired and Nesting	Paired with P-MDG and made one nest attempt which failed. P-MDG disappeared during incubation. LBP-M last seen at the site 5/3/10.
LBP-M	168187767	4 yrs	F	2013	427578	3723083	Quail Hill	QH07	Dispersal Paired & Fledged Chicks	First resighting of a wren that dispersed from Upper Newport Bay. Fledgling of OM-LG and M-WO, who were originally translocated in 2006. LBP-M paired with an unbanded male at QH07 produced 3 Fledglings in 2013.
LBLG-OM	233188331	HY	U	6/5/13	427599	3723083	Quail Hill	QH07	Fledgling	Fledgling of LBP-M and UnBanded male.
WLB-MK	233188332	HY	U	6/5/13	427599	3723083	Quail Hill	QH07	Fledgling	Fledgling of LBP-M and UnBanded male.
OM-YLB	233188333	HY	U	6/5/13	427599	3723083	Quail Hill	QH07	Fledgling	Fledgling of LBP-M and UnBanded male.
P-MDG	168187747	AHY	M	3/23/09	417355	3723260	Upper Newport Bay	UNB02	Paired & Nesting	Banded male with an unbanded female. One nest attempt, but it was depredated and the female was not resighted afterwards.
P-MDG	168187747	ASY	M	2010	417343	3723311	Upper Newport Bay	UNB02	Paired & Nesting	Paired with LBP-M and made one nest attempt which failed. P-MDG disappeared during incubation, last seen at the site 3/22/10.
RW-M	178175627	HY	U	5/21/09	417413	3723713	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and M-WO. Last seen 4/27/09, not detected since then to date, 2013.
Y-RM	178175628	HY	U	5/21/09	417413	3723713	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and M-WO. Last seen 4/27/09, not detected since then to date, 2013.
M-OW	178175629	HY	U	5/21/09	417413	3723713	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and M-WO. Last seen 4/27/09, not detected since then to date, 2013.
O-MDB	178175630	HY	U	5/21/09	417413	3723713	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and M-WO. Last seen 4/27/09, not detected since then to date, 2013.
YM-W	178175672	HY	U	3/18/10	417416	3723705	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and M-WO. Last seen 12/28/10.
YM-W	178175672	SY	U	2011	417443	3723714	Upper Newport Bay	UNB01	Single	Fledgling of OM-LG and M-WO. Apparently tried to establish a territory at the north edge of UNB01. Last seen 3/3/11, not detected since then to date, 2013.

Table 6b *continued* . Cactus Wrens, from 2006 to 2013, that are associated with the 2006 Translocation from Portola Springs area near the central reserve to Upper Newport Bay in the coastal reserve.

Color Bands (RLeg-LL)	USFWS Band Number	Age [†]	Sex	Date	NAD83 UTM		Location	Territory	Breeding Status	Summary Observations*
R-RM	168187839	HY	U	5/10/10	417413	3723706	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and M-WO. Last seen 5/31/10, not detected since then to date, 2013.
LG-MLB	178175671	HY	U	3/18/10	417416	3723705	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and M-WO. Was seen feeding a later fledgling, M-YLB. Last seen 11/8/10, but became the paired female at UNB02 in 2011.
LG-MLB	178175671	SY	F	2011	417349	3723326	Upper Newport Bay	UNB02	Paired & Fledged Chicks	Paired with the sibling from a later brood she was seen feeding in 2010. M-YDB. Produced 2 fledglings in 2011.
LG-MLB	178175671	TY	F	2012	417307	3723255	Upper Newport Bay	UNB02	Paired & Fledged Chicks	Still paired with M-YDB. Produced 2 fledglings in 2012.
LG-MLB	178175671	3 yrs	F	2013	417353	3723327	Upper Newport Bay	UNB02	Paired & Nesting	Still paired with M-YDB. Two brood nests depredated and no fledglings produced in 2013.
K-KM	233188207	HY	U	5/30/11	417349	3723326	Upper Newport Bay	UNB02	Fledgling	Fledgling of M-YDB and LG-MLB. Last seen 7/1/11, not detected since then to date, 2013
RM-YP	233188208	HY	U	5/30/11	417349	3723326	Upper Newport Bay	UNB02	Fledgling	Fledgling of M-YDB and LG-MLB. Last seen 7/1/11, not detected since then to date, 2013.
ODB-YM	233188230	HY	U	5/15/12	417307	3723255	Upper Newport Bay	UNB02	Fledgling	Fledgling of M-YDB and LG-MLB. Last seen 7/2/12, not detected since then to date, 2013.
MW-WO	233188231	HY	U	5/15/12	417307	3723255	Upper Newport Bay	UNB02	Fledgling	Fledgling of M-YDB and LG-MLB. Last seen 6/13/12, not detected since then to date, 2013.
OP-MK	233188326	N	U	5/13/13	417353	3723327	Upper Newport Bay	UNB02	Nestling	Fledgling of M-YDB and LG-MLB. Nest apparently depredated.
YGN-M	233188327	N	U	5/13/13	417353	3723327	Upper Newport Bay	UNB02	Nestling	Fledgling of M-YDB and LG-MLB. Nest apparently depredated.
MR-LBDB	233188328	N	U	5/13/13	417353	3723327	Upper Newport Bay	UNB02	Nestling	Fledgling of M-YDB and LG-MLB. Nest apparently depredated.
M-WGN	233188329	N	U	5/13/13	417353	3723327	Upper Newport Bay	UNB02	Nestling	Fledgling of M-YDB and LG-MLB. Nest apparently depredated.
W-MP	168187840	HY	U	5/10/10	417413	3723706	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and M-WO. Last seen 12/28/10, but became her father's, OM-LG, mate starting in 2011.

Table 6b *continued* . Cactus Wrens, from 2006 to 2013, that are associated with the 2006 Translocation from Portola Springs area near the central reserve to Upper Newport Bay in the coastal reserve.

Color Bands (RLeg-LL)	USFWS Band Number	Age [†]	Sex	Date	NAD83 UTM		Location	Territory	Breeding Status	Summary Observations*
W-MP	168187840	SY	F	2011	417453	3723769	Upper Newport Bay	UNB01	Paired & Fledged	Paired with her father, OM-LG. Produced 2-3 fledglings in 2011.
W-MP	168187840	TY	F	2012	417415	3723710	Upper Newport Bay	UNB01	Paired & Fledged	Paired with her father, OM-LG. Produced 3+ fledglings 2012.
W-MP	168187840	3 yrs	F	2013	417438	3723753	Upper Newport Bay	UNB01	Paired & Fledged	Paired with her father, OM-LG. Produced 4 fledglings 2013.
M-YDB	168187841	HY	U	5/10/10	417413	3723706	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and M-WO. Last seen 11/8/10, but became the paired male at UNB02 in 2011. An older sibling, LG-MLB, that was feeding it as a fledgling became its mate.
M-YDB	168187841	HY	U	10/27/10	417369	3723299	Upper Newport Bay	UNB02	Dispersal Juv	Found its way to UNB02 from its natal territory UNB01. It was building and calling in response to playback, territorial defense. A 2nd unidentified wren was seen in the area.
M-YDB	168187841	SY	M	2011	417349	3723326	Upper Newport Bay	UNB02	Paired & Fledged Chicks	Paired with sibling from an earlier brood in 2010, LG-MLB, who was seen feeding it as a fledgling. Produced 2 fledglings in 2011.
M-YDB	168187841	TY	M	2012	417351	3723258	Upper Newport Bay	UNB02	Paired & Fledged Chicks	Still paired with LG-MLB. Produced 2 fledglings in 2012.
M-YDB	168187841	3 yrs	M	2013	417353	3723327	Upper Newport Bay	UNB02	Paired & Nesting	Still paired with LG-MLB. Two brood nests depredated and no fledglings produced in 2013.
M-OLG	178175793	HY	U	7/22/10	417413	3723708	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and M-WO. Last seen 8/9/10, not detected since then to date, 2013.
YM-Y	178175794	HY	U	7/22/10	417413	3723708	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and M-WO. Last seen 8/9/10, not detected since then to date, 2013.
K-MR	178175795	HY	U	7/22/10	417413	3723708	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and M-WO. Last seen 8/9/10, not detected since then to date, 2013.
KDB-M	178175796	HY	U	7/22/10	417413	3723708	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and M-WO. Last seen 8/9/10, not detected since then to date, 2013.
OM-LG	168187706	AHY	M	7/15/06	435075	3728245	Portola Pkwy	2	Single	Wren captured near Portola Pkwy and 241 Toll Road and relocated to Upper Newport Bay the same day.

Table 6b *continued* . Cactus Wrens, from 2006 to 2013, that are associated with the 2006 Translocation from Portola Springs area near the central reserve to Upper Newport Bay in the coastal reserve.

Color Bands (RLeg-LL)	USFWS Band Number	Age [†]	Sex	Date	NAD83 UTM		Location	Territory	Breeding Status	Summary Observations*
OM-LG	168187706	AHY	M	7/15/06	418294	3723959	Upper Newport Bay	UNB04	Released Single	The wren began to forage, build roost nests, and engage in territorial defence behavior. This wren was last observe in 2006 on 9/22/06. Resighted at UNB01
OM-LG	168187706	ASY	M	4/16/07	417475	3723784	Upper Newport Bay	UNB01	Dispersal Unk	Dispersed from UNB04 and Resighted at UNB01.
OM-LG	168187706	ASY	M	2007	417475	3723784	Upper Newport Bay	UNB01	Paired & Fledged	In 2007, the wren's new mate was M-WO . Produced at least one fledglings in 2007.
OM-LG	168187706	4+ yrs	M	2009	417413	3723713	Upper Newport Bay	UNB01	Paired & Fledged	No monitoring conducted during 2008. In 2009, still paired with M-WO. Produced 6 fledglings in 2009.
OM-LG	168187706	5+ yrs	M	2010	417478	3723795	Upper Newport Bay	UNB01	Paired & Fledged Chicks	In 2010, still paired with M-WO. Produced 9 fledglings in 2010.
OM-LG	168187706	6+ yrs	M	2011	417453	3723769	Upper Newport Bay	UNB01	Paired & Fledged Chicks	Missing Orange band in 2011, paired with his daughter, W-MP from 2010. Produced 2-3 fledglings in 2011.
OM-LG	168187706	7+ yrs	M	2012	417415	3723710	Upper Newport Bay	UNB01	Paired & Fledged Chicks	In 2012, paired with his daughter, W-MP from 2010. Produced 3+ fledglings in 2012.
OM-LG	168187706	8+ yrs	M	2013	417438	3723753	Upper Newport Bay	UNB01	Paired & Fledged Chicks	In 2013, paired with his daughter, W-MP from 2010. Produced 4 fledglings in 2013.
WO-OM	233188202	HY	U	5/27/11	417453	3723769	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and W-MP. Last seen 7/1/11, not detected since then to date, 2013.
PP-OM	233188203	HY	U	5/27/11	417453	3723769	Upper Newport Bay	UNB01	Fledgling	Nestling of OM-LG and W-MP. Not resighted as a fledgling.
RM-RLG	233188204	HY	U	5/27/11	417453	3723769	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and W-MP. Last seen 6/16/11, not detected since then to date, 2013.
WM-WR	233188216	HY	U	4/25/12	417448	3723777	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and W-MP. Last seen 7/2/12, not detected since then to date, 2013.
MK-PO	233188321	N	U	4/17/13	417475	3723774	Upper Newport Bay	UNB01	Nestling	Nestling of OM-LG and W-MP. Nest apparently depredated.

Table 6b *continued* . Cactus Wrens, from 2006 to 2013, that are associated with the 2006 Translocation from Portola Springs area near the central reserve to Upper Newport Bay in the coastal reserve.

Color Bands (RLeg-LL)	USFWS Band Number	Age [†]	Sex	Date	NAD83 UTM		Location	Territory	Breeding Status	Summary Observations*
RM-GN	233188322	N	U	4/17/13	417475	3723774	Upper Newport Bay	UNB01	Nestling	Nestling of OM-LG and W-MP. Nest apparently depredated.
OP-MW	233188337	HY	U	7/2/13	417438	3723753	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and W-MP. Last seen 7/17/13.
GN-MR	233188338	HY	U	7/2/13	417438	3723753	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and W-MP. Last seen 7/17/13.
YK-MK	233188339	HY	U	7/2/13	417438	3723753	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and W-MP. Last seen 7/17/13.
PK-OM	233188340	HY	U	7/2/13	417438	3723753	Upper Newport Bay	UNB01	Fledgling	Fledgling of OM-LG and W-MP. Last seen 7/17/13, not detected since then to date, 2013.
MR-O	168187707	HY	U	7/18/06	434923	3727975	Irvine Blvd	3	Fledgling	Fledgling of LBM-LB and M-WLG.
MR-O	168187707	HY	U	7/18/06	417331	3723223	Upper Newport Bay	UNB02	Released Fledgling	Fledgling of M-RW and M-WO. Relocated to Upper Newport Bay with family group the same day. Last observed on 7/21/06, not detected since then to date, 2013.
MW-P	168187708	HY	U	7/18/06	434923	3727975	Irvine Blvd	3	Fledgling	Fledgling of LBM-LB and M-WLG.
MW-P	168187708	HY	U	7/18/06	417331	3723223	Upper Newport Bay	UNB02	Released Fledgling	Fledgling of M-RW and M-WO. Relocated to Upper Newport Bay with family group the same day. Last observed on 8/04/06, at about 37 days old, not detected since then to date, 2013.
MLG-LG	168187709	HY	U	7/18/06	434923	3727975	Irvine Blvd	3	Fledgling	Fledgling of LBM-LB and M-WLG.
MLG-LG	168187709	HY	U	7/18/06	417331	3723223	Upper Newport Bay	UNB02	Released Fledgling	Fledgling of M-RW and M-WO. Relocated to Upper Newport Bay with family group the same day. Last observed on 7/21/06, not detected since then to date, 2013.
LBM-LB	168187710	AHY	M	7/18/06	434923	3727975	Irvine Blvd	3	Paired & Fledged Chicks	Wren captured near Portola Pkwy and 241 Toll Road and relocated to Upper Newport Bay the same day. Relocated to Upper Newport Bay with family group the same day.
LBM-LB	168187710	AHY	M	7/18/06	417331	3723223	Upper Newport Bay	UNB02	Released Pair & Fledglings	The pair began to forage and feed their fledglings, build roost nests, and engage in territorial defence behavior. This wren was last observed 9/22/06.

Table 6b *continued* . Cactus Wrens, from 2006 to 2013, that are associated with the 2006 Translocation from Portola Springs area near the central reserve to Upper Newport Bay in the coastal reserve.

Color	USFWS	NAD83 UTM								Breeding	Summary Observations*
Bands (RLeg-LL)	Band Number	Age [†]	Sex	Date	Easting	Northing	Location	Territory	Status		
M-WLG	168187711	AHY	F	7/18/06	434923	3727975	Irvine Blvd	3	Paired & Fledged Chicks	Wren captured near Portola Pkwy and 241 Toll Road and relocated to Upper Newport Bay the same day. Relocated to Upper Newport Bay with family group the same day.	
M-WLG	168187711	AHY	F	7/18/06	417331	3723223	Upper Newport Bay	UNB02	Released Pair & Fledglings	The pair began to forage and feed their fledglings, build roost nests, and engage in territorial defence behavior. This wren was last observed 9/22/06.	
MLB-O	168187746	SY	U	3/23/09	417353	3723480	Upper Newport Bay	UNB03	Single	Single wren that moved between UNB03 and UNB04.	
MLB-O	168187746	TY	U	1/29/10	418190	3723968	Upper Newport Bay	UNB04	Single	Single wren that moved between UNB03 and UNB04. Last resighting to date, 2013.	

* Yellow - LBP-M dispersed from its natal site at Upper Newport Bay to Quail Hill.

* Orange - Inbreeding.

*Banding Code Definitions:*Age Codes

AHY = After Hatch Year (adult)

ASY = After Second Year

ATY = After Third Year

HY = Hatch year (juvenile)

N = Nestling or Fledgling

SY = In Second Year (The Yr after HY)

TY = In Third Year (The 2nd Yr after HY)

U = Unknown Age (HY or AHY)

3 yrs = Three years old

4 yrs = Four years old

4+ yrs = Four or more years old

5+ yrs = Five or more years old

6+ yrs = Six or more years old

7+ yrs = Seven or more years old

8+ yrs = Eight or more years old

† Age code follows the above categories until known age is past TY (Third Year or ~2 years old), then the age of the bird is in years.

Sex Codes

F = Female

M = Male

U = Unknown

Color Band Codes (Right Leg-Left Leg)

DB = Dark blue

GN = Medium Green

K = Black

H = Hot Pink

LB = Light blue

LG = Light green

M = Metal USFWS band

Mp = Metal USFWS band anodized purple

O = Orange

P = Purple

R = Red

W = White

X = Missing color band

Y = Yellow

Appendix I - Table 7. Dominant plant communities and dominant plant species in cactus scrub vegetation at Nature Reserve of Orange County's 2013 Cactus Wren Study Sites.

Site	Dominant Plant Communities (in approximate Order of Dominance)	Dominant Plant Species/Substrate in Cactus Scrub only (in approximate Order of Dominance)
Aliso Canyon	Coastal Sage Scrub Grassland Riparian Woodland Chapparal Cactus Scrub	California sagebrush (<i>Artemisia californica</i>) California buckwheat (<i>Eriogonum fasciculatum</i>) Coastal prickly pear (<i>Opuntia littoralis</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>) Trace amount
Buck Gully	Coastal Sage Scrub Ruderal Disturbed Riparian Woodland Grassland Oak Woodland Cactus Scrub	California sagebrush (<i>Artemisia californica</i>) California buckwheat (<i>Eriogonum fasciculatum</i>) Laurel sumac (<i>Malosma laurina</i>) Black sage (<i>Salvia mellifera</i>) Black mustard (<i>Brassica nigra</i>) Lemonadeberry (<i>Rhus integrifolia</i>) Coastal prickly pear (<i>Opuntia littoralis</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>) Trace amount
Bommer Canyon/ Bommer Ridge Road	Coastal Sage Scrub Grassland Ruderal Cactus Scrub Riparian Woodland Oak Woodland Developed Disturbed	California sagebrush (<i>Artemisia californica</i>) Laurel sumac (<i>Malosma laurina</i>) California buckwheat (<i>Eriogonum fasciculatum</i>) Coastal prickly pear (<i>Opuntia littoralis</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>) Trace amount Black mustard (<i>Brassica nigra</i>) Red bush monkeyflower (<i>Mimulus aurantiacus</i>) Mexican elderberry (<i>Sambucus mexicana</i>)
Boat Canyon	Disturbed (fire break zone) Coastal Sage Scrub Cactus Scrub	Bare ground Coastal prickly pear (<i>Opuntia littoralis</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>) Trace amount California sagebrush (<i>Artemisia californica</i>) California buckwheat (<i>Eriogonum fasciculatum</i>)
Bonita Reservoir	Coastal Sage Scrub Riparian Woodland	California buckwheat (<i>Eriogonum fasciculatum</i>) California sagebrush (<i>Artemisia californica</i>) Coastal prickly pear (<i>Opuntia littoralis</i>) California encelia (<i>Encelia californica</i>) Black sage (<i>Salvia mellifera</i>)
Crystal Cove State Park	Coastal Sage Scrub Grassland Ruderal Cactus Scrub Riparian Woodland Oak Woodland	Laurel sumac (<i>Malosma laurina</i>) California sagebrush (<i>Artemisia californica</i>) California buckwheat (<i>Eriogonum fasciculatum</i>) Grasses and forbs Black mustard (<i>Brassica nigra</i>) Laurel sumac (<i>Malosma laurina</i>)

Appendix I - Table 7 *continued* . Dominant plant communities and dominant plant species in cactus scrub vegetation at Nature Reserve of Orange County's 2013 Cactus Wren Study Sites.

Site	Dominant Plant Communities (in approximate Order of Dominance)	Dominant Plant Species/Substrate in Cactus Scrub only (in approximate Order of Dominance)
Calle Delgado* (non-NROC site)	Coastal Sage Scrub Riparian Scrub (revegetated) Developed	California sagebrush (<i>Artemisia californica</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>) Coyote Brush (<i>Baccharis pilularis</i>) California buckwheat (<i>Eriogonum fasciculatum</i>)
El Morro Ridge Road	Coastal Sage Scrub Grassland Ruderal Cactus Scrub	Laurel sumac (<i>Malosma laurina</i>) California sagebrush (<i>Artemisia californica</i>) California buckwheat (<i>Eriogonum fasciculatum</i>) Coastal prickly pear (<i>Opuntia littoralis</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>) Trace amount
James Dilley Preserve	Coastal Sage Scrub Chapparal Cactus Scrub Riparian Woodland Oak Woodland Grassland	Black sage (<i>Salvia mellifera</i>) California sagebrush (<i>Artemisia californica</i>) California buckwheat (<i>Eriogonum fasciculatum</i>) Coast prickly pear (<i>Opuntia littoralis</i>) Lemonadeberry (<i>Rhus integrifolia</i>) Coast cholla (<i>Cylindropuntia prolifera</i>)
Laguna Coast Wilderness	Coastal Sage Scrub Grassland Riparian Woodland Cactus Scrub Oak Woodland	Laurel sumac (<i>Malosma laurina</i>) California sagebrush (<i>Artemisia californica</i>) California buckwheat (<i>Eriogonum fasciculatum</i>) Black sage (<i>Salvia mellifera</i>) Coast prickly pear (<i>Opuntia littoralis</i>)
Laguna Canyon "Triangle" (Highway 133, 73, and El Toro Road)	Coastal Sage Scrub Grassland Cactus Scrub Oak Woodland	California sagebrush (<i>Artemisia californica</i>) Laurel sumac (<i>Malosma laurina</i>) Coastal prickly pear (<i>Opuntia littoralis</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>) Trace amount
Laguna Laurel	Coastal Sage Scrub Grassland Cactus Scrub	Grasses California sagebrush (<i>Artemisia californica</i>) California buckwheat (<i>Eriogonum fasciculatum</i>) Black sage (<i>Salvia mellifera</i>) Coastal prickly pear (<i>Opuntia littoralis</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>)
Muddy Canyon	Coastal Sage Scrub Grassland Cactus Scrub Riparian Woodland	Coastal prickly pear (<i>Opuntia littoralis</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>) Lemonadeberry (<i>Rhus integrifolia</i>) California sagebrush (<i>Artemisia californica</i>) Mexican elderberry (<i>Sambucus mexicana</i>)

Appendix I - Table 7 *continued* . Dominant plant communities and dominant plant species in cactus scrub vegetation at Nature Reserve of Orange County's 2013 Cactus Wren Study Sites.

Site	Dominant Plant Communities (in approximate Order of Dominance)	Dominant Plant Species/Substrate in Cactus Scrub only (in approximate Order of Dominance)
Mule Deer	Coastal Sage Scrub Ruderal Grassland Cactus Scrub Riparian Woodland	California buckwheat (<i>Eriogonum fasciculatum</i>) California sagebrush (<i>Artemisia californica</i>) Lemonadeberry (<i>Rhus integrifolia</i>) Laurel sumac (<i>Malosma laurina</i>) Coastal prickly pear (<i>Opuntia littoralis</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>)
NE Laguna Canyon (non-NROC site)	Grassland Ruderal Riparian Woodland Coastal Sage Scrub Disturbed	Forbs and grasses Bare ground Coastal prickly pear (<i>Opuntia littoralis</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>) California buckwheat (<i>Eriogonum fasciculatum</i>) California sagebrush (<i>Artemisia californica</i>)
Quail Hill	Coastal Sage Scrub Ruderal Grassland Cactus Scrub Disturbed	Coastal prickly pear (<i>Opuntia littoralis</i>) California buckwheat (<i>Eriogonum fasciculatum</i>) California sagebrush (<i>Artemisia californica</i>) Laurel sumac (<i>Malosma laurina</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>) White sage (<i>Salvia apiana</i>) Mexican elderberry (<i>Sambucus mexicana</i>)
Ridgeline	Coastal Sage Scrub Cactus Scrub Ruderal Grassland	California sagebrush (<i>Artemisia californica</i>) California buckwheat (<i>Eriogonum fasciculatum</i>) Coastal prickly pear (<i>Opuntia littoralis</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>) Trace amount Mexican elderberry (<i>Sambucus mexicana</i>) Bare ground Lemonadeberry (<i>Rhus integrifolia</i>) Laurel sumac (<i>Malosma laurina</i>) Black sage (<i>Salvia mellifera</i>) Forbs and grasses
Sand Canyon Reservoir	Coastal Sage Scrub Grassland Cactus Scrub Ruderal Disturbed	California sagebrush (<i>Artemisia californica</i>) California buckwheat (<i>Eriogonum fasciculatum</i>) Coastal prickly pear (<i>Opuntia littoralis</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>) Trace amount Grasses and forbs Laurel sumac (<i>Malosma laurina</i>) Lemonadeberry (<i>Rhus integrifolia</i>)

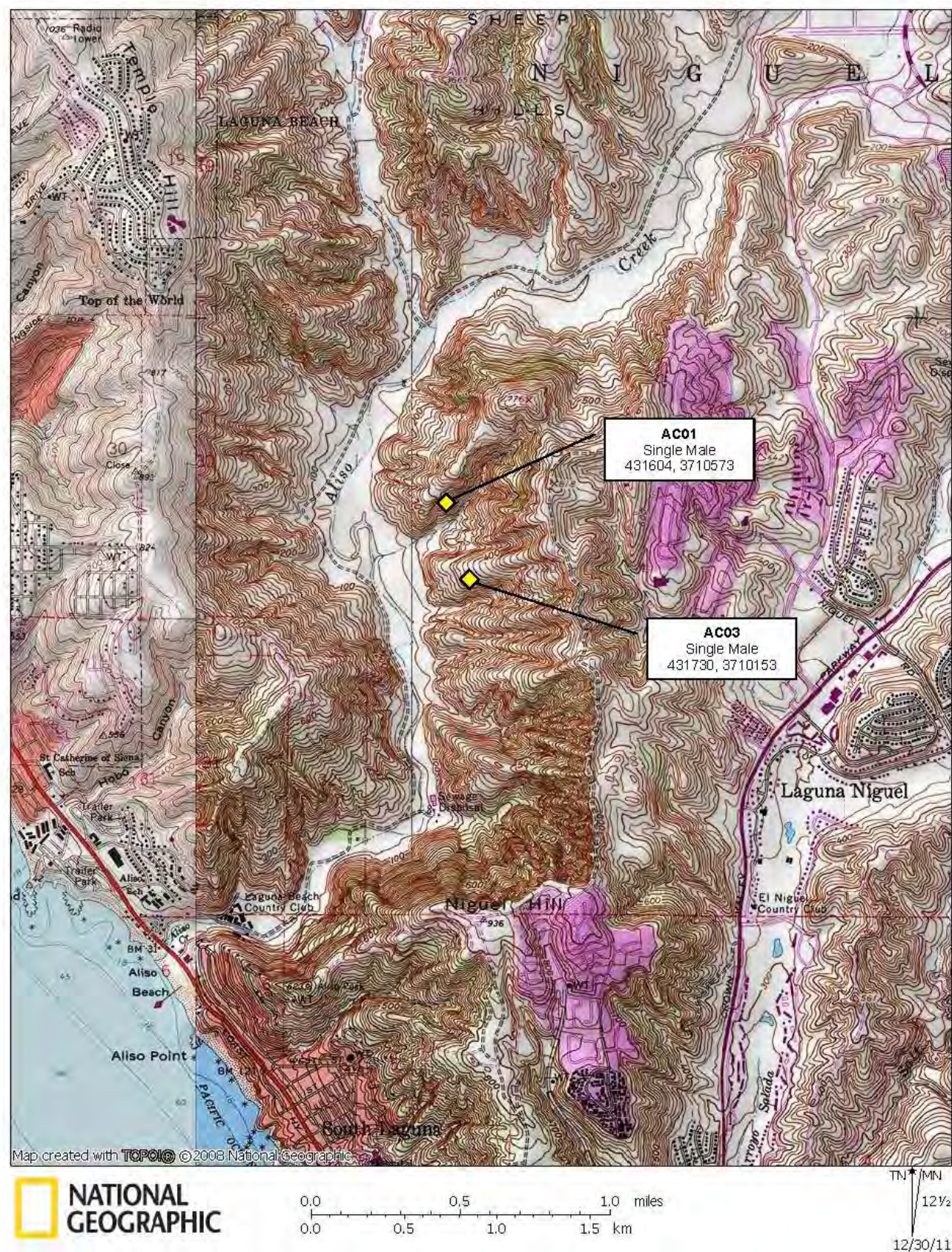
Appendix I - Table 7 *continued* . Dominant plant communities and dominant plant species in cactus scrub vegetation at Nature Reserve of Orange County's 2013 Cactus Wren Study Sites.

Site	Dominant Plant Communities (in approximate Order of Dominance)	Dominant Plant Species/Substrate in Cactus Scrub only (in approximate Order of Dominance)
Shady Canyon	Coastal Sage Scrub Grassland Ruderal Cactus Scrub	Laurel sumac (<i>Malosma laurina</i>) California sagebrush (<i>Artemisia californica</i>) California buckwheat (<i>Eriogonum fasciculatum</i>) Black sage (<i>Salvia mellifera</i>) Deerweed (<i>Lotus scoparius</i>) Coastal prickly pear (<i>Opuntia littoralis</i>)
Turtle Ridge	Coastal Sage Scrub Grassland Cactus Scrub Ruderal Riparian Woodland Oak Woodland	Laurel sumac (<i>Malosma laurina</i>) California sagebrush (<i>Artemisia californica</i>) California buckwheat (<i>Eriogonum fasciculatum</i>) Coastal prickly pear (<i>Opuntia littoralis</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>) Trace amount Red bush monkeyflower (<i>Mimulus aurantiacus</i>)
Turtle Rock	Coastal Sage Scrub Disturbed (mowed fire break zone) Ruderal	California sagebrush (<i>Artemisia californica</i>) California buckwheat (<i>Eriogonum fasciculatum</i>) California encelia (<i>Encelia californica</i>) Black mustard (<i>Brassica nigra</i>) Coastal prickly pear (<i>Opuntia littoralis</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>)
UC Irvine	Cactus Scrub Coastal Sage Scrub Grassland Ruderal Disturbed (restoration) Developed	California buckwheat (<i>Eriogonum fasciculatum</i>) California sagebrush (<i>Artemisia californica</i>) Coastal prickly pear (<i>Opuntia littoralis</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>) Trace amount California encelia (<i>Encelia californica</i>) Mexican elderberry (<i>Sambucus mexicana</i>) Laurel sumac (<i>Malosma laurina</i>)
Upper Newport Bay	Ruderal Coastal Sage Scrub Coastal Salt March Cactus Scrub	California encelia (<i>Encelia californica</i>) Coastal prickly pear (<i>Opuntia littoralis</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>) Trace amount California sagebrush (<i>Artemisia californica</i>) Lemonadeberry (<i>Rhus integrifolia</i>) Poison oak (<i>Toxicodendron diversilobum</i>) Mexican elderberry (<i>Sambucus mexicana</i>) California buckwheat (<i>Eriogonum fasciculatum</i>) Grasses and forbs Bare ground

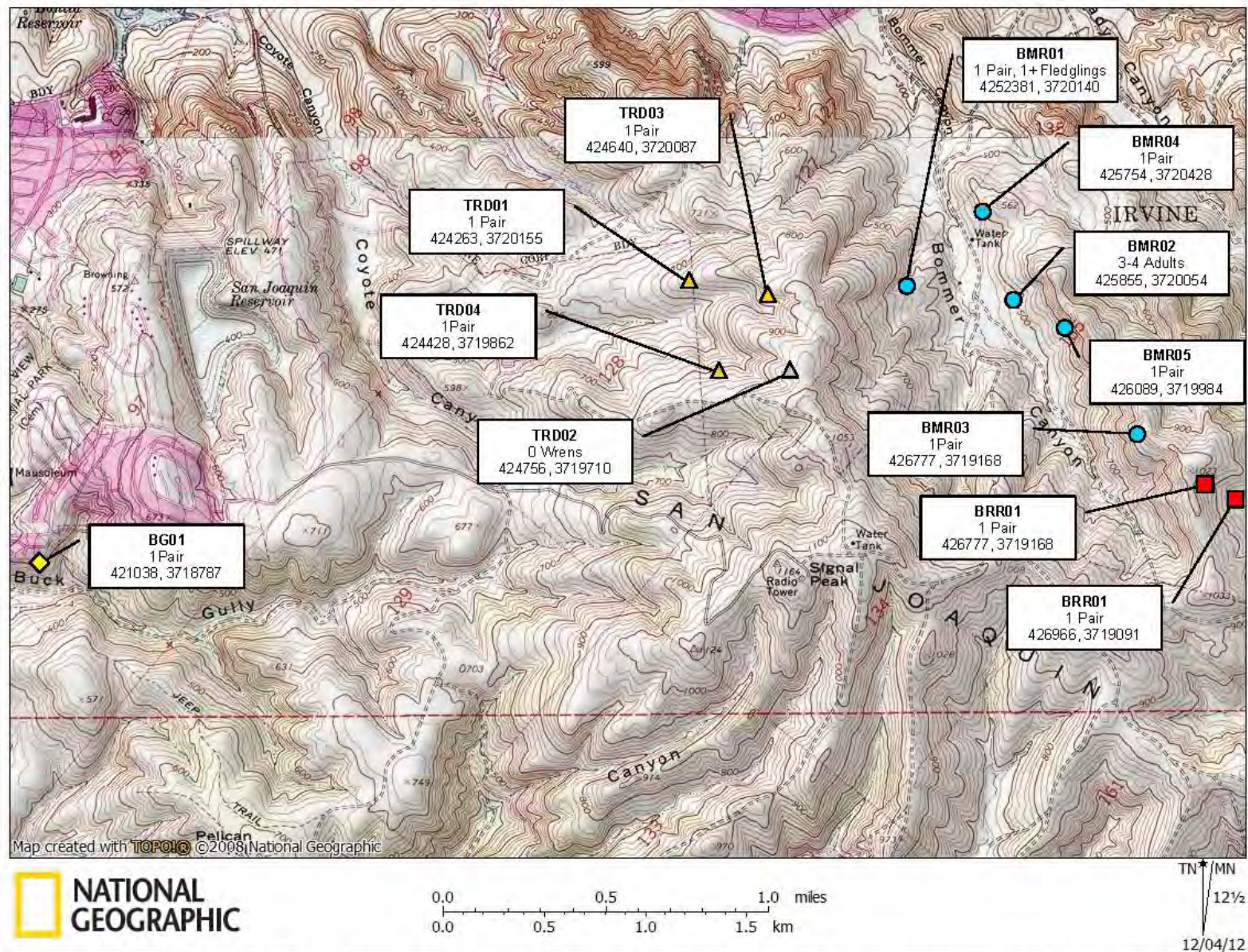
Appendix I - Table 7 *continued* . Dominant plant communities and dominant plant species in cactus scrub vegetation at Nature Reserve of Orange County's 2013 Cactus Wren Study Sites.

Site	Dominant Plant Communities (in approximate Order of Dominance)	Dominant Plant Species/Substrate in Cactus Scrub only (in approximate Order of Dominance)
Woods Canyon	Coastal Sage Scrub Cactus Scrub	California sagebrush (<i>Artemisia californica</i>) Lemonadeberry (<i>Rhus integrifolia</i>) California buckwheat (<i>Eriogonum fasciculatum</i>) Coastal prickly pear (<i>Opuntia littoralis</i>) Coastal cholla (<i>Cylindropuntia prolifera</i>) Trace amount Laurel sumac (<i>Malosma laurina</i>) Toyon (<i>Heteromeles arbutifolia</i>)

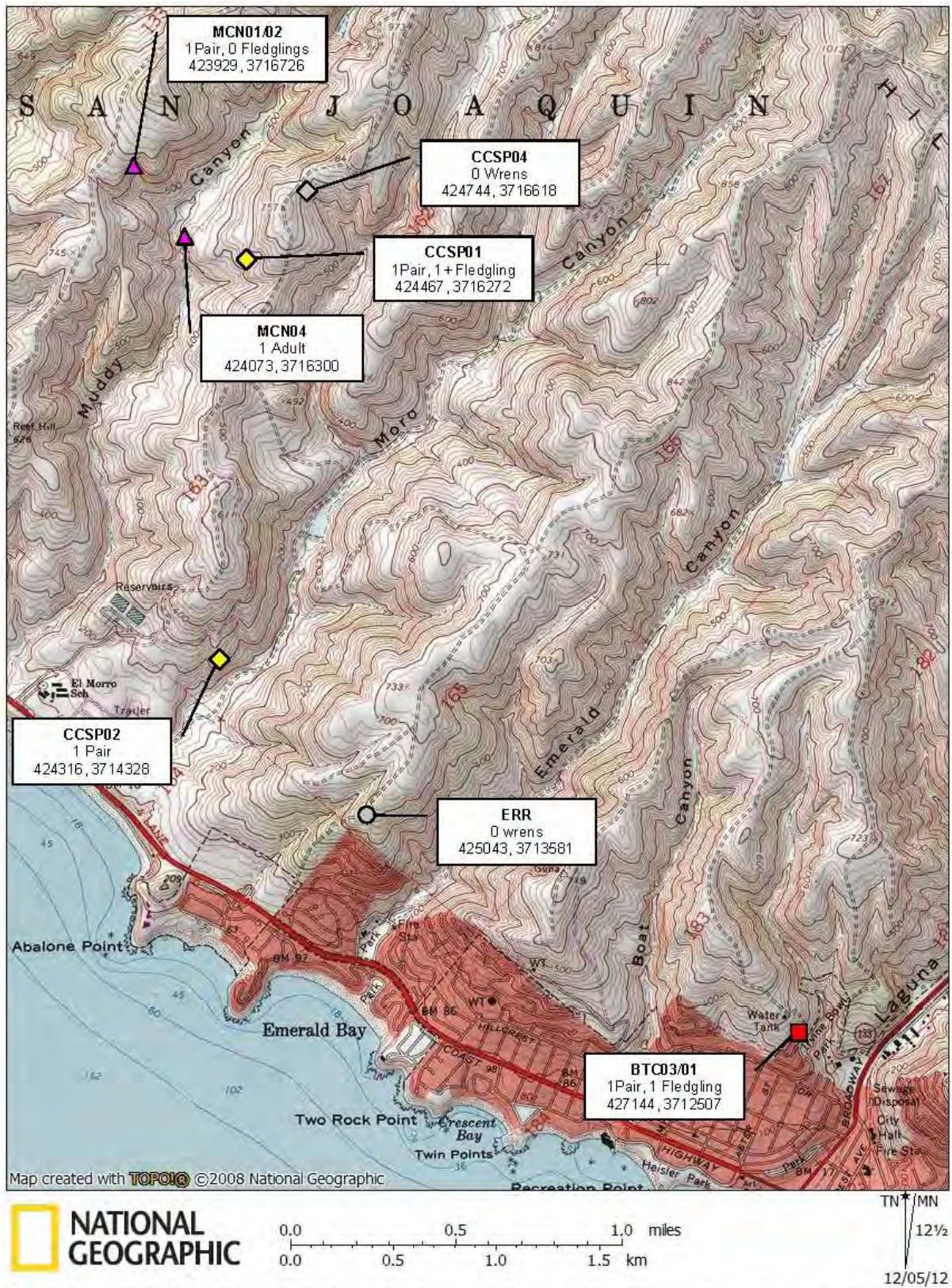
* This territory is not at a NROC study site.



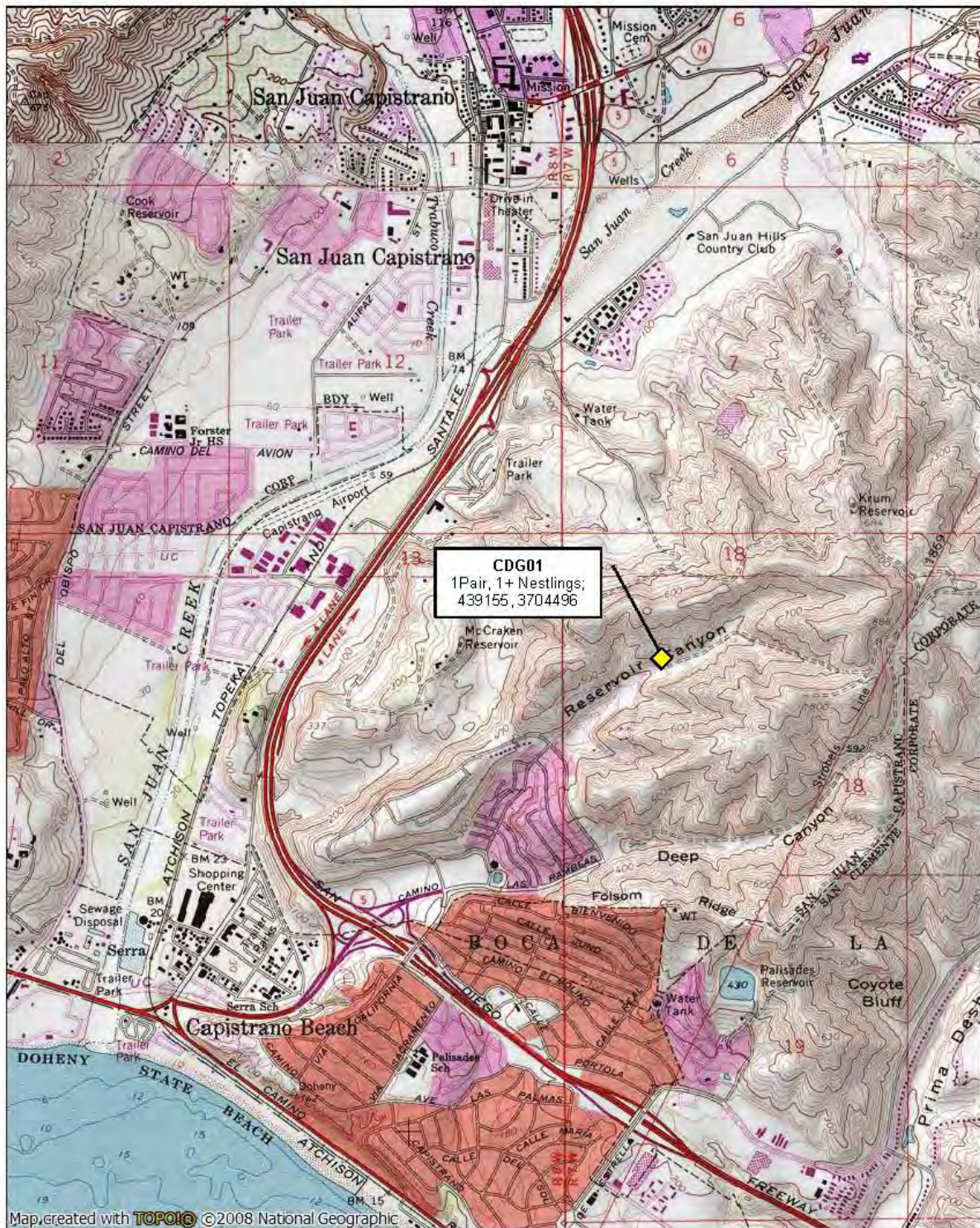
Appendix II - Figure 1.



Buck Gully, Turtle Ridge, Bommer Cyn., and Bommer Ridge Rd., 2013 Cactus wren territories. BG-2 Adults; TRD-6 Adults; BMR-11-12 Adults & 1+ Juvs.; BRR-4 Adults. Habitat was Coast prickly-pear series within coastal sage scrub or grassland. Laguna Beach 7.5' quad.; T6S, R9W. Field visits 15 Mar. to 8 Jul. 2013.



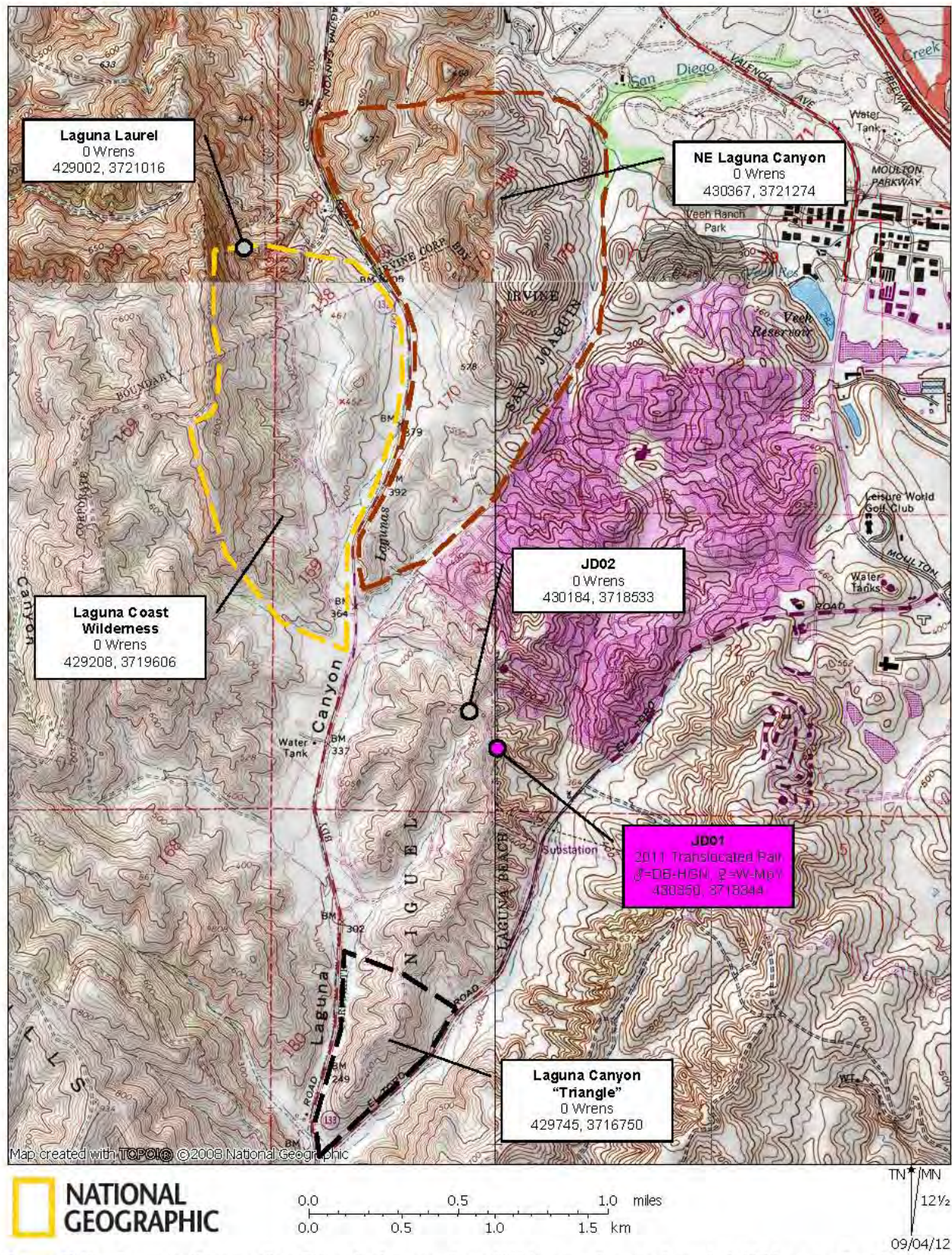
Boat Canyon, Crystal Cove State Park, El Moro Ridge Road, and Muddy Canyon: 2013 Cactus wren territories. BTC-2 Adults & 1 Juv.; CCSP-4 Adults & 1+ Juvs.; ERR-0 Wrens; MCN-3 Adults. Habitat was Coast prickly-pear series within coastal sage scrub. Laguna Beach 7.5' quad. T7S, R9W. Field visits 14 Mar. to 19 Jul. 2013.



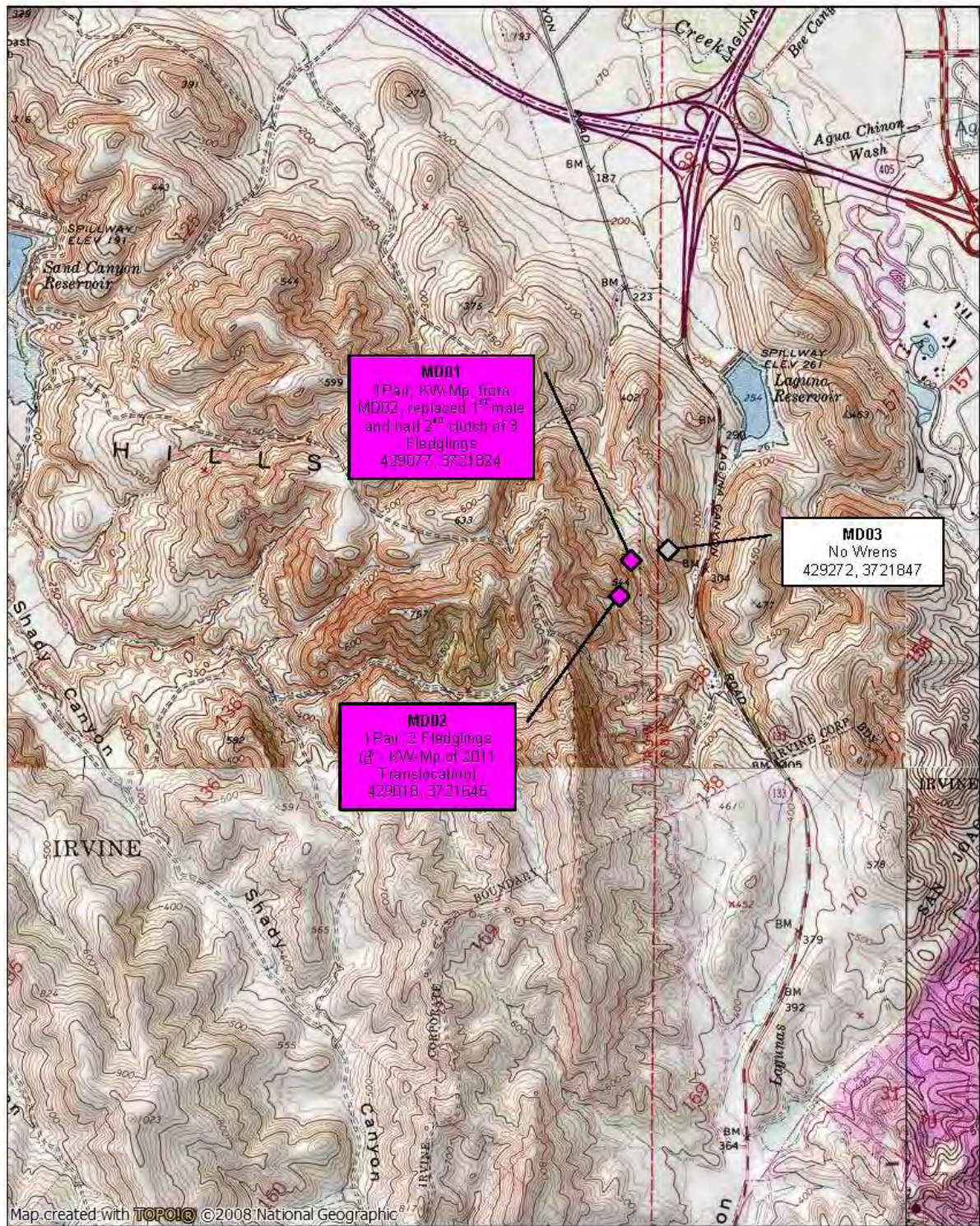
0.0 0.5 1.0 miles
0.0 0.5 1.0 1.5 km

TN MN
12°
01/03/14

Calle Delgado (not a NROC project site): Incidental 2013 cactus wren territory sighting. 2 Adults & a brood nest. Dana Point 7.5' quad.; T8S, R7W. Coast prickly-pear series; Field visits occurred 3 May 2013.



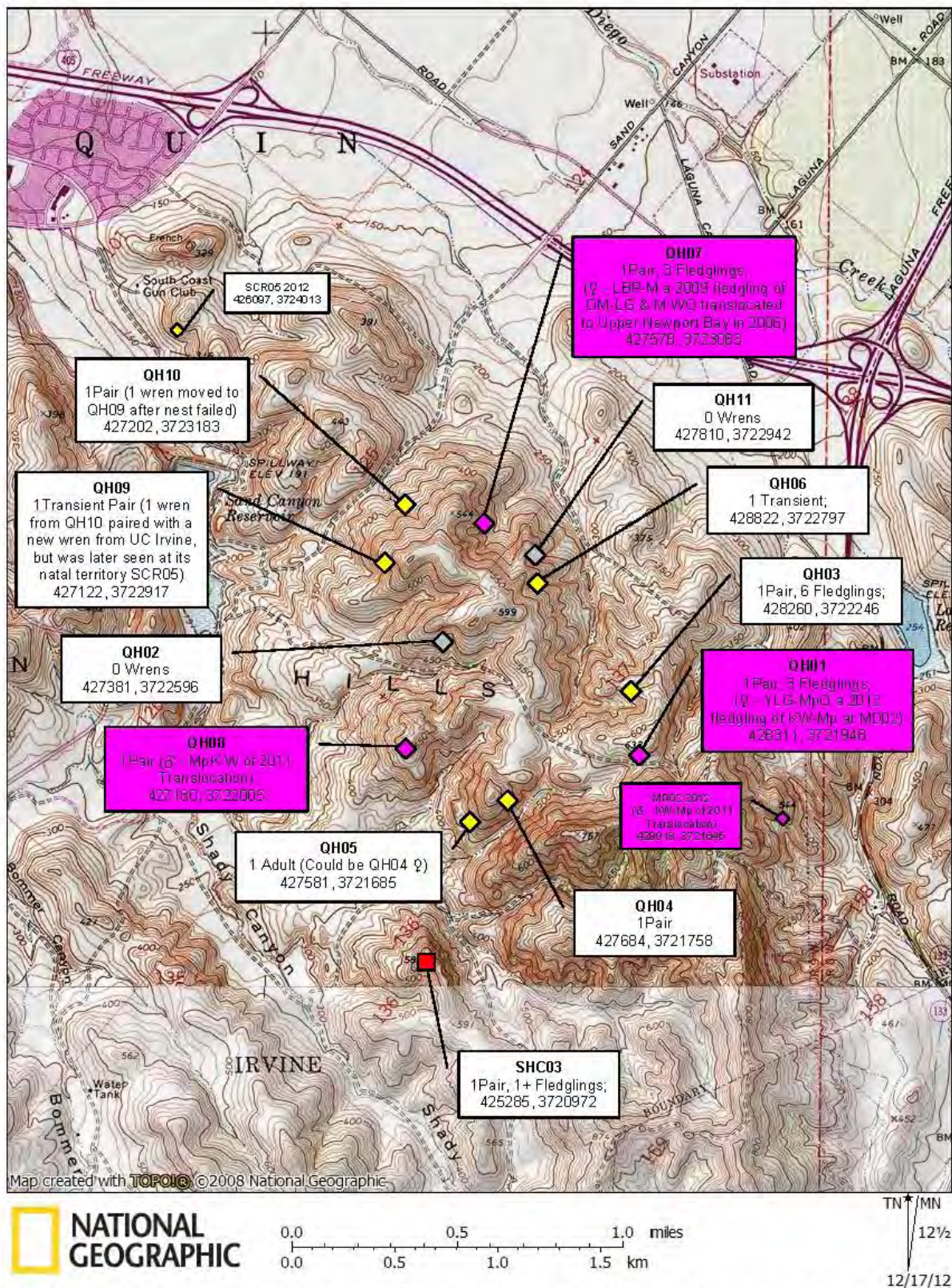
James Dilley Preserve, Laguna Cyn Triangle, Laguna Coast Wilderness, Laguna Laurel, & NE Laguna Cyn: 2013 Cactus wren territories. Wrens relocated to James Dilley Preserve in 2011. Habitat is Coastal sage scrub and Coast prickly-pear series. Laguna Beach 7.5' quad.; T6S, R8W, Sec. 31. Field visits 6 Mar. to 15 July 2013.



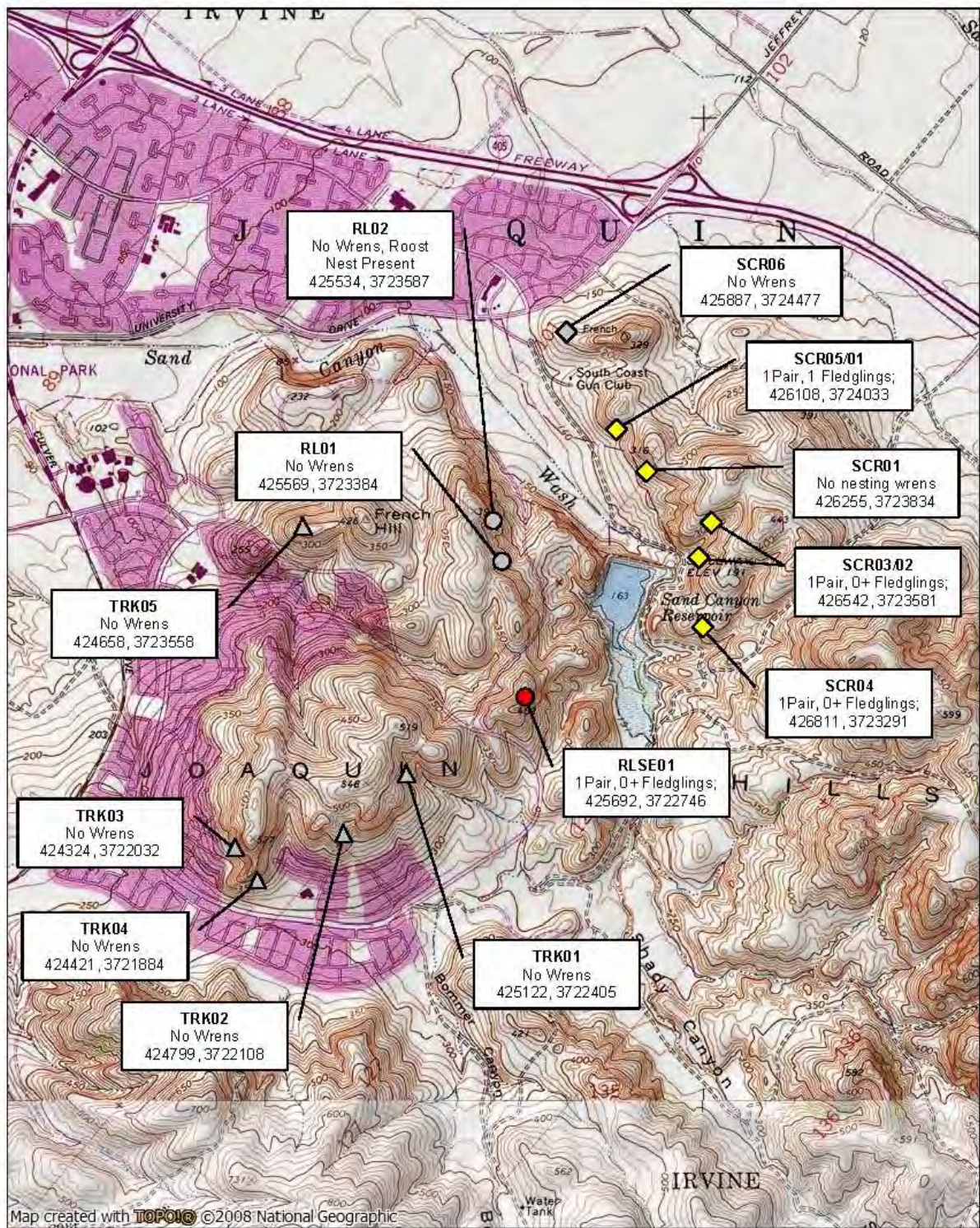
0.0 0.5 1.0 miles
0.0 0.5 1.0 1.5 km

TN MN
12°
01/05/14

Mule Deer: 2013 Cactus wren territories. 4 Adults & 5 Juvs. KW-Mp male wren was translocated to James Dille in 2011, feeding fledglings at MD02 in 2012 and 2013, and then paired with the MD01 female to raise another clutch, also in 2013. Habitat was Coast prickly-pear series within coastal sage scrub and grassland. Tustin quad 7.5' quad; T6S, R9W. Field visits 15 Mar. to 24 Jul. 2013.



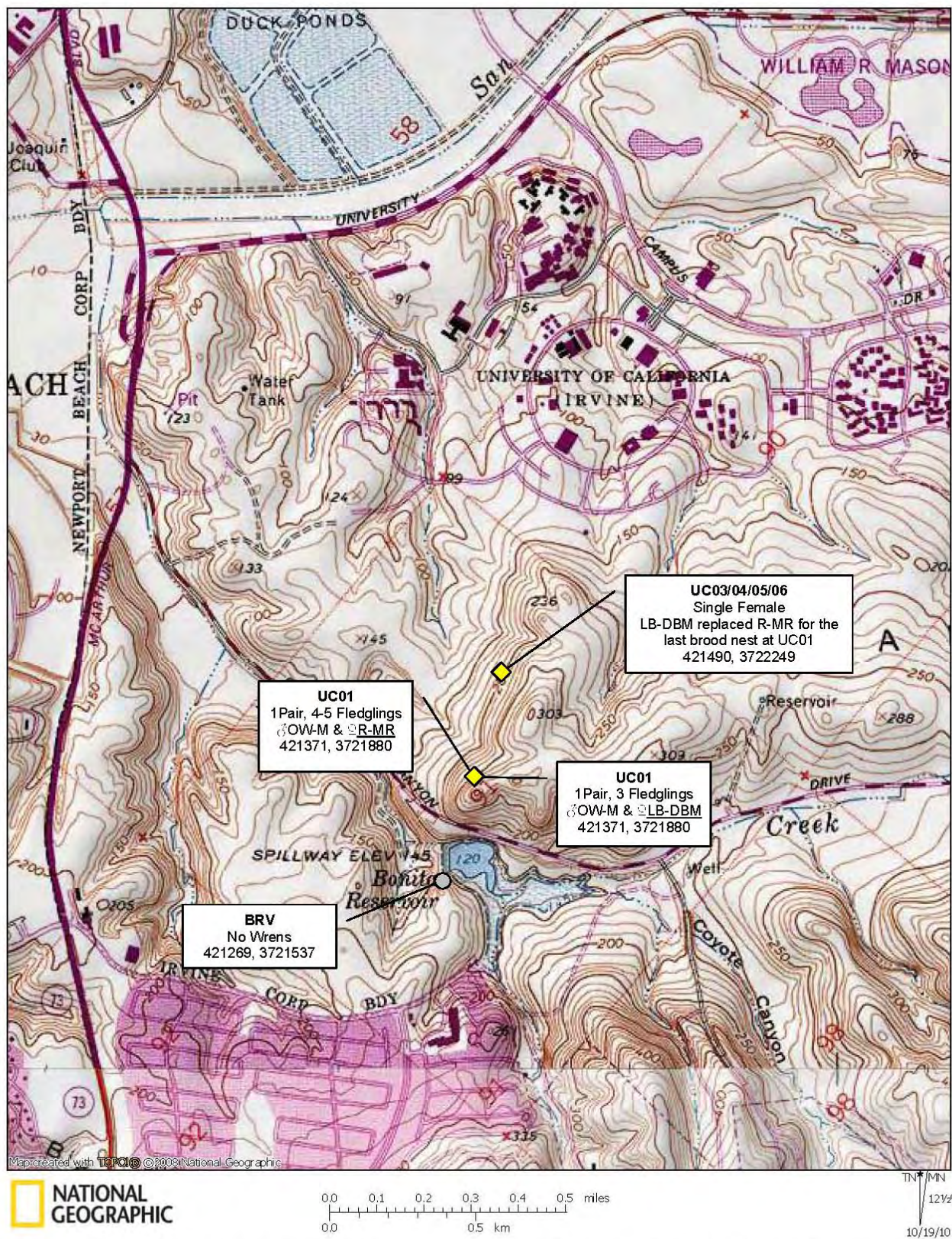
Quail Hill and Shady Canyon: 2013 Cactus wren territories. QH-15 Adults & 12 Juvs.; SHC-2 Adults & 1+ Juvs. Habitat was Coast prickly-pear series within coastal sage scrub and grassland. Tustin quad 7.5' quad; T6S, R9W. Field visits 15 Mar. to 19 Jul. 2013.



0.0 0.5 1.0 miles
0.0 0.5 1.0 1.5 km

TN MN
12½
01/06/14

Ridgeline, Sand Canyon Reservoir, and Turtle Rock: 2013 Cactus wren territories. RLSE-2 Adults & 0+ Juvs; SCR-6 Adults & 1+ Juvs. Habitat was Coast prickly-pear series within coastal sage scrub and grassland. Tustin 7.5' quad; T6S, R9W. Field visits 17 Mar. to 21 Jun. 2013.



UC Irvine and Bonita Reservoir: 2013 Cactus wren territories. 4 Adults and 7-8 Juvs. Tustin 7.5' quad.; T6S, R9W, Sec. 20. Habitat was patches of Coast prickly-pear series within coastal sage scrub and grassland. Field visits occurred 14 Feb. to 7 Aug. 2013.



0.0 0.5 1.0 miles
0.0 0.5 1.0 1.5 km

TN MN
12½
12/19/12

Upper Newport Bay: 2013 cactus wren territories. UNB-4 Adults & 4 Juvs. Newport Beach 7.5' quad; T6S, R10W. Coast prickly-pear series; Field visits occurred 19 Mar. to 17 Jul. 2013.

